NATIONAL COMPETITIVE BIDDING DOCUMENT

Engineering, Procurement, Construction, and Initial Operations, and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies

(One-Envelope Bidding Process)

Request for Bids (RFB) through Procurement of Work
National Competitive Bidding with international advertising

RFB No: 2.1.2/EU

Contracting Agency: Ministry of Science, Energy and Technology

August 2022

Preface

This document is a Request for Bids ("RFB") from the Government of Jamaica (GOJ), Ministry of Science, Energy and Technology (the "Purchaser") to eligible contractors for the Engineering, Procurement, Construction, and initial Operations and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems. The Purchaser has selected the Inter-American Development Bank's ("IDB") Standard Procurement of Works bidding document.

Engineering, Procurement, Construction, and initial Operations and Maintenance of Solar PV and Energy Efficient Air Conditioning Systems is supported by National Competitive Bidding ("NCB") procedure prepared under IDB Policies for Works Procurement GN2349-15, January 2020. Bidders are required to use the forms included in this RFB in submitting their bids.

Background information intending to help the bidders prepare more precisely targeted bids can be found in this RFB, Section "B" General Instructions, Section "C" Forms for Contractor's Bid, Section "D" The Scope of Work, Section "E" Contract Forms Annex I, II and III and Section "H" Annexes: I, II, III and IV.

The National Competitive Bidding, which is supported by the IDB Policies for Works procurement GN2349-15, is informed by supplemental documents:

1. Scope of works and Technical Specifications for rooftop solar PV installations
2. Scope of works and Technical Specifications for Inverter type air conditioning system and installations
3. Jamaica Public Service Company Limited Technical Guidelines for the interconnection of Renewable Energy
4. Systems larger than 100kW to the power grid.
5. Solar Panel Installation Evaluation Report, Inter-American Development Bank Initiative;
6. Appendix A-RFB Notice of Site Visit Acknowledgement Form;
7. ;
8. Appendix C- Listing of Existing Non-Inverter Type Split Air Conditioned Units and
9. Exhibit A – A8: Site Plan University Hospital of the West Indies, showing locations of buildings with the proposed roof-mounted solar PV systems.
10. Exhibit B - University Hospital of the West Indies (See Attachments).

Foreword

This National Competitive Bidding Document for the Engineering, Procurement, Construction, and initial Operations and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems has been prepared by the Ministry of Science, Energy and Technology as part of the Energy Management and Efficiency Programme (EMEP), the Project Execution Unit, of the Ministry of Science, Energy, and Technology and by the Inter-American Development Bank.

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Section A. INVITATION FOR NATIONAL COMPETITIVE BIDDING

Date: August 22, 2022

To: Prospective Bidder

Reference: **Engineering, Procurement, Construction, and Initial Operations and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies (UHWI) Government Facilities Kingston, Jamaica.**

Dear Sir or Madam:

This document defines the scope of work and technical specifications required for Engineering, Procurement, Construction, and initial Operations and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at a Government Facility, the University Hospital of the West Indies (UHWI) Kingston, Jamaica. The Project Owner will be the Government of Jamaica (GoJ) with the Project Execution Unit (PEU) within the Ministry of Science, Energy and Technology (MSET) providing project development and project management support as the Contracting Agency. The Rooftop Solar PV and Inverter Type Energy Efficient Air Conditioning Systems will be owned by the MSET.

Background

The Government of Jamaica at the UHWI has available approximately **77,794** square feet of usable roof space on sixteen (16) buildings to install solar PV systems to generate electricity for self-consumption.

1. The purpose of this contract is to Design, Procure, Construct, Operate and Maintain Grid Tied Solar Photovoltaic Systems and Energy Efficient Air Conditioning Systems on the listed buildings at the UHWI Government facility. The aim of which is to obtain a minimum of 808kWp of electricity, generated consistent with local utility interconnection requirements and 2.54 MBTU/hr cooling requirement.

Solar PV Systems

Table A – Square Footage and Minimum Installed Capacity per Building

Name of Building	Estimated Square Footage Available	Minimum kWp to be Installed	Number of Buildings	Number of Roof Sections
Tony Thwaite	7,462.83	80.99	1	1
Ward 7	2,975.04	30.3	1	1
Ward 4	2,975.04	30.3	1	1
Ward 3	2,975.04	30.3	1	1
Ward 8	2,975.04	30.3	1	1
Pharmacy and Casualty	5,876.99	61.88	1	1

Minor Operating Theater and Day Surgery	3,038.01	35.49	1	1
Ward 11	3,024.01	35.04	1	1
Ward 12	3,024.01	35.04	1	1
Operating Theater 1-5	8,152.05	83.72	1	1
Labour Ward	5,571.62	55.96	1	1
ICU A	5,574.52	60.97	1	1
Specialty Ward	3,707.74	35.49	1	1
Medical Library	5,125.99	49.14	1	1
X-Ray Department	8470.98	88.27	1	1
E.N.T & Orthopedics (Side 1)	3,431.97	32.76	1	1
E.N.T & Orthopedics (Side 2)	3,431.97	32.76		1
Total	**77,792.83**	**808**	**16**	**17**

The Project shall have a minimum total installed DC capacity of 808 kWp (based on the nameplate rating of the PV modules).

Subject to the specifications herein, the Project scope includes the following facilities:

- All equipment (including PV modules, mounting structures, inverters and related/ancillary equipment) to comprise PV systems with an aggregate capacity of 808kWp minimum.
- Air conditioning units and accessories
- AC collection equipment to combine the output of each inverter and connect to the relevant utility Points of Interconnection.
- Data acquisition systems.

Table B: Existing Air Conditioning Systems

Unit Capacity (BTU/hr)	**Quantity**	**Total Capacity (BTU/hr)**
5,000	2	10,000
7,000	1	7,000
9,000	15	135,000
10,000	2	20,000
12,000	24	288,000
13,000	1	13,000
18,000	74	1,332,000
23,500	1	23,500
24,000	16	384,000
36,000	3	108,000
48,000	2	96,000
60,000	2	120,000
Grand Total	**143**	**2,536,500**

The Project shall have a total MBTU/hr of 2.54 (based on the nameplate rating of the existing non-inverter type air condition units). Subject to the specifications herein, the project scope includes air conditioning units and accessories.

Non-inverter based mini-splits use a fixed-speed compressor which cycles the unit on and off depending on if the conditioned space has achieved its set-point temperature. Around 51% of the mini-splits on site are non-inverter technology based. It is recommended to upgrade these units to higher efficiency inverter based mini-splits.

Inverter driven mini-splits, through modulating their variable speed compressors, are generally more efficient in comparison to conventional forced air heat pumps when operating under part load conditions. Inverter driven units are also more efficient in comparison to fixed speed mini-splits through enabling an on-demand approach in meeting space cooling loads. Higher energy efficiency split-units (units with higher Energy Efficiency Ratio (EER) or Seasonal Energy Efficiency Ratio (SEER)) consume less electricity in comparison to standard efficiency units.

Design, supply, installation, and initial operation & maintenance of 2.54 MBTU/hr of inverter type air conditioning units at the University Hospital of the West Indies. Please see Exhibit B and Technical Specifications for more details.

The delivery/construction period for the Solar PV and Air Condition Systems is:

List of Goods and Delivery Schedule

Bidder to provide delivery date to complete the project (Solar PV systems)

Line Item Nº	**Description of Goods**	**Qty**	**No. of Buildings**	**No. of Roof Sections**	**Delivery Duration**	
					Earliest Delivery (Working days)	**Latest Delivery (Working days)**
1	Design, supply, installation, assembly of equipment, parts and accessories, commissioning and interconnection of the solar photovoltaic system with the Utility's (JPS) network.	1	16	17	90 days from signing of contract.	105 days from signing of contract.

List of Goods and Delivery Schedule

Bidder to provide delivery date to complete the project (Inverter type Air Condition Units)

Line Item Nº	Description of Goods	Qty	No. of Rooms	Delivery Duration	
				Earliest Delivery (Working days)	Latest Delivery (Working days)
1	Design, supply, installation, assembly of equipment, parts and accessories, commissioning and interconnection of the solar photovoltaic system with the Utility's (JPS) network.	143	97	77 days from signing of contract.	93 days from signing of contract.

This procurement process will be conducted in accordance with the Policies for Procurement of Goods and Works financed by the Inter-American Development Bank GN-2349-15 January 2020. Interested eligible bidders should carefully review the qualifications instructions stated in Clause 4 of Section B: General Instructions of this National Competitive Bidding document.

A complete set of this National Competitive Bidding Documents in English is available on the website of the Ministry of Science, Energy and Technology (www.mset.gov.jm). To increase its visibility and allow for an extended eligibility reach out this document will also be published in UNDB (https://devbusiness.un.org/) and in IDB website (https://projectprocurement.iadb.org/en/procurement-notices) to facilitate bidder's participation.

Bids will be accepted electronically at procurement@mset.gov.jm. All aspects of the procurement process will be handles electronically. No offline (hard copy) bids will be accepted and there will be no tender box available for the manual submission of bids. There will be no public opening of bids.

Bids must be submitted electronically on or before **2:00 p. m. on October 4, 2022**. Late bids will be rejected and returned to sender. Bids should be addressed to:

The Programme Manager
Project Execution Unit
Energy Management and Efficiency Programme
Ministry of Science, Energy and Technology
PCJ Building
36 Trafalgar Road, Kingston 10,
Jamaica.

A complete set of this National Competitive Bidding Documents in English is attached to this invitation letter for your consideration and preparation of your technical and financial offer that meet the project requirements. The content of the National Competitive Bidding set of documents includes:

a) The present invitation letter(s)
b) Section B General Instructions.
c) The Bid Forms
d) The scope of work, technical specifications and Performance requirements,
e) Contract forms
f) Annexes
g) Exhibits

A workshop to present this bidding document will be held on Thursday, September 15, 2022 at 11:30 a.m. You can connect in the following link -
https://us02web.zoom.us/meeting/register/tZEqf--rrz0vHdWGEuXp8auOP5JHQTT1VH1y

All bids shall be submitted in accordance to the instructions provided, electronic copy of the submitted documents. Also, the proposal shall be marked with the procurement name **("Engineering, Procurement, Construction, and initial Operations and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies")** and the name of the Bidder and accompanied by a Bid Security in the amount US$15,000.00.

The contract will be awarded to the Bidder whose Bid has been determined to be substantially responsive to the Bidding Documents and represents the lowest evaluated cost, provided that such Bidder has been determined to be eligible in accordance with the Inter-American Development Bank and EU provisions.

SECTION B. GENERAL INSTRUCTIONS

1. Scope of National Competitive Bidding

The Government of Jamaica, as part of the implementation of the program (Energy Management and Efficiency Programme (EMEP), and through the Ministry of Science, Energy and Technology invites offers for the construction of Works to design, supply, deliver, install, operate and maintain:

a. Rooftop utility-interactive solar photovoltaic systems as described, "Scope of work" and sub-section "Technical specifications", "Performance requirements.
Energy Efficient Air Conditioning Systems as described, "Scope of work" and sub-section "Technical specifications", "Performance requirements".

2. Time Limit

2.1 Successful Bidder shall be expected to complete the Works by the Intended Completion Date specified below:

i) Execution (Construction/Delivery) period should not exceed five (5) months.
ii) All quotes schedule exceeding the aforementioned period will be rejected.
iii) Offers shall remain valid for a period of ninety (90) days.

3. Prohibited Practices

3.1 For all procurement processes financed by the Bank, clauses of Prohibited Practices shall be applied during the Price Comparison Process and throughout negotiation or execution of a contract. See Section 1.16 of Policies GN-2349-15.

3.2 The Bank also entered into an agreement with other International Financial Institutions (IFIs) to mutually recognize debarment decisions. In this respect, economic resources provided by the Contracting Authority under this Action shall not be made available to, or for the benefit of, third parties - whether entities, individuals or groups of individuals - designated by the EU as subject to restrictive measures (financial sanctions) in the lists provided at https://www.sanctionsmap.eu (EU Restrictive Measures).

4. Eligible Bidders

4.1 A Bidder, and all parties constituting the Bidder, shall be nationals from member countries of the Bank. and EU Countries as listed in Part II of PRAG (Section Eligibility). Bidders from other countries shall be disqualified from participating in contracts intended to be financed in whole or in part from Bank loans. **Annex I. Eligible Countries** of this document establishes the Bank's and EU member countries, as well as the criteria to determine the nationality of the Bidders and the country of origin of goods and services.

5. Bidder Qualification

This National Bidding Process is open to international suppliers who wish to participate. The international suppliers must comply with the applicable requirements.

5.1 All bidders shall provide in Section C, "Forms of Contractor's Bid," a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.

5.2 Bidders shall include the following information and documents in their bids in Section C. See Appendix B.

Evaluation Criteria Rooftop Solar PV Phase

(a) Technical Ability
- A preliminary description of the proposed work plan and schedule.
- Provide a staffing plan showing ability to execute the bid by the contractor.
- Provide company Health & Safety Plan

(b) Past Performance
- Provide Information regarding any instance, current or during the last Five (5) years, in which the Bidder defaulted on a contract with the Government of Jamaica.
- Provide evidence having successfully installed at least four (4) commercial Solar PV system of at least 50kWp capacity within the last 2 years.

(c) Financial Strength
- Contractors should provide proof of having revenue of at least five hundred thousand US dollars (US$500,000.00) for each of the past Three (3) years, and a net worth of Five Hundred Thousand Dollars ($500,000.00), with verifiable evidence including 3 years of:
  - Audited financial statements
  - Bank references
  - Supplier references.
  - Tax Compliance Certificate (only for national suppliers)

(d) Key Staff
- Contractor shall provide qualifications and experience of at least three (3) Electrical Engineers for key site management with at least 5 years of experience with deliveries of similar contracts in Jamaica.
- Contract Manager with five years' experience in works of an equivalent nature and volume, including no less than three years as Manager.

Evaluation Criteria Energy Efficient Air Conditioning Systems

(a) Technical Ability

- A preliminary description of the proposed work plan and schedule.
- Provide a staffing plan showing ability to execute the project by the contractor.
- Provide company Health & Safety Plan

(b) Past Performance

- Provide Information regarding any instance, current or during the last five (5) years, in which the Bidder defaulted on a contract with The Government of Jamaica.
- Provide evidence having successfully installed at least 1MBTU energy efficient air conditioning commercial system of within the last 2 years.

(c) Key Staff

- Contractor shall provide Qualifications and experience of a key site supervisor, and technical personnel.
- The site supervisor shall have at least 5 years of experience in engineering and project management.

(d) Minimum Technical Requirement

- Energy Efficiency Performance Standards compliant (EER) meet minimum standard (Required) 2018 IECC Section C403.3.1 EER ≥12.
- Equipment voltage and frequency compatible with facility's existing power supply.

NATIONAL COMPETITIVE BIDDING DOCUMENTS

Contents of the National Competitive Bidding Documents

6.1 The content of the National Competitive Bidding documents includes:

a) Letter of Invitation
b) Description of Works
c) Bid Security
d) Form of Contractor's Bid
e) Sample of Contract document
f) Annexes

Clarification of National Competitive Bidding Documents

A prospective Bidder requiring any clarification of the National Competitive Bidding Documents may notify the Contracting Agency in writing at the Contracting Agency's address indicated in the

Bidding Document. Appropriate response will be given to all requests for clarification received earlier than 7 days prior to the deadline for submission of offers.

PREPARATION OF BIDS

Associated Cost of Bid Preparation

8.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid. At their own responsibility and risk, Bidders are encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Sites shall be at Bidder's own expense and the contracting agency shall in no case be responsible or liable for these costs.

Documents Comprising the Offer

9.1 To be admissible, all offers must be written in English and include the following:

i) Contractor's Bid Form.
ii) Bid Security.
iii) Information and documents described in Clause 5 (Bidders Qualification)

Bid Price

10.1 The amount of the offer must cover all the works, supplies, taxes and fees of any kind necessary for the completion of the work in accordance with the specifications, and with regards to best practice for quality performance purposes.

10.2 Prices are fixed and not subject to adjustment. The prices shall be quoted by the Bidder entirely in US Dollars.

Submission of Bids

11.1 Bids will be accepted electronically at procurement@mset.gov.jm. All aspects of the procurement process will be handles electronically. No offline (hard copy) bids will be accepted and there will be no tender box available for the manual submission of bids.

BID OPENING AND EVALUATION

Bid Opening

12.1 There will be no public opening of bids. Late Bids will be returned to the respective bidders unopened.

Confidentiality and Clarification of Bids

13.1 No information about the content, the analysis and evaluation of the offers, or the recommendation award, shall be disclosed to any Bidder or any person who is not involved in the evaluation process.

13.2 To assist in the examination, evaluation and comparison of Bids, the contracting agency may ask any Bidder for clarification of the Bidder's Bid including breakdowns of unit rates. The request for clarification and the response shall be in writing, but no change in the price or substance of the Bid shall be sought, offered, or permitted.

Examination of Bids and Determination of Responsiveness

14.1 The contracting agency will examine the bids to determine whether they are complete, a) meet the eligibility criteria; b) if the required guarantees have been submitted; c) have been properly signed; and d) if they contain errors of calculation and are substantially responsive to the requirements of the National Competitive Bidding documents.

14.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the Bidding Documents, without material deviation or reservation.

Evaluation and Comparison of Bids

15.2 The contracting agency shall evaluate and compare only the bids determined to be substantially responsive on the basis of the qualification criteria described in this present National Competitive Bidding document.

Evaluation criteria

Compliance [Pass/Fail]

In order to qualify the Bidder must pass the criteria specified in Appendix B.
Additionally, the contracting agency will evaluate the lowest offer:

AWARD OF CONTRACT

Award criteria

16.1 The Contracting Agency shall award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bidding Documents and represents the lowest evaluated cost, provided that such Bidder has been determined to be (a) **eligible**, and (b) **qualified** in accordance with National Competitive Bidding clauses 4 and 5 above.

Contracting Agency's Right to Accept any Bid and to Reject any or all Bids

17.1 The Contracting Agency reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder (s) or any obligation to inform the affected Bidder (s) of the grounds for the Contracting Agency's action.

Notification of Award and Signing of Agreement

18.1 The Contracting Agency will notify the successful Bidder in writing prior to expiration of the Bid validity period. A "Letter of Acceptance" shall provide further information on specific dates for reception of performance security, signing of the agreement and state the sum that the Contracting Agency shall pay the Contractor in consideration of the execution, completion, operation and maintenance of the Works by the Contractor as prescribed by the Contract.

18.2 After notification of the award, unsuccessful bidders may request in writing to the Contracting Agency for a debriefing seeking explanations for the failure of their bids. The Contracting Agency shall promptly respond and explain in writing on which grounds an unsuccessful bid was not selected.

SECTION C. FORMS FOR CONTRACTOR'S BID

Letter of Offer

*[The **Bidder** shall fill in and submit this form with the Bid.*

[date]

Identification No and Title of Contract: **RFB No: 2.1.2/EU** and **Request for Bids (RFB) through Procurement of Work National Competitive Bidding**

To: **Ministry of Science, Energy and Technology, PCJ Building, 36 Trafalgar Road, Kingston 10, Jamaica.**

Having examined the Price C Documents, including addenda *[insert list]*, we offer to execute the *[name and identification number of Contract]* in accordance with the stated Technical specifications.

a. The total price of our Bid, excluding any discounts offered in item (b) below is: *[insert amount in numbers]*, *[insert amount in words] [insert name of currency]*.

_____;

This total price is the sum of the following bid totals included in the Annex 3 SCHEDULE OF PRICING:

Solar PV System:

Inverter Type Energy Efficient Air Conditioning:

b. The discounts offered and the methodology for their application are: _____
_____
_____
_____

The Contract shall be paid in the following currencies:

Currency	Percentage payable in currency	Rate of exchange: *[insert number of local currency units per unit of foreign currency]*	Inputs for which foreign currency is required
(a)			
(b)			
(c)			
(d)			

This Bid and your written acceptance of it shall constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Bid you receive.

We hereby confirm that this Bid complies with the Bid validity and, if required, Bid Security or Bid Validity Declaration as required by the Bidding Documents.

We, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries in accordance with Clause 4. In the case that the works contract includes the supplying of goods and related services, we guarantee that these goods and related services will have their origin in any member country of the Bank.

We have no conflict of interest.

Our firm, its affiliates or subsidiaries—including any subcontractors or suppliers for any part of the contract—has not been declared ineligible by the Bank, or under the Contracting Agency's country laws or official regulations.

We do not have any outstanding sanctions from the Bank or any other International Financial Institution.

We will use our best efforts to assist the Bank in any investigation.

We hereby agree that in competing for (and, if the award is made to us, in executing) the Contract, we undertake to observe the laws against fraud and corruption, including bribery, in force in the country of the Client.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and address of agent	Amount and Currency	Purpose of Commission or gratuity

(if none, state "none")

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Bidder: _____

Address:

_____

Bid Security (Bank Guarantee)

*[If required, the **Bank/Bidder** shall fill in this Bank Guarantee form in accordance with the instructions indicated in brackets.]*

[insert bank's name, and address of issuing branch or office]

Beneficiary: *[insert name and address of Employer]*

Date: *[insert date]*

BID GUARANTEE No.: *[insert number]*

We have been informed that *[insert name of the Bidder; if a JVCA, list complete legal names of partners]* (hereinafter called "the Bidder") has submitted to you its bid dated *[insert date]* (hereinafter called "the Bid") for the execution of *[insert name of Contract]* under Request for Bids No. *[insert RFB number]* ("the RFB").

Furthermore, we understand that, according to your conditions, Bids must be supported by a Bid Guarantee.

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

(a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

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

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

This Guarantee shall expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the Contract signed by the Bidder and of the Performance Security issued to you by the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder that the Bidder was unsuccessful, or (ii) twenty-eight days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this Guarantee must be received by us at the office on or before that date. This Guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

_____

[signature(s) of authorized representative(s)]

Bid Validity Declaration

*[If required, the **Bidder** shall fill in this form in accordance with the instructions indicated in brackets.]*

Date: *[insert date]*
Name of contract: *[insert name]*
Contract Identification Nº: *[insert number]*
RFB No.: *[insert number]*

To: _____

We, the undersigned, declare that:

1. We understand that, according to your conditions, bids must be supported by a bid validity declaration.

2. We accept that we shall be suspended from being eligible for bidding in any contract with the Employer for the period of time of *[insert time period]* starting on *[insert start date]*, if we are in breach of our obligation(s) under the bid conditions, because we:

   (a) have withdrawn our Bid during the period of bid validity specified by us in the Bid Submission Sheet; or

   (b) do not accept the correction of errors ; or

   (c) having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract Form, if required, or (ii) fail or refuse to furnish the performance security, .

3. We understand this bid validity shall expire if we are not the successful bidder, upon the earlier of (i) our receipt of your notification informing us that we are not the successful bidder; or (ii) twenty-eight days after the expiration of our bid.

4. We understand that if we are a JVCA, the Bid Validity Declaration must be in the name of the JVCA that submits the bid. If the JVCA has not been legally constituted at the time of bidding, the Bid Validity Declaration shall be in the names of all future partners as named in the letter of intent.

Signed *[insert signature(s) of authorized representative]* In the Capacity of *[insert title]*

Name *[insert printed or typed name]*

Duly authorized to sign the bid for and on behalf of *[insert authorizing entity]*

Dated on *[insert day]* day of *[insert month], [insert year]*

Bid Security (Bid Bond)

*[If required, the **Surety/Bidder** shall fill in this Bid Bond Form in accordance with the instructions indicated in brackets.]*

BOND NO. *[insert Bond number]*

BY THIS BOND *[insert name of Bidder; if JVCA, insert complete legal names of partners]* as Principal (hereinafter called "the Principal"), and *[insert name, legal title, and address of Surety]*, **authorized to transact business in** *[insert name of country of Employer]*, as Surety (hereinafter called "the Surety"), are held and firmly bound unto *[insert name of Employer]* as Obligee (hereinafter called "the Employer") in the sum of *[insert amount in figures expressed in the currency of the Employer's Country or the equivalent amount in an international freely convertible currency] [insert amount in words]*, for the payment of which sum, well and truly to be made, we, the said Principal and Surety, bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has submitted a written Bid to the Employer dated the *[number]* day of *[month]*, *[year]*, for the construction of *[insert name of Contract]* (hereinafter called the "Bid").

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal:

(1) withdraws its Bid during the period of bid validity specified in the Form of Bid; or

(2) refuses to accept the correction of its Bid Price, pursuant to ITB Sub-Clause 28.2; or

(3) having been notified of the acceptance of its Bid by the Employer during the period of Bid validity;

   (a) fails or refuses to execute the Agreement in accordance with the Instructions to Bidders, if required; or

   (b) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

then the Surety undertakes to immediately pay to the Employer up to the above amount upon receipt of the Employer's first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has occurred.

The Surety hereby agrees that its obligation shall remain in full force and affect up to and including the date 28 days after the date of expiration of the Bid validity as stated in the Invitation to Bid or extended by the Employer at any time prior to this date, notice of which extension(s) to the Surety being hereby waived.

IN TESTIMONY WHEREOF, the Principal and the Surety have caused these presents to be executed in their respective names this *[insert number]* day of *[month], [year]*

Principal: _____	Surety: _____ Corporate Seal (where appropriate)
_____ *[insert signature(s) of authorized*	_____ *[insert signature(s) of authorized representative(s)]* *representative(s)]*
_____ *[insert printed name and title]*	_____ *[insert printed name and title]*

1. Bidder Qualification information form

Project name and country	Name of client and contact person	Type of work performed and year of completion	From *[Indicate Month and year start of work]*	*To [Indicate Month and year work completion]*	Value of contract (national currency equivalent)
(a)					
(b)					

The qualifications and experience of key personnel proposed are attached. *[Attach biographical data; include the list of such staff in the following table]*

Position	Name	Years of experience (general)	Years of experience in proposed position
(a)			
(b)			

The bidder must provide besides all the information specified in Appendix B in the column Qualification Topic

The following unit prices are asked only for information purpose.

DETAILS OF UNIT PRICE FOR SOLAR PV SYSTEM

MATERIALS				
Category	Quantity	Unit	Unit Price ($.)	Total Price ($.)
				0.00
				0.00
a) TOTAL MATERIALS				

LABOR				
Category	Quantity	Unit	Unit Price ($.)	Total Price ($)
				0.00
b) TOTAL LABOR				

EQUIPMENT				
Category	Quantity	Unit	Unit Price ($)	Total Price ($)
				0.00
				0.00
				0.00
				0.00
c) TOTAL EQUIPMENT				

1) DISBURSEMENT OR DIRECT COSTS (a + b + c) 0.00

2) GENERAL FEES, DUTIES AND TAXES (% of 1) 0.00

3) MARGIN FOR RISKS AND BENEFITS (% of 1+2) 0.00

TOTAL PRICE IN US DOLLAR CURRENCY FOR SOLAR PV SYSTEM (1+2+3)
0.00

DETAILS OF UNIT PRICE FOR ENERGY EFFICIENT AIR CONDITIONING SYSTEMS MATERIALS				
Category	Quantity	Unit	Unit Price ($.)	Total Price ($.)
				0.00
				0.00
a) TOTAL MATERIALS				

LABOR				
Category	Quantity	Unit	Unit Price ($.)	Total Price ($)
				0.00
b) TOTAL LABOR				

EQUIPMENT				
Category	Quantity	Unit	Unit Price ($)	Total Price ($)
				0.00
				0.00
				0.00
				0.00
				0.00
c) TOTAL EQUIPMENT				

2) DISBURSEMENT OR DIRECT COSTS (a + b + c) 0.00

4) GENERAL FEES, DUTIES AND TAXES (% of 1) 0.00

5) MARGIN FOR RISKS AND BENEFITS (% of 1+2) 0.00

TOTAL PRICE IN US DOLLAR CURRENCY FOR ENERGY EFFICIENT AIR CONDITIONING SYSTEMS (1+2+3) 0.00

The sum of the TOTAL PRICE FOR SOLAR PV SYSTEM plus the TOTAL PRICE FOR ENERGY EFFICIENT AIR CONDITIONING SYSTEMS must be equal to the total price of literal (a) of the letter of Offer.

2. Proposed Methodology and Schedule of Implementation

The Contractor shall provide a detailed program and schedule for the design and implementation of the work to be executed, including dates of commencement and completion for individual components and identification of milestones and the critical path. Program and implementation schedule will be prepared in accordance with the works requirements and must cover at least the following aspects:

(a) Detailed information on the timetable for the design work, including the provision of design documents, review and approval of the design by a Professional Engineer.

(b) Detailed information on the timetable for obtaining any necessary permits to start the work, including the preparation of required studies, documents and applications justification.

(c) Detailed information on the timetable for the completion of the Works, in accordance with contractual period of execution, with a bar chart showing in particular the critical path.

(d) Detailed information on the proposed construction program acceptance testing, commissioning and transfer of work completed.

SECTION D. **The scope of work**

1. Scope of Work

1.1 Contractor shall engineer, design, construct, operate and maintain the Project in accordance with the Technical Specifications.

1.2 Contractor's Scope of Work is to engineer, design, procure, permit, construct, interconnect, commission, startup, operate and maintain and test a turnkey solar PV and Energy Efficient Air Conditioning Systems which is built to the capacity as indicated in Section 5 and meets commissioning and testing requirements identified by Contracting Agency.

1.3 Contractor shall design all aspects of the Project to meet the minimum Design Life of 15 years for all systems (Solar PV System and Energy Efficient Air Conditioning Systems).

1.4 It is the Contractor's sole responsibility to ensure that all aspects of Project design and construction comply with all local code requirements and all industry codes and standards. This includes, but is not limited to, the list specified in Section 4.

1.5 Professional engineers registered or licensed in the jurisdiction where the Project will be constructed shall sign and seal all documents required for submittal to any applicable legal authority. Contractor shall provide a complete and functional Project up to the Point of Interconnection (POI).

1.6 Contractor shall perform, supply or cause to be supplied all equipment, materials, labor, services, supervision, testing devices, drawings, calculations, specifications, and manuals required for the Project.

1.7 Major components of the Scope of Work include:

1.7.1 Project management including, but not limited to:

- Project administration
- Scheduling
- Quality control
- Weekly and monthly progress reporting
- Coordination of Contractor's personnel and subcontractors
- Compliance with applicable permits and standard
- Operation and Maintenance agreement with Contracting Agency

1.7.2 Engineering including, but not limited to, detailed design of:

- Solar PV design with Year 1 production estimate prepared using standard industry design software.
- Energy Efficient Air Conditioning System
- Electrical systems
- Control and instrument systems
- Civil and structural systems
- HVAC systems (if necessary, for equipment cooling)

- Mechanical systems
- Calculations, analyses and third-party review, where required, of all engineering documents
- Comprehensive design manual including all engineering drawings, calculations and analyses performed
- Comprehensive operation and maintenance manuals for the Project

1.7.3 Procurement of all equipment, materials and services, including but not limited to:

- Air Conditioning Equipment and Accessories for Installation and Commissioning
- Procurement of all materials, including but not limited to, PV Modules, PV Module mounting structures, inverters, combiner boxes, disconnect switches, current transducers, potential transducers, fuses, meters, meteorological stations, DAS equipment, foundations and foundation materials, hardware and fasteners, conduits and raceways, conductors, junction boxes, bonding and grounding equipment, and all related materials
- Procurement of all services including, but not limited to, subcontracted services required to prepare, install, construct, connect and test equipment at the site, if applicable.
- Development of specifications and bid packages for subcontracted work
- Bid evaluation and selection for subcontracted work
- QA/QC material inspections
- Obtaining all datasheets, relevant technical notes, installation, operations and maintenance manuals for all Project equipment
- Priced list of recommended Operating Spare Parts with manufacturer-recommended quantities based on the quantity installed at the Project Site in accordance with Section 11.

