STANDARD BID SOLICITATION DOCUMENT

GOVERNMENT OF GUYANA

Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations

GUYANA ENERGY AGENCY

January, 2026

GOODS AND RELATED SERVICES
(VALUE G$15 million and above)

Introduction

Preface

This Standard Bid Solicitation Document (SBSD) has been prepared by the National Procurement and Tender Administration Board (NPTAB) for use by Procuring Entities for the procurement of goods and services. The procedures and methods presented in this document have been developed on the basis of practical experience and are mandatory for use in the procurement carried out in whole or in part from the state funds in accordance with the provisions of Guyana's Public Procurement Legislation.

In order to simplify the preparation of the bid document for each individual procurement proceeding, the SBSD groups the provisions that are not intended to be changed in "the Instructions to Bidders" and in "the General Conditions of Contract". Data and provisions specific to each procurement and contract should be included in the Bid Data Sheet, the Special Conditions of the Contract, Technical specifications, price schedule, schedule of requirements and the Evaluation Criteria. The applicable forms are listed in the table of contents, below.

Request for additional information can be forwarded to:

The Guyana Energy Agency
295 Quamina Street, South Cummingsburg, Georgetown
Tel Numbers: 226-0394 ext. 223/241
gea@gea.gov.gy
https://gea.gov.gy/

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INVITATION FOR BIDS (IFB)

1. **The Guyana Energy Agency** hereinafter referred to as "the Procuring Entity", invites eligible bidders to submit their bids for the **Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations**, as per the required specifications mentioned in the Bidding Documents.

2. Required period of supply: **One hundred and eighty (180) days from the signing of the Contract**.

   Bidders are required to visit the site to carry out their own assessment of how the system will be installed. GEA would facilitate contacting the appropriate entities and request access to the site by the bidders upon the bidder's request. The costs of visiting the site shall be at the bidder's own expense.

3. The bidding documents may be obtained and be examined by any interested bidder. Bids can be purchased for a non-refundable fee in the amount of $2,000 from the Cashier at the *Guyana Energy Agency, 295 Quamina Street, South Cummingsburg, Georgetown,* telephone 226-0394 or fax 226-5227, email at gea@gea.gov.gy. Alternatively, interested eligible bidders may download a free copy of the Bidding Documents from the GEA website at www.gea.gov.gy

4. All Bidders should submit their bids together with an original bid security of 2% of the tendered amount not later than 9:00 hours on January 29th, 2026, at the: **National Procurement & Tender Administration Board, Ministry of Finance, 49 Main & Urquhart Streets, Georgetown**.

   Clarifications must be submitted in writing to the GEA's email address at **gea@gea.gov.gy** no later than one week prior to the deadline for bid submission**.**

5. Bids shall be valid for one hundred and twenty (120) days after the date of bid opening.

6. Bids shall be opened by the National Procurement and Tender Administration Board in the presence of Bidders' representatives who wish to attend, at 9:00 hours on January 29th, 2026, at the address: 49 Main and Urquhart Streets, Georgetown, Guyana

   Bid opening link:
   https://teams.microsoft.com/l/meetupjoin/19%3ameeting_NWI2NTczNWUtMGY0NS00Njg3LTlhODEtMTNlOWUzNmRiNzg2%40thread.v2/0?context=%7b%22Tid%22%3a%22ff1d4318-046e-4143-8bac-9d503f00d12b%22%2c%22Oid%22%3a%22a0f8d988-3b0f-4653-a082-3a86d9ff7a9e%22%7d

7. Bidders are required to complete the Bidders Registration via the following NPTA website: Bidders Registration – The National Tender & Procurement Administration (NPTA) of Guyana

for **Dr. Mahender Sharma**
Chief Executive Officer- Guyana Energy Agency

INSTRUCTIONS TO BIDDERS

A. Introduction

1. Description of the Procurement

The Procuring Entity identified in the *Bid Data Sheet* intends to procure the goods identified in the *Bid Data Sheet* and in the Schedule of Requirements.

2. Eligibility and Qualifications of Bidders

2.1 In order to be awarded a procurement contract, Bidders should possess the technical and financial capacity needed to perform the contract, should fulfill their tax and social insurance fund liabilities in Guyana, should not currently be subject to a debarment penalty, and must comply with the specific eligibility and qualification requirements referred to in the *Bid Data Sheet and Evaluation Criteria*.

2.2 The bidders should not have conflicts of interest, including involvement in more than one bid in this proceeding, should not be associated nor have been associated in the past, directly or indirectly, with any agency or any of its representative(s), affiliate(s), that have been engaged by the Procuring Entity to provide consulting services at the preparation stage of the bidding documents, technical specifications and other documentation that are subject to be used in the procurement of goods which must be purchased in accordance with the Invitation for Bids. In cases when the indicated facts are discovered, the Bidder's bid shall be rejected.

B. Bidding Documents

3. Clarification and Amendment of Bidding Documents

3.1 The Procuring Entity, in not more than three (3) working days, will respond in writing or electronic mail to any request for clarification of the bidding documents to be received (in writing or electronic mail) not later than seven (7) days before the expiry of a deadline for submission of bids. At the same time, the Procuring Entity's response shall without identifying its source of the request, be distributed to all bidders who have received the bidding documents from the Procuring Entity.

3.2 At any time before the deadline for submission of bids, the Procuring Entity may amend the bid documents by issuing an Addendum to the bidders.

C. Preparation of Bid

4. Language of Bid

4.1 The bid prepared by the Bidder, as well as all correspondence and documents related to that bid and exchanged by the Bidder and the Procuring Entity shall be written in the language *specified in the Bid Data Sheet*.

5. Documents Included in Bid

5.1 The bid prepared by the Bidder should contain the Form of Bid, the Price Schedules and the other documents to be submitted in accordance with these Instructions to Bidders, Bid Data Sheet and Evaluation Criteria.

6. Bid Price

6.1. Subject to the choice of INCOTERMS as indicated in the Bid Data Sheet, the prices given in the Price Schedule shall include all transportation costs to the destination point indicated in the Contract, all taxes, duties, payments collected, in accordance with the laws of Guyana and delivery related and other costs on performing of contractual obligations.

6.2. The prices offered by the Bidders shall remain fixed during the whole period of Contract performance and shall not be modified in any circumstance.

7. Bid and Payment Currency

7.1 The prices shall be indicated in Guyana Dollars, unless otherwise specified in the *Bid Data Sheet.*

8. Bid Security

8.1 Unless otherwise provided in the *Bid Data Sheet*, the Bidder shall furnish, as part of his bid, an original Bid Security, in the form, currency and amount specified in the *Bid Data Sheet* with a validity period for not less than two (2) weeks upon the expiry of the bid validity period and in accordance with the specified form.

8.2 The bid security may be forfeited, if the Bidder:

(a) withdraws their bid after it is opened during the period of validity specified in the bid; or,

(b) having been awarded the contract fails:

(1) to sign the contract on the terms and conditions provided in their bid; or

(2) to furnish the Performance Security, if required to do so.

9. Period of Validity of Bid

9.1 Bids shall remain in force during the period specified in *the Bid Data Sheet* after the date of bid opening.

10. Format, Signing and Submission of Bid

10.1 The Bidder shall prepare one (1) original bid and one (1) hard copy which shall be completed in writing in indelible ink and shall be signed by the Bidder, or by the person (persons) duly authorized to sign the bid in accordance with the power of attorney and 2 (two) exact electronic PDF copies of the bid on Flash Drive, to be submitted with the bid. All pages of the bid where new information, modifications or erasures entered shall be initialed (signed) by the person or persons signing the bid. In the event of discrepancies between them, the original shall prevail.

10.2 The bid shall contain no interlineations, erasures or overwriting, except the cases when the Bidder needs to correct errors which must be initialed by the person or persons signing the bid.

10.3 The Bidder shall seal the original and Electronic PDF copies of the bid in different envelopes, marking them "**ORIGINAL**" and "**COPIES**", as appropriate. The envelopes shall then be sealed in an outer envelope.

10.4 The outer envelope shall:

(a) be addressed to the **Chairman, National Procurement & Tender Administration Board (NPTAB), Main & Urquhart Streets, Georgetown** (the address specified in

the Invitation for Bids);

(b) **bear the Name of the Project "*Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*"** and the words: "**DO NOT OPEN BEFORE"** 9:00 hours on the **January 29th, 2026**.

11. Deadline for Submission of Bids

11.1 Bids must be received by the Procuring Entity at the address and within the periods specified in *the Bid Data Sheet.* All bids received by the Procuring Entity upon the expiry of a period established for submission of bids as indicated by the Procuring Entity shall be rejected and returned to the Bidder unopened.

12. Modification and Withdrawal of Bids

12.1 The Bidder may modify or withdraw their bid after the bid's submission, provided that the Procuring Entity will receive a written notice of modification, substitution or withdrawal of bid before the deadline for submission of bids.

12.2 The Bidder's modification, substitution or withdrawal notice shall be prepared, sealed, marked, and sent in accordance with the provisions of ITB Clause 10. In that case the outer and inner envelopes will be additionally marked as "**MODIFICATION**" or "**WITHDRAWAL**", as appropriate. A withdrawal notice may also be sent by email with a subsequent written confirmation not later than the deadline for submission of bids.

D. Opening and Evaluation of Bids

13. Opening of Bids

13.1 The Procuring Entity will open all bids in the presence of bidders' representatives who wish to attend, at the time, on the date, and at the address specified in the *Bid Data Sheet***.** The bidders' representatives who are present shall sign a register evidencing their attendance.

13.2 The bidders' names, bid prices, including alternatives (if permitted), information on the presence or absence of required bid security, information on the presence (absence) of tax debts and debts of social insurance payments will be announced at the opening. No bid shall be rejected at the opening, exclusive of late bids and unidentified Bids to be returned to the Bidder unopened.

13.3 Bids and modifications sent pursuant to ITB Clause 12.2 that are not opened and read out during the bid opening shall not be accepted for further evaluation, regardless of circumstances.

14. Evaluation of Bids

14.1 During the evaluation of bids, the Procuring Entity may, at its discretion, request the Bidder to provide clarification of their bid. The request for clarification and the response thereto shall be made in writing, and in that case no change in price or substance of the bid shall be sought, offered, or permitted.

14.2 The Procuring Entity shall determine the responsiveness of each bid to requirements of the bidding documents. For the purposes of this Clause a substantially responsive bid is one which satisfies all the indicated provisions without a material deviation or reservation.

14.3 The Procuring Entity may regard a tender as responsive if it contains any minor deviations, that do not materially alter or depart from the characteristics, terms and conditions and other

requirements of the bid solicitation documents, or if it contains errors or over sights that are capable of being corrected without touching the substance of the tender. To the extent feasible and appropriate, for the purposes of comparing bids, acceptable deviations shall be quantified in monetary terms, and reflected in adjustments to the bid price (for the purposes only of comparison of bids).

14.4 Arithmetical errors shall be rectified in the following manner. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected. If there is a discrepancy between words and figures, the amount in words shall prevail. If the Bidder disagrees with such correction of errors, their bid shall be rejected.

14.5 The Procuring Entity shall evaluate and compare only the bids that are determined to be responsive to the Bid Solicitation Document.

15. Confidentiality and Contacting the Procuring Entity

15.1 No Bidder shall contact the Procuring Entity on any matter related to their bid from the date of bid opening until the date of contract award, except for requests related to clarification of the bid. Information concerning the evaluation of bids is confidential.

15.2 Any effort by the Bidder to influence the Procuring Entity's decision on bid evaluation and comparison, or contract award may result in the rejection of that Bidder's bid and subjected to debarment in accordance with Regulation 3(1)(b) of the Procurement (suspension and debarment) Regulations 2019.

E. Award of Contract

16. Award Criteria

16.1 Subject to ITB Clause 18, the Procuring Entity will award the Contract to the Bidder whose bid is determined to be substantially responsive to the requirements of the bid solicitation document, and who offered **the Lowest Evaluated Bid**, provided that the Bidder has been determined:
(a) to be eligible pursuant to Clause 2;
(b) to comply with qualification requirements, in accordance with Clause 2, and any technical requirements and evaluation criteria disclosed in the bid solicitation documents.

17. Procuring Entity's Right to Vary Quantities at Time of Entering into a Contract

17.1 The Procuring Entity reserves the right, when entering into a contract, to increase or decrease the quantity of goods and related services specified in the Schedule of Requirements, by the percentage indicated in the *Bid Data Sheet***,** no change in the unit price or other conditions shall be made (an increase of quantity **not exceeding *10 percent variation***)

18. Procuring Entity's Right to Accept Any Bid and to Reject All Bids

18.1 The Procuring Entity reserves the right to accept or reject any bid or all bids, and to cancel the bidding process at any time prior to award of contract, without thereby incurring any liability to Bidders and without being required to inform the Bidder or Bidders of reasons of such actions.

19. Notification of Award

19.1. The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the bid validity period.

19.2. The notice of acceptance shall be given to the successful bidder within fourteen (14) days of the award of contract.

19.3. At the same time that the Procuring Entity notifies the successful Bidder in accordance with sub-clause (1), the Procuring Entity will notify all other Bidders of the name of successful Bidder, and their bid price.

20. Signing of Contract and Performance Security

20.1 The Procuring Entity will send the successful Bidder the Form of Contract contained in the bid solicitation document. The successful Bidder shall sign and date the Contract and return it to the Procuring Entity within seven (7) days of receipt of notice of award.

20.2 Together with the signed Contract, the Bidder shall, if required to do so by the *Bid Data Sheet*, furnish the Procuring Entity with a Performance Security in the amount and form specified in the *Bid Data Sheet*.

20.3 If the successful Bidder fails to furnish the performance security, if required to do so, or within 7 (seven) days fails to return the Contract signed by them, then it shall be a sufficient ground to refuse the award of Contract, and to forfeit the bid security. In that case the Procuring Entity shall award the Contract to the next lowest evaluated Bidder, subject to the right of the Procuring Entity to reject all bids.

21. Settlement of Disputes

21.1 To settle the disputes which may arise during the execution of Contract, the parties shall follow the procedure referred to in the *Bid Data Sheet*.

22. Corrupt and Fraudulent Practices

22.1 The Procuring Entity requires that Bidders observe the highest standards of ethics during the bidding process and execution of such contracts. In pursuance of this policy, the Procuring Entity:

(a) will reject the bid if it establishes that the Bidder recommended for award has engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract in question.

(b) refer the matter to the Public Procurement Commission (PPC) in accordance with the provisions of Procurement (Suspension and Debarment) Regulations 2019.

23. Compliances

23.1 Bidder must submit valid certificates of compliances from Guyana Revenue Authority (GRA), National Insurance Scheme (NIS), and VAT registration (*where applicable).*

24. Defects Liability:

24.1 The "Defects Liability Period" for the goods and related services is six (6) months from the date of taking over possession or such other period as may be specified in the Bid Data Sheet. During

this period, the supplier will be responsible for rectifying any defects or replacement of goods free of cost to the Procuring Entity.

BID DATA SHEET (BDS)

The following specific data to clauses of the provisions of Instructions to Bidders which supplement or amend the provisions of the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in ITB.

