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DrukGreen
(a dhi company)

Procurement of Plant

(Single-Stage One-Envelope Bidding Procedure)

BIDDING DOCUMENT
for
Procurement of
Design, Supply, Installation, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems

Issued on: June 3, 2024
Invitation for Bids No.: DGPC/PCD/CS/68/2024/1303
OCB No.: DGPC/01-Subproject 1
Employer: Druk Green Power Corporation Limited
Country: Bhutan

Preface

This Bidding Document for Procurement of Plant – Design, Supply, and Installation, has been prepared by [Druk Green Power Corporation Limited] and is based on the Standard Bidding Document for Procurement of Plant – Design, Supply, and Installation (SBD Plant) issued by the Asian Development Bank dated [*December 2021*].

ADB's SBD Plant has the structure and the provisions of the Master Procurement Document entitled "Procurement of Plant – Design, Supply, and Installation", prepared by multilateral development banks and other public international financial institutions except where ADB-specific considerations have required a change.

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Invitation for Bids

IFB No. and Date	DGPC/PCD/CS/68/2024/1303 dated June 3, 2024
Loan/ Grant No. and Title	Project No. 56325-001-BHU: Distributed (Rooftop) Solar Photovoltaic Systems for Public Infrastructure
Contract No. and Title	OCB No: DGPC/01-Subproject 1: Procurement of Plant - Design, Supply, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems
Deadline for Submission of Bids	July 15, 2024, 15.00 hours (Bhutan Standard Time)

1. The Druk Green Power Corporation Limited has applied for financing from the Asian Development Bank (ADB) toward the cost of Design, Supply, Installation, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems. Part of this financing will be used for payments under the contract named above. Bidding is open to Bidders from eligible source countries of ADB.

2. The Druk Green Power Corporation Limited ("the Employer") invites sealed bids from eligible Bidders for the Design, Supply, Installation, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems ("the Facilities").

3. Open competitive bidding will be conducted in accordance with ADB's Single Stage: One Envelope procedure and is open to all Bidders from eligible countries as described in the Bidding Documents.

4. Eligible Bidders with key qualifications as defined below may participate in this bidding:

   Experience in Design, Supply, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems including micro inverters with phase couplers.

   Note: Detailed qualification criteria for the bidder are defined in the Bidding Documents.

5. A Pre–Bid meeting will be held on June 25, 2024 at 15:00hours.

6. Bidding Document can be downloaded from the Employer's website: https://www.drukgreen.bt

7. Electronic bid submission will not be allowed. The bid, in written hard copy, must be delivered to the Employer's address provided at serial number 9 and as detailed in the table below:

Sl. No.	Package No/Lot No	Item	Amount of Bid security in US$	Last Date for Selling of Bid Documents	Deadline for Bid Submission	Date & Time of Opening of bids
1	DGPC/01-Subproject 1	Design, supply, installation, testing, and commissioning of grid-connected solar photovoltaic systems	70,000.00	July 14, 2024	15:00 hours on July 15, 2024	15:30 hours on July 15, 2024

8. Bids will be opened promptly after the deadline for bid submission in the presence of Bidders' representatives who choose to attend in physical presence or attend through virtual meeting. For virtual attendance, Bidders shall request for virtual attendance one week prior to bid submission. The link for virtual attendance will be sent to bidders one day prior to bid opening.

9. Further information can be obtained from the address given below:

Head, Contracts Section
Projects and Contract Department
Druk Green Power Corporation Limited
Post Box No. 1351, Thori Lam
Thimphu, Bhutan
Tel: +975 2 339875
Email: d.wangdi269@drukgreen.bt

Section 1: Instructions to Bidders

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A. General

1. Scope of Bid

1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of plant and services as specified in Section 6 (Employer's Requirements). The name, identification, and number of lot/s (contract/s) of the open competitive bidding (OCB) are provided in the BDS.

1.2 Throughout this Bidding Document,

(a) the term "in writing" means communicated in written form and delivered against receipt;

(b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and

(c) "day" means calendar day.

2. Source of Funds

2.1 The Borrower or Recipient (hereinafter called "Borrower") indicated in the BDS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "ADB") toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.

2.2 Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called "Financing Agreement") and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.

3. Fraud and Corruption

3.1 ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders, Suppliers, and Contractors, agents, subcontractors, subconsultants, service providers, sub suppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

(ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

(v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;

(vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and

(vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.

(b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;

(d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate[1] in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices or other integrity violations; and

(e) will have the right to require that a provision be included in the Bidding Documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective

[1] Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

officers, directors, employees and personnel, to permit ADB or its representative to inspect the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

3.2 All Bidders, consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:

(a) being available to be interviewed and replying fully and truthfully to all questions asked;

(b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

(c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;

(d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

(e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and

(f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

3.3 All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contract with its sub-consultants, subcontractors, and other third parties engaged or involved in ADB-related activities, such sub-consultants, subcontractors, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

3.4 The Employer hereby puts the Bidder on notice that the Bidder or any Joint Venture partner of the Bidder (if any) may not be able to receive any payments under the Contract if the Bidder or any of its Joint Venture partners, as appropriate, is, or is owned (in whole or in part) by a person or entity subject to applicable sanctions.

3.5 Furthermore, Bidders shall be aware of the provision stated in GCC 9.6 and GCC 42.2.1 (c).

4. Eligible Bidders

4.1 A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5 - or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture. In the case of a Joint Venture,

(a) all partners shall be jointly and severally liable, and

(b) the Joint Venture shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.

4.2 A Bidder, and all partners constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if any of, including but not limited to, the following apply:

(a) they have controlling shareholders in common; or

(b) they receive or have received any direct or indirect subsidy from any of them; or

(c) they have the same legal representative for purposes of this bid; or

(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

(e) a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a Joint Venture, except for alternative offers permitted under ITB 13. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3 (a) - (d) above, this does not limit the participation of a Bidder as a subcontractor in another Bid or of a firm as a subcontractor in more than one Bid; or

(f) a Bidder, Joint Venture partner, associates, parent company or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the plant and services that are the subject of the Bid; or

(g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Borrower as Project Manager for the Contract; or

(h) a Bidder would be providing goods, works, or nonconsulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm.

(i) A Bidder that has a financial or familial relationship with staff of the Employer including project implementing/executing agency, or of a recipient of a part of the loan who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to ADB throughout the procurement process and execution of the contract.

4.4 A firm will not be eligible to participate in any procurement activities under an ADB-financed, -administered, or -supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporary suspended or debarred firm will be rejected and such bid may be in breach of debarment conditions, thereby subject to further ADB's investigation.

4.5 Government-owned enterprises in the Borrower's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not dependent agencies of the Employer.

4.6 A Bidder shall not be under suspension from bidding by the Employer as the result of the execution of a Bid–Securing Declaration.

4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

4.8 Bidders shall be excluded if by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods from, or payments to, a particular country, person, or entity in respect of goods or services originating in that country. Where the Borrower's country prohibits payments to a particular person or entity or for particular goods or services by such an act of compliance, that firm shall be excluded.

5. Eligible Plant and Services

5.1 The plant and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 and all expenditures under the Contract will be limited to such plant and services.

5.2 For purposes of ITB 5.1 above, "origin" means the place where the plant, or component parts thereof are mined, grown, produced, or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Document

6. Sections of Bidding Document

6.1 The Bidding Document consists of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITB 8.

PART I Bidding Procedures
Section 1 - Instructions to Bidders (ITB)
Section 2 - Bid Data Sheet (BDS)
Section 3 - Evaluation and Qualification Criteria (EQC)
Section 4 - Bidding Forms (BDF)
Section 5 - Eligible Countries (ELC)

PART II Requirements
Section 6 - Employer's Requirements (ERQ)

PART III Conditions of Contract and Contract Forms
Section 7 - General Conditions of Contract (GCC)
Section 8 - Special Conditions of Contract (SCC)
Section 9 - Contract Forms (COF)

6.2 The IFB issued by the Employer is not part of the Bidding Document.

6.3 The Employer 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 IFB.

6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the Bid.

7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting

7.1 A prospective Bidder requiring any clarification on the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the BDS, or raise inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond to any request for clarification, provided that such request is received no later than 21 days prior to the deadline for submission of bids. The Employer's response shall be in writing with copies to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 24.2.

7.2 The Bidder 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 provision of plant and services. The costs of visiting the site shall be at the Bidder's own expense.

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

and any other loss, damage, costs, and expenses incurred as a result of the inspection.

7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the pre-bid meeting.

7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.

7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

8. Amendment of Bidding Document

8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.

8.2 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 the Employer in accordance with ITB 6.3.

8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to ITB 24.2

C. Preparation of Bids

9. Cost of Bidding

9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

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

11. Documents Comprising the Bid

11.1 The Bid shall comprise two envelopes submitted simultaneously, one containing the Technical Bid and the other the Price Bid, both envelopes enclosed together in an outer single envelope.

11.2 The Technical Bid submitted by the Bidder shall comprise the following:

(a) Letter of Technical Bid;

(b) Bid Security or Bid-Securing Declaration, in accordance with ITB 21;

(c) alternative Bids, if permissible, in accordance with ITB 13;

(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 22.2;

(e) documentary evidence in accordance with ITB 14.1, that the plant and services offered by the Bidder in its Bid or in any alternative Bid, if permitted, are eligible;

(f) documentary evidence in accordance with ITB 15, the Bidder's eligibility and qualifications to perform the contract if its Bid is accepted;

(g) Technical Proposal in accordance with ITB 17.

(h) documentary evidence in accordance with ITB 16, that the plant and services offered by the Bidder conform to the Bidding Document;

(i) in the case of a bid submitted by a Joint Venture, the Bid shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement;

(j) list of subcontractors, in accordance with ITB 17.2; and

(k) any other document required in the BDS.

11.3 The Price Bid submitted by the Bidder shall comprise the following:

(a) Letter of Price Bid;

(b) completed schedules as required, including Price Schedules, in accordance with ITB 12 and ITB 18;

(c) alternative price Bids, if permissible, in accordance with ITB 13; and

(d) any other document required in the BDS.

12. Letter of Bid and Schedules

12.1 The Letters of Technical Bid and Price Bid, and the Schedules, and all documents listed under ITB 11, shall be prepared using the relevant forms furnished in Section 4 (Bidding Forms). 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 and as required in the BDS.

13. Alternative Bids

13.1 The BDS indicates whether alternative Bids are allowed. If they are allowed, the BDS will also indicate whether they are permitted in accordance with ITB 13.3, or invited in accordance with ITB13.2 and/or ITB 13.4.

13.2 When alternatives to the Time Schedule are explicitly invited, a statement to that effect will be included in the BDS, and the method of evaluating different time schedules will be described in Section 3 (Evaluation and Qualification Criteria).

13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the Employer's requirements as described in the Bidding Document must also provide: (i) a price at which they are prepared to offer a plant meeting the Employer's requirements; and (ii) all information necessary for a complete evaluation of the alternatives by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed installation methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

13.4 When Bidders are invited in the BDS to submit alternative technical solutions for specified parts of the facilities, such parts shall be described in Section 6 (Employer's Requirements). Technical alternatives for the specific parts of the facilities that comply with the performance and technical criteria specified for the plant and services shall be considered by the Employer on their own merits, pursuant to ITB 32.

14. Documents Establishing the Eligibility of Plant and Services

14.1 To establish the eligibility of the plant and services in accordance with ITB 5, Bidders shall complete the Country of Origin Declaration Form included in Section 4 (Bidding Forms).

15. Documents Establishing the Eligibility and Qualifications of the Bidder

15.1 To establish its eligibility and qualifications to perform the Contract in accordance with Section 3 (Evaluation and Qualification Criteria), the Bidder shall provide the information requested in the corresponding information sheets included in Section 4 (Bidding Forms).

15.2 Domestic Bidders, individually or in Joint Ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility as described in ITB 38.

16. Documents Establishing Conformity of the Plant and Services

16.1 The documentary evidence of the conformity of the plant and services to the Bidding Document may be in the form of literature, drawings and data, and shall furnish:

(a) a detailed description of the essential technical and performance characteristics of the plant and services, including the functional guarantees of the proposed plant and services, in response to the Specification;

(b) a list giving full particulars, including available sources, of all spare parts and special tools necessary for the proper and continuing functioning of the plant for the period named in the BDS, following completion of plant and services in accordance with provisions of the contract; and

(c) a commentary on the Employer's Specifications and adequate evidence demonstrating the substantial responsiveness of the plant and services to those specifications. Bidders 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 catalog numbers in its Bid, provided that it demonstrates to the Employer's satisfaction that the substitutions

are substantially equivalent or superior to the standards designated in the Specifications.

17. Technical Proposal, Subcontractors

17.1 The Bidder shall furnish a Technical Proposal, including a statement of work methods, equipment, personnel, schedule, environmental, health and safety (EHS) management plan commensurate with the proposed scope of works, EHS Code of Conduct, and any other information as stipulated in Section 4 (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.

17.2 For major items of plant and services as listed by the Employer in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria), which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including Manufacturers, for each of those items. In addition, the Bidder shall include in its Bid information establishing compliance with the requirements specified by the Employer for these items. Bidders are free to list more than one Subcontractor against each item of the plant and services. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

17.3 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB 4, and that any plant, or services to be provided by the Subcontractor comply with the requirements of ITB 5 and ITB 15.1

18. Bid Prices and Discounts

18.1 Unless otherwise specified in the BDS and/or Section 6 (Employer's Requirements), bidders shall quote for the entire plant and 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 and, where so required by the Bidding Document, the acquisition of all permits, approvals, and licenses, etc.; the operation, maintenance, and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions. 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.

18.2 Bidders are required to quote the price for the commercial, contractual, and technical obligations outlined in the Bidding Document. The prices for all items in the Price Schedules shall be expressed in positive values. If the prices are expressed in negative values, the bid will be rejected.

18.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section 4 (Bidding Forms). Where no different Price Schedules are included in the Bidding Document, Bidders shall present their prices in the following manner: Separate numbered Schedules included in Section 4 (Bidding Forms)

shall be used for each of the following elements. The total amount from each Schedule (Nos. 1 to 4) shall be summarized in a Grand Summary (Schedule No. 5) giving the total bid price(s) to be entered in the Letter of Price Bid. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.

Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad

Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer's Country

Schedule No. 3: Design Services

Schedule No. 4: Installation and Other Services

Schedule No. 5 Grand Summary (Schedule Nos. 1 to 4)

Schedule No. 6: Recommended Spare Parts

Bidders shall note that the plant and mandatory spare parts included in Schedule Nos. 1 and 2 above exclude materials used for civil, building, and other construction works. All such materials shall be included and priced under Schedule No. 4, Installation and Other Services.

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

(a) Plant to be Supplied from Abroad (Schedule No. 1):

(i) the price of the plant shall be quoted carriage and insurance paid (CIP)-named place of destination basis specified in the BDS;

(ii) all customs duties and other taxes paid or payable in the Employer's country on the plant if the contract is awarded to the Bidder; and

(iii) the total price for the plant.

(b) Plant Supplied from Within the Employer's Country (Schedule No. 2):

(i) the price of the plant shall be quoted on an EXW Incoterm basis (ex-works, ex-factory, ex warehouse, ex showroom, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of plant quoted ex works or ex-factory, or on the previously imported plant of foreign origin quoted ex warehouse, ex showroom;

(ii) sales tax and other taxes payable in the Employer's country on the plant if the contract is awarded to the Bidder, and

(iii) the total price for the plant.

(c) Design Services. (Schedule No. 3). Rates or prices shall include all taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of Bids.

(d) Installation and Other Services (Schedule No. 4) shall be quoted separately and shall include rates or prices for local transportation, insurance, and other services incidental to delivery of the plant, all

labor, contractor's equipment, temporary works, materials, consumables, and all matters and things of whatsoever nature, including operations and maintenance services, the provision of operations and maintenance manuals, training, etc., where identified in the Bidding Document, as necessary for the proper execution of the installation and other services, including all taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of bids.

(e) Recommended spare parts (Schedule No. 6) shall be quoted separately as specified in either subparagraph (a) or (b) above in accordance with the origin of the spare parts.

18.5 The current edition of Incoterms, published by the International Chamber of Commerce shall govern.

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

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

(b) In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport, and contractor's equipment in accordance with the procedures specified in the corresponding appendix to the Contract Agreement. A Bid submitted with a fixed price quotation will be treated as nonresponsive and be rejected. The Bidder shall furnish the indexes (e.g. for labor and materials), their weightings and source in the Tables of Adjustment Data included in Section 4 (Bidding Forms). The Employer may require the Bidder to justify its proposed indexes and weightings. Any bid that omits indexes and weightings shall be subject to clarification with the Bidder.

18.7 If so indicated in BDS 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer any price reduction (discount) for the award of more than one contract shall specify in their Letter of Price Bid the price reductions applicable to each package, or alternatively, to individual contracts within the package, and the manner in which the price reductions will apply.

19. Currencies of Bid and Payment

19.1 The currency(ies) of the bid shall be, as specified in the BDS.

19.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements.

20. Period of Validity of Bids

20.1 Bids shall remain valid for the bid validity period specified in the BDS. The bid validity period starts from the date fixed for the bid submission deadline date prescribed by the Employer in accordance with ITB 24.1. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.

20.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 21, it shall also be extended 28 days beyond the deadline of the extended bid 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.

21. Bid Security/ Bid Securing Declaration

21.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS.

21.2 If a Bid-Securing Declaration is required pursuant to ITB 21.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if a Bid-Securing Declaration is executed.

21.3 If a bid security is specified pursuant to ITB 21.1, the bid security shall be, at the Bidder's option, in any of the following forms:

(a) an unconditional bank guarantee (hard copy of the bank guarantee or in the form of SWIFT message MT760), or

(b) an irrevocable letter of credit, or

(c) a cashier's or certified check,

all from a reputable source from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted using either the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Employer. The form must include the complete name of the Bidder. The bid security shall be valid for 28 days beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB 20.2.

21.4 Unless otherwise specified in the BDS, any Bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 21.1, shall be rejected by the Employer as nonresponsive.

21.5 If a bid security is specified pursuant to ITB 21.1, the bid security of substantially nonresponsive Technical Bids shall be returned before opening the Price Bids. The bid security of unsuccessful Bidders at Price Bid evaluation shall be returned promptly upon the successful Bidder's furnishing of the performance security pursuant to ITB 46.

21.6 If a bid security is specified pursuant to ITB 21.1, the bid security of successful Bidders shall be returned promptly once the successful Bidder has signed the Contract and furnished the required performance security.

21.7 The bid security may be forfeited or the Bid-Securing Declaration executed, if

(a) notwithstanding ITB 26.3, a Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, except as provided in ITB 20.2 or

(b) the successful Bidder fails to:

(i) sign the Contract in accordance with ITB 45;

(ii) furnish a performance security in accordance with ITB 46; or

(iii) accept the arithmetical corrections of its Bid in accordance with ITB 36.

21.8 If the bid security is required as per ITB 21.1, the bid security of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security shall be in the name of any or all of the Joint Venture partners. If the Bid-Securing Declaration is required as per ITB 21.1, the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent referred to in ITB 4.1.

22. Format and Signing of Bid

22.1 The Bidder shall prepare one original set of the Technical Bid and one original set of the Price Bid comprising the Bid as described in ITB 11 and clearly mark it “ORIGINAL - TECHNICAL BID” and “ORIGINAL - PRICE BID”. Alternative bids, if permitted in accordance with ITB 13, shall be clearly marked “ALTERNATIVE”. In addition, the Bidder shall submit copies of the Bid, in the number specified in the BDS and clearly mark each of them “COPY.” In the event of any discrepancy between the original and the copies, the original shall prevail.

22.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Employer shall request the Bidder to submit an acceptable authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the period stated in the Employer’s request shall cause the rejection of the Bid. If either the Letter of Technical Bid or Letter of Price Bid or the Bid-Securing Declaration (if applicable) is not signed, the Bid shall be rejected.

22.3 A Bid submitted by a Joint Venture shall be signed so as to be legally binding on all partners.

22.4 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

D. Submission and Opening of Bids

23. Submission, Sealing, and Marking of Bids

23.1 Bidders shall submit their Bids as specified in the BDS. Procedures for submission, sealing and marking are as follows:

(a) Bidders submitting Bids by mail or by hand shall enclose the original and each copy of the Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL," "ALTERNATIVE," and "COPY." These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB 23.2 to ITB 23.6.

(b) Bidders submitting Bids electronically shall follow the electronic bid submission procedures specified in the BDS.

23.2 The inner and outer envelopes shall

(a) bear the name and address of the Bidder,

(b) be addressed to the Employer in accordance with ITB 24.1, and

(c) bear the specific identification of this bidding process indicated in the BDS 1.1.

23.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB 27.1.

23.4 The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB 27.7.

23.5 Alternative Bids, if permissible in accordance with ITB 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB 20 and ITB 21, with the inner envelopes marked in addition "ALTERNATIVE NO…." as appropriate.

23.6 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

24. Deadline for Submission of Bids

24.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.

24.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

25. Late Bids

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

26. Withdrawal, Substitution,

26.1 A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized

and Modification of Bids

representative, and shall include a copy of the authorization in accordance with ITB 22.2 (except for withdrawal notices, which do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be:

(a) prepared and submitted in accordance with ITB 22 and ITB 23 (except for withdrawal notices, which do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and

(b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 24.

26.2 Bids requested to be withdrawn in accordance with ITB 26.1 shall be returned unopened to the Bidders.

26.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Technical Bid or any extension thereof.

27. Bid Opening

27.1 The Employer shall open the Technical Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidder's designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 23.1, shall be as specified in the BDS. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening. If the Technical Bid and the Price Bid are submitted together in one envelope, the Employer may reject the entire Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.

27.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.

27.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 27.1. No envelope shall be substituted unless the corresponding Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

27.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original as well as Modification, will remain unopened in accordance with ITB 27.1.

27.5 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:

(a) the name of the Bidder;

(b) whether there is a modification or substitution;

(c) the presence of a bid security or a Bid-Securing Declaration, if required; and

(d) any other details as the Employer may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Technical Bid are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late Bids, in accordance with ITB 25.1.

27.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; and alternative Bids; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.

27.7 At the end of the evaluation of the Technical Bids, the Employer will invite 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 the Employer. Bidders shall be given reasonable notice of the opening of Price Bids.

27.8 The Employer will notify in writing Bidders who have been rejected for submitting nonresponsive Technical Bids and return their Price Bids unopened together with their bid securities, before opening the Price Bids of the substantially responsive Bidders.

27.9 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders` representatives who choose to attend at the address, on the date, and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.

27.10 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded:

(a) the name of the Bidder;

(b) whether there is a modification or substitution;

(c) the Bid Prices, including any discounts and alternative offers; and

(d) any other details as the Employer may consider appropriate.

Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Price Bid and Price Schedules are to be initialed by at least three representatives of the Employer attending bid the opening. No Bid shall be rejected at the opening of Price Bids.

27.11 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum: the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.

E. 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 Bidders or any other persons not officially concerned with such process until publication of Contract award.

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 should 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. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 36.

29.2 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:

(a) "Deviation" is a departure from the requirements specified in the Bidding Document;

(b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and

(c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

31. Examination of Technical Bids

31.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted. If any of these documents or information is missing, the Bid may be rejected.

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 offer shall be rejected.

(a) Letter of Technical Bid;

(b) written confirmation of authorization to commit the Bidder;

(c) Bid Security or Bid-Securing Declaration, if applicable; and

(d) Technical Proposal in accordance with ITB 17.

32. Responsiveness of Technical Bid

32.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB11.

32.2 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,

(a) if accepted, would:

(i) affect in any substantial way the scope, quality, or performance of the plant and services specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

32.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 17, Technical Proposal, in particular to confirm that all requirements of Section 6 (Employer's Requirements) have been met without any material deviation, reservation, or omission.

32.4 If a Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

33. Nonmaterial Nonconformities

33.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.

33.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities 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.

33.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or nonconforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).

34. Detailed Evaluation of Technical Bids

34.1 The Employer will carry out a detailed technical evaluation of the Bids not previously rejected as being substantially nonresponsive, to determine whether the technical aspects are in compliance with the Bidding Document. The Bid that does not meet minimum acceptable standards of completeness, consistency, and detail, and the specified minimum and/or maximum requirements for specified functional guarantees, will be treated as nonresponsive and hence rejected. To reach such a determination, the Employer will examine and compare the technical aspects of the bids on the basis of the information supplied by the Bidders, taking into account the following:

(a) overall completeness and compliance with the Employer's Requirements; deviations from the Employer's Requirements; conformity of the plant and services offered with specified performance criteria; suitability of the plant and services offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the Bid. The Bid that does not meet minimum and/or maximum acceptable standards of completeness, consistency, and detail will be rejected for nonresponsiveness;

(b) type, quantity, and long-term availability of mandatory and recommended spare parts and maintenance services; and

(c) other relevant factors, if any, listed in Section 3 (Evaluation and Qualification Criteria).

34.2 Where alternative technical solutions have been allowed in accordance with ITB 13, and offered by the Bidder, the Employer will make a similar evaluation of the alternatives. Where alternatives have not been allowed but have been offered, they shall be ignored.

35. Eligibility and Qualification of the Bidder

35.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether a Bidder meets the eligibility and qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).

35.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 15. Unless permitted in the BDS, the determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates.

35.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. The Employer reserves the right to reject the bid of any bidder found to be in circumstances described in

GCC 42.2.1(a). A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.

35.4 The capabilities of the manufacturers and subcontractors proposed in its Bid for the major items of plant and services to be used by a Bidder will also be evaluated for acceptability in accordance with Section 3 (Evaluation and Qualification Criteria). Their participation should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to propose, without changing its bid price, an acceptable substitute manufacturer or subcontractor meeting the minimum technical specifications stated in Section 6 (Employer's Requirements). If a Bidder does not provide an acceptable substitute manufacturer or subcontractor by the date and time set in the Employer's request for substitution of manufacturer or subcontractor, its Bid may be rejected.

35.5 Prior to signing the Contract, the corresponding Appendix to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.

36. Correction of Arithmetical Errors

36.1 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:

(a) 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 amounts given under the column for the price breakdown shall prevail and the Total Price will be corrected accordingly;

(b) where there are errors between the total of the amounts of Schedule Nos. 1 to 4 and the amount given in Schedule No. 5 (Grand Summary), the total of the amounts of Schedule Nos. 1 to 4 shall prevail and the Schedule No. 5 (Grand Summary) will be corrected accordingly;

(c) if there is a discrepancy between the grand total price given in Schedule No. 5 (Grand Summary) and the bid amount in item (c) of the Letter of Price Bid, the grand total price given in Schedule No. 5 (Grand Summary) will prevail and the bid amount in item (c) of the Letter of Price Bid will be corrected; and

(d) if 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 (a), (b), and (c) above.

36.2 If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its bid security may be forfeited or its Bid-Securing Declaration executed.

37. Conversion to Single Currency

37.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS.

38. Domestic Preference

38.1 Unless otherwise specified in the BDS, domestic preference shall not apply.

39. Evaluation and Comparison of Price Bids

39.1 The Employer shall use the criteria and methodologies listed in this clause. No other evaluation criteria or methodologies shall be permitted.

39.2 I. To evaluate a Price Bid, the Employer shall consider the following:

(a) the bid price, excluding provisional sums and the provision, if any, for contingencies in the Price Schedules;

(b) price adjustment for correction of arithmetical errors in accordance with ITB 36.1;

(c) price adjustment due to discounts offered in accordance with ITB 18.7;

(d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 33.3;

(e) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 37;

(f) assessment whether the bid is abnormally low in accordance with ITB 40; and

(g) the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).

II. The Employer's evaluation of a Bid will exclude and not take into account,

(a) in the case of Plant and Mandatory Spare Parts (Schedule No. 1) supplied from abroad, all taxes and duties, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder; and

(b) in the case of Plant and Mandatory Spare Parts (Schedule No. 2) supplied from within the Employer's country, sales and other taxes, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder.

39.3 If price adjustment is allowed in accordance with ITB 18.6, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.

39.4 If this Bidding Document allows Bidders to quote separate prices for different lots (contracts), and the award to a single Bidder of multiple lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Letter of Price Bid, is specified in Section 3 (Evaluation and Qualification Criteria).

39.5 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 methods and time schedule proposed. 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.

39.6 The Employer shall compare all substantially responsive Bids to determine the lowest evaluated Bid, in accordance with ITB 39.2.

40. Abnormally Low Bids

40.1 An abnormally low bid is one where the bid price, in combination with other elements of the bid, appears to be so low that it raises concerns as to the capability of the Bidder to perform the contract for the offered bid price.

40.2 When the offered bid price appears to be abnormally low, the Employer shall undertake a three-step review process as follows:

(a) identify abnormally low costs and unit rates by comparing them with the engineer's estimates, other substantially responsive bids, or recently awarded similar contracts;

(b) clarify and analyze the bidder's resource inputs and pricing, including overheads, contingencies and profit margins; and

(c) decide whether to accept or reject the bid.

40.3 With regard to ITB 40.2 (b) above, the Employer will seek a written explanation from the bidder of the reasons for the offered bid price, including a detailed analysis of costs and unit prices, by reference to the scope, proposed methodology, schedule, and allocation of risks and responsibilities. This may also include information regarding the economy of the manufacturing process; the services to be provided, or the construction method to be used; the technical solutions to be adopted; and any exceptionally favorable conditions available to the bidder for the works, equipment or services proposed.

40.4 After examining the explanation given and the detailed price analyses presented by the bidder, the Employer may:

(a) accept the bid, if the evidence provided satisfactorily accounts for the low bid price and costs, in which case the bid is not considered abnormally low;

(b) accept the bid, but 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. The amount of the performance security shall generally be not more than 20% of the contract price; or

(c) reject the bid if the evidence provided does not satisfactorily account for the low bid price, and make a similar determination for the next ranked bid, if required.

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

41.1 The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

42. Notice of Intention for Award of Contract

42.1 If Standstill provisions apply as specified in the BDS, the standstill period shall be defined in the BDS to specify the duration subsequent to notification of intention for award of contract (before making the actual contract award) within which any unsuccessful bidder can challenge the proposed award.

F. Award of Contract

43. Award Criteria

43.1 The Employer shall award the Contract to the Bidder whose offer has been determined successful in line with ITB 34 to ITB 40 above to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be eligible and qualified to perform the Contract satisfactorily.

44. Notification of Award

44.1 Prior to the expiration of the period of bid validity and upon expiry of the standstill period specified in ITB 42.1, or upon satisfactory resolution of a complaint filed within standstill period, if applicable, the Employer shall transmit the Notification of Award through issuance of Letter of Acceptance using the form included in Section 9 (Contract Forms) to the successful Bidder, in writing, that its Bid has been accepted. At the same time, the Employer shall also notify all other Bidders of the results of the bidding.

44.2 Unless standstill period applies, upon notification of award through issuance of Letter of Acceptance, unsuccessful Bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond in writing and/or in a debriefing meeting to any unsuccessful Bidder who, after publication of contract award, requests a debriefing.

44.3 Until a formal contract is prepared and executed, the notification of award through issuance of Letter of Acceptance shall constitute a binding Contract.

44.4 Within 2 weeks of the award of contract or expiry of the standstill period, where such period applies, or, if a complaint has been filed within the standstill period, upon receipt of ADB's confirmation of satisfactory resolution of the complaint, the borrower shall publish in an English language newspaper or widely known and freely accessible website the results identifying the bid and lot or package numbers, as applicable and the following information:

(a) name of each Bidder who submitted a bid;

(b) bid prices as read out at bid opening;

(c) name and evaluated prices of each bid that was evaluated;

(d) name of Bidders whose Bids were rejected and the reasons for their rejection; and

(e) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.

45. Signing of Contract

45.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.

45.2 Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

46. Performance Security

46.1 Within 28 days of the receipt of notification of award through issuance of Letter of Acceptance from the Employer, the successful Bidder shall furnish the performance security in accordance with the conditions of

contract, subject to ITB 39.5 and ITB 40.4, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Employer. If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.

46.2 Failure of the successful Bidder to submit the abovementioned performance security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event, the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

47. Bidding-Related Complaints

47.1 The procedures for dealing with Bidding-Related Complaints arising out of this bidding process are specified in the BDS.

Section 2: Bid Data Sheet

This section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section 1 (Instructions to Bidders).

A. General

ITB 1.1	The number of the Invitation for Bids (IFB) is: **DGPC/PCD/CS/68/2024/1303 dated June 3, 2024** The Employer is: **Druk Green Power Corporation Limited** The name of the open competitive bidding (OCB) is: **Design, Supply, Installation, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems** The identification number of the OCB is: **DGPC/01-Subproject 1 dated June 3, 2024** The number and identification of lots (contracts) comprising this OCB is: **None.**
ITB 2.1	The Borrower is: **Druk Green Power Corporation Limited**. The name of the Project is: **Project No. 56325-001-BHU: Design, Supply, Installation, Testing and Commissioning of Grid Connected Distributed (Rooftop) Solar Photovoltaic Systems**

B. Contents of Bidding Documents

ITB 7.1	For **clarification purposes** only, the Employer's address is: Attention: Head, Contracts Section Projects and Contract Department Druk Green Power Corporation Limited Street address: Thori Lam Post Box No. 1351 City: Thimphu, ZIP code: 11001 Country: Bhutan Phone no: +975 2 339875 E-mail: d.wangdi269@drukgreen.bt
ITB 7.2	If the bidder intends to make a visit, prior consent should be obtained from the Employer one week before the visit. A site visit will not be organized by the Employer and the costs of visiting the site shall be at the bidder's own expense and at his own risk.
ITB 7.4	A Pre-Bid meeting **will** take place. The date, time and place are as follows: Date: **June 25, 2024** Time: **15.00 hrs (BST)**

	Place: **Conference Hall, Corporate Office, DGPC.** The meeting will be conducted **face to face.** **Video Conference (VC)** shall be arranged for the pre-bid meeting for those who are not able to attend physically. The request should be made **one week** prior to the pre-bid meeting. Any interested party who wishes to attend the meeting virtually should contact: Head, Contracts Section Projects and Contract Department Druk Green Power Corporation Limited Thori Lam Post Box No. 1351 Thimphu, Bhutan Phone no: +975 2 339875 E-mail: d.wangdi269@drukgreen.bt **The Bidders are requested to submit any questions in writing, to reach the Employer not later than 1 week before the pre-bid meeting.**

C. Preparation of Bids

ITB 10.1	The language of the Bid is: **English.**
ITB 11.2 (k)	The Bidder shall submit with its Bid the following additional documents: The Bidder shall submit with its Bid the Attestation Letter using the form included in Section 4 (Bidding Forms) to demonstrate that works, goods and services, and related materials and products to be used for the Project do not involve production or activities involving forced labor and/or child labor. **Failure to submit the Attestation Letter is deemed to be a material deviation and shall result in rejection of the bid**.
ITB 11.3 (d)	The Bidder shall submit with its Price Bid the following additional documents: **No additional documents are required**.
ITB 12.1	The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive.
ITB 13.1	Alternative bids are **not** permitted.
ITB 13.2	Alternatives to the Time Schedule **shall not** be permitted**.**
ITB 13.4	Alternative technical solutions shall be permitted for the following parts of the plant and services: **Not Applicable.**

ITB 16.1 (b)	The period following completion of plant and services in accordance with provisions of the contract shall be: **1 (One) year.**
ITB 17.1	The Bidder shall furnish a Technical Proposal, including a statement of work methods, Health and Safety Management Plan (HSMP), and construction schedule (to be described by the Bidder in sufficient detail to demonstrate the adequacy of its work methods, scheduling, and material sourcing as detailed in Section 4) including the extent to which they are presented in a consistent manner and comply with requirements stipulated in Section 6 (Employer's Requirements) without material deviation, reservation, or omission. If a Bidder submits a proposal that is not commensurate with the proposed works and activities in the bidding document, the Employer shall issue a request for clarification for further information from the Bidder. The Bidder must submit the requested information within 14 calendar days from the date of receiving such a request. Failure to provide a satisfactory response to the request within the prescribed period may cause the rejection of the Bid.
ITB 18.1	Bidders shall quote for the entire plant and services **on a single responsibility basis.**
ITB 18.4(a)(i)	The Incoterm for quoting plant to be supplied from abroad is: **CIP Final destinations: as specified in Sub-project 1 under Section 6 - Employers Requirements.** The bidders shall include in their financial bid the taxes separately and the Employer will ensure that the bidder is exempted from all domestic taxes and duties, wherever applicable. The tax exemption will be provided prior to the import of the goods or in case of delay in obtaining approvals from the relevant Authority, the same will be reimbursed on the completion of the work depending upon the relevant policies at the time of the invoicing. However, the bidder will be liable for the income withholding tax as per the "Income Tax Act of the Kingdom of Bhutan 2001". Withholding tax is applicable over the entire contract amount and will be deducted at source.
ITB 18.6	The prices quoted by the Bidder shall be **fixed.**
ITB 19.1	The currencies of the Bid shall be as follows: (a) The prices shall be quoted either in the currency of the Employer's home country, or in US Dollar. (b) A Bidder expecting to incur a portion of its expenditures in the performance of the Contract in more than one currency, and wishing to be paid accordingly, shall so indicate in the Schedule of Prices and the Letter of Price Bid. (c) If some of the contract expenditures related to Design, Installation and Other Services are to be incurred in the Employer's country, such expenditures shall be quoted in either foreign and/or local currency, depending upon the currency in which the costs are to be incurred. (d) Bidders may be required by the Employer to clarify their local and foreign currency requirements, and to substantiate that the amounts included in the Price

	Schedules are reasonable and responsive to ITB 18.1 in which case a detailed breakdown of its foreign currency requirements shall be provided by the Bidder (e) During the performance of the contract, the foreign currency portions of the outstanding balance of the Contract Price may be adjusted by agreement between the Employer and the Contractor to reflect any changes in foreign currency requirements for the contract. Any such adjustment shall be affected by comparing the amounts quoted in the bid with the amounts already used in the Facilities and the Contractor's future needs for imported items.
ITB 20.1	The bid validity period shall be **120 (One Hundred Twenty)** days from the date of bid submission deadline.
ITB 21.1	The Bidder shall furnish a bid security in the amount of: **USD 70,000.00 (USD Seventy Thousand)**
ITB 21.2	The ineligibility period will be **Not Applicable.**
ITB 21.3	Bidders shall deposit Bid Security only in the form of **a) an unconditional bank guarantee (hard copy of the bank guarantee; or** **b) in the form of SWIFT message MT760)**
ITB 21.4	Subject to the succeeding sentences, any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Employer as nonresponsive. If a Bidder submits a bid security that: (i) deviates in form, amount, and/or period of validity, or (ii) does not provide sufficient identification of the Bidder (including, without limitation, failure to indicate the name of the Joint Venture or, where the Joint Venture has not yet been constituted, the names of all future Joint Venture Partners) the Employer shall request the Bidder to submit a compliant bid security within **14 (fourteen) calenda**r days of receiving such a request. Failure to provide a compliant bid security within the prescribed period of receiving such a request shall cause the rejection of the Bid.
ITB 22.1	In addition to the original Bid, the number of copies is: **1 (one)**
ITB 22.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of an organizational document, board resolution or its equivalent, or power of attorney specifying the representative's authority to sign the Bid on behalf of, and to legally bind the Bidder. If the Bidder is an intended or an existing Joint Venture, the power of attorney should be signed by all partners and specify the authority of the named representative of the Joint Venture to sign on behalf of, and legally bind the intended or existing Joint Venture.
ITB 22.2	The Bidder shall submit an acceptable authorization within **14 (fourteen) calendar** days from the date of receiving such a request.

D. Submission and Opening of Bids

ITB 23.1	Bidders shall submit their bids by hand/Courier.
ITB 23.1 (b)	Electronic bidding submission procedures shall be: **Not Applicable**
ITB 24.1	For **bid submission purpose by hand /Courier** the Employer's address is: Attention: Head, Contracts Section Projects and Contract Department Druk Green Power Corporation Limited Street address: Thori Lam Post Box No: 1351 City: Thimphu, ZIP code: 11001 Country: Bhutan Phone no: +975 2 339875 E-mail: d.wangdi269@drukgreen.bt **The deadline for bid submission is:** Date: **July 15, 2024** Time: **15.00 hrs (Bhutan Standard Time)**
ITB 27	This section will be read as below: 27.1 The Employer shall open the Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidders` designated representatives and anyone who choose to attend. 27.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Bid being substituted. The substituted Bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only envelopes that are opened and read out at bid opening shall be considered further. 27.3 All other envelopes shall be opened one at a time, reading out the name of the Bidder and whether there is a modification; the Bid Price(s), including any discounts and alternative Bids; the presence of a bid security, or a Bid-Securing Declaration, if required; and any other details as the Employer may consider appropriate. Only discounts and alternative Bids read out at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Bid and Price Schedules are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at bid opening except for late Bids, in accordance with ITB 25.1

	27.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot if applicable, including any discounts and alternative Bids; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.
ITB 27.1	The bid opening shall take place at: **Conference Hall, Druk Green Power Corporation Limited** Street address: Thori Lam Post Box No: 1351 City: Thimphu Country: Bhutan Date: **July 15, 2024** Time: **15.30 hrs (Bhutan Standard Time)** **Bidder's representative attending the bid-opening shall provide a letter of authorization from the Bidder**
ITB 27.1	**Video Conference (VC)** shall be arranged for the opening of bid for those who are not able to attend physically. Any interested party who wishes to attend this public opening virtually should contact: Head, Contracts Division Projects and Contract Department Druk Green Power Corporation Limited, Post Box No. 1351, Thori Lam, Thimphu, Bhutan Tel: +975 2 339875 Email id: d.wangdi269@drukgreen.bt **The request should be made 1 week before the deadline for submission of bid. The link to this event shall be sent out to all the registered bidders 1 (one) day prior to bid opening.**
ITB 27.10	The Letter of Bid and Price Schedules shall be initialed by **3** (**three)** representatives of the Employer attending the Bid opening.

E. Evaluation and Comparison of Bids

ITB 35.2	The qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates **"shall not"** be permitted.
ITB 37.1	The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: **BTN**

	The source of the selling exchange rate shall be: **Royal Monetary Authority of Bhutan**, **https://www.rma.org.bt/** The date for the selling exchange rate shall be**: the exchange rates confirmed by the Royal Monetary Authority of Bhutan as the selling exchange rate twenty-eight (28) days prior to the deadline for submission of bids.**
ITB 38.1	Domestic preference **shall not** apply.
ITB 42.1	Standstill provisions shall apply. The duration of standstill period will be **7 (seven)** Calendar days from the date of notice of intention for award of contract. The Employer shall, at the start of the standstill period, notify in writing each Bidder that submitted a bid, of its intention to award a contract to the successful Bidder at the end of standstill period. The notification using the form included in Section 9 (Contract Forms) shall include the following information: (a) the name of each Bidder who submitted a Bid; (b) the bid prices as read out at bid opening; (c) the name and evaluated prices of each Bid that was evaluated; (d) the name of Bidders whose bids were rejected and the reasons for their rejection; (e) the name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded; and (f) a statement of the reason(s) the bid of the unsuccessful Bidder to whom the notification is addressed was unsuccessful, unless the price information under (e) of this paragraph already reveals the reason.

F. Award of Contract

ITB 47.1	The procedures for Bidding-Related Complaints are referenced in Appendix 7 of the Procurement Regulations for ADB Borrowers. The Bidder should submit its complaint following these procedures, in writing, to: For the attention: **Sonam Wangd**i Title/position: **Director, Projects and Contract Department** Employer: **Druk Green Power Corporation Limited** E-mail address: **s.wangdi2586@drukgreen.bt**

Section 3: Evaluation and Qualification Criteria

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1. Evaluation

1.1 Technical Evaluation

In addition to the criteria listed in ITB 34.1 (a)–(b), other relevant factors are as follows:

Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to successfully implement the contract considering its proposed site organization, method statement, mobilization, and construction schedule (to be described by the Bidder in sufficient detail to demonstrate the adequacy of its work methods, scheduling, and material sourcing as detailed in Section 4) including the extent to which they are presented in a consistent manner and comply with requirements stipulated in Section 6 (Employer's Requirements) without material deviation, reservation, or omission.

Noncompliance with equipment and personnel requirements described in Section 6 (Employer's Requirements) shall not normally be a ground for bid rejection and such noncompliance will be subject to clarification during bid evaluation and rectification prior to contract award.

1.2 Alternative Technical Solutions

Technical alternatives, if permitted under ITB 13.4, will be evaluated as follows: **Not applicable.**

1.3 Economic Evaluation

In addition to the criteria listed in ITB 39.2(a)–(f), other relevant factors are as follows:

Adjustments in price that result from the procedures outlined below shall be added, for purposes of comparative evaluation only, to arrive at an "Evaluated Bid Price." Bid prices quoted by Bidders shall remain unaltered.

1.3.1. Quantifiable Deviations and Omissions

Pursuant to ITB 33.3, the cost of all quantifiable nonmaterial nonconformities or omissions from the contractual and commercial conditions shall be evaluated. The Employer will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of Bids.

1.3.2. Time Schedule

Time to complete the entire plant and services from the effective date specified in Article 3 of the Contract Agreement for determining the time for completion of commissioning activities is: **300 (three hundred) calendar days**. No credit will be given for earlier completion.

1.3.3. Operation and Maintenance (O&M) Costs

The O&M cost factors for calculating the life cycle cost are as follows: **None**

1.3.4. Functional Guarantees of the Facilities

The minimum and/or maximum requirements stated in the Specification for functional guarantees required in the Specification are:

	Functional Guarantee	Minimum and/or Maximum Requirements
1	Minimum Annual Energy generated in year 1	1,400 kWh per kW
2	Minimum Performance Ratio (PR) in year 1	80%

The above functional guarantee shall be performed as per Clause No. 1.1.3 (i) of Section 6: Employer's Requirement.