1.7.4 Construction of all Project facilities including, but not limited to:

- Securing and controlling the Site and Site access
- Construction management and supervision
- Construction labour and training
- Construction and installation of all Project equipment
- Safety program
- Quality program
- Construction equipment
- Construction utilities such as electrical power, water and telecommunications
- Parking for construction crews
- Construction, maintenance, removal and restoration of all temporary construction needs such as material laydown and staging areas
- Construction lighting
- Construction sanitary facilities
- Surveying
- All consumables
- Site Clean-up

1.7.5 Inspection, testing and commissioning activities including, but not limited to:

- Commissioning as specified by Contracting Agency
- Acceptance testing as specified by Contracting Agency
- Energy performance testing as specified by Contracting Agency
- All personnel and test equipment required to perform the inspection, testing and commissioning activities

1.7.6 Defects liability for first year after commissioning as outlined in Section 11.

1.8 Contractor shall be responsible for disposal of all waste material from the Work.

Minimum Technical Requirements

Table C: Minimum technical requirements

Facility	PV System Size (kWp)	Air Conditioning Size (MBTU/hr)
University Hospital of the West Indies	808	2.54
Total	**808**	**2.54**

SECTION E. Contract forms

Letter of Acceptance

Ministry of Science, Energy and Technology
PCJ Building
36 Trafalgar Road
Kingston, Jamaica

Date:

Identification No and Title of Contract: **2.1.2/EU - Engineering, Procurement, Construction, and initial Operations, and Maintenance of Rooftop Solar PV and Energy Efficient Air Condition Systems at the University Hospital of the West Indies, Kingston, Jamaica.**
To:*[insert name and address of the Contractor]*

This is to notify you that your Bid dated *[insert date]* for execution of the **2.1.2/EU -Engineering, Procurement, Construction, and initial Operations, and Maintenance of Rooftop Solar PV and Energy Efficient Air Condition Systems at the University Hospital of the West Indies, Kingston, Jamaica** for the Contract Price of *[insert amount in numbers and words] US Dollars* (USD), as corrected and modified[1] in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are hereby instructed to (a) proceed with the execution of the said Works in accordance with the Contract Documents, (b) sign and return the attached Contract Documents, and (c) forward the performance security pursuant to ITB Sub-Clause 35.1, i.e., within 21 days after receipt of this Letter of Acceptance, and pursuant to GCC Sub-Clause 52.1

Authorized Signature: _____
Name and Title of Signatory: _____
Name of Agency: _____

[1] *Delete "corrected and" or "and modified" if not applicable. See Notes on Standard Form of Agreement, next page.*

Agreement

[The Agreement shall incorporate any corrections or modifications to the Bid resulting from corrections of errors (ITB Clause 28), price adjustment during the evaluation process (ITB Sub-Clause 16.3, selection of an alternative offer (ITB Clause 18), acceptable deviations (ITB Clause 27), or any other mutually-agreeable changes allowed for in the Conditions of Contract, such as changes in key personnel, subcontractors, scheduling, and the like.]

This Agreement, made the *[insert day]* day of *[insert month]*, *[insert year]* between *[insert name and address of Contracting Agency]* (hereinafter called "the Contracting Agency") and *[insert name and address of Contractor]* (hereinafter called "the Contractor") of the other part.

Whereas the Contracting Agency is desirous that the Contractor execute *[insert name and identification number of Contract]* (hereinafter called "the Works") and the Contracting Agency has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

Now this Agreement witnesseth as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.

2. In consideration of the payments to be made by the Contracting Agency to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Contracting Agency to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

3. The Contracting Agency hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects wherein 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 whereof the parties thereto have signed this Agreement to be executed the day and year first before written.

The Common Seal of *[Witness entity]* _____
was hereunto affixed in the presence of: _____

Signed, Sealed, and Delivered by the said _____
in the presence of: _____

Binding Signature of Contracting Agency *[signature of an authorized representative of the Contracting Agency]*

Binding Signature of Contractor *[signature of an authorized representative of the Contract*

IDB *Eligible Countries*

Eligibility to provide goods, Works construction and render services for Bank financed procurement

Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement
1) List of Member Countries and Territories when the Inter-American Development Bank is financing:
Argentina, Austria, Bahamas, Barbados, Belgium, Belize, Bolivia, Brazil, Canada, Colombia, Costa Rica, Chile, Croatia, Denmark, Dominican Republic, Ecuador, El Salvador, Finland, France, Germany, Guatemala, Guyana, Haiti, Honduras, Israel, Italy, Jamaica, Japan, Mexico, Netherlands, Nicaragua, Norway, Panama, Paraguay, People's Republic of China, Peru, Portugal, Republic of Korea, Slovenia, Spain, Suriname, Sweden, Switzerland, Trinidad & Tobago, United Kingdom, United States, Uruguay and Venezuela.

Eligible Territories
a) Guadeloupe, French Guiana, Martinique, Reunion – as Departments of France
b) U.S. Virgin Islands, Puerto Rico, Guam – as Territories of the USA
c) Aruba – as a constituent country of the Kingdom of the Netherlands; and Bonaire, Curacao, Saint Marten, Saba, St Eustatius – as Departments of the Kingdom of the Netherlands
d) Hong Kong – as a Special Administrative Region of the People's Republic of China

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2) Nationality and origin of Goods and Services Criteria
These policy provisions make it necessary to establish criteria to determine: a) the nationality of the firms and individuals eligible to bid or participate in a bank-financed contract and b) the country of origin of goods, and services. For these determinations, the following criteria shall be used:

A) Nationality.
a) **An individual** is considered to be a national of a member country of the Bank if he or she meets either of the following requirements:
i i. is a citizen of a member country; or

ii ii. has established his/her domicile in a member country as a "bona fide" resident and is legally entitled to work in the country of domicile.

b) **A firm** is considered to have the nationality of a member country if it meets the two following requirements:
i i. is legally constituted or incorporated under the laws of a member country of the Bank; and

ii ii. more than fifty percent (50%) of the firm's capital is owned by individuals or firms from member countries of the Bank.

All members of a JVCA and all subcontractors must meet the nationality criteria set forth above.

B) Origin of Goods.
Goods have their origin in a member country of the Bank if they have been mined, grown, harvested, or produced in a member country of the Bank. A good has been produced when through manufacture, processing

or assembly another commercially recognized article results that differs substantially in its basic characteristics, function or purpose of utility from its parts or components.
For a good consisting of several individual components that need to be interconnected (either by the supplier, the purchaser or by a third party) to make the good operative and regardless of the complexity of the interconnection, the Bank considers that such good is eligible for financing if the assembly of the components took place in a member country, regardless of the origin of the components. When the good is a set of several individual goods that are normally packaged and sold commercially as a single unit, the good is considered to originate in the country where the set was packaged and shipped to the purchaser.

For purpose of origin, goods labeled “made in the European Union” shall be eligible without the need to identify the corresponding specific country of the European Union.
The origin of materials, parts or components of the goods or the nationality of the firm that produces, assembles, distributes or sells the goods, does not determine the origin of the goods.

C) Origin of Services.
The country of origin of services is that of the individual or firm providing the services as determined under the nationality criteria set forth above. These criteria apply to services ancillary to the supply of goods (such as transportation, insurance, erection, assembly, etc.), to construction services and to consulting services.

EU Eligible Countries

EXTERNAL ACTION FINANCIAL INSTRUMENTS AND EUROPEAN DEVELOPMENT FUND

RULES ON PARTICIPATION IN PROCUREMENT PROCEDURES AND GRANTS

PART I: 2014-2020 instruments for external action

1) DCI, ENI, PI, Greenland and INSC

2) IcSP and EIDHR

3) IPA II

Part II: Rules on nationality and origin for public procurement, grants and other award procedures financed under the ACP-EC Partnership Agreement, laid down in Annex IV to the latter Agreement as revised by DECISION No 1/2014 OF THE ACP-EU COUNCIL OF MINISTERS of 20 June 2014 (2014/428/EU)

Part III: rules on nationality and origin for public procurement, grants and other award procedures for instruments for external action financed under the Overseas Association Decision

Part II:

Participation in procedures for the award of procurement contracts or grants financed from the multi-annual financial framework of cooperation under the ACP-EC Partnership Agreement is open to international organisations and all natural persons who are nationals of, or legal persons who are effectively established in:

(a) *an ACP State* (appendix 12);
(b) *a Member State of the European Union* (appendix 1);
(c) *Beneficiaries of the Instrument for pre-accession assistance* (appendix 2);
(d) *a Member State of the European Economic Area* (appendix 3);
(e) *Overseas Countries and Territories* (appendix 8);
(f) developing countries and territories, as included in the OECD-DAC list of ODA Recipients, which are not members of the G20 group, without prejudice to the status of the *Republic of South Africa*, as governed by Protocol 3 of the partnership Agreement (appendices 4, 5, 6 and 7);
(g) countries for which Commission has adopted a decision approving the request for *reciprocal access* to external assistance in agreement with ACP countries;

Currently there are no such countries.

(h) *a* Member *State of the OECD* (appendix 9), in the case of contracts implemented in a Least Developed Country (LDC)[2] or a Highly Indebted Poor Country (HIPC)[3], or in the case of contract implemented in regional or global programmes which include at least one LDC or HIPC country.

A. Appendices

APPENDIX 1 : EU Member States

Austria, Belgium, Bulgaria, Czech Republic, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

APPENDIX 2 : IPA II beneficiaries

Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, Serbia, Turkey, the former Yugoslav Republic of Macedonia. * This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

APPENDIX 3 : European Economic Area

(only non-EU MS are mentioned) Iceland, Lichtenstein, Norway.

APPENDIX 4 : Least Developed Countries

Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Sao Tome & Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sudan, South Sudan, Tanzania, Timor-Leste, Togo, Tuvalu, Uganda, Vanuatu, Yemen, Zambia.

APPENDIX 5: Other Low Income Countries

Kenya, Democratic People’s Republic of Korea, Tajikistan, Zimbabwe.

[2] See appendix 4 for the full list of LDCs.
[3] See full list of HIPCs in footnote 4.

APPENDIX 6 : Lower Middle Income Countries and Territories

Armenia, Bolivia, Cabo Verde, Cameroon, Congo, Côte d´Ivoire, Egypt, El Salvador, Georgia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Kosovo, Kyrgyzstan, Micronesia, Moldova, Mongolia, Morocco, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Samoa, Sri Lanka, Swaziland, Syrian Arab Republic, Tokelau, Ukraine, Uzbekistan, Vietnam, West Bank and Gaza Strip.

APPENDIX 7 : Upper Middle Income Countries and Territories

Albania, Algeria, Antigua and Barbuda, Argentina, Azerbaijan, Belarus, Belize, Bosnia and Herzegovina, Botswana, Brazil, Chile, China (People's Republic of), Colombia, Cook Islands, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Fiji, Former Yugoslav Republic of Macedonia, Gabon, Grenada, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Lebanon, Libya, Malaysia, Maldives, Marshall Islands, Mauritius, Mexico, Montenegro, Montserrat, Namibia, Nauru, Niue, Palau, Panama, Peru, Saint Helena, Saint Lucia, Saint Vincent & the Grenadines, Serbia, Seychelles, South-Africa, Suriname, Thailand, Tonga, Tunisia, Turkey, Turkmenistan, Uruguay, Venezuela, Wallis and Futuna.

APPENDIX 8 : overseas countries and territories

Anguilla (UK), Aruba (NL), Bermuda (UK), British Indian Ocean Territory (UK), British Virgin Islands (UK), Cayman Islands (UK), Curação (NL), Falkland Islands (UK), French Polynesia (FR), French Southern and Antarctic Territories (FR), Greenland (DK), Montserrat (UK), New Caledonia and Dependencies (FR), Pitcairn (UK), Saba (NL), Saint Barthelemy (FR), Saint Helena Ascension Island Tristan da Cunha (UK), Sint Eustatius (NL), Sint Maarten (NL), South Georgia and South Sandwich Islands (UK), St. Pierre and Miquelon (FR), Turks and Caicos (UK), Wallis and Futuna Islands (FR).

APPENDIX 9 : OECD MEMBER STATES

Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

Australia, Canada, Chile, Iceland, Israel, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey, United States of America.

APPENDIX 10 : G20 member developing countries

Argentina, Brazil, China, India, Indonesia, Mexico, South-Africa, Turkey.

APPENDIX 11 : ENI PARTNER COUNTRIES AND TERRITORIES

Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, Republic of Moldova, Morocco, occupied Palestinian territory (oPt), Syria, Tunisia, Ukraine.

APPENDIX 12 : ACP COUNTRIES*

Africa:

South Africa**, Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Cameroon, Cabo Verde, Chad, Comoros Islands, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Zambia and Zimbabwe.

Caribbean:

Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Surinam, Trinidad and Tobago.

Pacific:

Cook Islands, East Timor, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, the Solomon Islands, Western Samoa, Tonga, Tuvalu, Vanuatu.

** While natural and legal persons established in South African are eligible to participate in procedures financed by the 10th/ 11th EDF, South Africa cannot be a beneficiary of contracts financed by the 10th/11th EDF.

* Cotonou Partnership Agreement of 23 June 2000 (as amended by the provisional application of Decision No 1/2000 of the ACP-EC Council of Ministers of 27 July 2000, Decision No 1/2000 of the ACP-EC customs cooperation committee of 18 October 2000, Decision No 1/2001 of the ACP-EC customs cooperation committee of 20 April 2001, Decision No 2/2001 of the ACP-EC customs cooperation committee of 20 April 2001, Decision No 3/2001 of the ACP-EC customs cooperation committee of 10 May 2001, Decision No 4/2001 of the ACP-EC customs cooperation committee of 27 June 2001, Decision No 5/2001 of the ACP-EC customs cooperation committee of 7 December 2001, Decision No 2/2002 of the ACP-EC customs cooperation committee of 28 October 2002, Decision No 1/2003 of the ACP-EC Council of Ministers of 16 may 2003, Council Decision (EC) of 19 December 2002, Decision No 1/2004 of the ACP-EC Council of Ministers of 6 may 2004, Decision No 2/2004 of the ACP-EC customs cooperation committee of 30 June 2004 and Decision No 4/2005 of the ACP-EC customs cooperation committee of 13 April 2005).

Prohibited Practices

Extract from *Standard Bidding Documents; Procurement for Procurement of Goods: IDB, January 2020*
Part I Section I.A.3. Prohibited Practices

Prohibited Practices

3.1 The Bank requires that all Borrowers (including grant beneficiaries), Executing Agencies and Contracting Agencies, including members of its personnel, as well as all firms, entities and individuals participating in a Bank-financed activity acting as, *inter alia*, bidders, proposers, suppliers, contractors, consultants, sub-contractors, sub-consultants, service providers and concessionaires (including their respective officers, employees and representatives or agents, irrespective of whether the agency is express or implied), adhere to the highest ethical standards, and report to the Bank[4] all suspected acts of Prohibited Practices of which they have knowledge or become aware both, during the bidding process and throughout the negotiation or execution of a contract. Prohibited Practices are: (i) corrupt practices; (ii) fraudulent practices; (iii) coercive practices; (iv) collusive practices; (v) obstructive practices; and (vi) misappropriation of funds. The Bank has established mechanisms to report allegations of Prohibited Practices. Any allegation shall be submitted to the Bank's Office of Institutional Integrity (OII) for the appropriate investigation. The Bank has adopted procedures to sanction those who have incurred in Prohibited Practices. The Bank also entered into an agreement with other International Financial Institutions (IFIs) to mutually recognize debarment decisions.

(a) For the purposes of this provision, the definitions of Prohibited Practices are as follows:

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

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

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

[4] Information on how to present allegations of Prohibited Practices, the application of rules regarding investigation and sanctions process, and the agreement regulating the mutual recognition of sanctions among the IFI's are available on the Bank's web site (www.iadb.org/integrity)

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

(v) "*obstructive practice*" is

(i) destroying, falsifying, altering or concealing of evidence material to an IDB Group investigation, or making false statements to investigators with the intent to impede an IDB Group investigation;

(ii) threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to an IDB Group investigation or from pursuing the investigation, or

(iii) acts intended to impede the exercise of the IDB Group's contractual rights of audit or inspection provided for under ITB 3.1(f) below or access to information; and

(vi) a "*misappropriation*" is the use of IDB Group financing or resources for an improper or unauthorized purpose, committed either intentionally or through reckless disregard.

(b) If, the Bank determines that at any stage of the procurement or implementation of a contract the Borrower (including beneficiaries of grants), Executing Agencies, Contracting Agencies, any firm, entity or individual participating in a Bank-financed activity as, *inter alia*, bidders, proposers, suppliers, contractors, consultants, personnel, sub-contractors, sub-consultants, goods or service providers, concessionaires, (including their respective officers, employees and representatives or agents irrespective of whether the attribution is express or implied) engaged in a Prohibited Practice during the award or implementation of the contract, the Bank may:

(i) not finance any proposal to award a contract for works, goods or services, and consulting services;

(ii) suspend disbursement of the operation if it is determined at any stage that an employee, agent or representative of the Borrower, Executing Agency or Purchaser has engaged in a Prohibited Practice;

(iii) declare Misprocurement and cancel, and/or accelerate repayment of the portion of a loan or grant earmarked for a contract, when there is evidence that the representative of the Borrower, or Beneficiary of a grant, has not taken the adequate remedial measures (including, ***inter alia***, providing adequate notice to the Bank upon learning of the Prohibited Practice) within a time period which the Bank considers reasonable;

(iv) issue the firm, entity or individual a reprimand in the form of a formal letter of censure for its behavior;

(v) declare that a firm, entity, or individual is ineligible, either permanently or for a stated period of time, to participate and/or be awarded additional contracts financed with IDB Group resources;

(vi) impose other sanctions that it deems to be appropriate, among others, the restitution of funds and of fines equivalent to the reimbursement for costs associated with investigations and proceedings contemplated in the Sanctions Procedures. Such other sanctions may be imposed in addition to or in lieu of the sanctions referred above (the "abovementioned" sanctions are reprimand and debarment/ineligibility);

(vii) extend the sanctions imposed on any individual, entity or firm that, directly or indirectly, owns or controls a sanctioned entity, is owned or controlled by a sanctioned entity or is the object of common ownership or control with a sanctioned entity, as well as to officials, employees, affiliates or representatives or agents of a sanctioned entity who also own a sanctioned entity and / or exercise control over a sanctioned entity, even if it has not been concluded that those parties directly incurred in a Prohibited Practice; and/or

(viii) refer the matter to appropriate law enforcement authorities.

(c) The provisions of ITB 3.1 (b) (i) and (ii) shall also be applicable when such parties have been temporarily suspended from eligibility to be awarded additional contracts pending a final outcome of a sanction proceeding, or otherwise.

(d) The imposition of any action to be taken by the Bank pursuant to the provisions referred to above may be made public.

(e) Pursuant to the Agreement for Mutual Enforcement of Debarment Decisions entered into with other IFIs, any firm, entity or individual bidding for or participating in a Bank-financed activity or acting as bidders, proposers, suppliers, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers, concessionaires, personnel of the Borrower (including grant Beneficiaries), Executing Agencies or Contracting Agencies, (including their respective officers, employees, representatives and agents, irrespective of whether the attribution is expressed or implied) may be subject to a sanction. For purposes of this paragraph the term "sanction" shall mean any debarment, conditions on future contracting or any publicly-disclosed action taken in response to a violation of an IFI's applicable framework for addressing allegations of Prohibited Practices.

(f) The Bank requires that all applicants, bidders, proposers, suppliers, and their representatives or agents, contractors, consultants, officers or employees, sub-contractors, service providers and concessionaires permit the Bank to inspect accounts, records and other documents relating to the submission of bids and contract performance as well as to have them audited by personnel appointed by the Bank. Applicants, bidders, proposers, suppliers, and their representatives or agents, contractors, consultants, sub-contractors, sub-consultants, service providers and concessionaires shall fully assist the Bank with its investigation. The Bank also requires that all applicants, bidders, proposers, suppliers, and their representatives or agents, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers and concessionaires: (i) maintain all documents and records related to the Bank-financed activities for seven (7) years after completion of the work contemplated in the relevant contract; (ii) deliver any document necessary for the investigation of allegations of Prohibited Practices; and (iii) ensure that employees, representatives or agents of the applicants, bidders, proposers, suppliers and their representatives or agents, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers or concessionaires who have knowledge that the Bank financed the activities to respond to questions from Bank personnel or any properly designated investigator, agent, auditor or consultant relating to the investigation. If the applicant, bidder, supplier and its representative or agent, contractor, consultant, personnel, sub-contractor, sub-consultant, service provider or concessionaire fails to cooperate and/or comply with the Bank's request, or otherwise obstructs the investigation, the Bank, discretionally, may take appropriate action against the applicant bidder, supplier and its agent or representative, contractor, consultant, personnel, sub-contractor, service provider or concessionaire.

(g) If the Borrower procures goods or services, works or consulting services directly from a specialized agency, all provisions under section 3 regarding Prohibited Practices and to the correspondent sanctions shall apply in their entirety to applicants, bidders, proposers, suppliers and their representatives or agents, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers, and concessionaires, (including their respective officers, employees, and representatives or agents, irrespective of whether the agency is express or implied), or to any other entities that signed contracts with such specialized agency to supply such goods, works, or non-consulting services in connection with the Bank-financed activities. The Bank will retain the right to require the Borrower to invoke remedies such as contract suspension or termination. Specialized agencies shall consult the Bank's list of suspended or debarred firms and individuals. In the event a specialized agency signs a contract or purchase order with a firm or an individual suspended or debarred by the Bank, the Bank

will not finance the related expenditures and will apply other remedies as appropriate.

3.2 By submitting bids bidders and proposers represent and warrant:

(h) that they have read and understood the Bank's definition of Prohibited Practices and the applicable sanctions pursuant to the Sanctions Procedures;

(i) that they have not engaged in any Prohibited Practice as set forth herein during the selection, negotiation, adjudication or execution of this contract;

(j) that they have not misrepresented or concealed any material facts during the procurement or contract negotiation processes or during the performance of the contract;

(k) that neither they nor their representatives or agents, sub-contractors, sub-consultants, directors, key personnel or principal shareholders have been declared ineligible to be awarded a contract by the Bank

(l) that all commissions, representative or agents' fees, facilitating payments or revenue-sharing agreements related to the Bank-financed activities have been disclosed; and

(m) that they acknowledge that the breach of any of these representations may constitute a basis for the adoption by the Bank of one or more of the measures set forth in ITB 3.1 (b).

Performance Security
Option 1: (Bank Guarantee)

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

[Guarantor letterhead or SWIFT identifier code]
Beneficiary: *[insert name and Address of Purchaser]*
Date: _ *[Insert date of issue]*
PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*
Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*
We have been informed that _ *[insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the supply of _ *[insert name of contract and brief description of Goods and related Services]* (hereinafter called "the Contract").
Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.
At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (_____) *[insert amount in words]*,[51] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.
This guarantee shall expire, no later than the …. Day of ……, 2…[62], and any demand for payment under it must be received by us at this office indicated above on or before that date.
This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____
[signature(s)]

---

[51] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, and denominated either in the currency (ies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[62] *Insert the date twenty-eight days after the expected completion date as described in GC Clause 18.4. The Purchaser should note that in the event of an extension of this date for completion of the Contract, the Purchaser would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Purchaser might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

Option 2: Performance Bond

By this Bond *[insert name of Principal]* as Principal (hereinafter called "the Supplier") and *[insert name of Surety]* as Surety (hereinafter called "the Surety"), are held and firmly bound unto *[insert name of Purchaser]* as Obligee (hereinafter called "the Supplier") in the amount of *[insert amount in words and figures]*, for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Supplier and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Supplier has entered into a written Agreement with the Purchaser dated the _____ day of _____, 20 _____, for *[name of contract and brief description of Goods and related Services]* in accordance with the documents, plans, specifications, and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, the Condition of this Obligation is such that, if the Supplier shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Supplier shall be, and declared by the Purchaser to be, in default under the Contract, the Purchaser having performed the Purchaser's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

(1) complete the Contract in accordance with its terms and conditions; or

(2) obtain a Bid or Bids from qualified Bidders for submission to the Purchaser for completing the Contract in accordance with its terms and conditions, and upon determination by the Purchaser and the Surety of the lowest responsive Bidder, arrange for a Contract between such Bidder and Purchaser and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "Balance of the Contract Price," as used in this paragraph, shall mean the total amount payable by Purchaser to Supplier under the Contract, less the amount properly paid by Purchaser to the Supplier; or

(3) pay the Purchaser the amount required by Purchaser to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Purchaser named herein or the heirs, executors, administrators, successors, and assigns of the Purchaser.

In testimony whereof, the Supplier has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this _____ day of _____ 20 ___.

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

Advance Payment Security
Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]
Beneficiary: *[Insert name and Address of Purchaser]*
Date: *[Insert date of issue]*
ADVANCE PAYMENT GUARANTEE No.: *[Insert guarantee reference number]*
Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the execution of *[insert name of contract and brief description of Goods and related Services]* (hereinafter called "the Contract").
Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum *[insert amount in figures]* () *[insert amount in words]* is to be made against an advance payment guarantee.
At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (_____) *[insert amount in words]*[71] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has used the advance payment for purposes other than toward delivery of Goods; or

(b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Applicant on its account number *[insert number]* at *[insert name and address of Applicant's bank]*.
The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, has been certified for payment, or on the *[insert day]* day of *[insert month]*, 2 *[insert year]*, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.
This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No.758, except that the supporting statement under Article 15(a) is hereby excluded.

---

[71] *The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Purchaser.*

_____
[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Section F. General Conditions of Contract

The General Conditions of Contract (GCC), read in conjunction with the Special Conditions of Contract (SCC) and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

The form of General Conditions of Contract that follows has been developed on the basis of considerable international experience in the drafting and management of contracts, bearing in mind a trend in the construction industry towards simpler, more straightforward language.

The form can be used directly for smaller admeasurement contracts and, with the modifications noted in the footnotes, it can be adapted for lump sum contracts.

The use of standard General Conditions of Contract (GCC) for building and civil works in a country shall promote comprehensiveness of coverage, general acceptability of its provisions, savings in cost and time in Bid preparation and review, and the development of a solid background of legal case histories.

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General Conditions of Contract

A. General

1. Definitions

1.1 Boldface type is used to identify defined terms.

(a) The **Adjudicator** is the person appointed jointly by the Contracting Agency and the Contractor to resolve disputes in the first instance, as provided for in GCC Clauses 24 and 25 hereunder.

(b) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.

(c) **Compensation Events** are those defined in GCC Clause 44 hereunder.

(d) The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 55.1.

(e) The **Contract** is the Contract between the Contracting Agency and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Clause 2.3 below.

(f) The **Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Contracting Agency.

(g) The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Contracting Agency.

(h) The **Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

(i) **Days** are calendar days; months are calendar months.

(j) **Dayworks** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.

(k) A **Defect** is any part of the Works not completed in accordance with the Contract.

(l) The **Defects Liability Certificate** is the certificate issued by Project Manager upon correction of defects by the Contractor.

(m) The **Defects Liability Period** is the period **named in the SCC** Sub-Clause 35.1 and calculated from the Completion Date.

(n) **Drawings** include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

(o) The **Contracting Agency** is the party who employs the Contractor to carry out the Works, **as specified in the SCC.-**

(p) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

(q) The **Initial Contract Price** is the Contract Price listed in the Contracting Agency's Letter of Acceptance.

(r) The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is **specified in the SCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

(s) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

(t) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

(u) The **Project Manager** is the person **named in the SCC** (or any other competent person appointed by the Contracting Agency and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

(v) **SCC** means Special Conditions of Contract

(w) The **Site** is the area **defined as such in the SCC**.

(x) **Site Investigation Reports** are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.

(y) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

(z) The **Start Date** is **given in the SCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

(aa) A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

(bb) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

(cc) A **Variation** is an instruction given by the Project Manager which varies the Works.

(dd) The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Contracting Agency, **as defined in the SCC.**

2. Interpretation

2.1 In interpreting these GCC, singular also means plural, male also means female, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

2.2 If sectional completion is **specified in the SCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

(a) Agreement,
(b) Letter of Acceptance,
(c) Contractor's Bid,
(d) Special Conditions of Contract,
(e) General Conditions of Contract,
(f) Specifications,
(g) Drawings,
(h) Activity Schedule and
(i) any other document **listed in the SCC** as forming part of the Contract.

3. Language and Law	3.1	The language of the Contract and the law governing the Contract are **stated in the SCC**.
4. Project Manager's Decisions	4.1	Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Contracting Agency and the Contractor in the role representing the Contracting Agency.
5. Delegation	5.1	The Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.
6.Communica-tions	6.1	Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.
7.Subcontracting	7.1	The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Contracting Agency in writing. Subcontracting shall not alter the Contractor's obligations.
8. Other Contractors	8.1	The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Contracting Agency between the dates given in the Schedule of Other Contractors, as **referred to in the SCC.** The Contractor shall also provide facilities and services for them as described in the Schedule. The Contracting Agency may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.
9. Personnel	9.1	The Contractor shall employ the key personnel named in the Schedule of Key Personnel, as **referred to in the SCC,** to carry out the functions stated in the Schedule or other personnel approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Schedule.
	9.2	If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Contracting Agency's and Contractor's Risks

10.1 The Contracting Agency carries the risks which this Contract states are the Contracting Agency's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Contracting Agency's Risks

11.1 From the Start Date until the Defects Correction Certificate has been issued, the following are the Contracting Agency's risks:

(a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to

(i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or

(ii) negligence, breach of statutory duty, or interference with any legal right by the Contracting Agency or by any person employed by or contracted to him except the Contractor.

(b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Contracting Agency or in the Contracting Agency's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

11.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is a Contracting Agency's risk except loss or damage due to

(a) a Defect which existed on the Completion Date,

(b) an event occurring before the Completion Date, which was not itself a Contracting Agency's risk, or

(c) the activities of the Contractor on the Site after the Completion Date.

12. Contractor's Risks

12.1 From the Starting Date until the Defects Correction Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Contracting Agency's risks are Contractor's risks.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Contracting Agency and the Contractor, insurance cover from the Start Date to

the end of the Defects Liability Period, in the amounts and deductibles **stated in the SCC** for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works, Plant, and Materials;

(b) loss of or damage to Equipment;

(c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and

(d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Contracting Agency may effect the insurance which the Contractor should have provided and recover the premiums the Contracting Agency has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

13.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Investigation Reports

14.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports **referred to in the SCC,** supplemented by any information available to the Bidder.

15. Queries about the Special Conditions of Contract

15.1 The Project Manager shall clarify queries on the **SCC.**

16. Contractor to Construct the Works

16.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

17. The Works to Be Completed by the

17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the

Intended Completion Date		Project Manager, and complete them by the Intended Completion Date.
18. Approval by the Project Manager	18.1	The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them if they comply with the Specifications and Drawings.
	18.2	The Contractor shall be responsible for design of Temporary Works.
	18.3	The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
	18.4	The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
	18.5	All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before their use.
19. Safety	19.1	The Contractor shall be responsible for the safety of all activities on the Site.
20. Discoveries	20.1	Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Contracting Agency. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.
21. Possession of the Site	21.1	The Contracting Agency shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date **stated in the SCC,** the Contracting Agency shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.
22. Access to the Site	22.1	The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.
23. Instructions, Inspections and Audits	23.1	The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.
	23.2	The Contractor shall permit the Bank to inspect their accounts, records and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by the Bank. The Contractor shall maintain all documents and records related to the Bank-financed project for seven (7) years after completion of the work. The Contractor shall deliver any

document necessary for the investigation of allegations of prohibited practices and require to employees or agents with knowledge of the Bank-financed project to respond to questions from the Bank.

24. Disputes

24.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.

25. Procedure for Disputes

25.3 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified **in the SCC.**

26. Replacement of Adjudicator

26.1 Should the Adjudicator resign or die, or should the Contracting Agency and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Contracting Agency and the Contractor. In case of disagreement between the Contracting Agency and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority **designated in the SCC** at the request of either party, within 14 days of receipt of such request.

B. Time Control

27. Program

27.1 Within the time **stated in the SCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works.

27.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

27.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period **stated in the SCC.** If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount **stated in the SCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted.

27.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

28. Extension of the Intended Completion Date

28.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

28.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

29. Acceleration

29.1 When the Contracting Agency wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Contracting Agency accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Contracting Agency and the Contractor.

29.2 If the Contractor's priced proposals for an acceleration are accepted by the Contracting Agency, they are incorporated in the Contract Price and treated as a Variation.

30. Delays Ordered by the Project Manager

30.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

31. Management Meetings

31.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

31.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Contracting Agency. The responsibility of

the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

32. Early Warning

32.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

32.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

33. Identifying Defects

33.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

34. Tests

34.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

35. Correction of Defects

35.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is **defined in the SCC.** The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

35.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

36. Uncorrected Defects

36.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.

D. Cost Control

37. Activity Schedule

37.1 The Contractor shall provide updated Activity Schedules within 14 days of being instructed to by the Project Manager. The activities on the Activity Schedule shall be coordinated with the activities on the Program.

37.2 The Contractor shall show delivery of Materials to the Site separately on the Activity Schedule if payment for Materials on Site shall be made separately.

38. Changes in the Quantities

38.1 The Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

39. Variations

39.1 All Variations shall be included in updated Programs Activity Schedule produced by the Contractor.

40. Payments for Variations

40.1 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager, before the Variation is ordered.

40.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

40.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

40.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

41. Cash Flow Forecasts

41.1 When the Program Activity Schedule is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies,

as defined in the Contract, converted as necessary using the Contract exchange rates.

42. Payment Certificates

42.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

42.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

42.3 The value of work executed shall be determined by the Project Manager.

42.4 The value of work executed shall comprise the value of completed activities in the Activity Schedule.

42.5 The value of work executed shall include the valuation of Variations and Compensation Events.

42.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

43. Payments

43.1 Payments shall be adjusted for deductions for advance payments and retention. The Contracting Agency shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Contracting Agency makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.