Item No.	
ITB 1.1	Guyana Energy Agency, 295 Quamina Street, South Cummingsburg, Georgetown, Tel:592- 226-0394, gea@gea.gov.gy. The subject of the procurement is: ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations.***
ITB 2.1	To qualify for award of the Contract, the bidders shall meet the qualification requirements set out in the evaluation criteria (page 78-79)
ITB 4.1	Language of Bid shall be English Language All submission must be in **English**
ITB 5.1	The Bidder shall submit the following additional documents in its bid: 1. Evidence of Financial Capability in the amount of 30% of the bid price in the form of a bank statement as at December 2025 or letter of credit from a commercial bank in the name of the bidder. Letter of credit must state a figure. The document must be dated within one month of the bid opening date and be clearly legible. When a photocopy of the letter of credit or bank statement is presented, it must be certified a "true copy of the original' by the issuing company. 2. Submission of a valid business registration or certificate of incorporation, inclusive of list of directors, that is clearly legible. Where bidder is part of an unincorporated joint venture, a legible copy of joint venture agreement is required. Copy of joint venture agreement must state the joint venture partner to which invoice will be paid and contract to be signed. Where bidder is a joint venture company, a legible copy of certificate of incorporation is to be submitted. Each party must submit valid compliance as per items 2 and 3 of the Evaluation Criteria. 3. Written confirmation of authorizing signatory must be provided. For the incorporated company this must be in the form of a Power of Attorney endorsed by a Commissioner of Oaths or Justice of Peace. For a registered business that has appointed an employee to sign the bid, a letter of authorizing signatory must be provided. 4. Valid certificates of compliance from GRA and NIS and VAT registration (only applicable to Bidders resident in the country of the Procuring Entity). 5. Completed litigation form on page 80 of the bidding documents. 6. A letter stating any or no termination or abandonment of projects. The letter must be dated within one month of the bid opening date. 7. Provide documentary evidence that the goods are ISO certified and Tropic resistant; 8. Provide documentary evidence that the PV modules comply with IEC 61215, IEC 62804 and UL 1703 listed for Crystalline Silicon PV Modules (or equivalent) standards, and that the inverters are UL 1741 listed; 9. Provide documentary evidence to demonstrate that the Goods offered meet all the technical specifications of the bidding document. Technical literature must include data sheets and specific technical information on each of the items of equipment and components proposed for the photovoltaic system; 10. A detailed schematic design layout for the solar PV systems (schematic should be NEC 2023 Compliant), including explanatory notes for sizing of equipment and components that comprise the system, and energy production calculations using a PV modelling software;

	11. Certificates of product quality (modules and inverters) issued by a recognized laboratory accredited by the International Laboratory Accreditation Cooperation (ILAC) and which must be valid up to the date of commissioning of the system; 12. Documentary evidence that batteries comply with IEC 61427:1999 and the manufacturing process conformed to environmental management standard ISO 14001. 13. An implementation schedule indicating important milestones such as equipment delivery to site, installation, testing and commissioning. Frequent (at least monthly) progress reports and work plan are to be provided to the Procuring Entity as required by the procuring entity during project execution. 14. Bidder must provide audited financial statements for the past three years for incorporated companies. Financial statements must be audited by a Chartered accountant/accountancy firm and include an auditor's note. OR Registered businesses must provide Balance Sheets, Profit and Loss Accounts, and Income and Expenditure Accounts for the past three years. These financial statements must be approved by a Chartered accountant/accountancy firm. The detailed evaluation criteria can be found on Page 79-80 of the bidding documents
ITB 6.1	The price quoted by bidders shall be on the basis of DDP for goods delivered from abroad, and for goods delivered from Guyana. Incoterms Delivered Duty Paid (DDP) are applicable. Bidders shall quote for the ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** 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 to the ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations.*** Items against which no price is entered by the Bidder for the ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.
ITB 7.1	Currency of Bid shall be in Guyana Dollars.
ITB 8.1	A bid security of two percent (2%) of the tendered sum is required in the form of a Bank guarantee or a bond from an Insurance company licensed by the Bank of Guyana.
ITB 9.1	The period of validity of bid is one hundred and twenty (120) days
ITB 11.1	Deadline and place for submission of bids: 9:00 hours on the **January 29th,2026** *at* ***The National Procurement & Tender Administration Board, Ministry of Finance, Main & Urquhart Streets, Georgetown, Guyana***
ITB 13.1	Time and place for opening of bid: 9:00 hours on **January 29th, 2026** at ***The National Procurement & Tender Administration Board, Ministry of Finance, Main & Urquhart Streets, Georgetown, Guyana.***
ITB 17.1	Increase or decrease in the quantity of goods and services not exceeding 10%
ITB 20.2	The amount of the performance security is 10% of the contract price. Performance Security must be in the form of a Bank Guarantee or a bond from an Insurance company licensed by the Bank of Guyana. This shall be valid for the duration of the contract period.
ITB 21.1	Disputes that may arise in the performance of the contract shall be settled in accordance with the applicable Laws of Guyana.
ITB 24.1	The duration of the defect's liability period is six (6) months following provisional acceptance.

GENERAL CONDITIONS OF CONTRACT (GCC)

The General Conditions are the Standard General Conditions of Contract. No alteration shall be made on the pages of these Conditions. The Procuring Entity, when amending or supplementing the General Conditions of Contract should do so only in the Special Conditions of Contract. Any amendment or addenda of the General Conditions of Contract shall conform to the legislation of Guyana.

1. Definitions and application

1.1 This Contract lists below the terms that have the following interpretation:

(a) **"Contract"** means the agreement entered into between the Procuring Entity and the Supplier, as recorded in the Form of Contract signed by the parties, including all attachments and appendices thereto and all the documents referenced therein.

(b) **"Contract Price"** means the price payable to the Supplier under the Contract for complete and proper performance of his contractual obligations.

(c) **"Goods"** means the item (s) referred to in the Schedule of Requirements contained in the Bid Solicitation Document.

(d) **"GCC"** means the General Conditions of Contract contained in this Section.

(e) **"SCC"** means the Special Conditions of Contract.

(f) **"Procuring Entity"** – means the Procuring entity carrying out the procurement of Goods, specified in the SCC.

(g) **"Supplier"** means an individual or legal entity, or a combination of any abovementioned forms which operate under the existing agreement as a joint venture and supply the Goods and Services under the Contract.

(h) **"Day"** means calendar day.

1.2 The General Conditions of Contract shall apply in the procurement of goods; the specific amendment, addition and alteration shall be indicated in the Special Conditions of Contract.

1.3 Warranty requirements are as specified in the Special Conditions of Contract.

2. Contract Documents

2.1 Subject to the order of precedence set forth in the Contract Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory. The contract shall be read as a whole.

3. Performance Security

3.1 If required by the SCC, within seven (7) days of receipt of notification of award, the successful Bidder shall furnish the Procuring Entity with the performance security the amount and form of which are indicated in the SCC.

4. Packing

4.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or

deterioration during transit to final destination specified in the Contract, and as may be required by the Special Conditions of Contract.

5. Delivery, Transportation, Mobilization Advance

5.1 The Supplier must deliver the Goods within the periods and to the Destination point indicated in the Schedule of Requirements and shall provide the documentation indicated in the SCC. Subject to the SCC, transportation of the Goods to the place specified by the Procuring Entity shall be carried out and paid by the Supplier and related costs shall be included in the Contract Price.

6. Payment

6.1 The payment to the Supplier for the Goods delivered shall be made in accordance with the Contract in the form and within the periods specified in the SCC**.**

6.2 If the Procuring Entity does not pay the Supplier the sum due within the periods specified in the Contract, in that case the Procuring Entity shall pay the Supplier [interest at the rate specified or determined pursuant to the Special Conditions of Contract].

7. Prices

7.1 Prices established by the Supplier in the Contract for goods delivered shall not vary from the prices quoted by the Supplier in his bid.

8. Assignment

8.1 The Supplier shall not assign, in whole or in part, his obligations under the Contract to a third party for the execution without the Procuring Entity's prior written consent.

9. Delays in the Supplier's Performance and Liquidated Damages

9.1 Delivery of the Goods shall be carried out by the Supplier, in accordance with the schedule indicated by the Procuring Entity in the *Schedule of Requirements*.

9.2 Except as provided under GCC Clause 13, any delay in the Supplier's performance of their delivery obligations shall render the Supplier liable for payment of liquidated damages in the amount specified in the SCC, unless an extension of time is agreed upon by the parties without application of liquidated damages. Once the maximum deduction specified in the SCC is reached, the Procuring Entity may consider termination of the Contract, in accordance with Clause 10 of the General Conditions of Contract.

10. Termination

10.1 The Procuring Entity, without detriment to any other sanctions of infringement of the provisions of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:

(a) if the Supplier fails to deliver a portion or all of the Goods within the periods provided for in the Contract, or within an extension period of that Contract, or to perform any of his obligations under the Contract.

(b) if bankruptcy procedures are applied to the Supplier, or it is declared insolvent.

(c) if the Supplier, in the Procuring Entity's opinion, has engaged in corrupt, fraudulent, collusive or coercive practices when entering into or executing the Contract.

(d) If the Procuring Entity deems that continued implementation of the contract would no longer be expedient from the standpoint of the public interest.

10.2 The notice of termination shall specify the reason of termination, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

10.3 Notwithstanding clauses 9 and 10.1(d), the Supplier shall not forfeit their performance security, and shall not be liable for payment of liquidated damages, or termination for default, if delay in executing the Contract or failure to perform obligations under the Contract is the result of an event of force majeure. When force majeure arises, the Supplier shall promptly notify the Procuring Entity in writing of such circumstance and its causes.

10.4 When the contract is terminated in accordance with clause 10.1(d), the Goods that are complete and ready for shipment within twenty-eight (28) days after the Supplier's receipt of notice of termination shall be accepted by the Procuring Entity at the Contract terms and prices. For the remaining Goods, the Procuring Entity may elect:

(a) to have any portion completed and delivered at the Contract terms and prices; and/or

(b) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier.

11. Settlement of Disputes

11.1 If any dispute or disagreement arises between the Procuring Entity and the Supplier for the Contract or in connection with it, the parties shall make every effort to resolve the dispute or disagreement amicably by mutual consultation.

11.2 If during twenty one (21) days, the parties failed to resolve their dispute or disagreement by mutual consultation; either the Procuring Entity or the Supplier may send the other party the notice of intent to commence arbitration, if an arbitration is incorporated in the Contract in the Special Conditions of Contract or otherwise agreed by the parties, or in the Court of General Jurisdiction if no arbitration is envisaged, and no arbitration or litigation in respect of that matter may be commenced unless such notice is given.

Any dispute or disagreement in respect of which the notice of intent is sent to commence trial shall be heard by the [Court of General Jurisdiction].

11.3 Notwithstanding any reference to dispute settlement herein, the parties shall continue to perform their obligations under the Contract, unless they agree otherwise.

12. Applicable Law

12.1 The Contract shall be interpreted in accordance with the Laws of Guyana.

13. Formal Communication between the Procuring Entity and the Supplier

13.1 Any notice given by one party to the other pursuant to the Contract shall be in force if it is done in writing and sent at the address of other party in the SCC**.**

13.2 A notice shall be effective when delivered or on the specified date, whichever is later.

14. Taxes and Duties

14.1 The Supplier shall be fully responsible for all taxes, duties, license taxes, etc., levied in accordance with the legislation of Guyana, and subject to the application of INCOTERMS in accordance with the SCC.

15. Retention

15.1 No retention shall be applied on consumables, but warranties, guarantees and expiry dates to apply.

15.2 Retention on fixed assets shall be determined by the Procuring Entity on a case-by-case basis.

SPECIAL CONDITIONS OF CONTRACT (SCC)

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract.

GCC Clause No.	Special Conditions of Contract
1.1	**Definitions** The Procuring Entity is the Guyana Energy Agency, 295 Quamina Street, South Cummingsburg, Georgetown, Tel:226-0394, Fax:226-5227, gea@gea.gov.gy. The Supplier is _____ *(indicate full name, legal address, phone, fax and e-mail of Supplier)* The Subject of procurement is: ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations.*** **Warranty** The supplier warrants all Goods supplied under the contract are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the contract. The supplier further warrants that all Goods supplied under this contract shall have no defect, arising from design, materials or workmanship or from any act or omission of the supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination. 24 months complete system warranty is applicable from provisional acceptance date. A final completion certificate shall be issued upon satisfactory commissioning of the systems.
3.1	**Performance Security** The amount and form of Performance Security is: 10% of the contract price in the form of a Bank Guarantee or a bond from an Insurance company licensed by the Bank of Guyana. The bond shall be valid for the entirety of the contract period.
4.1	**Packing:** The Supplier shall provide such packing of the Goods as is required to prevent damage or deterioration during transit to final destination, as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit.
5.1	**Delivery, Transportation** **The following documentation is to be provided by the Supplier to the Procuring Entity:** (1) Copies of Supplier's invoice(s) indicating a description, quantity, unit price of the Goods and sum total. (2) Shipping order, railway receipt or truck receipt. (3) Warranty certificate of Manufacturer or Supplier; (4) Inspection certificate issued by the authorized inspection service, and the supplier's factory inspection report (if any); (5) Certificate of origin; (6) Certificate of conformity (7) Certificate of Quality

6.1	**Payment schedule:** ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** *as per Price Schedule below:* (a) Ten percent (10%) of the contract price within 14 days of signing the contract and the submission of the performance bond. (b) Thirty percent (30%) of the contract price upon approval of the design drawings and physical verification by the Procuring Entity that major components such PV modules, inverters, carport structure have been received by the supplier and have complied with the technical specifications. (c) Twenty percent (20%) of the contract price upon completion of civil works relating to the carport structure foundation, carport structure and parking surface. (d) Thirty percent (30%) of the contract price upon installation and acceptance of the complete solar carport system by the Procuring Entity. (e) Ten percent (10%) of the contract price upon expiry of the defects liability period barring the correction of defects.
9.2	**Liquidated Damages** Applicable rate: 0.05% per week for untimely execution of order. Maximum deduction: 10% of the delayed works/delivery
11.2	**Settlement of Disputes** Disputes arising out of or in connection with the Contract shall be settled in accordance with the Laws of Guyana.
14.1	**Taxes and Duties** The version edition of INCOTERMS shall be: Delivered Duty Paid (DDP)
16.1	**Defects Liability** The duration of the defect's liability period is 6 months following provisional acceptance. During this period, the contractor will be responsible for rectifying any defects free of cost to the Procuring Entity.

DELIVERY SCHEDULE/ SCHEDULE OF REQUIREMENTS

The delivery schedule expressed as days specifies hereafter the date of delivery to destination point. In column "the delivery schedule", the Procuring Entity shall indicate the date from which schedule starts. It should be either the date of award, or the date of signing of Contract, or the date of opening of letter of credit, or the date of confirming the letter of credit (subject to circumstances). The Form of Bid shall specify only reference to that schedule.

Item No.	**Brief Description of Goods**	**Quantity**	**Place of Delivery**	**Procuring Entity's Completion Schedule (----days as of** signing of the contract	**Bidder's Offered Completion Schedule**	
					Earliest Delivery	**Latest Delivery**
	Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations					
1	Design Drawing	11	Guyana Energy Agency, 295 Quamina St. South Cummingsburg, Georgetown, Guyana	**30**		
2	11.25kWp Grid Interactive Solar PV System	11	As specified in the table below: *Location of ten (10) Solar Carports for EV Charging Stations*	**180**		
3	Remote Monitoring System	11				
4	2 Port Parking Surface/Concrete Slab	2		**180**		
5	2 Port Carport Structure; Foundation, Columns, PV array mounting structure, etc.	9		**180**		
6	As-Built Drawing	11	Guyana Energy Agency, 295 Quamina St. South Cummingsburg, Georgetown, Guyana	**180**		

Duly authorized to sign for and on behalf of

_____

(*name of Bidder*)

_____ _____ _____

(*Full name*) (*Title*) (*Signature and seal*)

Brief description of deliverables for each site:

No.	Site Name	Description of Works
1	50/50 Sports Bar, Region 3	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure.**
2	Ogle Airport, Region 4	Design, Supply, Installation and Commissioning of a roof mounted **11.25kWp solar PV system for a 50kW EV charger**
3	Giftland Office Max, Region 4	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure.**
4	KK Service Station, Region 4	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure.**
5	Providence Cricket Stadium, Site 1, Region 4	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure.**
6	Providence Cricket Stadium, Site 2, Region 4	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure.**
7	Rosignol Fisherman's Coop Society Ltd, Region 6	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure.**
8	Yas Karan Singh Service Station, Region 6	Design, Supply, Installation and Commissioning of a roof mounted **11.25kWp solar PV system for a 50kW EV charger**
9	Nand Persaud Company Ltd., Tain, Region 6	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure and 2 port parking surface/concrete slab**
10	Linden Technical Institute, Region 10	Design, Supply, Installation and Commissioning of a solar carport for a 50kW EV charger; inclusive of a **11.25kWp solar PV system, 2 port carport structure and 2 port parking surface/concrete slab**