1.3.5. Work, Services, Facilities, etc., to Be Provided by the Employer

Where bids include the undertaking of work or the provision of services or facilities by the Employer in excess of the provisions allowed for in the Bidding Document, the Employer shall assess the costs of such additional work, services and/or facilities during the duration of the contract. Such costs shall be added to the bid price for evaluation.

1.3.6. Specific Additional Criteria

The following additional criteria will be used in the evaluation:

1.3.6.1. Health and Safety Management Plan (HSMP)

Any bid not accompanied by the HSMP shall be rejected by the Employer as nonresponsive. If a Bidder has not submitted an HSMP that is commensurate with the risks and impacts of the proposed works and activities in the bidding document, the Employer shall issue a request for clarification to request for further information from the Bidder. The Bidder must submit the requested information within 14 (fourteen) Calendar days of receiving such a request. Failure to provide a satisfactory response to the request for further information within the prescribed period of receiving such a request may cause the rejection of the Bid.

1.3.7. Domestic Preference

Domestic preference will be granted to eligible domestically produced Plant and Equipment in accordance with the following provisions: **Not Applicable**

1.3.8. Multiple Contracts

Not applicable

2. Qualification

2.1. Eligibility

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

2.1.1 Nationality

Nationality in accordance with ITB 4.2.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1; ELI - 2 with attachments

2.1.2 Conflict of Interest

No conflicts of interest in accordance with ITB 4.3.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITB 4.4.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.1.4 Government-Owned Enterprise

Bidder required to meet conditions of ITB 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1; ELI – 2 with attachments

2.1.5 United Nations Eligibility

Not having been excluded by an act of compliance with a United Nations Security Council resolution in accordance with ITB 4.8.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.2. Historical Contract Nonperformance

2.2.1 History of Non-performing Contracts

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Non-performance of a contract[a] did not occur as a result of contractor default (including, but not limited to breach of obligations relating to forced labor or child labor) since 1 January 2014.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Form CON-1

[a] *Non-performance, as decided by the Employer, shall include all contracts where (a) non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where the Employer's decision was overruled by the dispute resolution mechanism. 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.*

[b] *This requirement also applies to contracts executed by the Bidder as Joint Venture partner*.

2.2.2 Suspension Based on Execution of Bid-Securing Declaration

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Not under suspension based on execution of a Bid Securing Declaration pursuant to ITB 4.6.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.2.3 Pending Litigation and Arbitration

Pending litigation and arbitration criterion shall apply.

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
All pending litigation, arbitration or other material events impacting the net worth and/or liquidity of the bidder, if any, shall be treated as resolved against the Bidder and so shall in total not represent more than fifty (50) percent of the Bidder's net worth calculated as the difference between total assets and total liabilities.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form CON – 1

2.2.4 Declaration: Environmental, and Health and Safety Past Performance.

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Declare any contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, health and safety contractual obligations in the past five years.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form CON – 2

2.3. Financial Situation

2.3.1 Historical Financial Performance

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Submission of audited financial statements or, if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, for the last three (3) years to demonstrate the current soundness of the Bidder's financial position. As a minimum, the Bidder's net worth for the last year calculated as the difference between total assets and total liabilities should be positive.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form FIN - 1 with attachments

2.3.2 Average Annual Turnover

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Minimum average annual turnover of USD 14 million (Fourteen Million US dollars), calculated as total certified payments received for contracts in progress or completed, for the last 5 years.	Must meet requirement	Must meet requirement	Must meet 25% of the requirement	Must meet 40% of the requirement	Form FIN – 2

Note : The Bidders submit for financial years 2022, 2021, 2020, 2019 and 2018. However, in case COVID-19 has impacted normal turnover for the financial year 2021 and 2020, the Employer will use the best turnover of 3 years out of the last 5 years from 2018 to 2022 for all the bidders**.** These criteria will apply to all the bidders.

2.3.3 Financial Resources

If the bid evaluation process and the decision for the award of the Contract takes more than 1 year from the date of bid submission, Bidders may be asked to resubmit their current contract commitments and latest information on financial resources supported by latest audited accounts or audited financial statements, or if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, and the Bidders' financial capacity, will be reassessed on this basis.

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
For Single Entities: The Bidder must demonstrate that its financial resources defined in FIN-3, less its financial obligations for its current contract commitments defined in FIN-4, meet, or exceed the total requirement for the Subject Contract of USD 2.3 million (Two million three hundred thousand US dollars).	Must meet requirement	Not applicable	Not applicable	Not applicable	Form FIN – 3 and Form FIN - 4
For Joint Ventures: (1) One partner must demonstrate that its financial resources defined in FIN-3, less its financial obligations for its own current contract commitments defined in FIN-4, meet, or exceed its required share of 40% of the total requirement for the Subject Contract - USD 920,000 (Nine hundred twenty thousand dollars), from the total requirement for the Subject Contract. AND	Not applicable	Not applicable	Not applicable	Must meet requirement	Form FIN – 3 and Form FIN - 4
(2) Each partner must demonstrate that its financial resources defined in FIN-3, less its financial obligations for its own current contract commitments defined in FIN-4, meet, or exceed its required share of 25% of the total requirement for the Subject Contract - USD 575,000 (Five hundred-seventy-five thousand dollars), from the total requirement for the Subject Contract. AND	Not applicable	Not applicable	Must meet requirement	Not applicable	Form FIN – 3 and Form FIN - 4

(3) The Joint Venture must demonstrate that the combined financial resources of all partners defined in FIN-3, less all the partners' total financial obligations for the current contract commitments defined in FIN-4, meet, or exceed the total requirement for the Subject Contract of USD 2.3 million (Two million three hundred thousand US dollars).	Not applicable	Must meet requirement	Not applicable	Not applicable	Form FIN – 3 and Form FIN - 4

2.4. Bidder's Experience

2.4.1 Contracts of Similar Size and Nature

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Participation as a contractor, Joint Venture partner, or Subcontractor in at least two contract that has been satisfactorily and substantially completed within the last five (5) years and that are similar to the proposed contract, where the value of the Bidder's participation under each contract exceeds USD 2.0 million (Two million US dollars). . The design, supply, erection and commissioning of works in grid connected Rooftop solar power plant	Must meet requirement	Must meet requirement as follows: (i) Either one partner must meet requirement Or (ii) any two partners must each demonstrate one (1) successfully or substantially completed contract of similar size and nature	Not applicable	Not applicable	Form EXP – 1[c]

[a] *For contracts under which the Bidder participated as a Joint Venture partner or Subcontractor, only the Bidder's share, by value, shall be considered to meet this requirement.*

[b] *For contracts implemented by a Joint Venture contractor, if the Bidder comprises the same Joint Venture, the 'Single Entity' requirements will apply.*

[c] *In addition to the submission requirement Form EXP – 1, the bidder shall provide the following supporting documents:*
1. Signed Contract Agreement, and
2. Taking-Over Certificate, Contract Completion Certificate or Performance Certificate,
in sufficient detail to verify the contract name, value, and completion time (or substantial completion). If the documents are other than in English, an accurate certified translation of these documents in English shall be provided.

2.4.2 Experience in Key Activities

2.4.2(a) Must be complied with by the Bidder. In case of a Joint Venture Bidder, the Bidder or at least one of the partners must meet the requirement in the key activity. For contracts under which the Bidder participated as a Joint Venture partner, only the Bidder's designated scope of works under the contracts shall be considered to meet this requirement.

Table A

Criteria	Compliance Requirements		Documents
Requirement	**Single Entity**	**Joint Venture**	**Submission Requirements**
For the above or other contracts executed during the period stipulated in 2.4.1, a minimum experience in the following key activities:	Must meet requirement	One of the Partners must meet requirement	Form EXP – 2[a]
1. The design, supply, erection, and commissioning of works in Grid connected Rooftop Solar Power Plant with cumulative capacity execution of 10 MWp			
2. The design, supply, erection, and commissioning of Grid connected Rooftop Solar Power Plants with individual system capacity of 30 kWp and lower.			
3. Installation of Micro inverters with phase coupler			

[a]*Submission requirements: Form EXP – 2 shall be supported by documents such as Signed Contract Agreement, Taking-Over Certificate or Contract Completion Certificate indicating the contract name, value, completion date (or percentage of substantial completion), activities performed by Joint Venture partners, and other relevant details sufficient to demonstrate compliance with the requirements.*

2.4.3 Specific Experience in Managing Environmental, Health and Safety Aspect

Criteria	Compliance Requirements		Documents
Requirement	**Single Entity or Its Specialist Subcontractors**	**Joint Venture or Its Specialist Subcontractors**	**Submission Requirements**
For the contracts in 2.4.1 and 2.4.2 above and/or any other contracts [substantially completed and under implementation] as prime contractor, Joint Venture partner, or Subcontractor between 1st January 2019 and Bid submission deadline, experience in managing EHS risks and impacts in the following aspects: i. Developing and implementing management plans to address the potential environment, health and safety impacts and risks	Must meet requirements	Both partners must meet requirements	Form EXP – 3 Proof of availability of in-house policies and procedures acceptable to the Employer for EHS management Separate declaration from the contractor regarding requirement (ii) and (iii)

related to solar installations ii. Experience in conducting risk assessment and developing and implementing health and safety management plans to protect workers, communities, and other stakeholders from potential hazards associated with the project iii. Working safety on roof top with minimum height of 6 meters; including usage of safety harness during installation of RTS systems			

2.5. Subcontractors

Subcontractors or Manufacturers for the following major items of plant and services must meet the following minimum qualification criteria, herein listed for a Subcontractor for that item. Failure to comply with this requirement will result in rejection of the Subcontractor but not the Bidder.

The specific experience of Subcontractors for works permitted by the Employer shall be considered. The general experience and financial resources of the Specialized Subcontractors shall not be added to those of the Bidder for purposes of qualification of the Bidder.

Item No.	Description of Item	Minimum Criteria to be met	Documents Submission Requirements
1	Solar panel manufacturer	• Manufacturing the proposed panel for at least five years. • Performance certificates for at least 50 MWp have been sold or installed and have been operating satisfactorily for at least 5 years. • Valid ISO9001 • ValidISO14001 • Valid ISO18001	**Form EXP-7 Duly stamped and signed by the manufacturer / contractor**
2	PV Inverter manufacturer	• Manufacturing the proposed inverter for at least five years. • Performance certificates for at least 50 MW have been sold or installed and have been operating satisfactorily for at least 5 years. • Valid ISO9001 • Valid ISO14001 • Valid ISO45001	**Form EXP-7 Duly stamped and signed by the manufacturer / contractor**
3	Installation contractor	• Installation of solar panels of capacity of 30kWp or more • EHS supervisor	**Form EXP-7 Duly stamped and signed by the manufacturer / contractor**

In the case of a Bidder who offers to supply and install major items of plant under the contract, which the Bidder did not manufacture or otherwise produce, the Bidder shall provide the Manufacturer's authorization, using the form provided in Section 4 (Bidding Forms), showing that the Bidder has been duly authorized by the Manufacturer or producer of the related plant and equipment or component to supply and install that item in the Employer's country. Failure to submit the Manufacturer's authorization at the first instance is considered a minor, nonmaterial omission and shall be subject to clarification. However, failure of the Bidder to submit the omitted authorization shall lead to rejection of the Subcontractor or Manufacturer of the item under evaluation in accordance with ITB 35.4.

2.6. Organizational Environmental, Health and Safety System

2.6.1 Environmental, Health and Safety Certification

Criteria	Compliance Requirements		Documents
Requirement	**Single Entity or Its Specialist Subcontractors**	**Joint Venture or Its Specialist Subcontractors**	**Submission Requirements**
Availability of a valid ISO certification or internationally recognized equivalent (equivalency to be demonstrated by the Bidder), and applicable to the worksite: 1. Valid ISO14001 for international subcontractors 2. Valid ISO45001 for international subcontractors 3. Self-declaration in line with ISO14001 guidelines for local subcontractors 4. Self-declaration in line with ISO45001 guidelines for local subcontractors	Must meet requirements	One of the partners must meet requirements	Form EXP –4

2.6.2 Environmental, Health and Safety Documentation

Criteria	Compliance Requirements		Documents
Requirement	**Single Entity or Its Specialist Subcontractors**	**Joint Venture or Its Specialist Subcontractors**	**Submission Requirements**
Availability of in-house policies and procedures for EHS management: **For example:** 1. Existence of an Ethics Charter. 2. Existence of a system for monitoring compliance with EHS commitments by the Bidder and of the Bidder's Subcontractors and all its partners. 3. ISO 45001: Occupational Health and Safety Management System	Must meet requirements	One of the partners must meet requirements	Form EXP – 5

4. ISO 14001: Environment Management System 5. Existence of official company procedures for the management of the following: • EHS resources and facilities and EHS monitoring system; • Temporary facilities management information (construction offices, labor camps, storage areas); • Health and Safety on worksites policy and related guidance; • Local recruitment, subcontractor and gang management and EHS trainings of local staff/subcontractors/local partners; • Community stakeholder engagement practice; • Traffic management practice; • Labor management practice and labor camp guidelines including sanitation and welfare provision; • Hazardous products management practice including transport, use and storage; • Solid waste management practice including track of waste generation, storage, transport and disposal; • Hazardous waste management practice including track of waste generation, storage, transport and disposal including transboundary movement; • E-waste management practice including track of waste generation, storage, transport and disposal including transboundary movement; • Protection of water resources; • Biodiversity protection practices; • Control of infectious and communicable diseases (HIV/AIDS, malaria, COVID-19 etc.) • Existence of official company procedures for solar PV and invertor suppliers of the			

management of the following relevant points: - environmentally safe and sound system for take back and safe disposal [recycling] of defunct or used PV panels or invertors			

2.6.3 Environmental, Health and Safety Dedicated Personnel

Criteria	Compliance Requirements		Documents
Requirement	**Single Entity or Its Specialist Subcontractors**	**Joint Venture or Its Specialist Subcontractors**	**Submission Requirements**
Availability of in-house personnel dedicated to EHS issues: • Environmental, Health and Safety Specialist	Must meet requirements	One of the partners must meet requirements	Form EXP – 6

Section 4: Bidding Forms

This section contains the forms to be completed by the Bidder and submitted as part of its Bid.

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Letter of Technical Bid

Note:

The Bidder must accomplish the Letter of Technical Bid on its letterhead clearly showing the Bidder's complete name and address.

Date: ……
OCB No.: DGPC/01-Subproject 1
Invitation for Bid No.: DGPC/PCD/CS/68/1303 dated June 3, 2024

To: [*insert complete name of the Employer*]

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.

(b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.

(c) We offer to design, manufacture, test, deliver, install, pre-commission, and commission in conformity with the Bidding Document the following Plant and Services: [*insert narrative*]

(d) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of [*insert bid validity period as specified in ITB 20.1 of the BDS*] days starts from the date fixed for the bid submission deadline in accordance with ITB 24.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

(e) Our firm, including any Subcontractors or Manufacturers for any part of the Contract, have or will have nationalities from eligible countries, in accordance with ITB 4.2.

(f) We, our directors, key officers, key personnel, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the Contract, do not have any conflict of interest in accordance with ITB 4.3.

If there is any conflict of interest, please state details:

(i) Parties involved in the conflict of interest: _____

(ii) Details about the conflict of interest: _____

(g) We are not participating, as a Bidder, either individually or as partner in a Joint Venture, in more than one bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers submitted in accordance with ITB 13.

(h) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Asian Development Bank or a debarment imposed by the Asian Development Bank in accordance with the Agreement for Mutual Enforcement of

Debarment Decisions between the Asian Development Bank and other development banks.[1]

(i) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not under ongoing investigation and/or sanctions proceedings by the Asian Development Bank or any multilateral development bank.

If under ongoing investigation and/or sanction proceedings by the Asian Development Bank or any multilateral development bank, please state details:

(i) Name of the multilateral development bank: _____

(ii) Reason for the ongoing investigation / allegations: _____

(j) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the Contract, are not temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency.

If so temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency, please state details (as applicable to each Joint Venture partner, their respective direct or indirect shareholders, directors, key officers, key personnel, associate, parent company, affiliate, subsidiaries, Subcontractors, consultants, subconsultants, manufacturers, service providers and/or Suppliers):

(i) Name of Institution: _____

(ii) Period of the temporary suspension, debarment, ineligibility, or national or international sanction [*start and end date*]: _____

(iii) Reason for the temporary suspension, debarment, ineligibility, or national or international sanction: _____

(k) Our firm, Joint Venture partners, associates, parent company affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers Suppliers, key officers directors and key personnel have never been *charged or convicted* with any criminal offense (including felonies but excluding misdemeanors) or infractions and/or violations of ordinance; nor charged or found liable in any civil or administrative proceedings in the last 10 years; or undergoing investigation for such, or subject to any criminal, civil or administrative orders, monitorship or enforcement actions.

[1] These institutions include African Development Bank, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB), and the World Bank Group. According to paragraph 9 of the Agreement, other international financial institutions may join upon the consent of all Participating Institutions and signature of a Letter of Adherence by the international financial institution substantially in the form provided (Annex B to the Agreement). Upon adherence, such international financial institution shall become a Participating Institution for purposes of the Agreement. Bidders are advised to check www.adb.org/integrity for updates.

If so charged, convicted/found liable, under ongoing investigation, or subject to orders, monitorship or enforcement actions, please state details:

(i) Nature of the offense/violation, proceedings, investigation, and/or monitorship or enforcement actions: _____

(ii) Court, area of jurisdiction and/or the enforcement agency: _____

(iii) Resolution [*i.e. dismissed, settled, or convicted; duration of penalty*]: _____

(iv) Other relevant details [*please specify*]: _____

(l) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers, can make and receive electronic fund transfer payments through the international banking system or otherwise discharge the Employer's obligation upon initiation of wire transfer.

If unable to make or receive funds through the international banking system or otherwise discharge the Employer's obligation upon initiation of wire transfer, please state the details:

(i) Nature of the restriction: _____

(ii) Jurisdiction of the restriction: _____

(iii) Other relevant details: _____

(m) Our firm, Joint Venture partners, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers, key officers, directors and key personnel are not from a country which is prohibited to export goods or services to, or receive any payments from the Employer's country and/or are not prohibited to receive payments for particular goods or services by the Employer's country by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations.

(n) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract.[2]

Name of Recipient	Address	Reason	Amount
			.

(o) We understand that it is our obligation to notify the Employer of any changes in connection with the matters described in paragraphs (f), (h), (i), (j), (k), (l), (m) and (n) of this Letter of Technical Bid.

2 If none has been paid or is to be paid, indicate "None".

(p) [We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5].[3]

(q) We have not been suspended nor declared ineligible by the Employer based on execution of a Bid-Securing Declaration in accordance with ITB 4.6.

(r) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our sites, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.

(s) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.

(t) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.

(u) If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 6 (Employer's Requirements) and our technical proposal, or as otherwise agreed with the Employer.

(v) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded, and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

[3] Use one of the two options as appropriate.

Country of Origin Declaration Form

Name of Bidder _____ IFB Number _____ Page ___ of ___

Item	Description	Country of Origin

Letter of Price Bid

-- Note –

The Bidder must accomplish the Letter of Price Bid on its letterhead clearly showing the Bidder's complete name and address.

Date:…….
OCB No.: DGPC/01-Subproject 1
Invitation for Bid No.: DGPC/PCD/CS/68/1303 dated June 3, 2024

To: [*insert complete name of the Employer*]

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.

(b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.

(c) We offer to design, manufacture, test, deliver, install, pre-commission, and commission in conformity with the Bidding Document the following Plant and Services: [*insert narrative*]

(d) The total price of our Bid, excluding any discounts offered in item (d) below is the sum of

[*amount of foreign currency in words*], [*amount in figures*], and [*amount of local currency in words*], [*amount in figures*]

The total bid price from the Grand Summary (Schedule No. 5) should be entered by the Bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.

(e) The discounts offered and the methodology for their application are as follows: [*insert discounts and methodology for their application if any*]

(f) Our Bid shall be valid for a period of [*insert bid validity period as specified in ITB 20.1 of the BDS*] days starts from the date fixed for the submission deadline in accordance with ITB 24.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

(g) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document.

(h) We understand that this bid, together with your written acceptance thereof included in your notification of award through the issuance of Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed.

(i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(j) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our sites, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.

(k) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.

(l) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after the completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.

(m) We confirm and stand by our commitments and other declarations made in connection with the submission of our Letter of Technical Bid.

(n) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded; and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Attestation Letter

Attestation Letter

Date: ……
OCB No.: DGPC/01-Subproject 1
To: **Druk Green Power Corporation**
Thimphu, Bhutan

We, the undersigned, acknowledge that ADB will not finance activities listed on the prohibited investment activities list, under Appendix 5 of its Safeguard Policy Statement (2009), which includes, among others, production or activities involving forced labor[4] or child labor[5].

After duly considering the above policy and commitment of ADB, we have conducted due diligence on the works, goods and services, and related materials and products to be used in the Project, and following such due diligence:

(a) we attest and represent that (i) to the best of our knowledge, we are not using (and we have not used, and we will not use) works, goods and services, and related materials and products in the Project, where the production and supply of such products used forced labor or child labor; (ii) we adhere to labor legislation of the Employer's country and require our subcontractors and suppliers for the Project to adhere to the same in the production and supply of works, goods and services, and related materials and products proposed to be used in the Project; and (iii) to the best of our knowledge, the works, goods and services, and related materials and products to be procured and/or supplied by us for the Project do not involve production or activities involving the use of forced labor or child labor;

(b) we attest and represent that our subcontractors, manufacturers and suppliers have confirmed to us separately that to their knowledge, after due enquiry and diligence, the offered works, goods and services, and related materials and products do not involve production or activities involving the use of forced labor or child labor;

(c) we further confirm that should you or ADB require an audit of our records related to the procurement of works, goods and services, and related materials and products used in the Project, we shall promptly make available to you, ADB or your respective designated representatives all relevant documents and records to assist with the audit, and grant access, to the extent practicable, to the sites, facilities, plants, and equipment to an independent auditor retained by you or ADB;

(d) we confirm that if the contract is awarded to us, (i) we shall monitor the works, goods and services, and related materials and products provided by us on an ongoing basis, (ii) require our subcontractors, suppliers or manufacturers to immediately notify to us any incidents of forced labor or child labor, and if new risks or incidents of forced labor or child labor are identified, (iii) we commit to promptly inform you, if we receive information that the representation in (a) is false and of any new risks or incidents of forced labor or child labor in

[4] Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.
[5] Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).
5

the production or activities for the offered works, goods and services, and related materials and products used in the Project, and to take appropriate steps to remedy them;

(e) we agree that a breach and misrepresentation of (a), (b), (c), or (d) above is a sufficient ground for bid rejection and may give the Employer/Purchaser the right to terminate the contract with us, if our bid is accepted and the contract is awarded to us.

Sincerely,

Authorized Signature [In full and initials]: _____
Name and Title of Signatory: _____
_____
Address: _____

Price Schedules

PREAMBLE

General

1. The Price Schedules are divided into separate Schedules as follows:

   Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad

   Schedule No. 2: Plant and Mandatory Spare Parts Supplied from within the Employer's Country

   Schedule No. 3: Design Services

   Schedule No. 4: Installation and Other Services

   Schedule No. 5: Grand Summary

   Schedule No. 6: Recommended Spare Parts

2. The Schedules do not generally give a full description of the plant to be supplied and the services to be performed under each item. Bidders shall be deemed to have read the Employer's Requirements and other sections of the Bidding Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.

3. If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITB 7 prior to submitting their bid

Pricing

4. The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive. Any alterations necessary due to errors, etc., shall be initialed by the Bidder.

   As specified in the Bid Data Sheet and Special Conditions of Contract, prices shall be fixed and firm for the duration of the Contract, or prices shall be subject to adjustment in accordance with the corresponding Appendix (Price Adjustment) to the Contract Agreement.

5. Bid prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Bidders in the Bidding Documents.

   For each item, Bidders shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules.

   Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section 6 (Employer's Requirements) or elsewhere in the Bidding Documents.

6. Payments will be made to the Contractor in the currency or currencies indicated under each respective item.

7. When requested by the Employer for the purposes of making payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may

reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.

Schedules of Rates and Prices

Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
Plant									
A	**SPV Module**								
i	Photovoltaic (PV) Modules with mono PERC half-cut cells of individual module capacity of 540 W_p – 550 W_p with factory fitted 4 mm^2 DC lead cable with MC4 connector		kWp	7827					
B	**Solar string inverter / Micro Inverter**								
i	30 kW grid-tied 3-phase string inverter with 4 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	134					
ii	25 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	28					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
iii	20 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	33					
iv	17 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	17					
v	15 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	18					
vi	12 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	23					
vii	10 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring		Nos.	13					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
	system with data logging facility and mounting accessories								
viii	6 x 4 Nos. APS grid-tied Micro- inverter ((12.96kWp)), online remote monitoring system with data logging facility and mounting accessories		Sets	106					
C	**Module Mounting Fixture**								
i	Flush mount type module mounting structure of anodized aluminum for installation of PV modules on corrugated/ Lysaght trapezoidal sheets with mounting brackets and accessories		kWp	7827					
D	**DCDB**								
i	1 kV, 32 A, 2P, DC Isolator for string disconnection (Load breaking), IP 65		Nos.	800					
ii	Surge Protection Device, Type II (for DC) for all PV strings at inverter input		Nos.	800					
iii	4 IN - 4 OUT, string combiner box with		Nos.	160					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
	cable entry flanges, cable glands, terminal block, IP 65 [DC isolator and SPD will be installed]								
iv	2 IN - 2 OUT, string combiner box with cable entry flanges, cable glands, terminal block, IP 65 [DC isolator and SPD will be installed]		Nos.	106					
E	**ACDB**								
i	500 V, 63 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65		Nos.	163					
ii	440 V, 40 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65		Nos.	68					
iii	440 V, 32 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65		Nos.	141					
iv	Surge Protection Device, Type II (for AC) for inverter output connecting to the grid		Nos.	372					
v	5 IN - 1 OUT, AC combiner box with cable entry flanges,		Nos.	1					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
	cable glands, terminal block, IP 65 [AC isolator and AC SPD will be installed]								
vi	4 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block, IP 65 [AC isolator and AC SPD will be installed]		Nos.	4					
vii	3 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block, IP 65 [AC isolator and AC SPD will be installed]		Nos.	8					
viii	2 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block, IP 6[AC isolator and AC SPD will be installed]		Nos.	26					
ix	AC combiner box/ phase coupler for micro inverters with cable entry flanges, cable glands, terminal block, IP 65		Nos.	121					
F	**DC Cable**								

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
i	1C, 4 mm^2 DC cable, UV stabilized, multi-strand XLPE PVC insulated for spring cable		m	7100					
G	**AC Cable**								
i	3.5C, 16 mm^2, 650/1100V, Copper cable from Inverter to main supply board		m	2050					
ii	3.5C, 10 mm^2, 650/1100V, copper cable from Inverter to main supply board		m	2019					
iii	3.5C, 6 mm^2, 650/1100V, copper cable from Inverter to main supply board		m	2046					
H	**Earthing Equipment**								
i	1C, 16 mm^2 copper cable for equipotential bonding and inverter earthing		m	10292					
ii	1C copper cable of 10 mm^2 for equipotential bonding and inverter earthing		m	2730					
iii	1C copper cable of 6 mm^2 for equipotential bonding and inverter earthing		m	6700					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
iv	Copper Earth Rod (3/4", 6'), clamp and accessories for earth pit		Sets	690					
v	Lighting Arrestors		Nos.	267					
I	**BoS**								
i	Central Remote Monitoring System (for a group of inverters in one location)		Sets	34					
ii	All accessories such as MC4 connectors, WEEB for equipotential bonding, stainless steel cable clips, MC4 tools and O&M tools.		Set	372					
iii	Residual current device (RCD) or Residual Current Circuit Breaker (RCCB) Type A or Type B		Nos.	267					
iv	Grid Connection Box fitted with Type A or Type B RCD		Nos	267					
v	Digital Energy Meter and installation accessories		Nos.	267					
vi	Meteorological Measurement Station		Nos	3					
Mandatory Spare Parts									

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
A	**SPV Module**								
i	Photovoltaic (PV) Modules with mono PERC half-cut cells of individual module capacity of 540 W_p – 550 W_p with factory fitted 4 mm^2 DC lead cable with MC4 connector		kWp	12					
B	**Solar string inverter / Micro Inverter**								
i	30 kW grid-tied 3-phase string inverter with 4 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	3					
ii	25 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	1					
iii	20 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	1					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
iv	17 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	1					
v	15 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	1					
vi	12 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	1					
vii	10 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories		Nos.	1					
viii	6 x 4 Nos. APS grid-tied Micro- inverter ((12.96kWp)), online remote monitoring		Sets	3					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
	system with data logging facility and mounting accessories								
C	**Module Mounting Fixture**								
i	Flush mount type module mounting structure of anodized aluminum for installation of PV modules on corrugated/ Lysaght trapezoidal sheets with mounting brackets and accessories		kWp	12					
D	**DCDB**								
i	1 kV, 32 A, 2P, DC Isolator for string disconnection (Load breaking), IP 65		Nos.	16					
ii	Surge Protection Device, Type II (for DC) for all PV strings at inverter input		Nos.	16					
E	**ACDB**								
i	500 V, 63 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65		Nos.	4					
ii	440 V, 40 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65		Nos.	2					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
iii	440 V, 32 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65		Nos.	3					
iv	Surge Protection Device, Type II (for AC) for inverter output connecting to the grid		Nos.	8					
F	**DC Cable**								
i	1C, 4 mm^2 DC cable, UV stabilized, multi-strand XLPE PVC insulated for spring cable		m	142					
G	**AC Cable**								
i	3.5C, 16 mm^2, 650/1100V, Copper cable from Inverter to main supply board		m	41					
ii	3.5C, 10 mm^2, 650/1100V, copper cable from Inverter to main supply board		m	41					
iii	3.5C, 6 mm^2, 650/1100V, copper cable from Inverter to main supply board		m	41					
H	**Earthing Equipment**								
i	1C, 16 mm^2 copper cable for equipotential bonding and inverter earthing		m	206					

SN	Description	Country of Origin	UoM	Qty	Unit Price[a]		Total Price[a]	Custom Duty	Sales Tax
					Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7	8= 5 x 7	9	
ii	1C copper cable of 10 mm² for equipotential bonding and inverter earthing		m	55					
iii	1C copper cable of 6 mm² for equipotential bonding and inverter earthing		m	134					
I	**BoS**								
i	Central Remote Monitoring System (for a group of inverters in one location)		Sets	1					
ii	All accessories such as MC4 connectors, WEEB for equipotential bonding, stainless steel cable clips, MC4 tools and O&M tools.		Set	8					
ii	Residual current device (RCD) or Residual Current Circuit Breaker (RCCB) Type A or Type B		Nos.	6					
iv	Digital Energy Meter and installation accessories		Nos.	6					

TOTAL Column 8 to be carried forward to Schedule No. 5: Grand Summary

Name of Bidder _____

Signature of Bidder _____

[a] *Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required*

Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer's Country)

Item	Description	UoM	Qty	Unit Price[a]		Total EXW Price[a]	Sales and other Taxes
				Local Currency	EXW Price[b]		
1	2	3	4	5	6	7= 4 x 6	8
Plant							
A	**SPV Module**						
i	Photovoltaic (PV) Modules with mono PERC half-cut cells of individual module capacity of 540 W_p – 550 W_p with factory fitted 4 mm^2 DC lead cable with MC4 connector	kWp	7827				
B	**Solar string inverter / Micro Inverter**						
i	30 kW grid-tied 3-phase string inverter with 4 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	134				
ii	25 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	28				
iii	20 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	33				

iv	17 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	17				
v	15 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	18				
vi	12 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	23				
vii	10 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	13				
viii	6 x 4 Nos. APS grid-tied Micro- inverter ((12.96kWp)), online remote monitoring system with data logging facility and mounting accessories	Sets	106				
C	**Module Mounting Fixture**						

i	Flush mount type module mounting structure of anodized aluminum for installation of PV modules on corrugated/ Lysaght trapezoidal sheets with mounting brackets and accessories	kWp	7827				
D	**DCDB**						
i	1 kV, 32 A, 2P, DC Isolator for string disconnection (Load breaking), IP 65	Nos.	800				
ii	Surge Protection Device, Type II (for DC) for all PV strings at inverter input	Nos.	800				
iii	4 IN - 4 OUT, string combiner box with cable entry flanges, cable glands, terminal block, IP 65 [DC isolator and SPD will be installed]	Nos.	160				
iv	2 IN - 2 OUT, string combiner box with cable entry flanges, cable glands, terminal block, IP 65 [DC isolator and SPD will be installed]	Nos.	106				
E	**ACDB**						
i	500 V, 63 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65	Nos.	163				

ii	440 V, 40 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65	Nos.	68				
iii	440 V, 32 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65	Nos.	141				
iv	Surge Protection Device, Type II (for AC) for inverter output connecting to the grid	Nos.	372				
v	5 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block, IP 65 [AC isolator and AC SPD will be installed]	Nos.	1				
vi	4 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block, IP 65 [AC isolator and AC SPD will be installed]	Nos.	4				
vii	3 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block, IP 65 [AC isolator and AC SPD will be installed]	Nos.	8				
viii	2 IN - 1 OUT, AC combiner box with cable entry flanges, cable glands, terminal block,	Nos.	26				

	IP 6[AC isolator and AC SPD will be installed]						
ix	AC combiner box/ phase coupler for micro inverters with cable entry flanges, cable glands, terminal block, IP 65	Nos.	121				
F	**DC Cable**						
i	1C, 4 mm^2 DC cable, UV stabilized, multi-strand XLPE PVC insulated for spring cable	m	7100				
G	**AC Cable**						
i	3.5C, 16 mm^2, 650/1100V, Copper cable from Inverter to main supply board	m	2050				
ii	3.5C, 10 mm^2, 650/1100V, copper cable from Inverter to main supply board	m	2019				
iii	3.5C, 6 mm^2, 650/1100V, copper cable from Inverter to main supply board	m	2046				
H	**Earthing Equipment**						
i	1C, 16 mm^2 copper cable for equipotential bonding and inverter earthing	m	10292				
ii	1C copper cable of 10 mm^2 for equipotential bonding and inverter earthing	m	2730				

iii	1C copper cable of 6 mm² for equipotential bonding and inverter earthing	m	6700				
iv	Copper Earth Rod (3/4", 6'), clamp and accessories for earth pit	Sets	690				
v	Lighting Arrestors	Nos.	267				
I	**BoS**						
i	Central Remote Monitoring System (for a group of inverters in one location)	Sets	34				
ii	All accessories such as MC4 connectors, WEEB for equipotential bonding, stainless steel cable clips, MC4 tools and O&M tools.	Set	372				
iii	Residual current device (RCD) or Residual Current Circuit Breaker (RCCB) Type A or Type B	Nos.	267				
iv	Grid Connection Box fitted with Type A or Type B RCD	Nos	267				
v	Digital Energy Meter and installation accessories	Nos.	267				
vi	Meteorological Measurement Station	Nos	3				
Mandatory Spare Parts							
A	**SPV Module**						
i	Photovoltaic (PV) Modules with mono	kWp	12				

	PERC half-cut cells of individual module capacity of 540 W_p – 550 W_p with factory fitted 4 mm^2 DC lead cable with MC4 connector						
B	**Solar string inverter / Micro Inverter**						
i	30 kW grid-tied 3-phase string inverter with 4 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	3				
ii	25 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	1				
iii	20 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	1				
iv	17 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	1				
v	15 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	1				

vi	12 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	1				
vii	10 kW grid-tied 3-phase string inverter with 2 MPPTs, online remote monitoring system with data logging facility and mounting accessories	Nos.	1				
viii	6 x 4 Nos. APS grid-tied Micro- inverter ((12.96kWp)), online remote monitoring system with data logging facility and mounting accessories	Sets	3				
C	**Module Mounting Fixture**						
i	Flush mount type module mounting structure of anodized aluminum for installation of PV modules on corrugated/ Lysaght trapezoidal sheets with mounting brackets and accessories	kWp	12				
D	**DCDB**						
i	1 kV, 32 A, 2P, DC Isolator for string disconnection (Load breaking), IP 65	Nos.	16				
ii	Surge Protection Device, Type II (for DC)	Nos.	16				

	for all PV strings at inverter input						
E	**ACDB**						
i	500 V, 63 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65	Nos.	4				
ii	440 V, 40 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65	Nos.	2				
iii	440 V, 32 A, 4P AC Isolators (MCB) to disconnect inverter, IP 65	Nos.	3				
iv	Surge Protection Device, Type II (for AC) for inverter output connecting to the grid	Nos.	8				
F	**DC Cable**						
i	1C, 4 mm^2 DC cable, UV stabilized, multi-strand XLPE PVC insulated for spring cable	m	142				
G	**AC Cable**						
i	3.5C, 16 mm^2, 650/1100V, Copper cable from Inverter to main supply board	m	41				
ii	3.5C, 10 mm^2, 650/1100V, copper cable from Inverter to main supply board	m	41				
iii	3.5C, 6 mm^2, 650/1100V, copper	m	41				

	cable from Inverter to main supply board						
H	**Earthing Equipment**						
i	1C, 16 mm² copper cable for equipotential bonding and inverter earthing	m	206				
ii	1C copper cable of 10 mm² for equipotential bonding and inverter earthing	m	55				
iii	1C copper cable of 6 mm² for equipotential bonding and inverter earthing	m	134				
I	**BoS**						
i	Central Remote Monitoring System (for a group of inverters in one location)	Sets	1				
ii	All accessories such as MC4 connectors, WEEB for equipotential bonding, stainless steel cable clips, MC4 tools and O&M tools.	Set	8				
ii	Residual current device (RCD) or Residual Current Circuit Breaker (RCCB) Type A or Type B	Nos.	6				
iv	Digital Energy Meter and installation accessories	Nos.	6				

TOTAL Columns 7 to be carried forward to Schedule No. 5: Grand Summary

Name of Bidder _____

Signature of Bidder _____

[a] *Specify currency in accordance with ITB 19.1 of the BDS.*

[b] *Column 5 EXW Price shall include all customs duties and sales and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of the item or the customs duties and sales and other taxes already paid on previously imported items.*

Schedule No. 3: Design Services

Item	Description	Quantity	Unit Price[a]		Total Price[a]	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
1	**Detailed design of grid connected Distributed (Rooftop) Solar PV system for each building:** • Detailed site survey and planning of rooftop PV systems on the selected buildings • List of Engineering Drawings and diagrams for all the systems • Layout drawings for all devices, Mounting Structure design and drawings, Single line diagrams, wiring diagrams for PV arrays, inverter and grid connection and Wiring diagrams for earthing and lighting protections *(Detailed scope of design is given in the Employer's requirement)*	**7,827 kWp** **(Across 267 Buildings)**				
TOTAL Columns 6 & 7 to be carried forward to Schedule No. 5: Grand Summary						

[a] *Specify currency in accordance with ITB 19.1 of the BDS.*

Schedule No. 4 - Installation and Other Services

Item	Description	UoM	Quantity	Unit Price[a]		Total Price[a]	
				Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2		3	4	5	6 = 3 x 4	7 = 3 x 5
1	Installation, Commissioning and Testing including Civil work and implementation of required environment, health, safety and labor measures	kWp	7,827				
TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary							

Name of Bidder _____

Signature of Bidder _____

[a] *Specify currency in accordance with ITB 19.1 of the BDS.*

[b] *As described in SCC 22.2.7.*

Schedule No. 5: Grand Summary

Schedule No.	Title	Total Price [a]	
		Foreign	Local
1	Plant and Mandatory Spare Parts Supplied from Abroad [b]		
2	Plant and Mandatory Spare Parts Supplied from Within the Employer's Country [b]		
3	Design Services		
4	Installation and Other Services		
Grand Total to be carried forward to Letter of Price Bid			

Name of Bidder _____

Signature of Bidder _____

[a] *Specify currency in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.*

[b] *Taxes and/or duties from Schedules 1 and 2 may be added to the contract price in accordance with GCC 14 (Taxes and Duties) but excluded from bid evaluation in accordance with ITB 39.2.*

Schedule No. 6: Recommended Spare Parts (Not Applicable)

Item	Description	Quantity	Unit Price[a]		Total Price[a]	
			EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
				TOTAL		

Name of Bidder _____

Signature of Bidder _____

[a] *Specify currency in accordance with ITB 19.1 of the BDS.*

Tables of Adjustment Data- Not Applicable

Table A – Local Currency

To be entered by the bidder

Index Code	Index Description	Source of Index	Base Value and Date	Bidder's Local Currency Amount	Bidder's Proposed Weighting
	Nonadjustable	---	---	---	a: 0.15 b: _____ c: _____ d: _____ e: _____
			Total		**1.00**

Table B – Foreign Currency

Name of Currency: _____

[Insert name of currency. If the Bidder wishes to quote in more than one foreign currency, this table should be repeated for each foreign currency.]

To be entered by the bidder

Index Code	Index Description	Source of Index	Base Value and Date	Bidder's Currency in Type/Amount	Equivalent in FC1	Bidder's Proposed Weighting
	Nonadjustable	---	---	---		a: 0.15 b: c: d: e:
				Total		**1.00**

- Note –

The base date shall be the date 28 days prior to the deadline for submission of the bid.

Tables of Adjustment Data shall only be included if prices are to be quoted as adjustable prices in accordance with ITB 18.6.

Bid Security

Bank Guarantee

[*Bank's name, and address of issuing branch or office*][6]

Beneficiary: [*Name and address of the Employer*]

Date:

Bid Security No.:

We have been informed that [*name of the Bidder*] (hereinafter called "the Bidder") has submitted to you its bid dated [*insert date*] (hereinafter called "the Bid") for the execution of [*name of contract*] under Invitation for Bids No. [*insert IFB number*] ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we [*name of Bank*] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [*amount in words*] [*amount in figures*] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letters of Technical and Price Bid; or

(b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or

(c) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This guarantee will expire (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder's bid.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No.758.[7]

[*Authorized signature(s) and bank's seal (where appropriate)*]

---

6 All italicized text is for use in preparing this form and shall be deleted from the final document.

7 Or the employer may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458" as appropriate.

Bid-Securing Declaration

Date: *[insert date (as day, month and year)]*

Bid No.: *[insert number of bidding process]*

Alternative No.: *[insert identification No if this is a bid for an alternative]*

To: *[insert complete name of the Employer]*

We, the undersigned, declare that:

We understand that, according to your conditions, Bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with the Borrower for the period of time of *[insert number of years as indicated in ITB 21.2 of the BDS]* starting on the date that we receive a notification from the Employer, if we are in breach of our obligation(s) under the bid conditions, because we

(a) have withdrawn our Bid during the period of bid validity specified in the Letters of Technical and Price Bid; or

(b) do not accept the correction of errors in accordance with the Instruction to Bidders (hereinafter "the ITB"); or

I having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract; if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the ITB.

We understand that this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) 28 days after the expiration of our Bid.

Signed: [*insert signature of person whose name and capacity are shown*]

In the capacity of [*insert legal capacity of person signing the Bid-Securing Declaration*]

Name: [*insert complete name of person signing the Bid-Securing Declaration*]

Duly authorized to sign the bid for and on behalf of [*insert complete name of the Bidder*]

Dated on _____ day of _____, _____ [*insert date of signing*]

Corporate Seal (*where appropriate*)

Technical Proposal

Site Organization

Method Statement

Mobilization Schedule

Construction Schedule

Environmental, Health and Safety Management Plan

Environmental, Health and Safety Code of Conduct

Plant

Personnel

Equipment

Proposed Subcontractors for Major Items of Plant and Services

Manufacturer's Authorization

Affiliate Company Guarantee

Time Schedule

Functional Guarantee of the Proposed Facilities

Site Organization

Method Statement

Mobilization Schedule

The Mobilization Schedule should reflect the no-objection request and approval step for Site Specific Environmental, Health and Safety Management Plan as per Contract Conditions.

Construction Schedule

The construction schedule shall include the following key milestones:

Environmental, Health and Safety Management Plan (EHSMP)

The Bidder shall submit an outline Environmental, Health and Safety Management Plan (EHSMP) commensurate with the risks and impacts of the proposed works and activities. These strategies and plans shall describe in detail the actions, materials, equipment, management processes, etc. that will be implemented by the Contractor, and its subcontractors to ensure minimal adverse environmental impacts result from the works. The scope will include the project facilities and any temporary facilities of the contractor. They shall ensure compliance with national laws and regulations, the ESARF of the project and criteria for rooftop solar type eligible as category C, the IFC EHS General Guidelines and the ILO Code of Practice on Safety and Health in Construction.

In developing these strategies and plans, the Bidder shall have regard to the EHS provisions of the contract and EHS risks including those as may be more fully described in the ESARF and Section 6 (Employer's Requirements).

Environmental, Health and Safety Code of Conduct

Environmental, Health and Safety Code of Conduct for Contractor's Personnel Form

Note to Bidder

The minimum content of the EHS Code of Conduct form as set out by the Employer shall not be substantially modified*. However, the Bidder may add requirements as appropriate, including to take into account Contract-specific issues/risks.*

The Bidder shall initial and submit the EHS Code of Conduct form as part of its bid.

ENVIRONMENTAL, HEALTH AND SAFETY CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL

We are the Contractor, [enter name of Contractor]. We have signed a contract with [enter name of Employer] for [enter description of the Works]. These Works will be carried out at [enter the Site and other locations where the Works will be carried out]. Our contract requires us to implement measures to address environmental, health and safety risks related to the Works.

This EHS Code of Conduct is part of our measures to deal with environmental, health and safety risks related to the Works. It applies to all our staff, labourers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "Contractor's Personnel" and are subject to this EHS Code of Conduct.

This EHS Code of Conduct identifies the behavior that we require from all Contractor's Personnel.

Our workplace is an environment where unsafe, offensive, abusive or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Contractor's Personnel shall:

1. carry out his/her duties competently and diligently;
2. comply with this EHS Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
3. maintain a safe working environment including by:
   a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;

b. wearing required personal protective equipment;

c. using appropriate measures relating to chemical, physical and biological substances and agents; and

d. following applicable emergency operating procedures.