43.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

43.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

43.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Contracting Agency and shall be deemed covered by other rates and prices in the Contract.

44. Compensation Events

44.1 The following shall be Compensation Events:

(a) The Contracting Agency does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 21.1.

(b) The Contracting Agency modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.

(c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.

(d) The Project Manager instructs the Contractor to uncover work done, or to carry out additional tests upon work, which is then found to have no Defects.

(e) The Project Manager unreasonably does not approve a subcontract to be let.

(f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.

(g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Contracting Agency, or additional work required for safety or other reasons.

(h) Other contractors, public authorities, utilities, or the Contracting Agency do not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

(i) The advance payment is delayed.

(j) The effects on the Contractor of any of the Contracting Agency's Risks.

(k) The Project Manager unreasonably delays issuing a Certificate of Completion.

44.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion

Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

44.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

44.4 The Contractor shall not be entitled to compensation to the extent that the Contracting Agency's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

45. Tax

45.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 47.

46. Currencies

46.1 Where payments are made in currencies other than the currency of the Contracting Agency's country **specified in the SCC,** the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor's Bid.

47. Price Adjustment

47.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC.** If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency:

$$\mathbf{P_c = A_c + B_c\ (Imc/Ioc)}$$

where:

P_c is the adjustment factor for the portion of the Contract Price payable in a specific currency "c."

A_c and B_c are coefficients[8] **specified in the SCC,** representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency "c;" and

Imc is the index prevailing at the end of the month being invoiced and Ioc is the index prevailing 28 days before Bid opening for inputs payable; both in the specific currency "c."

47.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

48. Retention

48.1 The Contracting Agency shall retain from each payment due to the Contractor the proportion **stated in the SCC** until Completion of the whole of the Works.

48.2 On completion of the whole of the Works and the Project Manager certification of completion of the works according to GCC Sub-Clause 55.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected.

48.3 On completion of the whole Works and the Project Manager certification of completion of the works according to GCC Sub-Clause 55.1, the Contractor may substitute retention money with an "on demand" Bank guarantee.

49. Liquidated Damages

49.1 The Contractor shall pay liquidated damages to the Contracting Agency at the rate per day **stated in the SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the SCC.** The Contracting Agency may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

49.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by

[8] *The sum of the two coefficients A_c and B_c should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulae for all currencies, since coefficient A, for the nonadjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency are added to the Contract Price.*

adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 43.1.

50. Bonus

50.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the SCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

51. Advance Payment

51.1 The Contracting Agency shall make advance payment to the Contractor of the amounts **stated in the SCC** by the date **stated in the SCC,** against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the

51.2 Contracting Agency in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.

51.3 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

51.4 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.

52. Securities

52.1 The Performance Security shall be provided to the Contracting Agency no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the SCC,** by a bank or surety acceptable to the Contracting Agency, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 days later than the date of issue of the

Certificate of Completion in the case of a Bank Guarantee, and until one year later than the date of issue of the Completion Certificate in the case of a Performance Bond.

53. Daywork

53.1 If applicable, the Daywork rates in the Contractor's Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

53.2 All work to be paid for as Daywork shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.

53.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

54. Cost of Repairs

54.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

55. Completion

55.1 The Contractor shall request the Project Manager to issue a certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the work is completed.

56. Taking Over

56.1 The Contracting Agency shall take over the Site and the Works within seven (7) days of the Project Manager's issuing a certificate of Completion.

57. Final Account

57.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

58. Operating and Maintenance Manuals

58.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates **stated in the SCC.**

58.2 If the Contractor does not supply the Drawings and/or manuals by the dates **stated in the SCC,** or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the SCC** from payments due to the Contractor.

59. Termination

59.1 The Contracting Agency or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

59.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager;

(b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;

(c) the Contracting Agency or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(d) a payment certified by the Project Manager is not paid by the Contracting Agency to the Contractor within 84 days of the date of the Project Manager's certificate;

(e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;

(f) the Contractor does not maintain a Security, which is required;

(g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as **defined in the SCC**;

(h) if the Contractor, in the judgment of the Contracting Agency has engaged in prohibited practices in competing for or in executing the Contract, as established in the

Policies of the Inter-American Development Bank, indicated in Clause 60 of these GCC.

59.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 59.2 above, the Project Manager shall decide whether the breach is fundamental or not.

59.4 Notwithstanding the above, the Contracting Agency may terminate the Contract for convenience at any time.

59.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

60. Prohibited Practices exclusive clause for loan agreements signed under policy GN-2349-15

60.1 The Bank requires that all Borrowers (including grant beneficiaries), Executing Agencies and Contracting Agencies, including members of its personnel, as well as all firms, entities and individuals participating in a Bank-financed activity acting as, *inter alia*, bidders, proposers, suppliers, contractors, consultants, sub-contractors, sub-consultants, service providers and concessionaires (including their respective officers, employees and representatives or agents, irrespective of whether the agency is express or implied), adhere to the highest ethical standards, and report to the Bank[9] all suspected acts of Prohibited Practices of which they have knowledge or become aware both, during the bidding process and throughout the negotiation or execution of a contract. Prohibited Practices are: (i) corrupt practices; (ii) fraudulent practices; (iii) coercive practices; (iv) collusive practices; (v) obstructive practices; and (vi) misappropriation of funds. The Bank has established mechanisms to report allegations of Prohibited Practices. Any allegation shall be submitted to the Bank's Office of Institutional Integrity (OII) for the appropriate investigation. The Bank has adopted procedures to sanction those who have incurred in Prohibited Practices. The Bank also entered into an agreement with other International Financial Institutions (IFIs) to mutually recognize debarment decisions.

(a) For the purposes of this provision, the definitions of Prohibited Practices are as follows:

[9] Information on how to present allegations of Prohibited Practices, the application of rules regarding investigation and sanctions process, and the agreement regulating the mutual recognition of sanctions among the IFI's are available on the Bank's web site (www.iadb.org/integrity)

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

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

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

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

(v) "*obstructive practice*" is

(i) destroying, falsifying, altering or concealing of evidence material to an IDB Group investigation, or making false statements to investigators with the intent to impede an IDB Group investigation;

(ii) threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to an IDB Group investigation or from pursuing the investigation, or

(iii) acts intended to impede the exercise of the IDB Group's contractual rights of audit or inspection provided for under ITB 3.1(f) below or access to information; and

(vi) "*misappropriation*" is the use of IDB Group financing or resources for an improper or unauthorized purpose, committed either intentionally or through reckless disregard.

(b) If, the Bank determines that at any stage of the procurement or implementation of a contract the Borrower (including beneficiaries of grants), Executing Agencies, Contracting Agencies, any firm, entity or individual participating in a Bank-financed activity as, *inter alia*, bidders, proposers, suppliers, contractors, consultants, personnel, sub-contractors, sub-consultants,

goods or service providers, concessionaires, (including their respective officers, employees and representatives or agents irrespective of whether the attribution is express or implied) engaged in a Prohibited Practice during the award or implementation of the contract, the Bank may:

(i) not finance any proposal to award a contract for works, goods or services, and consulting services;

(ii) suspend disbursement of the operation if it is determined at any stage that an employee, agent or representative of the Borrower, Executing Agency or Employer has engaged in a Prohibited Practice;

(iii) declare Misprocurement and cancel, and/or accelerate repayment of the portion of a loan or grant earmarked for a contract, when there is evidence that the representative of the Borrower, or Beneficiary of a grant, has not taken the adequate remedial measures (including, *inter alia*, providing adequate notice to the Bank upon learning of the Prohibited Practice) within a time period which the Bank considers reasonable;

(iv) issue the firm, entity or individual a reprimand in the form of a formal letter of censure for its behavior;

(v) declare that a firm, entity, or individual is ineligible, either permanently or for a stated period of time, to participate and/or be awarded additional contracts financed with IDB Group resources;

(vi) impose other sanctions that it deems to be appropriate, among others, the restitution of funds and of fines equivalent to the reimbursement for costs associated with investigations and proceedings contemplated in the Sanctions Procedures. Such other sanctions may be imposed in addition to or in lieu of the sanctions referred above (the "abovementioned" sanctions are reprimand and debarment/ineligibility);

(vii) extend the sanctions imposed on any individual, entity or firm that, directly or indirectly, owns or controls a sanctioned entity, is owned or controlled by a sanctioned entity or is the object of common ownership or control with a sanctioned entity, as well as to officials, employees, affiliates or representatives or agents of a sanctioned entity who also own a sanctioned entity and / or exercise control over a sanctioned entity, even if it has not

been concluded that those parties directly incurred in a Prohibited Practice; and/or

(viii) refer the matter to appropriate law enforcement authorities.

(c) The provisions of ITB 60.1 (b) (i) and (ii) shall also be applicable when such parties have been temporarily suspended from eligibility to be awarded additional contracts pending a final outcome of a sanction proceeding, or otherwise.

(d) The imposition of any action to be taken by the Bank pursuant to the provisions referred to above may be made public.

(e) Pursuant to the Agreement for Mutual Enforcement of Debarment Decisions entered into with other IFIs, any firm, entity or individual bidding for or participating in a Bank-financed activity or acting as bidders, proposers, suppliers, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers, concessionaires, personnel of the Borrower (including grant Beneficiaries), Executing Agencies or Contracting Agencies, (including their respective officers, employees, representatives and agents, irrespective of whether the attribution is expressed or implied) may be subject to a sanction. For purposes of this paragraph the term "sanction" shall mean any debarment, conditions on future contracting or any publicly-disclosed action taken in response to a violation of an IFI's applicable framework for addressing allegations of Prohibited Practices.

(f) The Bank requires that all applicants, bidders, proposers, suppliers, and their representatives or agents, contractors, consultants, officers or employees, sub-contractors, service providers and concessionaires permit the Bank to inspect accounts, records and other documents relating to the submission of bids and contract performance as well as to have them audited by personnel appointed by the Bank. Applicants, bidders, proposers, suppliers, and their representatives or agents, contractors, consultants, sub-contractors, sub-consultants, service providers and concessionaires shall fully assist the Bank with its investigation. The Bank also requires that all applicants, bidders, proposers, suppliers, and their representatives or

agents, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers and concessionaires: (i) maintain all documents and records related to the Bank-financed activities for seven (7) years after completion of the work contemplated in the relevant contract; (ii) deliver any document necessary for the investigation of allegations of Prohibited Practices; and (iii) ensure that employees, representatives or agents of the applicants, bidders, proposers, suppliers and their representatives or agents, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers or concessionaires who have knowledge that the Bank financed the activities to respond to questions from Bank personnel or any properly designated investigator, agent, auditor or consultant relating to the investigation. If the applicant, bidder, supplier and its representative or agent, contractor, consultant, personnel, sub-contractor, sub-consultant, service provider or concessionaire fails to cooperate and/or comply with the Bank's request, or otherwise obstructs the investigation, the Bank, discretionally, may take appropriate action against the applicant bidder, supplier and its agent or representative, contractor, consultant, personnel, sub-contractor, service provider or concessionaire.

(g) If the Borrower procures goods or services, works or consulting services directly from a specialized agency, all provisions regarding Prohibited Practices and to the correspondent sanctions shall apply in their entirety to applicants, bidders, proposers, suppliers and their representatives or agents, contractors, consultants, personnel, sub-contractors, sub-consultants, service providers, and concessionaires, (including their respective officers, employees, and representatives or agents, irrespective of whether the agency is express or implied), or to any other entities that signed contracts with such specialized agency to supply such goods, works, or non-consulting services in connection with the Bank-financed activities. The Bank will retain the right to require the Borrower to invoke remedies such as contract suspension or termination. Specialized agencies shall consult the Bank's list of suspended or debarred firms and individuals. In the event a specialized agency signs a contract or purchase order with a firm or an individual suspended or debarred by the Bank, the Bank will not

finance the related expenditures and will apply other remedies as appropriate.

60.2 By submitting bids bidders and proposers represent and warrant:

(n) that they have read and understood the Bank's definition of Prohibited Practices and the applicable sanctions pursuant to the Sanctions Procedures;

(o) that they have not engaged in any Prohibited Practice as set forth herein during the selection, negotiation, adjudication or execution of this contract;

(p) that they have not misrepresented or concealed any material facts during the procurement or contract negotiation processes or during the performance of the contract;

(q) that neither they nor their representatives or agents, sub-contractors, sub-consultants, directors, key personnel or principal shareholders have been declared ineligible to be awarded a contract by the Bank

(r) that all commissions, representative or agents' fees, facilitating payments or revenue-sharing agreements related to the Bank-financed activities have been disclosed; and

(s) that they acknowledge that the breach of any of these representations may constitute a basis for the adoption by the Bank of one or more of the measures set forth in ITB 3.1 (b).

61. Payment upon Termination

61.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as **indicated in the SCC.** Additional Liquidated Damages shall not apply. If the total amount due to the Contracting Agency exceeds any payment due to the Contractor, the difference shall be a debt payable to the Contracting Agency.

61.2 If the Contract is terminated for the Contracting Agency's convenience or because of a fundamental breach of Contract by the Contracting Agency, the Project Manager shall issue a

certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

62. Property

62.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Contracting Agency if the Contract is terminated because of the Contractor's default.

63. Release from Performance

63.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Contracting Agency or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

64. Payment's Suspension of Bank Loan

64.1 In the event that the Bank suspends the Loan or Credit to the Contracting Agency, from which part of the payments to the Contractor are being made:

(a) The Contracting Agency is obligated to notify the Contractor of such suspension within 7 days of having received the Bank's suspension notice.

(b) If the Contractor has not received sums due it within the 28 days for payment provided for in Sub-Clause 43.1, the Contractor may immediately issue a 14-day termination notice.

65. Eligibility

65.1 The Contractor and its Subcontractors shall have the nationality of a Bank's member country. A Contractor or Subcontractor shall be deemed to have the nationality of a country if it complies with the following requirements:

(a) **An individual** is considered to be a national of a member country of the Bank if he or she meets either of the following requirements:

(i) is a citizen of a member country; or

(ii) has established his/her domicile in a member country as a "bona fide" resident and is legally entitled to work

in the country of domicile.

(a) **A firm** is considered to have the nationality of a member country if it meets the two following requirements:

(i) is legally constituted or incorporated under the laws of a member country of the Bank; and

(ii) more than fifty percent (50%) of the firm's capital is owned by individuals or firms from member countries of the Bank.

65.2 All members of a JVCA and all subcontractors must meet the nationality criteria set forth above.

65.3 All the Goods and Related Services to be supplied under the Contract and financed by the Bank shall have their origin in any Bank's member country. Goods have their origin in a member country of the Bank if they have been mined, grown, harvested, or produced in a member country of the Bank. A good has been produced when through manufacture, processing or assembly another commercially recognized article results that differs substantially in its basic characteristics, function or purpose of utility from its parts or components.

Section G. Special Conditions of Contract

Except where otherwise indicated, all SCC should be filled in by the Contracting Agency prior to issuance of the Bidding Documents. Schedules and reports to be provided by the Contracting Agency should be annexed.

A. General	
GCC 1.1 (a)	It is not named an Adjudicator. In case of any dispute SCC GCC 25.3 shall be applied.
GCC 1.1 (o)	The Contracting Agency is Ministry of Science, Energy and Technology, 36 Trafalgar Road, Kingston 10. Jamaica.
GCC 1.1 (r)	The Intended Completion Date for the whole of the Works shall be **June 30, 2023** Operation & Maintenance to commence after the Completion Date and to continue for a period of one (1) year.
GCC 1.1 (u)	The Project Manager is the Programme Coordinator, Project Execution Unit, Ministry of Science, Energy and Technology
GCC 1.1 (w)	- The Site is located at: - University Hospital of the West Indies, Kingston, Jamaica.
GCC 1.1 (z)	The Start Date shall be **January 9, 2023.**
GCC 1.1 (dd)	The Works consist of: 2.1.2 - Engineering, Procurement, Construction of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies according with all the Specifications include in this RFB.
GCC 2.3	The following documents also form part of the Contract: N/A
GCC 3.1	The language of the contract is English The law that applies to the Contract is the law of Jamaica.
GCC 9.1	Key Personnel: Names of your Contract Manager, three Electrical Engineers, site technical and site supervisor.
GCC 13.1	The minimum insurance amounts and deductibles shall be: (a) for loss or damage to the Works, Plant and Materials: US$1,000,000 (b) For loss or damage to Equipment: US$1,000,000

	(c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract US$500,000 (d) for personal injury or death: (i) of the Contractor's employees: US$1,000,000 (ii) of other people: US$1,000,000
GCC 14.1	Site Investigation Report is the following: Ministry of Science, Energy and Technology Roof Structural Assessment Report.
GCC 16.1	*The Contractor is required to outfit the major pieces of equipment with signage referencing the project name and the flags of the European Union. The design must receive the prior approval of the Contracting Agency. During the inspection, the Contracting Agency will verify* that this requirement has been met by the Contractor. *This activity must comply with the rules laid down in the Communication and Visibility Manual for EU External Actions published on the EU International Partnerships Website:* **Communication and Visibility Requirements for EU External Actions | International Partnerships (europa.eu)** Before the Start Date, the Contractor must provide copy of current contractor's license issued by the Government of Jamaica.
GCC 19.1	As established in Annex IV. Occupational Health and Safety, the Health and Safety Plan is to be submitted by the Contractor for the approval of the Employer before the start of civil works and proceeding with purchase orders. This Plan must include a labour assessment to identify measures to assess, prevent, mitigate, and continuously monitor any Labour and Working Conditions risks and impacts to workers directly engaged by the contractor, subcontractors, and primary suppliers of polysilicon solar panels. If the assessment identifies inadequate labour and working conditions as defined by the ILO Core Labour Standards in any of the Contractor's subcontractors and primary suppliers of polysilicon solar panels that cannot be avoided or mitigated, the Contractor will shift its primary suppliers to suppliers that can demonstrate adequate Labour and Working Conditions and comply with the specifications of the technical offer. The Employer reserves the right

	to approve these changes based on the documentation provided and its own analysis.
GCC 21.1	The Site Possession Date(s) shall be: **February 13, 2023**
GCC 25.3	Any dispute arising out of the Contract, which cannot be amicably settled between the parties, shall be referred to arbitration in accordance with the laws of Jamaica.
B. Time Control	
GCC 27.1	The Contractor shall submit for approval by the Project Manager a Programme for the Works within 10 days from the date of the Letter of Acceptance.
GCC 27.3	The period between Programme updates is 20 days. The amount to be withheld for late submission of an updated Programme is $50,000
C. Quality Control	
GCC 35.1	The Defects Liability Period is: 24 months/ (730) days. During the first year of the Defects Liability Period the operation and maintenance will be an obligation of the Contractor. During the second year of the Defects Liability Period the operation and maintenance will be executed by the Contracting Agency.
D. Cost Control	
GCC 47.1	
GCC 48.1	The proportion of payments retained is: 10%
GCC 49.1	The liquidated damages for the whole of the Works are 0.33% per day. The maximum amount of liquidated damages for the whole of the Works is 5%
GCC 51.1	The Advance Payments shall be: 15% of Contract total value and shall be paid to the Contractor no later than one week after contract execution.
GCC 52.1	The Performance Security amount is:

	(a) Bank Guarantee: 10% of Contract Value (b) Performance Bond: 25% of Contract Value *[A **Bank Guarantee** shall be unconditional (on demand) . An amount of 5 to 10 percent of the Contract Price is commonly specified for Performance Bank Guarantees. A **Performance Bond** is an undertaking by a bonding or insurance company (surety) to complete the construction in the event of default by the Contractor, or to pay the amount of the Bond to the Contracting Agency. An amount of 30 percent of the Contract Price is commonly used internationally for this type of security*
E. Finishing the Contract	
GCC 58.1	The date by which operating and maintenance manuals are required is **June 30, 2023.** The date by which "as built" drawings are required is **July 14, 2023**.
GCC 58.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 58.1 is $17,000 USD
GCC 59.2 (g)	The maximum number of days is 15
GCC 60.1	All contractors and sub-contractors are subject to the Bank's prohibited practices as previously defined and to the EU Financial Sanctions Lists (https://sanctionsmap.eu).
GCC 61.1	The percentage to apply to the value of the work not completed is 20%
GCC 65.1	The Contractor and its Subcontractors shall have the nationality of a Bank's member country or EU as specified in the Section Eligibility.
GCC 65.3	All the Goods and Related Services to be supplied under the Contract and financed by the Bank shall have their origin in any Bank's member country or EU as specified in the Section Eligibility.

SECTION H. Annexes

Annex I. Emergency Preparedness and Response Management Plan (Contingencies)

1. Emergency Preparedness and Response Management Plan (Contingencies)

The Contingency Plan (the Plan) general scheme considers the global actions to be taken into account, in the case of project-related eventualities. In some of them we can work on its prevention, such as in the case of spills, fires, explosions, etc.; on the other hand, there is the other category in which no control is exercised, as is the case of natural phenomena eventualities: hurricanes and flooding that, however, must have actions or contingency plans associated. Risk management by natural phenomena was described in the previous section. In addition, as part of the contingency Plan, a formal procedure for recording and reporting internally any environmental incident will be set up.

The Contingency Plan will always remain active, by carrying out training activities and periodic simulacrum with personnel, as well as by taking actions of physical and operational data review and update, along with equipment and product inspection.

This Contingency Plan is closely intertwined with the Framework of the Disaster Management Plan, which is based on the operational policy OP-704 (Policy on Disaster Risk Management) of the IDB.

1.1 Objectives

The main objectives of this Contingency Plan are:

- Prevent or control operational emergencies or possible industrial accidents that may take place during the construction and operation phases of the projects.
- Establish procedures and response plans to attend in a timely, efficient and with the necessary resources to fires, accidents, attacks and any other emergency situation that arises.
- Prevent the consequences of a major event (fire, spillage of dangerous products) resulting in damage to human lives and property.
- Perform a permanent control over equipment and facilities through periodic inspections.

The contingency plan presents the most important guidelines for subsequent adoption and implementation by contractors. One of the fundamental purposes is to protect and safeguard the life of all personnel involved and reduce public and private property losses.

There are three elements that significantly influence the success of any contingency plan, which are:

- Resources: appropriate staff and equipment;
- Strategies, techniques and action plans; and
- Response management: leadership, cooperation and communication.

1.2 Emergency Levels

For the operation of the Contingency Plan, it is proposed to classify three levels of emergency and whose quality of response is appropriate to the seriousness of the situation:

Source: ERM, 2019.

Figure 1-1: Emergency Levels

1.3 Procedures to follow during the Application of the Contingency Plan

Considerations for the Design of Response Measures:

- **Identification of Available Resources.** The most important resource to respond to possible contingencies is the human being. The response groups work in situations that have high demands, for which reason the actions to be developed will depend to a large extent on the knowledge, confidence and capacity of the staff to perform the actions previously assigned in the respective plan. It is imperative to meet the needs of training, information and provide them with the appropriate personal protective equipment to fulfill their mission.
- **Access to information.** Have all the necessary information, combine it and evaluate it to minimize confusion, rumors and exaggeration. Obtaining timely and up-to-date information is a dynamic process, and in a timely manner, it is the best way to feedback the plan.
- **Communication.** The problems associated with communication are mainly related to the content of the messages, the means of transmission and the message interpretation of who receives it. Generally, internally used communication systems are prepared to handle a specific amount of information in an incident.
- **Priority setting.** In the place of the incident, the brigade or technical personnel in charge of responding to the emergency must be able to quickly alter the threats, in order to face possible changing and / or unexpected situations.
- **Coordination between the Authorities.** The emergency coordinator of the project site will be the shift operator during the operation stage or the contractor during the construction stage. In each project it should be determined which will be the national emergency coordinator, based on the location of the project and its type (sector).
- **Communication with the communities.** Throughout the construction phase, contractors must take communication initiatives with the communities for their safety. These initiatives may include an emergency alert system, a method to provide information on project findings and how to respond, and collaborate with communities to establish action plans, organize demonstrations or training on how to respond to emergencies, and / or introduce the emergency response team to the communities to establish a relationship before an emergency occurs.

Construction Phase

The responsibility in risk management will be the responsibility of the contractors of each project, being shared with subcontractors if applicable. However, the construction company will have their participation in the responsibility, as supervisors and owners of the projects, guaranteeing that the actions of responsibility in the management of risks and contingencies are carried out in a timely manner. Therefore, it will be established that contractors and / or subcontractors must follow the safety, occupational health

and environmental procedures to complete and deliver the work with a record of zero accidents and minimize health effects. During the construction phase, the program may be reviewed so that, if necessary, it is adapted according to the appropriate requirements for the activities.

Contractors will ensure compliance with the rules in each of their works, by jobs or disciplines, and this will be mandatory clause. Among such obligations:

- Guarantee workers conditions of prevention, health, safety and well-being in the workplace.
- Instruct and train workers regarding the prevention of accidents, occupational diseases, the risks to which they are exposed; as well as in relation to the use of personal protective equipment, if applicable to the work performed, through talks, posters, etc.
- Design an occupational health and safety program according to the activity to be carried out and containing the measures to be implemented, in order to avoid personal injury or property damage.
- Provide workers with personal protective equipment, according to the work done, to prevent injuries.
- In the area of vehicles, machinery and equipment, comply with preventive and / or corrective maintenance programs and safety requirements.
- Organize and maintain services such as first aid kit equipped in accessible places and staff knowledge.
- Hear and take in writing the statements made by the workers in relation to the unsafe conditions and workplace, and taking the corresponding participation and corrective action immediately.
- Report occupational diseases, work-related accidents and any other unsafe condition that is present within the workplace.

Workers will also have obligations to fulfill:

- To exercise the specific functions derived from the employment contract, in relation to the risks associated.
- Report to their immediate supervisors, directly and quickly, any unsafe condition that could threaten their physical integrity or health and/or that of other workers.
- Mandatory use, claim, accept and maintain in good condition personal protective equipment, giving immediate account to the person responsible for its supply, the loss, deterioration or expiration thereof.
- Report to your superior, when with good reasons, the implements do not correspond to the risk to be covered.
- Comply immediately with any observations made for the benefit of your safety and that of others.
- Take care of and maintain the sanitation and safety facilities facilitated for the development of their work-related activities, etc.
- Respect the posters and notices placed for information and security.
- Accept the provisions of the medical service and the competent bodies in the field of occupational safety for the prevention, rehabilitation treatment of occupational or non-occupational diseases and accidents at work.

Next, the actions and procedures to be considered in case of emergencies and undesirable events are described.

Emergency Procedures

The general procedure to follow when facing an emergency is depicted in the following Figure.

Source: ERM, 2019

Figure 1-2: General Procedure in an Emergency

The sequence of the actions to be followed in case of an unwanted event or accident, an emergency notification will be made, which may be as follows:

- Notification: Report the accident to the organization's personnel.
- Verification and evaluation: Confirm the notification of the current state of the installation and the associated risk for the moment the event notification is received.

The Plan must include a notification before the main authorities scheme that may include: the municipalities where the projects are developed, the relevant ministries of environment and natural resources, the local and national police, the general fire department, and/or the civil defense.

Calling Plan

The calling plan consists of three types of communications, internal, external and support:

- Internal Calls: The internal calling plan contemplates the emergency communication to senior management personnel, as well as to the members of the Contingency Plan that are outside the facilities.
- External Calls: Consider the communication of the emergency to the Government Authorities involved with the supervision of the company's activities, depending on the type of occurrence.
- Support Calls: In the control of emergencies they collaborate decisively and as members of the Contingency Plan, for example the units of the fire department, the national police, ambulance service, medical care if necessary, and government authorities.

Emergency Committee Organization

An Emergency Committee must be organized by the Contractor for the construction and operation stages. It is recommended that the Committee be made up of:

- Environmental Supervisor
- Security Supervisor
- Maintenance Supervisor

1.4 Contingency Types

The contingency of sinister that may occur in project areas are classified according to their origin in:

- Natural phenomena, such as hurricanes, flooding, etc. (see previous section).
- Operational emergencies or incidents normally caused by operations, fires, falling machinery, etc.
- Industrial accidents of own personnel or contractors, normally caused by unsafe acts, unsafe conditions or as a consequence of the natural phenomena or operational emergencies listed above.
- Social phenomena such as sabotage, terrorism, theft, etc.

1.5 Phases Considered for Each Event

Prevention Process

The best way to control any unwanted event and the impact they may have on the environment is to prevent them from happening. For this, it is necessary to apply preventive measures aimed at reducing the probability of occurrence of the event. The main preventive measures are described below.

Work Permits - All projects must comply with the requirements and procedures established by Law, including those related to work permits, in order to prevent unnecessary risks and/or accidents, and must comply with the following:

- In all areas with risk where work is carried out, prior authorization of work permits will be required, in order to perform them, and must be issued by authorized personnel.
- No work will be initiated without first issuing the respective work permit and verifying that the recommendations and requirements made therein have been complied with.
- Supervisors authorized to issue and receive work permits will be responsible for their correct issuance. They will also be responsible for ensuring that safety conditions are maintained for the time required to perform the work.
- A work permit covering several areas with different risks, will not be issued. As a general rule, each specific job will require a separate permit.

Personal Protective Equipment (PPE):

- Personal protective equipment will be mandatory. They will not prevent accidents, but will eliminate or reduce the severity of an injury.
- It is the responsibility of contractors to provide their workers with the personal protective equipment required in the execution of any work that generates risks that are difficult to control by other means.
- The equipment will be new and of good quality.
- It is the responsibility of the immediate supervisor of each worker, to determine the need for personal protective equipment and to ensure that the worker makes use of them.
- The worker will be responsible for the care, conservation and proper use of any equipment entrusted to him.

Order and Cleaning - Prior to the start of the work, the Contractor will develop a safety, order and cleaning program, where indicated, from inspections to detect failures to collection and/or garbage containers that must be arranged for different types of organic, inorganic waste, waste, debris and liquid waste. The disposition forms must be indicated according to the national regulations and the final disposition of these. Additionally, the following will be complied with:

- Each employee will keep their workplace clean, thus collaborating with the success of the order and cleaning programs.
- The employee will notify his supervisor of spills of oil, grease, etc., and they will be cleaned as soon as they occur.
- All tools, or any other material equipment used in the performance of a job will be kept well organized, and these objects should be avoided in places where they may be dangerous.
- Waste of flammable substances will not be allowed to spread, as there is a risk of spontaneous fire.
- Flammable liquids will be handled and stored safely.
- An adequate yard or space must be available to neatly store bulky objects or materials.
- All workplaces must be provided with fresh and potable water in sufficient quantity for the use of the workers.

- The toilets and bathrooms will be kept in optimal cleaning conditions and with sufficient provision of toilet paper, water and soap.
- If employees eat on the job site, no waste and debris will be left on site.

Training - Every worker, new or old, will receive operational training from their immediate boss (supervisor), in order to develop knowledge and skills for the safe execution of the assigned work, through talks at the beginning of the day on:

- Industrial safety corresponding to construction.
- Occupational health.
- Fire prevention.
- First aid.
- Personal protection equipment.
- Order and cleaning.
- Accident prevention.
- Accident analysis.
- Protection against fires.
- Works that require written permission for execution.
- Emergency control.
- Physical risk factors (electrical, mechanical, noise and vibration, lighting, heat, ventilation, etc.)
- Chemical risk factors (smoke, ambient gases (vapors, fumes), toxic, alkaline and corrosive substances, etc.)
- Other risk factors (health, third party actions, environmental, etc.).

Actions to be taken in case of an Emergency

General actions before an emergency:

- Upon receiving notice of an emergency, proceed immediately to its evaluation and the level of emergency reported. Then, determine what measures are necessary to apply for its solution, notifying the corresponding response groups.
- If necessary and according to the magnitude of the event, you can order the evacuation of the area or facilities and will initiate the respective procedures for its proper performance.
- Notify the relevant authorities.
- Consult the emergency response procedures to verify, apply and record the descriptive information of the event.
- Restrict access to the event area.

Communications must be carried out by portable radio transmitters, either between vehicles that move or with the base station.

Spills

Equipment and Materials Needed for Spill Response

Contractors will have the following materials to deal with spill incidents:

- Absorbent material, such as sand, sawdust, absorbent cloths (depending on spilled material).
- Safety equipment such as gloves, plastic aprons, goggles, boots.
- Containers for the collected material.

- Camera to document the incident.

Fires and/ or Explosions

A fire means the possibility of serious damage to equipment or personnel, so the action of the organization of the Contingency Plan to proceed has the mission of attacking the fire in a timely manner, to quell the fire in the minimum possible time. Therefore, the projects must comply with the following actions:

Before the Fire

- Training of operating personnel through fire courses, accident practices and simulations, use of fire extinguishers, etc.
- Have fire and protection infrastructure and equipment, and fire extinguishers that work in different environments depending on the type of project (for example, portable and rolling CO_2 and PQS type BC for high voltage transformers).
- Develop rigorous preventive maintenance programs for all types of equipment, review and recharge of extinguishers, etc.
- Identification and signaling of safe areas and establish evacuation routes in all facilities or work fronts.
- Keep fire extinguishers in good condition.
- Have a first aid kit, battery powered flashlights, extra batteries, etc.