Location of the ten (10) Solar Carports for EV Charging Stations

No.	Site Name	Location	GPS Coordinates
1	50/50 Sports Bar	Vreed En Hoop, West Coast Demera, Region 3	6°48'29.05"N, 58°11'17.82"W
2	Ogle Airport	Roraima Airways, Ogle, Region 4	6°48'23.54"N, 58° 6'10.55"W
3	Giftland Office Max	1 Plantation Pattensen, Turkeyen Georgetown, Region 4	6°49'06.1"N 58°07'05.6"W
4	KK Service Station	Unity, East Coast Demerara, Region 4	6°42'49.3"N 57°56'01.2"W
5	Providence Cricket Stadium, Site 1	Providence, East Bank Demerara, Region 4	6°45'28.7"N 58°10'47.7"W
6	Providence Cricket Stadium, Site 2	Providence, East Bank Demerara, Region 4	6°45'22.9"N 58°10'43.8"W
7	Rosignol Fisherman's Coop Society Ltd	Rosignol, West Bank Berbice, Region 6	6°16'13.64"N, 57°32'6.00"W
8	Yas Karan Singh Service Station	Port Mourant, Berbice, Region 6	6°15'1.94"N,

			57°20'59.90"W
9	Nand Persaud Company Ltd., Tain	Tain Public Road, Corentyne, Berbice, Region 6	6°14'27.86"N 57°20'18.86"W
10	Linden Technical Institute	Linden, Region 10	6°00'17.0"N 58°18'05.6"W

1. 50/50 Sports Bar

The site can be found as you enter the 50/50 Sports Bar compound to the left. The coordinates for the placement of the Solar Carport installation are:

1. **Latitude: 6°48'29.05"N**
2. **Longitude: 58°11'17.82"W**

2. Ogle Airport

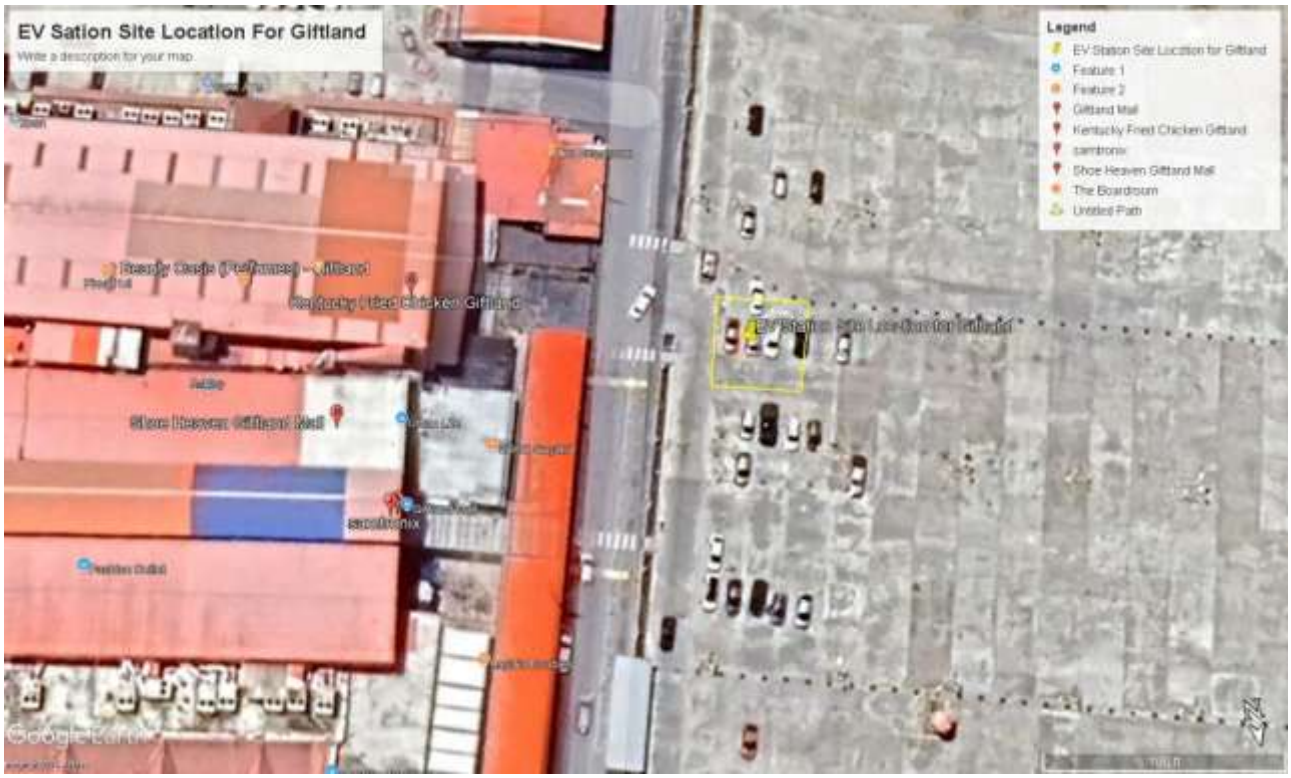
Ogle Airstrip, Roraima airway's location of carport Charger

The site is located at the Roraima Airway Terminal, Ogle Airport. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: **6°48'23.54"N**

2.Longitude: **58° 6'10.55"W**

3. MCG Investment Inc. Giftland Mall



The selected location can be found in the Mall Parking Lot right after the shed as you enter. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: **6°49'6.54"N**

2.Longitude: **58°7'6.72"W**

4. KK Service Station

The site is located at the K&K Service Station. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: **6°42'49.16 "N**

2.Longitude: **57°56'1.23 "W**

5. Providence Cricket Stadium, Site 1

Location of solar car port at Providence Cricket Stadium, **Site 1**, Region 4.

The site is located in the **western** parking area of the Providence Cricket Stadium. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: 6°45'28.7"N

2.Longitude: 58°10'47.7"W

6. Providence Cricket Stadium, Site 2

Location of solar car port at Providence Cricket Stadium, **Site 2**, Region 4.

The site is located in the **southern** parking area of the Providence Cricket Stadium. The coordinates for the placement of the Solar Carport installation are:

1. Latitude: 6°45'22.9"N
2. Longitude: 58°10'43.8"W

7. Rosignol Fisherman's Coop Society Ltd

Rosignol Fisherman's Coop Society Ltd, Region 5 Location of solar car port

The site is located outside at the entrance of the Rosignal Fisherman Coop Society. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: **6°16'13.64"N**

2.Longitude: **57°32'6.00"W**

8. Yas Karan Singh Service Station

The site is located at Yas Karan Service Station. The coordinates for the placement of the Solar Carport installation are:

1. Latitude: **6°15'1.94"N**
2. Longitude: **57°20'59.90"W**

10. Nand Persaud Company Ltd., Tain

The site is located outside the entrance of the Nand Persaud Company Ltd. Tain Facility. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: **6°14'27.86"N**

2.Longitude: **57°20'18.86"W**

11. Linden Technical Institute

The site is located within the compound of the Linden Technical Institute. The coordinates for the placement of the Solar Carport installation are:

1.Latitude: **6°00'17.0"N**

2.Longitude: **58°18'05.6"W**

CONCEPT DRAWINGS

Conceptual render of carport design

Conceptual render of carport design

Conceptual render of carport design

Conceptual render of carport design

Conceptual render of carport design

TECHNICAL SPECIFICATIONS

A. Carport Structure and Civil Aspects

Detailed and Construction Design

Detailed and construction design of the carport infrastructure

The Contractor will establish the detailed design of all structures and equipment in relation to the carport infrastructure. The Contractor will also establish the detailed design of the solar energy generating equipment and mounting structures inclusive of carport foundation, parking slab and Mounting structure.

The Contractor shall submit to the Engineers the following specifications. This is namely:

- The design load considerations inclusive of Live loads, Dead loads and wind loads
- The Design Drawings inclusive of sub-structure and superstructure/ mounting structure for solar array.
- Detail site plan clearly defining location of all permanent and temporary structures.
- Survey of sites inclusive of temporary benchmarks and established elevations, profile section of the area before excavation and after excavation.
- Detailed fabrication and connection drawings inclusive of base plate, anchor bolts, nuts & bolts, haunches, stiffeners and all details to facilitate fabrication of column and beam sections and construction.

The detailed design will allow the construction of the fully functioning solar Carport, optimized for minimal cost and at the same time adhering to the quality specifications given below and elsewhere in this tender dossier.
The Contactor shall apply the principles of value engineering for optimization of its design and shall fulfill the quality requirements as specified in the General and Technical Specifications.

The Contractor shall submit all designs to the Engineer for approval. No design or drawing will be released for construction that has not obtained the Engineer's approval. The approval procedure is described elsewhere in this dossier.

Temporary Structures

Site Installation

Provision of temporary quarters, offices, services, workshops, roads, yards, central production plants etc. including operation, maintenance and final removal. Preparation of the construction site and final restoration and all specified environmental protection measures.

Construction of Solar Carport, exclusive of Supply of the Solar array and charging port.

Construction of the Foundation

The concrete foundation structure will provide the support for the solar array and mounting structure (inclusive of beams, columns rafters and purlins). Anchor will be embedded into the concrete foundation to receive columns, beams, purlins and solar array.

Construction of Parking Surface

The Concrete parking surface will be sized to accommodate two full size EV pickup trucks along with the EV charger and allow for simultaneous charging and adequate ingress and egress without any disruptions to vehicle charging.

Construction of Solar PV mounting structure

The PV modules mounting structure must accommodate the PV modules supplied, including modules,

and balance of system components shall be designed to withstand wind loads of at least 60 mph (3-second gust). Array mounting hardware supplied shall be compatible with the site considerations and the environment. Mounting structures of anodized aluminum material shall be provided. Mechanical hardware shall be durable and corrosion resistant. The use of ferrous metals (including but not limited to painted or plated steel), dissimilar metals in contact, or any wood or plastic components is not allowed. Special attention shall be paid to minimizing the risk from exposed fasteners, sharp edges, and potential damage to the modules or support structure. All potentially hazardous hardware must be protected or shielded for safety.

Functional Description of the Permanent Structures

The Contractor shall develop the final design of all temporary and permanent civil structures and of the equipment of the project including for the design of the solar carport equipment such as columns , beams, rafters, purlins and parking surface.

In the following the technical functionality and specifications are described that the structures to be built and equipment to be installed must fulfil. The qualities described are to be considered as minimum requirements, which desirably are exceeded.

Solar Carport Structure

- Dimensions:
    - Length: supporting structure shall be built to accommodate solar panels totaling approximately 6 m, capable of shading two vehicles and an electric vehicle charger as illustrated below.
    - Width: supporting structure shall be built to accommodate solar panels totaling approximately 6 m, capable of shading two vehicles and an electric vehicle charger as illustrated below.
    - Height: 2.35m minimum from lowest point to ground level
    - Space between parking spaces to accommodate EV charger: 1m
- Material: aluminum or galvanized steel or structural steel (coated with anti-corrosive paint)
- Solar PV array DC capacity: 11.25 kWp minimum
- Solar PV array dimensions: approximately 6 m by 6 m from extreme end to end of the modules
- The PV modules mounting structure must accommodate the PV modules supplied.
- The PV array mounting structure, including modules, and balance of system components shall be designed to withstand wind loads of at least 60 kmph (3-second gust).
- Spot base or foundation for structure must be designed and installed for the carport.
- The base or foundation must not impede the parking space for vehicles.

Carport Parking Surface

- Construction of a concrete slab for parking will be required for the sites subject to the procuring entity's final decision on the exact location of the carports. The minimum requirements are as follows:
    - Dimensions: 6m by 6m
    - Excavation of topsoil to a minimum depth of 12 inches. Disposal of excavated material to spoil heap approved by the procuring entity's engineer.
    - Sand fill and compact white sand to a minimum thickness of 6 inches to meet 95% compaction.
    - Install Damp Proof Membrane (DPM) to receive 4-inch slab.
    - Installation of #65 BRC reinforced members tied at 8 inches apart in both directions with a minimum of 2-inch concrete covers.
    - Concrete slab with a minimum thickness of 4 inches at 4000 PSI at 28 days.
    - Final grade/height shall be level with surrounding/ adjacent all-weather surfaces.

Civil Design

Stability and Structural Calculations

Minimum Requirements

The proof of structural stability to be produced and submitted by the Contractor shall include a narrative step-by-step description of the calculations, indicating the applied methods (including the relevant theories, the analysis methods, the computer software etc.) and the obtained results.

The minimum requirements to permit the examination of the Contractor's submittals by the Engineer shall be:

- a description of the structure, or part of the structure, being designed and its structural system (the role of individual structural members within the overall concept);
- a description of the intended load propagation through the structural system into the foundation, and the intended effect of stabilization measures;
- the load assumptions applied, the prevailing ambient conditions, and all relevant material parameters, with a compilation into specific load cases, including for the final condition as well as for critical stages during construction;
- descriptions, characteristics and documentation of all significant software;
- the input data to each calculation;
- all relevant results to confirm the dimensions and efficiency of material utilization.

The proof of structural stability shall be provided for all relevant (critical) conditions during and after construction, and shall adequately consider the interface conditions between existing and new structures, foundations, backfill, etc.

Design Calculation

All design calculations shall include the following minimum formal information in an approved layout and format:

a) Name of Contractor and, if different, Name of Engineering Design Firm subcontracted by the Contractor

b) Name and position of engineer responsible for the design work

c) List of Contents including the sub-sections to be attached, reflecting:
   - the actual work done
   - the work in progress
   - the results.

d) An identification and classification shall be clearly given in the introduction to the descriptions. Data used within the course of the calculations shall be clearly related to the identification system.

All relevant data and results shall be reproducible, shall be sufficiently interpreted to be comprehensive, and shall be presented in English.

Design Criteria

Standards and Basic Information

In general, the British Standards (BS) shall be applied for the design of the Hydropower Plant and other project concrete structures.

The British Standards (BS) codes shall be used for stability calculations and for reinforced concrete dimensioning. In other than design issues, and so far as not specified as binding herein, codes can be applied as appropriate subject to the acceptance of the Engineer. Requirements from standards of different origin shall not be concurrently used without prior consultation of the Engineer.

Basic Documents

The Contractor shall make available to the Engineer the following basic documents within 28 days of the Commencement Date. The documents shall contain information for the use of the Contractor in the detailed design and shall include the following:

1) Design Criteria – Seismic Loads
2) Design Criteria – Climatic Data

Concrete, Steel and Reinforced Concrete Design Information

a) Concrete

According to the Technical Specifications, concrete classes according to BS will be used for the concrete structures.

b) Steel Reinforcement

According to the Technical Specifications, reinforcement steel according to BS will be used for reinforced concrete.

c) Structural Steel

According to the Technical Specifications, structural steel according to BS will be used.

d) Concrete Cover to Reinforcement

The minimum required cover of the reinforcement for all new concrete structures shall be as following:

Formed concrete permanently exposed to backfill or water (nominal)	60 mm
Formed concrete permanently exposed to backfill or water (minimum)	50 mm
Formed concrete not exposed to backfill or water (nominal)	40 mm
Formed concrete not exposed to backfill or water (minimum)	30 mm

e) Permissible Crack Width

Limitation of crack width shall be performed and based on the stipulations of BS and its supplementary documents in consideration of the special requirements of solid structures in hydraulic engineering. Structural elements temporarily or permanently exposed to water shall be

designed as "watertight". The permissible crack width for a stationary crack shall depend on the hydraulic gradient and is given in the following table:

Hydrostatic Pressure Gradient [mWC/m]	**Permissible Crack Width w_{cal} [mm]**
≤ 10	0.20
≤ 20	0.15
≤ 30	0.10

For elements not required to be watertight, the crack width shall not exceed $w_{cal} = 0.25$ mm.

All values given above for the permissible crack width are valid under normal conditions for the load case "heat of hydration" and the permanent structural loads including temperature variations.

f) Shrinkage and Creep

The effects of shrinkage and creep of concrete shall be taken into account in the structural calculations where necessary. In general shrinkage and creep for massive concrete structures (d > 0.80 m) has not to be considered in the calculation.

g) Spatial Reinforcement

Spatial reinforcement shall be provided for massive concrete sections. Spatial reinforcement shall comprise 20 mm reinforcement bars at an axial distance between bars of between 0.60 m and 0.80 m in all three directions. This requirement is based on practical experience and will be sufficient for the stresses resulting from shrinkage, creep and temperature effects.

h) Minimum Reinforcement

Orthogonal reinforcement must be arranged on both faces of plate elements and slabs.

Minimum reinforcement for elements deemed to be watertight shall be 0.1% of the concrete cross-sectional area for each face and each direction, but with a limiting maximum of 25 cm^2/m.

Minimum reinforcement for elements not required to be watertight shall be 0.06% of the concrete cross-section, but with a limiting maximum of 15 cm^2/m.