4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;

5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;

6. report violations of this EHS Code of Conduct; and

7. not retaliate against any person who reports violations of this EHS Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this EHS Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done by call [ ] to reach the Contractor's hotline (if any) and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

CONSEQUENCES OF VIOLATING THE ENVIRONMENTAL, HEALTH AND SAFETY CODE OF CONDUCT

Any violation of this EHS Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this EHS Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this EHS Code of Conduct, I can contact [enter name of Contractor's contact person(s) with relevant experience)] requesting an explanation.

Name of Contractor's Personnel: [insert name]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Plant

Personnel

Form PER – 1: Proposed Personnel

Bidders should provide the details of proposed personnel and their experience record in the relevant Information Forms below for each of the candidate.

1.	**Title of position**
	Name
2.	**Title of position**
	Name
3.	**Title of position**
	Name
4.	**Title of position**
	Name
etc.	**Title of position**
	Name

Note --

All titles of positions will be as listed in Section 6 (Employer's Requirements).

Form PER – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Use one form for each position.

<table>
<tr><td colspan="3">Position</td></tr>
<tr><td>Personnel information</td><td>Full Legal Name</td><td>Date of Birth</td></tr>
<tr><td></td><td>Known as</td><td>Place of Birth</td></tr>
<tr><td></td><td>Nationality</td><td>Citizenship</td></tr>
<tr><td rowspan="2"></td><td>Type of government ID

Attach a copy of ID to this form</td><td>ID number</td></tr>
<tr><td colspan="2">Professional qualifications</td></tr>
<tr><td rowspan="5">Present employment</td><td colspan="2">Name of employer</td></tr>
<tr><td colspan="2">Address of employer</td></tr>
<tr><td>Telephone</td><td>Contact (manager/personnel officer)</td></tr>
<tr><td>Fax</td><td>E-mail</td></tr>
<tr><td>Job title</td><td>Years with present employer</td></tr>
</table>

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	To	Company/Project/Position/Relevant Technical and Management Experience

Equipment

Form EQU: Equipment

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment requirements indicated in Section 6 (Employer's Requirements), using the Forms below. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

Item of Equipment		
Equipment Information	**Name of manufacturer**	**Model and power rating**
	Capacity	**Year of manufacture**
Current Status	**Current location**	
	Details of current commitments	
Source	**Indicate source of the equipment** **o** **Owned** **o** **Rented** **o Leased** **o Specially manufactured**	

Omit the following information for equipment owned by the Bidder.

Owner	**Name of owner**

	Address of owner	
	Telephone	**Contact name and title**
	Fax	**Telex**
Agreements	**Details of rental/lease/manufacture agreements specific to the project**	

Proposed Subcontractors and/or Manufacturers for Major Items of Plant and Services

The following Subcontractors and/or Manufacturers are proposed for carrying out the item of the facilities indicated based on Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria). Bidders are free to propose more than one for each item.

Major Items of Plant and Services	Proposed Subcontractors or Manufacturers	Nationality

Manufacturer's Authorization

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

OCB No.: DGPC/01-Subproject 1

To: *[insert complete name of the Employer]*

WHEREAS

We *[insert complete name of the manufacturer or manufacturer's authorized agent]*, who are official manufacturers or agent authorized by the Manufacturer of *[insert type of goods manufactured]*, having factories at *[insert full address of manufacturer's factories]*, do hereby authorize *[insert complete name of the Bidder]* to submit a bid the purpose of which is to provide the following goods, manufactured by us *[insert name and/or brief description of the goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 27 of the General Conditions of Contract, with respect to the goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the manufacturer]*

Title: *[insert title]*

Duly authorized to sign this Authorization on behalf of *[insert complete name of the manufacturer]*

Dated on _____ day of _____, _____ *[insert date of signing]*

-- Note

The bidder shall require the manufacturer to fill out this form in accordance with the instructions indicated. This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the manufacturer. The bidder shall include it in its bid, if so indicated in the BDS.

Affiliate Company Guarantee

Name of Contract/Contract No.: _____

Name and address of Employer: _____

_____

[*together with successors and assigns*].

We have been informed that [*name of Contractor*] (hereinafter called the "Contractor") is submitting an offer for the above-referenced Contract in response to your invitation, and that the conditions of your invitation require its offer to be supported by an affiliate company guarantee.

In consideration of you, the Employer, awarding the Contract to the Contractor, we [*name of affiliated company*] irrevocably and unconditionally guarantee to you, as a primary obligation, that (i) throughout the duration of the Contract, we will make available to the Contractor our financial, technical capacity, expertise and resources required for the Contractor's satisfactory performance of the Contract; and (ii) we are fully committed, along with the Contractor, to ensuring a satisfactory performance of the Contract.

If the Contractor fails to so perform its obligations and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) which arise from any such failure for which the Contractor is liable to the Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force and effect. If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter into the Contract with the Contractor, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Contractor's obligations and liabilities under the Contract have been discharged, when this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemental to the Contract as amended or varied by the Employer and the Contractor from time to time. We hereby authorize them to agree on any such amendment or variation, the due performance of which and compliance with which by the Contractor are likewise guaranteed hereunder. Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Contractor, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Contractor or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) that governs the Contract and any dispute under this guarantee shall be finally settled under the [*Rules or Arbitration provided in the Contract*]. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by:……	Signed by: ……
[*signature*]	[*signature*]
……	……
[*name*]	[*name*]
[*position in parent/subsidiary company*]	[*position in parent/subsidiary company*]

Date:……

-- Note --

If permitted in accordance with ITB 35.2 of the BDS, the Bidder shall provide the Affiliate Company Guarantee Form filled out and signed by each subsidiary, parent entity, or affiliate that the Bidder submits for consideration of the Employer in determining its qualifications.

Time Schedule

To be used by Bidder when alternative Time for Completion is invited in ITB 13.2.

Functional Guarantee of the Proposed Facilities

Form FUNC

The Bidder shall copy on the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Employer in EQC 1.3.4 of Section 3, Evaluation and Qualification Criteria, and on the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.

Functional Guarantee *[as required by the Employer in Section 3]*	**Functional Guarantee Value Offered by the Bidder**
1.	
2.	
3.	
…	

Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the following information requested in the corresponding Information Sheets.

Form ELI - 1: Bidder's Information Sheet

Bidder's Information				
			Information of the Bidder	**If the Bidder is a subsidiary or branch, information of any parent company/companies**
	Names	**Full legal name(s)**		
		Full trading name(s) (if any)		
	Addresses	**Registered address(es)**		
		Trading address(es)		
		Postal address(es) (if different from trading address)		
	Type of organization			
	Country of constitution/incorporation/registration			
	Year of constitution/incorporation/ registration			
	Corporate or registration number			

	In case of a Joint Venture, legal name of each partner	
	Bidder's authorized representative (name, address, telephone number(s), fax number(s), e-mail address)	
	Attached are copies of the following documents: ❑ 1. In case of a single entity, articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2. ❑ 2. Authorization to represent the firm or Joint Venture named above, in accordance with ITB 22.2. ❑ 3. In case of a Joint Venture, a letter of intent to form a Joint Venture or Joint Venture agreement, in accordance with ITB 4.1. ❑ 4. In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5.	

Form ELI - 2: Joint Venture Information Sheet

Each partner of the Joint Venture and Specialist Subcontractor must fill out this form separately.

Joint Venture / Specialist Subcontractor Information			
Bidder's legal name			
		Information of Joint Venture Partner or Specialist Subcontractor	**If any Joint Venture Partner or Specialist Subcontractor is a subsidiary or branch, information of any parent company/companies**
Names	**Full Legal name(s)**		
	Full trading name(s) (if any)		
Addresses	**Registered address(es)**		
	Trading address (es)		
	Postal address (es) (if different from trading address)		
Type of organization			
Country of constitution/ incorporation/ registration			
Year of constitution/ incorporation/ registration			
Corporate or registration number			
Joint Venture Partner's or Specialist Subcontractor's authorized representative information			

(name, address, telephone number(s), fax number(s), e-mail address)	

Attached are copies of the following documents:

❑ 1. Articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2.

❑ 2. Authorization to represent the firm named above, in accordance with ITB 22.2.

❑ 3. In the case of a government-owned enterprise, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5.

Subcontractors are those listed in Technical Proposal – Proposed Subcontractors and/or Manufacturers for Major Items of Plant and Services.

Form CON – 1: Historical Contract Nonperformance

Each Bidder must fill out this form in accordance with Criteria 2.2.1 and 2.2.3 of Section 3 (Evaluation and Qualification Criteria) to describe any history of nonperforming contracts and pending litigation or arbitration formally commenced against it.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Table 1: History of Nonperforming Contracts

Choose one of the following:

❑ No nonperforming contracts.

❑ Below is a description of nonperforming contracts involving the Bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Description	Amount of Nonperformed Portion of Contract ($ equivalent)	Total Contract Amount ($ equivalent)
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for nonperformance: *[indicate main reason(s)]*	*[insert amount]*	*[insert amount]*

Table 2: Pending Litigation and Arbitration

Choose one of the following:

❑ No pending litigation, arbitration or any other material events impacting the net worth and/or liquidity of the bidder.

❑ Below is a description of all pending litigation, arbitration involving the Bidder or any other material events impacting the net worth and/or liquidity of the bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Matter in Dispute	Value of Pending Claim ($ Equivalent)	Value of Pending Claim as a Percentage of Net Worth

[insert year]	Contract Identification, as applicable: *[indicate complete contract name/ number, and any other identification]* Name of Employer, parties involved in the material events impacting the net worth and/or liquidity of the bidder: *[insert full name]* Address of Employer, parties involved in the material events impacting the net worth and/or liquidity of the bidder: *[insert street/city/country]* Matter of Dispute: *[indicate full description of dispute]* Party who initiated the dispute: *[indicate "Employer" or "Contractor"]* Status: *[indicate status of dispute]*	*[insert amount]*	*[insert amount]*

- Note -

Table 2 of this form shall only be included if Criterion 2.2.3 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form CON – 2: EHS Performance Declaration

Each Bidder must fill out this form in accordance with Criterion 2.2.4 of Section 3 (Evaluation and Qualification Criteria).

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

In case of a Specialist Subcontractors, each Specialist Subcontractor must fill out this form and provide the Specialist Subcontractor's name:

Specialist Subcontractor: _____

Environmental and Health and Safety Performance Declaration in accordance with Section 3 (Evaluation and Qualification Criteria)

- ☐ **No suspension or termination of contract**: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental or Health and Safety performance since the date specified in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria).
- ☐ **Declaration of suspension or termination of contract**: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental or Health and Safety performance since the date specified in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria). Details are described below:
- ☐ **Declaration of request for replacement of Key Environment, Health and Safety Personnel**: The following contract(s) has/have experienced a request by the Employer to replace Environmental, Health and Safety Personnel for reasons related to Environmental or Health and Safety performance since the date specified in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria). Details are described below:
- ☐ **Declaration of past fatality resulted from EHS issues on site**: The following contract(s) has/have experienced a fatality resulted from EHS issues on site since the date specified in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria). Details are described below:

Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US$ equivalent)
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]*	*[insert amount]*

		Reason(s) for suspension or termination: *[indicate main reason(s) e.g., discharge over environmental limit, workers did not have required health and safety permits to undertake high risk work, work carried out was not adhered to approved construction methodology and quality control plan]*	
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s)]*	*[insert amount]*
…	…	*[list all applicable contracts]*	…
Performance Security called by an employer(s) for reasons related to EHS performance			
Year	**Contract Identification**		**Total Contract Amount (current value, currency, exchange rate and US$ equivalent)**
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s) e.g. discharge over environmental limit, workers did not have required health and safety permits to undertake high risk work, work carried out was not adhered to approved construction methodology and quality control plan]*		*[insert amount]*
Key EHS personnel replacement requested by the Employer for reasons related to EHS performance			
Year	**Contract Identification and Reasons**		**Personnel replacement action and results**
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]*		*[insert description]*

	Address of Employer: *[insert street/city/country]* Reason(s) for requesting for replacement: *[indicate main reason(s)]*	
Fatality due to EHS issues on Site		
Year	**Contract Identification**	**Follow-on actions taken by the contractor**
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Description of fatality event: Causation:	*[insert description]*

Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

	Financial Data for Previous _____ Years [$ Equivalent]		
	Year 1:	**Year 2:**	**Year __:**
Information from Balance Sheet			
Total Assets (TA)			
Total Liabilities (TL)			
Net Worth = TA-TL			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital = CA - CL			

Most Recent Working Capital		To be obtained for most recent year and carried forward to FIN - 3 Line 1; in case of Joint Ventures, to the corresponding Joint Venture Partner's FIN – 3.

Information from Income Statement

Total Revenues			
Profits Before Taxes			
Profits After Taxes			

❑ Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last _____ years, as indicated above, complying with the following conditions.

1. Unless otherwise required by Section 3 of the Bidding Documents, all such documents reflect the standalone financial situation of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.
2. Historical financial statements must be audited by a certified accountant.
3. Historical financial statements must be complete, including all notes to the financial statements.
4. Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

Form FIN - 2: Average Annual Turnover

Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each partner of a Joint Venture for the total certified payments received from the clients for contracts in progress or completed, converted to US dollars at the rate of exchange at the end of the period reported.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

_____			
Year	**Amount Currency**	**Exchange Rate**	**$ Equivalent**
Average Annual Turnover			

Form FIN – 3: Availability of Financial Resources

Bidders must demonstrate sufficient financial resources, usually comprising of Working Capital supplemented by credit line statements or overdraft facilities and others to meet the Bidder's financial requirements for

(a) its current contract commitments, and

(b) the subject contract.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Financial Resources		
No.	**Source of financing**	**Amount ($ equivalent)**
1	Working Capital (to be taken from FIN - 1)	
2	Credit Line[a]	
3	Other Financial Resources	
	Total Available Financial Resources	

[a] *To be substantiated by a letter from the bank issuing the line of credit.*

Form FIN- 4: Financial Requirements for Current Contract Commitments

Bidders (or each Joint Venture partner) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Current Contract Commitments						
No.	**Name of Contract**	**Employer's Contact (Address, Tel, Fax)**	**Contract Completion Date**	**Outstanding Contract Value (X) [a]**	**Remaining Contract Period in months (Y) [b]**	**Monthly Financial Resources Requirement (X / Y)**
1						
2						
3						
4						
Total Monthly Financial Requirement for Current Contract Commitments						**$** . . . . .

[a] *Remaining outstanding contract values to be calculated from 28 days prior to the bid submission deadline ($ equivalent based on the foreign exchange rate as of the same date).*

[b] *Remaining contract period to be calculated from 28 days prior to bid submission deadline.*

Form FIN - 5: Self-Assessment Tool for Bidder's Compliance to Financial Resources (Criterion 2.3.3 of Section 3)

This form requires the same information submitted in Forms FIN - 3 and FIN - 4. All conditions of "Available Financial Resources Net of CCC **≥** Requirement for the Subject Contract" must be satisfied to qualify.

Form FIN - 5A: For Single Entities

For Single Entities: (A)	Total Available Financial Resources from FIN – 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 4 (C)	Available Financial Resources Net of CCC D = (B - C)	Requirement for the Subject Contract (E)	Results: Yes or No [*D must be greater than or equal to E*] (F)
_____ (Name of Bidder)				. . . . .	

Form FIN - 5B: For Joint Ventures

For Joint Ventures: (A)	Total Available Financial Resources from FIN – 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 4 (C)	Available Financial Resources Net of CCC D = (B - C)	Requirement for the Subject Contract (E)	Results: Yes or No [*D must be greater than or equal to E*] (F)
One Partner:					
_____ ___ (Name of Partner)				. . . . .	
Each Partner:					

_____ (Name of Partner 1)				. . . . .	
_____ (Name of Partner 2)				. . . . .	
_____ (Name of Partner 3)				. . . . .	
All partners combined	∑ D = Sum of available financial resources net of current contract commitments for all partners		∑ D = _____	. . . . .	

- Note -

Form FIN – 5 is made available for use by the bidder as a self-assessment tool, and by the Employer as an evaluation work sheet, to determine compliance with the financial resources requirement as stated in 2.3.3. Failure to submit Form FIN - 5 by the Bidder shall not lead to bid rejection.

Form EXP – 1: Contracts of Similar Size and Nature

Fill out one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement, Taking-Over Certificate, Contract Completion Certificate or Performance Certificate.

The exchange rate to be used to calculate the value of the contract for conversion to a specific currency shall be the selling rate of the Borrower's Central bank on the date of the contract.

Contract of Similar Size and Nature			
Contract No . . . . . of	**Contract Identification**		
Award Date		**Completion Date**	
Role in Contract	❑ **Contractor**	❑ **Management Contractor**	❑ **Subcontractor**
Total Contract Amount			
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	**Percent of Total**	**Amount**	
Employer's name **Address** **Telephone number** **Fax number** **E-mail**			
Description of the Similarity in Accordance with Criterion 2.4.1 of Section 3 (Evaluation and Qualification Criteria)			

Form EXP - 2: Experience in Key Activities

Fill out one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement, Taking-Over Certificate or Contract Completion Certificate.

Each Bidder must fill out this form.

If complied by Specialist Subcontractor, each Specialist Subcontractor must fill out this form and provide the Specialist Subcontractor's name:

Specialist Subcontractor: _____

Contract with Similar Key Activities			
Contract No . . . . . **of**	**Contract Identification**		
Award Date		**Completion Date**	
Role in Contract	❑ **Contractor**	❑ **Management Contractor**	❑ **Subcontractor**
Total Contract Amount			
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	**Percent of Total**	**Amount**	
Employer's name **Address** **Telephone number** **Fax number** **E-mail**			
Description of the Key Activities in Accordance with Criterion 2.4.2 of Section 3 (Evaluation and Qualification Criteria)			

Form EXP – 3: Specific Experience in Managing Environmental, Health and Safety Aspects

Fill out one form per contract.

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

1. Key Requirement no 1 in accordance with Criterion 2.4.3 of Section 3:
_____

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor	Partner In JV	Management Contractor	Subcontractor
Total Contract Amount				
Details of relevant experience				

2. Key Requirement no 2 in accordance with Criterion 2.4.3 of Section 3:
_____

3. Key Requirement no 3 in accordance with Criterion 2.4.3 of Section 3:
_____

Form EXP – 4: Environmental, Health and Safety Certification

Please provide the following information:

Availability of the following valid ISO certification or internationally - recognized equivalent (equivalency to be demonstrated by the Bidder), and applicable to the worksite:

- Quality management certificate ISO 9001
- Environmental management certificate ISO 14001
- Health and Safety management certificate ISO 45001

Form EXP – 5: Environmental, Health and Safety Documentation

Please provide the following information:

Availability of in-house policies and procedures acceptable to the Employer for EHS management:

1. Existence of an Ethics Charter.

2. Existence of a system for monitoring compliance with EHS commitments by the Bidder and by the Bidder's Subcontractors and all its partners.

3. ISO 45001: Occupational Health and Safety Management System or equivalent

4. ISO 14001: Environment Management System or equivalent

5. Existence of official company procedures for the management of the following relevant points:

- EHS resources and facilities and EHS monitoring system;
- Temporary facilities management information (construction offices, labor camps, storage areas);
- Health and Safety on worksites policy and related guidance;
- Traffic management practice;
- Labor management practice and labor camp guidelines including sanitation and welfare provision;
- Hazardous products management practice including transport, use and storage;
- Solid waste management practice including track of waste generation, storage, transport and disposal;
- Hazardous waste management practice including track of waste generation, storage, transport and disposal including transboundary movement;
- E-waste management practice including track of waste generation, storage, transport and disposal including transboundary movement;
- Protection of water resources;
- Biodiversity protection practices;
- Control of infectious and communicable diseases (HIV/AIDS, malaria, COVID-19 etc.)
- Existence of official company procedures for solar PV and invertor suppliers of the management of the following relevant points:
  - environmentally safe and sound system for take back and safe disposal [recycling] of defunct or used PV panels or invertors

Form EXP – 6: Environmental, Health and Safety Dedicated Personnel

Please provide CV [Form PER-2] of the in-house personnel of the main contractor/ Joint Venture partners for the EHS positions specified in Section 6 (Employers Requirements):

Environmental, Health & Safety Manager (full time on site)

Form EXP - 7: Subcontractors

Fill out one (1) form per contract.

Contract for the Major Items			
Contract No . . . . . **of**	**Contract Identification**		
Award Date		**Completion Date**	
Role in Contract	❑ **Contractor**	❑ **Management Contractor**	❑ **Subcontractor**
Total Contract Amount			
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	**Percent of Total**	**Amount**	
Employer's name **Address** **Telephone number** **Fax number** **E-mail**			
Description of the Major Items in Accordance with Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria)			

Section 5: Eligible Countries

This section contains the list of eligible countries.

1	Afghanistan
2	Armenia
3	Australia
4	Azerbaijan
5	Bangladesh
6	Bhutan
7	Brunei Darussalam
8	Cambodia
9	Cook Islands
10	Federated States of Micronesia
11	Fiji
12	Georgia
13	Hong Kong, China
14	India
15	Indonesia
16	Japan
17	Kazakhstan
18	Kiribati
19	Kyrgyz Republic
20	Lao People's Democratic Republic
21	Malaysia
22	Maldives
23	Marshall Islands
24	Mongolia
25	Myanmar
26	Nauru
27	Nepal
28	New Zealand
29	Niue
30	Pakistan
31	Palau
32	Papua New Guinea
33	People's Republic of China
34	Philippines
35	Republic of Korea
36	Samoa
37	Singapore
38	Solomon Islands
39	Sri Lanka
40	Taipei,China
41	Tajikistan
42	Thailand
43	Timor-Leste
44	Tonga
45	Turkmenistan
46	Tuvalu
47	Uzbekistan
48	Vanuatu
49	Viet Nam
50	Austria
51	Belgium
52	Canada
53	Denmark
54	Finland
55	France
56	Germany
57	Ireland
58	Italy
59	Luxembourg
60	Netherlands
61	Norway
62	Portugal
63	Spain
64	Sweden
65	Switzerland
66	Türkiye
67	United Kingdom
68	United States

Section 6: Employer's Requirements

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1. Scope of Supply of Plant and Services

1.1 Design, Supply, Installation, Testing and Commissioning of Distributed (Rooftop) Solar Photovoltaic Systems

1.1.1 Background

The Royal Government of Bhutan (RGoB) has nominated DGPC with a mandate of developing 500 MWp of solar capacity by 2026, and further enhancing it to 1,000 MWp by 2030 to augment the solar capacity in the country.

DGPC under ADB's assistance plans to implement solar rooftop projects on public buildings across Bhutan. The program would target the following buildings (i) public buildings in Thimphu, Paro & Phuntsholing, (ii) Paro international airport and its facilities, (iii) DGPC's Hydropower colonies (iv) Technical Training Institutes, (v) Public Buildings in other Dzongkhags and (vi) Ground-mounted within premises. The total installed generation capacity of these systems is estimated at 35 MW.

As a part of this overarching initiative during the first phase, sub-project 1 has been identified that will include installation of rooftop solar systems on about 267 public buildings in Thimphu and DGPC hydropower colonies in Chhukha and Basochhu as detailed below:

Project scope

<table>
<tr><th colspan="3">Sub-Project 1</th></tr>
<tr><td rowspan="4">Public buildings in Thimphu</td><td>Government Buildings</td><td>Ministry of Health, Department of Immigration, Department of Civil Registration and Census, Department of Culture and Dzongkha Development, Royal Monetary Authority, Faculty of Nursing & Public Health, Royal Textile Academy, National Pension and Provident Fund, National Housing Development Corporation Limited, Ministry of Infrastructure and Transport, National Land Commission Secretariat, National Soil Service Centre, Bhutan Telecom Limited, Bank of Bhutan, Royal Insurance Corporation of Bhutan, Election Commission of Bhutan, Bhutan Youth Development Fund</td></tr>
<tr><td>Educational institutions</td><td>Taba Lower Secondary School, Kuensel Phodrang Primary School, Jungshina Primary School, Department of Youth and Sports, Royal University of Bhutan</td></tr>
<tr><td>Medical infrastructures</td><td>Jigme Dorji Wangchuck National Referral Hospital and Service Block, Mother and Child Building, National Eye Centre</td></tr>
<tr><td colspan="2">City Bus Stand Buildings</td></tr>
<tr><td rowspan="2">DGPC Colonies (Chhukha & Basochhu HP):</td><td colspan="2">Chhukha Hydropower Colonies (Including Bhutan Automation)</td></tr>
<tr><td colspan="2">Basochhu Hydropower Colonies</td></tr>
</table>

Vocational centres	Technical Training Institute, Serbithang, Thimphu
Other government institutions:	Royal Bhutan Army
	Royal Bodyguard of Bhutan

Considering subsequent sections, Section 1.1.2 describes the main objective and summarizes the Scope of Work (SOW. Section 1.1.3, provides further clarity about the activities of the SOW. Section 1.1.4 present the project schedule and section 5 describes the project's conditions.

1.1.2 Objective

This Scope of Work is designed to provide the **Successful bidder (Contractor)** with the necessary details to design, procure and construct the facilities as per the requirements set below and the technical specifications included within the tender package.

The primary objective of this assignment is to install rooftop solar systems on 267 public buildings, across the localities of Thimphu, DGPC Colonies (Chhukha & Basochhu HPP) and other government institutions (Royal Bhutan Army, Royal Bodyguard of Bhutan, and Technical Training Institute etc.). The total capacity of these rooftop solar systems will be **~7,827 kWp**. Detailed list of these buildings mentioned in Appendix 1.

1.1.3 Scope of Work

The scope of the EPC Contractor shall cover, but not limited to the following activities:

a) Rooftop site assessment

In order to facilitate the preparation of the in-situ analysis, information about each of the buildings (location, latitude, longitude etc.) is provided in Appendix 1: List of buildings and location.

The Contractor shall carry out site surveys of all selected buildings before planning and designing the systems, considering all factors related to roof features that may affect PV system performance, such as roof surface orientation, roof inclination, shading, and building obstructions (trees, chimneys, skylights, TV satellite, etc.). The contractor will also be responsible for analyzing and assessing the suitability of the roof and building structure for installation of PV arrays on the roof, taking into account wind loading, load on the roof, leakage, and safety of the building and personnel. No trees shall be trimmed unless a no objection has been issued by the employer.

The Contractor will submit a detailed report to the Employer approval on the roof and building assessment before planning and designing the PV systems for respective buildings.

DGPC has carried out a site survey of all selected buildings for proposed rooftop PV systems. Based on the survey, appropriate inverter capacity with Maximum Power Point Tracking (MPPT) for each site has been determined as presented in the table 1 below.

Table1: List of sites, number of buildings, estimated DC/AC capacity and Inverter capacity

SN	Site Name	No. of Building	Estimated total DC capacity (kW_p)	Inverter capacity and numbers	Total AC (inverter) capacity (kW)
1	Ministry of Health	1	79	30 kW inverter with 4 MPPT: 2 Nos. 20 kW inverter with 2 MPPT: 1 No.	80
2	Department of Immigration Department of Civil Registration and Census	1	71	20 kW inverter with 2 MPPT: 1 No. 15 kW inverter with 2 MPPT: 3 Nos.	65
3	Department of Culture and Dzongkha Development	1	75	30 kW inverter with 4 MPPT: 2 Nos. 15 kW inverter with 2 MPPT: 1 No.	75
4	Royal Monetary Authority	1	55.6	30 kW inverter with 4 MPPT: 1 No. 25 kW inverter with 2 MPPT: 1 No.	55
5	Faculty of Nursing & Public Health	6	260.1	30 kW inverter with 4 MPPT: 5 Nos. 25 kW inverter with 2 MPPT: 1 No. 20 kW inverter with 2 MPPT: 1 No. 15 kW inverter with 2 MPPT: 1 No. 12 kW inverter with 2 MPPT: 2 Nos. 21.6 kW micro-inverters: 10 - 40 Nos.	256
6	Royal Textile Academy (Phase 1 Building)	2	132.3	30 kW inverter with 4 MPPT: 4 Nos. 12 kW inverter with 2 MPPT: 1 No.	132
7	National Institute of Traditional Medicine (Academic Building)	2	134.5	30 kW inverter with 4 MPPT: 4 Nos. 10 kW inverter with 2 MPPT: 1 No.	130
8	National Pension and Provident Fund Office	1	46.4	30 kW inverter with 4 MPPT: 1 No. 15 kW inverter with 2 MPPT: 1 No.	45
9	Thimphu Thromde	1	146.8	30 kW inverter with 4 MPPT: 5 Nos.	150
10	National Pension and Provident Fund (NPPF) Colony	21	288.9	17 kW inverter with 2 MPPT: 5 Nos. 10 kW inverter with 2 MPPT: 6 Nos. 141 kW micro-inverters: 65 - 261 Nos.	275
11	National Housing Development Corporation (NHDC) Colony	55	1144.3	20 kW inverter with 2 MPPT: 18 Nos. 17 kW inverter with 2 MPPT: 4 Nos. 12 kW inverter with 2 MPPT: 8 Nos. 611 kW micro-inverters :283 -1131 Nos.	1090
12	Taba Lower Secondary School	1	66.4	30 kW inverter with 4 MPPT: 2 Nos. 6.48 kW micro-inverters: 3 - 12 Nos.	66

SN	Site Name	No. of Building	Estimated total DC capacity (kW_p)	Inverter capacity and numbers	Total AC (inverter) capacity (kW)
13	Kuensel Phodrang Primary School	2	28.6	17 kW inverter with 2 MPPT: 1 No. 10 kW inverter with 2 MPPT: 1 No.	27
14	Jungshina Primary School	2	35.6	17 kW inverter with 2 MPPT: 2 Nos.	34
15	Department of Youth and Sports (Office Building)	2	132.3	30 kW inverter with 4 MPPT: 4 Nos. 10 kW inverter with 2 MPPT: 1 No.	130
16	National Soil Service Commission	1	17.3	17 kW inverter with 2 MPPT: 1 No.	17
17	Royal University of Bhutan	3	270.5	30 kW inverter with 4 MPPT: 8 Nos. 17 kW inverter with 2 MPPT: 1 No.	257
18	Bhutan Telecom Limited	2	63.7	30 kW inverter with 4 MPPT: 1 No. 20 kW inverter with 2 MPPT: 1 No. 12 kW inverter with 2 MPPT: 1 No.	62
19	Bank of Bhutan	1	38.8	30 kW inverter with 4 MPPT: 1 No. 12 kW inverter with 2 MPPT: 1 No.	42
20	Royal Insurance Corporation of Bhutan	1	22.1	12 kW inverter with 2 MPPT: 1 No. 10 kW inverter with 2 MPPT: 1 No.	22
21	Election Commission of Bhutan	1	32.4	30 kW inverter with 4 MPPT: 1 No.	30
22	Youth Development Fund - Y1	7	124.2	30 kW inverter with 4 MPPT: 1 No. 20 kW inverter with 2 MPPT: 1 No. 75 kW micro-inverters: 114 Nos *75 kW micro-inverters: 35 - 138 Nos.	120
23	Wangchuk Hospital and Service Block	1	513	30 kW inverter with 4 MPPT: 17 Nos.	510
24	Mother and Child Building	1	238.1	30 kW inverter with 4 MPPT: 7 Nos. 10 kW inverter with 2 MPPT: 2 Nos.	230
25	National Eye Centre	1	79.4	30 kW inverter with 4 MPPT: 2 Nos. 20 kW inverter with 2 MPPT: 1 No.	80
26	City Bus Stand Building	1	583.2	25 kW inverter with 2 MPPT: 23 Nos.	575

SN	Site Name	No. of Building	Estimated total DC capacity (kW_p)	Inverter capacity and numbers	Total AC (inverter) capacity (kW)
27	Ministry of Works and Human Settlement	1	78.3	30 kW inverter with 4 MPPT: 1 No. 25 kW inverter with 2 MPPT: 1 No. 20 kW inverter with 2 MPPT: 1 No.	75
28	National Land Commission	1	245.7	30 kW inverter with 4 MPPT: 7 Nos. 15 kW inverter with 2 MPPT: 2 No.	240
29	Chhukha Hydropower Plant colony	45	534.4	30 kW inverter with 4 MPPT: 3 Nos. 25 kW inverter with 4 MPPT: 2 Nos. 20 kW inverter with 2 MPPT: 1 No. 15 kW inverter with 2 MPPT: 1 No. 12 kW inverter with 2 MPPT: 1 Nos. *327 kW micro-inverters :152 - 606 Nos.	485
30	Basochhu Hydropower Plant Colony	16	287.2	30 kW inverter with 4 MPPT: 4 Nos. 20 kW inverter with 2 MPPT: 1 No. 15 kW inverter with 2 MPPT: 1 No. 12 kW inverter with 2 MPPT: 8 Nos. *45 kW micro-inverters: 21 - 84 Nos.	293
31	Royal Bhutan Army Buildings	49	1341.8	30 kW inverter with 4 MPPT: 37 Nos. 17 kW inverter with 2 MPPT: 1 No. 15 kW inverter with 2 MPPT: 8 Nos. *69.7 kW micro-inverters: 32 – 129 Nos.	1311
32	Royal Bodyguard buildings	32	578.8	30 kW inverter with 4 MPPT: 13 Nos. 20 kW inverter with 2 MPPT: 6 Nos. *68 kW micro-inverters: 32 - 126 Nos.	574
33	Technical Training Institute	3	82.0	30 kW inverter with 4 MPPT: 1 No. 17 kW inverter with 2 MPPT: 2 No. 10 kW inverter with 2 MPPT: 1 No. *6.48 kW micro-inverters: 3 - 12 Nos.	80
Total			**7,827**	**30 kW inverter with 4 MPPT:134 Nos.** **25 kW inverter with 2 MPPT: 28 Nos.** **20 kW inverter with 2 MPPT: 33 Nos.** **17 kW inverter with 2 MPPT: 17 Nos.** **15 kW inverter with 2 MPPT: 18 Nos.** **12 kW inverter with 2 MPPT: 23 Nos.** **10 kW inverter with 2 MPPT: 13 Nos.**	**7,611**

SN	Site Name	No. of Building	Estimated total DC capacity (kW_p)	Inverter capacity and numbers	Total AC (inverter) capacity (kW)
				***1371 kW micro-inverters :636-2539 Nos.**	

** Two types of micro inverters have been considered: (i) 2 kW microinverter connected to four PV modules in parallel and (ii) 0.5 kW microinverters connected to a single PV module. However, for the Schedules of Prices and Rates in the Section-4, 2 kW microinverter connected to four PV modules in parallel is considered.*

The bidders shall note that estimates of capacity provided in the table above are indicative. The actual capacities shall be finalized upon detailed survey and design which should be approved by DGPC.

Upon completion of survey and PV system designs, the Contractor is required to prepare an updated schedule of quantities and cost estimates for each Site. The cost estimates shall be based on updated quantities and applicable contract rates. Contractor shall submit the updated schedule of quantities and cost estimates for approval.

b) Design Rooftop PV Systems

The Contractor shall prepare detailed engineering designs for grid-connected rooftop PV systems for each building or combination of a group of buildings within a campus. The Contractor shall be responsible to assess the buildings structural integrity, roof condition, far and near shading etc. to provide a design that complies with the technical specifications included in this tender.

The scope of design will include, but not limited to the following:

- Shadow analysis
- Detailed PV array layout plan
- Detailed design of PV array mounting structure
- Detailed design of mounting structure integration to the building roof
- Detailed design and materials to be used to prevent leakage on the roof
- Wind loading analysis on PV array mounting structure
- Exclusion of roof areas to avoid higher wind loading
- Electrical layout diagram showing positions of the PV arrays, inverter(s) and monitoring devices, combiner box, DC/AC cable layout, DC/AC Isolators, and grid integration point.
- DC string layout diagram showing the modules connected to a string and the location of each string on the roof using different color schemes and numbers indicating the connected inverters.
- Complete Single Line Diagram (SLD) with details of string size, inverters, DC combiner box, cables, and protection at each DC & AC side before integrating into the grid.
- For micro-inverters, the Contractor shall submit a detailed electrical diagram showing the grouping of micro-inverters through AC cable network and phase coupler with cables and protection before integrating into the grid.
- Connection diagram of energy meter and grid integration
- Earthing system layout for equipotential bonding and inverter earthing
- Provision to access the PV arrays for maintenance without stepping on the PV modules
- Complete Bill of Materials

The Contractor should identify the area for the inverter equipment that will meet the following criteria:

- Ease of maintenance and monitoring.
- Proper ventilation for low operating losses.
- Secured location and hardware.
- Compatibility with existing facilities.

c) Design Approval of Facilities

The design of PV systems will be subject to approval by DGPC. On approval of the design for respective buildings, a formal Notice to Proceed for each site will be issued.

The Contractor shall maintain a set of drawings for the systems as specified above, including all (DGPC approved) design changes made during construction, in case they are needed.

Upon completion of construction, and as conditions for the performance of the acceptance test, the Contractor shall submit final built-in design documents as specified above. Three (3) hard copies shall be submitted, as well as electronic copies of all documents.

d) Design and approval of Central Remote Monitoring System

The PV systems should be fitted with monitoring equipment capable of monitoring, analyzing, and displaying real-time and historical solar electricity generation data as per technical specification included in the tender package. Such specifications set the minimum data that is required.

The Contractor shall specify and install fully functional, web-based monitoring software for each system as specified in Section 6 of bid documents. The Contractor shall also supply, install, and commission the system hardware necessary for all monitoring activities. The Contractor shall demonstrate the features of the software to DGPC for approval during the design stage. Where multiple inverters are installed in a building or campus, a central remote monitoring system shall be installed combining multiple inverters as per the site conditions and connection feasibility.

e) Supply and Installation

The Contractor shall be required to supply all equipment, materials, and skilled and semi-skilled workers necessary to install the rooftop PV and systems and integrate them into the grid. Installation includes, but is not limited to, the following:

- Safety harness for working on the building roofs.
- Mechanical equipment for installation.
- Furnish and install all mounting equipment for deploying modules on the roof.
- Furnish and install all solar modules, inverters and other conditioning equipment and other required materials in order to have a complete and whole system.
- Where roof penetrations are made, they shall be properly sealed and waterproofed. The Contractor shall design the system for the minimal roof penetrations necessary to meet the wind loading on the systems.
- Raise all necessary materials to be mounted on the roof.
- Inspect and survey the structural materials and solar panels for manufacturing flaws and defects before installing.
- Inspect and survey the structure.
- Clean the work area at the job site upon completion.

The electrical installation includes, but is not limited to, the following:

- Include all necessary equipment installation and wiring for the complete system.
- Furnish and install combiner boxes.
- Furnish and install equipment necessary for proper earthing.
- All DC and AC cables are to be laid using proper cable trays/ conduits.
- The Contractor shall be responsible for electrical safety of the installation(s) including connectivity with the grid.

f) Factory Acceptance Test

The test specification for a factory acceptance test (FAT) for PV modules and Inverters shall be witnessed by the Employer or a third party, employed by Employer. The factory acceptance tests shall be carried out by the manufacturer in accordance with relevant IEC and IEEE standards.

The Contractor shall facilitate the Employer to witness the FAT by:

- Providing all required information of the manufacturer, procured equipment, etc. as deemed necessary
- Providing the test specification and any other technical requirement

The Contractor shall dispatch the material, only after the successful completion of Routine Tests/Factory Acceptance Tests (FAT) and after receiving written Material Dispatch Clearance (MDC) from the Employer.

The Employer will bear all related cost for travels of its employees for attending the FAT.

g) Pre-commissioning tests and start-up and system

The Contractor shall undertake final inspection and carry out pre-commissioning tests prior to the start-up and system. The Contractor should check for the following:

- The operation of the whole system.
- Installation matches the design documentation.
- Conductors, junction box, and disconnect are sized appropriately.
- Terminal connections and screws are securely tightened.
- Compliance with all technical specifications specified in this bid.
- Equipment is securely mounted (such as modules, racking, inverters, meters, panels and disconnects and so on).
- Roof penetrations are properly weather sealed.
- Applicable warning signs and labels are posted appropriately.
- The job site is clean and orderly.
- The documentation package is complete.
- Attention has been paid to details such as removing tools from the site before commissioning.

The Contractor will carry out all pre-commissioning tests as per the checklists approved by DGPC. It is mandatory to submit all pre-commissioning test reports to DGPC before completion of installation work.

h) Training

The Contractor shall provide training to nominated DGPC engineers on grid-connected rooftop PV system design, installation operation and maintenance specific to the systems installed under this contract, including specific training on maintenance, and troubleshooting of equipment and materials supplied. This will include the use of remote monitoring devices for performance monitoring, fault finding, root cause analysis and preventive and corrective maintenance.

The Contractor shall provide a general operation and maintenance manual for the solar PV rooftop system and specific operation and maintenance manuals for all major equipment such as PV modules, inverters, remote monitoring systems, phase couplers, etc. The O&M manuals should include preventive and predictive maintenance procedures and schedules, fault finding and diagnosis methods, troubleshooting, and safety precautions specific to the supplied equipment.

The training shall be provided on each phase of work for a tentative duration of 5-6 days however, the detailed training schedule shall be finalized on mutual agreement.

Details of the topics to be included in the training and equipment to be used for hands-on training has been provided in Appendix 2.

i) Commissioning & Acceptance

Commissioning including Acceptance test/Guarantee test shall be carried out in accordance with GCC 23 and GCC 25 and as specified below.

The commissioning and operational acceptance test will be carried out by Contractor in presence of the Employer in conjunction with the BPC (Bhutan Power Corporation Limited, the transmission & distribution utility in Bhutan), which will verify each system's grid connectivity compliance and performance.

The Employer, in conjunction with BPC and Contractor will review the system before the grid connection. After that, and only when accepted by BPC, the system will be connected to the grid for generation monitoring testing. The contractor will perform unintentional functionality test for each inverter and submit the test results to the Employer.

Unintentional islanding functionality test will be conducted as below:

1. The test must be conducted during noon time on a sunny day.
2. PV system shall produce more than 20% of the rated output of the PV array or the inverter – whichever is less.
3. The test should be carried out for all inverters.

Test 1: inverter must cease supplying power within **two seconds of a loss of mains**

Test 2: inverter must not resume supplying power until mains have been present for more than **60 seconds**.

The Contractor shall be starting up each system until it achieves the optimum performance requirements mentioned as below;

1 Minimum Energy generated: 0.16 kWh per kW per hour of test duration
2 Minimum Performance Ratio (PR): 80%.

The test will include three activities:

- Visual Inspection.
- In situ operational test.
- Generation monitoring over a consecutive seventy-two (72) hours period. Over such period, DGPC will check the data monitoring system.

The Acceptance Test /Guarantee Test will be considered completed after successful inspections, testing, and satisfactory performance of individual systems. Accordingly, Operational Acceptance Certificate shall be issued accordingly for respective systems.

j) Performance ratio

The performance ratio PR is the quotient of the system's final yield Y_f to its reference yield Y_r , and indicates the overall effect of losses on the system output due to both array temperature and system component inefficiencies or failures, including balance of system components. It is defined as:

$$PR = Y_f \div Y_r \quad (1)$$

$$= (E_{out} \,/\, P_o) \div \left(H_i \,/\, G_{i,ref}\right) \quad (2)$$

Expanding Formula (2) gives:

$$PR = \left[\sum_k (P_{out,k} \times \tau_k)\ \frac{1}{P_o}\right] \div \left[\sum_k (G_{i,k} \times \tau_k)\ \frac{1}{G_{i,ref}}\right] \quad (3)$$

Both the numerator and denominator of Formula (3) have units of kWh· kW^{-1} (or h). Moving P_o to the denominator sum expresses both numerator and denominator in units of energy, giving PR as the ratio of measured energy to expected energy (based only on measured irradiance and neglecting other factors) over the given reporting period:

$$PR = \left[\sum_k (P_{out,k} \times \tau_k)\ \right] \div \left[\sum_k (G_{i,k} \times \tau_k)\ \frac{P_o}{G_{i,ref}}\right] \quad (4)$$

The annual performance ratio, PR_{annual}, is the performance ratio of Formula (4) evaluated for a reporting period of one year.

The bidder can refer to IS-IEC 61724-Part 1-2017 standards for further clarifications on Performance Ratio.

1.1.4 Project Management System (PMS)

The Employer shall designate a Project Manager to coordinate and manage all project related activities. The Project Manager shall act as the overall in-charge of the Project. All communications between the Employer and the Contractor shall be coordinated through the Project Manager and Contractor Project Coordinator. The Employer shall engage Project Implementation Assistance Consultants to provide technical support in the successful implementation of the Project.

The Contractor shall comply with all requirements specified in the bid document including communications, submittals, approvals, documentation, progress monitoring, occupational health & safety management system (OSM) etc. to ensure smooth functioning of the PMS. Any non-compliances with respect to the above will be dealt with in accordance with the terms and conditions of the contract.

In the event computerized / web-based tools are introduced by the Project Manager for effective functioning of PMS, the Contractor is required to provide necessary facilities, data, and inputs in a timely manner for functioning of such a system.

1.1.5 Project Personnel

The Bidder must demonstrate that it has the suitably qualified and experienced personnel to manage and carry out project implementation works as per requirements indicated in Clause 8 of this section.

1.1.6 Organization

The Bidder shall provide to the Employer an organization chart showing the following if contract is awarded:

- Proposed Organization to be established for implementation of project activities
- Name of the experts along with their work location for duration of the project

1.1.7 Progress Report (CMP)

The Contractor shall prepare a monthly progress reports based on the attached Contract Management Plan. The report shall be submitted to the Employer every month.

The progress report shall be based on the attached Contract Management Plan (see point 2 below) and be created and submitted using the client's Project Monitoring Dashboard. This platform and any required training to use the platform will be provided free of charge by the employer.

1.1.8 Communication Plan

The Project Manager (DGPC) shall establish a communication plan with necessary time frames for supply of information and submittals etc. for effective management of the Project. The bidder shall provide his inputs / submittals according to such Plan.