During the Fire

- Evacuate the work area and/or facilities to safe areas.
- Communicate with the Fire Department, National Police and other entities depending on the severity of the emergency.
- Protect mouth and nose with damp cloths.
- Stoppage of any area that is running.
- Keep calm and avoid running.
- Take care of affected people immediately, if any.
- If appropriate, try to put out the fire with the use of fire extinguishers and other existing means. For this purpose, they must always and periodically be checked to determine the mechanical quality of the extinguishers and the product used against fire.
- If any equipment is involved in a fire or explosion, the operator must manually disconnect the electrical power that supplies the equipment, only if it can be done safely and without risk to human life.

In the event that the fire cannot be fought directly with fire extinguishers, or it is a danger to personnel, the actions to be taken are:

- Notify firefighters immediately for help.
- Evacuate the place to the meeting point previously agreed in the training and risk simulation plan.
- That the substation protection mechanisms act automatically, and clear the substation.
- Once the Firefighters determine that the emergency has ended, the emergency coordinator of the project affected must be informed.
- Proceed with the maintenance brigade to an inventory of damages and then make a detailed report in this regard.

1.1.a.i.1.1 After the Fire

- Cleaning of the affected area.
- Debris removal and elimination.

- Repair and/or demolition in case of major damage.
- When the fire is extinguished, proceed with the maintenance brigade to conduct an inventory of damages and then make a detailed report in this regard.

1.1.a.i.1.2 Adequate Staff Training

Practices or drills will be carried out every six-months, in coordination with the local Fire Department for on-site exercises, behavior of personnel not involved in firefighting, as well as surveillance personnel.

1.1.a.i.1.3 Availability and Use of Fire Extinguishers

- Fire extinguishers should be located in appropriate places and easily accessible.
- Every fire extinguisher must have a plaque with information about the kind of fire for which it is suitable and expiration date. Also, it must have the operating and maintenance instructions.
- Each fire extinguisher must be inspected on a bi-monthly basis, tested and maintained in accordance with the manufacturer's recommendations; similarly, it must have a label with the test date and expiration date.
- If a fire extinguisher is used, it will be refilled immediately; or if necessary it will be replaced immediately.

High Falls, Puncture Wounds, Electrocution, Burns

1.1.a.i.1.4 Before

- Training of personnel in industrial safety so that they do not commit unsafe acts and they use their protective equipment, such as helmet, boots, safety glasses, support strap, etc.
- Likewise, training of personnel in the course of first aid, in order to prepare them to help the injured fellow, until the arrival of the medical or paramedical personnel at the accident scene or their transfer to a hospital for their professional care.
- Provision of personal protective equipment to all operations and maintenance workers.

1.1.a.i.1.5 During

In the event of an accident on the premises, the staff will act as follows:

- If it is a minor accident, apply first aid to the injured person and transfer him/her immediately to the nearest clinic or hospital to be seen by a doctor, in order to rule out possible sequelae afterwards.
- If it is a fall in height with serious symptoms, shelter the injured and request an ambulance for immediate transfer to a hospital.
- If the injured person symptoms of suffocation, give artificial respiration by mouth and also request an ambulance for urgent medical attention.
- In case of a burn, do not apply home remedies to the injured person, only apply water. Request an ambulance to transfer the patient to a clinic or hospital as soon as possible.
- If the person has hemorrhage from a puncture wound, hold a gauze in place to prevent blood loss, if it is located in the extremities, make a tourniquet to cut the blood loss, loosening the tourniquet every 10 minutes to avoid gangrene and have the injured transfer to a nearby health center.
- If caught with weight on the chest, leverage the heavy element and remove it so that the injured person does not suffocate, until the arrival of the ambulance.

- If the person has suffered an electric shock, take care that he/she breathes, otherwise give mouth-to-mouth breathing to resuscitate and simultaneously request medical assistance or transfer to a clinic or hospital.
- Immediate care for the injured by means of First Aid knowledge can save their lives, as well as their rapid transfer to a health care center.

1.1.a.i.1.6 After

- Analyze the causes of the accident and the actions taken to help the injured on site, as well as the delay in the arrival of the ambulance or medical assistance, if applicable.
- Finally, prepare the preliminary and final report of the accident.

Equipment or Infrastructure Failure

- The person detecting the fault will immediately notify the Supervisor or Chief of Operations identifying and indicating the place and type of emergency.
- If possible, try to isolate the area or prevent vehicles or people from approaching.
- After the problem is overcome, the causes of the failures will be analyzed.
- Preliminary and final reports to government authorities will be complied with in a correct and timely manner.

Attacks and Sabotage

- Rigorous control of the entry of personnel to the facilities by a contracted Security Company, as well as surveillance in strategic areas outside the facilities.
- In the event of an attack or sabotage, the person who detects it will immediately notify the emergency supervisor of the emergency indicating the place and the affected equipment.
- If personnel outside the company are detected and armed, the personnel will be covered to safeguard their safety.
- The manager in shift will immediately inform the Delegation of Police and personnel in charge of monitoring the facilities, to neutralize the aggressors.
- Depending on the event caused by the attack, the response strategy to the specific emergency type will be determined and the external support units will be instructed to act, as described in the action guidelines for fires, spills, cable drops , etc.
- The preliminary and final report to the government authorities will be complied with.

Annex II. Hazardous Solid Waste Management Plan

1. Hazardous Solid Waste Management Plan

Every construction project executed under the loans of this Program has the capacity to generate solid and hazardous waste. It is necessary to design and implement a solid and hazardous waste management plan (the Plan) in order to mitigate potential sources of waste throughout the duration of the projects. The Plan should describe the measures and best management practices proposed for each phase of the projects, which will be used to protect the environmental and social communities affected from adverse impacts. The implementation and application of the guidelines of this Plan will allow the proper management, mitigation and recycling of the various types of waste generated.

This Plan defines the various potential sources of waste, and establishes how they will be controlled and monitored throughout the duration of the project.

In addition, the Plan will outline a system for determining the quantities of different solid waste materials disposed. It will promote the minimization of waste production, and the use of satisfactory disposal routes where recycling is not possible. Also, a waste oil management procedure will be set up to record the quantities of waste fuel and lube oil that will be generated and the storage and disposal method that will be used. The information will be collected by the manager and collated by the Safety and Environment Manager. A general guide procedure will be drafted to adopt, and the procedure covers a number of different disposal options.

1.1. Objectives

The objectives and goals of the Solid and Hazardous Waste Management Plan are:

- Avoid and control the generation of Project related waste during the construction and operation phases;
- Define procedures, integrated controls and mitigation measures to be used in the activities during the construction and operation phases that have the potential to affect the environment and communities;
- Comply with the local and national requirements regarding the management and disposal of different types of waste.

1.2. Procedure

Each project must present an outline of the Plan and establish its objectives and goals following the steps in the figure below.

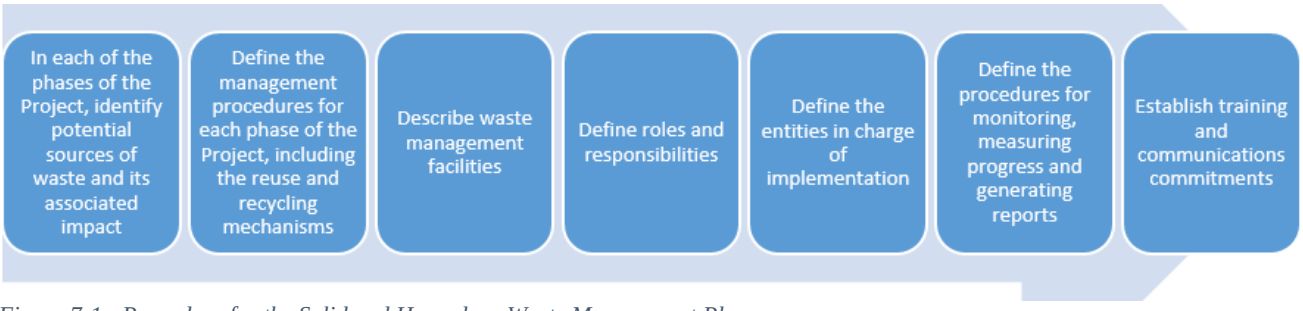


Figure 7-1: Procedure for the Solid and Hazardous Waste Management Plan

1.3. General Approach

Projects executed under the Program will comply with local and national laws and standards as well as international best practices for waste management. It is important to minimize the generation and transport of waste to waste disposal facilities. The general approach to waste management is described below:

Reduction: whenever possible, the generation of waste will be minimized, not only in order to save money but also to reduce the need for transportation and storage resources, as well as to foster sustainable working environments. During the construction phase of the projects, the contractors and operators of the construction works will be obliged to provide specific waste reduction plans and procedures. Workers and operating companies will avoid excessive use of materials in their work activities. During the project operation phase, operators, maintenance managers, and users will work in a sustainable manner and encourage members of the surrounding communities to do the same.

Reuse: it is expected that during the construction and operation phases of the projects multiple types of waste will be generated. When possible, any waste material that is salvageable and practical will be reused.

Recycling: recycling not only reduces the volume of waste, but also protects wildlife, reduces water pollution, creates jobs and fosters sustainable behavior. When possible, the following items will be recycled: plastics, cans and all the remains of glass, paper, cardboard, wood and metal. All recycling items will be collected, classified and stored at the point of origin and placed in different containers or containers clearly identified with marks and colors. After classification, the items will be transported to pre-approved recycling centers.

Classification: all waste materials (hazardous and non-hazardous) will be classified at the point of origin in separate areas for each type. Materials that can be reused or recycled will be separated into additional places or containers in order to minimize transport and waste disposal. Examples of acceptable materials for recycling were listed above. The monitoring of hazardous and non-hazardous waste will be done, and will be handled separately.

Recovery: some waste materials can be used for power generation, by incineration. Suitable materials for incineration include: used oils, non-liquid waste, pungent waste and non-pungent waste.

Transportation for disposal: Waste materials that cannot be reused, recycled or rescued will be taken to previously designated sanitary landfill and waste management facilities. Such facilities must satisfy and comply with all relevant standards; as established by local laws. Contractors will document and record all transportation of waste, which will include information such as the following: the type of waste, the amount, the source of the waste, the location of the disposal site and the receiving facilities.
Household waste, such as garbage (bottles, cans, clothing, compost, disposable items, food packaging, food waste, newspapers, magazines, others) will be classified at the point of origin, placed in containers of different colors (supplied by contractors) or containers and clearly identified, such as:

- Blue: plastic items;
- Green: cans and glassware;
- Red: residual waste;
- White: paper and cardboard; and
- Brown: food waste.

During both phases (construction and operation) of the Project, industrial waste will be classified at the point of origin in stacks or in properly identified steel containers and containers. Examples of types of waste include:

- Metal waste;
- Plastics;
- Concrete;
- Wood waste;
- Contaminated oil rags;
- Paperboard;
- Used oils and fats;
- Batteries;
- Paint containers; and
- Residues of chemical compounds (paints, adhesive materials, etc.).

1.4. Sources of Impacts

Solid waste generated during the construction phase of the projects will include domestic and industrial waste. Most of the waste (hazardous and non-hazardous) will be generated in the areas of the construction sites while smaller portions of waste will be generated in the offices and camps of the project staff.

If not handled properly, the potential impacts associated with waste include:

- Visual impacts in the areas of construction works;
- Pollution of soils and water resources;
- Impact on animals;
- Impact on human health;
- Unpleasant odors of residues in surrounding areas; and
- Waste due to poor management of recyclable waste.

1.5. Management Implementation

The Contractors of each individual project will be responsible for the management and implementation of the solid and hazardous waste management plan. It will be mandatory that all major contractors of the construction and operation phases of the projects develop their own waste management plans, specific to each activity that demonstrate compliance with the following (at a minimum):

- Measures to avoid the generation of waste or to minimize it;
- The mechanisms for collecting, transporting, identifying and temporarily storing the waste before moving out of the Project areas;
- The responsible parties;
- Measures for the reuse of waste;
- The options for recycling, treatment and disposal of waste, including the proposed final destinations of those that cannot be reused;
- Procedures for registration entry and documentation of waste transfers;
- Specific management measures for hazardous waste;
- Requirements and regulatory classification;
- The expected types and volumes of waste; and
- Training for staff awareness.

The services of contractor companies, with the requisite regulatory approvals to handle the categories of waste generated, must be used to ensure that the transportation, treatment, and/or disposal of project waste is done correctly.

1.6. Training and Communication

Before the project and works begin, all project personnel must have or receive specific training for their work, as well as participate in various induction training. Detailed information about the importance of proper waste management, including classification, must be provided to employees and contractors.

1.7. Responsibilities

As the construction and operation phases of the projects develop, contractors will be responsible for overseeing the implementation of the Waste Management Plan. Contractors must prepare and deliver a list of all waste management procedures, specific to each function.

Prior to the start of work involving the generation of waste, each contractor must prepare its own management plans and inspection procedures. The contracting companies that carry out work in both phases of the projects (construction and operation) must provide specific plans for each task in each of the phases. They should create separate waste management plans for each phase, or a single plan of greater scope if each phase is clearly detailed. Said management plans will be reviewed and approved by the executing agency before the start of the works, in order to ensure consistency between the waste management plans. In addition, contractor companies will also coordinate in accordance with all standards and regulations including the correct classification, disposal and reuse of waste.

Workplace supervisors will supervise health and safety factors for contractor companies in relation to waste management and enforce established practices for the prevention of environmental and safety incidents. They will provide supervision of the activities of classification, control, mitigation, transportation and disposal of all waste generated by the projects.

1.8. Control and Monitoring Measures

The monitoring and documentation of the generation, transport, and disposal of waste materials is essential for the construction and operation phases of the projects. Measures and standards that ensure compliance and that allow non-conformities with those standards have to be implemented. When a nonconformity is detected, a formal investigation will be carried out to determine its origin and establish the corrective actions necessary to comply with the standards.

Contractors must perform inspections, audits, monitoring and sampling activities (if necessary) in all areas associated with the generation and receipt of waste. Checklists will be written for use in each inspection, and will also be documented for reporting and monitoring purposes.

Inspection lists will include:

- All spills, leaks, absence of identification marks, containment problems and any other factor that may require corrective actions.
- It will be registered and document any corrective action and follow-up of the problems.

Additionally, inspections of all the buildings related to the facilities will be carried out, in order to establish their current conditions, cleanliness and order, the performance of the contractors, the classification process, the maintenance, and the conditions of the buildings and the study of additional areas of processing.

Annex III. Natural Disaster Management Plan

1. Natural Disaster Management Plan

The Natural Disaster Risk Management Plan (the Plan) must be aligned with national regulations and be designed taking into account the characteristics of the type of operation and location of the specific project. The Plan presents the guidelines and procedures to follow in the event of a natural disaster.

Disaster response planning involves determining, increasing and organizing resources and capabilities in order to achieve a level of preparedness that allows timely and effective response to a potential disaster. When a disaster ensues, plans must be monitored, evaluated and adapted to a given situation.

Source: ERM 2019

Figure 1-1: Preparation of the Natural Disaster Management Plan

1.1 Objectives

The main objectives of this Plan are:

- Minimize or control the damage caused by natural disasters that may occur at the facilities of each project;
- Establish procedures and response plans to respond in a timely, efficient and with the necessary resources to a natural disaster;
- Prevent damage to human lives and property of the company and third parties; and
- Perform permanent control over the equipment and facilities, through periodic inspections.

1.2 Responsibilities

1.1.a.i.1.7 Planification stage

During the development or planning stage, the Project Owner must take into consideration the level of risk or vulnerability to natural disasters. So that, as far as possible, the necessary integrated controls from the design stage are included, as well as the corresponding specifications so that the project is resistant to the type of natural disaster to which it is exposed (e.g., winds of hurricane, storm surge, flooding, or excessive rain).

1.1.a.i.1.8 Construction stage

In cases where the Project is carried out through Contractors, the responsibility in risk management is the responsibility of the Contractor, being shared with the different contractors and subcontractors involved. However, the Project Owner will be responsible for ensuring that the actions of responsibility in the management of risks and contingencies are carried out. Therefore, it will be established that contractors and/or subcontractors must follow the procedures of this plan. The Project owner is also responsible for communication and coordination with local authorities for the response to a natural disaster. During this phase, the program may be reviewed so that, if necessary, it is adapted according to the appropriate requirements for the activities.

The Contractor will ensure compliance with the rules in each of its works, for jobs or disciplines and this will be mandatory compliance clause. Among such obligations are mentioned:

- Provide workers with personal protective equipment appropriate for the activities to be carried out;
- Create an emergency brigade, which will receive specialized training in preparation and response to the different types of natural disasters to which they could be exposed depending on the location of the Project;
- Periodic training and training of Project staff regarding plans and procedures in an emergency generated by a natural disaster; and
- Coordination of drills.

1.1.a.i.1.9 Operation stage

During the operation stage, the Project Owner is responsible for leading the risk management of natural disasters. New specific plans and procedures should be developed, which are consistent with the processes and vulnerabilities particular to each operation.

The operation must also have a properly trained emergency brigade, staff must receive periodic training and drills will be conducted for each type of natural disaster to which the particular project is exposed.

1.3 Procedures to be followed during a Natural Disaster Emergency

1.1.a.i.1.10 General actions in case of hurricanes

In the case of threats due to extreme weather conditions, the following actions should be considered.

How to prepare before a hurricane:

- Train operational personnel to act in case of hurricane emergencies, so that personnel are prepared for these events.
- Emergency equipment will be inspected and kept ready for use. It will be guaranteed to have potable water and canned food on site.
- Secure with rope or chains all equipment that cannot be insured inside the building.
- Place vehicles protected against hurricane winds.
- Call the relevant authorities for the Project or the Operation, the Police and the security company, if any, and indicate that the place will be left with only the minimum emergency personnel on the site.
- For projects in operation, once the notification is received, the Emergency Coordinator, in case of meteorological risk, operators should go to the protected areas indicated within the control building.
- The Coordinator will determine, according to the prevailing or progressive conditions, whether the procedure for emergency stop should be executed.

After the hurricane:

- Equipment will not be energized until it has been checked by electricians.
- In case of spills, dripping or fire, proceed according to the sections related to these problems in the contingency plan.
- Take a tour and determine the damages caused.
- Proceed to repair minor damages and those necessary to provide immediate service.
- Proceed to clean the debris and artifacts that obstruct its operations.
- Prepare a written report at the end of the emergency. This report will contain the results of estimating damages to the company's property, affected people, damage to private property, and the environment.
- Plans for before and after a hurricane will be kept up to date to be effective.

1.4 Evaluation

When evaluating the response to an emergency, there is an opportunity to determine whether the concept of the management systems, procedures and processes of the Plan effectively addresses the problems and needs of the operation.

After the emergency is over, damage to personnel or facilities must be assessed and a report must be prepared to the corresponding authorities. Likewise, the Emergency Committee must analyze the actions of personnel and evacuation coordinators

The Emergency Committee should use previously established indicators and criteria to evaluate the different aspects of the plan in order to draw conclusions and lessons learned, and determine the actions necessary to improve it and that the responses to future emergencies address the problem-raising areas.

Annex IV. Occupational Health and Safety

1. Occupational Health and Safety

1.1 Objectives

The objectives of the Workers Health and Safety Plan are:

- Protect the health and safety of all workers and employees of the projects;
- Be proactive in identifying risks and activities that may affect the health and safety of workers; and
- Prevent the incidence of accidents and incidents due to project activities.

1.2 Activities or Key Actions

1.2.1 Prevention

The Workers Health and Safety Plan should identify and prioritize prevention measures and establish actions to mitigate the risk of accidents occurrence.

1.2.2 Protection Equipment

Collective and personal protective equipment must be provided to all employees of each project. Priority should be placed to collective measures. This equipment must:

- Provide adequate and effective personal protection against the risks that motivate its use, without causing additional risks or unnecessary inconvenience.
- Be available to all personnel and always keep in conditions that allow immediate use.
- Establish the conditions of use of collective and personal protective equipment and, in particular, its time of use, taking into account:
  - The severity of the risk
  - The time or frequency of risk exposure
  - The conditions of the job
  - The benefits of the team itself, taking into account its useful life and its expiration date.

Additionally, the following aspects will be taken into account:

- It will be the obligation of the workers to use the collective and personal protective equipment made available to them. Contractors must ensure that workers make use of it.
- All personnel who are in the work, regardless of the position, level or body to which they belong, will wear the protective helmet.
- Personnel who require it depending on their work, in addition to the helmet must have their sashes with safety belts, harnesses for heights, boots with steel tips, gloves and safety glasses.
- There should be a reserve of protective helmets to ensure compliance with this requirement.
- The necessary measures must be taken to provide quick first aid to any injured personnel during the working day.
- All first aid kits must be easily accessible and clearly marked, in order to provide first aid to any worker who has an accident during their work. First aid kits must be in charge of a responsible person, and trained to provide first aid.

1.2.3 Permanent Services or Sanitary Equipment

- The specific labor national regulations will be followed, however, by way of reference, for shifts of 25 workers or more, the contractor will guarantee a dining room so that the workers can eat their food comfortably and safely, this room will have enough tables and chairs or stools. Adequate facilities for preparing food will also be available when local conditions or custom require it.
- Construction workers will have toilets and / or latrines in sufficient quantities (for example, as a reference and if not established by the labor regulations of each country, 1 toilet will be installed for every 20 workers) and will be in good condition of conservation, hygiene and cleaning and will remain free of unwanted emanations. Separate facilities for men and women are required to a reasonable distance. For women, it will be one for every 15 women, unless the labor regulations establish a different number for these cases.
- In all construction work, the contractor will guarantee sufficient sources of drinking water so that the workers can adequately replenish and avoid dehydration. These water sources will be close to the jobs.

1.2.4 Environmental Protection

- It is strictly forbidden to burn waste from works or fuels. The waste must be deposited in the sites approved by the corresponding municipal authorities.
- Similarly, the installation of dumps or sites for the final disposal of wastes 200 meters or less from the banks of surface sources is prohibited. The corresponding municipality must previously authorize the location of dumpsites.
- In case of storing fuels in the work area, precautionary measures should be taken for potential spillage, such as placing the dispensers on pallets and these must be on a waterproof area. Maintain sand to contain any spillage. In case of spills, the material must be extracted, stored, treated, and disposed of by a qualified company authorized for such purposes. For fire prevention smoking ban signs should be displayed and sites should be entered only with authorization and / or authorized personnel. ABC category extinguishers will be available on site, which should be used by previously trained personnel.
- Equipment maintenance and repair activities should preferably be carried out in the contractor's workshop away from water courses.

1.2.5 Contractors' Obligations

- According to the national labor regulations, project owners, contractors, subcontractors at all levels, are obliged to comply with all current legal provisions regarding occupational health and safety.
- Each of the contractors, together with their sub-contractors, if any, is responsible for the occupational safety and behavior of their workers within and outside working hours, establishing penalties for those who incur in acts that threaten the moral and good behavior of the local population. The necessary basic services such as hygienic services, etc. must be guaranteed for all workers. Contractors are also responsible for the collection and disposal of the waste generated.
- The maintenance of the vehicles, machinery and equipment used in the projects should be carried out as far as possible from the water sources. Likewise, used oils, spare parts or the like that affect the quality of the environment may not be discharged to the ground or water sources, under any circumstances.
- In order to avoid air pollution, the contractor must perform periodic maintenance of construction equipment and machinery.
- The contractor should provide, whenever possible, employment to the local population.

- Ensure the placement of security signs and symbols that are required, as well as demand the care, conservation and replacement of them.
- Guarantee the acquisition and delivery of personal and collective protection equipment, as well as demand their use, care and conservation of them.
- Ensure compliance with the necessary measures to eliminate the causes of occupational accidents and occupational diseases, in coordination with union representatives.
- The contractor will guarantee the pre-employment medical exams to determine the aptitude of the workers, and newspapers according to the activity they carry out, for the early detection of occupational diseases.

1.2.6 Workers Obligations

- Comply with the instructions and regulations of each project regarding Occupational Health and Safety, as well as employ safe work methods.
- Maintain and use the personal and collective personal protection equipment received and return it to the person in charge, once the work in which it was required is finished.
- Provide the necessary assistance in case of accidents or imminent risks that endanger the assets of the company or its colleagues.
- Collaborate in the fulfillment of the Occupational Health and Safety plans.
- Collaborate in the inspection carried out by the competent authorities in Occupational Health and Safety, as well as in the investigation of occupational accidents and diseases that occur in companies and / or construction projects.
- Review the collective and Personal Protective Equipment (PPE) of work before and after work, to verify its correct state of conservation and immediately inform the Supervisor of Occupational Health and Safety, Immediate Chiefs and / or Person Responsible for Work, failures detected.

1.2.7 Prohibitions to Contractors and Workers

- Execute acts that jeopardize their own safety, that of their co-workers or that of third parties, as well as that of the establishments, workshops or places where they work.
- It is forbidden for workers to take raw materials or elaborated materials from workshops or their dependencies without permission and / or authorization.
- Present themselves to their work while intoxicated or under the influence of toxic drugs.
- Workers may not use the equipment entrusted to them in uses that are not in the service of the company, as well as taking it out of the workshop without corresponding permission.
- Smoking in restricted areas.
- Improvise a stove to make food in inappropriate places.
- Carry firearms and short sharps.
- Ingest alcoholic beverages or any psychotropic substance.
- Perform wildlife-hunting activities.

1.2.8 Security Measures

Next, general safety measures[10] are presented, however, each project must develop a safety plan and adjust it to its specific sector based on the best international health and safety practices.

Over-exertion

Over-exertion, and ergonomic injuries and illnesses, such as repetitive motion, over-exertion, and manual handling, are among the most common causes of injuries in construction and decommissioning sites. Recommendations for their prevention and control include:

- Training of workers in lifting and materials handling techniques in construction and decommissioning projects, including the placement of weight limits above which mechanical assists or two-person lifts are necessary;
- Planning work site layout to minimize the need for manual transfer of heavy loads;
- Selecting tools and designing work stations that reduce force requirements and holding times, and which promote improved postures, including, where applicable, user adjustable work stations;
- Implementing administrative controls into work processes, such as job rotations and rest or stretch breaks.

Slips and Falls

Slips and falls on the same elevation associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time accidents at construction and decommissioning sites. Recommended methods for the prevention of slips and falls from, or on, the same elevation include:

- Implementing good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot paths;
- Cleaning up excessive waste debris and liquid spills regularly;
- Locating electrical cords and ropes in common areas and marked corridors;
- Use of slip retardant footwear.

Work in Heights

Falls from elevation associated with working with ladders, scaffolding, and partially built or demolished structures are among the most common cause of fatal or permanent disabling injury at construction or decommissioning sites. If fall hazards exist, a fall protection plan should be in place which includes one or more of the following aspects, depending on the nature of the fall hazard:

- Training and use of temporary fall prevention devices, such as rails or other barriers able to support a weight of 200 pounds, when working at heights equal or greater than two meters or at any height if the risk includes falling into operating machinery, into water or other liquid, into hazardous substances, or through an opening in a work surface;

[10] Sourced from: "Environmental, Health, and Safety (EHS) Guidelines - GENERAL EHS GUIDELINES: CONSTRUCTION AND DECOMMISSIONING", World Bank Group (2007)

- Training and use of personal fall arrest systems, such as full body harnesses and energy absorbing lanyards able to support 5000 pounds, as well as fall rescue procedures to deal with workers whose fall has been successfully arrested. The tie in point of the fall arresting system should also be able to support 5000 pounds;
- Use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones, as well as securing, marking, and labeling covers for openings in floors, roofs, or walking surfaces.

Struck By Objects

Construction and demolition activities may pose significant hazards related to the potential fall of materials or tools, as well as ejection of solid particles from abrasive or other types of power tools which can result in injury to the head, eyes, and extremities. Techniques for the prevention and control of these hazards include:

- Using a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels;
- Conducting sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable;
- Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap;
- Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged;
- Evacuating work areas during blasting operations, and using blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures;
- Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes.

1.1.a.i.1.11 Electrocution

- Only trained personnel should handle electrical cables and equipment that require electricity for operation;
- Personnel handling cables and electrical equipment must follow the rules for work on power lines;
- Mandatory use of personal protective equipment such as glasses, helmet, gloves, etc., when working with electrical cables and equipment;
- Warning signs of danger in areas where power lines are located and work with equipment that needs electricity to operate;
- Immediate aid for personnel who have suffered burns due to electrocution, provide necessary first aid, and depending to the severity of the accident, determine whether the patient needs to be transferred to the nearest health center or hospital.

Moving Machinery

Vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dust, emissions, and noise. Heavy equipment operators have limited fields of view close to their equipment and may not see pedestrians close to the vehicle. Center-articulated vehicles create a significant impact or crush hazard zone on the outboard side of a turn while moving. Techniques for the prevention and control of these impacts include:

- Planning and segregating the location of vehicle traffic, machine operation, and walking areas, and controlling vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic
- Ensuring the visibility of personnel through their use of high visibility vests when working in or walking through heavy equipment operating areas, and training of workers to verify eye contact with equipment operators before approaching the operating vehicle;
- Ensuring moving equipment is outfitted with audible back-up alarm;
- Using inspected and well-maintained lifting devices that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations.

Dust

- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements;
- PPE, such as dusk masks, should be used where dust levels are excessive.

Confined Spaces and Excavations

Examples of confined spaces that may be present in construction or demolition sites include: silos, vats, hoppers, utility vaults, tanks, sewers, pipes, and access shafts. Ditches and trenches may also be considered a confined space when access or egress is limited. The occupational hazards associated with confined spaces and excavations in construction and decommissioning sites should be prevented according to the following recommendations:

- Controlling site-specific factors which may contribute to excavation slope instability including, for example, the use of excavation dewatering, side-walls support, and slope gradient adjustments that eliminate or minimize the risk of collapse, entrapment, or drowning;
- Providing safe means of access and egress from excavations, such as graded slopes, graded access route, or stairs and ladders;
- Avoiding the operation of combustion equipment for prolonged periods inside excavations areas where other workers are required to enter unless the area is actively ventilated.

Other Site Hazards

Construction and decommissioning sites may pose a risk of exposure to dust, chemicals, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms, which should be prevented through the implementation of project-specific plans and other applicable management practices, including:

- Use of specially trained personnel to identify and remove waste materials from tanks, vessels, processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation, construction, dismantling or demolition;
- Use of specially trained personnel to identify and selectively remove potentially hazardous materials in building elements prior to dismantling or demolition including, for example, insulation or structural elements containing asbestos and Polychlorinated Biphenyls (PCBs), electrical components containing mercury;
- Use of waste-specific PPE based on the results of an occupational health and safety assessment, including respirators, clothing/protective suits, gloves and eye protection

Common Injuries and Accidents

- Use rolling cats or other comfortable and easy-to-use equipment or tools to reduce material handling by hand;
- Place materials in easily accessible sites;
- To lift weight, the correct technique should be used: lifting weight by flexing the legs, not with the back; girdles and other protections should be used;
- To avoid the exhaustion of personnel, sufficient liquids should be provided, mandatory breaks at small intervals of time, especially in hot weather to avoid to heat stroke and / or excess humidity; use light colored clothes and cotton.

1.2.9 Community Health and Safety

General Site Hazards

Projects should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning. Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling and entrapment hazards. Risk management strategies may include:

- Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community;
- Removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials.

Disease Prevention

Increased incidence of communicable and vector-borne diseases attributable to construction activities represents a potentially serious health threat to project personnel and residents of local communities. Recommendations for the prevention and control of communicable and vector-borne diseases also applicable to construction phase activities should be established.

Traffic Safety

Construction activities may result in a significant increase in movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized through a combination of education and awareness-raising, and the adoption of procedures.

1.3 Responsibilities

Each project should establish roles and responsibilities in a clear way. These responsibilities and roles of each person in charge will be communicated to the workers from the beginning, so that they know who to turn to if an incident occurs or if their role implies any specific responsibility related to health and safety.

1.4 Control and Monitoring Measures

- Reports of accident, illness and injury incidents including investigation and improvements to be implemented;
- Workers' health controls to determine an increase in diseases that could be associated with the projects;
- Incidents reported through the registration system;
- Health and safety monitoring records; and
- Regular evaluations with findings regarding the conditions of work fronts.

1.5 Internal Complaints Mechanism

Each project must have an internal grievance mechanism for workers and contractors. The objectives of these mechanisms are:

- Develop and implement an internal grievance mechanism to ensure transparency and commitment between projects, their employees and their contractors;
- Provide employees and contractors with an accessible and efficient process to present concerns, suggestions and complaints that may arise in relation to their work environment;
- Allow employees and contractors to raise their concerns, suggestions and complaints anonymously;
- Define a general methodology to manage and resolve concerns, suggestions and complaints in a timely manner; and
- Manage possible conflicts of interest by segregating the roles and responsibilities of the people involved in the process of managing concerns, suggestions or grievances and avoiding placing people in a position where conflicts can be perceived.