Dead Loads

A concrete unit weight of 25 kN/m^3 shall be used for the determination of the dead loads, however in the case of verification of safety against uplift a value of 23 kN/m^3 shall be used. A unit weight for structural steel of 78.5 kN/m^3 shall be used in all structural calculations.

Wind Loads

The wind loads during the construction stage shall be considered according to British Standard, wherever necessary.

Temperature Loads

A minimum temperature difference of T = 10° C shall be considered wherever necessary. Higher values of temperature difference and/or differential temperature shall be used whenever required by relevant standards.

Earth Pressure Loads

For the determination of the earth pressure loads, the "earth at rest" pressure shall be considered for structures which are massive (such as the powerhouse and anchor block elements) or which are prevented from significant movement. For these structures the compaction effort loading shall be considered with a value of 50 kN/m^2 within the depth where the earth pressure itself is less than this value.

The Contractor shall carefully examine each structural element to be designed to determine whether an earth pressure other than the earth pressure 'at rest' should be applied in accordance with accepted international design practice. The value of earth pressure to be applied in every case shall be subject to the approval of the Engineer.

Seismic Loads

The seismic loads to be considered in the design are as follows: “Operation Basis Earthquake” (OBE) shall be applied in unusual load cases and the “Maximum Credible Earthquake” (MCE) shall be applied for exceptional load cases. Determination and application of the seismic coefficients based on

the abovementioned peak ground accelerations shall be subject to the approval by the Engineer.

Design Loads Caused by Installed Plant and Equipment

The loads and points of application to be assumed due to turbines or pumps, hydro-mechanical and electrical equipment to be installed under this Contract shall be submitted by the Contractor to the Engineer once they have been confirmed by the Contractor, and not later than 90 days after the Commencement Date.

Service Live Loads

Service live loads are defined as uniformly distributed loads due to general electrical and auxiliary equipment. Where not otherwise defined or notified by the Engineer, service loads will be in accordance with BS. Service live loads shall also include, where appropriate, heavy vehicle loads (e.g. mobile crane load, heavy truck load), impact loads from vehicles etc.

Load Cases and Combinations of Load Cases

Load Cases

Load cases shall be divided in three categories in accordance with British Standards:

Category 1 (main load cases):	all permanent load cases and the load cases which occur very often
Category 2 (unusual loads cases):	load cases which occur with large time intervals
Category 3 (exceptional load cases):	load cases which occur seldom or have an exceptional character.

Permanent loads are defined as relevant loads for the normal operational situation.

Combination of Load Cases

The combination of load cases shall be according to BS for the stability analysis and structural design and shall be approved by the Engineer. Hence three following load combinations are to be considered:

- Load combination 1

  In this load combination, all load cases belonging to category 1 shall be considered with the relevant superposition of load cases.

- Load combination 2

  In this load combination, all load cases belonging to category 1 and category 2 shall be considered with the relevant superposition of load cases.

- Load combinations 3

  In this load combination, all load cases belonging to category 1 and category 3 shall be considered with the relevant superposition of load cases.

Stability Analyses

General

The standard to be applied for the calculation of overall stability shall be British Standard.

The stability analysis comprises the following verifications for the overall stability of the structure:

a) safety against sliding

b) safety against overturning

c) safety against uplift

d) safety against permissible bearing stresses of foundation.

Permissible Bearing Stress

In this verification it shall be checked that in all load case combinations the maximum bearing stress in the foundation area is less than the permissible bearing stress of the foundation ground.

Safety Factors

The required factors of safety shall be in accordance with British Standard. The relevant load case combinations for the four verifications for the overall stability specified above shall be derived for each particular load constellation.

Geotechnical Calculations

The Contractor is responsible to establish all geotechnical parameters necessary for the works by means of appropriate field and laboratory tests. The procedures are subject to the Engineer's approval and will serve as basis for geotechnical calculations.

The geotechnical design shall include:

(i) Foundation design of powerhouse/pumping station

(ii) Design of all types and locations of retaining structures

(iii) Settlement of embankments and backfilled areas

(iv) Critical hydraulic gradients, erosion, suffusion, piping

(v) Slope stability of permanent and temporary embankments

(vi) Earthquake loading by pseudo-static approach.

Since soil behavior in general is non-linear regarding deformation, resistance and see page, the geotechnical design calculations shall address the whole construction process from an initial reference state, taking all non-linear effects into account.

1 Specifications - Technical

1.1 Description of Works

- The Works shall include the supply of all necessary materials, labour, tools, and equipment required for the successful completion of carports at the designated locations. The scope of work includes, but is not limited to, the following works:
- General Carpentry
- Concrete
- Steel
- Painting
- Plumbing
- Electrical installation

All works are to be carried out in accordance with relevant building codes, safety regulations, and project specifications

1.2 National Specifications

Certain specifications issued by widely recognized bodies are referred throughout this Specification. Such Specification shall be defined and referred to as **National Specifications** as hereunder and shall be the latest editions of such National Specifications available twenty-eight (28) days prior to the date set for the submission of Tenders, unless otherwise noted on the plans.

In reference to National Specifications, the following abbreviations are used:

BS	British Standards
BSCP or CP	British Standards Code of Practice
AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society of Testing and Materials

1.3 Units

In general, the Contract Documents and this Specification have been drafted using Imperial System of units where the various National Standards or Specifications are written using metric (SI) units or where metric units occur in the Specification text.

Where the metric units are specified, the use of equivalent Imperial Units or values may be permitted subject to approval of the Engineer. The Contractor shall ensure that any such conversions are accurate and that consistency is maintained throughout the Works.

1.4 Abbreviations

The following abbreviations are used in this Specification:

Units	Abbreviation
Millimetre	mm
Inch	in.
Linear Foot	ln.ft. or ln.ft.
Yard	yd.
Square Yard	sq. yd.
Cubic Yard	cu. Yd.
Cubic Foot	cu. Ft.
Pound	lb.

Gallon	gall.
Number	no. nr.
Diameter	dia.
Hours	hrs.
Pounds per Square Inch	p.s.i.
Newtons per Square Millimetre	N/mm
Kip	k (= 1000 lbs.)
Kips per Square Inch	k.s.i.
Short – Ton (2000 lbs.), Unless otherwise noted.	T or Ton

1.5 **Language and Spelling**

The official language for documentation, communication, and correspondence related to this project shall be English. Spelling maybe in UK – English or US – English appropriate to the subject matter, specification or drawing.

In all cases, the use of one customary spelling implies the other and vice – versa.

1.6 **Method of Construction**

The Contractor shall submit to the Engineer, no later than seven (7) days from the date of award of the Contract, a general description of the proposed arrangements and methods for the execution of the works.
This submission shall include, but not be limited to, the following information:

- Proposed layout of temporary offices and other facilities,
- Details of constructional plant and equipment including type, capacity and intended production output
- Proposed working hours and shift arrangements
- Estimated labour strength and supervisory arrangements
- Sources, quantities, and delivery schedule of materials supply.

During the execution of the works, the Contractor shall also submit to the Engineer full and detailed particulars of any proposed amendments to the arrangements and methods submitted in accordance with the foregoing.
The Engineer's normal working hours shall be confirmed by the Contractor. Sundays and Public Holidays will normally be set aside for rest. If the Contractor wishes to execute permanent works outside these hours, he shall obtain the written permission of the Engineer at least one full working day in advance to enable the Engineer to make provision for supervision of such work.

1.7 **Notice of Operation**

No operation shall be carried out without full and complete notice, having been given to the Engineer by the Contractor, at least twenty-four hours in advance of time of the operation, to enable the Engineer to make such arrangements as he may deem necessary for its inspection and checking. Each stage of the works to be checked shall be agreed with by the Engineer.

The Contractor shall give the Engineer not less than one full working days' notice in writing of his intention to set out or give levels for any part of the works in order that arrangements may be made for checking.

1.8 **Transport for Workmen**

The Contractor shall include the rates and prices for all transport of staff and workmen to and from various parts of and upon or in connection with the works and all costs incurred in securing, recruiting and transporting labour to and from the Site.

1.9 **Temporary Works**

After the Contract is placed and before work commences, the Contractor shall submit drawings to the Engineer showing the general arrangement of his Temporary Works with diagrams and description showing how he proposes to execute such Temporary Works and how they fit into his programme for the Permanent Works, all to be subject to adjustment and approval by the Engineer. The whole Temporary Works and the plant and appliances used, will be the liability of the Contractor in regard to their construction, sufficiency, safety maintenance and removal on completion of the Contract and approval by the Engineer shall in no way relieve the Contractor of his liability. Examination by the Engineer of the Contractor's and/or subcontractors' Temporary Works or of the drawings connected therewith shall not absolve the Contractor from any liability upon him by the provisions of the Contract.

1.10 **Construction Generally**

The following general requirements shall apply: -

When night work is authorized by the Engineer or his Representative, the Contractor shall provide adequate lighting where work is being executed at night and shall provide and install any additional lighting, which the Engineer may require in order to gain access to watch and supervise the works and carry out any testing and examination of materials.

Materials available on the site or materials made available or supplied by the Engineer shall be used solely for the execution of the works.
The Contractor shall minimize the pollution of and disturbance to lands, roads and other places on and around the site. No trees or other vegetation shall be removed except if necessary, for the works.

The Contractor shall ensure that access is provided to all properties adjacent to the site for the duration of the Contract.

The Contractor shall take all reasonable precautions: -

(a) In connection with any rivers, streams, waterways, drains, watercourses, lakes and the like to prevent sitting, flooding, erosion of beds and banks, and pollution of the water so as to affect adversely the quality or appearance thereof or cause injury or death to human, animal or plant life

(b) In connection with underground water resources (including percolating water) prevent any interference with the supply to or abstraction from such sources and to prevent pollution of as to affect adversely the quality thereof.

The Contractor shall be responsible for acquainting himself with observing all current State Ordinances, by – Laws or Regulations including those relating to training levies and similar taxes.

1.11 **Health, Safety and Accident**

The Contractor shall ensure, so far as is reasonably practicable and to the satisfaction of the Engineer, the health, safety and welfare at work of his employees including those of his subcontractors and of all other persons on site. His responsibilities shall include: -

(a) The provision and maintenance of constructional plant and systems of work that are lighted, safe and without risks to health.

(b) The execution of suitable arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage, transport and disposal of articles and substances.

(c) The provision of protective clothing and equipment first aid stations with such personnel and equipment is necessary and such information, instruction, training and supervision are necessary to ensure the health and safety at work of all persons employed on the works all in accordance with applicable laws.

(d) Designation as Safety Officer of one of his senior staff who shall have specific knowledge of safety regulations and experience of safety precaution on similar works and who shall advise on all matters affecting the safety of workmen and on measures to be taken to promote safety.

(e) The provision and maintenance of access to all places on the site in a condition that is safe and without risk of injury.

(f) The provision of adequate waterborne sanitation, refuse collection and disposal, complying with all Application Laws and By Laws and to the satisfaction of the Engineer, for all houses, offices, workshops and laboratories erected on site.

(g) The provision of an adequate number of suitable sanitary facilities at the sites where work is in progress and the execution of appropriate measures in consultation with the appropriate Public Health Authority to control within the site, mosquitoes, flies and pests including the application of suitable chemicals to breeding areas.

Reporting details of any accident to the Engineer and the police and any other applicable regulatory bodies without delay

1.12 Protection of Existing Works and Services

(a) The Contractor shall acquaint himself with the position of all existing services such as sewers, surface water drains, and cables for electricity and telephone, telephone and lighting poles, water main and the like before commencing any work likely to affect the existing services.

(b) The Contractor shall be held responsible for injury to existing works or services and shall indemnify the Employer against any claims in this respect (including consequential damages). The Contractor shall be responsible for the reinstatement of the services so affected.

(c) In all cases where such works or services are exposed, they shall be properly shored, hung up or otherwise protected. Special care must be exercised in filling and compacting the ground under mains, cables, etc., so to leave uncovered exposed water meters, stopcock boxes and similar items.

(d) The Contractor's attention is drawn to BS 162, which gives safe clearance for the various voltages where work is to be carried out in the vicinity of overhead power lines.

(e) Notwithstanding the foregoing requirements, and without reducing the Contractor's responsibility, the Contractor shall inform the Engineer immediately if any existing works or services are exposed, located or damaged.

(f) All costs which may be incurred by the Contractor as a result of programming and coordinating work to enable any alterations to the services to be carried out and the cost of any safety precautions which shall be deemed necessary due to the proximity of the works to the power lines shall be at the Contractor's expense.

2 Concrete

2.1 Cement

The cement used in the Works shall be ordinary Portland cement (OPC) or equivalent complying with BS 12.
The Contractor shall supply samples of cement, when requested by the Engineer, both from the Contractor's store on Site and from the place of supply. All cement shall be fresh, free from lumps, and stored in a dry, weatherproof location.

2.2 Aggregate

Aggregates for concrete shall comply with BS 882 at the time of use. Fine aggregate shall consist of natural sand. The Engineer will permit the addition of suitable crushed rock where in his opinion it is impracticable to obtain the required grading of the combined aggregates otherwise than by such addition. The maximum quantities of clay, silt and fine dust shall, in any event, not exceed 3% by weight as determined by the test given in Clause 7.2.4 of BS 812: Part 1.

Coarse aggregate shall comply with the requirements in Table 1 of BS 882 for graded aggregate to the nominal maximum size specified for the appropriate class of concrete.

The aggregates shall be such that concrete, when made and tested in accordance with Building Research Station Digest 35 (2nd series), shall not show a drying shrinkage greater than 0.065%.

Immediately after commencement of the Works the Contractor shall make tests to the satisfaction of the Engineer before the Engineer will give approval to the source of aggregate proposed by the Contractor. Alternatively, and subject to the approval of the circumstance by the Engineer, the Contractor may submit a certificate from an independent laboratory.
Unless otherwise specified, separate fine aggregate and ¾ in. nominal maximum size coarse aggregate shall be used.

During the performance of the Contract, the Contractor shall supply samples of aggregates when required by the Engineer (the samples shall be taken in accordance with BS 812) at a frequency at least once weekly at each source of each grading approved by the Engineer.

2.3 Water

The water used for making and curing concrete shall be from a source approved by the Engineer and at the time of use shall be clean, free from salinity and polluting matter in any quantity.

2.4 Additives

Concrete shall be made from cement, aggregate and water as specified. No other ingredient shall be mixed with the concrete or mortar without the Engineer's approval.

2.5 Chemicals in Materials

The total sulphate content, whether as gypsum or more soluble salts, of concrete ingredients, shall together not exceed 4% of the weight of cement in the concrete.

The chloride content of concrete ingredients when measured as CI (Choride Ion) shall together not exceed 0.2% of the weight of cement in the concrete mix.

2.6 Storage of Materials

The Contractor's arrangements for storing and handling the materials for concrete shall be subject to the approval of the Engineer. Materials shall be stored in a manner that prevents contamination, deterioration, or segregation and ensures their quality is maintained up to the point of use. The Contractor shall provide adequate protection against weather and other adverse environmental conditions, and shall implement appropriate handling procedures to avoid damage or loss.

2.7 Formwork

Formwork shall be constructed to obtain the required profiles and surface textures of the structures and be such that it remains rigid during the placing and setting of the concrete.

It shall be fixed in accurate alignment and to the true shape and dimensions of the Permanent Works shown on the Drawings or ordered by the Engineer.

A method of support which would result in holes extending the whole width from face to face of concrete which forms part of the Permanent Works may be permitted at the Engineer's sole discretion. Any such holes shall be made good to the satisfaction of the Engineer and shall be located a minimum of 2 ins. clear of any reinforcement.

No plugs, bolts, wire ties, hold fasts or any other appliance whatsoever, for the purpose of supporting the formwork or reinforcement, shall be fixed permanently into the structure so that they have less cover than the reinforcement or in any way impair the strength or appearance of the work, nor shall they be placed in such a manner that damage to the work would result in the removal of the same at the time of striking the formwork.

Unless otherwise approved, top formwork shall be provided for concrete upper surfaces where the slope exceeds one vertical in three horizontals.

Except where otherwise specified, formwork for concrete faces which will remain exposed in the Permanent Works, shall be "fair finish" formwork, which is to say that it shall be such as will prevent the loss of any ingredients from the concrete and will produce a dense smooth concrete surface without discontinuities of line, texture or appearance.

Except where otherwise specified, formwork for concrete faces which will remain hidden in the Permanent Works, shall be "rough finish" formwork, which is to say that it shall be such as will prevent the loss of any ingredients from the concrete and will produce a dense concrete surface.