1.1.9 Meetings

Scheduled project meetings shall be conducted each month attended by the Contractor and Employer in order to review the progress and to discuss and resolve any implementation issues. Minutes of the meetings shall be maintained.

1.1.10 Suggested Project Schedule*

SN	Tasks	Months									
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
A	**On-site evaluation**										
1	Conduct Rooftop solar feasibility assessment										
2	Final roof suitability verification										
B	**System Design**										
1	Perform Electrical & Structural Engineering design										
2	Design PV system layout & configuration										
3	Prepare & submit documentation to DGPC										
4	Review & Finalize documentation										
5	Obtain DGPC approval										
C	**Supply & Installation**										
1	Procurement of material & equipment for Rooftop solar installations										
2	Delivery of material at site										
3	Prepare site for installation										
4	Install Rooftop PV system										
D	**Commissioning & Acceptance testing**										
1	Precommissioning test										
2	Conduct final acceptance test & handover (DGPC+BPC)										
3	Completion of documentation										

Tentative project schedule

1.1.11 Conditions

The Contractor may like to inspect the proposed sites before the submission of his proposal. Interested bidders willing to inspect the sites before submission of proposal must intimate DGPC for prior approval to visit the sites.

a) The contractor would need to agree to keep noise and disturbance down to the minimum, keep the site tidy and clean, respecting the provisions of national laws and regulations and their ISO14000.

- Safety requirements and insurance for the site and contractor team members is the sole responsibility of the contractor.

- Contractor to be responsible for all security of his assets, personnel, and site during the construction phase.

b) The contractor shall be responsible for the safety of its personnel while working in the different buildings.

c) DGPC is not responsible in case of any type of accidents occurring to the contractor's personnel in the building premises.

d) The contractor's price shall include the following provisions:

- Any auxiliary work including taxes, transportation, logistics, loading, unloading and insurance that may be required for the proper execution of the works.
- Supply materials and equipment to the site.
- Installation of materials and equipment.
- All civil, mechanical, and electric works required for the installation, such as supports, chasing through walls and slabs for passage of cables, sleeves, fixing of cables, excavation and backfilling and returning the site as before situation, water proofing, cleaning, protection, painting, removing and transportation of old excavation outputs and any materials exceeded after the finishing of the works.
- All testing, balancing, adjusting, commissioning, and handling to client complete operational systems.
- Allowance for cleaning and for proper protection of all equipment plants, electrical installation and structures during installation and paintings.
- Submittal of original catalogues, instruction, and operation manuals, troubleshooting and maintenance for all equipment.
- Establish and submit electrical diagrams and circuits for grid utility supply.
- Drawings with all exact details for all executed works.
- All necessary cables, switches, and accessories to ensure the system is connected properly, and functionally working as intended. Capable of injecting power to the Grid.
- Provision of an Central Remote Monitoring System (for a group of inverters in one location)
- Meteorological measurement stations

2. Contract Management Plan and Reporting Requirements

The detailed monthly reporting requirements are presented in the Contract Management Plan (CMP) template, presented below.

The Contractor, the Employer and Project Implementation Assistance Consultant will use a dedicated web-based Project Management Dashboard (PMD) system for reporting, which will be based on the CMP structure. The PMD will be supplied free of charge by the employer & user manual on how to use the system will also be provided.

CMP TEMPLATE

Contract Management Plan (CMP)

1. Project Key Data

FORMAL PROJECT NAME	
PROJECT SUMMARY	
CONTRACT SCOPE	
CONTRACT TYPE	
EXICUTING AGENCY	
MAIN CONTRACTOR	
CONSULTANT	
PROJECT MANAGEMENT COMPANY	
CONTRACT AMOUNT	USD $
ORIGINAL CONTRACT COMPLETION DATE	
CONTRACT SIGNING DATE	
CONTRACT COMMENCEMENT DATE	

2. Executive Summary

3. Permits, Licenses and Approvals

Application Type	Relevant Law or Regulation	Responsible Party	Approving Authority	Planned Date	Actual Date	Comments

4.2 Residual Tender Stage Actions

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments

4.3 Contract Requirements

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments

4.4 Contract Activities Required Within 30 Days of Commencement Date

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments

5. Risk Management

Ref	Description	Impact Rating	Likelihood Rating	Risk Level	Mitigation Measure	Responsible Party	Comments

6. Project Monitoring

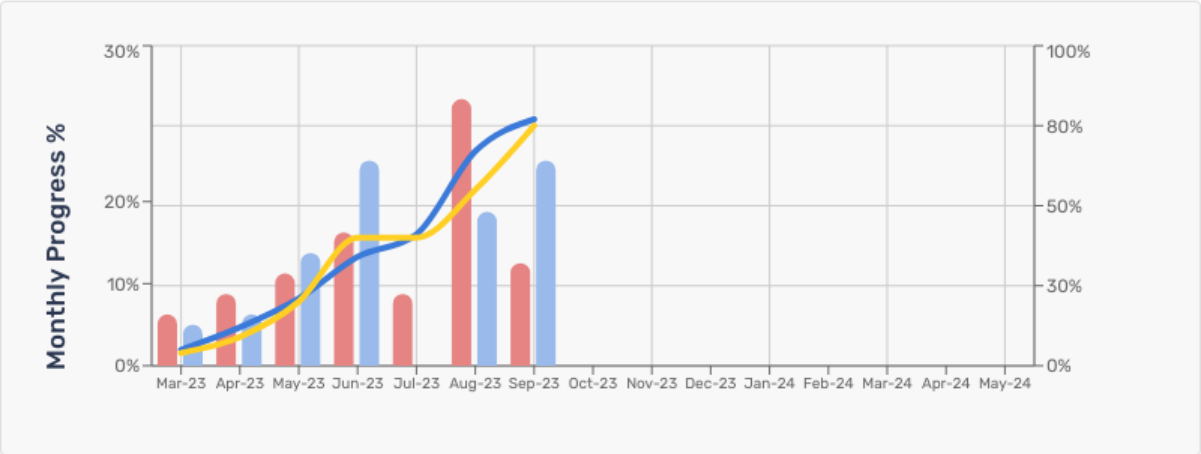
6.1 Project status as of

Project Status as of Date	
Commencement Date	
Completion Date	
Time Elapsed	
Planned Progress	
Actual Progress	
Expected Completion Date	
Variance to Completion	

6.2 Major Project Milestones

Ref	Description	Original Program Milestone	Updated Completion Date	Variance

6.3 Program Progress



6.4 Program Overview

7. Variations and Claims

7.1 Summary

Total Estimated Variations Amount	
Total Approved Variations Amount	
Total Variations Pending Approval Amount	
Total Claims Submitted Amount	
Total Claims Certified Amount	

Total Claims Pending Certification Amount	
Total Estimated Contract Amount Changes	
Total Approved Contract Amount Changes	
Total Pending Contract Amount Changes	
Prior Contract Amount	
Estimated Revised Contract Amount	
Approved Revised Contract Amount	

7.2 Variation Register

Ref	Variation Description	Date Instruction Issued	Estimated Variation Amount	Approved Variance Amount	Current Status

7.3 Claim Register

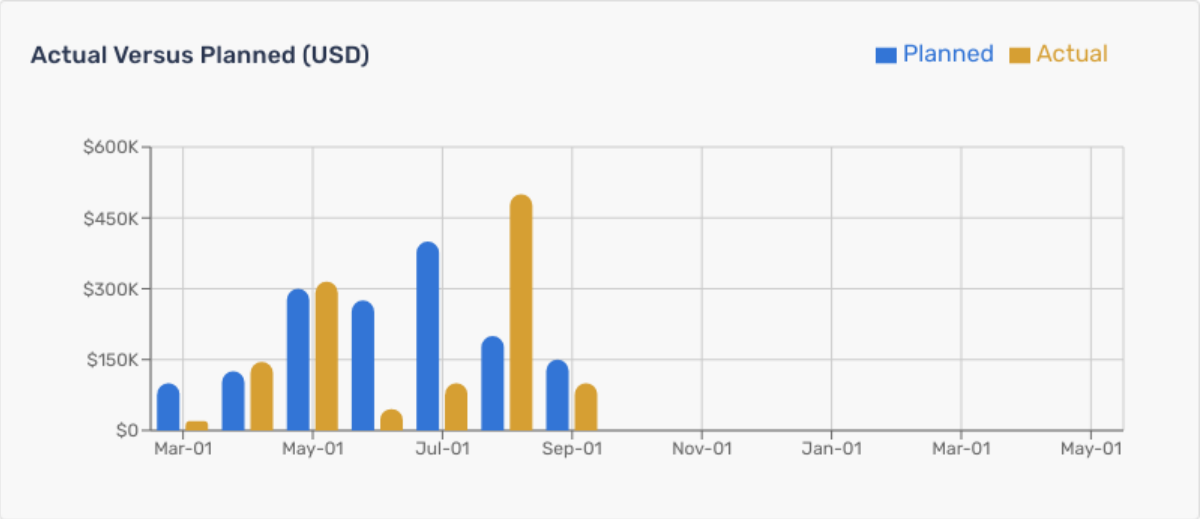
Ref	Description	Submission of Notice of Claim	Submission of Fully Detailed Claim	Claimed Amount	Amount Certified	Current Status

8. Financial Management

8.1 Actual Project Payments

Description	Date	Amount

8.2 Actual Versus Planned Project Payments



12. Environment, Social Health & Safety, and Security Related Obligations

12.2 SSEMP Activity Monitoring

Description of SSEMP Activities	Corresponding Submittal	Planned Date	Actual Date Received	Activity Received Completed

12.3 Social Safeguard Monitoring

Description of Social Safeguard Activities	Corresponding Submittal	Planned Date	Actual Date Received	Completed

12.4 Health and Safety Monitoring (Activities Described in the H&S Plan)

Health & Safety Activities Description	Corresponding Submittal	Planned Date	Actual Date	Completed

Health & Safety Activities Description	Corresponding Submittal	Planned Date	Actual Date	Completed

12.5 Health and Safety Statistics (Current Period)

Average Daily Manpower (including Subs)	
Lost Time Injury (LTI_n)	
Lost Time Injury Frequency Rate ($LTIFR_n$)	
First Aid Injury (FAI_n)	
Medical Treatment Injury (MTI_n)	
Significant Near Misses (SNM_n)	
Total Recordable Injury Frequency Rate ($TRIFR_n$)	

LTI = number of work related injuries or disease that result in a fatality, permanent disability or time lost from work. It could be as little as one day or shift (excluding the day of the incident).
LTIFR = number of lost-time injuries (LTIs) within a given accounting period, relative to the total number of hours worked in that period. The formula measures the number of LTIs per million hours worked during an accounting period and is as follows:
(Number of LTIs in accounting period) / (Total hours worked in accounting period) x 1,000,000
FAI = number of injury that requires a single first aid treatment and a follow up visit for subsequent observation involving only minor injuries, and for which the person would typically return immediately to their normal activities.
MTI = number of injuries or disease that resulted in a certain level of treatment given by a physician or other medical personnel under standing orders of a physician other than on-site first aid treatment.
SNM = number of unplanned events that did not result in injury, illness, or damage – but had the potential to do so (i.e. 'Close-Call', 'Nearly a Collision', 'Near Hit').
TRIFR = number of injuries (excluding fatalities) requiring medical treatment per million hours worked within an organization. The formula is as follows:
(Number of recordable injuries in accounting period) / (Number of hours worked by all staff in the same accounting period) x 1,000,000

12.6 Complaints (Grievances)

Name of Complainant	Complaint Description	Date Filed	Affected Person(s)	Responsible Party	Complaint Status

13. Site Photographs

14. Completion of Work and Contract Closure Activities

Completion Activity Description	Planned Date	Actual Date	Activity Completed

Completion Activity Description	Planned Date	Actual Date	Activity Completed

15. Contract Details

15.1 Contract Details & Key Dates

Contract Title	
Contract Number	
Contract Type	
Sector	
Contract Scope	
Location	
Original Contract Amount	
Date of Issuance of Letter of Acceptance	
Contract Signing Date	
Contract Commencement Date	
Contract Effective Date	
Contract Project Start Date	
Contract Time for Completion (days)	
Original Contract Completion Date	
ADB	
Executing Agency	
Contractor	
Design Consultant	
Project Manager	
Defects Liability Period (days)	
ADB Loan Effectiveness Date	
ADB Loan Closing Date	

16. Communications and Reporting

16.1 Contact Details

Ref	Name	Title	Position	Phone	Email
Executing Agency:					
Implementing Agency:					

Ref	Name	Title	Position	Phone	Email
Contractor:					
Engineer:					
ADB					
Dispute Board Members					
Other					

Appendix

5. Risk Management – Continued

Ref	Description	Impact Rating	Likelihood Rating	Risk Level	Mitigation Measure	Responsible Party	Comments

3. Specifications

a) General

All equipment supplied under this tender must fulfill the technical specifications listed herein for each component.

Bidders are required to fill out *Specification Forms* as mentioned in this document (SF1-SF4) and submit them with their bids, for the required components

Ownership for all items supplied shall be transferred to the client's name upon purchase of the goods. This includes all rights and privileges provided by the manufacturer, including warranties and preferential access.

Items supplied shall be designed to operate within the environmental conditions present at the site. Sites are located in the Himalayan region at an average altitude of 2,300m experiencing mild snowfall during the winter. The following environmental conditions apply:

- Ambient Temperature: (-) 10^{o}C to 30^{o}C
- Altitude: 2300 m
- Relative Humidity: 82% to 99%
- Wind Speed: Gusts up to 47 m/s

b) Photovoltaic (PV) Modules

PV modules made of monocrystalline silicon PERC half-cut cells that comply with IEC 61215 and are manufactured by Tier 1 manufacturers shall be supplied. Module efficiency should be more than 20%. All modules should include bypass diodes. Only "Class A" modules according to IEC 61730-1 and IEC 61730-2 shall be supplied. The capacity of a single module shall be 540 W_p – 570 W_p. All modules shall be from a single manufacturer with similar wattage and shall be with positive power tolerance only. Negative power tolerance shall not be accepted.

Material Warranty:

The manufacturer should warrant the Solar Module(s) to be free from (i) defects and/or failures due to manufacturing defects and/or failures due to materials, including PID defects and (ii) non-conformity to specifications due to faulty manufacturing and/or inspection processes for a period not less than ten (10) years from the date of commissioning. If the solar Module(s) fails to conform to this warranty, the contractor will replace the solar module(s) found defective. This Warranty shall be transferable to the end-owner of PV system.

Performance Warranty:

Performance of all PV modules shall be warranted with more than 95% power output for 5 years and 87% of minimum rated power for 25 years with not more than 0.6% degradation over a period of one year excluding for the first year where a maximum degradation up to 2.5% is allowed. If PV module(s) fail(s) to exhibit such power output in the prescribed time span, the Contractor will replace the PV Module(s) at their own cost.

Test Certificates:

Valid test certificates for PV modules issued by ISO 17025/ ISO 17065 certified test laboratories must be provided. The authenticity and validity of the certificates will be verified. The Contractor shall also provide a factory test certificate for the electrical characteristics of each solar PV module, including current-voltage (I-V) performance curves and temperature coefficients of power, voltage and current.

Test certificates must be provided to show adherence to show following standards:

a) IEC 61215: Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules.

b) IEC 61721 Photovoltaic (PV) module safety qualification – Part 1: Requirements for construction.

c) IEC 61730-1, 2: Photovoltaic (PV) Module Safety Qualification – Part 1: Requirements for Construction, Part 2: Requirements for Testing.

d) IEC 61853 – Part 1: Photovoltaic (PV) module performance testing and energy rating: Irradiance and temperature performance measurements, and power rating.

e) IEC 62804: Photovoltaic (PV) modules – Test methods for the detection of potential-induced degradation.

The following information must be mentioned in each module (this can be inside or outside the laminate but must be able to withstand harsh environmental conditions).

a) Name of the manufacturer of the PV module

b) I-V curve for the module

c) Wattage, Im, Vm and FF for the module

d) Unique Serial No and Model No of the module

e) Date and year of obtaining IEC PV module qualification certificate

f) Name of the test lab issuing IEC certificates

c) Grid-tied PV Inverter

Grid-connected String Inverters in compliance with IEC 62109-1:2010 and IEC 62109-2 will be supplied. Inverter Total Harmonics Distortion (THD) shall be below 3%. The inverter shall be tested for electromagnetic compatibility in accordance with standards IEC 61000-6-2 (interference immunity) and IEC 61000-6-4 (interference emission). Remote monitoring of various parameters at the inverter level should be made possible at the site by installing a suitable monitoring system. Any fault in the inverter could be recognizable by that system.

Test Certificates:

Valid test certificates for PV inverters issued by ISO 17025/ ISO 17065 certified test laboratories must be provided. The authenticity and validity of the certificates will be verified. The following test certificates must be provided to qualify PV modules:

a) IEC 60068 Parts 1, 2, 14, 17, 27, 30 and 64: Environmental Testing of PV System – Power Conditioners and Inverters.

b) IEC 61000-3: Electromagnetic compatibility.

c) IEC 61000-4-7: Testing and measurement techniques – General guide on harmonics and inter harmonics measurements and instrumentation, for power supply systems and equipment connected thereto.

d) IEC 61727 Photovoltaic (PV) systems – Characteristics of the utility interface.

e) IEC 62109-1 Part 1: Safety of power converters for use in photovoltaic power systems – General requirements and Safety of power converters for use in photovoltaic power systems.

f) IEC 62109-2 Part 2: Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting).

g) IEC 62116: Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters.

The bidder shall provide, as a minimum, the following documentation:

a) Technical data sheets

b) Inverter installation manual

c) Layout drawings for all devices

d) Mounting Structure design and drawings

e) Single line diagrams

f) Wiring diagrams for PV arrays, inverter and grid connection

g) Wiring diagrams for earthing and lighting protections

h) Operation and maintenance manual

i) Reports of tests and commissioning with protocols

Warranty:

The inverters shall be warranted for a minimum period of 10 (ten) years from the date of commissioning. This Warranty shall be transferable to the end-owner of PV system. Provision of extended warranty against payment shall be preferred.

Technical parameters of the grid-tied inverters are given below:

Technical Specification	**30 kW**	**25 kW**	**20 kW**	**17 kW**	**15 kW**	**12 kW**	**10 kW**	**Micro Inverter**
Efficiency								
Minimum efficiency at standard test conditions	>98%	>98%	>98%	>98%	>98%	>98%	>98%	>97%
DC input parameters								
Minimum DC input power	36000 Wp	30000 Wp	24000 Wp	20400 Wp	18000 Wp	14400 Wp	12000 Wp	540Wp to 570 Wp
Maximum DC input voltage	1100 V	1100 V	1100 V	1100 V	1100 V	1100 V	1100 V	60 V
MPPT operating voltage range	200 V - 1000 V	200 V - 1000 V	170 V - 900 V	170 V - 900 V	170 V - 900 V	170 V - 900 V	170 V - 900 V	26 V - 60 V
Minimum number of MPP trackers	4	2	2	2	2	2	2	1 per module
Minimum number of inputs to each MPPT	8	4	4	4	4	4	4	1
Minimum input current per MPPT	25 A	25 A	25 A	25 A	25 A	25 A	25 A	20 A
Minimum short-circuit current	40 A	40 A	38 A	38 A	38 A	38 A	38 A	25 A
AC output parameters								
Grid connection	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE	3ϕ, 400 V, 50 Hz, 3W / N+PE

Rated output power	30,000 W	25,000 W	20.000 W	17,000 W	15,000 W	12,000 W	10,000 W	2 kW to 12 kW (Group of 4 to 24)
Rated AC Apparent power	30,000 VA	25,000 VA	20.000 VA	17,000 VA	15,000 VA	12,000 VA	10,000 VA	2 kVA to 12 kVA
Maximum apparent power	33,000 VA	27,500 VA	22,000 VA	18,700 VA	16,500 VA	13,200 VA	11,000 VA	2 kVA to 12 kVA
Adjustable power factor	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging	0.8 leading to 0.8 lagging
Max. total harmonic distortion	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %
Features & Protections								
Input-side disconnection device	Required	Required	Required	Required	Required	Required	Required	Required
Anti-Islanding protection	Required	Required	Required	Required	Required	Required	Required	Required
DC reverse polarity protection	Required	Required	Required	Required	Required	Required	Required	NA
Insulation monitoring	Required	Required	Required	Required	Required	Required	Required	NA
DC surge protection	Required	Required	Required	Required	Required	Required	Required	NA
AC surge protection	Required	Required	Required	Required	Required	Required	Required	Required
Residual current monitoring	Required	Required	Required	Required	Required	Required	Required	Required
AC over-current protection	Required	Required	Required	Required	Required	Required	Required	Required
AC short-circuit protection	Required	Required	Required	Required	Required	Required	Required	Required
AC over-voltage protection	Required	Required	Required	Required	Required	Required	Required	Required
Arc fault protection	Required	Required	Required	Required	Required	Required	Required	Required
Ripple receiver control	Required	Required	Required	Required	Required	Required	Required	Required
Integrated PID recovery	Required	Required	Required	Required	Required	Required	Required	NA
Compatible with RCD	Required	Required	Required	Required	Required	Required	Required	Required

Type A and Type B								
Minimum Ingress Protection	IP-65	IP-65	IP-65	IP-65	IP-65	IP-65	IP-65	IP-67
General Data								
Operating Temperature Range	−25°C to + 60°C	−25°C to + 60°C	−25°C to + 60°C	−25°C to + 60°C	−25°C to + 60°C	−25°C to + 60°C	−25°C to + 60°C	−25°C to + 60°C
Operating altitude	> 2000 m	> 2000 m	> 2000 m	> 2000 m	> 2000 m	> 2000 m	> 2000 m	> 2000 m
Cooling	Natural/forced convection	Natural/forced convection	Natural/forced convection	Natural/forced convection	Natural/forced convection	Natural/forced convection	Natural/forced convection	Natural convection
LED Display	Required	Required	Required	Required	Required	Required	Required	Required
Communication	RS485, WLAN/Ethernet	RS485, WLAN/Ethernet	RS485, WLAN/Ethernet	RS485, WLAN/Ethernet	RS485, WLAN/Ethernet	RS485, WLAN/Ethernet	RS485, WLAN/Ethernet	Encrypted ZigBee or equivalent

a) All string inverters shall be of three phase power output and single-phase micro inverters will be grouped with the help of phase couplers to provide three phase power output.

b) All inverters shall be of static solid-state type power conditioning unit.

c) The inverter shall be capable of complete automatic operation, including wake-up synchronization & shutdown.

d) Inverters shall be compatible and functional with RCD Type A and Type B installed in the grid integration point.

e) The inverter operation manual must have an instruction for installation and the type of RCD compatible with the inverter

f) Inverter shall have provisions/features to allow interfacing with monitoring software and hardware devices and should have Wi-Fi connectivity capability. It shall provide information about generation power for different periods (hour, day, month, and year).

g) Inverter shall have an LCD screen to display power, voltage, ampere, and energy parameters/information.

h) The inverter generated harmonics, flicker, DC injection limits, voltage range, frequency range and anti-islanding measures at the point of connection to the Utility services should follow the international standard such as the IEC 61000-4-7 mentioned above.

i) Inverter should be suitably placed in a covered area with adequate ventilation.

j) Inverters should not be exposed to direct sunlight.

k) Inverters should not get wet from rain or snow.

l) Installation of the inverter cannot be tilted too much (15° maximum), inverted, or tiled.

m) The inverter should not have any negative impact on its efficiency due to higher altitude (2300 meters) of the sites.

d) Module mounting structure

PV module mounting structure shall consist of anodized aluminum guide rails placed on the roof through L-foot type roof fixing mounts. PV modules shall be fixed to the rail using mid-clamps and end-clamps. L-foot shall

consist of an L-foot mount, self-tapping wood screw (80 mm), rubber gasket, bolt, nut, and washer. All screws, bolts, and washers shall be made of stainless-steel SS 304 or higher grade.

a) Mid-clamp shall consist of mid-clamp (50 mm), bolt, nut, and washer.

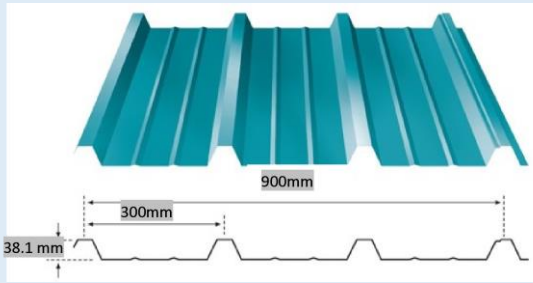
b) End-clamp shall consist of an end clamp (50 mm), bolt, nut, and washer.

The mid-clamps used for attaching the modules must be longer than 50 mm (2 inches). When there are multiple modules in a single row, consideration shall be given to using an end clamp for every fourth module, so if one does become loose, then only a few other modules would be affected, not necessarily the whole array.

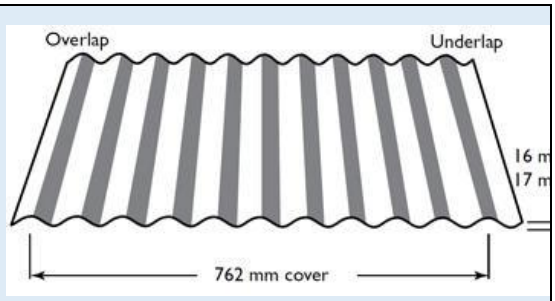
Guide rails, mid-clamps and end-clamps shall be made of anodized aluminum. It must be suitable for the highly saline and corrosive local climate. The length of each rail shall be between 3.5 m and 4.5 m.

The rail splice shall be compatible with the guide rail supplied and shall be complete with all accessories (nuts, bolts, etc.) necessary for installation.

Roofing is composed of Lysaght trapezoidal or corrugated sheets. The figure below shows roofing sheet type and indicative dimensions. Actual dimensions likely to vary for different building roofs. The Contractor has to measure the dimensions at site and design the structure accordingly.



Trapezoidal profile



Corrugated profile

Warranty:

The structure and its accessories shall be warranted for a minimum period of ten (10) years from the date of commissioning against any manufacturing defects and corrosion. This Warranty shall be transferable to the end-owner of PV system.

Other requirements:

a) The mounting structure should be able to withstand 47 m/s wind speed and support the installed solar PV modules, ensuring the roof remains waterproof, stability and wind withstanding capacity.

b) The design and specification of the PV array mounting system should take into account the wind and snow loads to be expected.

c) The contractor needs to take care of the load bearing capacity of the roof and need to arrange suitable structures based on the quality of the roof.

d) The Contractor must provide the technical design and drawing of the PV mounting structure.

e) The total load of the structure (when installed with PV modules) should be less than 30 kg/m2.

f) The rooftop mounting structure shall be aluminum of suitable grade minimum alloy AA6063 or better.

g) Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, and nuts and bolts.

h) The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module.

i) The bidder will have to confirm the mechanical strength of the whole structure with a design calculation with a safety factor of 1.5.

j) All solar panels must be accessible from the top for cleaning.

e) Solar DC cables

The DC solar cable must be of copper with UV protection type insulation with a minimum voltage rating of 1000V DC as specified below:

Voltage Rating	1000 V_{DC}
Number of Cores	1
Cross-sectional area	4 mm^2
Conductor Material	Stranded Copper (Tinned coated)
Cable Type	PV 1-F / H1Z2Z2-K
Insulation	XLPE (double insulation)
Temperature Rating	120^oC
Dielectric Strength	> 6.5 kV, 1 s
Other Mandatory Features	• High Resistance to weathering • High UV resistance • High thermal endurance
Standard	EN 50521:2008/ UL 6703/IEC 62852:2014
Certification	TUV/UL/CE

a) All connections should be properly made through suitable lug/terminal crimped with use of suitable proper cable glands.

b) The size of cables/wires should be designed considering the line losses, maximum load on line, keeping voltage drop within permissible limit and other related factors.

c) The cable/wire should be of ISI/ISO mark for overhead distribution.

d) Cables should be sized such that the overall voltage drop, at array maximum operating power (STC), between the array and the inverter is within 2%.

f) Plugs, sockets and connectors

Plugs and socket (MC4) connectors mated together in a PV system shall be of the same type from the same manufacturer i.e., a plug from one manufacturer and a socket from another manufacturer or vice versa shall not be used to make a connection. In the event that plug and sockets are from different manufacturers, a compatibility test certificate must be provided by the manufacturer for the specific lot supplied for this project.

Plugs, sockets, and connectors shall comply with EN 50521:2008/ UL 6703/IEC 62852:2014; shall be rated for DC use; have a voltage rating of 1000V DC; shall be protected from contact with live parts in the connected and disconnected state; have a current rating equal to or greater than the current carrying capacity for the circuit to which they are fitted.

When installed outdoors, plugs, sockets and connectors shall be UV-resistant and be rated for IP 67 or above.

Rated Voltage	1000 V
Rated Resistance	< 0.5 mΩ
Contact material	Copper (tinned, cross-linked)
Cross-section area	4 mm^2
Temperature Rating	Up to 90 degrees Celsius
Features	• High resistance to weathering • High thermal endurance • Anti-aging capability • Resistant to UV
Protection Classification	IP 67
Safety Class	Class II
Standards	EN 50521:2008/ UL 6703/IEC 62852:2014

g) DC Combiner Boxes (DCCB)

A separate DC combiner box will be used to install DC isolators in each string and DC surge protection devices (Type II) in each input to the inverter before connecting the PV array to the inverters. The bus bars are made of copper of desired size. Combiner boxes shall be at least IP 65 compliant in accordance with IEC 60529 and shall be UV resistant. An over-current protection device (fuse) will be used when the module fuse rating is 25A or less and more than three (3) strings are connected in parallel. When overcurrent protection is incorporated, it shall be rated as per IEC 62548. Combiner boxes shall have suitable cable entry with cable glands (IP 65) for both input and output cables. Suitable markings on the bus bars shall have to be provided to identify the bus bars etc. suitable ferrules shall also have to be provided to identify interconnections.

h) AC Combiner Boxes (ACCB)

When multiple string inverters or micro-inverters are to be connected together, AC combiner boxes shall be used with appropriate circuit breakers and surge protection devices. Interconnection to the main LT panel for grid-connection shall be made from the ACCB. All switches and the circuit breaker connectors should conform to IEC 60947, Part I, II and IIII. All indoor panels will have minimum ingress protection of IP54. All outdoor panels will have ingress protection of IP65 or higher.

All devices/equipment like bus support insulators, circuit breakers, SPDs etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance at 400 V operation under the following supply conditions:

- Variation in supply voltage: +/- 6%.

- Variation in supply frequency: -2% and +1%

i) Disconnectors

All disconnectors shall comply with the following requirements:

a) It does not have exposed live metal parts in a connected or disconnected state;

b) They have a current rating equal to or greater than the associated overcurrent protection device or, in the absence of such a device, have a current rating equal to or greater than the minimum required current carrying capacity of the circuit to which they are fitted.

Switch disconnectors shall be certified to meet IEC 60947-1 and IEC 60947-3 requirements and have mechanisms that have an independent manual operation.

In addition, circuit breakers and any other load-breaking switch-disconnectors used for protection and/or disconnecting means shall comply with the following requirements:

a) Do not be polarity sensitive.

b) Be rated to interrupt full load and prospective fault currents from the PV array, diesel generators (if any) and the grid.

j) Grid connection box with RCD, AC isolator and AC SPD

A separate grid connection box will be installed for each system connected to the grid. This box will be installed near the main distribution panel and shall have an ingress protection level of IP65. The solar energy generation meter (gross meter) will be installed near to this box. The box will be fitted with a residual current device (RCD) of appropriate current rating as per the inverter capacity, an AC surge protection device (SPD) and a lockable manual AC isolator to disconnect the PV system from the grid. The RCD will disconnect the active and neutral conductors from the incoming supply in case of an earth fault to eliminate a potentially lethal shock hazard. RCD must operate correctly with the DC fault current level that could be injected into the mains from a faulty inverter. RCD shall be of Type A or Type B. RCD must be installed according to the manufacturer's instructions. A warning sign containing the type and rating of the RCD must be located on the port of the inverter.

k) Lightning/Surge arrestor and over voltage protection

a) The rooftop PV systems should be provided with lightning (surge arrestor) and over-voltage protection. The principal aim of this protection is to reduce the overvoltage to a tolerable value before it reaches the PV or other sub-systems components.

b) If the building or dwelling is fitted with a lightning protection system (LPS), the array frame should be connected to the LPS. Where an LPS is fitted, PV system components should be mounted away from lightning rods and associated conductors. For example, an inverter should not be mounted on an inside wall that has a lightning protection system down conductor running just the other side of the brickwork on the outside of the building.

c) Where there is a perceived increase in risk of direct lightning strike as a consequence of the installation of the PV system, specialists in lightning protection should be consulted with a view to installing a separate lightning protection system in accordance with the following specification:

- IEC 62305-4 Lightning Protection Standard.
- IEC 60364-5-53: Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control.
- IEC 61643-11-2011: Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods.

- IEC 62561-1 Lightning protection system components (LPSC) - Part 1: Requirements for connection components.
- IEC 62561-2 Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes.
- IEC 62561-7 Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds.

l) Earthing System

a) All conductive parts of PV array mounting structure and PV modules shall be earthed/ grounded properly for equipotential bonding. In each array every module should be connected to each other with copper wires or WEEB or teethed clamps/washers.

b) For the PV modules connected to the microinverters, follow instruction of the microinverter manufacturer if earthing is required.

c) The cross-section area or the earthing conductor for PV equipment should not be less than 6 mm^2 if copper. For the earthing of lightning arrestor, the cross-section of the earthing conductor should not be less than 16 mm^2 of copper. The complete Earthing system shall be mechanically & electrically connected to provide an independent return to Earth.

d) Masonry enclosure with an earth pit of size not less than 300mm x 300 mm (depth), complete with cemented brickwork of a minimum of 150 mm width duly plastered with cement mortar (inside) shall be provided as per IEC 60364. Hinged inspection covers of sizes not less than 300 mm x 300 mm with a locking arrangement shall be provided. A suitable handle shall be provided on the cover by means of welding a rod on top of the cover for future maintenance.

e) The inverters' Earthing system shall be provided per the inverter manufacturer's recommendations.

m) Grid islanding (manual)

A lockable manual disconnect isolation switch beside automatic disconnection to the grid would have to be provided at the utility end to isolate the grid connection by the utility personnel to carry out any maintenance or emergency.

n) AC Cable

AC cable size will be in accordance with the inverter manufacturer's recommendation. The indicative size of AC cables are as follows:

a) 3.5C, 16 mm^2, 650/1100V, copper cable from inverter to main supply board for 30 kW, 25 kW and 20 kW inverters

b) 3.5C, 10 mm^2, 650/1100V, copper cable from inverter to main supply board for 17 kW and 15 kW inverters and a group of microinverters for a maximum of 24 modules.

c) 3.5C, 6 mm^2, 650/1100V, copper cable from inverter to main supply board for 12 kW and 10 kW inverters.

o) Cable tray

All conductors should be suitably protected from mechanical damage; suitable methods may include the use of the appropriate cable tray and trucking in accordance with IEC 61537.

All the cables should be laid in appropriate cable tray as per the requirement of the site. No cable should be laid directly on ground or wall. Cable trays should be laid such that there is gap of at least four inches above

ground/roof/wall. IEC 61537 shall be followed for cable management, cable tray systems and cable ladder systems.

p) Data acquisition system

The rooftop PV system shall include data monitoring, remote diagnosis, data storage and visualization. The Contractor shall provide software (web-based monitoring) which is able to collect data from the inverter, keeping the DGPC asset management team informed of the system's status at any given time, including data – but not limited – about

a) System details Site (location and building name)

b) Generation before inverter (DC) and after inverter (AC) in kWh, voltage, current, etc.

c) The program shall be capable of showing instantaneous and historical data.

d) Such systems must be capable of providing information for each installation and adding different installations as needed by DGPC through the dashboard installed for monitoring on a single computer at DGPC premises.

e) The Contractor is responsible for providing data connection for each project. Communications shall be transmitted via the most effective way in each location.

f) The system shall display data in real-time and record and log performance data at regular intervals to be agreed upon over a minimum of two years. Data could be downloaded at any moment in a format compatible with MS Excel.

q) Energy Meter

SN	Parameter	Description
1	Meter Type	a) 3-ø, 4 wires Static Watt-hour Smart Meter The Smart Meters shall comprise of load control switch with pluggable bi-directional communication module. Pluggable communication module shall be interchangeable with another module of same communication technology or module with different communication technology (RF mesh and GSM).
2	Connection	Direct / Whole current
3	Rated Voltage	415V (phase to neutral) with minimum variation of ± 15%. However, meter should withstand the maximum system voltage.
4	Rated Current	3-ø, Ib - 5A and Imax - 100 A
5	Starting current	0.2 % of base current
6	Rated Frequency	50Hz ± 5%
7	Accuracy Class	0.5s
8	Power Consumption	Power consumption of the smart meter with integrated communication modules and load control switch shall be as per IEC standard or IS 16444-1 or Equivalent. Meter with lowest power consumption shall be preferred.
9	Meter constant	Imp/ unit (Bidder to specify meter constant)
10	Insulation and Impulse test	Meter shall comply with IEC standard or IS 13779 or Equivalent.
11	Influence of supply voltage	Meter shall comply with IEC standard or clause 4.4.2 of IS 15884 or Equivalent.
12	Short time over current	Meter shall comply with IEC standard or clause no. 4.4.3 of IS 15884 or Equivalent.
13	Immunity to phase and earth fault	Meter shall comply with IEC standard or clause no. 9.6 of IS 13779 or Equivalent.

14	Influence of Self Heating	Meter shall comply with IEC standard or clause no. 4.4.4 of IS 15884 or Equivalent.
15	Influence of Heating	Meter shall comply with IEC standard or clause no. 4.4.5 of IS 15884 or Equivalent.
16	Electromagnetic compatibility (EMS)	a. Meter along with (NIC) shall remain immune to electrostatic discharge (up to and including 35KV), electromagnetic HF field and fast transient burst along-with NIC. b. The meter shall be designed in such a way that conducted or radiated electromagnetic disturbances as well as electrostatic discharge do not influence the meter. c. Meter shall be type tested for electromagnetic compatibility. d. Meter shall comply requirement of IEC standard or clause no. 4.5 and 5.5 of IS 15884 or Equivalent.
17	Limits of error due to influence quantities	Meter shall work within guaranteed accuracy as per IEC62053-21 / IS 13779 or Equivalent under and after influence of following :- a. Current Variation b. Ambient Temperature variation c. Voltage variation d. Frequency variation e. 10% third harmonic in current f. Reversed phase sequence g. Voltage unbalance h. Harmonic components in current and voltage circuit i. DC and even harmonics in AC current circuit j. Odd harmonics in AC current circuit k. Sub harmonics in AC current circuit l. Continuous (DC) "stray" magnetic induction of 67mT ±5%. m. Continuous (DC) "abnormal" magnetic induction of 0.27T ±5%. n. Alternating (AC) "stray' magnetic induction of 0.5mT ±5% o. Alternating (AC) "abnormal' magnetic induction of 10mT. p. External magnetic field of 0.5T q. Electromagnetic HF fields r. Radio frequency interference s. DC immunity test Note: DGPC reserves the right to formulate any other test method to check magnetic immunity/ logging of meter.

Construction Feature

SN	Parameter	Description
1	General	Construction of meters shall conform to the relevant IEC standard or IS 16444-1 or Equivalent.

2	Meter Body	a) Base body and top cover shall be made of UV stabilized polycarbonate, unbreakable high grade flame retardant insulating material of good dielectric and mechanical strength with FV0/V0 in flammability level. b) Base body shall be opaque. c) Top cover shall be transparent or opaque/translucent with viewing window. d) Top cover and base should be ultrasonically welded. e) Meter body shall be sealed in such a way that opening of meter base and cover is not possible without breaking the seals. f) Thickness of meter body (Base and Terminal cover) shall be minimum 2mm. g) Mechanism shall be provided to log event in case of top cover is opened. Bidder shall explain its mechanism.
3	Terminal Block	a) The terminal block should satisfy all the conditions specified in IS:13779 or Equivalent and IEC 62052 - 11. The material of the terminal block should fulfil the requirement of following tests: 1) The flame retardant rating of V-0 as per UL 94 testing. 2) The glow wire test for temperature of 960ºC as per IEC 60695-2-1 or IS:11000-2-Sec.1 or Equivalent. 3) Heat deflection temperature (HDT) test of 135ºC as per ISO 75 or ASTM D-648. 4) Ball pressure test at 125ºC as per IEC 60335-1. b) Terminal block shall be opaque. c) Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135ºC and pressure of 1.8MPa. d) The terminals shall be designed to ensure adequate and durable contact such that there is no risk of loosening or undue heating.
4	Terminal cover	a. Material - UV stabilized transparent/Opaque polycarbonate cover. b. Provision of sealing through sealing screws. c. The sealing screws shall be held captive in the terminal cover. d. Terminal cover should have provision for cable entry from bottom. e. Baffle wall shall be provided above the cable entry base wall so that access to the terminals is not possible (even with thin metallic wire) without breaking the seal. f. Diagram of external connections should be embossed on terminal cover. Sticker is not acceptable. g. Mechanism shall be provided to record an event with occurrence and restoration in case of terminal cover is opened.
5	Terminals	a. Terminals shall be suitable for 25 Sqmm aluminium stranded cable. b. Two no's flat head screws and washers per terminal shall be provided. c. Material of terminals, screws and washers should be brass or tinned copper. Terminals shall be tested for continuous current of 150 % Imax. d. Terminals shall be clearly marked for phase/neutral/outgoing etc. e. Clearances and creep age shall be as per IEC standard or IS 13779 or Equivalent. f. All electrically live screws shall be of brass/ nickel tin-plated. All other screws shall be electro plated.

6	Fixing Arrangement	a. The meter shall have minimum three fixing holes, one at the top for mounting and two at the bottom, inside the terminal cover. b. The top hole shall be keyhole type on the back of the meter base so that hanging screw is not accessible after fixing of the meter and it shall not be possible to remove the meter from the hanging screw without removing the terminal cover and screws behind the terminal block cover. c. Manufacturer shall provide the appropriate fixing screws along with the meters.
7	Ingress Protection	IP 52 or better
8	Real Time Clock (RTC)	a. The meter shall have internal real time crystal clock to set date and time. b. Drift in time of this clock shall not be more than ±5 minutes/ year at a reference temperature of 27°C. c. Meter should have capability of Time synchronization through optical port/ remote communication (via HES) with proper authentication. d. The Real Time Clock (RTC) battery shall have long life (10 Years); it should be with permanent Non Rechargeable Battery.
9	Battery	Lithium ion battery with guaranteed shelf life of minimum 10 years and capacity life of 15 years. Lithium thioyl Chloride battery will be preferred. In case battery removal or total discharge same should not affect the working & memory of the meter even in case of single wire power condition.
10	Memory	Non-volatile memory independent of battery backup, memory should be retained up to 10 years without any auxiliary power.
11	Self-Diagnostic feature	Meter shall have self-diagnostic for the following a. Date and RTC. b. Battery. c. Non-volatile memory. d. Display e. Communication card status
12	Load Control Switch	a. Smart meter shall be equipped with integrated load control switches to control flow of electricity to the load at the instance of connect/ disconnect commands as per functional need of the system. b. Load switch for connect/ disconnect purpose shall be mounted inside the meter with suitable arrangement. c. Load Switches shall be provided in phase(s) and neutral d. The rating of switches used shall be in line with meter rating.
12.1	Performance requirement for load switching	a. Utilization category of the load switch shall be UC2 or better as per IEC standard or clause no. 4.6.6.2 of IS 15884 or Equivalent. b. All load switches shall operate simultaneously.
13	Optical port	Meter shall have an optical port with a rust resistance coated metal ring to hold magnet of downloading probe. Optical port shall comply with hardware specifications provided in IEC-62056-21.
14	Communication Module Interface	a. Meter should have the provision for 01 no's plug-in communication module (NIC card) for two-way communication. The same interface shall be compatible with both Cellular and RF communication technologies interchangeable in field. b. Interface shall support data transfer between meter and network interface card over UART/ RS232. Bidder shall explain its pin out and standard in detail.

		c. Meter shall have mechanism to log communication module removal as an event in its memory with date and time stamp.
14.1	Communication modules (NIC)	a. Smart meter shall have 01 no's plug-in type communication modules/ Network Interface card (NIC) for connectivity of meter to HES from following options as per tender requirement: i. Communication Module/ NIC Type 1: RF based suitable for communication Network of BPC designated RF canopy provider. ii. Communication Module/ NIC Type 2: RF and cellular communication module (LTE 4G with 3G and 2G fall back as per Telecom Standards of Kingdom of Bhutan). b. Meter shall have separate indications on display/ for remote and local communication. c. Communication module shall held in a casing which can be directly plugged in the meter. Sealing screw shall be provided.
15	Meter Sealing Arrangement	a. Reliable sealing arrangement shall be provided to make the meter tamper evident and to avoid fiddling or tampering by unauthorized persons. b. Sealing shall be in accordance with IEC/ IS standards or Equivalent with latest amendments. c. In case of plug in communication module, sealing arrangement shall also be provided for the same.
15.1	Manufacturer's Seals	a. Manufacturer has to provide one polycarbonate seal on either side/front of the meter. b. Minimum one hologram type seal, numbered with hologram transfer on tamper proof paper seal. c. Minimum one polycarbonate seal in loose condition to be provided for terminal cover of the meter. Note: The Serial Number of Meter, Polycarbonate Body Seal/ Sticker Seal and Loose Seal for Terminal Cover shall be same.
15.2	Metal Seals	a. Minimum one Polycarbonate seal should be provided on top cover. b. Minimum one hologram type seal, numbered with hologram transfer on tamper proof paper seal. c. Minimum one polycarbonate seals shall be provided for communication module.
16	Name Plate and marking	a. Meter should have clearly visible, indelible and distinctly marked name plate in accordance with IEC standard or IS 16444-1 or Equivalent and clause no.11 of this specification. b. Paper stickers are not allowed for name plate.
17	Resistance against heat and fire	The terminal block and meter case shall have safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per IEC standard or IS 13779 or Equivalent.
18	Connection Diagram	The connection diagram of the meter shall be clearly shown on the meter nameplate and shall be of permanent nature. Alternatively, connection diagram can be permanently embossed on the inside/outside portion of terminal cover.