1.6 Principles

The Internal Complaint Mechanism has been developed in accordance with international best practices. A successful grievance mechanism is receptive and fair. The project claims management process must guarantee the same level of integrity and respect to any employee and contractor, and any type of claim received.

The objective is to guarantee transparency and commitment between projects, their employees and their contractors, as well as improve the organizational work of each project and facilitate communication between employees, contractors and the administration.

This mechanism is based on the following principles:

- Respect for national laws and international standards; however, this mechanism does not replace any legal recourse;
- Transparency and the ability of employees and contractors to express their complaints anonymously;
- Non-discrimination and no compensation or penalties against those who express their claims;
- Fair treatment of complaints that arise; and
- Effective communication between employees, contractors and administration.

1.7 Internal Complaint Mechanism Process

To comply with international best practices, each project must have an internal grievance mechanism that includes a process to receive and record claims, to examine and evaluate them, to reach a resolution, to challenge the final decision and to make Follow up and document the process. The following Figure presents the different stages of this process.

Source: ERM, 2019

Figure 1-1: Different stages of the internal complaint mechanism process

1. Receive and register complaints

Any temporary or permanent employee, as well as any consultant, contractor, subcontractor or supplier, can submit claims, both verbally and through a written form, to their immediate manager, the human resources department or a worker's representative.

Any employee or contractor can make a claim and is entitled to anonymity.

Claims received must be recorded and documented. As a general rule internal complaints are managed by the Human Resources teams. The records will be kept updated throughout the life of the projects. The record includes a summary of the claim, the date it was received and a reference to any supporting documentation (for example, images).

Complaints are addressed within a specific period agreed upon by each project after receipt of the claim.

2. Examine and Evaluate

For claims that have not been resolved immediately by the recipient, Human Resources conducts an initial assessment of the severity and assigns the claim to a claim supervisor (for example, construction manager, engineering manager or other area directly involved in the claim). Human Resources and the owner of the claim agree the deadlines for an investigation and any follow-up action.

For claims related to problems for which a more appropriate company process already exists, Human Resources refers the matter to the appropriate Claim Owner for further action. This is usually the case for claims related to contractual or commercial matters, commercial integrity or criminal matters, and issues subject to current or pending litigation.

3. Resolution

If the claimant cannot obtain a resolution within a specific period established by each project, after the claim is received, he or she will inform Human Resources through a form.

If no agreement is reached on a resolution within a certain period, meetings and discussions should be scheduled with the project manager of the project, as well as with other relevant departments, to agree on a final solution.

Before issuing the final resolution, the claimant, or the Workers' Representative, reviews it and confirms its agreement with the proposed solution.

4. Disagreement on the decision

In the event that a claimant wishes to challenge / appeal the project decision, the Project Manager and the Project Director will decide if the project can resolve the dispute or if it is necessary to involve a third party (for example, a mediator, an expert technician, a local representative or authority) to reach an agreement between the parties involved and resolve the dispute.

5. Follow-up and Documentation

Once an agreement is reached, the designated person or department (usually Human Resources) and responsible for the internal grievance mechanism of each project, is responsible for following up on the claimant to confirm that appropriate resolution measures are implemented and continuously coordinate with the areas involved in the claim.

Each project must maintain an updated database with all documentation and information related to internal complaints submitted by workers or contractors. The claims process must also be followed, coordinate with the areas involved through meetings and facilitate the participation of the claimant. A single file for each case must be completed and registered with the form, all correspondence related to the claim and the reference to the claim register.

The complaint log provides a record to show that actions are tracked and that these are carried out. Register:

- Date of the complaint;
- Person responsible for the claim (i.e. claimant);
- Information on the proposed corrective action (if applicable);
- Date the complaint was closed;
- Date the response was sent to the complainant.

1.8 Communication of Responsibilities

The Human Resources teams of each project will communicate to the workers and contractors this procedure and its different steps before construction and regularly during the duration of the different projects.

1.9 Reports

Projects track all complaints through an Internal Complaint Registry.

1.10 Monitoring

The Internal Complaint Mechanism will be monitored quarterly during construction and annually during operations by a third party to determine the success of the process. An evaluation will be carried out for each internal complaint and the project response to assess the effectiveness of the response mechanism or address systemic problems that may require changes in the policies or performance of each project.

Annex V. Gender Equality Plan

1. Gender Equality Plan

The projects commit to promote gender equality and ensure equal opportunities and results for all staff.

"Gender equality" means the existence of equal opportunities and rights between women and men in the private and public spheres, which provides and guarantees them with the possibility of living the life they want. Currently, it is internationally recognized that gender equality is a key piece of sustainable development (UNESCO).

An UN report on global sustainability highlighted that "any serious change towards sustainable development requires gender equality. The collective intelligence and capacity of half of humanity is a resource that we must nurture and develop, for the sake of all future generations" (UN, 2012). Likewise, the IDB defends that gender equality contributes to poverty reduction and results in higher levels of human capital for future generations. According to the IDB, the empirical evidence in this regard is overwhelming: equality within the home, in the labor market, in access to financial services and technology, and in civic and political participation reinforce each other and contribute to the effectiveness of development efforts (IDB Operational Policy on Gender Equality in Development, 2010).

The projects will work to ensure that all staff feel respected, safe and valued in the workplace, and will take proactive measures to prevent and eliminate gender discrimination and provide equal opportunities for all staff.

1.1 Objectives

The objectives of the Gender Equality Plan are:

- Promote equal power relations between women and men;
- Use appropriate language and behavior that reflects gender equality;
- Strengthen the organizational structure of each project towards an inclusive and participatory work model;
- Avoid gender stereotypes;
- Provide training that promotes knowledge, values and benefits on gender equality;
- Have an organizational policy on gender for each project.

1.2 Activities and/ or Key Actions

Below are general activities or actions to promote gender equality and ensure equal opportunities and results for all staff. However, each project must develop an organizational policy on gender and adjust this plan to its specific social and geographical context based on international best practices.

1.3 Appropriate language and behavior

All work and sexual harassment behavior will be prevented in the projects, through prevention and sanction mechanisms. Depending on the context of each project, training, programs or campaigns to prevent workplace and sexual harassment can be carried out among its staff and also towards the community. The

dissemination of the policies of each project and the performance of the internal complaints mechanism will be key to preventing and detecting this type of harassment.

1.4 Equitable Opportunities

Projects should offer equitable and inclusive opportunities for men and women alike. No lower wages and benefits will be offered in relation to what men earn. Likewise, the difficulty of hiring or firing for pregnancy or for being working mothers will not be accepted. Job offers, both informal and qualified offers and leadership positions, will be available for both genders with the objective of moving towards a representation of men and women similar to that observed in the gender composition of society. All of the above will be carried out respecting the labor legislation of each country.

Training

The projects will provide training for all staff on gender issues. These trainings can offer tools and activities to promote gender equality in each project; facilitate sessions to reflect on personal experiences and observations; present gender stereotypes and their consequences and talk about serious problems related to gender, such as gender violence or domestic violence.

These trainings will aim to provide knowledge, techniques and tools to develop skills, changes in attitudes and behaviors to advance gender equality at work. They will also contribute to the empowerment of women within the projects and will promote an organizational culture that integrates gender equality values. These trainings can be carried out in coordination with civil organizations or associations dedicated to gender equality.

Health and Safety at Work

Projects must have adequate infrastructure for mixed work teams (for example, bathrooms). Likewise, the equipment, machinery and personal protection material will be adapted so that the work can be carried out under equal conditions between men and women.

Grievance Mechanism

The internal grievance mechanism, presented in detail in the Workers' Health and Safety Plan, must be culturally appropriate, accessible, anonymous, confidential, transparent and inclusive. Additionally, if a worker asks to discuss a complaint or a particular situation with an employee or other involved person of the same gender, the projects will facilitate this request.

1.5 Responsibilities

Projects are the main responsible for complying with the objectives and commitments established in this plan and in their own gender policies. Project staff and contractors will be responsible for carrying out work and labor relations in a manner that meets the expectations of gender equality established by each project during the different phases of the projects. The Human Resources team of each project will be responsible for circulating the gender equality plan, as well as gender policies among the staff.

1.6 Monitoring

The purpose of monitoring and evaluating the Plan is to record the degree to which prevention and sanction measures achieve their intended objectives to promote gender equality in the work environment of each

project. The monitoring and evaluation activities will be carried out both by the projects and by independent third parties as appropriate in each case. The projects will be responsible for evaluating each project's contractors.

To this end, the number of gender-related complaints and resolutions will be evaluated and recorded, an updated record of gender equality-related trainings and materials distributed among staff (policies, pamphlets, campaigns, etc.) will be maintained and if necessary, internal surveys on the opinions and concerns of staff in relation to gender equality may be conducted.

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2 INTRODUCTION

This document defines the scope of work and technical specifications required for Engineering, Procurement, Construction, and initial Operations and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies. The Project Owner will be The Government of Jamaica (GoJ) with the Project Execution Unit (PEU) being the Ministry of Science, Energy and Technology (MSET) providing project development and project management support as the Contracting Agency. The Rooftop Solar PV and Energy Efficient Air Conditioning Systems will be owned by the MSET and transferred to the UHWI eventually.

Background

The University Hospital of the West Indies has available approximately 77,793 square feet of usable roof top space on sixteen (16) buildings within the facility to install solar PV systems to generate electricity for self-consumption (see Table 2 for details). The purpose of this contract is to Design, Procure, Construct, Operate and Maintain Grid Tied Solar Photovoltaic Systems on sixteen buildings within the UHWI. The aim of which is to obtain a minimum of 808 kWp of electricity, generated consistent with local utility interconnection requirements.

The Project shall have a minimum total installed DC capacity of 808 kWp (based on the nameplate rating of the PV modules).

Subject to the specifications herein, the Project scope includes the following facilities:

- All equipment (including PV modules, mounting structures, inverters and related/ancillary equipment) to comprise PV systems with an aggregate capacity of 808 kWp minimum.
- AC collection equipment to combine the output of each inverter and connect to the relevant utility Points of Interconnection.
- Data acquisition systems to allow for online or virtual monitoring.

Note: Certain subsections within this document such as subsection 8.7 (Concrete Equipment Foundations) and subsection 8.8 (Trenches) may not be applicable for some or all sites.

In addition, the project includes the installation of 2.54 MBTU of inverter type split air conditioning units in 97 rooms across the facility (see table B for details). See Appendix C for details.

3 DEFINITIONS FOR THE TECHNICAL SPECIFICATIONS

All defined terms shall have the meaning prescribed to them in the Works Contract, or as defined below:

Term	Definition
AC	Alternating Current
AHJ	Authority Having Jurisdiction (e.g., Government Electrical Regulator)
API	Application Programming Interface
Applicable Laws	All laws, rules and regulations applicable to the Works in the jurisdiction of Jamaica.
Applicable Standards	Governmental and industry standards and requirements to which the Works shall comply
Array	May describe the entire PV System or a portion of it, representative of all equipment necessary to facilitate PV power generation and delivery of electricity including but not limited to Modules, Racking, Combiner Boxes and all necessary wiring
CEC	Canadian Electrical Code (CAN/CSA-C22)
Combiner Boxes	DC Combiner Boxes including UL listed enclosure, bus work and OCPD required to combine multiple DC source circuits onto a single, larger, set of conductors
Contractor	Engineering, procurement, and construction firm engaged to undertake the Project scope of work
CT	Current transformer
DAS	Data acquisition system
DC	Direct Current
Design Documents	Drawings, technical specifications and calculations prepared and packaged as the design basis for the Works.
Design Life	The required period of performance (without major repairs) of installed components, i.e., 25 years
DWG	Electronic data file format for AutoCAD drawings developed by Autodesk, Inc.
EPC	Engineer, procure, and construct
EER	Energy Efficiency Ratio (EER): The ratio of net cooling capacity is Btu/h to total rate of electricity input in watts under designated operating conditions (Btu hour/Watt).
Good industry Practices	Performance of the Work in a good and workmanlike manner in accordance with internationally accepted professional best practices, methods, techniques, and standards
HVAC	Heating, ventilation and air conditioning
Hz	Hertz
kV	Kilovolts
IEC	International Electrotechnical Commission
IFC	Issued for construction
kW	Kilowatts
kWh	Kilowatt hours

Term	Definition
kWp	Kilowatt-peak
Limited Notice to Proceed Date	Date when written notice is given by Contracting Agency to Contractor authorizing Contractor to proceed with the Works in a limited manner as specified by Contracting Agency
LOTO	Lock-out, tag-out
LV	Low voltage, defined as less than 1,000 Volts
MET Station	Meteorological station, consisting of multiple sensors to record environmental conditions
Module, Modules	Solar Panel(s)
Mounting Structure, Racking	A mechanical assembly of racking members used to support the PV modules and string wiring
MPPT	Maximum power point tracking
MSET	Ministry of Science, Energy and Technology
MV	Medium Voltage, defined as between 1,000 V and 35 kV
OCPD	Overcurrent Protection Device
O&M	Operations and Maintenance
Project Owner	The entity on whose property the solar PV equipment will be installed and to which the benefits of energy/power generated by said equipment will redound
Owner	Ministry of Science, Energy and Technology
Contracting Agency	The entity designated by Owner to interface with the Contractor on behalf of Owner on all matters related to the Project (the Project Execution Unit in this case)
PDF	Portable document format, an electronic data file format developed by Adobe Systems Inc.
POI, Point of Interconnection	The Point of Interconnection is the location at which the Project's power system is interconnected with the Utility's facilities. The Point of Interconnection is the physical termination point between the Contractor and the Utility's facilities. Unless otherwise indicated, the Point of Interconnection is the LV terminals provided by the Facility. Where a standby generator is in place for emergency power to entire site, the Point of Interconnection must be on the Utility side of the transfer switch in order to avoid PV inverter and standby generator interactions
PPE	Personal protective equipment
Project	The series of activities and tasks involved in the engineering, procurement, and construction of Energy Efficient Air Conditioning Systems and solar PV systems at the identified sites or the physical outcomes from the undertaking, i.e., the solar PV installations
PV	Photovoltaic
Safety Plan	a written document that describes the process for identifying the physical and health hazards that could harm workers, procedures to prevent accidents, and steps to take when accidents occur.

Term	Definition
Scope of Work	A description of the work to be performed by the Contractor, including deliverables to be provided and end products, in order to achieve the objectives of the Project
Site	The specific facility/location at which a solar PV and the Energy Efficient Air Conditioning Systems Project is to be undertaken
SEER	Seasonal Energy Efficiency Ratio (SEER): The ratio of the total cooling output of an air conditioner during its normal annual usage period for cooling in Btu/h divided by total electric energy input in watts during the same period (Btu hour/Watt).
STC	Standard Test Conditions (1000 W/m2, 25ºC module temperature and AM1.5 spectrum)
String	Circuit of PV Modules connected in series
Technical Specifications	The set of engineering and functional requirements of the PV system and its individual components that must be adhered to for system design, procurement, and installation
Test, Testing	Any visual, mechanical, electrical, or functional inspection or examination required to confirm Project equipment and/or systems have been installed in accordance with Technical Specifications, Good Industry Practices, Applicable Laws, Applicable Standards and manufacturer recommendations
Work, Works	The activities and tasks required to achieve the objectives of the Project
Works Contract	Contract between the Contracting Agency and the Contractor to execute, complete, and maintain the Works
Wp	DC capacity measured as the sum of the nameplate rating of each PV Module

Term	Definition
50% Design Documents	Design Documents intended to represent a reasonably complete design package. Many of the design submittals may be preliminary or conceptual in nature, without having all exact details defined. 50% Design Documents shall be provided as a single comprehensive submittal. To the extent possible, all PDF's shall be combined into a single file. 50% Design Documents shall include (at a minimum): ***Design Basis:*** ● Design criteria for each engineering discipline. ● Contractor's equipment and system designation methods. ● List of systems and system designations. ***Electrical Package:*** ● Schematics and single line drawings detailing: array and DC collection system circuits, LV AC collection system, site lighting, auxiliary and backup power, MET stations, DAS and communications systems, grounding design wiring details including: specifications for all conductor types, conduit, protective devices and relays; ampacity calculations for all

Term	Definition
	directly buried conductors; voltage drop calculations for all conductor runs; trench details, Combiner Box wiring details (both DC and AC), minimum bend radius, conductor termination details, conduit fittings, etc. ● Equipment pad layout design including conduit entry. ● Supporting documentation for all components (transformers, modules, Combiner Boxes, etc.) including specification of all requirements for all components, manufacturer's datasheets, installation manuals, operations and maintenance manuals. ***Structural Package:*** ● Calculations in accordance with Section 8.5.2. ● Elevations depicting mounting configurations for all equipment. ● Structural designs for all mounting structures. ● Roof attachment layout and means of affixing to structural members. ● Torque requirements for all mounting structure and module fasteners. ● Corrosion analysis.
90% Design Documents	Design Documents intended to represent a nearly complete design package for final approvals prior to being issued for permit approval. The 90% Design Documents shall be provided as a single comprehensive submittal. 90% Design Documents shall include (at minimum): ● An updated version of the 50% Design Documents with revisions and additional detail where applicable. ● Equipment ratings for all power systems equipment, bus work, enclosures, protective devices, etc. ● All detailed information required to obtain all necessary construction permits from the AHJ.
IFC Design Documents	Design Documents intended to provide all required information for subcontractors to construct the Project. IFC Design Documents shall be provided as a single comprehensive submittal. IFC Design Documents shall include, at minimum, complete and fully detailed submittals (including all applicable drawings and calculations) for the following: ● An updated version of the 90% Design Documents with revisions and additional detail where applicable. ● Shall address any responses/comments from the AHJ.
As-Built Design Documents	Design Documents intended to reflect design changes after the release of the IFC Design Documents and to document the design of the as-constructed facility
MBTU	Millions of British Thermal Units per hour
JPS	Jamaica Public Service Company Ltd. (Electric Utility)

4 INDUSTRY STANDARDS AND CODES

4.1 Government and Jurisdictional Codes and Requirements

Contractor shall engineer and construct the Project in compliance with all applicable local building codes including the Jamaica Building Code, Third Edition (2003), and the National Electrical Code 2011 and JS 21.

4.2 Industry Codes and Standards

Additional industry codes and standards include, but are not limited to, the following:

- AASHTO - Association of State Highway and Transportation Officials
- ACI - American Concrete Institute
  - ACI 318-05 - Building Code Requirements for Reinforced Concrete
  - ACI 301 - Specifications for Structural Concrete
- AEIC - Association of Edison Illuminating Companies
  - AEIC CS8 - Specification for Extruded Dielectric, Shielded Power Cables Rated 5 through 46kV

Air Conditioning, Heating, and Refrigeration Institute (ARI/AHRI):

- 495-//2005// Standard for Refrigerant Liquid Receivers
- 730-//2013// Flow Capacity Rating of Suction-Line Filters and Suction-Line Filter-Driers
- 750-//2016// Thermostatic Refrigerant Expansion Valves
- 760 //202014// Performance Rating of Solenoid Valves for Use with Volatile Refrigerants

- Air-Conditioning, Heating, and Refrigeration Institute (AHRI):
  - 210/240-//2017// Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment
  - 270-//2015// Sound Rating of Outdoor Unitary Equipment
  - 310/380-//2017// Standard for Packaged Terminal Air-Conditioners and Heat Pumps (CSA-C744-04)
  - 340/360-//2015// Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment
  - 520-//2004// Performance Rating of Positive Displacement Condensing Units
- AISC - American Institute of Steel Construction
- AISI - American Iron and Steel Institute

American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE):

- 15 //2019// Safety Standard for Refrigeration Systems (ANSI)
- 17 //2008// Method of Testing Capacity of Thermostatic Refrigerant Expansion Valves (ANSI)
- 63.1-//2001// Method of Testing Liquid Line Refrigerant Driers (ANSI)
- 63.2-//2010// Method of Testing Liquid Line Filter Drier Filtration Capability (ANSI)

- American National Standards Institute (ANSI):
  - A13.1-//2015//Scheme for Identification of Piping Systems
  - Z535.1-//2017// Safety Color Code

- ASCE - American Society of Civil Engineers

  - ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
  - ASCE 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures

American Society of Mechanical Engineers (ASME):

- B16.22 //2018// Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings (ANSI)
- B16.24 //20016//Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500 (ANSI)
- B31.5-//2013// Refrigeration Piping and Heat Transfer Components (ANSI)
- B40.100-//2013//Pressure Gauges and Gauge Attachments
- B40.200-//2008//Thermometers, Direct Reading and Remote Reading

· ASTM - American Society for Testing and Materials

- A126-//2014// Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
- B32 08Standard Specification for Solder Metal
- B88 //2016// Standard Specification for Seamless Copper Water Tube
- B88M-//2018// Standard Specification for Seamless Copper Water Tube (Metric)
- B280 //2019// Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service

· American Welding Society, Inc. (AWS): Brazing Handbook

- A5.8/A5.8M //2011// Standard Specification for Filler Metals for Brazing and Braze Welding

· Caribbean Uniform Building Code (CUBiC) – Wind and seismic loading

· IEC - International Electrotechnical Commission

- IEC 61215 Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval
- IEC 61646 Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval
- IEC 61730 Photovoltaic (PV) module safety qualification
- IEC61730-2 Photovoltaic (PV) module safety qualification – Part 2: Requirements for testing
- IEC TS 62548 – Photovoltaic (PV) arrays - Design requirements
- IEC 60364-5-52, Selection and erection of electrical equipment – Wiring systems
- IEC 60536 Classification of electrical and electronic equipment with regard to protection against electric shock
- IEC 61140 Protection against electric shock - Common aspects for installation and equipment
- IEC 61000-6-2:2005 - Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- IEC 61000-6-4:2006 - Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
- IEC 62109 Parts 1 and 2 - Safety of power converters for use in photovoltaic power systems

- IEC 60269-6 Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems
- IEC 62930 Electric cables for Photovoltaic systems
- IEC 60296 Mineral Insulating oils for transformers & switchgear
- IEC 60099, Surge Arrestors -
    - Part 4: Metal-oxide surge arresters without gaps for AC systems
    - Part 5: Selection and application recommendations
    - Part 6: Surge arresters containing both series and parallel gapped structures - Rated 52 kV and less
- IEC 61850 (Communication networks and systems in substations).
- IEC 60870-5-104 (Telecontrol equipment and systems - Part 5-104: Transmission protocols
- IEC 60529 Degrees of Protection Provided by Enclosures (IP Code)

· IEEE - Institute of Electrical and Electronic Engineers

- IEEE 1547-2018 - IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

National Fire Protection Association (NFPA) Publications:

- 90A-//2018// Standard for the Installation of Air-Conditioning and Ventilating Systems

· NETA - International Electrical Testing Association

- ATS - Acceptance Testing Specifications
- ETT - Standard for Certification of Electrical Testing Personnel

· UL - Underwriters Laboratories

- UL 2703: Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
- Standards for miscellaneous parts and components

U.L.207-//2018// Standard for Refrigerant-Containing Components and Accessories, Nonelectrical

- U.L.429-//2013//Standard for Electrically Operated Valves

5 PROJECT DETAILS

5.1 General Project Information

5.1.1 Project Name: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies.

5.1.2 Project Coordinates:

5.1.2.2 University Hospital of the West Indies – 18.009785° N / 76.744335° W

5.1.3 General Project elevation:

5.1.3.2 University Hospital of the West Indies – 202 meters.

5.1.4 Site plan and other characteristics:

5.1.4.2 University Hospital of the West Indies – **See Exhibit A**

5.1.5 Contractor interconnection voltage: Contractor to determine

5.1.6 Contractor POI: Contractor to determine

5.1.6.2 University Hospital of the West Indies – Contractor to determine

5.2 Project Attributes

Solar PV Systems

5.2.1 DC Capacity (kWp) per Inverter: Contractor to determine.

5.2.2 AC Inverter Nameplate Rating (kWac): Contractor to determine.

5.2.3 Quantity of Inverter blocks: Contractor to determine.

5.2.4 Minimum total DC Capacity (kWp): 808kWp

5.2.5 Minimum total inverter AC nameplate rating (kWac): Contractor to determine.

5.2.6 DC:AC Ratio (kWp/kWac): 1.25 maximum.

5.2.7 Expected year 1 project specific yield (kWh/kWp): Contractor to provide.

5.2.8 Expected year 1 project 12-month energy production (kWh): Contractor to provide.

5.3 Design Conditions

5.3.1 Maximum Design temperature: 50° C (Ambient).

5.3.2 Minimum Design temperature: 10° C (Ambient).

5.3.3 The complete generating system, support structure, and ancillary structures shall comply with 180 mile per hour basic design wind speed, Risk Category III or IV per ASCE 7 or greater requirements of the local building code requirements. The EPC Contractor shall confirm all wind load requirements with the Ministry of Public Works and the Contracting Agency prior to initiating design activities.

5.4 Project Special Conditions

5.4.1 The building facilities are provided by Owner. The Contractor will be required to coordinate certain aspects of the interface between Contractor's Works and the facilities provided by Owner and Utility. Such interface shall include (but may not be limited to):

5.4.1.1 Specification of the termination type for the low voltage output circuit to the POI at the Site.

5.4.1.2 Specification of the number/type of communications required by the Contractor for the DAS system.

5.4.1.3 Coordination on the final DAS points list.

6 GENERAL REQUIREMENTS

This section provides explanation and lists an overview of the requirements of the Technical Specifications. The intent of this section is to illustrate that the Contractor is responsible for all activities to complete the Project except for those items not specifically identified and specified herein.

6.1 Scope of Work

6.1.1 Contractor shall engineer, design and construct the Project in accordance with the Technical Specifications.

6.1.2 Contractor's Scope of Work is to engineer, design, procure, permit, construct, interconnect, commission, startup and test a turnkey solar PV System which is built to the capacity as indicated in Section 5 and meets commissioning and testing requirements identified by Contracting Agency.

6.1.3 Contractor shall design all aspects of the Project to meet the minimum Design Life.

6.1.4 It is the Contractor's sole responsibility to ensure that all aspects of Project design and construction comply with all local code requirements and all industry codes and standards. This includes, but is not limited to, the list specified in Section 4.

6.1.5 Professional engineers registered or licensed in the jurisdiction where the Project will be constructed shall sign and seal all documents required for submittal to any applicable legal authority. Contractor shall provide a complete and functional Project up to the POI.

6.1.6 Contractor shall perform, supply or cause to be supplied all equipment, materials, labor, services, supervision, testing devices, drawings, calculations, specifications, and manuals required for the Project.

6.1.7 Major components of the Scope of Work include:

6.1.7.1 Project management including, but not limited to:

- Project administration.
- Scheduling.
- Quality control.
- Weekly and monthly progress reporting.
- Coordination of Contractor's personnel and subcontractors.
- Compliance with applicable permits and standards.

6.1.7.2 Engineering including, but not limited to, detailed design of:

- Solar PV design with Year 1 production estimate prepared using standard industry design software and uncertainty analysis for the production estimate.
- Electrical systems.
- Control and instrument systems.
- Civil and structural systems.
- HVAC systems (if necessary, for equipment cooling).
- Mechanical systems.
- Calculations, analyses and third-party review, where required, of all engineering documents.
- Comprehensive design manual including all engineering drawings, calculations and analyses performed.
- Comprehensive operation and maintenance manuals for the Project.

6.1.7.3 Procurement of all equipment, materials and services, including but not limited to:

- Procurement of all materials, including but not limited to, PV Modules, PV Module mounting structures, inverters, combiner boxes, disconnect switches, current transducers, potential transducers, fuses, meters, meteorological stations, DAS equipment, foundations and foundation materials, hardware and fasteners, conduits and raceways, conductors, junction boxes, bonding and grounding equipment, and all related materials.
- Procurement of all services including, but not limited to, subcontracted services required to prepare, install, construct, connect and test equipment at the Site.
- Development of specifications and bid packages for subcontracted work.
- Bid evaluation and selection for subcontracted work.
- QA/QC material inspections.
- Obtaining all datasheets, relevant technical notes, installation, operations and maintenance manuals for all Project equipment.
- Priced list of recommended operating spare parts with manufacturer-recommended quantities based on the quantity installed at the Project in accordance with Section 11.

6.1.7.4 Construction of all Project facilities including, but not limited to:

- Securing and controlling the Site and Site access.
- Construction management and supervision.
- Construction labor and training.
- Construction and installation of all Project equipment.
- Safety program.
- Quality program.
- Construction equipment.
- Construction utilities such as electrical power, water and telecommunications.
- Parking for construction crews.

- Construction, maintenance, removal and restoration of all temporary construction needs such as material laydown and staging areas.
- Construction lighting.
- Construction sanitary facilities.
- Surveying.
- All consumables.
- Site clean-up.

6.1.7.5 Inspection, testing and commissioning activities including, but not limited to:

- Commissioning as specified by Contracting Agency.
- Acceptance testing as specified by Contracting Agency.
- Energy performance testing as specified by Contracting Agency.
- All personnel and test equipment required to perform the inspection, testing and commissioning activities.

6.1.7.6 Defects liability for two years after commissioning as outlined in Section 11.

6.1.8 Contractor shall be responsible for disposal of all waste material from the Work.

1.2 Safety

1.2.1 A Health and Safety Management Plan should be provided before the commencement of the construction works, together with an emergency/contingency plan. The Health and Safety Management Plan should assess the risks of all activities associated with the Work (such as working at height, electrocution, blows, cuts, wounds caused by machinery and equipment) and provide appropriate management measures for the works activities (prevention and protection measures). The emergency plan should provide specific workers' instruction and procedures to respond to emergency events (e.g. fire, hurricanes, tornadoes, explosions, severe workers' accidents).

1.2.2 The Health and Safety Management Plan should be aligned with the content of chapter 7.5.6 (Occupational Health and Safety see Section F Annex IV) of the **IDB's Strategic Environmental and Social Assessment & Environmental and Social Management** and the emergency plan with the content of chapter 7.5.4 (Natural Disaster Management Plan see Section F Annex III) and 7.5.5 (Emergency Preparedness and Response Management Plan / Contingencies see Section F Annex I).

1.2.3 Additionally, within Thirty (30) days following the Limited Notice to Proceed Date, Contractor shall provide to Contracting Agency a Site-specific Safety Plan for the Work to ensure that appropriate measures are taken to support safe construction.

1.2.4 The Health and Safety Plan and the Emergency/Contingency Plan should be aligned with the requirements The Jamaica Health and Safety at Work Act and the Jamaica Occupational and Safety Act 2017; and of the **IDB's Strategic Environmental and Social Assessment & Environmental and Social Management** as set out in 6.2.2. above.

1.2.5 The Health and Safety Plan should include a Code of Conduct for workers involved in the construction activities that includes the expectations and will define acceptable behaviours, regarding to topics such as use of Company's goods, privacy, safety, drugs and alcohol, internal behaviour and expected behaviour with the community, discrimination, sexual harassment and gender-based violence, forced labor and child labor, disciplinary actions see Section F Annex V).

1.2.6 The Contractor should nominate a person responsible for the health and safety supervision and management of the Work.

1.2.7 Before the commencement of the construction works, the Contractor should provide evidence that all workers have received appropriate health and safety and emergency training, and that adequate protective equipment is available for all workers performing the construction works.

1.2.8 During construction, the Contractor should provide evidence of the effective implementation the health and safety plan (providing photographs and a brief supervision).

1.2.9 Contractor shall provide safety supervision to maintain safe working conditions.

1.2.10 Contractor shall perform arc-flash calculations, and utilize appropriate PPE, for work performed in or near any live electrical components.

1.2.11 Contractor shall perform daily safety briefings and inform all workers of relevant hazards involved in the Works.

1.2.12 Contractor shall develop lock-out-tag-out (LOTO) procedures for performing the Work and operation of the Project.

6.3 Permits and Environmental Compliance

6.3.1 Contractor shall be responsible for providing all required engineering plans, designs and documents as needed to obtain all building and construction permits necessary to complete the Work including, but not limited to: a) Building permits issued through the AHJ; b) Electrical permits; and c) Temporary construction power, fire, and sanitation permits. Contractor shall bear any cost/fees associated with obtaining the above-identified approvals and permits.

6.3.2 Contractor shall comply with all conditions of approval and all mitigation measures required by the AHJ and demonstrate compliance as required by the AHJ. Any mitigation measures that require substantial physical work may be cause for a change order as per the EPC agreement.

6.3.3 Within thirty (30) days following the Limited Notice to Proceed Date, Contractor shall provide an Environmental Compliance and Protection Plan. This plan shall describe the environmental protection measures that will be implemented for the Project (e.g., waste management/disposal, environmental protection measures inspection schedule, etc.)

6.3.4 The Contractor should develop a Work's waste management plan aligned with the content of Chapter 7.5.2 (Hazardous Solid Waste Management Plan see Section F Annex II) of the **IDB's Strategic Environmental and Social Assessment & Environmental and Social Management**; during construction, the Contractor should provide evidence of its effective implementation.