Unless otherwise shown on the Drawings, exposed concrete edges shall be formed with a chamfer measuring ¾ in. x ¾ in.

Before each concreting operation is commenced, formwork shall be carefully examined and cleaned.

All formwork in contact with concrete shall be treated with an approved composition before each usage to prevent adhesion of the concrete. Such composition shall be carefully applied in such a manner that there is no contamination of the reinforcement or previously placed concrete by the composition.

Formwork shall only be removed with the permission of the Engineer, and the work of removing it after the receipt of such permission shall be carried out under the personal supervision of a competent foreman. Great care shall be exercised during the removal to avoid shocks to, or reversal of stress in the concrete.

2.8 Reinforcement

Reinforcement shall be deformed mild steel bars and shall comply with BS 4449.

Steel fabric reinforcement shall comply with BS 4483. The reinforcement at the time of incorporation in the Permanent Works shall be clean and free from damage, loose mill scale and loose rust. Bars which have become bent shall not be straightened or re-bent for incorporation in the Works without the Engineer's approval.

2.9 Bending Schedules

Bar bending and fixing shall be according to the Bar Bending Schedule. Alteration to the bending and fixing of bars shall only be made with the approval of the Engineer.

2.10 Fixing Reinforcement

Steel reinforcement shall be cut from straight bars free from links and bends or other damage, and bent by experienced competent workmen. Bars of diameter ¾ in. or greater shall be bent in a bending machine designed for that purpose and approved by the Engineer.

The Contractor shall place and fix steel reinforcement accurately in the position shown on the Drawings and shall ensure that it remains rigidly in that position during the placing of concrete. Tack welding, with the prior approval of the Engineer, may be permitted for fixing bars crossing at right angles but no other welding will be allowed. Supports, spacers including PVC spacers and ties shall be subject to the approval of the Engineer. Concrete spacers shall be made of the same quality concrete as that for the work in which they will be embedded. Metallic spacers, fixing clips and tying wire shall be compatible with the material of the reinforcement, and the specified cover shall be maintained. Reinforcement projecting from previously cast concrete and not wholly embedded in concrete shall not be bent and re-bent or reshaped without the prior approval of the Engineer.

The main wires of adjacent sheets of steel fabric reinforcement shall be lapped at least 12 ins. and the transverse wires at least 6 ins.

The Contractor shall not place concrete around reinforcement until the Engineer has inspected and approved it.

2.11 Cover to Reinforcement

Except where otherwise shown on the Drawings or ordered by the Engineer, the concrete cover in the finished Permanent Works to the nearest reinforcement (exclusive of concrete blinding, plasters or decorative finishes) shall be 2 ins. This requirement does not apply to concrete faces in box-outs left for the installation of gates etc.

The distance between any two parallel bars shall not be less than ¼ in. more than the normal maximum size of aggregate in the concrete, except at approved laps.

2.12 Classes of Concrete

The concrete used in the Permanent Works shall be of the class shown on the Drawings or indicated in the Bill of Quantities or ordered by the Engineer. Characteristics of the Classes of concrete which may be used are given in Tables 4.1 and 4.2 herein.

Except where otherwise specified herein, the concrete ingredients, manufacturer, testing and workmanship shall conform to the requirements of BS 8110 and BS 5328.

The water cement ratios referred to in the Specification are the ratios by weight of free water to cement in the mix and are based on the aggregates being in a saturated surface-dry condition.

The Contractor shall not commence concreting in the Permanent Works until a trial mix design for the class of concrete required has been approved by the Engineer pursuant to Clauses 3.13 hereof.

Adjustments to the concrete mix proportions will only be made if, in the opinion of the Engineer such adjustments are necessary.

The Contractor shall not alter the mix proportions or the source of supply of any of the ingredients without having previously obtained the approval of the Engineer.

2.13 **Designed Mixed Concrete**

Contractor shall determine to the approval of the Engineer the actual proportions of ingredients for each class of concrete. Unless otherwise agreed by the Engineer and except where not consistent with this Specification, such determination shall be in accordance with the recommendations of BS 5328 and BS 8110: Part 1.

The Contractor shall make trial mixes for each class of concrete using the same type of Constructional Plant and the same material as are proposed for the Permanent Works. The Contractor shall give 24 hours' notice of such trials to enable the Engineer's Representative to attend. For each trial mix, three separate batches of concrete shall be made. From each batch of concrete, three 6 ins. concrete cubes shall be made by the Contractor and will be tested by the Engineer at 28 days all in accordance with BS 1881. A trial mix design will be approved by the Engineer.

Note: High workability: slump 65 to 135mm.
Medium workability: slump 50 to 100mm.
Quoted slump values are given as guide only and 2021
be varied to the approval of the Engineer.

2.14 **Compliance with Strength Requirements**

Of the three cubes made from each sample of fresh concrete in accordance with Clause 14.2 of the Specification, one will be crushed at 7 days and the other two at 28 days. The average of the 28 days strength will be taken as the test result. Compliance with the specified strength requirements shall always be judged on the 28 days tests results. Concrete shall be considered to have failed to comply with the Specification:

(a) if a test result is less than the testing plan minimum specified for that class of concrete, in which case the concrete which it represents shall be broken out and removed by the Contractor when ordered;

(b) if the average of four consecutive test results for that class of concrete shall have failed to exceed the testing and strength as specified in which case no further concrete of that class shall be placed in the Permanent Works until the Contractor shall have discovered the cause of such failure and rectified to the satisfaction of the Engineer.

2.15 Control and Mixing Ingredients

The Contractor shall proportion the ingredients of each batch of concrete accurately by weight. The water shall be added to the aggregates and cement in a mechanical batch mixer; it shall not exceed the amount specified in Table 4.2 hereof and shall otherwise be the minimum amount necessary consistent with complete compaction. The device for measuring water shall show accurately the weight required having regard to the moisture content of the aggregate and shall be so designed that the water supply will be stopped automatically when the correct quantity have been discharged into the mix. The concrete ingredients shall then be mixed thoroughly.

2.16 Truck Mixed Concrete

Truck mixed concrete may be used with the prior approval of the Engineer provided that it complies with the Specification and with BS 5328, and that the water for the mix is added at the sites adjacent to the point of final deposit.

Truck mixers shall comply with BS 4251. The manufacturer's data listed in Appendix B of BS 4251 shall be submitted to the Engineer for approval if requested.

2.17 Transporting, Placing and Compacting Concrete

The concrete shall be handled so that, at the point of deposition, it is of the specified quality and consistency, nothing having been added to it or lost from it since leaving the mixer, and segregation of the concrete ingredients is avoided.

The Contractor shall obtain the approval of the Engineer to these proposed arrangements before commencing concreting. The Contractor shall regard the compaction of the concrete as a work of fundamental important and shall produce a watertight concrete of maximum density compatible with the approved mix. Compaction shall be assisted by the use of mechanical vibrators of the immersion type but shall not involve the vibration of reinforcement or shutters. The number and type of vibrators available for use during each period of concreting shall be to the approval of the Engineer, which will not be given if sufficient stand-by vibrators are not readily available in good working order.

2.18 Surface Finishes Produced Without Formwork

a) Screeded Finish

The concrete shall be levelled and screeded to produce a uniform plain or ridged surface as required. No further work shall be applied to the surface unless it is a first stage for a Wood Float or Steel Trowel Finish.

b) Wood Float Finish

The Screeded Finish shall be wood floated under light pressure to eliminate surface irregularities.

c) Steel Trowel Finish

When the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the surface to the Wood Float shall be steel-towelled under firm pressure to produce a dense, smooth, uniform surface free from trowel marks.

Where the type of finish is not given, it shall be Wood Float Finish.

2.19 Surface Finishes Produced with Formwork

a) Smooth Finish

This finish shall be obtained by use of formwork lined with material approved by the Engineer to provide a smooth finish of uniform texture and appearance. The contractor shall make good any imperfections in the finish as required by the Engineer.

b) Rough Finish

This finish shall be obtained by the use of molds or properly designed forms of closely-jointed sawn boards. The surface shall be free from substantial voids, honeycombing or other large blemishes.

2.20 Concrete Surfaces to Be Repaired

Except at movement joints, concrete surfaces which are to be covered by further concrete or cement mortar shall be thoroughly cleaned to expose the surface of the aggregate and to remove all laitance by hacking, wire brushing, washing with water or air under pressure or other approve means.

2.21 Concreting in Unfavorable Weather

The Contractor shall not place concrete:

(a) during heavy rain

(b) when the air temperature is more than 43°C.

When the air temperature exceeds 30°C, the Contractor shall not place concrete without the approval of the Engineer and without taking such precautions as may be required to keep the temperature of the concrete during mixing and setting below 30°C, for example, keeping the concrete materials and shutters shaded from the sun and the aggregate and shutters sprayed with water.

Concrete shall not be poured against shutters which are hotter than 86°F (30°C) without approval of the Engineer.

2.22 Curing Concrete

Until it has thoroughly hardened, concrete shall be protected from the harmful effects of wind, sun, temperature and variations of temperature, premature loading or deflection or impact, and aggressive groundwater.

Unless otherwise approved by the Engineer, exposed concrete surface shall be kept continuously moist after casting for not less than 7 days. Such surfaces, immediately upon exposure, shall be covered with thick Hessian or sand or other material as may be approved by the Engineer, which shall be in continuous contact with the concrete and which shall be kept wet to the satisfaction of the Engineer. The use of curing membranes will not be permitted.

2.23 Payment

Item - Blinding Concrete - Sq. yd.

Blinding concrete shall be measured by the plan area below the structure to the thickness shown in the drawings.

Item – Structural Concrete – Cu. yd.

Structural concrete shall be measured to the lines shown on the drawings or to such other lines as ordered by the Engineer.

No deduction in volume shall be made for chamfers, rebates, nosings, bolt holes, joining materials reinforcement.

Concrete used to fill cavities resulting from over excavation shall not be measured for payment.

The rate shall include for the preparation and testing of trial mixes and sampling and testing of approved mixes.

Item – Reinforcement bars - lbs
Steel bar reinforcement shall be measured by mass calculated from the dimensions shown on the drawings. Laps not shown on the drawings or specified on the approved bar bending schedule shall not be paid for.

The rates shall include for cleaning, cutting and bending, binding wire, supports and spaces.

Item - Fabric Reinforcement - Sy. yd.
Fabric reinforcement shall be measured as the area of work covered stating the BS Reference Type. The rate shall include for laps binding wire and supports.

Item – Formwork
– Sy. yd.
Formwork shall be measured by the area of the sides and soffits or the reinforced concrete structural members. The rates shall include for struts, ties and shores that are required

3 Roofing and Gutters, Galvanized Steel Sheeting

3.1 Roof covering shall be Industrial Profile Trapezoidal sheeting of approved manufacture to the gauge specified conforming in all respects to BS 3083 (for standard Industrial profile sheeting). The contractor will verify with the Engineer the exact length of sheet used for roofing.

3.2 Shingles

Shingles shall be hand split wallaba 16-inch-long in random widths laid to 5-inch (125mm) gauge on 2-inch x 1 1/4-inch timber battens each shingle fixed with two 1 1/2-inch-long galvanized nails. Eaves shall have a double course of shingle. Ridges shall comprise two courses of shingles 5-inch-wide each wing with staggered joints and fixed with galvanized nails through the shingles.

3.3 Aluminum Sheeting

Aluminum sheet roofing shall comply with B.S. 2855 (for Trapezoidal sheeting) and B.S. 3428 (for trougbed sheeting). Fixing aluminum sheets to timber shall be with aluminum alloy drive screws with saddles, plastic washers and covers.

3.4 Fixing Roof Sheeting

Lay sheets as described with at least one full Trapezoidal side lap or 6 inches overlap. Sheets shall be securely nailed to the roof with galvanized broad-headed roof nails of suitable length at intervals not exceeding ten inches to give continuous lines. The laying of sheets shall commence at the western-most end of the roof slopes so that exposed edges are downwind.

3.5 Ridgings and Flashings

Ridgings and flashings shall be 22-gauge aluminum or 24-gauge galvanized sheeting cut to the size, and bent to the profile shown and accurately fixed with galvanized drive screws and reopened washers.

3.6 Watertight

Leave roofs clean and watertight at completion to the satisfaction of the Engineer. All cavities between roof and ceiling are to be adequately ventilated.

3.7 **Prices**

Prices for roofing and gutters shall include: -
All materials, plant and labour required for completing the works and shall not be limited to sealing all joints and securing each member according to specifications.

Payment shall be made as itemized in the Bill of Quantities i.e. in Sq. yd. (squared yards), Lin. Ft. (linear feet) and No. (number).

4 **Painting**

4.1 **General**

All paints are to be delivered to site in the manufacturers' sealed containers and to be used strictly in accordance with the manufacturers' instructions. All materials used unless otherwise stated shall be anti-fungus.

4.2 **Preparation and Application**

Thoroughly dust and clean down surfaces to be painted, cut out cracks, stop holes and clean steelwork of rust in accordance with approved practice. Apply paint by brush, roller or spray with the minimum of dilution. Allow to dry well and rub down each coat of paint before the next is applied. No paint shall be applied to a damp surface, and no external painting shall be carried out during wet weather.

4.3 **Brand Names**

The brands of paints which the Engineer will accept in these Works are Berger, TORGINOL (Guyana) Ltd. manufactured by Continental Agencies Ltd., Sissons Paints (West Indies) Limited, or ICI Paints Limited, or other equivalent brands as may be approved by the Engineer.

4.4 **Woodwork**

All wood surfaces to be painted shall be properly rubbed down, and primed before painting.
Woodwork is to be painted with one coat of lead-free wood primer after which all cracks, holes etc. shall be filled with anti-fungus putty which shall be allowed to set before sanding and applying two coats of oil paint.

All timber will be painted as specified above with the exception of the underside of floors, threaders, landing boards and all roof members when not exposed.

4.5 **Metal Work**

The surfaces of metal work to be painted shall be prepared by removing dirt, grease etc. with an approved solvent and rust and scale by wire brushing and allowing to dry.

Metal surfaces are to be painted with at least one coat of primer and two coats of oil paint allowing at least one hour drying between coats.

4.6 **Masonry**

Masonry surfaces are to be prepared for painting by allowing them to dry for as long as possible, remaining all mortar splashes by rubbing with a pumice or flat stone and thoroughly brushing to remove dust. The priming coat shall be allowed to dry. All cracks, holes etc. shall then be filled with a patent filler which shall be allowed to set and sanded to a smooth finish before the application of subsequent coats.

Colours are to be specified by the Client from an approved range of colours.
Prices for painting shall include: -

For supply of labour, plant and material required for completing of the works. Rates shall also include for overheads, wastages, profits or any other as the contractor may deem necessary.

Payment shall be made in Sq. yd. or otherwise described in the Bill of Quantities.

5 **Materials Testing and Workmanship**

5.1 **Standard Specification**

Except where otherwise specified all materials and workmanship shall conform with the requirements of the relevant British Standards and British Standards Codes of Practice (hereinafter referred to as BS or CP) issued by the British Standards Institution current on 1st January, 1995. Other equivalent international Standard Specifications may be substituted at the sole discretion of the Engineer or as may have been agreed in the Contract.
All materials and workmanship not fully specified herein or covered by an approved Standard shall be of such kind as is used in first class work and suitable to the climate in the Project Area.

5.2 **Concrete Sampling and Testing**

The Contractor shall be responsible for providing samples of concrete and its constituent materials, either for testing by himself on behalf of the Engineer or for testing at an approved laboratory. For this purpose, concrete test cubes which shall be made in accordance with BS 1881, shall be deemed to be "samples". All sampling of constituent materials shall be carried out in accordance with the provisions of the appropriate British Standard, and all sampling of fresh and of hardened concrete shall be carried out in accordance with the provisions of the relevant British Standard.

Details of all such samples shall be recorded by the Contractor and passed to the Engineer. The frequency with which such samples are to be delivered will be given by the Engineer in the form of the sampling plan. The Engineer will make available to the Contractor the results of each tests carried out on the samples so provided.

The tests which the Contractor is required to undertake himself on behalf of the Engineer are those to be carried out on fresh concrete at the place of final deposit, or elsewhere on the Site as directed by the Engineer. These tests comprise slump tests to BS 1881. The Contractor shall keep records of all such tests results and supply copies of same to the Engineer. The frequency with which these tests are carried out shall be as directed by the Engineer in the form of a testing plan.