Functional Requirement

SN	Parameter	Description
1	Meter category	Meter shall comply with IEC standard or D1 category of IS 15959-2 or Equivalent.
2	Mode of metering	It should be possible to configure meters in following modes of metering: Forward: In this mode any export active energy shall be treated as import energy and shall be recorded in forward only register. Default mode of metering shall be forward.
3	Payment Mode	It should be possible to configure meter in following modes of payment: a. Post-payment mode b. Pre-payment Mode Any change in payment mode shall be logged in events with date and time stamp. Prepayment facility shall be achieved by server / HES. Default mode of metering shall be post payment until specified otherwise.
4	KVAH Calculation	Lag only: KVAh is computed based on KVArh and KWH value. If PF=1, or leading, then KVAh = KWH. At no instance KVAh<KWh.
5	MD calculation	Block window with default demand integration period of 15mins configurable from 1min to 60mins as per requirement and meter shall be configurable for block/sliding window for MD recording.
6	TOD Metering	a. Meter shall be capable of doing TOD metering in minimum 4 tariff rate registers programmable for minimum 8 time zones and 4 seasonal profiles. b. TOU metering shall be implemented by the activity calendar method of DLMS UA-1000-1/ IEC standard/ IS 15959-1 clause 9 or Equivalent. c. Special Day table shall be defined as per DLMS UA-1000-1/ IEC standard d. Default TOU programming shall be as per latest DERC guidelines. Prior approval shall also be taken from DGPC for the same. e. Tariff rate registers shall be as follow R1: Rate register for Peak R2: Rate register for Normal R3: Rate Register for Off Peak
7	Instantaneous Parameters	All the parameters mentioned in IEC standard or table-A1 of IS 15959-2 or Equivalent along with following additional parameters shall be supported by meter: a. RF/ GSM signal Strength in milli db. b. Displacement PF. c. GPS coordinates. d. Temperature in ºC e. kVARH f. kVAH

8	Billing data	a. Billing parameters shall be generated at the end of each billing cycle and stored in memory as per IEC standard or provisions provided in clause no. 14 of IS 15959-2 or Equivalent. b. Support for selective access shall be provided for billing parameters as per IEC standard or clause no 11.3 of IS 15959-1 or Equivalent c. All the parameters mentioned in IEC standard or table-A4 of IS 15959-2 or Equivalent shall be supported by meter. d. The current cycle billing parameters shall be readable as the values of the latest billing period, on demand. This shall be in addition to the last six billing period data, which shall be available in the profile buffer as the last six entries in the buffer.
8.1	Selective access of billing data	Support for selective access shall be provided for billing parameters as per IEC standard or clause no 11.3 of IS 15959-1 or Equivalent.
8.2	Billing period reset/ MD reset	24:00 Hrs of last day of each billing cycle. Default billing cycle shall be monthly.
8.3	Billing period reset mechanism	Meter shall comply with IEC Standard or clause 10 of IS 15959-1 or Equivalent.
8.4	Billing period counter	Cumulative billing period counter since installation and available billing periods shall be provided as per IEC Standard or clause 11.2 of IS 15959-1 or Equivalent.
9	Load survey Parameters	a. Load survey parameters shall be measured and recorded at the end of each profile capture period (minimum 30 mins) for last 60 days (Power ON days). b. All the parameters mentioned in IEC standard or table-A15 of IS 15959-2 or Equivalent shall be supported by meter.
9.1	Selective Access	Support for selective access shall be provided for billing parameters as per IEC Standard or clause no 11.3 of IS 15959-1 or Equivalent.
9.2	Profile capture period	Default 15mins programmable from 1min to 60mins
10	Daily load profile	Daily load profile parameters shall be measured and recorded at each midnight i.e. 00:00 hrs for last 60 Power ON days. All the parameters mentioned in IEC standard or table-A16 of IS 15959-2 or Equivalent shall be supported by meter as Daily load profile parameters.
11	General Purpose Parameters	Following parameters shall be provided in Non-Volatile memory (NVM) of the meter as per IEC standard or clause 16 of IS 15959-2 or Equivalent.
11.1	Name Plate Detail	The smart meter shall comply with relevant IEC standard or Table-A26 of IS 15959-2 or Equivalent with additional parameters of month of manufacturing and as per clause no. 11 of this specification.

11.2	Programmable parameters	a. These parameters can be programmed remotely by HES and locally by CMRI via proper access writes. Every transaction shall be logged in non-volatile memory of the meter with date and time stamp. b. Programming of any of the parameters shall increment the 'Cumulative programmable count' value. c. All the parameters mentioned in IEC standard or Table-A27 of IS 15959-2 or Equivalent shall be supported by meters.
11.3	Push Services	a. Smart meter is able to automatically notify data, event, and messages to a destination client system in an unsolicited manner (without a request from a client) as per IEC standard or clause no 6 of IS 15959-2 or Equivalent. b. Randomization: Data from different endpoints shall be pushed intelligently on the network in order to avoid excessive traffic on the network. c. It shall also be possible to configure push services for all profiles i.e. instantaneous, billing, load survey, daily energy and events. Bidder should explain its capability to configure push services. However following push services shall be available by default. i. Load survey profile data at after every 4 hours configurable to any predefined interval. ii. Mid night data at 00:00 hrs of every day. iii. Billing profile data on occurrence of billing.
11.3.1	Periodic push (Smart meter to HES)	a. Meter shall be able to push instantaneous parameters to HES at predefined intervals. Parameters required for push shall be intimated during detailed engineering in the event of order. b. Parameters to be included as per IEC standard or clause 6.1.4 of IS 15959-2 or Equivalent.
11.3.2	Event Push (Smart meter to HES)	a. Meter is able to report HES, the status change of any of the identified events (· Earth Loading, · Influence of permanent magnet or AC/ DC electromagnet, · Neutral disturbance- HF, DC or AC, · Meter cover opening, · Meter load Disconnected/ meter load connected, · Power Outage, · Power Restoration · Manual/ MRI reset) mapped in to event status word (ESW) of size 128 bits by pushing following objects to HES. i. Device ID ii. Push Setup ID iii. Real time clock- Date and Time iv. Event Status Word 1 (ESW 1). b. Each of the bits in ESW shall reflect the current state of the event and are mapped against each of the identified events. c. An event status word filter (ESWF) of 128 bit shall also be provided to configure events for event push. Events which are supported in meter shall only be configured for event push. Bit value 1 in ESWF shall indicate that the event is supported and value 0 indicates that event is not supported for event push. Position of the event bit in ESWF shall be same as in ESW.
11.3.3	Event status Bit mapping	Meter shall comply with IEC standard or IS-15959-3 or Equivalent

12	Firmware upgrade	a. Smart meter shall support remote firmware upgrade feature without loss of any data and metrology for a part or complete firmware of meter. b. Firmware upgrade shall use the Image transfer classes and mechanisms specified in IEC62056-6-2 and IEC62056-5-3 or clause 9 of IS 15959 (Part 2) or Equivalent. c. Broad cast facility shall be supported in HES for simultaneously upgrading the firmware of a group of meters installed in field. d. Firmware upgrade feature shall be provided with proper security. The design shall take into account field scenarios such as power failure during F/W upgrade. e. Once the firmware is upgraded, meter shall send an acknowledgment to HES. It shall also log it as an event in its memory. f. Meter shall support capability to self register the meter with new firmware. g. The execution time of the change of the firmware within the meter should be below 3 minutes.
13	Support for broadcast message	Meter shall support connection less messaging services of DLMS to support broadcast messages for a group of meters for following actions: a. Gap reconciliations. b. Firmware upgrade. c. On demand readings. d. Meter connection and disconnection. e. Updating of Programmable parameters.
14	Disconnection mechanism	a. The Smart meter shall support disconnection (all the switches shall operate simultaneously) on the following conditions as per IEC standard or clause 11 of IS 16444-1 or Equivalent: i. Over current (105 % of Imax in any element for predefined persistence time) ii. Load control limit (Programmable) iii. Pre-programmed tamper conditions (Factory programmed) iv. Disconnection signal from Head end system. v. Pre-paid meter disconnection functionality for prepayment mode. b. Meter shall use the disconnection control object as defined in IEC standard or clause 10 of IS 15959-2 or Equivalent. c. Load limit function shall be disabled by default until other specified. Relay for connect/disconnect shall comply all relevant requirements of IEC standard or IS 15884 or Equivalent

15	Local reconnection	a. Meter shall be able to reconnect load switches locally only for overload and load control limit disconnections. 1. The meter will try to reconnect the load up to predefined time, with predefined interval (Time and interval is programmable). 2. If the consumption is still more than the programmed limits, it will lock out and wait for 30 minutes. 3. If the consumption is still above the limit, the procedure defined above in 1 and 2 shall be repeated. e. It shall be possible to remotely connect/disconnect the relay via commands from HES. f. In case of relay malfunction i.e., connect/disconnect action of relay is not taking place due to welding of contacts or any other reason, then it shall be logged as an event in the non-rollover compartment. Same shall be sent as an alert to HES. g. Remote command shall have priority over local communication.
16	Reconnection mechanism	a. Reconnection shall be done from HES except for over current and load control limit. In case of failure of communication / HES, reconnection shall be possible locally through Hand Held Device (CMRI)/ rugged computer via proper security. b. Reconnection in case of prepayment meter shall be as per prepayment profile and balance/credit availability in the meter.
17	Status of load switch	a. Indication of status of relay i.e. connected/disconnected should be available on display as well as through communication to HES. b. Connection and disconnection should be logged as events.
18	Last gasp and First breath	The meter shall send abnormalities at the consumers' end like Power failure (Last Gasp) and Power Restoration (First Breath) to HES. Meter shall comply with IEC standard or IS 16444 or Equivalent.
19	Security	Meter shall comply with IEC standard or clause 7.1.2 of IS 15959-1 or Equivalent
19.1	Encryption for data communication	Meter shall comply with IEC standard or clause 7.1 of IS 15959-2 or Equivalent
19.2	Encryption/ Authentication for data transport	Meter shall comply with IEC standard or clause 7.2 of IS 15959-2 or Equivalent
19.3	Key requirement and handling	Meter shall comply with IEC standard or clause 7.3 of IS 15959-2 or Equivalent
19.4	NIC security	a. Proper security at end points as well as network level shall be present to prevent unauthorized hacking of the end points or the network itself. b. The meter password is required to open a session between NIC and meter c. The meter shall maintain counter for monitoring of unsuccessful attempts of performing meter operations and alerts to HES. d. Up to 3 no's successful attempts are allowed, after which the port is locked out until authenticated from system administrator.
20	IP communication profile support	Meter shall support TCP-UDP/ IP communication profile for smart meter to HES. Meter shall comply with IEC standard or clause 8 of IS 15959. or Equivalent

Note:

The Application Programming Interface software (*RESTful API*) for all the software in this specification shall be provided along with the meter supply.

Anti-tamper and Fraud Detection Requirement

SN	Parameter	Description
1	Current Related	a. Occurrence and restoration of following current related events shall be logged in meter memory as per IEC standard or table A5 of IS 15959-2 or Equivalent. b. For each occurrence event captured, the cumulative tamper count shall be incremented. c. Selective access shall be provided as per IEC standard or clause 11.3 of IS 15959-1 or Equivalent.
2	Power related	a. Occurrence and restoration of following Power related events should be logged in meter memory as per IEC standard or table A6 of IS 15959-2 or Equivalent. b. Only Real clock (date and time) and event code shall be captured. c. Selective access shall be provided as per IEC standard or clause 11.3 of IS 15959-1 or Equivalent.
3	Power On/ Off	Meter shall detect occurrence and restoration of power off if the phase voltage is absent more than a threshold period.
4	Voltage related	a. Occurrence and restoration of following Voltage related events shall be logged in meter memory. d. For each occurrence event captured, the cumulative tamper count shall be incremented.
5	Low Voltage Logging	Event shall be logged in memory along with Occurrence and restoration event data. Threshold should be below 180 Volts. Manufacturer should explain behavior of meter below 120V.
6	Protection against HV spark	Meter shall continue to record energy or log the event, in case it is disturbed externally using a spark gun/ ignition coil. Up to 35 KV meter should remain immune. Communication port shall also be immune upto 35KV with cover in place. Bidder should have valid test report from Same/ UL lab for the same.
7	Others	a. Occurrence and restoration of following events shall be logged in meter memory as per IEC standard or table A8 of IS 15959-2 or Equivalent. b. For each occurrence event captured, the cumulative tamper count shall be incremented. c. Selective access shall be provided as per IEC standard or clause 11.3 of IS 15959-1 or Equivalent.
8	Neutral disturbance	Meter shall log all events when AC/DC/ Pulsating voltage is injected in neutral circuit especially when it can disturb the recording of energy. Manufacturer should specify the method of testing of Neutral disturbance.

9	External Magnetic Interference	a. The meter shall either remain immune to tamper through application of external magnetic field (AC electro magnet or DC magnet) as per value specified in IEC/IS standard or Equivalent. b. In case of abnormal permanent magnetic field, either meter shall remain immune or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F and it should also be logged as event with date & time. c. The meter shall be provided with built in logic/ indication and sensor to detect tamper beyond meter's magnetic immunity level and display of such occurrences. The meter accuracy or accuracy display shall not be affected by permanent magnetic field up to meter's magnetic immunity level. d. At the time of occurrence of magnetic tamper, meter should record tamper event with Imax, rated voltage and unity P.F and at the time of restoration it should logged with actual parameters. e. Manufacturer should explain method of MD computation during magnetic interference.
10	Non rollover events	a. Occurrence of following non-rollover events shall be logged in meter memory as per IEC standard or table A9 of IS 15959-2 or Equivalent. b. For each occurrence event captured, the cumulative tamper count shall be incremented. c. For these events, only date and time shall be captured. d. Selective access shall be provided as per IEC standard or clause 11.3 of IS 15959-1 or Equivalent.
11	Top cover open	Meter shall detect opening of top cover and this event shall be logged. Detection and logging mechanism shall work even when the meter is de-energized. Logic shall be defined.
12	Connection Related Tamper Conditions	The meter shall not get affected by any remote-control device & shall continue recording energy under any one or combinations of the following conditions:
12.1	I/C & O/G Interchanged Condition	Meter should record forward energy within limits of accuracy class 1.0.
12.2	Phase & Neutral Interchanged Condition	Meter should record forward energy within limits of accuracy class 1.0.
13	Event Logging	Total number of events to be stored shall be minimum 20 for power On/ OFF event and not more than 50 for all other events in FIFO basis.
14	Parameter Snapshot	Captured parameters mentioned above are to be captured when event occurrence and restoration is logged as per IEC standard table A11 of IS 15959-2 or Equivalent.
15	Tamper Indication	Appropriate Indications/Icons for all tampers should appear on the meter display either continuously or in auto display mode.

16	Tamper Logics	A logic sheet for tamper/ event detection and logging shall be submitted for purchaser's approval. Following details should be provided for each tamper in tabular form a. Detailed Tamper logic b. Threshold values c. Persistence times d. Restoration time e. Event count

Data and Communication Requirements (Protocol / Software)

SN	Parameter	Description
1	Data Exchange protocol	a) Meter shall comply DLMS standards/ IEC DLMS protocols suite (62056) or IS 15959-2 or Equivalent. b) Bidder shall explain in detail the additional parameters/services/ methods used in meters from IS 15959 (part 2) or Equivalent and its reference to DLMS books/ IEC standard. c) Prior to manufacturing of meters bidder shall provide a detailed specification explaining all parameters/ services/methods used in meter in addition to IS 15959 (Part 2) or Equivalent.
2	Base computer software	Licensed Software (including activation keys if required) with the following features should be supplied for free to download meter through optical port.
2.1	Operating System	BCS should be compatible for latest Windows operating system.
2.2	Security	System shall be password protected where user can login only if login ID is provided by administrator. BCS shall have rights management system so that access rights can be provided as per requirement to maintain security.
2.3	Database	BCS shall maintain master database according to desired area, location, and region etc.
2.4	Reporting	a) BCS shall have option of user defined report generation in format of Excel, Word and CSV, XML, PDF etc. b) BCS shall have capability to export data in ASCII, CSV and XML format at desired location so that the same could be integrated with BPC billing data for processing. c) All the data available in the meter shall be convertible to user defined ASCII, CSV and XML file format.
2.5	Data transfer rate	BCS and communication ports should support data transfer rate of 9600 bps (minimum).
2.6	Meter data download time	Meter data consisting of all parameters and complete load survey/load profile (minimum 60 days) and any other meter data download time shall be less than 10 mins. Meter with lowest download time shall be preferred.

2.7	Integration with existing BPC Head End System (HES)	BPC currently has ISKRAEMECO HES system installed and the contractor shall be responsible for integration and data communication of meter specified in this tender.
3	Software for local communication (HHU/Laptop)	a) The successful bidder shall provide life time activated software capable of downloading all the data stored in meter memory through window/ android operating system based handheld units (HHU)/ laptop through optical port. b) HHU/ Laptop software should have option for selection of parameters to be downloaded from meter. c) Meter data consisting of all parameters and complete load survey for all parameters shall be read by HHU and downloaded on HES in minimum possible time (not more than 5 minutes). d) Optical probe (minimum 30 numbers) shall be provided with minimum 1.5 meters cable, having optical sensor at one end and USB connector on another end.

Meter Display

S. No	Parameter	Description		
1	LCD Type	STN Liquid crystal with backlit		
2	Viewing angle	The display visibility should be sufficient to read the Meter mounted at height of 0.5 m as well as at the height of 2 m.		
3	Size of LCD	Minimum 10 mm X 5 mm		
4	LCD Digits	7 digits		
5	LCD language	English		
6	Display mode	Following parameters should be displayed in Auto scroll with programmable interval		
		Order	Parameter	Display time
		1	LCD Test	5 Sec
		2	Meter Sr. No.	5 Sec
		3	Date	5 Sec
		4	Time	5 Sec
		5	Cumulative kWh	30 Sec
		6	Current month MD	5 Sec
		7	Instantaneous Voltage	5 Sec
		8	Instantaneous Current	5 Sec
		9	Power Factor	5 Sec
		10	Frequency	5 Sec
		11	Instantaneous Load KW	5 Sec
		12	Signal Strength (RF/ GSM)	5 Sec
		13	Temperature	5 Sec

		14	kVARh	5 Sec
		15	kVAH	5 Sec
		16	Instantaneous Generation	
		17	Cumulative Export kWh	
		18	Cumulative Import kWh	
7	Display indications	a) Appropriate indications/flags for all tampers and self-diagnostic features should be provided. b) Data Communication c) Relay Status		

Familiarization

1	**Familiarization**	The successful bidder shall provide free familiarization training (in addition, to the submission of in-depth written user manual) to DGPC and BPC of all the relevant software and connections for successful installation and commissioning of smart meters.

r) Meteorological Station

The contractor will supply and install three meteorological measurement stations to monitor ambient and weather conditions with respect to the below mentioned meteorological parameters. These meteorological measurement stations will be installed in the locality where rooftop PV systems will be installed. Specific site and building for installation of these stations will be provided by DGPC. The bidder shall be responsible for the installation of a meteorological measurement stations before the commissioning of the PV power plants. The power supply for the meteorological measurement station shall be from UPS. The meteorological measurement station shall be compatible with remote monitoring systems of rooftop PV systems. The meteorological station shall be installed by the bidder on a location where no shading from any building, light pole, or any other obstacle is expected on the reference cells, nor from the meteorological station on the modules of the PV field.

The following measurement equipment shall be provided for the meteorological station:

1) Solar irradiation sensor (reference cell). Reference cell of same technology as used in PV power plant, to be installed at the same tilt angle that of PV array.
2) Air temperature sensor with accuracy: ± 0.5 °C
3) Module temperature sensor. PT1000 or PT 100 adhesive foil resistor in 4 wire measuring technology). At least two (2) independent sensors shall measure the module temperature of the modules.
4) Data logger must have the following specifications
    - The data logger shall be time synchronized
    - Analogue inputs with a resolution of at least 16 bits
    - Input voltage range: ± 10 mV to ± 10 V, full-scale
    - Interface Base: Must be compatible with remote monitoring systems
    - Standard protocol: Modbus
    - Linearity: ± 0.005% Absolute Accuracy: 0.05%
    - Data Storage Space: At least 1 GB

s) Specification Forms

SF1: PV Module Form

				To be filled by Bidder	
Sl. No.	Description	Unit	Requirements	**Data**	**Remarks**
1	Manufacturer		Tier 1		
2	Type		Monocrystalline PERC half cut cell		
3	Min/Max Operating Temperature	^oC			
5	Maximum DC system Voltage	V	1000		
6	Nominal Power at STC	W	>540		
7	Power Tolerance (+/-)	%			
8	Temperature Coefficient (Power)	%/^oC	< 0.38		
9	Temperature Coefficient (Voltage)	%/^oC			
10	Temperature Coefficient (Current)	%/^oC			
11	Module Efficiency at STC	%	>20		
12	Cable Connectors		MC4 compatible		
13	Voltage at P_{max}	V			
14	Open Circuit Voltage	V			
15	Current at P_{max}	I			
16	Short Circuit Current	I			
17	Height/Width/Depth	mm			
18	Weight	Kg			
19	Safety Class		II		
20	IEC 61730 Certificate		Mandatory		
21	IEC 61215 Certificate		Mandatory		

22	IEC 61701 Certificate		Mandatory		
23	Product Warranty	Years	10		
24	Power Guarantee	%/Year	87% of minimum rated power for 25 years with not more than 0.5% - 0.6% degradation over a period of one year.		
25	Quantity of PV Modules	kW	≥7,827		

SF 2: PV Inverter Form (Submit a separate form for different capacity inverter)

				To be filled by Bidder	
Sl. No.	Description	Unit	Requirements	**Data**	**Remarks**
1	Inverter Capacity				
2	Manufacturer	N/A			
3	Documents proving proposed inverter brand has been in use in North America, Australia, and Europe for past 5 years			[Submitted / Not Submitted]	
4	Min/Max Operating Temperature	^{o}C			
6	Maximum DC system Voltage	V	1000		
7	Nominal MPP Voltage Range	V			
8	Maximum DC Current	A			
9	Number of DC Inputs				
10	Fuse Rating for DC Input	A			
11	Total nominal DC Power	W			
12	Nominal AC Output Power	W			
13	Nominal AC Current	A			
14	Nominal AC Voltage	V			

15	AC Grid Frequency	Hz	50 (±2.5)		
16	Power Factors				
17	Maximum THD_i	%	<3		
18	Height/Width/Depth	mm			
19	Weight	Kg			
20	Operation Consumption	W			
21	Standby Consumption	W			
22	Communication Protocol				
23	Certificates				
24	Product Warranty	Years	10		
25	Frequency measurement average	ms			
26	Total quantity of inverters	Nos.			

SF3: Solar Cable Form

				To be filled by Bidder	
Sl. No.	Description	Unit	Requirements	**Data**	**Remarks**
1	Manufacturer				
2	Type		Copper, double insulated		
4	Rated Voltage	V	1500		
5	Cable Length	m			
6	Number of Cores		1		
7	Conductor		Copper		
8	Cross-section area	mm^2	4 mm^2		
9	Conductor Shape				
10	Insulation Material		XLPE		

11	Type Test Certification		PV 1-F/ H1Z2Z2-K		
12	Total Length of Cable	m			

SF 4: MC4 Connector Form

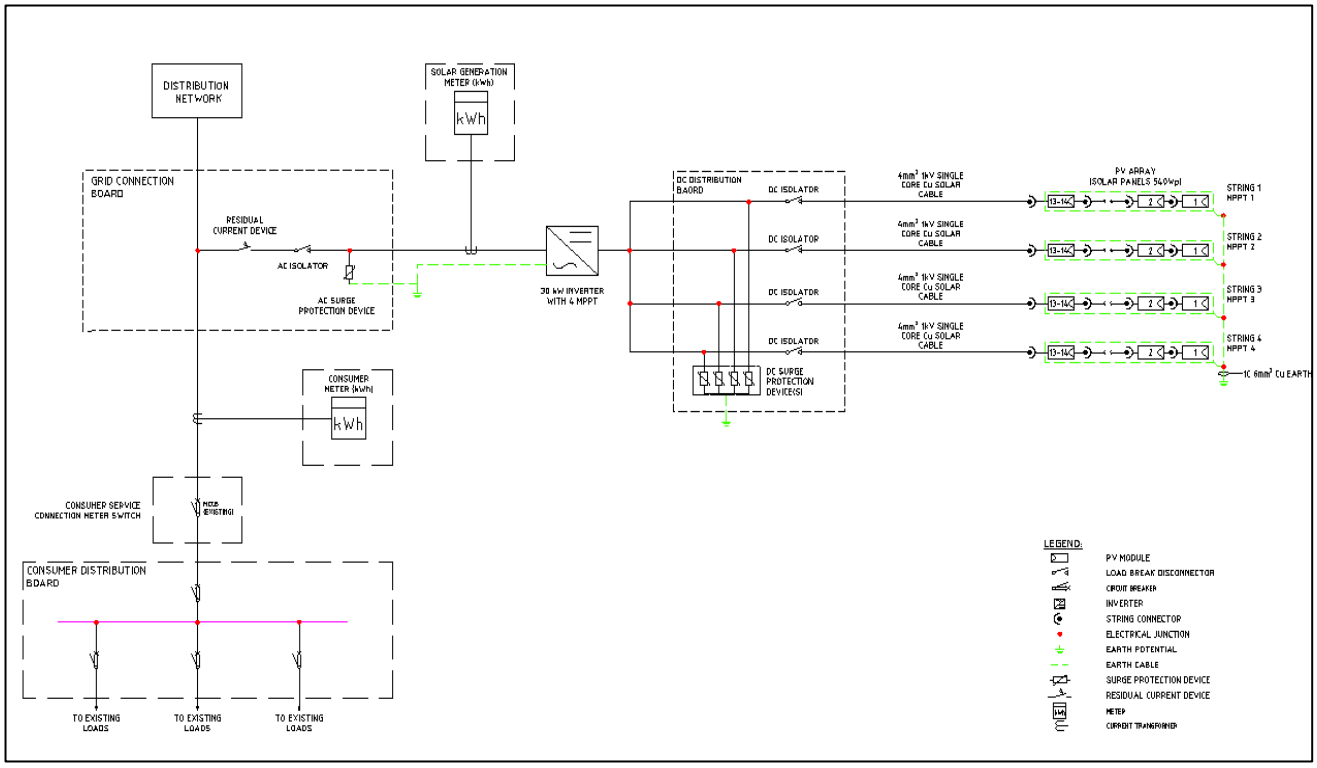
				To be filled by Bidder	
Sl. No.	Description	Unit	Requirements	**Data**	**Remarks**
1	Manufacturer				
2	Type				
4	Rated Voltage	V	1000		
5	Rated Resistance	Ω	<0.5		
6	Contact Material		Tinned Copper, cross-linked		
7	Temperature Rating	^{o}C	Up to 90		
8	Protection Class		IP 67		
9	Safety Class		II		
10	Certificate		EN 50521:2008/ UL 6703/IEC 62852:2014		
11	Total Number MC4 Connectors	Pairs			

4. Health and Safety Management Requirement

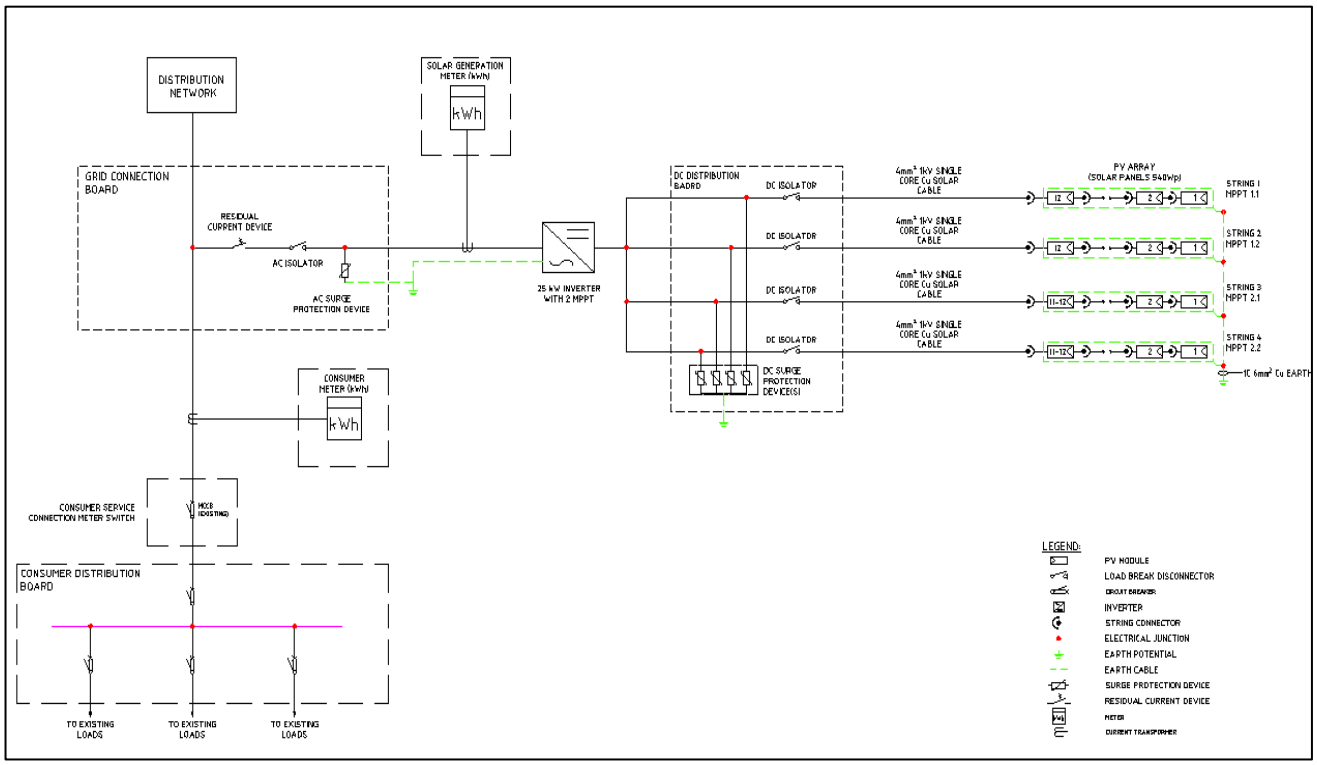
The contractor shall provide the documents/ declarations as mentioned in Section 3: Evaluation criteria.

5. Drawings

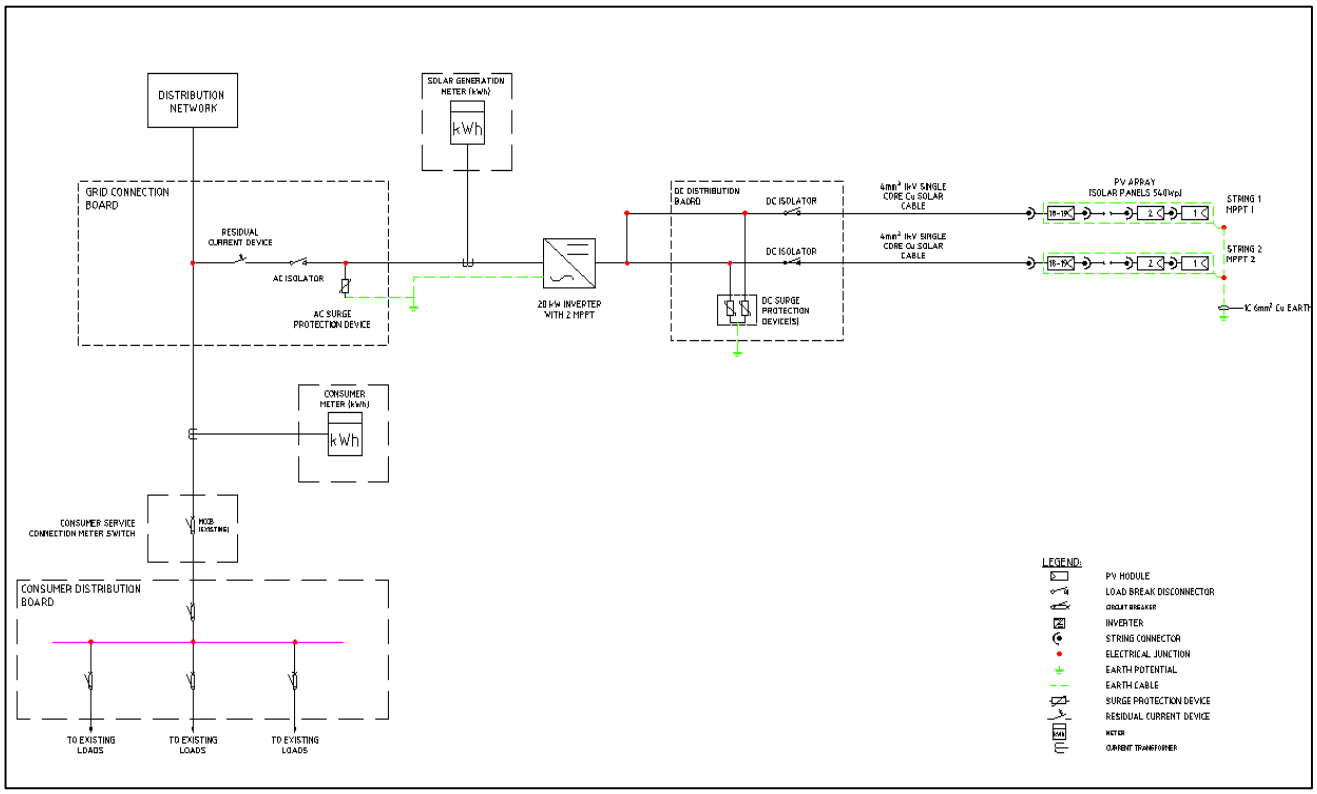
1) Typical single line diagram (SLD) for 30 kW inverter



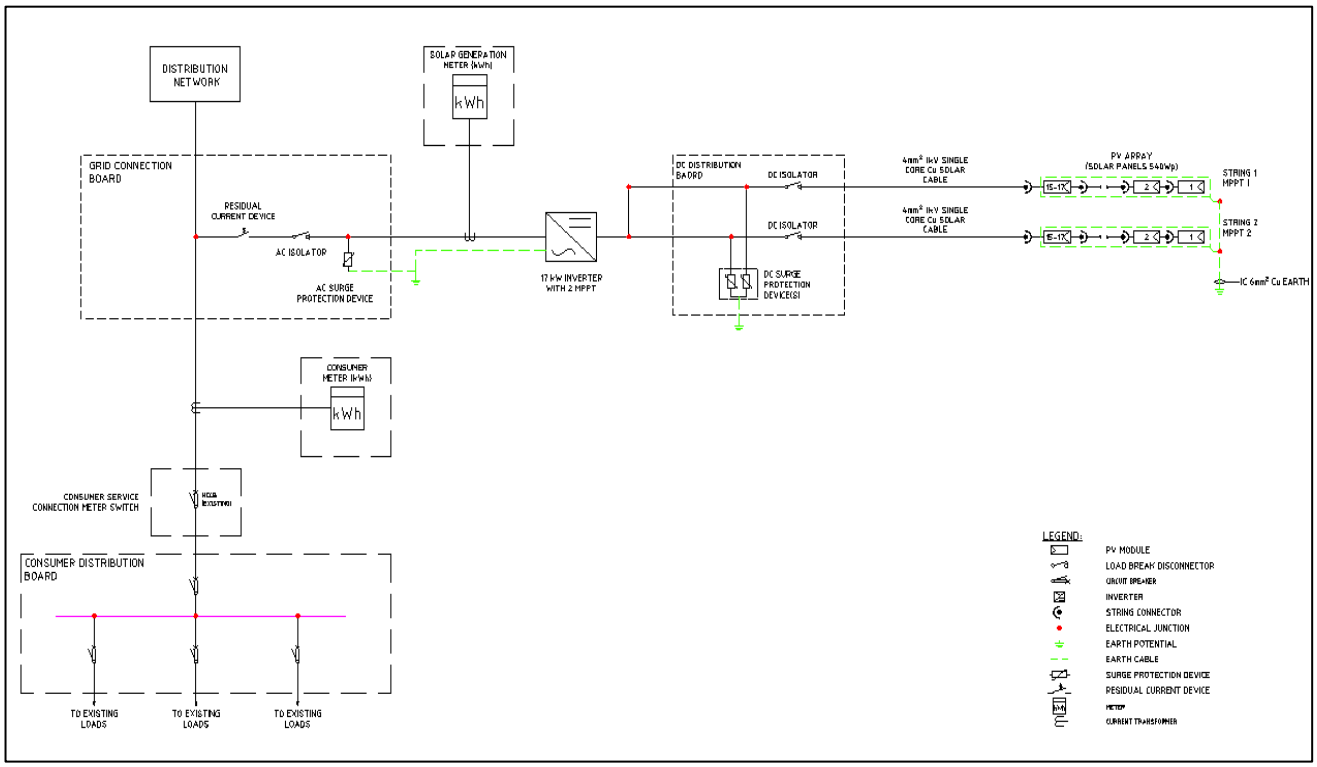
2) Typical single line diagram (SLD) for 25 kW inverter



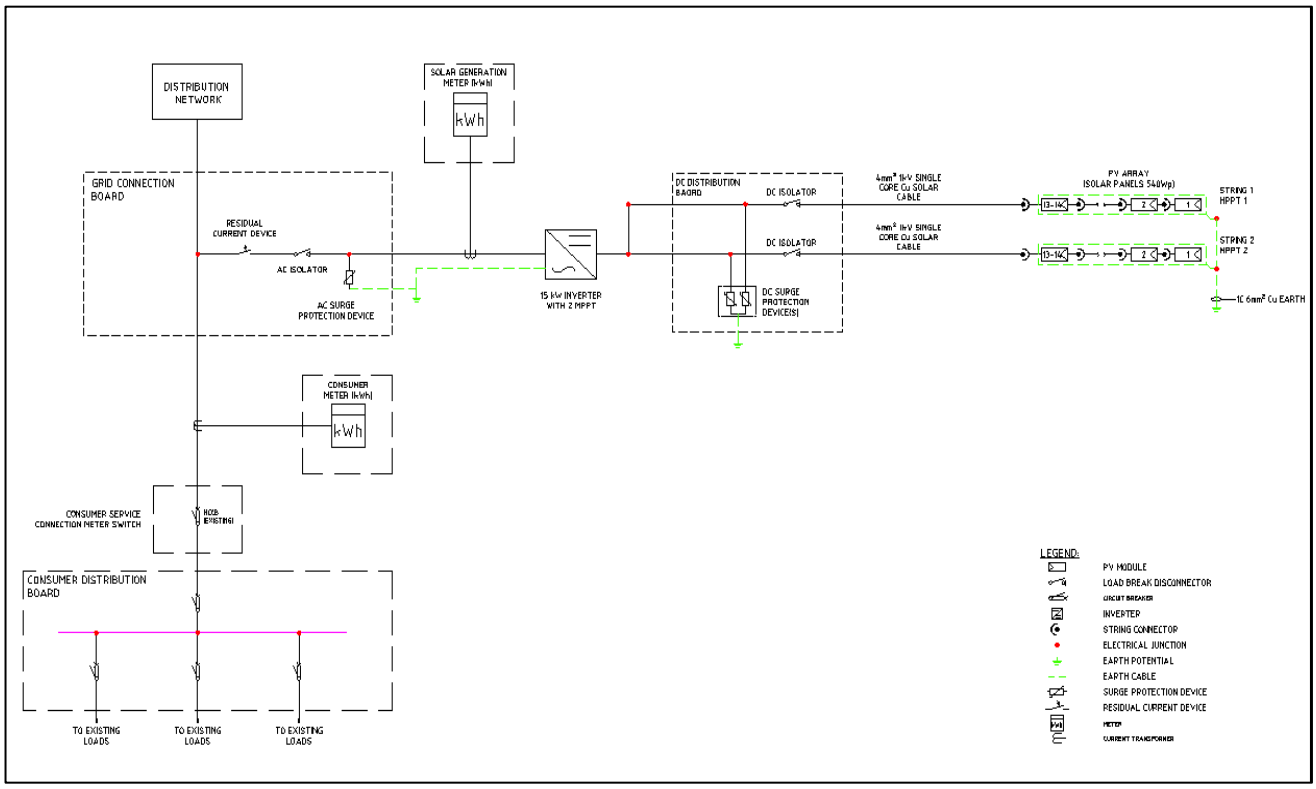
3) Typical single line diagram (SLD) for 20 kW inverter



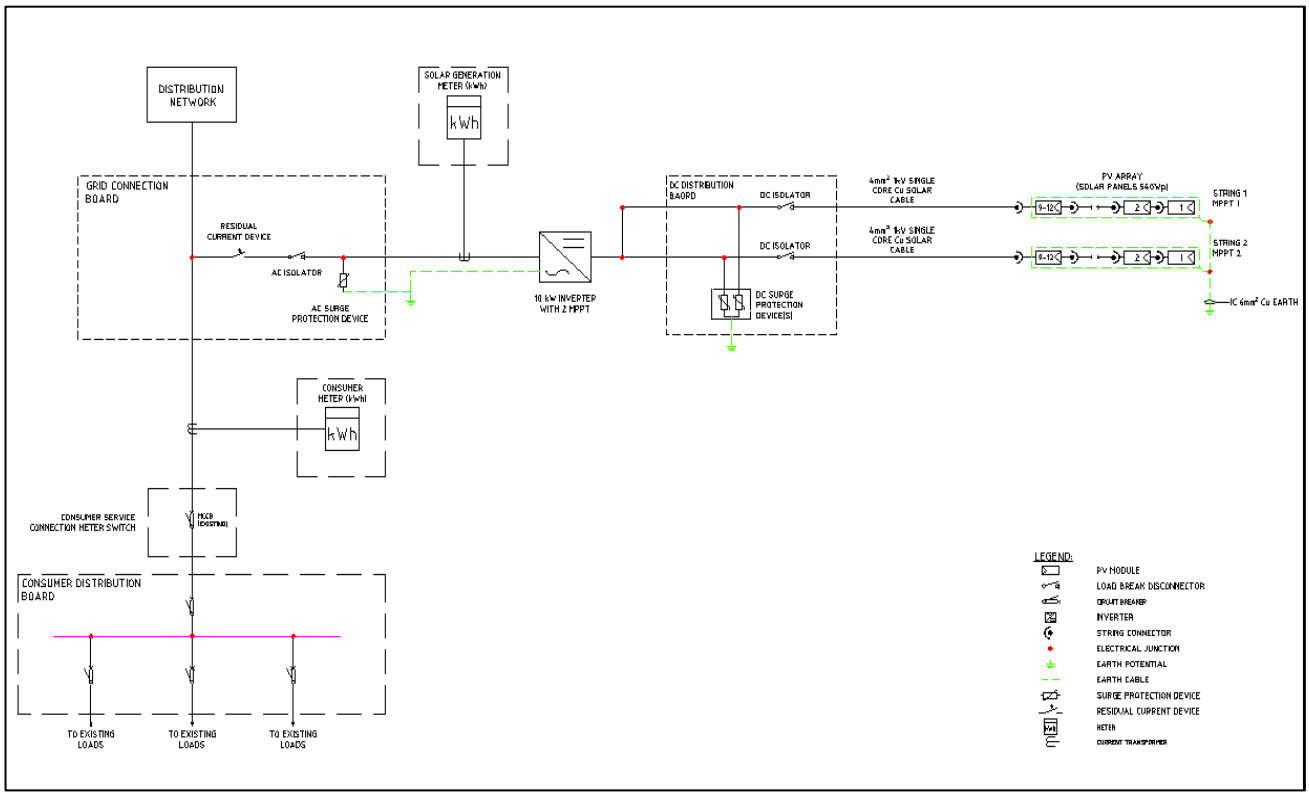
4) Typical single line diagram (SLD) for 17 kW inverter



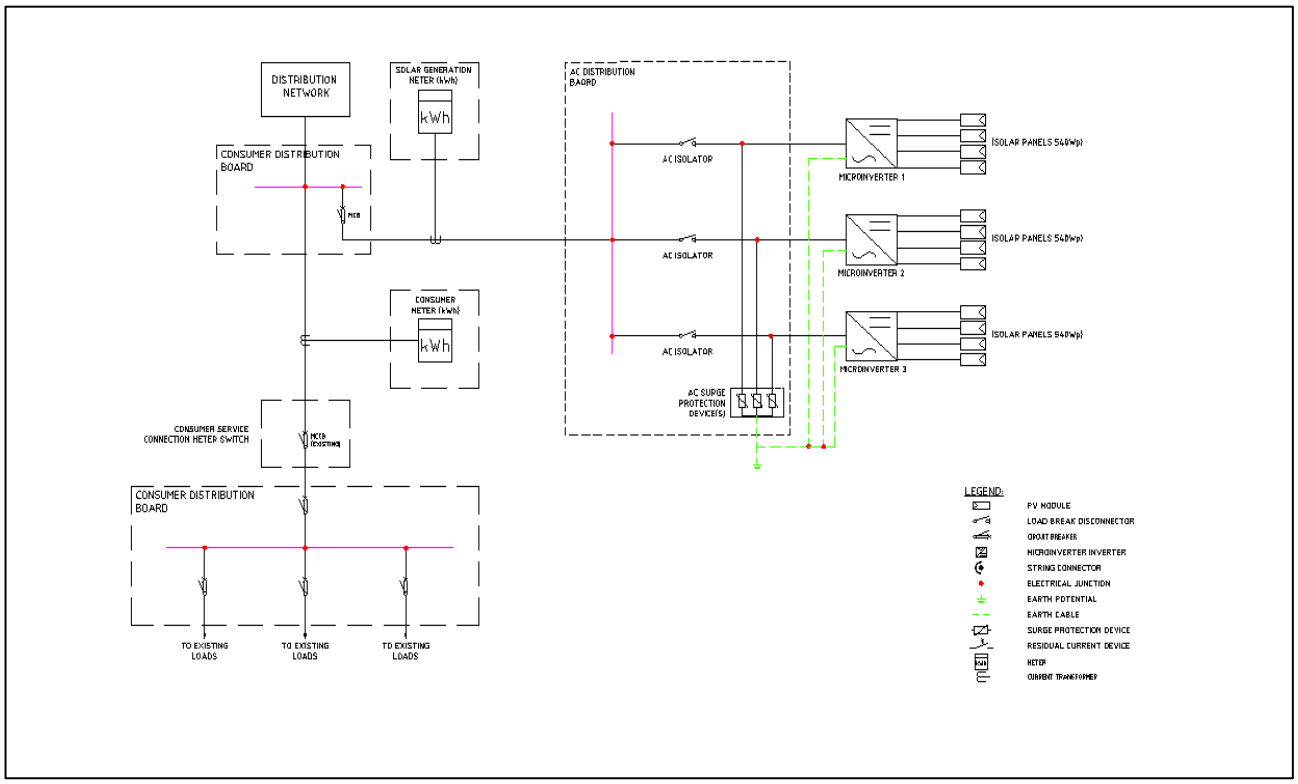
5) Typical single line diagram (SLD) for 15 kW inverter



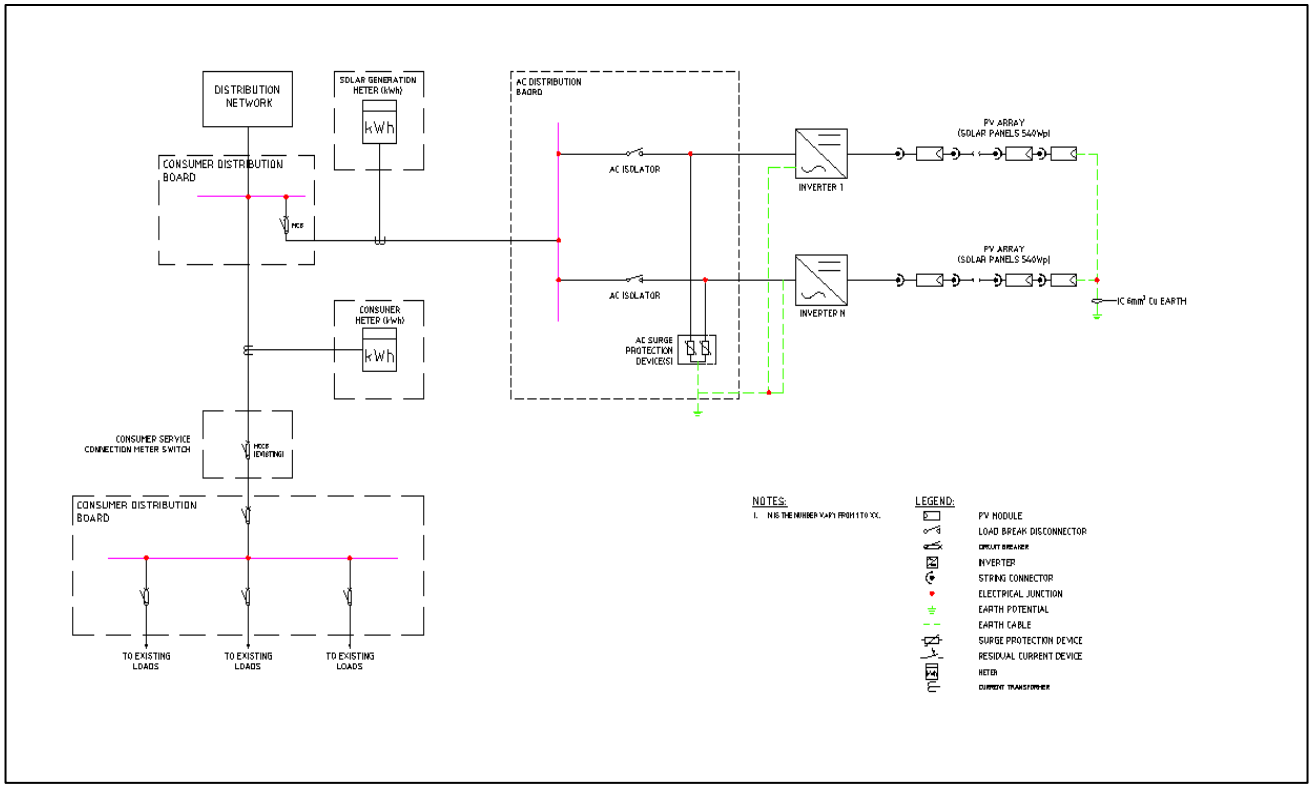
6) Typical single line diagram (SLD) for 10 - 12 kW inverter



7) Typical single line diagram (SLD) for 3 x Microinverters



8) Typical single line diagram (SLD) for combination of multiple string inverters



6. Supplementary Information

7. Certificates

7.1 Form of Completion Certificate

Contract: [. . . . *.insert name of contract and contract identification details*. . . . .]