6.4 Schedule

6.4.1 Contractor shall develop a detailed (Level 3 or 4 critical path method) Project Schedule of the Work to include all key milestone dates (subject to approval by Contracting Agency) and Contractor deliverables no later than thirty (30) calendar days following the Limited Notice to Proceed Date.

6.4.2 Contractor shall provide weekly updates to the Project Schedule that shall indicate at a minimum the following:

6.4.2.1 Major changes in scope.

6.4.2.2 Activities modified since previous submission.

6.4.2.3 Revised projections of progress and completion.

6.4.2.4 Other identifiable changes.

6.4.3 Contractor shall provide schedules in electronic format.

6.4.4 Contractor shall provide immediate written notice to Contracting Agency at any time that Contractor becomes aware of a change to the Project Schedule that is expected to impact any of the milestone dates. Contractor shall have five (5) days to provide Contracting Agency with a mitigation plan and revised Project Schedule.

6.5 Project Management

6.5.1 Contractor shall submit a Project Management Plan within 10 days from the date of the Letter of Acceptance meeting the following requirements:

6.5.1.1 Designated engineering, procurement, and resident construction managers who will be responsible for each portion of the Project.

6.5.1.2 Project reporting procedures and frequencies.

6.5.1.3 Chain of communication.

6.5.1.4 Change control plan.

6.5.2 Contractor shall identify a single point of contact (Contract manager) within Contractor's organization for Contracting Agency to communicate with regarding the Work.

6.5.3 The Contract manager shall convene weekly conference calls or site meetings with the Contracting Agency and other stakeholders designated by the Owner to communicate status of the Work.

6.5.4 The Contract shall maintain and issue progress reports on a bi-weekly basis (once every two weeks) and/or as requested by the Contracting Agency to communicate the status of the Work. The progress reports shall include:

6.5.4.1 Safety report.

6.5.4.2 Report on construction progress.

6.5.4.3 Updated schedule of values.

6.5.4.4 Updated schedule for the Work.

6.5.4.5 Meeting minutes.

6.5.4.6 Action item list.

6.5.4.7 Construction progress photographs.

6.5.4.8 Submittal Log including submittals from Contractor to Contracting Agency for approval and Requests for Information (RFIs) from Contracting Agency to Contractor. The proposed format of the Submittal Log shall be included in the Project Management Plan (subject to approval by the Contracting Agency).

6.5.4.9 Risk matrix identifying potential risks and actions taken by the Contractor to mitigate such risk.

6.5.5 Before any work is performed, a pre-construction conference call or in-person meeting shall be held to review contract requirements; establish a detailed schedule of operations; discuss the Contractor's safety rules and policies and the contractor's site safety plan; discuss material handling; introduce various members of the Contractor's, Contracting Agency 's, and engineer's staffs; and resolve any questions raised by any of the parties.

6.5.6 During construction, weekly progress meetings shall be held to review job progress; review project work schedules; review requests for payment; resolve problems that may arise; discuss any accidents or near accidents since the last meeting; and address any other matters of concern to any of the parties.

6.5.7 The Contractor shall prepare a summary of each meeting within two (2) working days of the meeting, especially noting any decisions made, and shall deliver a copy of same to the Contracting Agency.

6.6 Engineering

6.6.1 Contractor is responsible for all electrical, structural, mechanical and civil engineering and design. All drawings, studies and documentation submitted to any AHJ shall be signed and sealed by a professional engineer registered in Jamaica.

6.6.2 The design basis for the Project shall be the Project specific information included in this RFB.

6.6.3 Contractor shall include in the Design Documents a general arrangement drawing, to scale, indicating the location of all major Project equipment. The general arrangement drawing shall include, at a minimum:

6.6.3.1 PV arrays.

6.6.3.2 Inverters.

6.6.3.3 Underground low voltage cables.

6.6.3.4 Low voltage switchgear.

6.6.3.5 Meteorological stations.

6.6.3.6 Disconnect switches.

6.6.3.7 Point(s) of interconnection.

6.6.3.8 Staging and laydown areas.

6.6.3.9 Equipment building(s)/room(s).

6.6.4 Contractor shall perform all engineering and design Work within the scope defined and in accordance with all applicable building, electrical, safety and fire codes.

6.6.5 Contractor shall provide full turnkey engineering design for all PV systems and ancillary Site civil Work.

6.6.6 Contractor shall designate an engineering manager who will be responsible for the overall management and administration of engineering and design Work.

6.6.7 Contractor shall work with the Contracting Agency to apply for and obtain all required construction permits in order to construct the Project.

6.6.8 Contractor shall provide submittals to Contracting Agency pursuant to agreed Project Schedule. Engineering submittals shall be provided at intervals sufficient for Contracting Agency to review and comment on design decisions. Submittal milestones include:

6.6.8.1 50% Design Documents.

6.6.8.2 90% Design Documents.

6.6.8.3 IFC Design Documents.

6.6.8.4 As-Built Design Documents.

6.6.9 Power generated by the Project shall be compatible with the electric power system to which the Project is interconnected.

6.6.10 Contractor shall complete the final detailed engineering drawing package (IFC Design) required for all construction permits within forty-five (45) days following the Start Date.

6.6.11 An up-to-date printable index listing of all Contractor Design Documents including specifications, drawings, calculations, and as-built revisions organized by document number, title and revision shall be maintained by Contractor and shall be available to Contracting Agency at all times.

6.6.12 All engineering and design calculations prepared by Contractor during the design of the Project shall be available for Contracting Agency to review electronically. Such calculations shall include structural, electrical, mechanical and instrumentation and control details. Contractor shall make calculations available for Contracting Agency within thirty (30) days of the Start Date.

6.6.13 All vendor documents received by Contractor shall be maintained by Contractor and available to Contracting Agency at all times.

6.6.14 Contractor shall make all engineering documentation available in PDF format.

6.6.15 Contractor shall make all drawings available in DWG (AutoCAD) and PDF format.

6.7 Procurement

6.7.1 Contractor shall be responsible for the procurement, handling, shipping costs and delivery of all equipment, materials and services, including, without limitation, locating, negotiating, inspecting, expediting, shipping, shipping permits, unloading, receiving, verifying, customs clearance, and transportation and delivery to Site.

6.7.2 Packing lists shall be maintained by Contractor at the Project and shall be available for Owner‘s Agent review.

6.7.3 Contractor shall update a schedule of values maintained in electronic format that accurately describes the quantities of all Project equipment received at the Project. The schedule of values shall be updated within seven (7) days after each delivery of equipment. The schedule of values shall be available for Contracting Agency review.

6.7.4 All freight costs for all equipment shall be the responsibility of the Contractor.

6.7.5 All applicable taxes, service charges, and import duties shall be the responsibility of the Contractor unless otherwise agreed with the Contracting Agency .

6.7.6 Contractor shall work with Contracting Agency to secure any available customs concessions on the goods imported for the project.

6.7.7 All customs documentation and fees shall be the responsibility of the Contractor.

6.7.8 All equipment stored at the Site shall be in accordance with Good Industry Practices and manufacturer's recommendations. Contractor shall use all reasonable measures to keep the equipment free from dirt and debris.

6.7.9 Contractor shall perform all inspection and pre-installation maintenance activities to ensure compliance with manufacturer's recommendations. Contractor shall maintain a log of such maintenance activities, such log to include the date of such activities and the names and signatures of the personnel performing such activities. Such log shall be available to Contracting Agency for review.

6.7.10 Contractor shall obtain all warranty information for all Project equipment. All key equipment warranties shall permit assignment to Contracting Agency without consent.

6.7.11 Contractor shall obtain all installation, operations and maintenance manuals for all Project equipment.

6.7.12 Contractor shall secure all equipment located at the Site prior to each Phase Completion Date.

6.8 Construction

6.8.1 Prior to any Work at the Site, Contractor shall demonstrate or provide to Contracting Agency:

6.8.1.1 All safety requirements of Section 6.2 have been met.

6.8.1.2 All engineering and design requirements of this document have been met.

6.8.1.3 Structural analysis and calculations have been completed.

6.8.1.4 Contractor has received all installation manuals and requirements for all Project equipment.

6.8.1.5 Contractor has provided to Contracting Agency an up-to-date procurement and construction schedule indicating firm commitment dates for all Project equipment.

6.8.1.6 Contractor has obtained all required permits necessary to conduct the Work at the Site.

6.8.2 All workmanship shall comply with Good Industry Practices, Applicable Laws and Applicable Standards, including but not limited to those specified in Section 4.

6.8.2.1 For each portion of the Work, the contractor shall provide at least one person per shift who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the referenced standards and requirements of the work, and who shall personally direct and/or inspect all work performed.

6.8.2.2 For each portion of the work, sufficient skilled workers shall be provided who are thoroughly familiar with the type of construction, materials, and techniques specified.

6.8.2.3 No allowance will be made in the acceptance or rejection of any portion of the work for lack of skill on the part of the workers.

6.8.2.4 Where regulatory requirements mandate that one or more workers performing a task have specialized training or certification, Contractor shall provide workers that possess such training or certification.

6.8.3 Contractor is responsible for on-site security until Project Completion.

6.8.4 Contractor shall provide all required temporary construction utilities such as electric power, water for concrete and dust control and telecommunication service.

6.8.5 Contractor shall provide all fuels required for construction activities.

6.8.6 Contractor shall provide adequate lavatory facilities for the maximum quantity of people at the Site. Contractor is responsible for all service and waste removal.

6.8.7 Contractor shall utilize dust suppression systems and procedures to minimize fugitive dust.

6.8.8 Contractor is responsible for properly containerizing, removal and disposal of all solid waste, including any Hazardous Materials waste generated during the Work.

6.9 Quality Assurance and Control

6.9.1 Contractor shall implement a quality assurance and quality control (QA/QC) program to ensure the necessary measures are taken to support successful execution of the EPC agreement.

6.9.2 Contractor shall provide QA/QC supervision to maintain quality control in line with industry standards for similar work.

6.9.3 Within thirty (30) days following the Limited Notice to Proceed Date, Contractor shall provide to Contracting Agency a Site-specific, detailed QA/QC Plan. The Plan, at a minimum, shall address all aspects of:

6.9.3.1 Procurement of equipment, including inspections

6.9.3.2 Construction of the Project, including inspection and testing procedures to verify the construction complies with the AHJ-approved design and permit conditions

6.9.3.3 Commissioning and testing of the Project

6.9.3.4 Corrective action procedures that address defective materials, chain of supply, discrepant system components and field issues.

6.9.4 Contractor shall have the QA/QC Plan reviewed by the third party to ensure all testing and inspection procedures satisfy Applicable Standards and regulations.

6.9.5 Contracting Agency may perform an audit of the Plan at any point during the Work.

6.9.6 The Plan shall include a continuous improvement program. All improvements shall be logged as lessons learned and made available to the Contracting Agency.

6.9.7 Contractor shall perform inspections and field quality control testing throughout the construction process including:

6.9.7.1 Assessing existing conditions.

6.9.7.2 Construction installation placement and qualification measurements.

6.9.7.3 Final inspections and tests.

6.9.8 Testing shall comply with Good Industry Practices, Applicable Laws and Applicable Standards.

6.9.9 Testing shall include, but is not limited to:

6.9.9.1 Commissioning and testing including:

6.9.9.1.1 PV string voltage measurements at inverter inputs.
6.9.9.1.2 PV string IV curve tests at inverter inputs.
6.9.9.1.3 AC voltage measurements at inverter outputs.
6.9.9.1.4 Inverter anti-islanding tests.
6.9.9.1.5 PV system rapid shutdown tests.

6.9.9.2 NETA ATS standards.

6.9.9.3 Confirmation of racking system roof attachment or ballast design parameters (e.g., bolt penetration depth into concrete slabs or roof structural members, concrete ballast weight and placement, etc.)

6.9.9.4 Underground cabling for burial depth, spacing, tape placement and insulation resistance.

6.9.9.5 Photographs shall be taken of each open trench with all conductors prior to backfill.

6.9.9.6 Any other tolerance requirements as outlined in the approved engineering drawings and/or manufacturer's recommendations.

6.9.10 Torque:

6.9.10.1 Contractor shall ensure all fasteners are torqued properly according to the manufacturer's instructions.

6.9.10.2 Torque marks shall be provided on all structural fasteners and electrical terminations to indicate torque has been verified.

6.9.10.3 Proper torque shall be achieved through the use of non-powered, calibrated torque wrenches. Electric and air-driven tools shall not be relied upon to provide final torque without Contracting Agency approval.

6.9.10.4 Contractor shall compile a torque chart for the Project that includes the required torque settings for all fasteners and electrical terminations.

6.9.11 Contractor shall coordinate and document all QA/QC requirements and inspection and test results.

6.9.12 Contractor shall provide a three (3) Business Day notice to Contracting Agency prior to the following events for Contracting Agency review of the QA/QC inspection and testing results required of each:

6.9.12.1 Installation of mounting structure posts.

6.9.12.2 Backfill of first trench of each trench type.

6.9.12.3 Installation roof attachment fasteners (if applicable).

6.9.12.4 Installation of mounting structure.

6.9.12.5 Installation of mounting structure ballasts (if applicable).

6.9.12.6 Installation of inverters.

6.9.12.7 Installation of PV modules.

6.9.12.8 PV system commissioning.

6.9.12.9 Backfeed to the Utility.

6.10 Commissioning

6.10.1 Commissioning shall be performed in accordance with the manufacturer's installation, commissioning and O&M manuals, and in accordance with industry best practice and specifications provided by Contracting Agency.

6.11 Manuals

6.11.1 Contractor shall provide comprehensive Project Manual which shall contain the following as a minimum:

6.11.1.1 Final Contract Agreements.

- EPC Agreement (including Exhibits).
- Completion Certificates.
- Warranties.

6.11.1.2 Project Overview and As-Built Drawings.

- PV Module Database complete with model number, serial number, power and voltage rating, flash test data, etc. for all modules.
- Balance of System Database complete with model number, serial number, applicable rating for all equipment including but not limited to inverters, switchgear and breakers.

6.11.1.3 Studies and Reports

6.11.1.4 Commissioning Reports, Test Reports, Inspection Reports and QA/QC Documentation

6.11.1.5 Capacity Test Reports.

6.11.1.6 Availability Test Reports.

6.11.1.7 Module Factory Test Results.

6.11.1.8 Independent Laboratory Test Results.

6.11.1.9 QA/QC Documentation.

6.11.1.10 Applicable Permits

- Owner Permits.
- Contractor Permits.
- Permit Compliance Matrix.

6.11.2 Contractor shall provide comprehensive Operating Manual, detailing all services to be provided through the duration of the life of the system.

6.11.3 Complete Project Manual and Operating Manual shall be submitted to Contracting Agency no later than Substantial Completion.

6.12 Community Relations

6.12.1 Contractor shall maintain positive relations with the community and neighbors during the Work.

6.12.2 Contractor shall take appropriate steps to minimize disturbance to local residents.

6.13 Security Requirements

6.13.1 The contractor shall provide a Security Plan. At a minimum, the Plan shall address the following:

6.13.1.1 Security measures to protect equipment, materials, and personnel.

6.13.1.2 Work zone access and controls.

6.13.1.3 Coordination with local law enforcement agencies.

6.13.1.4 Warning signs of the presence of hazardous substances and the potential of hazardous work activities, as appropriate.

6.13.1.5 Lighting requirements for working during non-daylight hours, as applicable.

7 ELECTRICAL REQUIREMENTS

7.1 General

7.1.1 It is the Contractor's sole responsibility to ensure that all aspects of electrical design for the Project comply with all local code requirements, Applicable Standards, and the following System Operating Conditions:

7.1.1.1 Voltage range: Per Jamaica Public Service Interconnection Technical Guidelines (See Appendix D).

7.1.1.2 Frequency range: Jamaica Public Service Interconnection Technical Guidelines (See Appendix D).

7.1.1.3 Harmonics: Jamaica Public Service Interconnection Technical Guidelines (See Appendix D).

7.1.2 All electrical design including conductors and equipment design attributes shall comply with the National Electrical Code 2011 including, but not limited to, ampacity rating, jacket type, conditions of use, conductor color conventions, labeling, terminations,

conduit fill, protection and isolation, disconnecting means, signage and labeling requirements.

7.1.3 Equipment specifications shall comply with Section 10.

7.1.4 Contractor is responsible for electrical system studies for design of all electrical components and systems, including but not limited to, protective device coordination, grounding assessment, DC and AC voltage drop calculations, cable sizing, and thermal ampacity calculations for conditions of use.

7.1.5 Contractor is responsible to engineer and install all aspects necessary for a fully functional Project, including but not limited to, the following items:

7.1.5.1 PV array & DC collection system circuit: Modules, DC cabling, combiner boxes, protection and isolation devices, complete grounding design, surge/lightning protection, and inverters.

7.1.5.2 AC LV collection system: LV cabling between inverters and LV switchgear, protection and isolation devices, surge/lightning protection, as applicable.

7.1.5.3 Operations and Maintenance (O&M): DAS, backup power, auxiliary power, protection and isolation devices, as applicable.

7.2 PV Array Design

7.2.1 Project Layout

7.2.1.1 Contractor shall provide a design layout of the PV Module configuration in compliance with the technical specifications.

7.2.1.2 Contractor shall provide adequate space between roof edges and array modules in order to allow for walking space and/or compliance with applicable codes and standards.

7.2.1.3 PV Modules shall be oriented in portrait or landscape orientation based on manufacturer's recommendations and installation instructions.

7.2.1.4 Contractor shall provide adequate space between rows of PV Modules to reduce row-to-row shading impacts.

7.2.1.5 Contractor shall provide adequate space around rooftop objects to prevent shading of solar PV Modules.

7.2.2 Modules

7.2.2.1 If PV Modules with multiple nameplate ratings are used, the PV Modules shall be grouped such that all PV Modules connected to an inverter have the same nameplate rating. Contractor shall organize PV Module serial numbers by inverter.

7.2.2.2 All PV Modules shall utilize the same brand and model connector even if different types of PV Modules are used.

7.2.2.3 All PV Modules supplied for the Project shall have a positive power tolerance of 0-3% of its nominal factory power output as measured at Standard Test Conditions (STC). Contractor shall provide Module manufacturer flash test

data results to Contracting Agency 30 days prior to Module installation in the field, or as soon as it is available thereafter.

7.3 DC Collection System

7.3.1 General DC requirements

7.3.1.1 The maximum voltage of the DC collection system shall be 1,000 Vdc, unless otherwise approved by Contracting Agency. All components utilized in the DC collection system shall be rated for the maximum voltage of the DC system, 1,000 Vdc.

7.3.1.2 The DC collection system circuits shall be designed to limit total electrical losses at STC conditions to no more than 1.5%.

7.3.2 DC Cabling

7.3.2.1 Wiring shall be secured to the PV Module mounting structures utilizing UV-resistant devices and secured in a manner such that no exposed wiring is in direct contact with unfinished metal edges.

- UV resistant zip ties shall be allowed for the purpose of securing cabling to racking only for 1 or 2 individual conductors. Zip ties shall not be used to secure cabling to racking, for groups of more than 2 individual conductors.
- Stainless steel zip ties with protective backing or stainless-steel wire clips may be used, but shall be installed in a manner not to deform or compress
the cable insulation.

7.3.2.2 All conductors shall be protected by conduit from the array up to the electrical enclosure termination point and in any locations where they would be exposed to the elements. Conduit shall comply with IEC or UL requirements.

7.3.2.3 No splices shall be permitted.

7.3.2.4 For the purposes of establishing cable ampacity for direct buried DC circuits CEC or IEC procedures shall be followed. Calculations shall be subject to review by the Contracting Agency during the execution phase.

7.3.2.5 Warning tape shall be provided in all trenches.

7.3.3 Combiner Boxes

7.3.3.1 Conduit and cable entry into combiner boxes shall be through the bottom or sides of the enclosure only.

7.3.3.2 Contractor shall provide universal key locks for all combiner boxes.

7.3.4 Disconnect Switches

7.3.4.1 Disconnect switches shall have visible blades and be rated for full load disconnect.

7.4 AC Collection System

7.4.1 General AC requirements

7.4.1.1 The AC collection system shall encompass all equipment from the inverter output to the POI.

7.4.1.2 For LV Switchgear that collects multiple circuits, it shall include a circuit breaker and protective relaying for the combined output.

7.4.1.3 The low voltage AC collection system shall be designed to limit electrical losses at STC conditions to no more than 0.5%.

7.4.1.4 AC collection system cabling shall be installed in conduit or duct-bank when crossing under all vehicle roadways.

7.4.1.5 Warning tape shall be provided in all trenches.

7.4.1.6 For the purposes of establishing cable ampacity for direct buried AC circuits CEC or IEC procedures shall be followed. Calculations shall be subject to review by the Contracting Agency during the execution phase.

7.4.1.7 No splices shall be permitted, except with Contracting Agency approval.

7.4.1.8 Minimum electrical clearances from energized parts shall be in accordance with CEC or IEC requirements.

7.4.1.9 A disconnecting means shall be provided for each circuit at the AC collection system. The intent of this provision is to ensure that a fault occurring within the AC collection system can be isolated, to the extent possible, such that the remainder of the system can continue to operate while the faulted section is repaired.

7.4.1.10 A 480V circuit breaker shall be provided by Contractor at the point of interconnection at the Owner LV switchgear. Contractor shall be responsible for terminating the output circuit at the Owner LV switchgear.

7.4.1.11 All switchgear shall be rated for the environment and conditions of use and shall meet all Applicable Standards.

7.4.1.12 The AC collection system shall be equipped with all appropriate isolation mechanisms, including but not limited to: overcurrent protection, breakers, and surge arrestors.

7.5 Project Wiring

7.5.1 To calculate total array wiring and transformation losses, each run (modules to combiners boxes, combiner box to DC disconnects, etc.) will be individually calculated. Conductor type, current at maximum power, voltage at maximum power, estimated length of line (one-way) and associated voltage drop will be shown in a table.

7.6 Inverter Station

7.6.1 Inverter station, consisting of inverters and switchgear shall be an appropriately sized and ventilated room or a suitable exterior location.

7.6.2 Inverters shall be housed in an appropriate manner that protects internal hardware and circuitry based on the Design Conditions indicated in Section 5.

7.6.3 Inverter station shall include any required HVAC to ensure the inverter performance is not de-rated due to temperatures above or below the temperature at which the inverter is rated for full nameplate operation. If HVAC is required to maintain the temperature inside a shelter housing the inverters, the HVAC system shall be designed to maintain a temperature within the range required for the inverter's full-power operation.

7.6.4 If HVAC is required to meet the requirement of Section 7.6.3, the inverter supplier shall approve the thermal design.

7.6.8 Contractor shall select inverter output to match the building's or facility's electricity supply (JPS) and any other internal power supply system.

7.7 Conduit

7.7.1 Conduit shall comply with the requirements of the CEC and/or relevant IEC standards for the conditions of use.

7.7.2 Where required, PVC conduit shall be a minimum schedule 40 PVC for individual conduits direct-buried in the ground and schedule 80 where exposed to physical damage.

7.7.3 Conduit that is used outdoors shall be rated for continuous outdoor exposed use.

7.8 Protection and Isolation Devices

7.8.1 Overcurrent protection devices shall be appropriately rated for the voltage and current as specified by the CEC and/or relevant IEC standards.

7.8.2 Overcurrent protection devices shall be rated for reverse flow.

7.9 Lightning Protection

7.9.1 Contractor shall evaluate the need for lightning protection using Good Industry Practices which shall include the requirements of the CEC and/or relevant IEC standards.

7.9.2 Lightning arrestors shall be provided at each inverter on the AC and DC sides.

7.9.3 Lightning arrestors shall be provided on above ground electrical power line poles, if provided by the Contractor.

7.10 Electrical Grounding

7.10.1 Contractor shall provide an overall electrical grounding schematic of the Project. The grounding schematic shall indicate the primary connections to earth and the manner in which all components are grounded.

7.10.2 Grounding design shall comply with all requirements of the CEC and/or relevant IEC standards. All metal objects, likely to be energized, including but is not limited to module frames, all racking structure members, metal conduit, metal enclosures, fencing, etc. shall be grounded.

7.10.3 The Project shall include remote ground fault detection within each inverter block.

7.10.4 All grounding and bonding conductors shall be stranded copper.

7.10.5 Hardware utilized in grounding design shall avoid risk of galvanic corrosion from contact of dissimilar metals.

7.10.6 All ground lugs and ground terminations shall be CSA or UL Listed for use in the environment installed. Grounding connections terminated below grade shall be CSA or UL Listed specifically for direct burial applications.

7.10.7 Equipment grounding conductors shall be routed with the associated phase or DC conductors.

7.10.8 A grounding system shall be installed at each inverter station and at each pad-mount electrical enclosure. Such grounding system shall consist of a grounding electrode and buried copper ground ring at least 36 inches below grade. A minimum of two (2) copper or copper clad ground rods shall be installed equidistant along the ground ring. A grounding ring test well shall be provided for access to the ground ring at each ground ring.

7.11 Signage, Equipment Marking and Labeling

7.11.1 Signage shall be provided on all electrical equipment in accordance with requirements of the CEC and/or IEC TS 62548.

7.11.2 Signage shall be weather-proof, corrosion-proof, UV-stabilized and fade-resistant and shall be capable to last the duration of the minimum Design Life.

7.11.3 Signs shall be attached using non-corrosive materials suitable to meet the Design Life.

7.11.4 All combiners, re-combiners, inverters, transformers, disconnect switches and circuit breakers shall have an engraved permanent identification label visible and readable from distance of 1.5 m that provides the unique identification number as indicated on the electrical drawings and in the LOTO procedure.

7.11.5 All conductors, including DC conductors utilized in the PV Module string circuits and for conductors between combiners and inverters, shall bear permanent cable labels at each end that uniquely identify the cables and are traceable to the electrical drawings.

7.11.6 Permanent labels shall be suitable for wet locations and rated for UV resistance if exposed.

7.11.7 Each row of PV Module mounting structures shall be permanently marked at each end indicating both the combiner box and inverter identification numbers to which that row is connected.

7.11.8 A DC and AC single line diagram shall be posted inside the system (at or near the main AC switchgear) that clearly identifies the DC and AC disconnect locations. If not apparent from the single line diagrams, a Project map shall also be provided indicating the approximate locations of the disconnect switches. DC and AC disconnect switch designations shall match the electrical drawings, device labels and LOTO procedures.

8 CIVIL, STRUCTURAL AND ELECTRICAL REQUIREMENTS

8.1 General

8.1.1 It is the Contractor's sole responsibility to ensure the Project structural and architectural facilities comply with all local code requirements and all industry codes and standards.

8.1.2 Contractor is responsible to determine all Site data necessary for the design and construction of the Project. This includes, but is not limited to, determination of local design wind speed, seismic design coefficients, and any areas restricted from construction.

8.1.3 A Roof Structure Assessment Report is included in **Appendix E** which provides information on the following:

- The existing roof structures at the relevant site on which PV arrays are to be installed.
- The capability of the roof structures to bear the load of PV arrays under normal circumstances and during high wind speed events
- Any roof reinforcement required prior to the installation of PV arrays.

8.1.4 Contractor shall comply with the recommendations of all Site studies performed including but not limited to the Roof Structure Assessment Report.

8.1.5 The Contractor shall provide all structural calculations and drawings to the Contracting Agency with the 50% Design Documents.

8.1.6 The drawings and calculations to support the design of all Structural elements shall include, but are not limited to:

8.1.6.1 Array rack mounting structures, and array roof attachments where applicable.

8.1.6.2 Inverter station and any other ancillary structure foundations (if ground-mounted) or means of attachment (if mounted on building).

8.1.6.3 Product specifications, installation manual, operations and maintenance manuals and other commissioned or forthcoming reports.

8.1.7 The Contracting Agency will review documents and submit comments. The Contractor shall address in writing any and all comments received from Contracting Agency.

8.1.5 Contractor shall conduct detailed electrical assessments after contract signing to finalize designs.

8.2 Structural Steel and Fasteners

8.2.1 Steel members of any structural system shall be Grade 50 and meet the requirements of the applicable local or ASTM standard based on the application.

8.2.2 Stainless steel hardware shall conform to local standards or ASTM F593.

8.2.3 Mechanical fasteners used in any structural or support system shall meet the requirements of local standards or ASTM A325 or A490 for bolts nominally ½" diameter and larger, or ASTM A449 for bolts smaller than ½" diameter.

8.2.4 Anchor bolts used to secure any structural member to the building shall be galvanized and specifically identified by the structural engineer and include installation requirements, minimum projection, material grade, appropriate local standard or ASTM standard and torque specification. Anchor bolts shall conform to local standards or ASTM A449, ASTM F1554, Grade 36, or A307. Anchor bolt sleeves shall conform to local standards or ASTM A501.

8.2.5 All structural welding shall conform to the requirements of local standards or AWS D1.1.

8.3 Aluminum

8.3.1 Design of structural and miscellaneous aluminum shall be in accordance with local standards or the latest edition of the Aluminum Association – "Aluminum Design Manual" and "Aluminum Standards and Data."

8.3.2 Materials for structural and miscellaneous aluminum, including structural shapes and plate, shall conform to local standards or ASTM B209 and ASTM B308.

8.4 Corrosion Prevention

8.4.1 All Project equipment shall be protected from corrosion due to known or expected atmospheric conditions local to the Site in accordance with the Design Life and Good Industry Practices. Consideration shall be given to humidity, salinity, acidity, condensation, air particulates and other conditions likely to cause or accelerate corrosion of materials.

8.4.2 A service life analysis shall be completed that takes into account atmospheric conditions at the Site in order to estimate corrosion rates. The service life shall meet or exceed the required minimum Design Life.

8.4.3 Structural design calculations shall be based on the reduction in steel thickness over the Design Life of the Project.

8.4.5 Contact of dissimilar metals and finishes shall be avoided or intentionally managed to prevent premature galvanic corrosion.

8.4.5.1 Aluminum shall not be in direct contact with concrete or copper.

8.4.6 Fasteners and hardware shall be stainless steel (300 series, if available with required mechanical strength) or hot-dipped galvanized steel.

8.4.7 Galvanizing of steel products shall conform to the requirements of ASTM A123, ASTM A153 or ASTM F2329, as appropriate.

8.4.8 For any components where the galvanization is disturbed due to factory processing or during installation, those surfaces shall be repaired in accordance with ASTM A780 and A780M-09.

8.5 Structural Design Requirements

8.5.1 Structural Design Loads

8.5.1.1 The design loads and other information pertinent to the structural design – including, but not limited to, wind design data, and earthquake design data – shall be indicated on the construction documents.

8.5.1.2 Load combinations shall be determined in accordance with local standards or ASCE 7, Design Loads for Buildings and Other Structures, and from appropriate material codes. Load combinations found in the Jamaican Building Code that differ from those found in ASCE 7 and material codes shall govern over those found in ASCE 7 and material codes.

8.5.1.3 Dead loads shall include all gravity loads due to self-weight of permanent structural and nonstructural components, including permanent hung loads.

8.5.1.4 Wind loads shall be in accordance with the Caribbean Uniform Building Code (CUBiC) and the current edition of ASCE 7 as modified by any locally adopted code. The Module rack shall be designed in such a way that deflections due to wind will not damage the Modules.

8.5.1.5 Seismic loads shall be in accordance with the Caribbean Uniform Building Code (CUBiC) and the current edition of ASCE 7 as modified by any locally adopted code.

8.5.1.6 Structural design shall account for thermal loads including thermal expansion, contraction and cycling. Structures shall be designed for forces and/or displacements resulting from changes in ambient temperature. Induced thermal loads (i.e., thermal loads induced by equipment operating temperatures) shall be considered in design of applicable structural elements.

8.5.2 Structural Design Calculations

8.5.2.1 The structural analysis shall conform to the Jamaican Building Code, the CUBiC and ASCE 7.

8.5.2.2 Contractor shall provide a complete and comprehensive report demonstrating structural adequacy of the PV module mounting structure that considers all structural components, hardware, and connections, in a complete load path to the building attachments. The structural analysis shall conform to the locally adopted code, using design loads determined according to ASCE 7.

8.5.2.3 Structural systems and members thereof shall be designed to have adequate stiffness to limit deflections and lateral drift.

8.5.2.4 Structural analysis shall consider the static and dynamic effects of wind. Structural design shall not result in dynamic excitation of the structural system during wind events. The Project must resist wind loading without damage due to resonance or fatigue.

8.5.2.5 Wind and other environmental loads must be calculated for individual PV modules as well as all structural components in the System.

8.5.2.6 Worst-case wind loads on individual modules shall be calculated using an effective wind area of one PV module and must not exceed the wind rating of the PV module.

8.5.2.7 Structural design calculations shall consider loss of material due to corrosion.

8.6 Solar Array Building Attachment

8.6.1 Types of roof attachments required shall be as recommended by Contractor's structural engineer based on the roof structure conditions found in the Roof Structure Assessment Report (see attachment).