5.3 **Sampling**

The Contractor shall provide for the approval of the Engineer samples of all construction materials and manufactured items required for the Permanent Works, if ordered. All samples rejected by the

Engineer shall be removed from Site. All approved samples shall be stored on Site by the Contractor for the duration of the Contract, and any materials or manufactured items subsequently delivered to Site for incorporation in the Permanent Works shall be of a quality at least equal to the approved sample.

Item – Prov. Sum.
Payment for material testing shall be made based on the number of tests ordered by the Consultant.

6 Masonry

6.1 Introduction

This Specification covers the materials and workmanship in connection with concrete blockwork both externally and internally, and the mortars to be used. It includes associated materials and workmanship for wall ties, damp-proof courses, mesh reinforcement, cavity wall insulation and movement joints.

6.2 References

The Works shall be designed and the materials, workmanship and tests conform to the following Standards and to the Standards and Codes of Practice that are referred to within those Standards.

Number	Title
BS 12	Ordinary and Rapid Hardening Portland Cement
BS 743	Materials for damp-proof courses
BS 890	Building limes
BS 1200	Building sands from natural sources
BS 1243	Metal ties for cavity wall construction
BS 3533	Glossary of Thermal Insulation Terms
BS 4027	Sulphate Resisting Cement
BS 4449	Specification for hot rolled steel bars for the reinforcement of concrete
BS 4482	Hard drawn mild steel wire for the reinforcement of concrete
BS 5224	Masonry cement
BS 5628	Use of Masonry
BS 5642	Sills and copings
BS 6073	Pre-cast concrete masonry units

6.3 Submittals

The Contractor shall make the following submittals to the Engineer:

(1) Material Samples - blocks, mortar, dpc, ties, cavity insulation, reinforcement.

(2) Manufacturer's Certificates stating that the materials and goods comply with the Specification.

6.4 Materials

6.4.1 General

The Contractor shall provide all necessary accessories, including cavity wall ties, angle cramps, nails, shot fired fixings and screws for building in and tying in b10ckwork to frames, damp-proof courses and expanded metal or wire mesh reinforcement as specified.

6.4.2 Concrete Blocks

Blocks shall be in accordance with BS 6073 and shall be marked with the following particulars either by delivery note, invoice or suppliers certificate.

(i) Name of Manufacturer

(ii) Dimensions and whether solid, cellular or hollow

(iii) Thermal conductivity value

(iv) Minimum compressive strength

6.4.3 Cements for Mortars

Cements for mortars shall comply with one of the following British Standards:

BS 12 Ordinary and Rapid Hardening Portland Cement

BS 4027 Sulphate Resisting Cement

BS 5224 Masonry Cement

Masonry cements shall be used strictly in accordance with the manufacturer's recommendations.

High aluminia cement shall not be used. .

6.4.4 Lime for Mortar

Lime for mortar shall by hydrated grey-stone lime in accordance with BS 890 for hydrated calcium limes. Magnesium lime shall not be used in mortar for brickwork below the damp-proof course.

The Contractor shall forward copies of Manufacturer's Certificates to the Engineer, which, in addition to certifying compliance with BS 890, shall give details of the type of lime. If lime is delivered as lime putty, the certificate shall state whether quicklime or hydrated lime was used in its manufacture.

All lime shall be efficiently protected against deterioration during transport and whilst stored on site. Different types or brands of lime shall be stored separately in dry conditions in a manner that allows it to be used in the order of delivery.

When lime putty is to be used, the Contractor shall obtain the approval of the Engineer of his arrangements for transport, handling and storage. Precautions shall be taken to prevent contamination and drying out of lime putty stored on site. Lime putty made from quicklime should mature for at least fourteen days before being used. Where it is made from hydrated lime (powder), lime putty should stand for at least sixteen hours before use.

6.4.5 Water

Water shall be as specified as for concrete.

6.4.6 Sand for Mortars

Sand for mortar shall be naturally occurring material Complying with BS 1200. It shall be stored on clean surfaces in such a manner as to allow adequate drainage and to prevent contamination by other materials.

The Contractor shall obtain certificates of compliance with BS 1200 for the supplier and submit copies to the Engineer. If additional information called for in BS 1200 clause 8. If certificates or control information is not available, the Contractor shall carry out his own regular tests to the satisfaction of the Engineer.

Marine sand shall not be used.

6.4.7 Plasticisers for Mortars

Plasticisers, when added to mortars, shall be used strictly in accordance with the manufacturer's instructions.

6.4.8 **Mortar Mixes**

The mortar mix proportions for all work covered in this section shall be appropriate to the strength and permeability of the building block used and to the degree of exposure of the finished work.

6.4.9 **Wall Ties**

Wall ties for cavity walls shall be galvanised steel complying with BS 1243 and at spacings in accordance with BS 5628.

6.4.10 **Metal Fixings for Masonry**

Cramps, dowels and other metal fixings for masonry_work shall be of galvanised steel or nonferrous metals.

6.4.11 **Reinforcement in Brickwork and Blockwork**

Where required for structural stability, vertical reinforcement of high yield deformed steel to BS 4449 shall be provided for hollow concrete blocks, the voids being filled with concrete as the work proceeds.

Lap lengths for vertical reinforcement shall be a minimum of 50 diameters.

6.4.12 **Lintels**

The blockwork over all openings in walls shall be supported on pre-cast concrete lintels or purpose made stainless or galvanised steel lintels.

6.4.13 **Sills and Thresholds**

External sills and thresholds are to be formed with tiles or pre-cast concrete complying with BS 5642.

Internal skills shall be of softwood in dry areas, or tiles, slates etc., in wet areas.

6.5 **Workmanship**

6.5.1 **General**

All work shall be carried out in accordance with the recommendations of BS 5628 Pt 3 for block masonry.

Sample panels shall be prepared for not less than 2 square metres of each class of facing masonry to be *employed in the* mortar, gauge and pointing specified. Work shall not proceed until the sample panels are approved. All facing masonry shall conform with the approved Sample.

6.5.2 **Laying of Brickwork and Blockwork**

Blocks shall be laid on a full bed of mortar with joints filled solid to a consistent thickness of not more than 12 mm.

Walls shall be carried up uniformly with no part more than 1.7 m higher than any other. Work shall be plumbed and levelled at each course.

Blockwork below ground level shall be laid in 1:3 cement mortar.

Faces of walls shall be kept clean and free from mortar droppings and splashes.

6.5.3 **Bonding of Blockwork**

All drawings shall define the bond pattern for every leaf shown.

No half blocks or bats shall be used except where necessary for bonding.

6.5.4 **Hot Weather Laying**

In hot dry weather absorbent blocks shall be wetted before laying.

Blockwork shall be protected from the effects of hot sunlight and drying winds until the mortar has sufficiently matured.

6.5.5 Wet Weather Laying

Freshly laid blockwork shall be protected against the effects of wet weather during interruptions in work and at the end of each day.

6.5.6 Finishing Joints in Blockwork

Joints which are not visible on the finished work shall be struck off as the work proceeds.

Exposed blockwork shall be finished with an approved joint profile.

Where blockwork is to be plastered, joints are to be struck off and left rough to provide a key.

6.5.7 Movement Joints

Movement joints shall be provided at 7.5 m. centres maximum. They shall incorporate a joint filling strip and sealant. Gaps in movement joints shall be left free from debris and shall not be pointed with mortar.

6.5.8 Concrete Abutting Blockwork

Where concrete abutts external blockwork it shall be coated with two coats of bitumen paint.

Blockwork shall be tied to concrete surfaces with stainless steel adjustable ties fixed to slots cast into the concrete.

6.5.9 Building in Frames

Openings in masonry for doors, windows, air conditioning units, ventilators and fans etc., shall be properly marked out and built as the work proceeds. Where frames are to be built in as the masonry work proceeds the frames shall be fitted with approved anchors and propped and strutted as required.

The back surface of steel and galvanised fitting shall be coated with a bituminous paint before fixing.

6.5.10 Stacking and Storage of Blocks

All blocks shall be stacked by hand on approved hard standings. They are to be stored in orderly stacks so arranged that they are used approximately in the order in which they are delivered. The stacks are to be clear of standing water and the blocks are to be protected from splashing by mud or contamination by other materials.

Blocks shall be stored either on pallets or by other methods to the approval of the Engineer, in order to prevent absorption of moisture from the ground which may contain dissolved sulphates or other soluble salts.

6.5.11 Finished Blockwork

All blockwork shall be true to line and level. On completion, the work shall be cleaned down and mortar droppings and other marks removed.

Stained, chipped or any other defects of materials or workmanship shall be made good at the Contractor’s expense.

The Contractor shall take all precautions to prevent efflorescence which could be caused by soluble materials from other sources.

6.5.12 Testing of Concrete Blocks

Concrete blocks shall be tested in accordance with BS 6073 at the rate and for the test given by Table. This information shall form part of the manufacturer’s certificate of compliance. Where no such certificate is available, the Contractor shall carry out independent test according to BS 6073 Appendices A, B, C and D.

7 Structural Steelwork

7.1 Introduction

This section covers the supply and erection of the structural steelwork and all associated components which are necessary for the proper completion of the Works.

7.2 References

The Works shall be designed and the materials, workmanship and tests conform to the following standards, and to the standards and Codes of Practice that are referred to within these standards.

Number	Title
BS 499	Welding terms and symbols
BS 709	Methods of testing fusion welded joint and weld metal in steel.
BS 729	Hot dip galvanised coatings on iron and steel articles.
BS 2600	Methods for radiographic examination fusion welded butt joints in steel.
BS 2853	Design and testing of steel overhead runway beams.
BS 2989	Hot-dip zinc coated steel sheet and coil.
BS 3692	ISO metric precision hexagon bolts, screws and nuts.
BS 3900	Methods of tests for paints.
BS 3923	Methods for ultrasonic examination of welds.
BS 4190	ISO metric black hexagon bolts, screws and nuts.
BS 4232	Surface finish of blast-cleaned steel for painting.
BS 4360	Weldable structural steels.

American Welding Society (A WS) D "Structural Welding Code - Steel". AISC "Code of Standard Practice for Steel Buildings".

National Structural Steelwork Specification - BSCA Publication

BS 4395	High strength friction grip bolts.
BS 4416	Method for penetrant testing of welded or brazed joints in metal.
BS 4592	Industrial open type metal flooring and stair treads.
BS 4870	Approval testing of welding procedures.
BS 4871	Approval testing of welders working to approved welding procedures
BS 4921	Sheradized coatings on iron and steel articles.
BS 5135	Metal arc welding of carbon and carbon manganese steels.
BS 5493	Protective coating of iron and steel structures against corrosion.
BS 5950	Structural use of Steelwork in Building.

7.3 Submittals

The Contractor shall make the following submittals to the Engineer:

(1) Production mill sheet and quality control tests sheets for each delivery of structural steel.

(2) Full details of the results of material tests.

(3) Full details of steel types and types of nuts and bolts to be used.

(4) Full details of erection procedures

(5) Full details of proposals for all main welds, arrangement of welded assemblies and welding procedure.

(6) Approval of welders including all tests for welders.

(7) Full details of protection system to be used for steelwork.

(8) Test results for paint thickness.

7.4 Materials

7.4.1 Steel

Materials and workmanship shall conform to BS 5950.

The quality of the steel to be used shall conform to the requirements of BS 4360.

Each steel section shall be stamped or marked with a private mark for the purpose of identification.

The Contractor shall produce for each delivery of structural steel copies of the manufacturers production mill sheets and quality control test sheets.

7.4.2 Nuts and Bolts

The Contractor shall supply and fix nuts and bolts that comply with one or more of the following standards.

The Contractor shall submit details of nuts and bolts to be used in the construction to the Engineer for approval.

- BS 3692
- BS 4190
- BS 4395

7.4.3 Holding Down Bolts

Holding down bolts shall be mild steel and shall be adequately anchored in the foundation by washer plates or other approved method.

7.4.4 Protection of Bolts

All bolts shall be galvanised to BS729.

7.4.5 Floor Plates

Floor plates shall be non-skid mild steel plates with raised pattern (not diamond), shall be a minimum of 10 mm thick and shall be adequately supported.

7.4.6 Welding Electrodes

Electrodes for metal arc welding shall comply with BS-3639.

7.4.7 Protection for Steelwork

The Contractor shall provide and apply protective coatings to all steelwork Protective coatings shall comply with the requirements and recommendations of BS 5493.

The protective coating shall comply with the requirements and recommendations of BS 5493 Table For exterior steelwork the finish shall comply with Table 3 part 3 - Exterior Exposed Polluted Coastal Atmosphere. The typical time to first maintenance shall be taken as 10-20 years.

The Contractor shall submit to the Engineer full details of the protective system to be used. All manufacturer's data, instructions and recommendations related to the system shall be submitted.

Where steelwork is to be cased in masonry the surface shall be given two coats of approved bitumen paint in addition to the paint system specified above. Where steelwork is to be cast into concrete, the surface shall be left unfinished, and shall be thoroughly wire brushed prior to placing of concrete. Adjacent finishes shall continue a minimum of 100 mm into the concrete casing.

7.4.8 **Workmanship**

7.4.9 **Standard of Workmanship**

All workmanship shall comply with BS5930: Part 2 plus the following requirements.

7.4.10 **Thermal Cutting**

Manual thermal cutting of edges to be welded shall not be carried out.

Manual thermal cutting shall not be carried out except for wall end of beams, notching and such other applications as may be approved.

The edges of all plate cut by flame and subsequently welded shall be machined prior to welding.

7.4.11 **Heat treatment**

Details of all heat treatment shall be submitted for approval prior to the commencement of fabrication.

7.4.12 **Burrs**

Holes which are drilled through two or more separable parts shall have all burrs removed after separating the parts.

7.4.13 **Holes in Welded Members**

All bolt holes in members built up by welding shall be drilled after welding has been completed.

7.4.14 **Welding**

Welding procedures shall comply with British Standards 449, 499 and 5135.

7.4.15 **Welding Procedures**

The Contractor shall submit to the Engineer for approval his proposals for all main welds, arrangement of welded assemblies and welding procedure, at least 6 weeks prior to fabrication.

7.4.16 **Approval and Testing of Welders**

The Contractor shall submit to the Engineer documentation showing that the welders are suitable for the work upon which they will be employed. For this purpose the welders shall have satisfied the relevant requirements of BS 4872, Part 1. If the welders will be working to approved welding procedures, they shall have satisfied the relevant requirements of BS 4871, Part 1.

7.4.17 **Connections**

Bracing connections shall develop forces not less that 50 percent of the effective capacity of the number.

All connections shall have a minimum of 2 bolts per connection and the gusset plates shall have a minimum thickness of 10 mm.

Beam connections shall be designed to resist the reaction of the beam considering it to be uniformly loaded, laterally support, and fully stressed in bending where this is less than the actually applied load.

In general shop connections shall be welded connections and field connections shall be bolted connections.

7.4.18 **Bolting**

Holes shall not be distorted or enlarged when using drifts. Drifts of larger diameter than the *hole* shall not be used.

For all bolt assemblies the strength grade combination of bolts/nuts/ washers used shall be as recommended in the relevant British Standard.

No threaded portion of any bolt shall be within the thickness of the parts bolted together, nor shall any portion of the shank extend beyond the face of the washer when fully tightened.

The end of each bolt shall protrude by at least one complete thread and by not more than three complete threads beyond the outer face of the nut.

The Contractor shall carry out only bolted connections for steelwork erected on site. All welded connections shall be carried out under workshop conditions.

7.4.19 **Paint Treatment and Preparation**

The thickness of each coat of paint should in no case be less than 80% of the thickness required by BS 5493 and the average over any area should equal or exceed the specified thickness.

Dirt and grease shall be removed by emulsion cleaners followed by thorough rinsing with water, or by steam cleaning, or by control led high-pressure water jets. The Contractor shall not use solvents or detergents.

Standards of surface finish or blast-cleaned steelwork shall comply with BS 4232 and shall be better or equal to Second Quality .with an amplitude maximum of 0.01 mm on the cleaned surface.

Blast-cleaning shall be carried out wherever possible after fabrication but when this is not possible, or when some time is allowed to elapse before painting, then the cleaned steel shall be protected by application of a single coat of a suitable prefabrication weldable primer within 4 hours of blast-cleaning (2 hours for outdoor blast-cleaning). All dust, residues and debris shall be removed from the steel surface after blast-cleaning before the protective coating is applied.