Date:

Certificate No.:

To: [. . . . *.insert name and address of contractor*. . . . .]

Dear Ladies and/or Gentlemen,

Pursuant to GCC Clause 24 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated [. . . . *.insert date*. . . . .], relating to the [. . . *.brief description of the Facilities* . . . .], we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the Facilities or part thereof: [. . . *.description* . . . .]
2. Date of Completion: [. . . *.date* . . . .]

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

[. . . *.Signature* . . . .]

Project Manager

7.2 Form of Operational Acceptance Certificate

Contract: [. . . . *.insert name of contract and contract identification details*. . . . .]

Date:

Certificate No.:

To: [. . . . *.insert name and address of contractor*. . . . .]

Pursuant to GCC Subclause 25.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated [. . .*date. . .*], relating to the [. . .*brief description of the facilities*. . .], we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof: [. . . *description . . .*]
2. Date of Operational Acceptance: [. . . *date* . . .]

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

[. . . .*Signature* . . . .]

Project Manager

8. Change Orders

8.1 Change Order Procedure

8.1.1 General

8.1.2 Change Order Log

8.1.3 References for Changes

8.2. Change Order Forms

8.2.1 Request for Change Proposal

8.2.2 Estimate for Change Proposal

8.2.3 Acceptance of Estimate

8.2.4 Change Proposal

8.2.5 Change Order

8.2.6 Pending Agreement Change Order

8.2.7 Application for Change Proposal

8.1. Change Order Procedure

8.1.1 General

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with GCC Clause 39 (Change in the Facilities) of the General Conditions.

8.1.2 Change Order Log

The Contractor shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Changes authorized or pending. Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

8.1.3 References for Changes

(1) Request for Change as referred to in GCC Clause 39 shall be serially numbered CR-X-nnn.

(2) Estimate for Change Proposal as referred to in GCC Clause 39 shall be serially numbered CN-X-nnn.

(3) Acceptance of Estimate as referred to in GCC Clause 39 shall be serially numbered CA-X-nnn.

(4) Change Proposal as referred to in GCC Clause 39 shall be serially numbered CP-X-nnn.

(5) Change Order as referred to in GCC Clause 39 shall be serially numbered CO-X-nnn.

Note:

(a) Requests for Change issued from the Employer's Home Office and the Site representatives of the Employer shall have the following respective references:

Home Office	CR-H-nnn
Site	CR-S-nnn

(b) The above number "nnn" is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal and Change Order.

8.2 Change Order Forms

8.2.1 Request for Change Proposal Form

[*Employer's letterhead*]

To: [*Contractor's name and address*] Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within [*number*] days of the date of this letter [or on or before (*date*)].

1. Title of Change: [*Title*]
2. Change Request No./Rev.: [*Number*]
3. Originator of Change:

   Employer: [Name]

   Contractor (by Application for Change Proposal No. [Number Refer to Annex 6.2.7])
4. Brief Description of Change: [*Description*]
5. Facilities and/or Item No. of equipment related to the requested Change: [*Description*]
6. Reference drawings and/or technical documents for the request of Change:

   Drawing No./Document No. *Description*
7. Detailed conditions or special requirements on the requested Change: [*Description*]
8. General Terms and Conditions:
   (a) Please submit your estimate showing what effect the requested Change will have on the Contract Price.
   (b) Your estimate shall include your claim for the additional time, if any, for completing the requested Change.
   (c) If you have any opinion that is critical to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract or the safety of the Plant or Facilities, please inform us in your proposal of revised provisions.
   (d) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.

(e) You shall not proceed with the execution of the work for the requested Change until we have accepted and confirmed the amount and nature in writing.

[*Employer's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

8.2.2 Estimate for Change Proposal Form

[*Contractor's letterhead*]

To: [*Employer's name and address*] Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost to prepare the below-referenced Change Proposal in accordance with GCC Subclause 39.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Subclause 39.2.2, is required before estimating the cost for change work.

1. Title of Change: [*Title*]
2. Change Request No./Rev.: [*Number*]
3. Brief Description of Change: [*Description*]
4. Scheduled Impact of Change: [*Description*]
5. Cost for Preparation of Change Proposal: [*insert costs, which shall be in the currencies of the contract*]

(a) Engineering (Amount)

(i) Engineer _____ hours (hrs) x _ rate/hr = _____

(ii) Draftsperson _____ hrs x _____ rate/hr = _____

Sub-total _____ hrs _____

Total Engineering Cost _____

(b) Other Cost _____

Total Cost (a) + (b) _____

[*Contractor's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

8.2.3 Acceptance of Estimate Form

[*Employer's letterhead*]

To: [*Contractor's name and address*] Date:

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change: [*Title*]
2. Change Request No./Rev.: [*Request number/revision*]
3. Estimate for Change Proposal No./Rev.: [*Proposal number/revision*]
4. Acceptance of Estimate No./Rev.: [*Estimate number/revision*]
5. Brief Description of Change: [*Description*]
6. Other Terms and Conditions: In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparing the Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GCC Clause 39 of the General Conditions.

[*Employer's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

8.2.4 Change Proposal Form

[*Contractor's letterhead*]

To: [*Employer's name and address*] Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]
Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

In response to your Request for Change Proposal No. [Number], we hereby submit our proposal as follows:

1. Title of Change: [*Name*]
2. Change Proposal No./Rev.: [*Proposal number / revision*]
3. Originator of Change: Employer: [*Name*] / Contractor: [*Name*]
4. Brief Description of Change: [*Description*]
5. Reasons for Change: [*Reason*]
6. Facilities and/or Item No. of Equipment related to the requested Change: [*Facilities*]
7. Reference drawings and/or technical documents for the requested Change:
   [*Drawing/Document No./Description*]
8. Estimate of increase/decrease to the Contract Price resulting from the Change Proposal:

		Amount
		[*insert amounts in the currencies of the Contract*]
(a)	Direct material	_____
(b)	Major construction equipment	_____
(c)	Direct field labor (Total hrs)	_____
(d)	Subcontracts	_____

(e) Indirect material and labor _____

(f) Site supervision _____

(g) Head office technical staff salaries

Process engineer _____ hrs @ _____ rate/hr _____

Project engineer _____ hrs @ _____ rate/hr _____

Equipment engineer _____ hrs @ _____ rate/hr _____

Procurement _____ hrs @ _____ rate/hr _____

Draftsperson _____ hrs @ _____ rate/hr _____

Total _____hrs

(h) Extraordinary costs (computer, travel, etc.) _____

(i) Fee for general administration, % of Items _____

(j) Taxes and customs duties _____

Total lump sum cost of Change Proposal [*Sum of items (a) to (j)*]

Cost to prepare Estimate for Change Proposal [*Amount payable if Change is not accepted*]

9. Additional time for Completion required due to Change Proposal
10. Effect on the Functional Guarantees
11. Effect on the other terms and conditions of the Contract
12. Validity of this Proposal: within [Number] days after receipt of this Proposal by the Employer
13. Other terms and conditions of this Change Proposal:
    (a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within [Number] days from your receipt of this Proposal.
    (b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.
    (c) Contractor's cost for preparation of this Change Proposal: [*. . . .insert amount. This cost shall be reimbursed by the employer in case of employer's withdrawal or rejection of this Change Proposal without default of the contractor in accordance with GCC Clause 39 of the General Conditions . . . .*]

[*Contractor's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

8.2.5 Change Order Form

[*Employer's letterhead*]

To: *[Contractor's name and address]* Date:

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We approve the Change Order for the work specified in the Change Proposal (No. [*number*]), and agree to adjust the Contract Price, Time for Completion, and/or other conditions of the Contract in accordance with GCC Clause 39 of the General Conditions.

1. Title of Change: [*Name*]
2. Change Request No./Rev.: [*Request number / revision*]
3. Change Order No./Rev.: [*Order number / revision*]
4. Originator of Change: Employer: [*Name*] / Contractor: [*Name*]
5. Authorized Price:
   Ref. No.: [*Number*] Date: [*Date*]
   Foreign currency portion [*Amount*] plus Local currency portion [*Amount*]
6. Adjustment of Time for Completion
   None Increase [*Number*] days Decrease [*Number*] days
7. Other effects, if any

Authorized by: _____ Date: _____

Employer

Accepted by: _____ Date: _____

Contractor

8.2.6 Pending Agreement Change Order Form

[*Employer's letterhead*]

To: *[Contractor's name and address]* Date:

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We instruct you to carry out the work in the Change Order detailed below in accordance with GCC Clause 39 of the General Conditions.

1. Title of Change: [*Name*]
2. Employer's Request for Change Proposal No./Rev.: [*number/revision*] dated: [*date*]
3. Contractor's Change Proposal No./Rev.: [*number / revision*] dated: [*date*]
4. Brief Description of Change: [*Description*]
5. Facilities and/or Item No. of equipment related to the requested Change: [*Facilities*]
6. Reference Drawings and/or technical documents for the requested Change:
   [*Drawing / Document No. / Description*]
7. Adjustment of Time for Completion:
8. Other change in the Contract terms:
9. Other terms and conditions:

[*Employer's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

8.2.7 Application for Change Proposal Form

[*Contractor's letterhead*]

To: [*Employer's name and address*] Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]
Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

We hereby propose that the work mentioned below be treated as a Change in the Facilities.

1. Title of Change: [*Name*]
2. Application for Change Proposal No./Rev.: [*Number / revision*] dated: [*Date*]
3. Brief Description of Change: [*Description*]
4. Reasons for Change:
5. Order of Magnitude Estimation (amount in the currencies of the Contract): [*Amount*]
6. Scheduled Impact of Change:
7. Effect on Functional Guarantees, if any:
8. Appendix:

[*Contractor's name*]
[*Signature*]
[*Name of signatory*]
[*Title of signatory*]

9. Personnel Requirements

Using Form PER - 1 and PER - 2 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has personnel who meet the following requirements:

No.	Position	Total Work Experience [years]	Experience In Similar Work [years]
1	Project Coordinator Bachelor's or a higher degree in Engineering	12	5
2	Project Engineer (Civil) Bachelor's degree in civil engineering	5	3
3	Project Engineer (Electrical) Bachelor's degree in electrical engineering	5	3
4	Site Supervisor (Electrical) Diploma qualification in Electrical Engineering	7	5
5	Environmental, Health and Safety Specialist (full time) Bachelor's or a higher degree in related subject e.g. environment management, environment engineering NEBOSH/IOSH[1] certification or similar qualification EHS site supervision experience of construction sites involving electrical installations and working at height	10	7

Note: All staff must be fluent in English and submit the qualification certificates. The documents mentioning work experience of the staff to be validated and certified by the bidder and submitted along with the bid.

[1] Or Equivalent qualification

10. Equipment Requirements

Using Form EQU in Section 4 (Bidding Forms), the Bidder must demonstrate that it has the key equipment listed below:

No.	Equipment Type and Characteristics	Minimum Number Required
1	Personal Protective Equipment – safety harness, safety helmet, safety shoes, safety belt, nose mask, safety goggles, safety glove, cotton hand glove, reflective jacket	20 (full PPE is required for all workers on site)
2	General mechanical and electrical tools: double-ended flat spanner, double-ended ring spanner, combination pliers, side cutting pliers, nose pliers, wire stripper, electrician knife, hack saw frame with blades, industrial hand crimping tools, torque wrench, torque tester, cable cutter, screwdriver, water level, measuring tape, digital distance meter, Centre punch, standard wire gauge, vernier caliper, chisel, cordless drill machine, plumb bob, spirit level, flat file, round file, triangle file, hand saw, PVC mallet, ball pin hammer, fuse puller etc.	2
3	Electrical measuring equipment: DC and AC Clamp meter, multimeter, insulation resistance meter, earth resistance tester	2
4	Infrared camera (pocket)	2
5	I-V Tracer	2
6	Electroluminescence tester (Camera) with DC power supply and accessories for testing	1
7	Irradiance meter (Solar Intensity Meter)	2
8	Ultrasonic thickness gauge	2
9	TDS meter	2

11. Compliance of Environment, Health and Safety

Compliance with ADB SPS Policy, National Laws, rules and regulations

(i) contractor shall comply with ADB's Safeguard Policy Statement 2009, the general IFC EHS Guidelines, the ESARF for the project, and all national laws and regulations for environment, health and safety.

(ii) contractor must obtain all the necessary environment, health and safety (labor) approvals, clearances, and permits from the relevant authorities and share copies of these with DGPC prior to starting works on the RTS installation.

(iii) contractor will ensure all RTS installations will meet category C for environment as per ADB's Safeguard Policy Statement 2009 i.e., they will result in minimal or no adverse environmental impacts.

(iv) contractor will comply with the ESARF eligibility criteria (general, overall and RTS eligible as category C) and immediately report any unanticipated impacts to DGPC for further instructions on eliminating the building from the RTS.

(v) contractor must not install a new access road, a new distribution line to evacuate power, or undertake civil works for temporary or permanent facilities to be installed.

(vi) contractor must not clear vegetation or cut down trees to facilitate access, reduce roof shadowing or to support temporary facilities such as site offices or labor camps.

(vii) contractor will ensure all their subcontractors and third parties, comply with these provisions, contractors will ensure subcontractors are provided a copy of these provisions, health and safety plan, pollution control plan, waste management plan, and code of conduct with provisions for compliance in their contract.

Worker recruitment, working conditions and facilities.

(viii) contractor shall comply with all applicable Bhutan Labour acts and regulations

(ix) Ensure that the International Labor Organization (ILO) Core Labor Standards (CLS) and the applicable laws and regulations of Bhutan are applied to the contractor's workers (including workers employed by subcontractors and gangs), including laws related to their employment, health, safety, and welfare during the construction of the facilities.

(x) workers to operate within the legal working hours verifiable proof of age documentation to be maintained for every worker.

(xi) no child will be employed, and no under 18s will be engaged on construction site (hazardous work)

(xii) contractor shall seek the required permit from Bhutan Power Corporation to supply electricity for site offices and worker accommodation. contractor shall ensure that site offices and worker accommodation are maintained with good sanitation and hygiene (drainage system, septic tank with soakaway or sewerage connection, environmentally safe and sound waste management, good housekeeping, etc.).

(xiii) contractor shall ensure fire safety measures are in place at the site office and workers accommodation.

Worker and Community Health and Safety

(xiv) contractor shall appoint a dedicated environment, health and safety officer with IOSH, NEBOSH or equivalent certification who is full-time on the project, with clear mandates to ensure that health and safety measures and practices are observed at the workplace.

(xv) contractor shall conduct a health and safety risk assessment (with facilitated workshop involving DGPC during detailed design) and prepare and follow an occupational and

community health and safety plan. In completing the risk assessment and developing the plan include specific measures to address risks involved with working at heights.

(xvi) contractor shall conduct site induction, monthly health and safety trainings, with records kept.

(xvii) contractor shall provide the required personal protective equipment to all workers, maintain a well-stocked first aid kit at the work site and transportation to the nearest health facility in case of medical emergencies.

(xviii) each active construction site is to have adequate health and safety supervision to ensure the health and safety of all workers and local communities with a full-time on-site Health and Safety Steward(s) with at least one steward for each 50 persons – a steward will not supervise more than one site/RTS installation or more than 50 workers at a time.

(xix) contractor shall ensure that only trained solar PV installers are employed in installation work and qualified electricians are used for electrical work.

(xx) contractor shall conduct site induction, monthly health and safety trainings, and with records kept.

(xxi) contractor shall ensure that no unsafe conditions are permitted, in case safe conditions cannot be ensured, work must be halted until provisions are made to ensure worker safety.

(xxii) contractor shall k and report any l fatalities within 24 hours to DGPC together with an incident report, Record of all incidents and response taken should include date, time, details of incident, treatment given and outcome, and lessons learnt for the future.

(xxiii) contractors will ensure all workers are covered by insurance to pay out in the event of a disability or fatality.

(xxiv) emergency contact number and details for medical, fire, etc. are to be displayed in all construction sites.

(xxv) contractor to conduct their own trainings for their construction management and provide all workers and visitors on site, irrespective of them being formally or informally employed by the contractor, subcontractor or third party with an EHS induction before being allowed on site – induction to cover orientation on EHS requirements and roles and responsibilities in relation to EMP implementation, dos and don'ts in relation to the construction site, employer provided staff accommodation, code of conduct and interaction with local communities, etc. Contractor to ensure topics covered by training and induction include, but are not limited to, good housekeeping at all times; environmentally safe and sound waste management practices; hygiene and communicable disease prevention including HIV/AIDS; gender-based violence and sexual exploitation, abuse and harassment prevention; code of conduct, interaction with local communities and culturally acceptable practices; biodiversity conservation awareness; fire safety prevention; prohibition on firewood collection by workers; prohibition on trapping, hunting, fishing, or poaching by workers; chance find procedures; H&S including use of PPE; etc. Contractor to continue to deliver short monthly EHS refresher sessions to construction management and all workers and cover pertinent environmental, health and safety topics on daily basis in toolbox talks to be delivered to all workers. Records of all these training activities are to be retained.

(xxvi) contractor to ensure workers with a specific role have, before been allocated the task, attended specialized health and safety trainings related that role e.g., health and safety stewards, first aiders, fire safety officers, as well as ensuring workers have received task-specific trainings for working at height, working with electricity, etc. Only allow suitably trained and qualified workers to work on electrical equipment and at height on rooftops, these workers must have training record of attending suitable training course on electrical safety and working at height and be provided with and wear the

appropriate PPE for their role. Untrained workers must not be permitted to work with live electricity or at height.

Impacts on air and noise and water pollution.

(xxvii) contractor shall ensure that all works are carried out in an environmentally friendly manner, minimizing environmental impacts while ensuring the health and safety of all its workers and the minimizing disturbance to the surrounding environment, building users and the neighboring community.

(xxviii) contractor shall limit working hours to daytime only and consult with institutions and hospitals on suitable working hours to avoid disturbance to building residents.

(xxix) contractor shall ensure that effluent from worker camps are not discharged directly into streams and rivers but to septic tank with soakaway or the existing sewerage system.

(xxx) use of pit latrines and disposal of untreated sanitary wastewater to surface or groundwater is prohibited.

(xxxi) strict prohibition on open defecation and urination by construction workers.

(xxxii) contractor shall prepare a Construction Method Statement identifying all construction activities, schedule, access routes, anticipated traffic volumes, and construction methods to be used as well as temporary construction facilities needed and their location within the premises e.g., laydown areas, stores, construction workers rest areas, toilets/washrooms, temporary worker camps/overnight accommodation etc. and a site-specific construction pollution control plan to ensure that all work is carried out in an environmentally friendly manner, minimizing environmental impacts and disturbance to the surrounding environment, building users and the neighbouring community.

(xxxiii) contractor shall limit vehicular emissions and noise associated with project, complying with the requirements of National Environmental Standards 2020.

(xxxiv) contractor shall ensure strict compliance with national vehicle testing requirements and conducting regular maintenance of vehicles and machinery to ensure efficient functioning and reduced vehicular emission.

(xxxv) contractor shall schedule installation works in schools during school breaks to minimize disturbance to students.

(xxxvi) Waste Management

(xxxvii) contractor shall comply with the Waste Prevention and Management Act of Bhutan, 2009 and the Waste Prevention and Management Regulation, 2012 (Amended 2016)

(xxxviii) contractor shall prepare a waste management plan covering all types of waste they may generate and setting out how they will follow the waste hierarchy and comply with national laws and regulations for approval by DGPC before any works commence. Long distance movement of construction waste to Phuentsholing will need to be factored in given the given the lack of suitably engineered and licensed sanitary waste facilities elsewhere within Bhutan, for hazardous waste any transboundary movement will need to accord with the Basel Convention. Leaving or disposing of construction wastes by burying them on-site or disposing of them at unlicensed waste management facilities is strictly prohibited.

(xxxix) contractors shall ensure that adequate bins/receptacles are provided for waste segregation and storage and follow the prevailing waste collection schedule for the locality and remove all waste from the worksite weekly. Where no waste collection services are available, ensure that segregated waste is safely transported to the waste deposit drop off centres, licensed recyclers or to an approved waste disposal site.

(xl) contractor shall ensure that all e-waste and damaged or non-functioning solar panels are channelized for disposal as per the directives of the Department of Environment

and Climate Change and GovTech Agency. Records to be kept of the volume of all wastes generated, stored and disposed and reported monthly to DGPC.

(xli) contractor shall, upon completion of the installation works, dismantle site offices and worker camps, remove all waste and restore the site to its pre-project condition.

(xlii) prohibit open burning of construction wastes and dumping of construction wastes on -site, in streams, drains, agricultural fields etc.

Community health and safety

(xliii) contractor shall meet with the building representatives/managers/principals prior to installation of the RTS, to discuss and plan work program, Grievance Redress Mechanism and approaches to manage community health and safety and SEAH/GBV risks and allow issues to be raised and addressed 15 days prior to installation, records of all consultations and matters discussed to be kept

(xliv) contractor shall prepare a code of conduct setting out the expectations of installers with respect to health and safety and community interaction for approval by DGPC before any works commence. This includes restrictions on trespassing, required social behavior at the workplace and reporting of incidents.

(xlv) contractor shall ensure code of conduct requirements are communicated to building users, and disciplinary action is taken against any worker that are found to have breached them,

(xlvi) contractor shall provide all workers with a photographic identity card detailing the contact number of the contractor and DGPC to ensure that only authorized personnel perform installations and for building users to be able to check they are genuine,

(xlvii) contractor is to place signs or stickers with emergency contact information of DGPC on the building entrance.

(xlviii) contractor shall undertake a pre-condition inspection with a photographic record taken for submission to DGPC before any works commence,

(xlix) contractor shall take proper precautions to prevent damage to the roof, building or personal property.

(l) contractor will be responsible for repairing or paying DGPC to arrange repair of any damage caused by them to buildings or landscaping during material transportation, storage or installation.

(li) contractor must obtain permission from the building representative /manager to store materials on site, especially if parking is limited. Materials must be neatly and safely stored in designated areas, to avoid obstruction of passage corridors and access to the roof or building.

(lii) contractor's staff will act as site GRM Focal and keep affected persons and local communities informed of the status of work and be readily available onsite to receive, document and deal with grievances at site level.

(liii) contractor shall nominate a GRM focal to receive grievances from both the building users and workers and place signage with details of their focals' contact and DGPC's EHS and Social Safeguards Officers numbers at each site together with a grievance box, with any grievance received by any route to be immediately reported to DGPC with the action taken to address it if already quickly resolved by the contractor.

(liv) GRM will be available to all workers for receiving and handling complaints about unfair treatment or unsafe living or working conditions, ensuring no coercion nor reprisal. Construction workers will be given access to register any grievances with the contractor or direct access to the DGPC GRM Focal.

(lv) contractor to carry out awareness raising for all construction workers about the GRM at the start of their employment on site including disseminating GRM contact details on noticeboards at construction site offices and at employer provided staff

accommodation. Suggestion boxes to be provided for construction workers at construction site offices and at employer provided staff accommodation.

(lvi) contractor to undertake construction and electrical safety community awareness raising activities in local affected communities prior to construction and again on the completion of works having greater emphasis on electrocution risks etc.

(lvii) on all individual items of electrical equipment provide written (Dzongkha) and visual warning signs to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of risk of electrocution

Ecology

(lviii) contractor must not set up temporary facilities (excluding use of existing facilities) within a legally protected area, biological corridor, key biodiversity area, important bird area, Ramsar site, forest land (including the community forest areas) or wetland habitat.

(lix) strict prohibition on workers to enter legally protected area, biological corridor, key biodiversity area, important bird area, Ramsar site, forest land (including the community forest areas) or wetland habitat beyond the confines of the existing facilities on which RTS is being installed and access routes to it.

(lx) strict prohibition on the purchase, sale, and use of firewood, timber and NTFPs, fishing, hunting and poaching of fauna by contractor and their workers; posting of information and warning signs for workers; and strict disciplinary procedures for any contraventions. Contractor to provide good standard of worker camp with heating and all meals and alternative fuels to wood provided to help discourage breaches of prohibition by the workers.

(lxi) contractor must not cut down any trees or trim or lop any trees within a legally protected area, biological corridor, key biodiversity area, important bird area, Ramsar site, forest land (including the community forest areas) or wetland habitat.

General

(lxii) contractor must provide monthly reports to DGPC on compliance with the environmental and social mitigation and report on health and safety incidents and the volume of waste generated together with the disposal routes.

Appendix 1: List of buildings and location

Table 1: List of buildings with geographical coordinates

Sl. No.	Building Name	Latitude	Longitude
Building 1	Ministry of Health	27.480278	89.630556
Building 2	Department of Immigration	27.484293	89.632198
Building 3	Department of Civil Registration and Census	27.484664	89.631942
Building 4	Department of Culture and Dzongkha Development	27.483056	89.633056
Building 5	Royal Monetary Authority	27.481944	89.633611
Building 6	Faculty of Nursing & Public Health (Administrative Block)	27.461944	89.639722
Building 7	Faculty of Nursing & Public Health (Girls Hostel 1)	27.461944	89.638889
Building 8	Faculty of Nursing & Public Health (Girls Hostel 2)	27.461667	89.638889
Building 9	Faculty of Nursing & Public Health (Girls Hostel 3)	27.461667	89.638611
Building 10	Faculty of Nursing & Public Health (Office building)	27.461389	89.639167
Building 11	Faculty of Nursing and Public Health (Boys Hostel)	27.460556	89.640278
Building 12	Royal Textile Academy (Phase 1 Building)	27.479000	89.635694
Building 13	Royal Textile Academy (Phase 3 Building)	27.479472	89.636028
Building 14	National Institute of Traditional Medicine (Academic Building)	27.480417	89.629000
Building 15	National Institute of Traditional Medicine (Hostel Building)	27.480861	89.628917
Building 16	National Pension and Provident Fund Office	27.475583	89.638889
Building 17	Thimphu Thromde	27.46875	89.639500
Building 18	National Pension and Provident Fund (NPPF) Colony - Class II A - 1	27.469362	89.632773
Building 19	National Pension and Provident Fund (NPPF) Colony - Class II A - 2	27.469591	89.633038
Building 20	National Pension and Provident Fund (NPPF) Colony - Class II A - 3	27.469301	89.633124
Building 21	National Pension and Provident Fund (NPPF) Colony - Class II A - 4	27.470263	89.632827
Building 22	National Pension and Provident Fund (NPPF) Colony - Class II A - 5	27.468916	89.633869
Building 23	National Pension and Provident Fund (NPPF) Colony - Class II B -1	27.469193	89.632577
Building 24	National Pension and Provident Fund (NPPF) Colony - Class II B -2	27.46861	89.632557
Building 25	National Pension and Provident Fund (NPPF) Colony - Class II B -3	27.469162	89.633053
Building 26	National Pension and Provident Fund (NPPF) Colony - Class II B -4	27.469175	89.633151

Sl. No.	Building Name	Latitude	Longitude
Building 27	National Pension and Provident Fund (NPPF) Colony - Class II B -5	27.468813	89.633186
Building 28	National Pension and Provident Fund (NPPF) Colony - Class II B -6	27.470583	89.632425
Building 29	National Pension and Provident Fund (NPPF) Colony - Class II B -7	27.470139	89.632472
Building 30	National Pension and Provident Fund (NPPF) Colony - Class II B -8	27.470222	89.632627
Building 31	National Pension and Provident Fund (NPPF) Colony - Class II B -9	27.470263	89.632827
Building 32	National Pension and Provident Fund (NPPF) Colony - Class II C -1	27.46978	89.631172
Building 33	National Pension and Provident Fund (NPPF) Colony - Class II C -2	27.469484	89.63144
Building 34	National Pension and Provident Fund (NPPF) Colony - Class II C -3	27.469446	89.631492
Building 35	National Pension and Provident Fund (NPPF) Colony - Class IV - 1	27.47015	89.631294
Building 36	National Pension and Provident Fund (NPPF) Colony - Class IV - 2	27.470075	89.631372
Building 37	National Pension and Provident Fund (NPPF) Colony - Class IV - 3	27.470393	89.631658
Building 38	National Pension and Provident Fund (NPPF) Colony - Class IV - 4	27.470556	89.632014
Building 39	National Housing Development Corporation (NHDC) Colony - Type I - 1	27.454116	89.653882
Building 40	National Housing Development Corporation (NHDC) Colony - Type I - 2	27.453909	89.653973
Building 41	National Housing Development Corporation (NHDC) Colony - Type I - 3	27.453489	89.653567
Building 42	National Housing Development Corporation (NHDC) Colony - Type I - 4	27.453453	89.65353
Building 43	National Housing Development Corporation (NHDC) Colony - Type II - 1	27.456443	89.651936
Building 44	National Housing Development Corporation (NHDC) Colony - Type II - 2	27.45613	89.651777
Building 45	National Housing Development Corporation (NHDC) Colony - Type II - 3	27.45625	89.651547
Building 46	National Housing Development Corporation (NHDC) Colony - Type II - 4	27.455957	89.652127
Building 47	National Housing Development Corporation (NHDC) Colony - Type II - 5	27.455936	89.652296
Building 48	National Housing Development Corporation (NHDC) Colony - Type II - 6	27.455986	89.651819
Building 49	National Housing Development Corporation (NHDC) Colony - Type II - 7	27.455471	89.651878
Building 50	National Housing Development Corporation (NHDC) Colony - Type II - 8	27.45529	89.65198
Building 51	National Housing Development Corporation (NHDC) Colony - Type II - 9	27.45529	89.65431
Building 52	National Housing Development Corporation (NHDC) Colony - Type II - 10	27.4551	89.6545

Sl. No.	Building Name	Latitude	Longitude
Building 53	National Housing Development Corporation (NHDC) Colony - Type II - 11	27.45494	89.65485
Building 54	National Housing Development Corporation (NHDC) Colony - Type II - 12	27.45482	89.65521
Building 55	National Housing Development Corporation (NHDC) Colony - Type II - 13	27.45458	89.65549
Building 56	National Housing Development Corporation (NHDC) Colony - Type II - 14	27.45447	89.65583
Building 57	National Housing Development Corporation (NHDC) Colony - Type II - 15	27.45428	89.65597
Building 58	National Housing Development Corporation (NHDC) Colony - Type II - 16	27.45424	89.65616
Building 59	National Housing Development Corporation (NHDC) Colony - Type II - 17	27.45407	89.65608
Building 60	National Housing Development Corporation (NHDC) Colony - Type II - 18	27.453921	89.655233
Building 61	National Housing Development Corporation (NHDC) Colony - Type II - 19	27.453885	89.655781
Building 62	National Housing Development Corporation (NHDC) Colony - Type II - 20	27.645411	89.655614
Building 63	National Housing Development Corporation (NHDC) Colony - Type II - 21	27.454423	655386
Building 64	National Housing Development Corporation (NHDC) Colony - Type II - 22	27.454423	89.655386
Building 65	National Housing Development Corporation (NHDC) Colony - Type II - 23	27.454947	89.654314
Building 66	National Housing Development Corporation (NHDC) Colony - Type II - 24	27.454995	89.654004
Building 67	National Housing Development Corporation (NHDC) Colony - Type II - 25	27.454534	89.654088
Building 68	National Housing Development Corporation (NHDC) Colony - Type II - 26	27.45413	89.654917
Building 69	National Housing Development Corporation (NHDC) Colony - Type II - 27	27.453619	89.655112
Building 70	National Housing Development Corporation (NHDC) Colony - Type II - 28	27.45442	89.65352
Building 71	National Housing Development Corporation (NHDC) Colony - Type II - 29	27.453982	89.653102
Building 72	National Housing Development Corporation (NHDC) Colony - Type III - 1	27.453849	89.653627
Building 73	National Housing Development Corporation (NHDC) Colony - Type III - 2	27.45384	89.65407
Building 74	National Housing Development Corporation (NHDC) Colony - Type III - 3	27.453286	89.654008
Building 75	National Housing Development Corporation (NHDC) Colony - Type III - 4	27.452823	89.654391
Building 76	National Housing Development Corporation (NHDC) Colony - Type IV - 1	27.456944	89.651174
Building 77	National Housing Development Corporation (NHDC) Colony - Type IV - 2	27.456758	89.651257
Building 78	National Housing Development Corporation (NHDC) Colony - Type IV - 3	27.456562	89.651936

Sl. No.	Building Name	Latitude	Longitude
Building 79	National Housing Development Corporation (NHDC) Colony - Type IV - 4	27.45651	89.651233
Building 80	National Housing Development Corporation (NHDC) Colony - Type IV - 5	27.455633	89.65165
Building 81	National Housing Development Corporation (NHDC) Colony - Type IV - 6	27.455692	89.652753
Building 82	National Housing Development Corporation (NHDC) Colony - Type IV - 7	27.455141	89.653822
Building 83	National Housing Development Corporation (NHDC) Colony - Type IV - 8	27.455106	89.653893
Building 84	National Housing Development Corporation (NHDC) Colony - Type IV - 9	27.45468	89.65358
Building 85	National Housing Development Corporation (NHDC) Colony - Type IV - 10	27.454518	89.653548
Building 86	National Housing Development Corporation (NHDC) Colony - Type IV - 11	27.454133	89.653497
Building 87	National Housing Development Corporation (NHDC) Colony - Type IV - 12	27.454119	89.654132
Building 88	National Housing Development Corporation (NHDC) Colony - Type IV - 13	27.453958	89. 654269
Building 89	National Housing Development Corporation (NHDC) Colony - Type IV - 14	27.41413	89.653514
Building 90	National Housing Development Corporation (NHDC) Colony - Type IV - 15	27.453918	89.652983
Building 91	National Housing Development Corporation (NHDC) Colony - Type IV - 16	27.453728	89.653033
Building 92	National Housing Development Corporation (NHDC) Colony - Type IV - 17	27.453212	89.653599
Building 93	National Housing Development Corporation (NHDC) Colony - Type IV - 18	27.453155	89.653856
Building 94	Taba Lower Secondary School	27.512778	89.648528
Building 95	Kuensel Phodrang Primary School (Building 1)	27.450444	89.646583
Building 96	Kuensel Phodrang Primary School (Building 2)	27.450323	89.646825
Building 97	Jungshina Primary School (Building 1)	27.50575	89.633111
Building 98	Jungshina Primary School (Building 2)	27.505743	89.633433
Building 99	Department of Youth and Sports (Office Building)	27.481325	89.634375
Building 100	Department of Youth and Sports (Hostel Building)	27.480556	89.634722
Building 101	National Soil Service Commission	27.440944	89.665056
Building 102	Royal University of Bhutan (IT Centre)	27.478556	89.628417
Building 103	Royal University of Bhutan (Office Centre)	27.478944	89.628167
Building 104	Royal University of Bhutan (Auditorium)	27.478444	89.628333
Building 105	Bhutan Telecom Limited (Main Office Building)	27.481325	89.634375

Sl. No.	Building Name	Latitude	Longitude
Building 106	Bhutan Telecom Limited (Customer Service Building)	27.480556	89.634722
Building 107	Bank of Bhutan	27.474194	89.637861
Building 108	Royal Insurance Corporation of Bhutan	27.473833	89.638
Building 109	Election Commission of Bhutan	27.481667	89.630472
Building 110	Youth Development Fund - Y1	27.370783	89.631457
Building 111	Youth Development Fund - Y2	27.470627	89.631492
Building 112	Youth Development Fund - Y3	27.470423	89.631038
Building 113	Youth Development Fund - Y4	27.470921	89.630582
Building 114	Youth Development Fund - Y5	27.471121	89.630769
Building 115	Youth Development Fund - Y6	27.471269	89.630705
Building 116	Youth Development Fund Hall	27.470558	89.630863
Building 117	Wangchuk Hospital and Service Block	27.463528	89.638278
Building 118	Mother and Child Building	27.4630025	89.6362151
Building 119	National Eye Centre	27.46432	89.637069
Building 120	City Bus Stand Building	27.465328	89.642325
Building 121	Ministry of Works and Human Settlement	27.474361	89.638472
Building 122	National Land Commission	27.4805	89.630472
	Chhukha Hydro Power Project Colonies (44 Buildings)		
Building 123	Upper terrace P7B1	27.0584	89.56242
Building 124	Upper terrace P7B2	27.0584	89.56242
Building 125	Upper terrace P6	27.05803	89.56294
Building 126	Lower terrace P7A1	27.455471	89.651878
Building 127	Lower terrace P7A2	27.05716	89.56633
Building 128	Lower terrace P7B1	27.05759	89.56574
Building 129	Lower terrace P7B2	27.05744	89.56561
Building 130	Lower terrace P7B3	27.05732	89.56531

Sl. No.	Building Name	Latitude	Longitude
Building 131	Lower terrace P7B4	27.05728	89.56562
Building 132	Lower terrace P7B5	27.05727	89.56505
Building 133	Lower terrace PLT1	27.05716	89.56633
Building 134	Lower terrace PLT2	27.05717	89.566044
Building 135	Lower terrace PLT3	27.0325	89.3358
Building 136	Lower most terrace P8B1	27.05695	89.56254
Building 137	Lower most terrace P8B2	27.05667	89.56273
Building 138	Lower most terrace P8B3	27.05649	89.56269
Building 139	Lower most terrace P8B4	27.05644	89.56303
Building 140	Lower most terrace P7B1	27.0323	89.3345
Building 141	Lower most terrace P7B2	27.05607	89.56332
Building 142	Lower most terrace P7B3	27.0322	89.3347
Building 143	Lower most terrace P6B1	27.0322	89.3349
Building 144	Lower most terrace P6B2	27.05667	89.5642
Building 145	Lower most terrace P6B3	27.0324	89.3351
Building 146	Lower most terrace P6B4	27.056818	89.56481
Building 147	Lower most terrace P6B5	27.056667	89.564848
Building 148	Lower most terrace P7A1	27.05662	89.56541
Building 149	Lower most terrace P7A2	27.0325	89.3356
Building 150	Lower most terrace P7A3	27.0323	89.3356
Building 151	Lower most terrace P7A4	27.05665	89.56608
Building 152	Lower most terrace Wangchu School	27.056194	89.564167
Building 153	Dzong PD7B1	27.052786	89.57784
Building 154	Dzong PD7B2	27.05279	89.5778
Building 155	Dzong PD6B1	27.05157	89.57699
Building 156	Dzong PD6B2	27.05157	89.57699

Sl. No.	Building Name	Latitude	Longitude
Building 157	Dzong PD6B3	27.0518	89.57697
Building 158	Dzong PD6B4	27.05205	89.57682
Building 159	Dzong PD6B5	27.05216	89.57673
Building 160	Dzong PD6B6	27.05241	89.57654
Building 161	Dzong PD2	27.052101	89.578232
Building 162	Dzong PD4	27.05156	89.57744
Building 163	Dzong PD3B1	27.051361	89.578056
Building 164	Dzong PD3B2	27.051528	89.577889
Building 165	Dzong PD3B3	27.051694	89.577694
Building 166	Dzong ZB	27.051806	89.575333
Building 167	Bhutan Automation	27.056975	89.567492
	Basochhu Hydro Power Project Colonies (16 buildings)		
Building 168	Office Complex	27.33947	89.921387
Building 169	Tsira Colony Type A - B1	27.342632	89.911573
Building 170	Tsira Colony Type A - B2	27.335007	89.925658
Building 171	Tsira Colony Type B - B1	27.34313	89.91136
Building 172	Tsira Colony Type B - B2	27.34339	89.91105
Building 173	Tsira Colony Type B - B3	27.34339	89.91105
Building 174	Tsira Colony Type B - B4	27.34353	89.91091
Building 175	Tsira Colony Type C - B1	27.343	89.91025
Building 176	Tsira Colony Type C - B2	27.343	89.91025
Building 177	Tsira Colony Type C - B3	27.3428	89.91004
Building 178	Tsira Colony Type C - B4	27.34256	89.90955
Building 179	Tsira Colony Type C - B5	27.34224	89.90936
Building 180	Tsira Colony Type C - B6	27.3423	89.90947
Building 181	Tsira Colony Type C - B7	27.34223	89.90916

Sl. No.	Building Name	Latitude	Longitude
Building 182	Tsira Colony Multi-Purpose Hall	27.342417	89.910639
Building 183	Hebesa Primary School	27.35137	89.89724
	Royal Bhutan Army (49 buildings)		
Building 184	Officer Transit camp - 1	27.454147	89.663297
Building 185	Officers Family quarters - 39	27.453704	89.661628
Building 186	Officers Family quarters - 40	27.453473	89.661503
Building 187	Officers Family quarters - 41	27.45329	89.661343
Building 188	Officers Family quarters - 42	27.453419	89.66195
Building 189	Officers Family quarters - 43	27.453215	89.661803
Building 190	Officers Family quarters - 44	27.4530005	89.661565
Building 191	Officers Family quarters - 45	27.453115	89.662169
Building 192	Officers Family quarters - 46	27.452804	89.661822
Building 193	Signal Line Family Quarters - 10	27.45414	89.664302
Building 194	Signal Line Family Quarters - 11	27.453487	89.664557
Building 195	Signal Line Family Quarters - 12	27.453364	89.664123
Building 196	Signal Line Family Quarters - 13	27.453477	89.663622
Building 197	Signal Line Family Quarters - 14	27.452761	89.663582
Building 198	PFQ lhakhang Family Quarters - 1	27.457166	89.664301
Building 199	PFQ lhakhang Family Quarters - 2	27.457636	89.664392
Building 200	PFQ lhakhang Family Quarters - 3	27.453364	89.664123
Building 201	PFQ lhakhang Family Quarters - 4	27.457571	89.664623
Building 202	PFQ lhakhang Family Quarters - 5	27.457569	89.663992
Building 203	PFQ lhakhang Family Quarters - 6	27.456922	89.664051
Building 204	PFQ lhakhang Family Quarters - 7	27.457268	89.663482
Building 205	PFQ lhakhang Family Quarters - 8	27.457306	89.663357
Building 206	PFQ lhakhang Family Quarters - 9	27.457013	89.663277