8.6.2 Contractor shall use a mounting structure, in accordance with the conditions of the roofs in the Roof Structure Assessment Report, to mount the PV arrays.

8.6.3 The PV Module mounting structure manufacturer shall approve Contractor's design and installation to ensure that the mounting structure warranty remains in effect.

8.7 Concrete Equipment Foundations

8.7.1 Design of structural concrete shall be in accordance with local standards or the latest version of the American Concrete Institute (ACI) 318. All concrete formwork shall conform to local standards or ACI 347.

8.7.2 Construction of the concrete shall be in accordance with local standards or ACI 301.

8.7.3 Steel reinforcement shall be grade 60 minimum and conform to local standards or ASTM A615. Welded steel mesh shall conform to local standards or ASTM A185. Plain wire shall conform to local standards or ASTM A82. Placement shall be in accordance with local standards or Chapters 7 and 12 of ACI 318 and the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.

8.7.4 Concrete shall conform to local standards or ASTM C150 with a 28-day compressive strength of 4,000 psi minimum.

8.7.5 Aggregates for normal weight concrete shall conform to local standards or ASTM C33.

8.7.6 Concrete mix proportions, including documentation of materials, admixture product information, and compressive strength of mix, shall be submitted and approved by the Owner‘s Agent prior to placing concrete.

8.7.7 Water used for concrete shall be clean and potable.

8.8 Trenches

8.8.1 Cables and conduits installed in trenches shall comply with requirements of the CEC and/or relevant IEC standards.

8.8.2 Direct burial of cables is not permitted. All buried cables shall be in conduit.

8.9.3 All buried cables in conduits shall include a marker tape below grade continuously over the conductors.

8.9.4 Trench backfill shall comply with local standards. An engineered fill shall be used if required based on the cable ampacity calculations.

8.9.5 A sand bed of at least 5 cm shall be used as the base layer for all trenches housing conduit and cables. The sand bed shall be clean natural sand and should not include other objectionable materials.

8.9.6 Trenches shall be backfilled in layers of no more than 15 cm each and mechanically compacted at each layer.

8.9.7 Contractor shall take appropriate measures to minimize the time that trenches are left open.

8.9.8 Trenches shall not be backfilled while there is any standing water in the trench.

8.9.9 Contractor shall inspect and, if necessary, repair sand beds in open trenches after rainfall events.

8.9.10 Conduit stub-ups and sweeps shall be used as needed for conductors entering and exiting a trench.

8.9.11 Open conduit ends shall be equipped with bushings and approved sealant to reduce intrusion of water, rodents and insects.

8.9.12 Trenches shall be designed and constructed, to the extent possible, in straight lines.

9 DAS, COMMUNICATIONS AND METERING REQUIREMENTS

9.1 General

9.1.1 Data acquisition system (DAS) requirements include design, engineering, labor, material, products, guarantees, training and services for, and incidental to, the complete installation of a new and fully functional DAS for the Project.

9.1.2 Contractor shall be responsible for all DAS equipment, software and programming for all DAS-related communications equipment to communicate with all Contractor-provided equipment.

9.1.3 The DAS shall include all instrumentation, hardware and capability to support the required data acquisition of the Project.

9.1.4 Contractor shall provide the following DAS submittals within 30 days following the Limited Notice to Proceed Date:

9.1.4.1 Hardware and software manufacturer and specification sheets

9.1.4.2 Single line drawing, including devices, interconnection of devices, wiring types and protocols used.

9.1.4.3 Data list with device name and individual addresses of data points.

9.1.4.4 Installation, Operation and Maintenance manual.

9.1.4.5 Software manuals.

9.2 DAS Equipment

9.2.1 Enclosures located outdoors shall be IP54 rated or better.

9.2.2 Fuse holders shall be finger safe.

9.2.3 Equipment shall be rated for continuous operation at 50°C ambient temperature unless located in a controlled environment building.

9.3 Acceptable Manufacturers

9.3.1 Equipment manufacturer and software suppliers shall be approved by the Contracting Agency.

9.4 Delivery & Identification

9.4.1 Contractor shall provide an identification nameplate for each device and enclosure with the designated tag number. The enclosure nameplate shall be engraved UV resistant material and attached to the front cover with rivets or stainless-steel screws. Device nameplates shall be adhesive labels with ¼" lettering that are moisture resistant.

9.4.2 Shipment and handling of materials shall be in a manner that avoids damage.

9.4.3 Equipment shall be inspected for damage prior to installation. Damaged equipment shall be repaired or replaced.

9.5 Communication System

9.5.1 The communication system shall consist of the following:

9.5.1.1 Communication cables including twisted pair copper or fiber optic cables as needed.

9.5.1.2 Ethernet switches.

9.5.1.3 Fiber to Ethernet converters (if necessary).

9.5.2 At nodes in the network, managed switches shall be used.

9.5.2.1 Switches shall be approved by Contracting Agency .

9.5.2.2 Switches shall have a minimum of one spare port.

9.5.3 The communication protocol between the primary DAS location and inverter station(s) shall be Ethernet TCP/IP with MODBUS TCP.

9.5.4 Contractor shall be responsible for interfacing the Contractor-provided communication network to the Owner.

9.6 Component Level Communication

9.6.1 Communication between nodes and equipment at each node (such as inverters and data loggers) shall be copper Ethernet.

9.6.1.1 Transmission speed shall be 100BASE-T.

9.6.1.2 Ports shall be standard Ethernet RJ-45

9.6.1.3 Cabling shall be a minimum of CAT 5E with a jacket rating of CMR or CMP.

9.6.2 Communication between components such as data loggers, sub meters, inverters, weather station and Sensor I/O components shall comply with the component manufacture's installation instructions.

9.6.2.1 The cable shield shall be grounded on one end of the cable only.

9.6.2.2 Termination resistors shall be used at each end of any daisy chain connections in accordance with device manufacturer instructions.

9.6.3 Inverters that have a proprietary communication protocol shall be ordered with conversion devices to connect them to an Ethernet network.

9.7 Sensor Level Communication

9.7.1 Cabling shall be specified by the component manufacturer or provided with the sensors.

9.7.2 Sensor cabling that is not completely contained within enclosures and conduit shall be outdoor and UV rated.

9.7.3 Sensor cabling shall not exceed the manufacturer's recommended maximum length.

9.8 Metering

9.8.1 AC Metering shall be provided by Contractor and located at the LV Switchgear. The Contractor DAS shall communicate with meters.

9.8.2 The measurement of the energy produced by the photovoltaic systems shall be integrated into the DAS. For the purpose of using and processing the measurement data, the monitoring system shall present the information taking into account the following considerations:

9.8.2.1 Frequency (resolution): Generation data in kWh of the PV solar system should be available at least in hourly resolution, ideally every 15 minutes.

9.8.2.2 Availability: ideally data for the period (h-1)-h is available at time h.

9.8.2.3 Data Format: Instantaneous power meter readings should be available in a cumulative format with date and time recording, not in increments.

- Example accumulated readings: (09h00;120kWh;ID)- (09h15;150kWh;ID)- (09h30;170kWh;ID)-
- Example of incremental readings: (09h00;0kWh;ID)- (09h15;30kWh;ID)- (09h30;20kWh;ID)-

9.8.2.4 Data collection: The measured data must be available in a cloud service in order to be accessed through an API.

9.8.2.5 Meter Type: In order to facilitate the integrity and security of the electricity generation measurement data, it is recommended to use an intelligent meter with asymmetric encryption (optional).

9.9 Monitored Data Points

9.9.1 Meteorological Stations

9.9.1.1 Irradiance (horizontal and plane of array).

9.9.1.2 Ambient air temperature.

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9.9.1.3 Back of module temperature.

9.9.1.5 Wind speed.

9.9.1.6 Wind direction.

9.9.2 Inverter Performance

9.9.2.1 Real time AC and DC electrical characteristics, including power, energy, voltage, current, frequency, power factor, inverter status, fault codes and diagnostics, and all data available from inverter system.

9.9.2.2 DC circuit earth fault monitoring at the inverter input

9.9.3 Combiner Boxes and Strings

9.9.3.1 DC string current, if available.

9.9.3.2 DC string voltage, if available.

9.9.3.3 Combiner enclosure temperature, if available.

9.9.3.4 Combiner status and fault codes, if available.

9.10 Meteorological Stations

9.10.1 The total number of meteorological stations shall be determined by the Contractor for the Site to be strategically located throughout the facility.

9.10.2 The meteorological station shall be compatible with the DAS.

9.10.3 The meteorological station shall include, at minimum, the following:

9.10.3.1 Data logger shall be equipped/capable of the following:

- Sample each sensor at no greater than 5 second intervals.
- Calculate minimum, maximum, average and standard deviation values for the measurements at 1, 5 and 15 minute intervals.
- Local data buffering.
- Battery backup power.

9.10.3.2 One (1) global horizontal (GHI) secondary standard pyranometer.

9.10.3.3 One (1) plane of array (POA) secondary standard pyranometer.

9.10.3.4 One (1) back of module temperature sensor.

9.10.3.5 One (1) Ambient air temperature sensor housed in a solar shield, with an accuracy of ±1ºC.

9.10.3.6 One (1) Wind speed sensor, with an accuracy of 1 m/s, installed at or above 3-meter height.

9.10.3.7 One (1) Wind direction sensor with an accuracy of ±5º.

9.11 DAS Control Equipment

9.11.1 System data shall be recorded with the following detail:

9.11.1.1 The main AC Meter data shall be recorded at 1-minute intervals.

9.11.1.2 DC meter data shall be recorded at 1-minute intervals.

9.11.1.3 Inverter data and fault codes shall be recorded at 1-minute intervals.

9.11.1.4 Environmental data shall be recorded at 1-minute intervals.

9.11.2 The DAS shall have provisions for full remote access.

9.11.3 A firewall shall be installed between the Project network and the incoming connection.

9.11.4 Single pair instrument cable shall be rated 300/500V minimum according to the relevant local standards, with XLP or PVC insulation.

9.11.5 Multiple pair instrument cable shall be rated 300/500V minimum according to relevant local standards, with XLP or PVC insulation.

9.11.6 Single or multiple twisted shielded pair cable shall include a drain wire and an overall PVC jacket.

9.11.7 Data communications cable shall be stranded copper 0.34 mm2 minimum, twisted pair, shielded.

9.11.8 External Interfaces

9.11.8.1 An external interface shall be available to authorized users to view the DAS screens through an Internet browser.

9.11.9 Calculated Points

9.11.9.1 The DAS shall allow user to create calculated data points that calculate new values based on the values of any monitored or calculated data points.

9.11.9.2 Calculated data points shall be available for alarming and trending.

10 EQUIPMENT SPECIFICATIONS

10.1 General

10.1.1 All equipment located outdoors shall have enclosures complying with CSA, IEC and/or NEMA requirements for wet and high salinity locations.

10.1.2 All equipment shall be new.

10.1.3 Enclosures shall have a minimum rating of IP54 for electromechanical equipment and IP54 for electronic equipment and be corrosion resistant.

10.1.4 All equipment shall be specified with the Project-specific design conditions indicated in Section 5.

10.1.5 All equipment shall be specified to ensure all required System Operating Conditions are met as per Section 7.1.1.

10.2 PV Modules

10.2.1 PV Modules shall have glass covered with antireflective coating.

10.2.2 PV Modules shall be listed as Tier 1 in the Q2 2020 Bloomberg New Energy Finance solar PV module list.

10.2.3 PV Modules shall be of either monocrystalline or polycrystalline type.

10.2.4 PV Modules shall have a minimum efficiency of 19.5%.

10.2.5 PV Modules shall have wind pressure uplift rating of at least 4,000 Pa.

10.2.6 PV Modules shall be certified to CSA or UL standards or IEC 61730 and the applicable part of IEC 61215.

10.2.7 PV Modules shall be installed according to the manufacturer's installation instructions and in compliance with the CEC or relevant IEC standards.

10.2.8 PV Module manufacturer shall be certified to ISO9001:2000 and ISO140001:2004.

10.2.9 PV Modules shall have a minimum 10-year manufacturer's warranty covering defects and workmanship that provides for all shipping costs and parts required to replace or repair warranty-eligible failures.

10.2.10 PV Modules shall have a minimum 25-year manufacturer's warranty covering product performance that incorporates a linear degradation guarantee with peak power rating at year 25 not less than 80% of the original peak power rating identified on the product nameplate.

10.2.11 PV Modules shall be marked with a unique serial number.

10.2.12 PV Modules shall be supplied with original factory flash test data including, at minimum, serial number, model number, manufacture date, Isc, Voc, Imp, Vmp and Pmp.

10.2.13 PV Modules shall be supplied with a copy of CSA, UL and/or IEC certification reports indicating compliance for the model numbers used and indicating the certification is in force as of the dates of module manufacture.

10.2.14 PV modules shall be supplied with documentation confirming that the PV modules have been manufactured in accordance with the manufacturer's specifications.

10.2.15 PV modules shall be installed so as to achieve the wind load requirements indicated in Section 5.3.3.

10.3 PV Module Mounting Structures

10.3.1 PV Module mounting structures should comply to the extent possible with the grounding and bonding requirements of the CEC and/or UL 2703.

10.3.2 PV Module mounting structures shall be designed in accordance with applicable building code requirements.

10.3.3 PV Module mounting structures shall be aluminum or hot dipped galvanized steel in accordance with ASTM A123.

10.3.4 For any components where the galvanization is disturbed due to factory processing after the galvanization, those surfaces shall be repaired in accordance with ASTM A780 and A780M-09.

10.3.5 PV Module mounting structures shall be supplied with installation manuals, list of required fasteners and a torque chart for all fasteners providing structural support.

10.3.6 Where nuts and bolts are used as means of fastening PV Modules to mounting structure the nuts shall be vibration resistant.

10.3.7 The PV Module mounting structures shall have a minimum 5-year manufacturer's warranty covering defects and workmanship that provides for all parts and labor required to replace or repair warranty-eligible failures.

10.4 Combiner Boxes

10.4.1 Components within combiner boxes shall be certified to IEC 61439-2 or IEC 50178, or alternatively to UL 1741.

10.4.2 Combiner boxes shall be rated IP54.

10.4.3 Combiner boxes shall be equipped with approved means of drainage for accumulated moisture which does not compromise enclosure warranty or allow entrance of contaminants or rodents into the enclosure.

10.4.4 Combiner boxes shall have provisions for a universal pad lock.

10.4.5 Combiner boxes shall incorporate overcurrent protection for each String.

10.4.6 Combiner boxes shall utilize "touch-safe" fuse holders.

10.4.7 Combiner boxes shall be equipped with a load-break disconnect switch.

10.4.8 Combiner boxes shall include a touch-safe barrier over exposed terminations or buses.

10.4.9 Combiner boxes shall be compatible with the inverters.

10.4.10 Combiner boxes terminals for DC output cables shall include provisions to accommodate compression ring lugs.

10.4.11 Terminal ratings for the DC output cables shall be 90ºC and rated for copper and aluminum.

10.4.12 Combiner boxes shall be labeled to comply with the requirements of the CEC or relevant IEC standards and at minimum include:

10.4.12.1 Maximum voltage.

10.4.12.2 Operating voltage.

10.4.12.3 Operating current.

10.4.12.4 Short-circuit current rating.

10.4.12.5 Short-circuit current rating per pole.

10.4.12.6 Warning language that fuses are energized if the PV Modules are exposed to light even if the inverter is not running.

10.5 Re-Combiner Boxes

10.5.1 These requirements apply to the inverter if the re-combiner function is supplied as part of the inverter.

10.5.2 Re-combiner boxes shall comply with IEC 61439-2 or IEC 50178, or alternatively UL 1741.

10.5.3 Re-combiner boxes shall be rated IP54 or better.

10.5.4 Re-combiner boxes shall be equipped with approved means of drainage for accumulated moisture which does not compromise enclosure warranty or allow entrance of contaminants or rodents into the enclosure.

10.5.5 Re-combiner boxes shall have provisions for a pad lock.

10.5.6 Re-combiner boxes shall incorporate overcurrent protection for each combiner circuit.

10.5.7 Re-combiner boxes shall be of the "smart" type with current monitoring of each combiner box circuit.

10.5.8 Re-combiner boxes shall be compatible with the inverters.

10.5.9 Re-combiner box monitoring shall be compatible with the DAS.

10.5.10 Re-combiner boxes terminals for DC cables shall include provisions to accommodate compression ring lugs.

10.5.11 Terminal ratings for the DC cables shall be 90ºC and rated for copper and aluminum.

10.5.12 Re-combiner boxes shall be labeled to comply with the requirements of the CEC or relevant IEC standards and at minimum include:

10.5.12.1 Maximum voltage

10.5.12.2 Operating voltage

10.5.12.3 Operating current

10.5.12.4 Short-circuit current rating

10.5.12.5 Short-circuit current rating per pole

10.5.12.6 Warning language that circuit breakers are energized if the PV Modules are exposed to light even if the inverter is not running.

10.5.13 Re-combiner boxes shall also be labeled to comply with the DC disconnect marking requirements of the CEC or relevant IEC standards.

10.6 Inverters

10.6.1 Inverters shall be as specified in Section 5, unless otherwise approved by Contracting Agency.

10.6.2 Inverters shall be utility-interactive (not standalone).

10.6.3 Inverters shall meet the requirements of UL 1741.

10.6.4 Inverters and power and control electronics shall be housed in enclosures rated IP54 or above.

10.6.5 Inverters shall have a 3-phase AC output.

10.6.6 Inverters shall not include an integrated transformer and shall be designed for operation with an external medium voltage transformer.

10.6.7 Inverters shall have a California Energy Commission-weighted efficiency of at least 97.5%.

10.6.8 Inverters shall have a maximum DC voltage rating of 1,000 Vdc.

10.6.9 String configuration and inverter selection shall be reviewed and approved by Contracting Agency.

10.6.10 Inverters shall have an operating temperature range of 15ºC to 40ºC at full rated power.

10.6.11 Inverter shall be capable of operating with a power factor of 0.90 leading to 0.90 lagging.

10.6.12 Inverters shall be capable of completely automatic unattended operation, including wake up, sleep mode, synchronization and disconnect.

10.6.13 Inverters shall have Rapid Shutdown capability.

10.6.14 Inverters shall be capable of being configured with Hawaii frequency ride through settings.

10.6.15 Inverters shall be capable of communicating with the DAS and allow for monitoring and control of set points.

10.6.16 Inverter manufacturer shall be certified to ISO9001:2000 and ISO140001:2004.

10.6.17 The inverter shall not generate audible noise exceeding 68 db(A) at 10 meters during operation at full-rated power. Inverter noise shall comply with applicable local ordinances.

10.6.18 Inverters shall be supplied with installation, operations and maintenance manuals in hard copy and PDF formats.

10.6.19 Inverters shall be supplied with a complete points list that provides sufficient information for a DAS engineer to communicate with the inverter and interpret all data points, including read/write status and data type.

10.6.20 All inverters shall be of identical manufacturer and model number unless approved by Contracting Agency.

10.6.21 Inverters shall also comply with Section 10.5 if the re-combiner function is integrated into the inverter.

10.6.22 Inverters shall be completely factory-built, assembled, wired and tested as a complete unit. If it is necessary to disassemble the units for ease of transportation, all materials and instructions shall be provided for field re-assembly.

10.6.23 Inverters shall have a minimum 10-year manufacturer's warranty covering defects and workmanship that provides for all shipping costs, parts and labor required to replace or repair warranty-eligible failures.

10.6.24 Inverter warranty shall allow for unlimited usage at full rated power during the term of the warranty.

10.7 Low Voltage Cable and Terminations (1,000 V or less)

10.7.1 All conductors shall be stranded, single conductor cables.

10.7.2 All conductors shall be rated for 90ºC in wet locations.

10.7.3 Conductors utilized in PV circuits shall be specified in accordance with the applicable requirements of the CEC.

10.7.4 Ungrounded conductors utilized in PV circuits shall have red (if positive) or black (if negative) insulation or jacketing.

10.7.5 Grounded conductors utilized in PV circuits shall have green insulation or jacketing.

10.7.6 All conductors between PV Modules and combiner boxes shall be copper.

10.7.7 Conductors between combiner boxes and inverters shall be copper.

10.7.8 Terminations for all conductors shall be rated for 90ºC and for the conductor material (copper).

10.8 Low Voltage Switchgear for AC Collection System and Junction Enclosures

10.8.1 Switchgear shall be in a IP54 enclosure.

10.8.2 Switchgear shall conform to appropriate standards for purpose and other applicable parts for metal-enclosed switchgear.

10.8.3 Switchgear shall be metal enclosed made of steel with protective coating against salt corrosion.

10.8.4 Switchgear shall be provided with LOTO capabilities including pad-lockable with ON – OFF and OFF - Earth switch positions.

10.8.5 Switchgear shall provide visible indication of switch position.

10.9 Surge Arrestors

10.9.1 Surge arrestors shall be station class.

10.9.2 Surge arrestors shall conform to IEC 60099, Parts 4, 5, and 6.

10.10 Meters

10.10.1 Meters shall be ANSI C12.2 revenue grade meters.

10.10.2 Meters shall support the Modbus and DNP 3.0 communication protocols.

10.11 Air Conditioning (AC) Equipment

10.11.1 Energy Efficiency Ratio (EER): Energy Efficiency Ratio shall be not less than 12.0 for unit smaller than 6 kW (20,000 Btu/hr), and not less than 13.0 for unit 6 kW (20,000 Btu/hr) and larger. Technical specifications regarding energy efficiency of proposed air conditioning equipment shall be provided with the bidder's quote. Installed units shall be of inverter type with multi speed fan motors.

10.11.2 Applicable AHRI Standards: Units shall be listed in the corresponding ARI Directory of Certified products using the following testing procedures (or equivalent procedure):

1. Air Source Unitary heat pumps with capacity less than 19 KW (65,000 Btu/hr), Comply with AHRI 210/240 (Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment).

2. Air Source heat pump with capacity above 19KW (above 65,000 Btu/hr, Comply with AHRI 340/360 (Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment).

10.11.3 Refrigerant Circuit: A minimum of two circuits is required. Each refrigerant circuit shall have independent fixed orifice or thermostatic expansion devices, service pressure ports, and refrigerant line filter driers factory installed as standard. An area shall be provided for replacement suction line driers.

10.11.4 Install air conditioning equipment according to manufacturers printed instructions.

10.11.5 Refrigerant piping shall be sized, selected, and designed either by the equipment manufacturer or in strict accordance with the manufacturer's published instructions. : A separate circuit for each compressor, with externally equalized thermal-expansion valve with // adjustable superheat //, filter-dryer, sight glass, high-pressure relief valve, and charging valves.

1. Install piping as short as possible, with a minimum number of joints, elbow and fittings.

2. Install piping with adequate clearance between pipe and adjacent walls and hangers to allow for service and inspection. Space piping, including insulation, to provide 25 mm (1 inch) minimum clearance between adjacent piping or other surface. Use pipe sleeves through walls, floors, and ceilings, sized to permit installation of pipes with full thickness insulation.

3. Locate and orient valves to permit proper operation and access for maintenance of packing, seat and disc. Generally, locate valve stems in overhead piping in horizontal position. Provide a union adjacent to one end of all threaded end valves. Control valves usually require reducers to connect to pipe sizes shown on the drawing.

4. Protect refrigerant system during construction against entrance of foreign matter, dirt and moisture; have open ends of piping and connections to compressors, condensers, evaporators and other equipment tightly capped until assembly.

10.11.7 Insulation: Minimum 25-mm (1-inch) thick, // neoprene coated// aluminum foil faced// glass fiber duct liner on cabinet interior and control panel.

10.11.8 Perform startup checks according to manufacturer's written instructions.

10.11.9 The Commissioning Agent will observe startup and contractor testing of selected equipment. Coordinate the startup and contractor testing schedules with the Commissioning Agent. Provide a minimum of 7 days prior notice.

10.11.10 Test controls and demonstrate its compliance with project requirements. Replace damaged or malfunctioning controls and equipment and retest the equipment to the satisfaction of the Commissioning Agent.

10.11.11 Furnish test reports.

11 DEFECTS LIABILITY, PERFORMANCE VERIFICATION, OPERATION & MAINTENANCE, AND OPERATING SPARE PARTS AND TOOLS

This section outlines post-commissioning requirements as it pertains to repair of equipment and workmanship defects, verification of the Energy Efficient Air Conditioning Systems and PV system energy production performance, and system operation and maintenance. It also outlines information to be provided by the Contractor regarding operating spare parts that would be required for the long-term operation and maintenance of the PV system.

11.1 Defects Liability

11.1.1 There shall be a defects liability period of 24 months commencing from the Completion Date. During the defects liability period the Contractor shall do the following at no additional cost to Owner:

11.1.1.1 Contractor shall perform the services set forth in Section 11.1.2, in a prudent, reasonable, and efficient manner and in accordance with the operating data, design drawings, specifications, vendors' manuals, warranty requirements, maintenance and safety procedures.

11.1.1.2 Contractor shall provide all labor as is required to perform the services as set forth in Section 11.1.2. All individuals retained by Contractor to perform the services shall be employees or subcontractors of Contractor.

11.1.1.3 Contractor shall maintain the PV system operating logs, records, and reports that document the operation and maintenance of the PV system. Contractor shall maintain current revisions of drawings, specifications, lists, clarifications and other materials related to operation and maintenance of the Energy Efficient Air Conditioning Systems and the PV system provided.

11.1.1.4 Contractor shall provide the Owner with reasonably necessary assistance in connection with Owner’s compliance with any reporting requirements to funders, the Utilities Regulation or any other parties to which Owner is obligated to provide information relating to the PV system.

11.1.1.5 If an emergency endangering the safety or protection of persons, the Energy Efficient Air Conditioning Systems and the PV system, or property located near the PV system occurs, Contractor shall promptly notify Owner and take all necessary action to attempt to prevent or mitigate any such threatened damage, injury or loss.

11.1.2 Contractor Defects Liability Minimum Requirements

11.1.2.1 Preventative Maintenance for the PV system

Item Number	Service Description	Frequency
1.	Remotely monitor all PV system data and communications including production and any system errors.	Continuously
2.	Address any system errors within 5 business days of alert.	Upon Occurrence
3.	Visual inspection of racking, frames, and overall mounting structure for damage or fatigue. Also, confirm that base/roof attachment is stable to manufacturer's recommended standard.	Once every six months
4.	Visual inspection of PV Modules, inverters, DAS equipment, meteorological station, combiner boxes, LV switchgear, AC meter and electrical systems including ensuring that PV wiring is secure, ground connections are intact, weatherproof boxes are sealed and dry, and conduit is undamaged.	Once every six months
5.	Visual inspection of general site conditions. Note any shading concerns.	Once every six months
6.	Record AC meter readings.	Monthly
7.	Perform inverter preventive maintenance per manufacturer's operating guidelines including cleaning cooling fins, fans and screens.	Once every six months
8.	Document inspection findings, AC meter readings and inverter preventive maintenance activities and provide report to Owner.	Once every six months

11.1.2.2 Issue Resolution

11.1.2.2.1 Contractor shall within three (3) business days of being made aware, respond to a request from Owner or an issue detected by PV system sensors, meters, or monitoring, or a defect identified during preventive maintenance inspections.

11.1.2.2.2 Contractor shall repair any workmanship defects in a manner reflective of Good Industry Practices.

11.1.2.2.2 Contractor shall perform troubleshooting on any malfunctioning equipment and shall repair or replace defective equipment at no additional cost to Owner.

11.1.2.3 Preventative Maintenance for the Energy Efficient Air Conditioning Systems

Item Number	Service Description	Frequency
1.	Check and confirm refrigerant level to keep its efficiency at factory standards.	Once every six months.
2.	Inspect and confirm that fins and coils are kept to their efficiency at factory standards.	Once every six months.
3.	Inspect and ensure filters are at factory standards.	Once every six months.

11.1.2.3.1 Issue Resolution

11.1.2.3.2 Contractor shall within three (3) business days of being made aware, respond to a request from Owner an issue detected or a defect identified during preventive maintenance inspections.

11.1.2.3.3 Contractor shall repair any workmanship defects in a manner reflective of Good Industry Practices.

11.1.2.3.4 Contractor shall perform troubleshooting on any malfunctioning equipment and shall repair or replace defective equipment at no additional cost to Owner.

11.2 Performance Verification

11.2.1 During the defects liability period the Contractor shall be responsible for the monitoring and documenting of the Energy Efficient Air Conditioning Systems and the PV system energy production via the Contractor-supplied AC metering in order to verify that projected energy production is being achieved.

11.2.2 Contractor shall provide to Owner on a quarterly basis a report comparing the monthly energy production recorded with that projected by the Contractor's PV system model that was provided by Contractor to Contracting Agency during the Project's detailed engineering phase.

11.2.3 Contractor must provide evidence (weather records, grid outage data, etc.) justifying any shortfalls in energy production, i.e., where actual energy production is lower than projected energy production for the quarter in question.

11.2.4 Should it be determined that the energy production shortfall is due to a technical issue with the PV system the Contractor must immediately correct the issue at no additional cost to Owner and provide evidence to Owner that said corrections have been made.

11.4 Operating Spare Parts Priced List

11.4.1 Contractor shall submit to Contracting Agency, not later than 30 days Start Date a priced list of recommended Operating Spare Parts for the operation of the Project.

11.4.1.1 The recommended Operating Spare Parts list shall incorporate manufacturer- recommended components for all Project equipment.

11.4.1.2 The recommended Operating Spare Parts list shall incorporate consumable items required to perform the manufacturer-recommended preventative maintenance for Project equipment.

11.4.1.3 If Operating Spare Parts require special storage requirements, special tools, vehicles or other non-standard equipment in order to replace such Operating Spare Parts, these conditions shall be noted on the Operating Spare Parts list.

11.4.1.4 If Operating Spare Parts require calibration while in storage, the calibration requirements shall be noted on the Operating Spare Parts list.

11.4.1.5 Operating Spare Parts quantities shall be based on the quantity required for the first 2 years of operation and based on the quantity of associated equipment installed at the Project.

Summary of Interconnection Technical Guidelines for
Renewable Energy Systems 0-100 kW under Standard Offer Contract

(Extract from JPS Guide to Interconnection of Distributed Generation)

This document is a summary of the JPS Guide to Interconnection of Distributed Generation. Reference must be made to the JPS Guide to Interconnection of Distributed Generation for full details of the JPS Interconnection Technical Guidelines.

1.0 Overview

The requirements and specifications outlined in this paper are applicable to all classes of distributed generation, unless otherwise specified. The minimum protection and safety devices and other requirements imposed in this document are intended to provide protection for the JPS system and its other customers. They are not imposed to provide protection for the customer's generation equipment; this is the sole responsibility of the customer. These requirements are in addition to requirements outlined in the JPS Guide to Interconnection of Distributed Generation.

Beyond the requirements presented here in this document, the Distributed Generator (DG) facility must meet all applicable national, local and other JPS safety and construction codes.

2.0 General Characteristics of JPS Distribution Grid

All distribution feeders in the JPS' distribution system are supplied radially from a single source (substation). In some cases, some feeders may have alternate points of supply, but will be operated with more than one source of supply only momentarily during switching operations. JPS' distribution feeders operate at the following voltages:

Primary Voltage

Phase-phase/phase-neutral: 24/13.8 kV star, 13.8 kV delta, 12/6.9 kV star.

Secondary Voltage

Single phase 110/220 V, three phase 220 V delta or 415/240 V star

System Voltage

JPS' distribution system operates within the range of ±5% of the nominal voltage. The System shall be designed to ensure that under normal and planned contingency conditions, voltages at all connection points and buses are to be within:

a. ± 5% of nominal voltage under normal conditions

b. ±6% of nominal Voltage under planned contingency conditions

System Frequency

The nominal frequency of JPS' system is 50 Hz. During normal operation (steady state), the frequency may deviate between 49.8 and 50.2. Under contingencies, the frequency deviations may be larger.

Fault and Line Clearing

JPS uses automatic reclosing to maintain the reliability of the Distribution Network. The DG operator needs to be aware of line reclosing when designing or purchasing protection schemes to ensure that the DG ceases to energize before the automatic reclosing of JPS substation reclosers (recloser closes 2 seconds after opening). Grid-tied inverters manufactured to the UL 1741 Standard are recommended for this purpose. Systems manufactured to other international standards may be accepted subject to approval of JPS/BSJ.

3.0 General Technical Requirements for DG Facilities

3.1 Electrical Diagrams

The applicant shall submit an electrical single-line schematic diagram, a three- wire protection diagram and a tripping logic diagram that shall be reviewed and approved by a Professional Electrical Engineer registered in Jamaica with the completed standard application form. ANSI symbols shall be used in the electrical diagrams to show the following:

(a) Generator and/or inverter.