Dust and detritus shall be removed positively from the prepared surfaces prior to painting.

7.4.20 **Application of Paint**

No paint shall be applied until the previous paint coat has dried or cured sufficiently to receive it.

Each coat shall be a different colour or shade to the one beneath it.

Damaged areas of priming coats or undercoats shall be made good before further coats of paint are applied.

7.4.21 **Painted Welded Connections**

Where welded steelwork is prepared and primed before fabrication then weld-through primers shall be employed.

No welding shall be carried out' subsequent to the application of the paint system without the written permission of the Engineer.

7.4.22 **Transportation and Storage**

All steelwork shall be transported, lifted and handled in a manner that does not affect the shape or surfaces of the section. Lifting slings shall be of nylon rope; chains and hooks shall not be used in contact with the steelwork.

The position of lifting points used on sections shall be such that the stresses induced in the sections do not exceed one half of the yield stress of the material.

Steelwork shall be stored in clean, dry conditions off the ground. Separate pieces of steelwork shall have spacer blocks between them.

7.4.23 **Erection Procedure**

The Contractor shall prepare and submit details of the following, at least four weeks before starting to erect steelwork:

method and sequence of erection

type of crane age

calculation of erection stresses

temporary guys and bracing proposed for use during erection

lifting points

transportation proposals

During erection the work shall be securely bolted or otherwise fastened and if necessary, temporarily braced, to provide safety for all erection stresses and conditions, including those due to erection equipment and its operation.

7.5 **Inspection and Tests**

7.5.1 **Inspection**

The Contractor shall supply to the Engineer details of all steelwork and accessories in order that inspection can be effected. Details shall include dates, times and places of manufacturing, rolling, fabricating, painting, galvanising and all other processes. The details shall be given to the Engineer at least 7 whole days prior to such operations taking place.

All tests shall be carried out by the Contractor.

The Contractor shall prepare test pieces to suit the appropriate testing method.

All test and inspection results shall be submitted to the Engineer within 24 hours of the test completion.

7.5.2 **Inspection and Testing of Welds**

Welds which are to be inspected shall not be painted or otherwise obscured until they have been *inspected.*

10% of all fillet welds shall be tested in accordance with BS 4416.

25% of all butt welds shall be tested in accordance with BS 2600 or BS 3923.

7.5.3 **Inspection and Testing of Paints**

Tests shall be carried out to the appropriate sections of BS 3900.

Tests for final dry film thickness *(DFT)* shall be carried out over 10% of the painted area. Over such test areas, readings shall be taken on a grid 200 mm square and recorded.

7.5.4 **Tests for Steel**

The Contractor shall carry out the tests required by BS 4360 Table 1 at the rates given in BS 4360 Section 3.

Solar PV and Electrical Aspects

1 General

The tender calling for convenient bids is dedicated to identifying and contracting a Supplier and Installer for the following services:

1.1 **Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations**.
The minimum capacities required for the Solar Photovoltaic Systems are as follows:

No.	Carport/Location	PV Array (kWp)
1	50/50 Sports Bar, Region 3	11.25
2	Ogle Airport, Region 4	11.25
3	Giftland Office Max, Region 4	11.25
4	KK Service Station, Region 4	11.25
5	Providence Cricket Stadium, Site 1, Region 4	11.25
6	Providence Cricket Stadium, Site 2, Region 4	11.25
7	Rosignol Fisherman's Coop Society Ltd, Region 6	11.25
8	Yas Karan Singh Service Station, Region 6	11.25
9	Nand Persaud Company Ltd., Tain, Region 6	11.25
10	Linden Technical Institute, Region 10	11.25
	Total	**112.5**

1.2 Provide all technical documentations including user and operational manuals to the GEA. **The bidder must include all brochures, certifications, technical specifications, brand, and models of ALL equipment provided in one location in their submission in the following order.**

1) PV Modules
2) Grid Interactive Inverter
3) Remote Monitoring System
4) Cabling and Miscellaneous
5) Schematic Diagram of the Solar PV System

Bidders must ensure that all equipment supplied under the contract is new, unused and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.

1.3 Provide 3 years after sales services to GEA. Bidders must provide a statement indicating its acceptance or otherwise of this requirement.

2 Climate and Site Conditions

Altitude	: <1000m above sea-level
Maximum daily mean temperature	: 35° C
Maximum outdoor ambient shade temperature	: 50° C
Minimum outdoor ambient shade temperature	: 15° C
Maximum relative humidity	: 100%
Average Wind Velocity	: 18 mph
Maximum Wind Velocity	: 60 mph (3-second gust)
Isokeraunic level	:70
Average Number of days with Rain p.a.	:120
Average Annual rainfall, cm	:150

It is recommended that Bidders conduct site visits to carry out their own assessment of how the system and structure will be installed. As practical as possible all systems shall be installed to avoid shading and any obstruction that would decrease the efficiency of the system.

3 Existing Power Supply Conditions & Configurations

Bidders are required to visit the site to determine appropriate equipment selection and obtain any other information required to prepare their bids.

The sites will have a 3 phase, 230/400V, 150A, 60hz, electrical supply infrastructure. The solar PV system must be interconnected to this system and configured in grid-interactive mode of operation.

4 Specification of Required Hardware

4.1 General Remark

The whole system must be designed in such a way that all components are resistant to climate conditions of the specific sites, specifically against corrosion. Special attention should be made in the equipment selection in such a way that the risk of theft and vandalism is minimised. Bolts and nuts of the PV arrays should be affixed in such a way that theft is minimised. The contractor is required to make all the necessary provisions, where applicable, for ensuring that the PV system can be commissioned.

4.1 Photovoltaic Module

- PV modules should be in accordance with international standards (IEC 61215, IEC 61730, IEC 61701, IEC 62804, UL1703, UL 61730-1, UL 61730-2) and the National Electrical Code 2023
- **750 watts** or greater rated solar modules
- Maximum Dimensions: 2384mm X 1303mm X 30-35mm
- Bifacial Dual Glass solar modules
- All modules should be made of crystalline silicon solar cells with conversion efficiency not less than 19.5% at Standard Test Condition
- All PV modules shall show the same capacity
- The Manufacturer should be internationally recognised and provide references and certificates on module testing
- MC4 connectors for all Modules
- 20 years warranty on Modules

4.2 Mounting Structure for PV Modules

4.2.1 Sites with carport

- The PV modules mounting structure must accommodate the PV modules supplied.
- The purlins of the carport structure can be used to directly attach/mount the PV modules to the carport.
- The PV array mounting structure, including modules mounting hardware, and balance of system components shall be designed to withstand wind loads of at least 60 mph (3-second gust).
- Array mounting hardware supplied shall be compatible with the site considerations and the environment. Mounting structures of anodised aluminium material can be provided.

Mechanical hardware shall be durable and corrosion resistant. The use of ferrous metals (including but not limited to painted or plated steel), dissimilar metals in contact, or any wood or plastic components is not allowed.

- Special attention shall be paid to minimising the risk from exposed fasteners, sharp edges, and potential damage to the modules or support structure. All potentially hazardous hardware must be protected or shielded for safety.
- PV modules must be oriented in a southern direction where possible.
- The mounting structure must be able to absorb and transfer the mechanical loads to the carport structure without impeding on its structural integrity.
- The mounting structure should be designed to enable precise alignment of the PV module edges, facilitating the application of a waterproof and UV-resistant sealant to create a leakproof PV array.

4.2.2 Sites without carport

- The PV modules mounting structure must accommodate the PV modules supplied.
- The mounting structure is rooftop mounted.
- The PV array mounting structure, including modules, and balance of system components shall be designed to withstand wind loads of at least 60 mph (3-second gust).
- Array mounting hardware supplied shall be compatible with the site considerations and the environment. Mounting structures of anodised aluminium material shall be provided. Mechanical hardware shall be durable and corrosion resistant. The use of ferrous metals (including but not limited to painted or plated steel), dissimilar metals in contact, or any wood or plastic components is not allowed.
- Special attention shall be paid to minimising the risk from exposed fasteners, sharp edges, and potential damage to the modules or support structure. All potentially hazardous hardware must be protected or shielded for safety.
- PV modules must be oriented in a southern direction where possible.
- The mounting structure must be able to absorb and transfer the mechanical loads to the roof of the building without impeding on the structural integrity of the building.
- The mounting structure should be attached to the existing roof in such a way to prevent water leaks and prevent the possibility of leaks developing in the future. Leaks observed during the defects liability period must be resolve by and at the cost of the bidder.
- The mechanism used to attach the array mounting structure to the roof must be designed for and compatible with the roof type at the site. The attachment mechanism must be attached to the roof by the method specified by the OEM of the attachment mechanism.

4.3 Grid Interactive Inverter

- The minimum size of each Inverter shall be 5 kWac and totaling a minimum of 80% of the solar array name plate capacity of the system
- Master/Slave or String type
- **AC Grid Frequency – 60 Hz**
- **Operating Frequency range: Frequency Range ≥ 58.4 to ≤ 61.7 (Field Selectable)**
- Certificates and Compliance with International Standards Including (UL 1741-2010, UL 1699B, IEEE 1547-2003, IEEE 1547.1-2003, ANSI/IEEE C62.41, FCC Part 15 A & B)
- Grid Voltage: 3 phase, 230/400V +/- 10%
- Pure Sinewave output
- High efficiency (AC) > 90% @ P/Pn (AC) = 10%
- Protection against overcurrent and overvoltage
- Indications of status of operation (e.g. LED)
- Automatic disconnect from the grid in case of need
- Capability of connecting monitoring devices

- Ground fault monitoring / grid monitoring
- Include Surge Protection Devices (SPDs)
- Safety measures (EN 61000, EN 60950 and others)
- Interface to the main grid (switchboard including manual disconnection device)
- 5 Years warranty

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4.4 Remote Monitoring System

- Remote monitoring system; including but not limited to providing operation, production and consumption data.
- Separate system or integrated with the inverter
- Connection to the internet via wired LAN or Wi-Fi.
- Overcurrent protection
- Complete with NEMA 4X enclosure
- Compatible with 3 phase system
- Complete with cabling and measuring sensors/ current transformers rated to measure current at 0-200Amps
- 2 Years Warranty

4.5 Electrical Cables

Cables exposed to the sun should show an adequate type designed to withstand harsh weather conditions (UV radiation, salty humidity etc.), e.g. type HN07-RNF and cables must be clearly identifiable (colour coded).

- Appropriate length USE-2 #10 AWG Sunlight Resistant Cable to connect solar modules in the designed configuration.
- The appropriate number of Solar Disconnect Switches and Combiner boxes.
- Appropriate size and number of interconnecting cables between combiner boxes and inverters.
- Appropriate size AC Interconnecting cables.

4.6 Protections

The solar PV system should be provided with lightning, & over voltage protection. The main aim in this protection shall be to reduce the overvoltage to a tolerable value before it reaches the PV or other subsystem components. The source of over voltage can be lightning, atmosphere disturbances etc. The protection against induced high-voltages shall be provided by the use of MOV type surge arrestors and suitable earthing such that induced transients find an alternate route to earth. In addition, the lightning arrestor/SPD should also be adequately earthed for the system.

4.7 Fire Extinguisher

- Can be of type: Carbon Dioxide, Dry Chemical, Clean Agent or Dry Powder
- 20 pounds (lbs.)
- Class C rated
- Operation type (P.A.S.S)

4.8 Schematic Diagram

A detailed system schematic design layout of all components and how they interconnect with each other **MUST** be provided in accordance with NEC 2023 Article 690. Drawings provided **MUST** be electrical schematic drawings and show all components and their respective rating (e.g., wires and circuit breaker sizes). An as-build electrical schematics of the systems must be submitted to the

Procuring Entity for review and approval before commissioning the solar PV system. The as-built electrical schematic must include the following:

- Solar array layout
- Size of the solar modules in watts and quantity per string.
- The direction/azimuth (deg) and the tilt (deg) of the modules in each string.
- Layout of DC combiner box showing electrical connections and ratings of fuses, breakers and/or disconnects.
- Model number and basic electrical specifications of major electrical components like inverters, charge controllers, battery banks, transformers, circuit breakers, disconnects, monitoring device, etc. must be included in the electrical schematics.
- The point of interconnection/s of the solar PV system to the existing electrical infrastructure must be clearly indicated on the drawing.
- The main electrical disconnect of the existing electrical infrastructure must be shown in the electrical schematic. Basic information of the main disconnect must be included e.g. current rating and number of poles.
- The size of the electrical conductors must be shown on the electrical schematic.
- Grounding circuit of major electrical components and grounding electrode/s.
- The size and position of current transformers used by the solar PV monitoring system (if installed) must be included in the electrical schematic.
- The point/s where voltage and current readings are measured by the monitoring system (if installed) must also be shown in the electrical schematics. Basic specifications of the CTs must be included in the drawing.
- The point of connection of the data cable or wireless signal for the monitoring system (if installed) at the facility data network with internet access must be indicated in the electrical schematic.
- The contractor is responsible for all interconnections, including the grid (where applicable) and building electrical system interconnection. All the hardware required for successful interconnection must be provided by the contractor.

  The contractor is required to have a laminated copy of the system schematic installed at the location where the system components are sited before the system is commissioned.

5. Specification of Required Services

5.1 Systems Design

Bidders are required to visit the selected sites and determine the best possible locations for the complete system, voltage and phase requirements for inverters and to become acquainted with the site for the installation of the systems. ***A detailed schematic diagram is required, showing system layout and include all interconnection equipment and points of connection for DC, AC, lightning and grounding protection.***

The successful bidder shall be required to provide/construct all necessary infrastructure for mounting/positioning the inverters, raceways, panels, switch gears, etc. All infrastructure constructed must be structurally sound, secure and provide protection and adequate ventilation/cooling for the equipment installed.

Detailed design drawings of the solar PV and BESS system will be required from the contractor for review and approval by the procuring entity before commencement of construction. As-Built drawings in both hard and soft copies will be required by the procuring entity before the system is commissioned.

5.2 System Operation

a) The system must be configured in a grid-interactive mode of operation.

b) Electricity generated from the PV arrays shall be used for real-time consumption, and excess energy must be exported to the grid.

5.3 Solar Photovoltaic System Installation

a) All installations are to be conducted in accordance with **NEC 2023 Article 690** which covers solar PV systems installation, protection (AC, DC and lightning) and grounding, Chapter 3 of the NEC 2023 which covers wiring method and materials, and **Article 705** for interconnection to the grid**. All labels/ markings are to be provided by the contactor in accordance with the NEC 2023 Article 690 requirements.**

b) **GEI requires that the contractor applies and pays for an independent inspection certificate for all completed installations.** This inspection certificate is required by the GEA before a final completion certificate could be issued.

c) The contractor is responsible for interconnecting the solar PV system to the electrical supply system at the facility. All materials required for this task must be provided by the contractor.

d) Damages to internal and external walls e.g. any holes, cuts or any actions/activities resulting in the defacing of any building during installation, must be repaired (neatly covered with appropriate molding, paint or filling material) and returned to the original state at the expense of the contractor.

e) All the modules in a string must have the same azimuth and tilt. If strings are connected in parallel, the strings must contain the same number of modules and have the same azimuth and tilt to reduce losses due to module mismatch.

f) If multiple strings are connected to the same MPPT input of a charge controller or inverter, each string must be identical (number and type of modules, and orientation) to reduce losses due to module mismatch.

5.4 Safety

The work shall be carried out with every reasonable precaution and provisions being taken for the safety of those concerned in the preparation, excavation, erection, stringing and all other operations as well as for persons in the vicinity.

5.5 Inspection and Testing

Inspection and testing shall conform to the Quality Assurance requirements of this Specification.
The Contractor shall inspect the Works prior to testing to ensure compliance with the specified requirements and the drawings.

The inspection of the Works shall be attended and witnessed by the procuring entity or representative.

5.6 Drawing and Records

The Contractor will develop the drawings, both layouts and detail guides, required by the Procuring Entity for the construction of the Works. The Procuring Entity will review and approve the drawings in before construction commences.

5.7 Compliance with Regulations

All the equipment and accessories shall comply in every respect with the Regulations and Acts in force in Guyana.

The equipment and connections shall be designed and arranged to minimise the risk of fire and any damage that might be caused in the event of fire.

To ensure that the Works are in accordance with the Specification, with the regulations and with relevant authorised international standards, the Contractor shall have in place suitable Quality Assurance Programmes and Procedures to ensure that all activities are being controlled as necessary.