Sl. No.	Building Name	Latitude	Longitude
Building 207	PFQ THADAGOENPA Family Quarters - FQ 43	27.459444	89.667222
Building 208	PFQ THADAGOENPA Family Quarters - FQ 44	27.459444	89.6675
Building 209	PFQ THADAGOENPA Family Quarters - FQ 45	27.459722	89.6675
Building 210	PFQ THADAGOENPA Family Quarters - FQ 46	27.4600001	89.667778
Building 211	PFQ THADAGOENPA Family Quarters - FQ 48	27.460278	89.668056
Building 212	PFQ THADAGOENPA Family Quarters - FQ 49	27.459444	89.668056
Building 213	MH LINE Family Quarters - FQ 27	27.454923	89.659613
Building 214	MH LINE Family Quarters - FQ 28	27.45543	89.658421
Building 215	MH LINE Family Quarters - FQ 29	27.453364	89.664123
Building 216	MH LINE Family Quarters - FQ 30	27.457571	89.664623
Building 217	MH LINE Family Quarters - FQ 31	27.457569	89.663992
Building 218	MH LINE Family Quarters - FQ 32	27.456922	89.664051
Building 219	MP LINE Family Quarters - FQ 15	27.450393	89.662606
Building 220	MP LINE Family Quarters - FQ 16	27.450693	89.662607
Building 221	MP LINE Family Quarters - FQ 17	27.449688	89.66346
Building 222	MP LINE Family Quarters - FQ 18	27.449689	89.66346
Building 223	MP LINE Family Quarters - FQ 19	27.449688	89.663461
Building 224	MP LINE Family Quarters - FQ 20	27.448919	89.663827
Building 225	MP LINE Family Quarters - FQ 21	27.428901	89.663913
Building 226	MP LINE Family Quarters - FQ 22	27.447782	89.665061
Building 227	MP LINE Family Quarters - FQ 23	27.447375	89.666574
Building 228	MP LINE Family Quarters - FQ 24	27.447375	89.666574
Building 229	MP LINE Family Quarters - FQ 25	27.447375	89.666574
Building 230	MP LINE Family Quarters - FQ 26	27.447375	89.666574
Building 231	Main Head Quarter Office - 1	27.45536	89.663076
Building 232	OT Hospital - 1	27.455778	89.659722

Sl. No.	Building Name	Latitude	Longitude
	Royal Bodyguard (32 buildings)		
Building 233	Shopping complex - P7B1	27.532931	89.646523
Building 234	Officer quarters Dzong Site - Double storey buildings - 1	27.531253	89.642448
Building 235	Officer quarters Dzong Site - Double storey buildings - 2	27.530951	89.64251
Building 236	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 1	27.533318	89.641055
Building 237	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 2	27.533653	89.641135
Building 238	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 3	27.533683	89.640788
Building 239	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 4	27.533283	89.640682
Building 240	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 5	27.533757	89.640511
Building 241	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 6	27.533873	89.640592
Building 242	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 7	27.533892	89.641006
Building 243	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 8	27.530316	89.641315
Building 244	Officer quarters Dzong Site - Single storey buildings (Upper Block) - 9	27.530317	89.641317
Building 245	Officer quarters Dzong Site - Single storey buildings (Lower Block) - 1	27.529852	89.642031
Building 246	Officer quarters Dzong Site - Single storey buildings (Lower Block) - 2	27.529851	89.642033
Building 247	Family Quarters - Double storey buildings - 1	27.533712	89.647387
Building 248	Family Quarters - Double storey buildings - 2	27.533712	89.647387
Building 249	Family Quarters - Double storey buildings - 3	27.533712	89.647387
Building 250	Family Quarters - Double storey buildings - 4	27.533712	89.647387
Building 251	Family Quarters - Double storey buildings - 5	27.535665	89.645615
Building 252	Family Quarters - Double storey buildings - 6	27.535772	89.645388
Building 253	Family Quarters - Double storey buildings - 7	27.533758	89.645025
Building 254	Family Quarters - Double storey buildings - 8	27.53551	89.644538
Building 255	Family Quarters - Double storey buildings - 9	27.535382	89.644732
Building 256	Family Quarters - Double storey buildings - 10	27.535621	89.644082
Building 257	Family Quarters - Double storey buildings - 11	27.533623	89.644167

Sl. No.	Building Name	Latitude	Longitude
Building 258	Family Quarters - Single storey buildings - 1	27.533205	89.646432
Building 259	Family Quarters - Single storey buildings - 2	27.533254	89.647083
Building 260	Family Quarters - Single storey buildings - 3	27.533682	89.647329
Building 261	Family Quarters - Single storey buildings - 4	27.533601	89.643897
Building 262	Family Quarters - Single storey buildings - 5	27.533908	89.643145
Building 263	Family Quarters - Single story buildings - 6	27.534016	89.643664
Building 264	Office building	27.5300032	89.644403
	Technical Training Institute (3 buildings)		
Building 265	Principal Quarter	27.413221	89.656671
Building 266	Staff Quarter	27.413188	89.656756
Building 267	Main Academic Building	27.412618	89.657408

Appendix 2: Training topics to be covered

Sl. No	Main topics	Sub-topics	Method/Tools to be used	Time Period (Days)
1.	Overview of Rooftop PV plants installed under the contract	• Site details • Installed/under installation Rooftop plant details • Health and safety aspects related to sites • How to reach out the systems for maintenance	• PPT • Site details • Coordinates • Photographs • Illustrations	5-6 days (full days)

2.	Design and installation details of Rooftop PV systems installed under the contract	• Different configurations of rooftop PV systems installed under the contract based on inverters and grid connectivity
		• Component details with specifications (Complete BoQ)
		  ○ PV modules
		  ○ Inverters
		  ○ Mounting structure
		  ○ Cables
		  ○ Combiner boxes
		  ○ Grid connection box
		  ○ System protection
		  ○ Energy meters
		  ○ Monitoring system
		  ○ Phase coupler (for micro inverters)
		• Mounting structure installation details
		• String design and wring of PV modules
		• Inverter wiring
		• Combiner box wiring
		• Grid connection wiring
		• Energy meter wiring
		• Monitoring system wiring
		• Installation instruction of mounting structure
		• Installation instruction of PV modules
		• Installation instruction of Inverters
		• Installation instruction of system protection
		• Grid connection procedures
		• Stringing of PV modules
		• DC combiner box installation and DC wiring
		• Inverter installation and AC wiring
		• Gird connectivity and isolation
		• Meter installation
			• PPT
			• Illustration
			• Components specifications in soft and hard copies
			• Hard copies and soft copies of wiring diagrams
			• Hard copies and softcopies of mounting structure design and installation instructions
			• Installation instruction of all components and accessories
			• Videos	

3.	Overview of PV system documentation requirements	• Overall system information • System design and installation information • PV array layout and DC system configuration • String configurations • Wiring diagrams for all DC and AC systems • Earthing system and overvoltage protection • Datasheets of all equipment • Module mounting structure information • Operation and maintenance information	• PPT • Illustration • Hard copies of actual documents related to the systems installed	

Sl. No	Main topics	Sub-topics	Method/Tools to be used	Time Period (Days)
		• Test results and commissioning data • Checklist for documentation		
4.	Operation and maintenance planning for grid-connected PV power plants	• Energy generation and performance monitoring • Monitoring of physical conditions of plant and components • Key performance indicators • Performance benchmarking • Preventive maintenance schedule • Predictive maintenance strategy • Corrective maintenance • Spare part details (provided with the systems) • PV Array cleaning best practices as per manufacturer's recommendations • System fault diagnostics • Troubleshooting of inverter (installed under the contract) • Troubleshooting of monitoring system (installed under the contract) • Safety guidelines to follow during O&M	• PPT • Illustration • O&M manuals • Hand-on training on equipment	
5.	PV systems inspection and testing	• Safety guidelines to follow during inspection • Collection of system information • Verification of system design and planning • Verification of system components • Verification of system installation • Verification of Electrical and fire safety compliances • System performance evaluation • Checklist for inspection and compliance verification	• PPT • Illustration • Checklist	
6.	On-site practical on PV systems during installation	• During installation • During wiring • During testing • During commissioning • During grid connection • Use of multimeter • Use of earth tester • Polarity test • Continuity test • Practical on use of IV tracer • Practical on use of IR camera • Use of torque wrench • Roof sealant to prevent leakage • Use of PPE	• Demo • Practical • Use of tools • Use of PPE	

Section 7: General Conditions of Contract

These General Conditions of Contract (GCC) are based on the Model Form of International Contract for Process Plant Construction published by the Engineering Advancement Association of Japan (ENAA). The Multilateral Development Banks (MDBs) participating in the procurement harmonization process gratefully acknowledge the contribution of ENAA to the advancement of good contracting practices by its borrowers. The GCC contain general clauses to be applied on all contracts. The GCC in this section, read in conjunction with the Special Conditions of Contract in Section 8 and other documents listed therein, should be a complete document expressing all the rights and obligations of the contracting parties. The General Conditions herein shall not be altered.

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A. Contract and Interpretation

1. Definitions

1.1 The following words and expressions shall have the meanings hereby assigned them:

(a) "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.

(b) "Contract Documents" means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).

(c) "GCC" means the General Conditions of Contract.

(d) "SCC" means the Special Conditions of Contract.

(e) "day" means calendar day.

(f) "year" means 365 days.

(g) "month" means calendar month.

(h) "Party" means the Employer or the Contractor, as the context requires.

(i) "Employer" means the person named as such in the SCC and includes the legal successors or permitted assigns of the Employer.

(j) "Project Manager" means the person appointed by the Employer in the manner provided in GCC Subclause 17.1 (Project Manager) hereof and named as such in the SCC to perform the duties delegated by the Employer.

(k) "Contractor" means the person(s) named as Contractor in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

(l) "Contractor's Representative" means any person nominated by the Contractor and approved by the Employer in the manner provided in GCC Subclause 17.2 (Contractor's Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

(m) "Construction Manager" means the person appointed by the Contractor's Representative in the manner provided in GCC Subclause 17.2.4.

(n) "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.

(o) "Dispute Board" means the person or persons named as such in the SCC appointed by agreement between the Employer and the Contractor to make a decision on or to settle any dispute or difference between the Employer and the Contractor referred to him or her by the parties pursuant to GCC Subclause 45.1 (Dispute Board) hereof.

(p) "The Bank" means the financing institution named in the SCC.

(q) "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.

(r) "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.

(s) "Plant" means permanent plant, equipment, machinery, apparatus, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GCC Subclause 7.3 hereof), but does not include Contractor's Equipment.

(t) "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.

(u) "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.

(v) "Country of Origin" means the countries and territories eligible under the rules of the Bank as further elaborated in the SCC.

(w) "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.

(x) "Effective Date" means the date of fulfillment of all conditions stated in Article 3 (Effective Date) of the Contract Agreement, upon which the period until the Time for Completion shall be counted from.

(y) "Time for Completion" means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) is to be attained, as referred to in GCC Clause 8 and in accordance with the relevant provisions of the Contract.

(z) "Completion" means that the Facilities (or a specific part thereof where specific parts are specified in the Contract) have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Precommissioning of the Facilities or such specific part thereof has been completed, and that the Facilities or specific part thereof are ready for Commissioning as provided in GCC Clause 24 (Completion) hereof.

(aa) "Precommissioning" means the testing, checking and other requirements specified in the Employer's Requirements that are to

be carried out by the Contractor in preparation for Commissioning as provided in GCC Clause 24 (Completion) hereof.

(bb) "Commissioning" means operation of the Facilities or any part thereof by the Contractor following Completion, which operation is to be carried out by the Contractor as provided in GCC Subclause 25.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

(cc) "Guarantee Test(s)" means the test(s) specified in the Employer's Requirements to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement in accordance with the provisions of GCC Subclause 25.2 (Guarantee Test) hereof.

(dd) "Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GCC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GCC Clause 25 (Commissioning and Operational Acceptance) hereof.

(ee) "Defect Liability Period" means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC Clause 27 (Defect Liability) hereof.

2. Contract Documents

2.1 Subject to Article 1.2 (Order of Precedence) of the Contract Agreement, all documents forming part of the Contract (and all parts thereof) are intended to be correlative, complementary and mutually explanatory. The Contract shall be read as a whole.

3. Interpretation

3.1 In the Contract, except where the context requires otherwise,

(a) words indicating one gender include all genders;

(b) words indicating the singular also include the plural and words indicating the plural also include the singular;

(c) provisions including the word "agree," "agreed," or "agreement" require the agreement to be record in writing;

(d) the word "tender" is synonymous with "bid," "tenderer" with "Bidder," and "tender documents" with "Bidding Documents;" and

(e) "written" or "in writing" means handwritten, typewritten, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

3.2 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.

"Incoterms" means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1er, 75008 Paris, France.

3.3 Entire Agreement

Subject to GCC Subclause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

3.4 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed 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 GCC Subclause 3.6.2 below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.6.2 Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, must be dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

3.7 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity, or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

3.8 Country of Origin

"Origin" means the place where the plant and component parts thereof are mined, grown, produced, or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

4. Communications

4.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests, and discharges, these communications shall be

(a) in writing and delivered against receipt; and

(b) delivered, sent, or transmitted to the address for the recipient's communications as stated in the Contract Agreement.

When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Project Manager, a copy shall be sent to the Project Manager or the other Party, as the case may be.

5. Law and Language

5.1 The Contract shall be governed by and interpreted in accordance with laws of the country specified in the SCC.

5.2 The ruling language of the Contract shall be that stated in the SCC.

5.3 The language for communications shall be the ruling language unless otherwise stated in the SCC.

6. Fraud and Corruption

6.1 ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders, Suppliers, and Contractors, agents, subcontractors, subconsultants, service providers, sub suppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

(ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

(v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;

(vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and

(vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.

(b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;

(d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate[1] in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and

(e) will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective officers,

[1] Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

directors, employees and personnel, to permit ADB or its representative to inspect the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

6.2 All Bidders, consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:

(a) being available to be interviewed and replying fully and truthfully to all questions asked;

(b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

(c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;

(d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

(e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and

(f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

6.3 All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contract with its sub-consultants, subcontractors, and other third parties engaged or involved in ADB-related activities, such sub-consultants, subcontractors, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

The Contractor undertakes that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the bid, have been given or received in connection with the procurement process or in the contract execution.[2]

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

[2] The undertaking also applies during the period of performance of the contract.

performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, pre-commissioning and delivery) of the Plant and the installation, completion, and commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes, and any other documents as specified in the section Employer's Requirements. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor, materials, equipment, spare parts (as specified in GCC Subclause 7.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures, and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage, except for those supplies, works, and services that will be provided or performed by the Employer, as set forth in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement.

7.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.

7.3 In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the SCC and the provisions, if any, specified in the SCC. However, the identity, specifications, and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedule No. 6, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price therefore and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.

8. Time for Commencement and Completion

8.1 The Contractor shall commence work on the Facilities within the period specified in the SCC and without prejudice to GCC Subclause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Appendix 4 (Time Schedule) to the Contract Agreement.

8.2 The Contractor shall attain Completion of the Facilities or of a part where a separate time for Completion of such part is specified in the Contract, within the time stated in the SCC or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.

9. Contractor's Responsibilities

9.1 The Contractor shall design, manufacture, including associated purchases and/or subcontracting, install, and complete the Facilities in accordance with the Contract. When completed, the Facilities should be fit for the purposes for which they are intended as defined in the Contract.

9.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities, including any data as to boring tests provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site if access thereto was available and of other data readily available to it relating to the Facilities as of the date 28 days

prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

9.3 The Contractor shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the country where the Site is located, which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under GCC Subclause 10.3 hereof and that are necessary for the performance of the Contract.

9.4 The Contractor shall comply with all laws in force in the country where the Facilities are to be implemented. The laws will include all local, state, national, or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC Subclause 10.1 hereof.

9.5 Any plant and services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GCC Clause 1 (Country of Origin). Any Subcontractors retained by the Contractor shall be from a country as specified in GCC Clause 1 (Country of Origin).

9.6 The Contractor shall permit ADB or its representatives to inspect the Contractor's site, assets, accounts and records, and other documents relating to the bid submission and contract performance of the Contractor and to have them audited by auditors appointed by ADB, if so required by ADB.

9.7 If the Contractor is a joint venture or consortium 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 joint venture or consortium. The composition or the constitution of the joint venture or consortium shall not be altered without the prior consent of the Employer.

9.8 Protection of the Environment

(a) The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise, and other results of his operations.

(b) The Contractor shall ensure that emissions, surface discharges, and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

10. Employer's Responsibilities

10.1 All information and/or data to be supplied by the Employer as described in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement shall be deemed to be accurate, except when the Employer expressly states otherwise.

10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.

10.3 The Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities, or public service undertakings in the country where the Site is located which (a) such authorities or undertakings require the Employer to obtain in the Employer's name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract, and (c) are specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement.

10.4 If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals, and/or licenses necessary for the execution of the Contract from all local, state, or national government authorities, or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all raw materials, utilities, lubricants, chemicals, catalysts, other materials and facilities; and shall perform all work and services of whatsoever nature, including those required by the Contractor to properly carry out Pre-commissioning, Commissioning, and Guarantee Tests, all in accordance with the provisions of the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement at or before the time specified in the program furnished by the Contractor under GCC Subclause 18.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.

10.6 The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GCC Subclause 24.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GCC Subclause 25.2.

10.7 All costs and expenses involved in the performance of the obligations under this GCC Clause 10 shall be the responsibility of the Employer,

except those incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GCC Subclause 25.2.

10.8 In the event that the Employer shall be in breach of any of his obligations imposed by the Contract, then the additional cost reasonably incurred by the Contractor in consequence thereof shall be added to the Contract Price.

C. Payment

11. Contract Price

11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.

11.2 Unless an adjustment clause is provided for in the SCC, the Contract Price shall be a firm 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 GCC Subclauses 9.2, 10.1, and 35 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

12. Terms of Payment

12.1 The Contract Price shall be paid as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement and in the Appendix (Terms and Procedures of Payment) to the Contract Agreement, which also outlines the procedures to be followed in making application for and processing payments.

12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.

12.3 In the event that the Employer fails to make any payment by its respective due date or within the period set forth in the Contract, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the rate(s) shown in the Appendix (Terms and Procedures of Payment) to the Contract Agreement for the period of delay until payment has been made in full, whether before or after judgment or arbitrage award.

12.4 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the Appendix (Terms and Procedures of Payment) to the Contract Agreement, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated in the Contractor's bid.

13. Securities

13.1 Issuance of Securities
The Contractor shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner, and form specified below.

13.2 Advance Payment Security

13.2.1 The Contractor shall, within 28 days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with the Appendix (Terms and Procedures of Payment) to the Contract Agreement, and in the same currency or currencies.

13.2.2 The security shall be in the form provided in the Bidding Documents or in another form acceptable to the Employer. The amount of the security shall be reduced in proportion to the value of the Facilities executed by and paid to the Contractor from time to time, and shall automatically become null and void when the full amount of the advance payment has been recovered by the Employer. The security shall be returned to the Contractor immediately after its expiration.

13.3 Performance Security

13.3.1 The Contractor shall, within 28 days of the notification of contract award, provide a security for the due performance of the Contract in the amount specified in the SCC.

13.3.2 The security shall be denominated in the currency or currencies of the Contract, or in a freely convertible currency acceptable to the Employer, and shall be in one of the forms of bank guarantees provided in the Bidding Documents, as stipulated by the Employer in the SCC, or in another form acceptable to the Employer.

13.3.3 Unless otherwise specified in the SCC, the security shall be reduced by half on the date of the Operational Acceptance. The Security shall become null and void, or shall be reduced pro rata to the Contract Price of a part of the Facilities for which a separate Time for Completion is provided, 540 days after Completion of the Facilities or 365 days after Operational Acceptance of the Facilities, whichever occurs first; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC Subclause 27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor, pursuant to GCC Subclause 27.10, is liable for an extended defect liability obligation, the performance security shall be extended for the period and up to the amount specified in the SCC.

14. Taxes and Duties

14.1 Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies, and charges assessed on the Contractor, its Subcontractors, or their employees by all municipal, state, or national government authorities in connection with the Facilities in and outside of the country where the Site is located.

14.2 Notwithstanding GCC Subclause 14.1 above, the Employer shall bear and promptly pay all customs and import duties as well as other local taxes like, e.g., a value-added tax (VAT), imposed by the law of the country where the Site is located on the Plant specified in Price Schedule No. 1 and that are to be incorporated into the Facilities.

14.3 If any tax exemptions, reductions, allowances, or privileges may be available to the Contractor in the country where the Site is located, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.

14.4 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies, and charges prevailing at the date 28 days prior to the date of bid submission in the country where the Site is located (hereinafter called "Tax" in this GCC Subclause 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 GCC Clause 36 hereof.

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 nontransferable license (without the right to sublicense) to the Employer under the patents, utility models, or other industrial property rights owned by the Contractor or by a third party from whom the Contractor has received the right to grant licenses thereunder, and shall also grant to the Employer a nonexclusive and nontransferable right (without the right to sublicense) 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 furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during, or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data, and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GCC Clause 16.

16.2 The Employer shall not use such documents, data, and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data, and other information received from the Employer for any purpose other than the design, procurement of Plant, construction, or such other work and services as are required for the performance of the Contract.

16.3 The obligation of a party under GCC Subclauses 16.1 and 16.2 above, however, shall not apply to that information, which

(a) now or hereafter enters the public domain through no fault of that party;

(b) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto; 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 GCC Clause 16 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

16.5 The provisions of this GCC Clause 16 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

17. Representatives

17.1 Project Manager

If the Project Manager is not named in the Contract, then within 14 days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the Project Manager. The Employer may from time to time appoint some other person as the Project Manager in place of the person previously so appointed, and shall give 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.

All notices, instructions, information, and other communications given by the Contractor to the Employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.

17.2 Contractor's Representative and Construction Manager

17.2.1 If the Contractor's Representative is not named in the Contract, then within 14 days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within 14 days,

the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within 14 days giving the reason therefor, then the Contractor shall appoint a replacement within 14 days of such objection, and the foregoing provisions of this GCC Subclause 17.2.1 shall apply thereto.

17.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the performance of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information, and all other communications under the Contract.

All notices, instructions, information, and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.
The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC Subclause 17.2.1.

17.2.3 The Contractor's Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions, and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager.

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Subclause 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, the Contractor's Representative or the Construction Manager shall appoint a suitable person to act as the Construction Manager's deputy.

17.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or

negligent, or may commit a serious breach of the Site regulations provided under GCC Subclause 22.4. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.

17.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC Subclause 17.2.5, the Contractor shall, where required, promptly appoint a replacement.

18. Work Program

18.1 Contractor's Organization

The Contractor shall supply to the Employer and the Project Manager a chart showing the proposed organization to be established by the Contractor for carrying out work on the Facilities within 21 days of the Effective Date. The chart shall include the identities of the key personnel, and the curricula vitae of such key personnel to be employed shall be supplied together with the chart. The Contractor shall promptly inform the Employer and the Project Manager in writing of any revision or alteration of such an organization chart.

18.2 Program of Performance

Within 28 days after the Effective Date, the Contractor shall submit to the Project Manager a detailed program of performance of the Contract, made in a form acceptable to the Project Manager and showing the sequence in which it proposes to design, manufacture, transport, assemble, install, and pre-commission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion, Commissioning, and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in the Appendix (Time Schedule) to the Contract Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion given in the SCC and any extension granted in accordance with GCC Clause 40, and shall submit all such revisions to the Project Manager.

18.3 Progress Report

The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Subclause 18.2 above, and supply a progress report to the Project Manager every month.

The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.

18.4 Progress of Performance

If at any time the Contractor's actual progress falls behind the program referred to in GCC Subclause 18.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress

so as to attain Completion of the Facilities within the Time for Completion under GCC Subclause 8.2, any extension thereof entitled under GCC Subclause 40.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

18.5 Procedures

The Contract shall be executed in accordance with the Contract Documents including the procedures given in the Forms and Procedures of the Employer's Requirements.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

19.Subcontracting

19.1 The Appendix 5 (List of Major Items of Plant and Services and List of Approved Subcontractors) to the Contract Agreement specifies major items of plant and services and a list of approved Subcontractors against each item, including manufacturers. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties, or responsibilities under the Contract.

19.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in GCC Subclause 19.1.

19.3 For items or parts of the Facilities not specified in the Appendix (List of Major Items of Plant and Services and List of Approved Subcontractors for Major Items) to the Contract Agreement, the Contractor may employ such Subcontractors as it may select, at its discretion.

19.4 Each subcontract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GCC 19.5 (if and when applicable), or in event of termination by the Employer under GCC 42.2.

19.5 If a Sub-contractor's obligations extend beyond the expiry date of the relevant Defects Liability Period and the Project Manager, prior to that date, instructs the Contractor to assign the benefits of such obligations to the Employer, then the Contractor shall do so.

20. Design and Engineering

20.1 Specifications and Drawings

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.

The Contractor shall be responsible for any discrepancies, errors, or omissions in the specifications, drawings, and other technical documents that it has prepared, whether such specifications, drawings, and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors,

or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

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 date 28 days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GCC Clause 39.

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 the Appendix (List of Documents for Approval or Review) to the Contract Agreement for its approval or review as specified and in accordance with the requirements of GCC Subclause 18.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.

GCC Subclauses 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

20.3.2 Within 14 days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Subclause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.

If the Project Manager fails to take such action within the said 14 days, 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 his decision.

20.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Subclause 20.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required

modification(s), whereupon the document shall be deemed to have been approved.

20.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the parties within a reasonable period, then such dispute or difference may be referred to a Dispute Board for determination in accordance with GCC Subclause 45.3 hereof. If such dispute or difference is referred to a Dispute Board, the Project Manager shall give instructions as to whether and, if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Dispute Board upholds the Contractor's view on the dispute and if the Employer has not given notice under Subclause 45.3 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Dispute Board shall decide, and the Time for Completion shall be extended accordingly.

20.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.

20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Subclause 20.3.

If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC Clause 39 shall apply to such request.

21. Procurement

21.1 Materials

Subject to GCC Subclause 14.2, the Contractor shall procure and transport all materials in an expeditious and orderly manner to the Site.

21.2 Employer-Supplied Materials

If the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement 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 program furnished by the Contractor, pursuant to GCC Subclause 18.2, 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 GCC Subclause 21.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.

21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody, and control shall not relieve the Employer of liability for any undetected shortage, defect, or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GCC Clause 27 or under any other provision of Contract.

21.3 Transportation

21.3.1 The Contractor shall at its own risk and expense transport all the materials and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

21.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the materials and the Contractor's Equipment.

21.3.3 Upon dispatch of each shipment of materials and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile, or electronic means, of the description of the materials and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival 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 endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges, or any other traffic facilities that may be caused by the transport of the materials and the Contractor's Equipment to the Site.

21.4 Customs Clearance

The Contractor shall, at its own expense, handle 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 GCC Subclause 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 GCC Clause 40.

22. Installation

22.1 Setting Out/Supervision

22.1.1 Benchmark

(a) 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.

(b) If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level, or alignment of the Facilities, the Contractor shall forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

22.1.2 Contractor's Supervision

The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

22.2 Labor

22.2.1 Engagement of Staff and Labor

(a) Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding, and transport.

(b) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled, and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.

(c) The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site into the country where the Site is located. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.

(d) The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

22.2.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer's Personnel.

22.2.3 Labor Laws

(a) The Contractor shall comply with all the relevant labor Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration, and emigration, and shall allow them all their legal rights.

(b) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous, or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.

(c) The Contractor shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious, or other customs and all local laws and regulations pertaining to the employment of labor.

22.2.4 Rates of Wages and Conditions of Labor

(a) The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

(b) The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

22.2.5 Working Hours

(a) No work shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the SCC, unless

(i) otherwise stated in the Contract;

(ii) the Project Manager gives consent; or

(iii the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Project Manager.

(b) If and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Project Manager's consent thereto, the Project Manager shall not unreasonably withhold such consent.

(c) This Subclause shall not apply to any work which is customarily carried out by rotary or double shifts.

22.2.6 Facilities for Staff and Labor

(a) Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

(b) The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

22.2.7 Health and Safety

(a) The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay, and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

(b) The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

(c) The Contractor shall send to the Project Manager, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports

concerning health, safety, and welfare of persons, and damage to property, as the Project Manager may reasonably require.

22.2.8 Funeral Arrangements
In the event of the death of any of the Contractor's personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial, unless otherwise specified in the SCC.

22.2.9 Records of Contractor's Personnel
The Contractor shall keep accurate records of the Contractor's personnel, including the number of each class of Contractor's Personnel on the Site and the names, ages, gender, hours worked, and wages paid to all workers. 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.

22.2.10 Supply of Foodstuff
The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

22.2.11 Supply of Water
The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

22.2.12 Measures against Insect and Pest Nuisance
The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

22.2.13 Alcoholic Liquor or Drugs
The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter, or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift barter, or disposal by Contractor's Personnel.

22.2.14 Arms and Ammunition
The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

22.2.15 Prohibition of All Forms of Forced or Compulsory Labor
The contractor shall not employ "forced or compulsory labor" in any form. "Forced or compulsory labor" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

22.2.16 Prohibition of Harmful Child Labor
The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to,

or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

22.3 Contractor's Equipment

22.3.1 All Contractor's Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor's Equipment is no longer required for the execution of the Contract.

22.3.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

22.3.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

22.4 Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.

22.5 Opportunities for Other Contractors

22.5.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.

22.5.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

22.5.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of

other contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.

22.5.4 The Contractor shall notify the Project Manager promptly of any defects in the other Contractors' work that come to its notice, and that could affect the Contractor's work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.

22.6 Emergency Work

If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.

22.7 Site Clearance

22.7.1 Site Clearance in Course of Performance

In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store, or remove any surplus materials, clear away any wreckage, rubbish, or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

22.7.2 Clearance of Site after Completion

After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish, and debris of any kind from the Site, and shall leave the Site and Facilities in a clean and safe condition.

22.8 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

23. Test and Inspection

23.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and any part of the Facilities as are specified in the Contract.

23.2 The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

23.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give a reasonable advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager or their designated representatives to attend the test and/or inspection.

23.4 The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection.

If the Employer or Project Manager or their designated representatives fails to attend the test and/or inspection, or if it is agreed between the parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.

23.5 The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of work on the Facilities and/or the Contractor's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.

23.6 If any Plant or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC Subclause 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 an Dispute Board for determination in accordance with GCC Subclause 45.3.

23.8 The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Plant are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.

23.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC Subclause 23.4, shall release the Contractor from any other responsibilities under the Contract.

23.10 No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such parts of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.

23.11 The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Subclause 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.

24. Completion of the Facilities

24.1 As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Employer's Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.

24.2 Within 7 days after receipt of the notice from the Contractor under GCC Subclause 24.1, the Employer shall supply the operating and maintenance personnel specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement for Pre-commissioning of the Facilities or any part thereof.

Pursuant to the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement, the Employer shall also provide, within the said 7-day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services, and other matters required for Pre-commissioning of the Facilities or any part thereof.

24.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services, and other matters have been provided by the Employer in accordance with GCC Subclause 24.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GCC Subclause 25.5.

24.4 As soon as all works in respect of Pre-commissioning are completed and, in the opinion of the Contractor, the Facilities or any part thereof is

ready for Commissioning, the Contractor shall so notify the Project Manager in writing.

24.5 The Project Manager shall, within 14 days after receipt of the Contractor's notice under GCC Subclause 24.4, either issue a Completion Certificate in the form specified in the Employer's Requirements (Forms and Procedures), stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's notice under GCC Subclause 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 GCC Subclause 24.4.

If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within 7 days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's repeated notice.

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within 7 days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

24.6 If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within 14 days after receipt of the Contractor's notice under GCC Subclause 24.4 or within 7 days after receipt of the Contractor's repeated notice under GCC Subclause 24.5, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be.

24.7 As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.

24.8 Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

25. Commissioning and Operational Acceptance

25.1 Commissioning

25.1.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the Project Manager, pursuant to GCC Subclause 24.5, or immediately after the date of the deemed Completion, under GCC Subclause 24.6.

25.1.2 The Employer shall supply the operating and maintenance personnel and all raw materials, utilities, lubricants, chemicals,

catalysts, facilities, services, and other matters required for Commissioning.

25.1.3 In accordance with the requirements of the Contract, the Contractor's and Project Manager's advisory personnel shall attend the Commissioning, including the Guarantee Test, and shall advise and assist the Employer.

25.2 Guarantee Test

25.2.1 Subject to GCC Subclause 25.5, 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 (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.

25.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Completion specified in the SCC or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GCC Subclauses 28.2 and 28.3 shall not apply.

25.3 Operational Acceptance

25.3.1 Subject to GCC Subclause 25.4 below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

(a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or

(b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion specified in the SCC, or any other agreed upon period as specified in GCC Subclause 25.2.2 above; or

(c) the Contractor has paid the liquidated damages specified in GCC Subclause 28.3 hereof; and

(d) any minor items mentioned in GCC Subclause 24.7 hereof relevant to the Facilities or that part thereof have been completed.

25.3.2 At any time after any of the events set out in GCC Subclause 25.3.1 have occurred, 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 (Forms and Procedures) in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

25.3.3 The Project Manager shall, after consultation with the Employer, and within 7 days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate.

25.3.4 If within 7 days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as of the date of the Contractor's said notice.

25.4 Partial Acceptance

25.4.1 If the Contract specifies that Completion and Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.

25.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the Project Manager shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

25.5 Delayed Pre-Commissioning and/or Guarantee Test

25.5.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Subclause 24.3, or with the Guarantee Test pursuant to Subclause 25.2, for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions leading to "deemed" completion of activities such as Completion, pursuant to GCC Subclause 24.6, and Operational Acceptance, pursuant to GCC Subclause 25.3.4, and Contractor's obligations regarding Defect Liability Period, pursuant to GCC Subclause 27.2, Functional Guarantee, pursuant to GCC Clause 28, and Care of Facilities, pursuant to GCC Clause 32, and GCC Clause 41.1, Suspension, shall not apply. In this case, the following provisions shall apply.

25.5.2 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above Subclause 25.5.1, the Contractor shall be entitled to the following:

(a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Subclause 26.2;

(b) payments due to the Contractor in accordance with the provision specified in the Appendix (Terms and

Procedures of Payment) to the Contract Agreement, which would not have been payable in normal circumstances due to noncompletion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding those payments, subject to the provision of Subclause 25.5.3 below;

(c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer;

(d) the additional charges towards the care of the Facilities pursuant to GCC Subclause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Subclause 25.5.4 below. The provision of GCC Subclause 33.2 shall apply to the Facilities during the same period.

25.5.3 In the event that the period of suspension under above Subclause 25.5.1 actually exceeds 180 days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor.

25.5.4 When the Contractor is notified by the Project Manager that the plant is ready for Pre-commissioning, the Contractor shall proceed without delay in performing all the specified activities and obligations under the contract.

F. Guarantees and Liabilities

26. Completion Time Guarantee

26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the SCC pursuant to GCC Subclause 8.2, or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.

26.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount specified in the SCC as a percentage rate of the Contract Price or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as “Maximum” in the SCC as a percentage rate of the Contract Price. Once the “Maximum” is reached, the Employer may consider termination of the Contract, pursuant to GCC Subclause 42.2.2.

Such payment shall completely satisfy the Contractor’s obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GCC Clause 40.

The Contractor shall have no further liability whatsoever to the Employer in respect thereof.

However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.

Save for liquidated damages payable under this GCC Subclause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the Appendix (Time Schedule) to the Contract Agreement and/or other program of work prepared pursuant to GCC Subclause 18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.

26.3 If the Contractor attains Completion of the Facilities or any part thereof before the Time for Completion or any extension thereof under GCC Clause 40, the Employer shall pay to the Contractor a bonus in the amount specified in the SCC. The aggregate amount of such bonus shall in no event exceed the amount specified as "Maximum" in the SCC.

27. Defect Liability

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 Defect Liability Period shall be 540 days from the date of Completion of the Facilities (or any part thereof) or 1 year from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, unless specified otherwise in the SCC pursuant to GCC Subclause 27.10.

If during the Defect Liability Period any defect should be found in the design, engineering, materials, and workmanship of the Plant supplied or of the 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. The Contractor shall not be responsible for the repair, replacement, or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

(a) improper operation or maintenance of the Facilities by the Employer,

(b) operation of the Facilities outside specifications provided in the Contract, or

(c) normal wear and tear.

27.3 The Contractor's obligations under this GCC Clause 27 shall not apply to:

(a) any materials that are supplied by the Employer under GCC Subclause 21.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein;

(b) any designs, specifications or other data designed, supplied, or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein; or

(c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC Subclause 27.7.

27.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC Clause 27.

The Contractor may, with the consent of the Employer, remove from the Site any Plant or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

27.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good, as the case may be, until that part of the Facilities passes such tests. The tests shall be agreed upon by the Employer and the Contractor.

27.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than 15 days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.

27.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

27.9 Except as provided in GCC Clauses 27 and 33, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant, design, or engineering, or work executed that appear after Completion of the Facilities or any part thereof, except where such defects are the result of the gross negligence, fraud, criminal, or willful action of the Contractor.

27.10 In addition, any such component of the Facilities and during the period of time as may be specified in the SCC shall be subject to an extended Defect Liability Period. Such obligation of the Contractor shall be in addition to the Defect Liability Period specified under GCC Subclause 27.2.

28. Functional Guarantees

28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Appendix (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 the Appendix (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 GCC Subclause 42.2.2.

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix (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, at the Contractor's option, either

(a) make such changes, modifications, and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense, and shall request the Employer to repeat the Guarantee Test or

(b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in the Appendix (Functional Guarantees) to the Contract Agreement.

28.4 The payment of liquidated damages under GCC Subclause 28.3, up to the limitation of liability specified in the Appendix (Functional Guarantees) to the Contract Agreement, shall completely satisfy the Contractor's guarantees under GCC Subclause 28.3, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.

29. Patent Indemnity

29.1 The Contractor shall, subject to the Employer's compliance with GCC Subclause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions, or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement

or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract by reason of (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located, and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Contractor, pursuant to the Contract Agreement.

29.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GCC Subclause 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 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 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) the Contractor shall not be liable to the Employer, 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, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer, and

(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed a multiple of the Contract Price specified in the SCC or, if a multiple is not so specified, 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 the country where the Site is located 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 that country.

31.2 Ownership of the Plant (including spare parts) procured in the country where the Site is located shall be transferred to the Employer when the Plant are 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 Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant in question are no longer required for the Facilities.

31.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant are incorporated.

32. Care of Facilities

32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to GCC Clause 24 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC Clause 27. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Subclauses 32.2 and 38.1.

32.2 If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of

(a) insofar as they relate to the country where the Site is located, nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are

mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under GCC Clause 34 hereof; or

(b) any use or occupation by the Employer or any third party other than a Subcontractor, authorized by the Employer of any part of the Facilities; or

(c) any use of or reliance upon any design, data, or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein,

the Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed, or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed, or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GCC Clause 39. If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GCC Subclause 42.1 hereof.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in GCC Subclause 32.2 with respect to the Contractor's temporary facilities, and (ii) where such loss or damage arises by reason of any of the matters specified in GCC Subclauses 32.2 (b) and (c) and 38.1.

32.4 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 GCC Subclause 38.1, the provisions of GCC Subclause 38.3 shall apply.

33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

33.1 Subject to GCC Subclause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions, or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property other than the Facilities whether accepted or not, arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers, or agents, except any injury, death, or property damage caused by the negligence of the Employer, its contractors, employees, officers, or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Subclause 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 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 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.

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers, and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion, or any other perils, in excess of the amount recoverable from insurances procured under GCC Clause 34, provided that such fire, explosion, or other perils were not caused by any act or failure of the Contractor.

33.4 The party entitled to the benefit of an indemnity under this GCC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.

34. Insurance

34.1 To the extent specified in the Appendix (Insurance Requirements) to the Contract Agreement, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

(a) Cargo Insurance During Transport

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.

(b) Installation All Risks Insurance

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.

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties including the Employer's personnel, and loss of or damage to property

occurring in connection with the supply and installation of the Facilities.

(d) Automobile Liability Insurance

Covering use of all vehicles used by the Contractor or its Subcontractors, whether or not owned by them, in connection with the execution of the Contract.

(e) Workers' Compensation

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(f) Employer's Liability

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(g) Other Insurances

Such other insurances as may be specifically agreed upon by the parties hereto as listed in the Appendix (Insurance Requirements) to the Contract Agreement.

34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1, except for the Third Party Liability, Workers' Compensation, and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1 except for the Cargo Insurance During Transport, Workers' Compensation, and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

34.3 The Contractor shall, in accordance with the provisions of the Appendix (Insurance Requirements) to the Contract Agreement, 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 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 Appendix (Insurance Requirements) to the Contract Agreement, 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 deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than 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 GCC Subclause 34.5.

34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Subclause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GCC 34.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer, and the Contractor shall have full recourse against the Employer for any and all liabilities of the Employer herein.

34.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC Clause 34, and all monies payable by any insurers shall be paid to the Contractor. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.

35. Unforeseen Conditions

35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions other than climatic conditions, or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities including any data as to boring tests, provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site if access thereto was available, or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant or Contractor's Equipment, notify the Project Manager in writing of

(a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen;

(b) the additional work and/or Plant and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions;

(c) the extent of the anticipated delay; and

(d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this GCC Subclause 35.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in GCC Subclause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

35.3 If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in GCC Subclause 35.1, the Time for Completion shall be extended in accordance with GCC Clause 40.

36. Change in Laws and Regulations

36.1 If, after the date 28 days prior to the date of Bid submission, in the country where the Site is located, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated, or changed, which shall be deemed to include any change in interpretation or application by the competent authorities, that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the SCC, pursuant to GCC Subclause 11.2.

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 labor, materials, or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either party is prevented, hindered, or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within 14 days after 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 GCC Clause 40.

37.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GCC Subclauses 37.6 and 38.5.

37.5 No delay or nonperformance by either party hereto caused by the occurrence of any event of Force Majeure shall

(a) constitute a default or breach of the Contract; or

(b) give rise to any claim for damages or additional cost or expense occasioned thereby, subject to GCC Subclauses 32.2, 38.3 and 38.4

if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

37.6 If the performance of the Contract is substantially prevented, hindered, or delayed for a single period of more than 60 days or an aggregate period of more than 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 GCC Subclause 38.5.

37.7 In the event of termination pursuant to GCC Subclause 37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GCC Subclauses 42.1.2 and 42.1.3.

37.8 Notwithstanding GCC Subclause 37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.

38. War Risks

38.1 "War Risks" shall mean any event specified in paragraphs (a) and (b) of GCC Subclause 37.1 and any explosion or impact of any mine, bomb, shell, grenade, or other projectile, missile, munitions or explosive of war, occurring or existing in or near the country (or countries) where the Site is located.

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 and so far as may be required by the Employer, and as may be necessary for completion of the Facilities;

(b) replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged; and

(c) replacing or making good any such destruction or damage to the Facilities or the Plant or any part thereof.

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction, or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to GCC Subclause 42.1.

If the Employer requires the Contractor to replace or make good on any such destruction or damage to the Facilities, the Time for Completion shall be extended in accordance with GCC 40.

38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract 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 GCC Subclauses 38.3 or 38.5, the rights and obligations of the Employer and the Contractor shall be specified in GCC Subclauses 42.1.2 and 42.1.3.

H. Change in Contract Elements

39. Change in the Facilities

39.1 Introducing a Change

39.1.1 Subject to GCC Subclauses 39.2.5 and 39.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition, or deletion to, in or from the Facilities hereinafter called "Change," provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.

39.1.2 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. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.

39.1.3 Notwithstanding GCC Subclauses 39.1.1 and 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 GCC Subclauses 39.2 and 39.3, and further details and forms are provided in the Employer's Requirements (Forms and Procedures).

39.2 Changes Originating from Employer

39.2.1 If the Employer proposes a Change pursuant to GCC Subclause 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

(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 GCC Subclause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC Subclause 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 inequitable, 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 GCC Clause 39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Contract Agreement by more than 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 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 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 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 GCC Subclause 39.2.2.

39.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable 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 60 days from the date of issue of the Pending Agreement Change Order, then the matter

may be referred to the Dispute Board in accordance with the provisions of GCC Subclause 45.3.

39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to GCC Subclause 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 GCC Subclause 39.2.1.

Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in GCC Subclauses 39.2.6 and 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.

40. Extension of Time for Completion

40.1 The Time(s) for Completion specified in the SCC shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

(a) any Change in the Facilities as provided in GCC Clause 39;

(b) any occurrence of Force Majeure as provided in GCC Clause 37, unforeseen conditions as provided in GCC Clause 35, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Subclause 32.2;

(c) any suspension order given by the Employer under GCC Clause 41 hereof or reduction in the rate of progress pursuant to GCC Subclause 41.2; or

(d) any changes in laws and regulations as provided in GCC Clause 36; or

(e) any default or breach of the Contract by the Employer, or any activity, act or omission of the Employer, or the Project Manager, or any other contractors employed by the Employer; or

(f) any other matter specifically mentioned in the Contract; or

(g) any delay on the part of a sub-contractor, provided such delay is due to a cause for which the Contractor himself would have been entitled to an extension of time under this Subclause

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer's estimate of a fair and reasonable time extension,

the Contractor shall be entitled to refer the matter to a Dispute Board, pursuant to GCC Subclause 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.

In all cases where the Contractor has given a notice of a claim for an extension of time under GCC 40.2, the Contractor shall consult with the Project Manager in order to determine the steps (if any) which can be taken to overcome or minimize the actual or anticipated delay. The Contractor shall there after comply with all reasonable instructions, which the Project Manager shall give in order to minimize such delay. If compliance with such instructions shall cause the Contractor to incur extra costs and the Contractor is entitled to an extension of time under GCC 40.1, the amount of such extra costs shall be added to the Contract Price.

41. Suspension

41.1 The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons therefor. The Contractor shall thereupon suspend performance of such obligation, except those obligations necessary for the care or preservation of the Facilities, until ordered in writing to resume such performance by the Project Manager.

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than 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 28 days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GCC Clause 39, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC Clause 39 or, where it affects the whole of the Facilities, as termination of the Contract under GCC Subclause 42.1.

41.2 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 the Appendix (Terms and Procedures of Payment) 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 interest thereon as stipulated in GCC Subclause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such

approval, or fails to remedy the breach or take steps to remedy the breach within 14 days after receipt of the Contractor's notice; or

(b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas in accordance with GCC Subclause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities, then the Contractor may by 14 days' notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor's performance of its obligations is suspended, or the rate of progress is reduced pursuant to this GCC Clause 41, then the Time for Completion shall be extended in accordance with GCC Subclause 40.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.

41.4 During the period of suspension, the Contractor shall not remove from the Site any Plant, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.

42. Termination

42.1 Termination for Employer's Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GCC Subclause 42.1.

42.1.2 Upon receipt of the notice of termination under GCC Subclause 42.1.1, the Contractor shall, either immediately or upon the date specified in the notice of termination,

(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition;

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below;

(c) remove all Contractor's Equipment from the Site, repatriate the Contractor's and its Subcontractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition; and

(d) subject to the payment specified in GCC Subclause 42.1.3,

(i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination;

(ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination,

and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and

(iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities.

42.1.3 In the event of termination of the Contract under GCC Subclause 42.1.1, the Employer shall pay to the Contractor the following amounts:

(a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination;

(b) the costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel;

(c) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges;

(d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Subclause 42.1.2; and

(e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

42.2 Termination for Contractor's Default

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this GCC Subclause 42.2:

(a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up, other than a voluntary liquidation for the purposes of amalgamation or reconstruction, a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt;

(b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 43; and

(c) if the Contractor, in the judgment of the Employer has engaged in integrity violations, as defined in GCC Clause 6, in competing for or in executing the Contract.

42.2.2 If the Contractor

(a) has abandoned or repudiated the Contract;

(b) has without valid reason failed to commence work on the Facilities promptly or has suspended, other than pursuant to GCC Subclause 41.2, the progress of Contract performance for more than 28 days after receiving a written instruction from the Employer to proceed;

(c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause;

(d) refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the program furnished under GCC Subclause 18.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended;

then the Employer may, without prejudice to any other rights it may possess under the Contract, 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 14 days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GCC Subclause 42.2.

42.2.3 Upon receipt of the notice of termination under GCC Subclauses 42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition;

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below;

(c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination;

(d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; 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 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer's use of such equipment, any Contractor's Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site and shall return such Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

42.2.5 Subject to GCC Subclause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Subclause 42.2.3. Any sums due the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined.

If the sum that the Contractor is entitled to be paid, pursuant to GCC Subclause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GCC Subclause 42.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due the Contractor under GCC Subclause 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 Contractor

42.3.1 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 the Appendix (Terms and Procedures of Payment) 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 interest thereon as stipulated in GCC Subclause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within 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 or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities;

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 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 28 days of the said notice, the Contractor may by a further notice to the Employer referring to this GCC Subclause 42.3.1, forthwith terminate the Contract.

42.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this GCC Subclause 42.3.2, if the Employer becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

42.3.3 If the Contract is terminated under GCC Subclauses 42.3.1 or 42.3.2, then the Contractor shall immediately

(a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition;

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii);

(c) remove all Contractor's Equipment from the Site and repatriate the Contractor's and its Subcontractors' personnel from the Site; and

(d) subject to the payment specified in GCC Subclause 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.

42.3.4 If the Contract is terminated under GCC Subclauses 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in GCC Subclause 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.

42.3.5 Termination by the Contractor pursuant to this GCC Subclause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by GCC Subclause 42.3.

42.4 In this GCC Clause 42, the expression “Facilities executed” shall include all work executed, Installation Services provided, and all Plant acquired, or subject to a legally binding obligation to purchase, by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this GCC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the Appendix (Terms and Procedures of Payment) 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 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Subclause shall apply.

The Contractor shall also submit any other notices, which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Project Manager. Without admitting the Employer's liability, the Project Manager may, after receiving any notice under this Subclause, monitor the record keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Project Manager to inspect all these records, and shall (if instructed) submit copies to the Project Manager.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim, which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect,

(a) this fully detailed claim shall be considered as interim;

(b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Project Manager may reasonably require; and

(c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Project Manager.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Project Manager and approved by the Contractor, the Project Manager shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

Each payment certificate 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 Project Manager shall agree with the Contractor or estimate: (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with GCC Clause 40, and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Subclause are in addition to those of any other Subclause, which may apply to a claim. If the Contractor fails to comply with this or another Subclause 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 Subclause.

In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either party may refer the matter to the Dispute Board pursuant to GCC 45 hereof.

45. Disputes and Arbitration

45.1 Appointment of the Dispute Board

Disputes shall be referred to a Dispute Board for decision in accordance with GCC Subclause 45.3. The Parties shall appoint a Dispute Board by the date stated in the SCC.

The Dispute Board shall comprise, as stated in the SCC, either one or three suitably qualified persons ("the members"), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of activities involved in the performance of the Contract and with the interpretation of contractual documents. If the number is not so stated and the Parties do not agree otherwise, the Dispute Board shall comprise three persons, one of whom shall serve as chairman.

If the Parties have not jointly appointed the Dispute Board 21 days before the date stated in the SCC and the Dispute Board is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members is included in the SCC, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the Dispute Board.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the General Conditions of Dispute Board Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the Dispute Board consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment of the member or such expert

(as the case may be). Each Party shall be responsible for paying one-half of this remuneration.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Subclause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the Dispute Board (including each member) shall expire when the Operational Acceptance Certificate has been issued in accordance with GCC Clause 25.3.

45.2 Failure to Agree Dispute Board

If any of the following conditions apply, namely:

(a) the Parties fail to agree upon the appointment of the sole member of the Dispute Board by the date stated in the first paragraph of GCC Subclause 45.1;

(b) either Party fails to nominate a member (for approval by the other Party) of a Dispute Board of three persons by such date;

(c) the Parties fail to agree upon the appointment of the third member (to act as chairman) of the Dispute Board by such date; or

(d) the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation, or termination of appointment;

then the appointing entity or official named in the SCC shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the Dispute Board. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

45.3 Obtaining Dispute Board's Decision

If a dispute (of any kind whatsoever) arises between the Parties in connection with the performance of the Contract, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Project Manager, either Party may refer the dispute in writing to the Dispute Board for its decision, with copies to the other Party and the Project Manager. Such reference shall state that it is given under this Subclause.

For a Dispute Board of three persons, the Dispute Board shall be deemed to have received such reference on the date when it is received by the chairman of the Dispute Board.

Both Parties shall promptly make available to the Dispute Board all such additional information, further access to the Site, and appropriate facilities, as the Dispute Board may require for the purposes of making a decision on such dispute. The Dispute Board shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the Dispute Board and approved by both Parties, the Dispute Board shall give its decision, which shall be reasoned and shall state that it is given under this Subclause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the performance of the Facilities in accordance with the Contract.

If either Party is dissatisfied with the Dispute Board's decision, then either Party may, within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction and intention to commence arbitration. If the Dispute Board fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give notice to the other Party of its dissatisfaction and intention to commence arbitration.

In either event, this notice of dissatisfaction shall state that it is given under this Subclause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in GCC Subclauses 45.6 and 45.7, neither Party shall be entitled to commence arbitration of a dispute unless a notice of dissatisfaction has been given in accordance with this Subclause.

If the Dispute Board has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either Party within 28 days after it received the Dispute Board's decision, then the decision shall become final and binding upon both Parties.

45.4 Amicable Settlement

Where notice of dissatisfaction has been given under GCC Subclause 45.3 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 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.

45.5 Arbitration

Unless settled amicably, any dispute in respect of which the Dispute Board's decision (if any) has not become final and binding shall be finally settled by international arbitration. Unless otherwise agreed by both Parties,

(a) arbitration proceedings shall be conducted as stated in the Special Conditions;

(b) if no arbitration proceedings is so stated, the dispute shall be finally settled by institutional arbitration under the Rules of Arbitration of the International Chamber of Commerce;

(c) the dispute shall be settled by three arbitrators; and

(d) the arbitration shall be conducted in the language for communications defined in GCC Subclause 5.3.

The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Project Manager, and any decision of the Dispute Board, relevant to the dispute. Nothing shall disqualify the Project Manager from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence or arguments previously put before the Dispute Board to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the Dispute Board shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Project Manager and the Dispute Board shall not be altered by reason of any arbitration being conducted during the progress of the Works.

45.6 Failure to Comply with Dispute Board's Decision

In the event that a Party fails to comply with a Dispute Board decision which has become final and binding, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under GCC Subclause 45.5. GCC Subclauses 45.3 and 45.4 shall not apply to this reference.

45.7 Expiry of Dispute Board's Appointment

If a dispute arises between the Parties in connection with the performance of the Contract, and there is no Dispute Board in place, whether by reason of the expiry of the Dispute Board's appointment or otherwise,

(a) GCC Subclauses 45.3 and 45.4 shall not apply, and

(b) the dispute may be referred directly to arbitration under GCC Subclause 45.5.

APPENDIX A

General Conditions of Dispute Board Agreement

1 Definitions

Each “Dispute Board Agreement” is a tripartite agreement by and between

(a) the “Employer”;

(b) the “Contractor”; and

(c) the “Member” who is defined in the Dispute Board Agreement as being

(i) the sole member of the "Dispute Board" and, where this is the case, all references to the “Other Members” do not apply; or

(ii) one of the three persons who are jointly called the “Dispute Board” (or “dispute board”) and, where this is the case, the other two persons are called the “Other Members”.

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

2 General Provisions

Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

(a) the Commencement Date defined in the Contract;

(b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement; or

(c) when the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days’ notice of resignation to the Employer and to the Contractor, and the Dispute Board Agreement shall terminate upon the expiry of this period.

3 Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Project Manager. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which might appear inconsistent with his/her warranty and agreement of impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member’s representations that he/she is

(a) experienced in the work, which the Contractor is to carry out under the Contract,

(b) experienced in the interpretation of contract documentation, and

(c) fluent in the language for communications defined in the Contract.

4 General Obligations of the Member

The Member shall

(a) have no interest financial or otherwise in the Employer, the Contractor or the Project Manager, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;

(b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor, or the Project Manager, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;

(c) have disclosed in writing to the Employer, the Contractor, and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer, or employee of the Employer, the Contractor, or the Project Manager, and any previous involvement in the overall project of which the Contract forms part;

(d) not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor, or the Project Manager, except as may be agreed in writing by the Employer, the Contractor, and the Other Members (if any);

(e) comply with the annexed procedural rules and with GCC Subclause 45.3;

(f) not give advice to the Employer, the Contractor, the Employer's Personnel, or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;

(g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor, or the Project Manager regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Board Agreement;

(h) ensure his/her availability for all site visits and hearings as are necessary;

(i) become conversant with the Contract and with the progress of the Facilities (and of any other parts of the project of which the Contract forms part) by studying all documents received, which shall be maintained in a current working file;

(j) treat the details of the Contract and all the Dispute Board's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor, and the Other Members (if any); and

(k) be available to give advice and opinions on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

5 General Obligations of the Employer and the Contractor

The Employer, the Contractor, the Employer's Personnel and the Contractor's Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the Dispute Board's activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any)

(a) be appointed as an arbitrator in any arbitration under the Contract;

(b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or

(c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding paragraph.

Whenever the Employer or the Contractor refers a dispute to the Dispute Board under GCC Subclause 45.3, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.

6 Payment

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

(a) a retainer fee per calendar month, which shall be considered as payment in full for

(i) being available on 28 days' notice for all site visits and hearings;

(ii) becoming and remaining conversant with all project developments and maintaining relevant files;

(iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and

(iv) all services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one-third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

(b) a daily fee, which shall be considered as payment in full for

(i) each day or part of a day up to a maximum of 2 days' travel time in each direction for the journey between the Member's home and the site, or another location of a meeting with the Other Members (if any);

(ii) each working day on site visits, hearings, or preparing decisions; and

(iii) each day spent reading submissions in preparation for a hearing.

(c) all reasonable expenses, including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, facsimiles, and telexes, and use of the internet: a receipt shall be required for each item in excess of 5% of the daily fee referred to in sub-paragraph (b) of this Clause;

(d) any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the SCC shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the Dispute Board; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in accordance with GCC Subclause 12.3.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

7 Termination

At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days' notice to the Member, or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

8 Default of the Member

If the Member fails to comply with any of his obligations under Clause 4 concerning his impartiality or independence in relation to the Employer or the Contractor, he/she shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the Dispute Board which are rendered void or ineffective by the said failure to comply.

9 Disputes

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.

Annex - DISPUTE BOARD GUIDELINES

1. Unless otherwise agreed by the Employer and the Contractor, the Dispute Board shall visit the site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor, and the Dispute Board, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.

2. The timing of and agenda for each site visit shall be as agreed jointly by the Dispute Board, the Employer, and the Contractor, or in the absence of agreement, shall be decided by the Dispute Board. The purpose of site visits is to enable the Dispute Board to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to prevent potential problems or claims from becoming disputes.

3. Site visits shall be attended by the Employer, the Contractor, and the Project Manager and shall be coordinated by the Employer in cooperation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each site visit and before leaving the site, the Dispute Board shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.

4. The Employer and the Contractor shall furnish to the Dispute Board one copy of all documents which the Dispute Board may request, including Contract documents, progress reports, variation instructions, certificates, and other documents pertinent to the performance of the Contract. All communications between the Dispute Board and the Employer or the Contractor shall be copied to the other Party. If the Dispute Board comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

5. If any dispute is referred to the Dispute Board in accordance with GCC Subclause 45.3, the Dispute Board shall proceed in accordance with GCC Subclause 45.3 and these Guidelines. Subject to the time allowed to give notice of a decision and other relevant factors, the Dispute Board shall

   (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case; and

   (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.

6. The Dispute Board may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.

7. Except as otherwise agreed in writing by the Employer and the Contractor, the Dispute Board shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor, and the Project Manager, and to proceed in the absence of any party who the Dispute Board is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.

8. The Employer and the Contractor empower the Dispute Board, among other things, to

   (a) establish the procedure to be applied in deciding a dispute;

(b) decide upon the Dispute Board's own jurisdiction, and as to the scope of any dispute referred to it;

(c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Guidelines;

(d) take the initiative in ascertaining the facts and matters required for a decision;

(e) make use of its own specialist knowledge, if any;

(f) decide upon the payment of financing charges in accordance with the Contract;

(g) decide upon any provisional relief such as interim or conservatory measures;

(h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Project Manager, relevant to the dispute; and

(i) appoint, should the Dispute Board so consider necessary and the Parties agree, a suitable expert at the cost of the Parties to give advice on a specific matter relevant to the dispute.

9. The Dispute Board shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the Dispute Board shall make and give its decision in accordance with GCC Subclause 45.3, or as otherwise agreed by the Employer and the Contractor in writing. If the Dispute Board comprises three persons

(a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;

(b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and

(c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless

(i) either the Employer or the Contractor does not agree that they do so, or

(ii) the absent Member is the chairman and he/she instructs the other Members to not make a decision.

Section 8: Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC. The clause number of the SCC is the corresponding clause number of the GCC.

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1.	**Definitions**	
	The Employer is: **Druk Green Power Corporation Limited (DGPC)** The Project Manager is: **XXXXX** The Bank is: **Asian Development Bank (ADB)** Country of Origin: **All countries and territories as indicated in Section 5**: Eligible Countries of the bidding documents or the most recent list of eligible member countries obtainable from www.adb.org/about/members. In case of discrepancy, the most recent list of eligible member countries obtainable from www.adb.org/about/members shall prevail.	
5.	**Law and Language**	
	5.1	The Contract shall be interpreted in accordance with the laws of **the Kingdom of Bhutan**
	5.2	The ruling language is: **English**
	5.3	The language for communications is: **English**
6.	**Fraud and Corruption**	
	6.4	The Contractor has the obligation to notify the Employer of any changes in connection with the matters described in paragraphs (f), (h), (i), (j), (k), (l), (m) and (n) of the Letter of Technical Bid.
	6.5	If the Contractor is debarred or temporarily suspended by ADB, it shall inform the Employer of such debarment or suspension, and that the endorsement of ADB's Office of Anticorruption and Integrity is required for any variations, extensions or modifications to the Contract.
7.	**Scope of Facilities**	
	7.3	The Contractor agrees to supply spare parts for a period of years: **None**. The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the Plant. Other spare parts and components shall be supplied as promptly as possible, but at the most within 6 months of placing the order and opening the letter of credit. In addition, in the event of termination of the production of spare parts, advance notification will be made to the Employer of the pending termination, with sufficient time to permit the Employer to procure the needed requirement. Following such termination, the Contractor will furnish to the extent possible and at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested.
8.	**Time for Commencement and Completion**	
	8.1	The Contractor shall commence work on the Facilities within **14 (Fourteen) calendar** days from the Effective Date for determining Time for Completion as specified in the Contract Agreement provided that access to and possession of the Site or any part thereof have been given under subclause 10.2, and shall then proceed with the work on the Facilities with due expedition and without delay.

	8.2 The Time for Completion of the whole of the Facilities shall be **300 (Three Hundred) days** from the Effective Date as described in the Contract Agreement. Time for Completion for parts of the Facilities: **Not Applicable**
10.	**Employer's Responsibilities**
	10.2 There shall be no work nor construction activities at the Site or any part thereof (as the case may be) unless the Employer has granted access to the Site or part thereof (as the case may be) in accordance with this Subclause 10.2.
11.	**Contract Price**
	11.2 The Contract Price shall **not** be subject to price adjustment.
13.	**Securities**
	13.3.1 The amount of performance security, as a percentage of the Contract Price for the Facility or for the part of the Facility for which a separate Time for Completion is provided, shall be: **10% of the Contract Price.**
	13.3.2 The performance security shall be in the form of the **Bank Guarantee** as per form included in Section 9 (Contract Forms).
	13.3.3 The performance security shall not be reduced on the date of the Operational Acceptance
14.	**Taxes and Duties**
	14.2 The bidder will be liable for the income earned from the construction works rendered in Bhutan. The bidder shall pay local taxes (Business Income Tax) @ 3% of the contract price and shall be treated as final as per the "Income Tax Act of the Kingdom of Bhutan 2001 and its amendment thereof. The Employer shall furnish necessary Tax Deducted Source Certificate to the Contractor.
19.	**Subcontracting**
	19.6 The Contractor shall not subcontract any of the works without Employer's approval
22.	**Installation**
	22.2 Labor 22.2.5 **Working Hours** (a) Normal working hours are**: 9.00 to 17.00 hrs, Monday to Saturday** 22.2.7 **Health and Safety** (d) The Contractor shall throughout the contract (including the Defect Liability Period): (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's employees, all Subcontractors and Employer's and Project Manager's employees, and all truck drivers and crew making deliveries to

	Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD)—or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labor as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labor. The Contractor shall include in the program to be submitted for the execution of the Facilities under Subclause 18.2 an alleviation program for Site staff and labor and their families in respect of STI and STD including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Subclause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related subcontracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for the preparation and implementation this program shall not exceed the amount dedicated for this purpose. After the existing paragraph in GCC 22.2.7 (a), add the following: "The Contractor is responsible for establishment of preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks of the construction site work to the health and safety of local communities. Within 28 days of the Effective Date the Contractor shall submit a detailed Site Specific Health and Safety Management Plan (SSHSMP), based on the Environmental Health and Safety Management Plan submitted in the technical proposal, for the Project Manager 's no objection showing how he/she intends to comply with the local Health and Safety laws and regulations and other specific requirements prescribed in the Contract, taking into account the Supplementary Information in Section 6- Employer's Requirements. Work shall not commence on the Site until the confirmation of no objection of the SSHSMP has been obtained from the Project Manager and is being implemented. Where unanticipated health and safety hazards or risks become apparent during the Contract, the Contractor is required to update the SSHSMP to outline the potential impacts to site works and associated mitigation measures for the Project Manager's no objection. The Contractor shall comply with the approved SSHSMP and any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the project EMP through the SSHSMP. In particular, the Contractor is required to provide all personnel on site including Employer's Personnel and visitors with personal protective equipment, including protection for feet (safety boots), head, eyes, ears (safety helmets) and hands, etc., in accordance with the Contractor's SSHSMP. The Contractor should ensure that his Subcontractors comply with the SSHSMP and provide all such necessary equipment to their personnel. The Contractor shall bear the costs to ensure that such measures, requirements and actions are carried out. The Contractor shall submit semi-annual reports on the compliance of such measures to the Employer." Add after the existing paragraph in GCC 22.2.7 (c) the following:

	"In the event of a significant injury involving medical treatment or hospitalization and fatal accident the Contractor shall notify the Project Manager immediately by verbal communication and submit a formal report as soon as practicable after its occurrence. For all accidents, whether fatal or not, the Contractor shall also notify the appropriate local authorities in accordance with the Laws of the Country." 22.2.8 **Funeral Arrangements** Funeral arrangements**:** shall be made in accordance with Employer's country's norms or in keeping with the victim's religious requirements. 22.2.17 **Respectful Work Environment** The Contractor shall ensure that its employees and Subcontractors observe the highest ethical standards and refrain from any form of bullying, discrimination, misconduct, and harassment, including sexual harassment and shall, at all times, behave in a manner that creates an environment free of unethical behavior, bullying, misconduct, and harassment, including sexual harassment. The Contractor shall take appropriate action against any employees or Subcontractors, including suspension or termination of employment or subcontract, if any form of unethical or inappropriate behavior is identified. The Contractor shall conduct training programs for its employees and Subcontractors to raise awareness on and prevent any form of bullying, discrimination, misconduct, and harassment including sexual harassment, and to promote a respectful work environment. The Contractor shall keep an up to date record of its employees and subcontractors who have attended and completed such training programs and provide such records to the Employer or the Engineer at their first written request.
25.	**Commissioning and Operational Acceptance**
	25.2.2 The Guarantee Test of the Facilities shall be successfully completed within **28 (twenty-eight) calendar days** from the date of Completion.
26.	**Completion Time Guarantee**
	26.2 Applicable rate for liquidated damages: **0.5% of the contract price per week.** Maximum deduction for liquidated damages: **10% of the Contract Price.**
	26.3 No bonus will be given for earlier Completion of the Facilities or part thereof.
27.	**Defect Liability**
	27.10 The critical components covered under the extended defect liability are: • PV modules and the period shall be 3650 days; and • Inverters and the period shall be 1825 days.
30.	**Limitation of Liability**
	30.1 (b) The multiplier of the Contract Price is: **1 (One)**
42.	**Termination**
	42.1 Termination for Employer's Convenience

	42.1.3 (f) a reasonable amount of profit for the parts of the Works not executed by the Contractor as at the date of termination.
45.	**Disputes and Arbitration**
	45.1 The Dispute Board shall be appointed within **30 (thirty) days** after the Effective Date. The Dispute Board shall be **having three members** List of potential Dispute Board members is: **None**
	45.2 Appointment (if not agreed) to be made by: **Singapore International Arbitration Centre, SIAC**
	45.3 This sentence shall be added as last paragraph in GCC Subclause 45.3: If the decision of the Dispute Board requires a payment by one Party to the other Party, the Dispute Board may require the payee to provide an appropriate security in respect of such payment.
	45.5 Rules of procedure for arbitration proceedings: (a) Contracts with foreign contractors: International arbitration shall be conducted in accordance with the rules of Singapore International Arbitration Centre (SIAC) shall apply. Arbitration shall be administered by **SIAC.** The place of arbitration shall be the place of the institution administering the arbitration. (b) Contracts with contractors being nationals of the Employer's country: **The Laws of Bhutan**
46.	**Eligibility**
	46.1 The Contractor shall have the nationality of an ADB member country. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services. 46.2 The materials, equipment and services to be supplied under the Contract shall have their origin in eligible source countries and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment and services. 46.3 For purposes of SCC 46.2, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

Section 9: Contract Forms

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Notice of Intention for Award of Contract

[*on letterhead paper of the Employer*]

[*date of notification*]

To: [*name of the Bidder*]
Attention: [*insert name of the Bidder's authorized representative*]
Address: [*insert address of the Bidder's authorized representative*]
Telephone/Fax numbers: [*insert telephone/fax numbers of the Bidder's authorized representative*]
E-mail Address: [*insert e-mail address of the Bidder's authorized representative*]

This is to notify you of our intention to award the contract [*insert name of the contract and identification number, as given in the Bid Data Sheet*]. You have [*insert number of days as specified in ITB 40.1 of the BDS*] days, from the date of this notification to (i) request for a debriefing in relation to the evaluation of your Bid, and/or (ii) submit a bidding-related complaint in relation to the intention for award of contract, in accordance with the procedures specified in ITB 45.1.

The summary of the evaluation are as follows:

1. List of Bidders

Name of Bidder	Bid Price as Read Out at Opening	Evaluated Bid Price

2. Reason/s Why Your Bid Was Unsuccessful

……
……
……

3. The Successful Bidder

Name of Bidder:	
Address:	
Accepted Contract Amount:	
Duration of Contract:	
Scope of the Contract Awarded:	
Amount Performance Security Required:	

Authorized Signature: ……

Name and Title of Signatory: ……

Name of Agency: ……

Letter of Acceptance

[*date*]

To: [*Name and address of the contractor*]

Subject: Contract No. [please specify]

This is to notify you that your Bid dated [*date*] for execution of the [*name of the contract and identification number, as given in the Bid Data Sheet*] for the Contract Price in the aggregate of [*amounts in words and figures*] [*name of currency*], as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract and any additional security required as a result of the evaluation of your bid, using for that purpose one of the Performance Security Forms included in Section 9 (Contract Forms) of the Bidding Document.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made on the [*insert number*] day of [*insert month*], [*insert year*],

BETWEEN

(1) [*name of the employer*], a corporation incorporated under the laws of [*country of the Employer*] and having its principal place of business at [*address of the Employer*] (hereinafter called "the Employer"), and (2) [*name of the contractor*], a corporation incorporated under the laws of [*country of the contractor*] and having its principal place of business at [*address of the contractor*] (hereinafter called "the Contractor").

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, complete and commission certain Facilities, viz. [*list of facilities*] ("the Facilities") and the Contractor have agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1 Contract Documents

1.1 **Contract Documents** (Reference GCC Clause 2)
The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

(a) This Contract Agreement and the Appendixes hereto
(b) Letter of Bid and Price Schedules submitted by the Contractor
(c) Special Conditions of Contract
(d) List of Eligible Countries that was specified in Section 5 of the Bidding Document
(e) General Conditions of Contract
(f) Specifications
(g) Drawings
(h) Other completed Bidding Forms submitted with the Letter of Bid
(i) Any other documents forming part of the Employer's Requirements
(j) Any other documents shall be added here[1]

1.2 **Order of Precedence** (Reference GCC Clause 2)
In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 **Definitions** (Reference GCC Clause 1)
Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

[1] Tables of Adjustment Data may be added if the contract provides for price adjustment (see GCC 11).

Article 2
Contract Price and Terms of Payment

2.1 **Contract Price** (Reference GCC 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 [*amounts of foreign currency in words*], [*amounts in figures*] as specified in Price Schedule No. 5 (Grand Summary), [*amounts of local currency in words*], [*amounts in figures*], or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 **Terms of Payment** (Reference GCC Clause 12)
The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in the Appendix (Terms and Procedures of Payment) hereto.

The Employer shall instruct its bank to issue an irrevocable confirmed documentary credit made available to the Contractor in a bank in the country of the Contractor. The credit shall be for an amount of [*amount equal to the total named in Schedule 1 less the advance payment to be made for plant and mandatory spare parts supplied from abroad*]; and shall be subject to the Uniform Customs and Practice for Documentary Credits 1993 Revision, ICC Publication No. 500.[2]

In the event that the amount payable under Schedule No. 1 is adjusted in accordance with GCC 11.2 or with any of the other terms of the Contract, the Employer shall arrange for the documentary credit to be amended accordingly

Article 3
Effective Date

3.1 **Effective Date** (Reference GCC Clause 1)
The Effective Date upon which the period until the Time for Completion of the Facilities shall be counted from is the date when all of the following conditions have been fulfilled:

(a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor.

(b) The Contractor has submitted to the Employer the performance security and the advance payment guarantee.

(c) The Employer has paid the Contractor the advance payment.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the conditions listed under 3.1 are not fulfilled within 2 months from the date of this Contract notification because of reasons not attributable to the Contractor, the parties shall discuss and agree on an equitable adjustment to the Contract Price and the Time for Completion and/or other relevant conditions of the Contract.

[2] Or Uniform Customs and Practice for Documentary Credits 2007 Revision, ICC Publication No. 600 (or the latest version).

Article 4 Communications

4.1 The address of the Employer for notice purposes, pursuant to GCC 4.1 is: [*Employer's address*].

4.2 The address of the Contractor for notice purposes, pursuant to GCC 4.1 is: [*Contractor's address*].

Article 5. Appendixes

5.1 The Appendixes listed in the attached List of Appendixes shall be deemed to form an integral part of this Contract Agreement.

5.2 Reference in the Contract to any Appendix shall mean the Appendixes 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 duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Employer

[*Signature*]

[*Title*]

in the presence of

[*Signature*]

[*Title*]

Signed by, for and on behalf of the Contractor

[*Signature*]
[*Title*]

in the presence of

[*Signature*]
[*Title*]

APPENDIXES

Appendix 1: Terms and Procedures of Payment
Appendix 2: Price Adjustment
Appendix 3: Insurance Requirements
Appendix 4: Time Schedule
Appendix 5: List of Major Items of Plant and Services and List of Approved Subcontractors
Appendix 6: Scope of Works and Supply by the Employer
Appendix 7: List of Documents for Approval or Review
Appendix 8: Functional Guarantees

Appendix 1: Terms and Procedures of Payment

In accordance with the provisions of GCC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, based on the Price Breakdown given in the section on Price Schedules. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

(A) Terms of Payment

Schedule No. 1 - Plant and Mandatory Spare Parts Supplied from Abroad

In respect of plant and mandatory spare parts supplied from abroad, the following payments shall be made:

Ten percent (10%) of the total CIP amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the plant and mandatory spare parts delivered to the site, as evidenced by delivery documents.

Eighty percent (80%) of the total or pro rata CIP or amount upon Incoterm “CIP,” upon delivery to the site within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata CIP or amount upon issue of the Completion Certificate, within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata CIP or amount upon issue of the Operational Acceptance Certificate, within 45 days after receipt of invoice.

Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country

In respect of plant and mandatory spare parts supplied from within the Employer’s country, the following payments shall be made:

Ten percent (10%) of the total EXW amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the plant and mandatory spare parts delivered to the site, as evidenced by delivery documents.

Eighty percent (80%) of the total or pro rata EXW amount upon Incoterm “Ex-Works,” upon delivery to the site within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount upon issue of the Completion Certificate, within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount upon issue of the Operational Acceptance Certificate, within 45 days after receipt of invoice.

Schedule No. 3 - Design Services

In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made:

Ten percent (10%) of the total design services amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer.

Ninety percent (90%) of the total or pro rata design services amount upon acceptance of design by the Project Manager within 45 days after receipt of invoice.

Schedule No. 4 - Installation and Other Services

In respect of installation services for both the foreign and local currency portions, the following payments shall be made:

Ten percent (10%) of the total installation and other services amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of work performed by the Contractor as evidenced by the invoices for installation services.

Eighty percent (80%) of the measured value of work performed by the Contractor, as identified in the said Program of Performance, during the preceding month, as evidenced by the Employer's authorization of the Contractor's application, will be made monthly within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer's authorization of the Contractor's monthly applications, upon issue of the Completion Certificate, within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer's authorization of the Contractor's monthly applications, upon issue of the Operational Acceptance Certificate, within 45 days after receipt of invoice.

In the event that the Employer fails to make any payment on its respective due date, the Employer shall pay to the Contractor interest on the amount of such delayed payment as per the Minimum Lending Rate (MLR) of the Royal monetary Authority of Bhutan (RMA) previewing on the due date of payment (*The MLR is a single benchmark or minimum reference rate for lending to be uniformly applied across all the financial institution).*

(B) Payment Procedures

The procedures to be followed in applying for certification and making payments shall be as follows:

1. The Contractor submits all claims to the Employer via the Project Manager. The Contractor shall submit all associated documents as required by the Project Manager and as stipulated in the Terms of Payment.

2. The Project Manager reviews and verifies the claim as submitted for accuracy and compliance. This verification is provided after the Project Manager has reviewed the claim, the current work or delivery status and associated measurement requirements as defined in the Contract. The Project Manager may liaise with the Contractor if any anomalies are found during this process and adjust accordingly;

3. The Project Manager prepares and submits a Payment Certificate to the Employer/Employer Representative for review and authorization;

4. If the Payment Certificate is deemed incorrect or is disputed by the Employer, it is returned to the Project Manager for verification and notification to the Contractor accordingly. The undisputed portion shall be paid in accordance with the timeline as specified in (A) Terms of Payment above.

5. Upon approval by the Employer /Employer Representative, the Project Manager formally notifies the Contractor.

6. The Contractor submits an invoice in the amount of the Payment Certificate for payment by the Employer.

7. The payment is processed by the Employer, directly to the Contractor, in accordance with the time stipulated in the Contract. Confirmation of payment is issued by the Employer to the Contractor.

8. The Contractor shall provide formal confirmation to the Employer and Project Manager that payment has been received.

Appendix 2: Price Adjustment

Not Applicable

Appendix 3: Insurance Requirements

(A) Types of Insurance to Be Taken Out by the Contractor

In accordance with the provisions of GCC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the types of insurance set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

(a) Cargo Insurance

Covering loss or damage occurring, while in transit from the supplier's or manufacturer's works or stores until arrival at the Site, to the Facilities (including spare parts therefore) and to the construction equipment to be provided by the Contractor or its Subcontractors.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
110% of the CIP value of goods shipped and full replacement value of the contractor's equipment	Minimum: USD15,000	The Employer, The Contractor	Contractors' place	Sites

(b) Installation All Risks Insurance

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.

Amount	Deductible limits	Parties insured	From	To
[in currency(ies)]	[in currency(ies)]	[names]	[place]	[place]
110% of value of work on the facilities and full replacement of Equipment	Minimum: USD50,000	Employer, Contractor, Subcontractors and Households	In Bhutan	

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities that have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

Amount	Deductible limits	Parties insured	From	To
[in currency(ies)]	[in currency(ies)]	[names]	[place]	[place]
USD10 million	Minimum: USD10,000 per occurrence	Employer, Contractor, Subcontractors and Households	In Bhutan	

(d) Automobile Liability Insurance

Covering use of all vehicles used by the Contractor or its Subcontractors (whether owned by them or not) in connection with the supply and installation of the Facilities. Comprehensive insurance in accordance with statutory requirements.

(e) Workers' Compensation
In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(f) Employer's Liability
In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(g) Other Insurance
The Contractor is also required to take out and maintain at its own cost the following types of insurance:

Details:

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
None				

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1, except for the Third-Party Liability, Workers' Compensation, and Employer's Liability Insurance, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1, except for the Cargo, Workers' Compensation and Employer's Liability Insurance. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

(B) Types of Insurance to Be Taken Out by the Employer

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurance policies.

Details:

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
None				

Appendix 4: Time Schedule *(to be filled by the Bidder)*

SN	Tasks	Months									
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
A	**On-site evaluation**										
1	Conduct Rooftop solar feasibility assessment										
2	Final roof suitability verification										
B	**System Design**										
1	Perform Electrical & Structural Engineering design										
2	Design PV system layout & configuration										
3	Prepare & submit documentation to DGPC										
4	Review & Finalize documentation										
5	Obtain DGPC approval										
C	**Supply & Installation**										
1	Procurement of material & equipment for Rooftop solar installations										
2	Delivery of material at site										
3	Prepare site for installation										
4	Install Rooftop PV system										
D	**Commissioning & Acceptance testing**										
1	Precommissioning test										
2	Conduct final acceptance test & handover (DGPC+BPC)										
3	Completion of documentation										

The Bidder shall submit with its bids a detailed program, in the form of a bar chart, using a latest Project software Primavera (Professional 6) showing how and the order in which it intends to perform the Contract and showing the key events requiring action or decision by the Employer. In preparing this Program, the Bidder shall adhere to the Time(s) for Completion given in the Bid Data Sheet (or giving its reasons for not adhering thereto). The Time Schedule submitted by the selected Bidder and amended as necessary prior to award of Contract shall be included as Appendix to the Contract Agreement before the Contract is signed.

The Time Schedule shall indicate periods of time in months and not specify calendar dates. All periods shall be shown from the Effective Date of the Contract. The time schedule should not normally contain more than one hundred (100) tasks or sub tasks.

Appendix 5: List of Major Items of Plant and Services and List of Approved Subcontractors *(to be filled by the Bidder)*

A list of major items of plant and services is provided below.

The following Subcontractors and Manufacturers are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with GCC Subclause 19.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Major Items of Plant and Services	Approved Subcontractors and Manufacturers	Nationality
PV modules		
Solar string inverter / Micro Inverter		
PV mounting structures		
Direct Current Distribution box		
Alternating Current Distribution Box		
AC Cables		
DC cables		
Earthing Equipment		
Central Remote Monitoring System		
All accessories such as MC4 connectors, WEEB for equipotential bonding, stainless steel cable clips, MC4 tools and O&M tools.		
Residual current device (RCD) or Residual Current Circuit Breaker (RCCB) Type A or Type B		
Grid Connection Box fitted with Type A or Type B RCD		
Digital Energy Meter and installation accessories		
Meteorological Measurement Station		
Design and engineering of the Rooftop solar systems.		
Installation, and commissioning of Rooftop solar systems.		

Appendix 6: Scope of Works and Supply by the Employer

The following personnel, facilities, works, and supplies will be provided or supplied by the Employer, and the provisions of GCC Clauses 10, 21, and 24 shall apply as appropriate.

All personnel, facilities, works, and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor, in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Subclause 18.2.

Unless otherwise indicated, all personnel, facilities, works, and supplies will be provided free of charge to the Contractor.

Personnel	Charge to Contractor (if any)
Employer's personnel will be engaged to oversee and verify the works and test results. Names of the personnel will be disclosed after award of contract.	

Facilities	Charge to Contractor (if any)

Works	Charge to Contractor (if any)
Permits (including work permits), approvals and/or licenses i) The Employer shall, if so requested by the Contractor, provide reasonable assistance to the Contractor in ascertaining the nature and extent of any laws, regulations, order, or by-laws, and customs in the Employer's country, which may affect the Contractor in the performance of his obligations under the Contract. The Employer shall, if so requested, procure for the Contractor copies thereof and information relating thereto at the Contractor's cost. ii) The Employer shall, if so requested, assist the Contractor in obtaining all import permits or licenses required for any part of the Plant and Equipment or Facilities in reasonable time having regard to the time for delay of the equipment and materials and completion of the Facilities. iii) The Employer shall, if so requested, assist the Contractor in obtaining customs clearance of the equipment and materials including the Contractor's Equipment to be imported into the Employer's country and in securing the necessary Government consent for re-exporting such Contractor's Equipment. iv) The Employer's assistance will be limited to administrative procedure requested by the Contractor.	All costs shall be borne by the Contractor.

Supplies	Charge to Contractor (if any)
The Employer will not generally supply any machinery/Equipment and materials to the Contractor. In the event of any such requirement and subject to availability, the Employer may extend the facilities to use such machinery and materials by the Contractor on rental charge/cost under normal terms and conditions	The Contractor will be required to pay the amount to be determined by the Employer for such facilities.

Appendix 7: List of Documents for Approval or Review

Pursuant to GCC Subclause 20.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GCC Subclause 18.2 (Program of Performance), the following documents for

(A) Approval

1 Drawings
2 Technical specification forms
3 Time Schedule
4 Survey data
5 General & Detailed Drawings and Specifications for Electrical Equipment & civil work
6 Revised schedules of quantities and cost estimates for each subproject upon survey and design
7 Environmental, Health and Safety Management Plan
8 Testing Plan & Commissioning Schedules
9 CVs and qualification certifications from the employees/contracted staff of the Contractor in case of introduction of new personnel
10 Any other documents as required in the bid document

(B) Review

1 Operation and Maintenance Manuals
2 Manufacturer / subcontractor information
3 Monthly Progress Report

Appendix 8: Functional Guarantees

1. General

This Appendix sets out

(a) the functional guarantees referred to in GCC Clause 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

(d) the formula for calculating 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:

- Not applicable

3. Functional Guarantees

Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

Functional Guarantee	Values
1 Minimum Annual Energy generated in year 1	1,400 kWh per kW
2 Minimum Performance Ratio (PR) in year 1	80%

The above functional guarantee shall be performed as per Clause No 1.1.3 (i) of Section 6: Employer's Requirement.

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 guaranteed test, pursuant to GCC Subclause 25.2, is less than the guaranteed figure specified in para. 3 above, but the actual production capacity attained in the guaranteed 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 in lieu of making changes, modifications and/or additions to the Facilities, pursuant to GCC Subclause 28.3, then the Contractor shall pay liquidated damages as per the following formulae for the individual systems failing to attain the functional guarantee as mentioned in para 3:

Liquidated damages = (Target annual generation (as above mentioned in paragraph 3; 1st row of the table) in kWh - Actual annual generation in kWh) x Generation tariff in Nu.4.00/kWh x 25 years= XXX (this value shall be converted to USD at the time)

4.2 Raw Materials and Utilities Consumption in Excess of Guaranteed Level

Not applicable

4.3 Minimum Levels

As specified in para 3 above.

4.4 Limitation of Liability

Subject to para. 4.1 above, the Contractor's aggregate liability to pay liquidated damages for failure to attain the functional guarantees shall not exceed **Ten percent (10%)** of the Contract price

Performance Security

[*Bank's name, and address of issuing branch or office*]

Beneficiary: ..... [*Name and address of the Employer*] .....

Date:.....

Performance Guarantee No.: .....

We have been informed that [*name of the contractor*] (hereinafter called "the Contractor") has entered into Contract No. [*reference number of the contract*] dated [*date*] with you, for the execution of [*name of contract and brief description of plant and services*] (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 Contractor, we [*name of the bank*] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [*name of the currency and amount in words*][1] [*amount in figures*] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire no later than the earlier of

(a) 18 months after our receipt of

(i) a copy of the Completion Certificate; or

(ii) a registered letter from the Contractor, attaching a copy of the notice to the project manager that the Facilities are ready for commissioning, and stating that 14 days have elapsed from receipt of such notice (or 7 days have elapsed if the notice was a repeated notice) and the project manager has failed to issue a Completion Certificate or inform the Contractor in writing of any defects or deficiencies; or

(iii) a registered letter from the Contractor stating that no Completion Certificate has been issued but the Employer is making use of the Facilities; or

(b) the [*date*] day of [*month*], [*year*][2].

Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

. . . . . .

[*Signature(s) and seal of bank (where appropriate)*]

[1] The guarantor shall insert an amount representing the percentage of the accepted contract amount specified in the contract and denominated either in the currency(ies) of the contract or in any freely convertible currency acceptable to the Employer.

[2] Insert the expected expiration date of the Defect Liability Period. The employer should note that in the event of an extension of the time for completion of the contract, the Employer would need to request an extension of this guarantee from the guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [6 months][1 year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

-- Note to Bidder --

If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.

Advance Payment Security

[*Bank's name, and address of issuing branch or office*]

Beneficiary: ..... [*Name and address of the Employer*] .....

Date:.....

Advance Payment Guarantee No.: .....

We have been informed that [*name of the contractor*] (hereinafter called "the Contractor") has entered into Contract No. [*reference number of the contract*] dated [*date*] with you, for the execution of [*name of contract and brief description of plant and services*] (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum [*name of the currency and amount in words*][1] [*amount in figures*] is to be made against an advance payment guarantee.

At the request of the Contractor, we [*name of the bank*] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [*name of the currency and amount in words*][2] [*amount in figures*] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor:

(a) used the advance payment for purposes other than the costs of mobilization and cash flow support in respect of the Works; or

(b) has failed to repay the advance payment when it has become due and payable in accordance with the conditions of the Contract, specifying the amount payable by the Contractor.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number [*contractor's account number*] at [*name and address of the bank*].

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates, which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate, indicating that 80% of the Contract Price has been certified for payment, or on the [*date*] day of [*month*], [*year*], [3] whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758 , except that the supporting statement under Article 15(a) is hereby excluded.[4]

. . . . . .

[*Signature(s) and seal of bank (where appropriate)*]

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1 The guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the contract, or in any freely convertible currency acceptable to the Employer.

2 Footnote 1.

3 Insert the expected expiration date of the time for completion. The Employer should note that in the event of an extension of the time for completion of the contract, the Employer would need to request an extension of this guarantee from the guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [6 months] [1 year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

4 Or the Employer may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded" as appropriate.

-- Note to Bidder --

If the bank issuing advance payment security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.