The quality assurance arrangements shall conform preferably to the relevant requirements of ISO 9001 or ISO 9002 as appropriate.

5.8 Progress Reporting

The Contractor shall submit progress reports on a monthly basis by the end of the first week of the month for the previous month's progress.

5.9 Delivery of Equipment to Installation Sites

The Bidder is fully responsible for organising and guaranteeing timely delivery and transport of the equipment to the installation site.

The Bidder is requested to present detailed information on the schedule of delivery and transport modalities of the equipment to the project site. Close coordination with responsible staff from the procuring entity is recommended. The Bidder is requested to consider site conditions having a potential influence on delivery and installation.

5.10 Transfer of Ownership

An Acceptance Inspection will be organised by the procuring entity and in presence of the Seller will allow for the issuance of a certificate to transfer ownership to the Purchaser.

5.11 Warranty

Two types of warranty have to be offered by the Bidder:

a) Warranty on hardware failures on all products offered and used according to international established terms;

b) Warranty on the proper operation of the provided equipment according to the specification and terms fixed in the contract between the bidder and the procuring entity.

5.12 After Sales Service

The Supplier must provide a local after-sales service of no less than 3 years.

5.13 Commissioning

Commissioning refers to inspection and testing the solar PV system after installation and certifying that it operates as expected and is installed according to the design plans and complies with NEC 2023 Articles 690 and 705.

SUPPLIER'S BID

TO: _____
(Name and address of Procuring Entity)

Dear Sir / Madam,

Having examined the bidding documents including Annexes and Addenda No _____ *[specify numbers]*, the receipt of which is hereby acknowledged, we offer to execute the ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** in accordance with the Contract conditions attached herein for the total amount of _____

The Value Added Tax (VAT) for our bid is
…….
(amount in words and figures)

The Price of our bid, including VAT is
……
…… ……*(insert the total bid price in words and figures, in Guyana dollars as per details given in the price schedule attached)*

Alternative bids (at the Employer's request):
Also we offer to execute the works pursuant to alternative bids for the amount of _____ GYD

(a) We, including all subcontractors, regarding any part of the Contract, in accordance with the bidding documents, have no conflict of interests pursuant to subclause 2 (i) of the Instructions to Bidders;

(b) We, including all subcontractors, regarding any part of the Contract, in accordance with the bidding documents, have not been declared by the authorized State body on procurement to be ineligible, or are not ineligible, in accordance with the legislation of Guyana.

We undertake, if our Bid is accepted, to supply the Goods, in accordance with a delivery schedule given in the Schedule of Requirements.

If our Bid is accepted, we undertake to furnish the Performance security in the form of _____ to the amount of _____, comprising _____% of the Contract Price in order to execute the Contract properly and within the time period(s) specified in the Bidding Documents.

We hereby confirm that this bid shall be valid during _____ days starting from the date established for bid opening, and it shall be binding until the expiry of the indicated period.

We understand that you are not bound to accept the lowest or any bid you receive.

Dated the_____ day of _____ 202__.

Duly authorized to sign the Bid for and on behalf of

_____
(*name of Supplier*)

_____	_____	_____
(*Full name)*	*(Title)*	*(Signature and seal)*

PRICE SCHEDULE

Item No.	Brief Description of Goods	Quantity	Unit Price (GYD)	Total Cost (GYD)
	Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations			
1	Design Drawing	11		
2	11.25kWp Grid Interactive Solar PV System	11		
3	Remote Monitoring System	11		
4	2 Port Parking Surface/Concrete Slab	2		
5	2 Port Carport Structure; Foundation, Columns, PV array mounting structure, etc.	9		
6	As-Built Drawing	11		
	Total (GYD)			

Please note that the Procuring Entity will not be responsible for customs clearance of the goods.

Duly authorized to sign for and on behalf of

_____

(*name of Bidder*)

_____ _____ _____

(*Full name)* *(Title)* *(Signature and seal)*

SUPPLY CONTRACT FOR GOODS

THIS CONTRACT made the _____ day of _____ 202__ between *Guyana Energy Agency* (hereinafter referred to as "the Procuring Entity"), on the one hand, and_____ *[name of Supplier]* from _____*[city and country of Supplier]* (hereinafter referred to as "the Supplier"), on the other hand have come to an Agreement on the following:

The Procuring Entity has announced bid for procurement of goods and services, namely ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** and has accepted the Supplier's bid for the supply of indicated goods and services to the sum of _____*[Contract Price in words and figures]* (hereinafter referred to as "the Contract Price").

THIS CONTRACT WITNESSES AS FOLLOWS:

1. In this Contract, the terms and expressions have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents shall form the Contract and shall be deemed its integral part, viz.:
   (a) Procuring Entity's Notification of Award;
   (b) Bid and Price Schedule submitted by Bidder;
   (c) Schedule of Requirements;
   (d) Technical Specifications;
   (e) General Conditions of Contract;
   (f) Special Conditions of Contract;
   (g) Other documents included in the Contract documents;

3. This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

4. In consideration of the payments to be made by the Procuring Entity to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Procuring Entity to provide the Goods and Services, and remedy defects therein in conformity in all respects with the provisions of the Contract.

5. The Procuring Entity hereby agrees to pay the Supplier in consideration of the delivery of the Goods and Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS of the aforesaid, the parties hereto have caused this Contract to be executed in accordance with the legislation of Guyana the day and year first above written in the beginning of the document.

Signed and Sealed _____ *[Full name and title of Procuring Entity's representative]*

Signed and Sealed _____ *[Full name and title of Supplier's representative]*

BID SECURITY
(Bank Guarantee or Insurance Bond)

Whereas _____ *[name of Bidder]* (hereinafter referred as "the Bidder") is ready to submit his bid dated _____*[date of bid submission]* for the ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** (hereinafter referred as "the Bid"),

KNOW ALL PEOPLE, that WE _____ *[name of Bank / Surety]* from _____ *[name of country]*, having our registered office at the address _____ *[address of Bank / Surety]*, (hereinafter referred as "the Bank"), are bound to _____ *[name of Procuring Entity]* to the sum of _____, by which payment to the indicated Procuring Entity shall be made in whole and in a timely manner; the Bank is bound on behalf of its name, its successors and authorized persons. This is to confirm that the license issued to the Bank shall provide for activity on issuance of the guarantee, and the person(s) signing that guarantee is entitled to act on behalf of the Bank, and if the approval of Board of Directors, or of General Stockholders Meeting is required, it is already received and there is no other approval required.

THE CONDITIONS of this obligation are as follows:

1. If the Bidder:
   (a) Withdraws their Bid during the period of bid validity specified by the Bidder on the Form of Bid; or
2. If the Bidder having received notice from the Procuring Entity that their bid is accepted within the period of bid's validity:
   (a) fails or rejects to sign the Contract at the request of; or
   (b) fails or rejects to furnish the performance security in accordance with the Instructions to Bidders;

We undertake to pay the Procuring Entity the above sum upon receipt of their first written request, without needing the Procuring Entity to show grounds or reasons of that request, provided that the sum requested by the Procuring Entity is due to him because of the occurrence of one or two or both conditions, specifying the condition or conditions occurred.

This guarantee shall remain in force during _____ days inclusive following the expiry of the bid validity period, and any request in respect thereof should reach the Bank not later than the abovementioned date.

_____	_____	_____
(Full name of Bank / Surety representative)	*(Title)*	*(Signature and seal)*

Dated on ____ day of _____202__.

Address of the Bank / Surety issuing guarantee:

_____

Manufacturer's Authorization

The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and 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.****]*

Date of Bid Submission *(day/ month/ year):*
IFB No.:*[insert number of bidding process]*
Alternative No.: [*insert identification No if this is a Bid for an alternative]*

To: _____ *[insert complete name of Purchaser]*

WHEREAS

We _____ *[insert complete name of Manufacturer],* who are official manufacturers of _____*[insert type of goods manufactured],* having factories at _____ [insert full address of Manufacturer's factories], do hereby authorize _____ *[insert complete name of 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 1.3 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 Bidder]*

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

PERFORMANCE SECURITY
(Bank Guarantee or Insurance Bond)

TO: _____
[Name of Procuring Entity]

WHEREAS _____*[name of the Supplier]* (hereinafter called "the Supplier") has undertaken, in accordance with the Contract No. _____*[Contract number]* dated _____ 202 _ to ***Design, Supply, Installation and Commissioning of ten (10) Solar Carports for EV Charging Stations*** (hereinafter called "the Contract"),

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a Bank Guarantee or Performance Bond from an Insurance company licensed by the Bank of Guyana, to the sum specified therein as a security for compliance with the Supplier's obligations under the Contract,

AND WHEREAS we have agreed to furnish the Supplier with a security,

THEREFORE WE hereby confirm that we are the Guarantors and are responsible to you on behalf of the Supplier, up to a total of _____*(amount of security in words and figures)* and, we undertake to pay you, on your first request notifying of the Contractor's default with the Contract, and without cavil or argument, any sum or sums within the above limits, as aforesaid, without your needing to show grounds or reasons of your request or the sum specified therein.

Any modification or addition, or amendment in the terms of Contract which may be made by the Procuring Entity and the Supplier by Additional Agreement shall in no way release us from obligations under the Guarantee, and we waive any notice of modification, addition, or amendment. This guarantee shall be valid until full completion of the Contract Conditions by the Supplier. Also, we confirm that the license issued to the Bank shall provide for activity on issuance of a bank guarantee, and the person signing the guarantee is entitled to act on behalf of the Bank, and if the approval of Board of Directors or of General Stockholders Meeting is required, it is already received, and there is no other approval required

This guarantee shall be valid till the _____day of _____ 202_.

_____ _____ _____
(Full name of Bank / Surety's representative) (Title) (signature and seal)

Dated on _____ day of _____202___.

Address of the Bank issuing guarantee:
_____

Letter of Acceptance

(Letterhead paper of Procuring Entity)

_____ (date)

To: _____

(Name of Supplier)

_____

(address of Supplier)

We hereby notify you that your bid dated the _____ day of _____202__, for the supply of goods _____ (*description of goods*) up to a total of_____

(amount in figures and words)

as amended and modified in accordance with the Instructions to Bidders is hereby accepted by our agency.

Simultaneously, we send you the Form of Contract and request you, pursuant to Clause 20.1 of the Instructions to Bidders, during seven (7) days to sign and date the Form of Contract and return it at our address. Jointly with the signed Contract, we request you to furnish the performance security, in accordance with ITB Clause 20.2.

You hereby entrusted to start supply of the Goods, in accordance with the terms and conditions of a Contract.

Name of Agency _____

Full name and Title _____

Signature of Authorized Representative _____

Annex: The Contract

Affidavit of Authorization

TO: _____ *[name of Procuring Entity]*

WHEREAS _____ *[name of Supplier]*, who is the Supplier _____*[name and/or description of goods].*

do hereby authorize _____ *[name and address of Supplier's Representative]* to submit the Bid, and sign the Contract based on I*nvitation for Bids* for the abovementioned goods to be supplied by us, and

_____

[Full name, title, signature for and on behalf of Supplier]

Dated on «_____» day of _____202___. (seal)
(date)

Note: *The affidavit of authorization must be drafted on a letterhead of the Supplier and signed by a Commissioner of Oats to Affidavit or Justice of the peace. The Bidder shall include this authorization in their Bid.*

EVALUATION AND QUALIFICATION CRITERIA

NO.	DESCRIPTION	PASS/FAIL
1.	Submission of a **valid** business registration or certificate of incorporation that is **clearly legible. Incorporated companies must submit a list of directors.**	
2.	Submission of a **valid** NIS compliance certificate in the name of the business as per business registration. **Document must be clearly legible.**	
3.	Submission of a **valid** GRA compliance certificate in the name of the business as per business registration. **Document must be clearly legible.**	
4.	**Completed and signed** supplier's bid form (*page 70)*.	
5.	Completed and signed price schedule must be submitted.	
6.	**Completed and signed** delivery schedule (*page 18*) or **statement of agreement** to supply goods/services **within the period specified by the Procuring Entity in the delivery schedule.**	
7.	Provision of **documentation detailing the technical specifications** for the items listed in the Schedule of Requirement (*page 18)* or **evidence to show that the goods match the requirements of the items listed in the Technical Specifications.**	
8.	Submission of bid security **in the amount of 2%** of the bid price **in the form of** a bond from an Insurance company licensed by the Bank of Guyana or a bank guarantee or manager's cheque.	
9.	Demonstrate experience and technical capacity by providing **documentary evidence** that shows the completion of a minimum of two (2) contracts of similar size and scope to the Project over the last two (2) years. Bidder must **provide copies of contracts** with previous clients. Bidder must also demonstrate the experience of completing contracts of a **minimum value of $4,000,000 for each year over two (2) years**.	
10.	Evidence of financial capacity, in the name of the bidder, representing 3**0%** of the bid price. Financial Capacity must be evidence in the form of a **bank statement or Line of credit from a bank or Insurance company licensed by the Bank of Guyana**. **The line of credit must state a figure**. The document must be **dated within one month** of the bid opening date and be **clearly legible**. When a photocopy is presented, it must be certified a 'true copy of original' by the issuing company	
11.	Bidder must provide a letter of Authorization for the Procuring Entity to seek reference from the bidder's Bank/financial institution **relating to the financial capacity evidence supplied**. The document must be **dated within one month** of the bid opening date and be **clearly legible**.	
12.	Written confirmation of authorizing signatory must be provided. This must be in the form of an **Affidavit of Authorization endorsed by a Commissioner of Oaths or Justice of Peace.**	
13.	Bidder must provide **audited financial statements** for the **past three years for incorporated companies**. Financial statements must be **audited by a Chartered accountant/accountancy firm** and **include an auditor's note.** **OR** **Registered businesses** must provide **Balance Sheets, Profit and Loss**	

	Accounts, and Income and Expenditure Accounts for the **past three years** These financial statements must be **approved by a Chartered accountant/accountancy firm**. The financial analysis would include: Current ratio: >1 for each year of the last 3 years; Net worth: +ve and minimum of 20% of bid value; Average annual turnover: GYD 4million.	
14.	The Bidder shall provide accurate information on the related bidding form as provided on page 80 about any litigation or arbitration resulting from contracts completed or on-going under its execution over the last five years. **Pending Litigation**: All pending litigation shall in total not represent more 50% of the Bidder's net worth and shall be treated as resolved against the bidder. **If bidder has pending litigation representing more than the stated percentage, the bid will not be considered.** **Litigation History**: Non-performance of a contract did not occur as result of supplier's default since 1st January, 2024. **If bidder has a history of nonperforming contract the bid will not be considered.**	
15.	Bidder must provide a letter stating **any or no terminated or abandonment of projects**. The letter must be **dated within one month** of the bid opening date.	
16.	Provision of valid manufacturer's authorization or authorized distributor letter	
17.	Provision of a signed statement of warranty and/or guarantee for applicable items. At least three (3) years warranty on complete system is required	
18.	Bidder must provide a statement for the availability of spare parts and/or after sales services. Bidders statement indicating its acceptance or otherwise in offering Local after sales service of no less than three (3) years. Bidder must state the nature of service that will be provided.	

Pending Litigation Format				
☐ No pending litigation in accordance with Evaluation Criteria # 14				
Year of dispute	**Amount in dispute (currency)**	**Outcome as Percentage of Net Worth**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and USD equivalent)**
[*insert year*]	[*insert amount*]	[*insert percentage*]	• Contract Identification: [*indicate complete contract name, number, and any other identification*] • Name of Purchaser: [*insert full name*] • Address of Purchaser: [*insert street/ city/ country*] • Matter in dispute: [*indicate main issues in dispute*] • Status of dispute: [*indicate if it is being treated under Arbitration or being dealt with by the Judiciary*]	[*insert amount*]

Litigation History

Litigation History Format		
☐ No court/arbitral award decisions against the Bidder since 1st January 2024, in accordance with Evaluation Criteria # 14		
Year of award	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and USD equivalent)**
	•	
[*insert year*]	• Contract Identification: [*indicate complete Contract name, number, and any other identification* • Name of Purchaser: [*insert full name*] • Address of Purchaser: [*insert street/city/country*] • Matter in dispute: [*indicate main issues in dispute*] • Party who initiated the dispute: [*indicate "Purchaser" or "Supplier"*] • Status of dispute: [*indicate if it is being treated by under Arbitration or being dealt with by the Judiciary*]	[*insert amount*]