(b) Point where the DG facility is electrically connected to the customer's electrical system (interconnection point). JPS will determine the point of electrical connection to the grid, or the point of common coupling (PCC). Please reference Appendices 2-7. All interconnections must be compliant with the NEC and all local electrical standards. (c) Lockable interconnections disconnect switch.

(d) Method of grounding, including generator and transformer ground connections.

(e) Protection functions and systems.

(f) Generator disconnect switch/breaker Drawings are not limited to the above items.

3.2 Anti-Islanding Systems

Upon loss of voltage in one or more phases of the JPS distribution system, the DG facility shall automatically disconnect from JPS' distribution network prior to the enclosure of JPS protection equipment. Local islanding detection is required.

3.3 Voltage

Voltage variations at the PCC are limited to ± 5% of the nominal voltage under normal operating conditions and ± 6% under contingency conditions. However, extreme operating conditions may occur causing voltages to go in the region of ± 10%. The DG must be capable of operating satisfactorily within the extreme voltage limits. The DG facility shall not actively regulate the system voltage.

Table 1

System Voltages	Voltage Variation Limits for Secondary Distribution Voltages			
	Extreme	Operating		Conditions
		Normal and Contingency Operating Conditions		
Single Phase	(-10%)	(-6%)	(+6%)	(+10%)
110V	99.0V	103.4V	116.6V	121.0V
220V	198.0V	206.8V	233.2V	242.0V
Three Phase-Delta				
220V	198.0V	206.8V	233.2V	242.0V
Three Phase-Wye				
240V	216.0V	225.6V	254.4V	264.0V
415V	373.5V	390.1V	439.9V	456.5V

3.4 Frequency

The generators at the DG facility must operate at a nominal frequency of 50Hz (±0.2 Hz). For frequencies outside of this band, as given in table 3, the DG is required to trip off JPS Distribution System.

3.5 Power Factor

The DG facility shall be capable of operating in the power factor range of 0.90 lagging to 0.95 leading.

3.6 Power Quality

The DG facility must not negatively impact the power quality of JPS' distribution system. IEEE Std. 519 should be consulted to determine industry standards for power quality along with the requirements in this document. Power quality parameters to be taken into consideration are:

- Harmonics
- Flicker
- Voltage sags and swells
- Voltage and current imbalance

3.7 Grounding Issues

It is the responsibility of the interconnection customer to provide the required grounding for the generation system. The DG must be grounded as per the manufacturers' recommendations and shall be in accordance with the requirements of the Government Electrical Inspectorate (GEI). The recommended standard for this is the IEEE Std. 142-1991.

3.8 Disconnect Switch (Point of Disconnection)

The DG facility shall install and maintain a visible open, manually- and gang- operated load-break disconnect switch ("disconnect switch") capable of being locked in a visibly "open" position by a standard JPS padlock that will completely isolate the customer's generating facility from the JPS system, in order to establish the safety isolation required for work on the distribution system.

3.9 Protection Requirements

Abnormal conditions in the DG facility and on JPS' distribution system require that the DG facility respond and protect itself and JPS distribution system. This response contributes to the safety of JPS' and the DG personnel and the general public and avoids damage to DG facility, JPS and JPS customers' equipment.

At a minimum, the DG facility shall incorporate the following protective functions:

- Anti-Islanding
- Under/over-voltage trip
- Over-current trip
- Under/over-frequency trip

3.10 Voltage and Current Imbalance

The DG facility must not further deteriorate existing unbalance conditions at the PCC and the distribution system. The phase-phase voltage unbalance of three phase distributed generators must not be greater than 1% as measured with balanced three phase loading and with no load. The current imbalance for a three-phase system as measured at the customer's service entrance section shall not be greater than 10% at any time.

3.11 Synchronization

The DG that can generate an AC Voltage Waveform independent of JPS's grid shall be connected in parallel only in combination with its synchronizing capabilities. The DG shall synchronize to JPS's Grid while meeting the stipulated interconnection technical requirements.

4.0 Interconnection of Grid-Tied Inverters

General

Inverter connections represent a continuous parallel connection with the Distribution System. The design of such inverters shall either contain all necessary protection to prevent unintentional islanding, or the DG owner shall install conventional protection to affect the same protection. Grid-tied inverters are required to produce a sine wave output and be synchronous with JPS Distribution Grid. See Appendix 1 for the net billing application process and Appendices 2-7 for the various grid-tied inverter arrangements.

Inverter Certification

Prior to installation, the inverter shall be Type-Certified for interconnection to the electrical power system. The certification will confirm its anti- islanding protection and power quality related levels at the Point of Common Coupling. Also, utility compatibility should be approved through UL listing of the model (UL 1741). Systems manufactured to other international standards may be accepted subject to approval of JPS/BSJ.

Three Phase Operation

For three-phase operation, the inverter control must also be able to detect and separate for the loss of one phase.

Disconnect Switch

The inverter shall not be used as a safety isolation device. A visible disconnect is required for safely isolating the Distributed Generation when connecting with an inverter. (Please see Appendices 2-7).

Transformer vs Transformerless

Grid-tied inverters of both the transformerless and transformer type are accepted for interconnection to the JPS Distribution Network, providing that they are compliant

with the stipulated interconnection requirements. For inverters whose output does not match

the voltage of the Distribution Network at the Interconnection Point, transformers may be required to bring the output voltage within a suitable operating range for synchronism with the JPS Distribution Grid.
For split single phase services, due to the configuration of the Grid, a split-phase transformer is strongly recommended for interconnection of European type 240V (L - N) 50 Hz single phase inverters. However, some manufacturers state that, based on their inverter design, the transformer may be excluded. In this event, JPP requires that:

(i) The inverter is equipped with ground fault protection; and

(ii) The manufacturer of the inverter or his agent must supply a statement approving the interconnection of same inverter with a split-phase grid configuration.
JPS will not accept responsibility for any equipment malfunction or damage arising from the Customer-Generator's choice of configuration.

Over/Under Voltage Protection

On detection of a system over or under voltage, the DG shall cease to energize the Distribution Network according to the following table 2:

Table 2

Voltage Condition (% of nominal voltage)	Maximum time to disconnect
V<50%	0.16 secs – (8 cycles)
50% < V < 88%	2 secs – (100 cycles)
110 % <V <120%	1 sec – (50 cycles)
V > 120%	0.16 secs – (8 cycles)

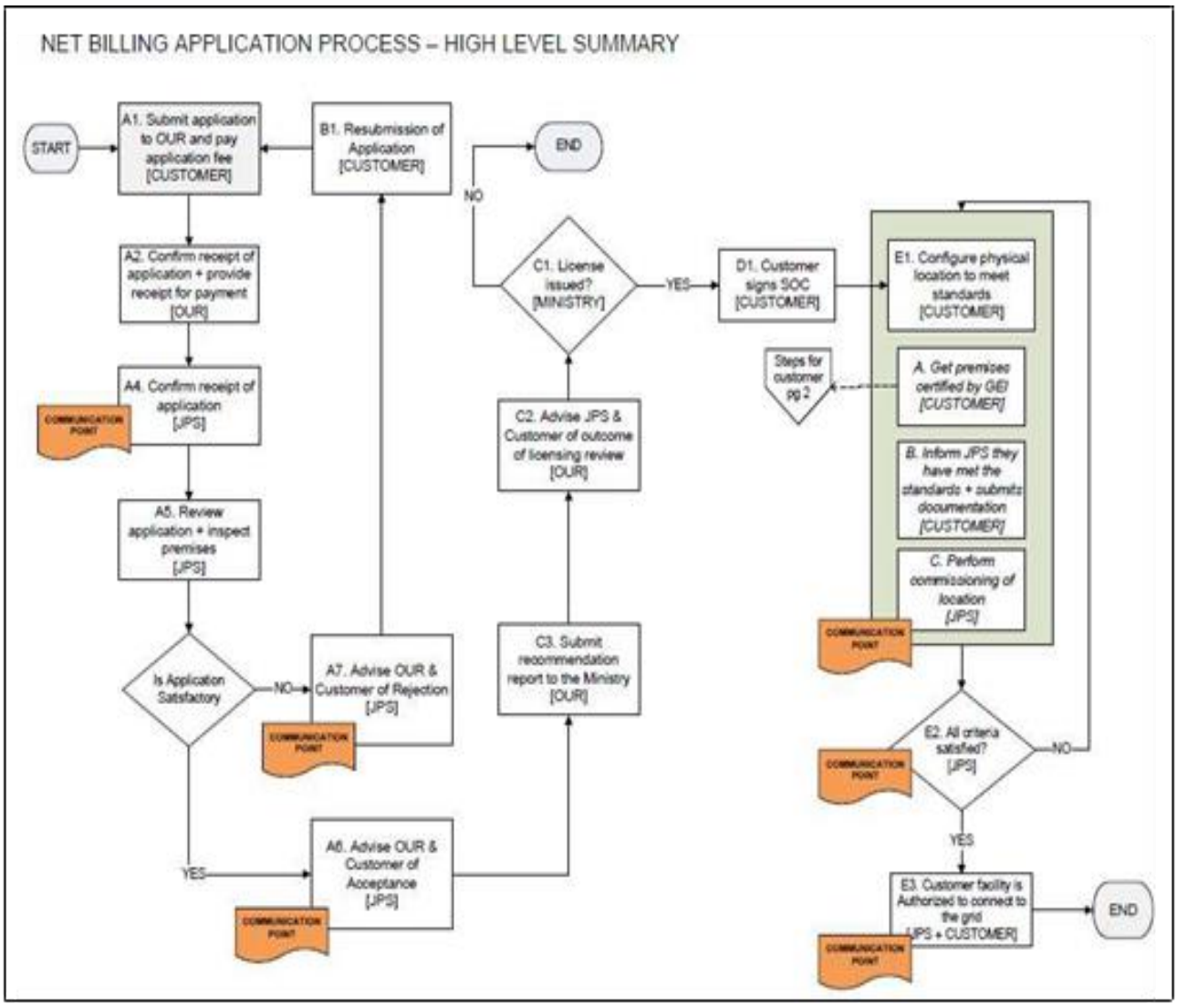
Over/Under Frequency Protection

The DG shall cease to energize during over/under frequency conditions within the maximum delay times shown in table 3 below and shall not reconnect until JPS's Grid has stabilized.

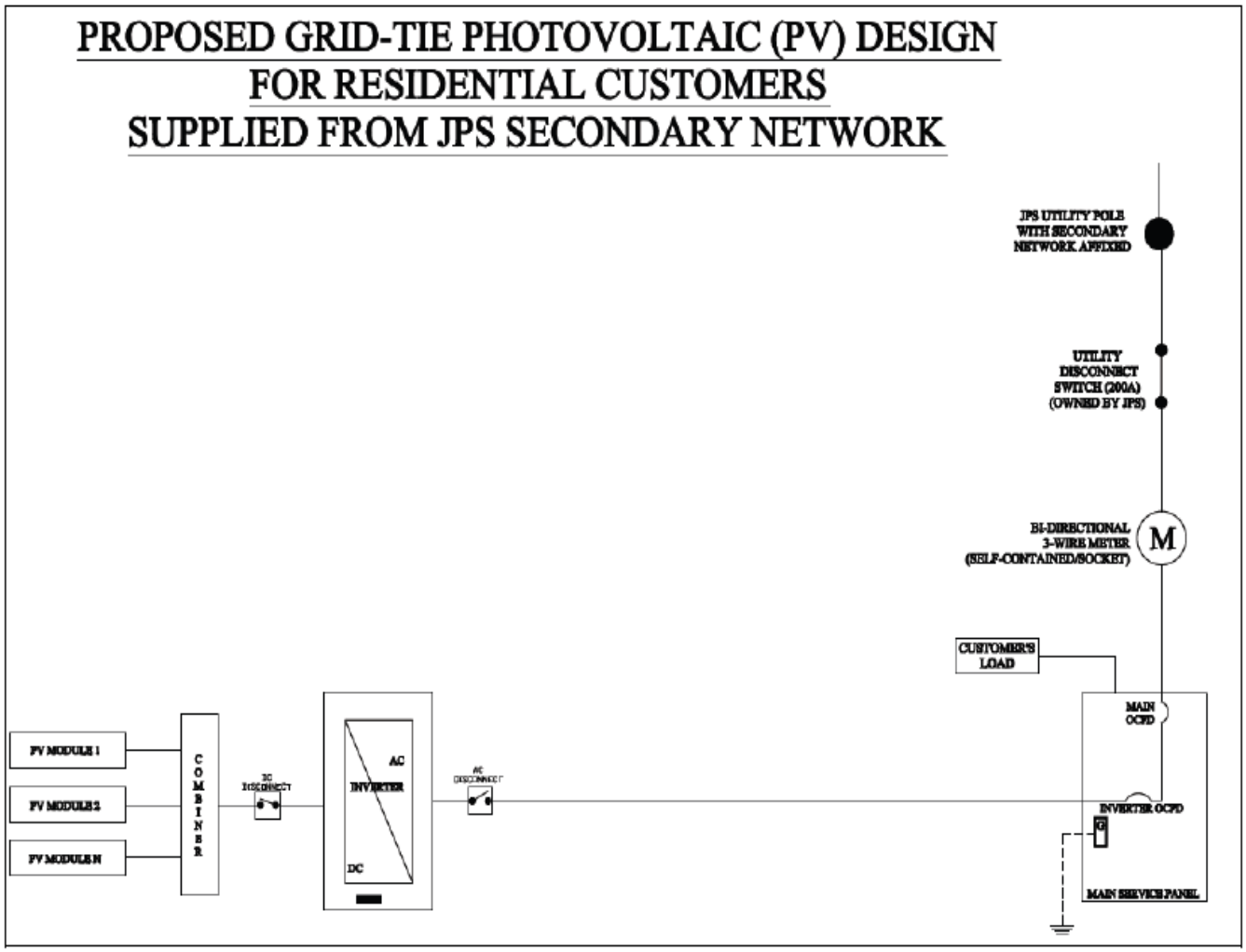
Table 3

JPS Distribution System Voltage Condition	Frequency Condition	Maximum Time to Disconnect
Rated Voltage	Frequency < 48Hz	0.16 secs – (8 cycles)
Rated Voltage	Frequency > 50.5Hz	0.16 secs – (8 cycles)

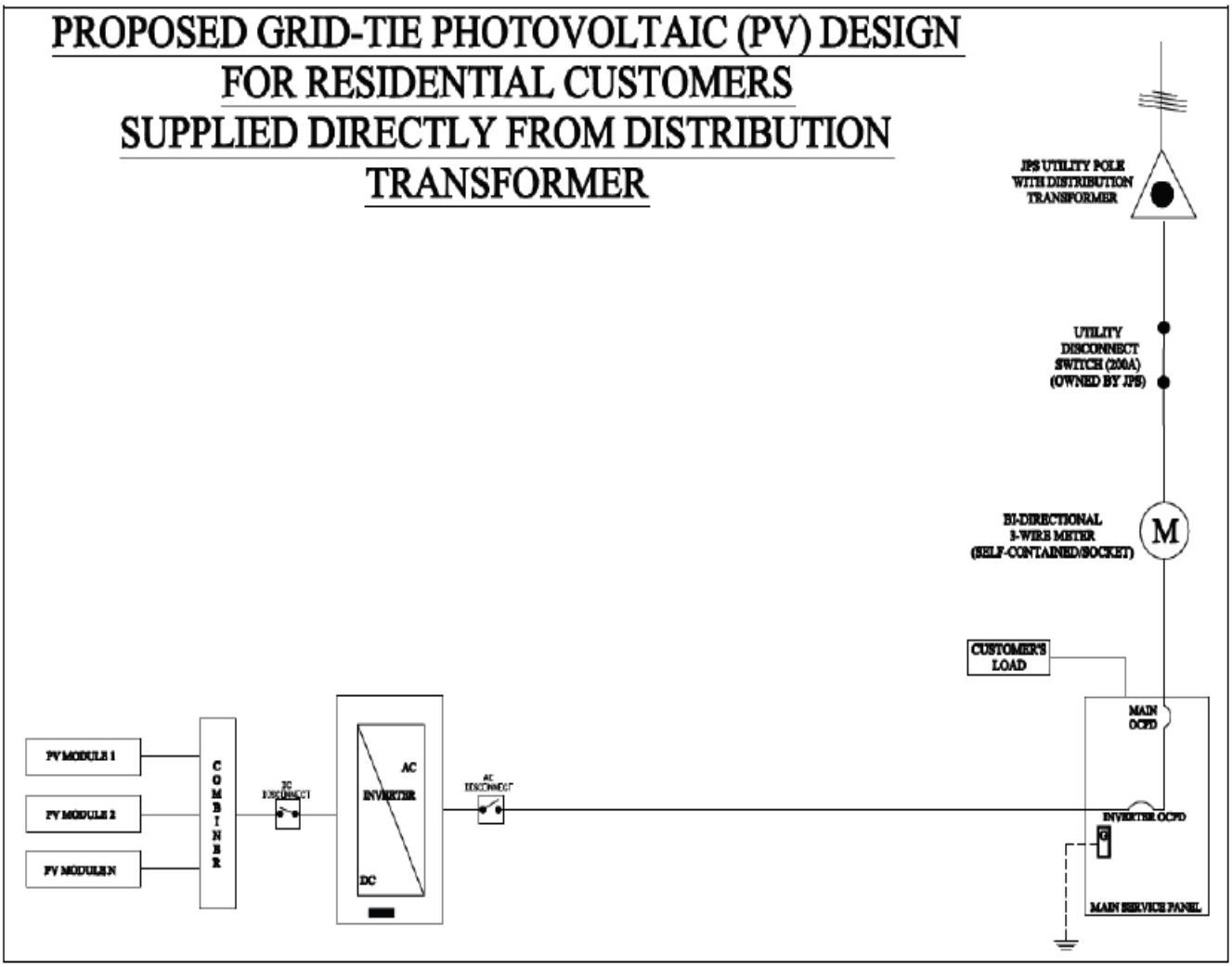
APPENDIX 1


NET BILLING APPLICATION PROCESS – HIGH LEVEL SUMMARY
START
A1. Submit application to OUR and pay application fee [CUSTOMER]
B1. Resubmission of Application [CUSTOMER]
END
NO
A2. Confirm receipt of application + provide receipt for payment [OUR]
C1. License issued? [MINISTRY]
YES
D1. Customer signs SOC [CUSTOMER]
E1. Configure physical location to meet standards [CUSTOMER]
Steps for customer pg 2
A. Get premises certified by GEI [CUSTOMER]
A4. Confirm receipt of application [JPS]
COMMUNICATION POINT
C2. Advise JPS & Customer of outcome of licensing review [OUR]
B. Inform JPS they have met the standards + submits documentation [CUSTOMER]
A5. Review application + inspect premises [JPS]
C. Perform commissioning of location [JPS]
COMMUNICATION POINT
Is Application Satisfactory
NO
A7. Advise OUR & Customer of Rejection [JPS]
COMMUNICATION POINT
C3. Submit recommendation report to the Ministry [OUR]
E2. All criteria satisfied? [JPS]
COMMUNICATION POINT
NO
YES
A6. Advise OUR & Customer of Acceptance [JPS]
COMMUNICATION POINT
YES
E3. Customer facility is Authorized to connect to the grid [JPS + CUSTOMER]
COMMUNICATION POINT
END

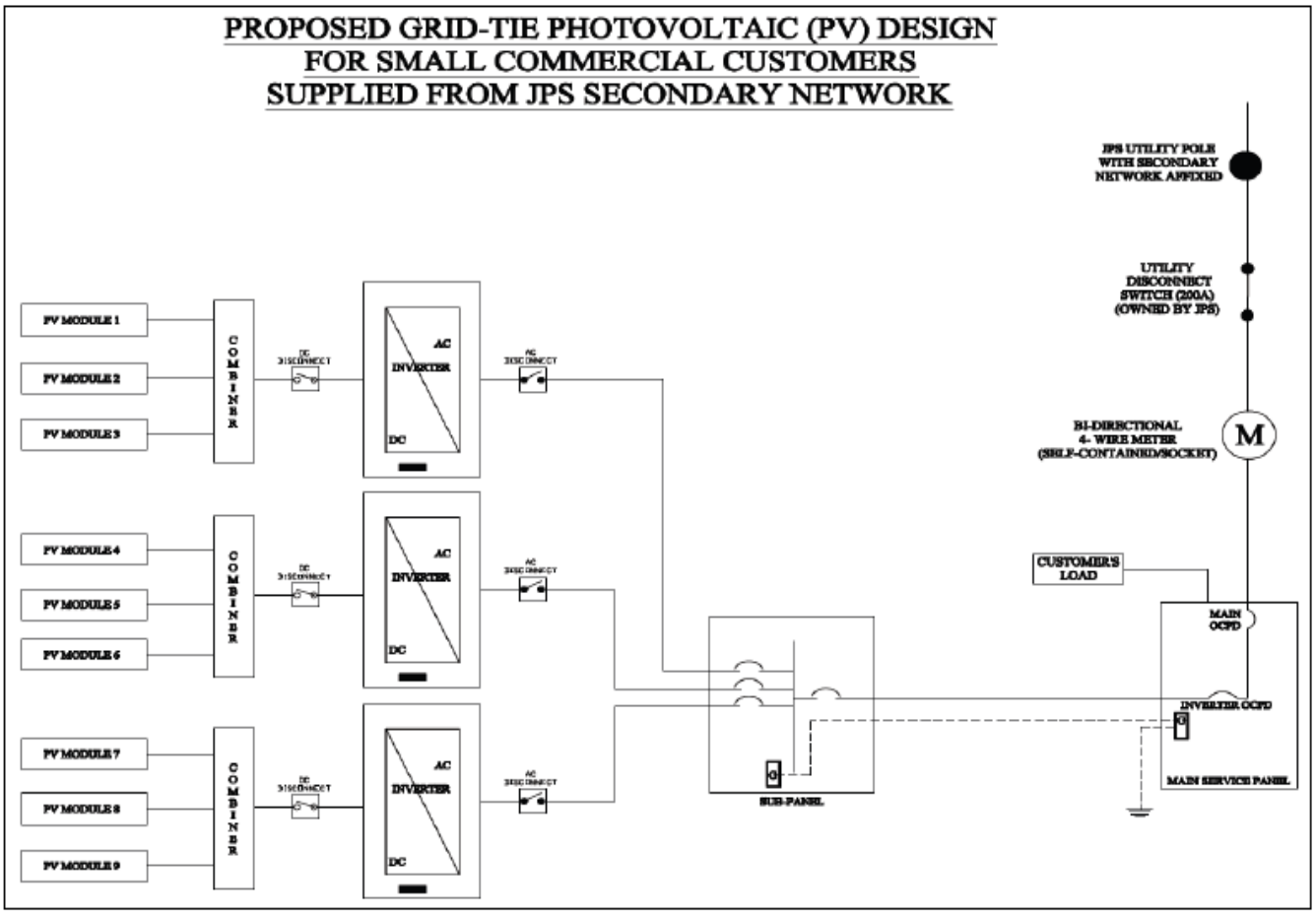
APPENDIX 2


PROPOSED GRID-TIE PHOTOVOLTAIC (PV) DESIGN
FOR RESIDENTIAL CUSTOMERS
SUPPLIED FROM JPS SECONDARY NETWORK
JPS UTILITY POLE WITH SECONDARY NETWORK AFFIXED
UTILITY DISCONNECT SWITCH (200A) (OWNED BY JPS)
BI-DIRECTIONAL 3-WIRE METER (SELF-CONTAINED/SOCKET)
M
CUSTOMER'S LOAD
MAIN OCPD
INVERTER OCPD
MAIN SERVICE PANEL
PV MODULE 1
PV MODULE 2
PV MODULE N
COMBINER
AC
INVERTER
DC

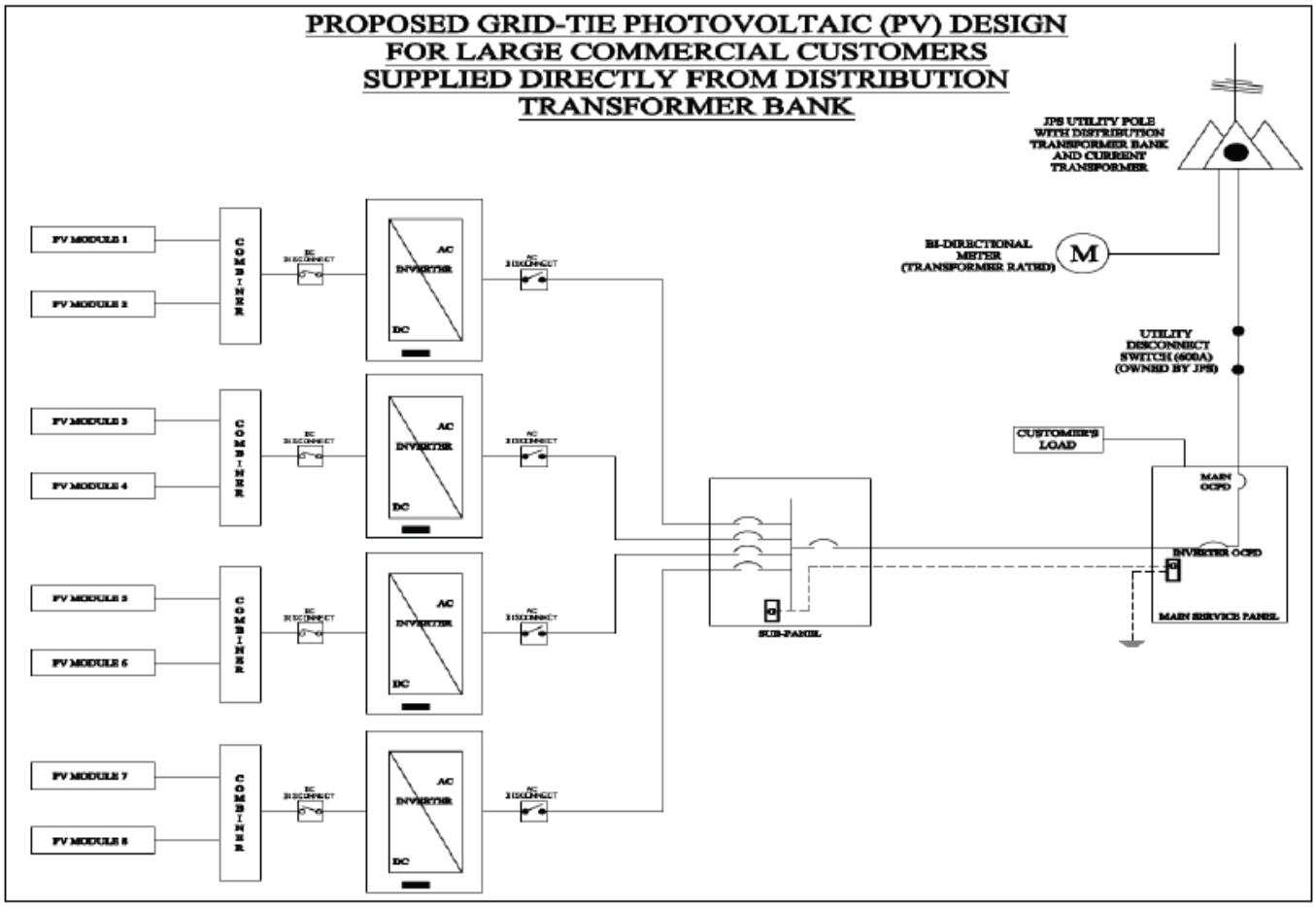
APPENDIX 3


PROPOSED GRID-TIE PHOTOVOLTAIC (PV) DESIGN
FOR RESIDENTIAL CUSTOMERS
SUPPLIED DIRECTLY FROM DISTRIBUTION
TRANSFORMER
JPS UTILITY POLE
WITH DISTRIBUTION
TRANSFORMER
UTILITY
DISCONNECT
SWITCH (200A)
(OWNED BY JPS)
BI-DIRECTIONAL
3-WIRE METER
(SELF-CONTAINED/SOCKET)
M
CUSTOMER'S
LOAD
MAIN
OCPD
PV MODULE 1
PV MODULE 2
PV MODULE N
COMBINER
DC
DISCONNECT
AC
INVERTER
DC
AC
DISCONNECT
INVERTER OCPD
MAIN SERVICE PANEL

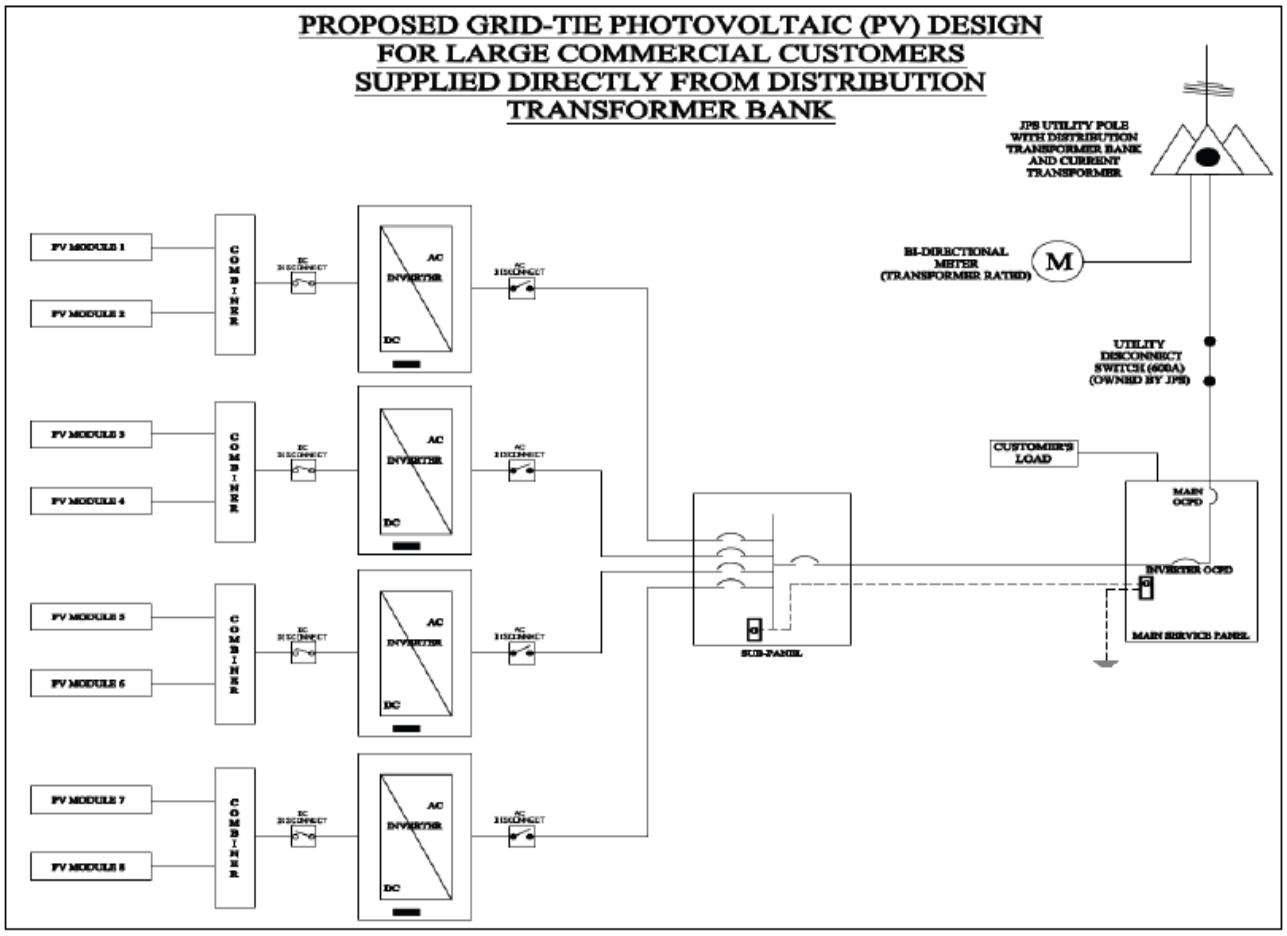
APPENDIX 4


PROPOSED GRID-TIE PHOTOVOLTAIC (PV) DESIGN
FOR SMALL COMMERCIAL CUSTOMERS
SUPPLIED FROM JPS SECONDARY NETWORK
JPS UTILITY POLE WITH SECONDARY NETWORK AFFIXED
UTILITY DISCONNECT SWITCH (200A) (OWNED BY JPS)
BI-DIRECTIONAL 4- WIRE METER (SELF-CONTAINED/SOCKET)
M
CUSTOMER'S LOAD
MAIN OCPD
INVERTER OCPD
MAIN SERVICE PANEL
SUB-PANEL
PV MODULE 1
PV MODULE 2
PV MODULE 3
PV MODULE 4
PV MODULE 5
PV MODULE 6
PV MODULE 7
PV MODULE 8
PV MODULE 9
COMBINER
COMBINER
COMBINER
DC DISCONNECT
AC DISCONNECT
AC
INVERTER
DC

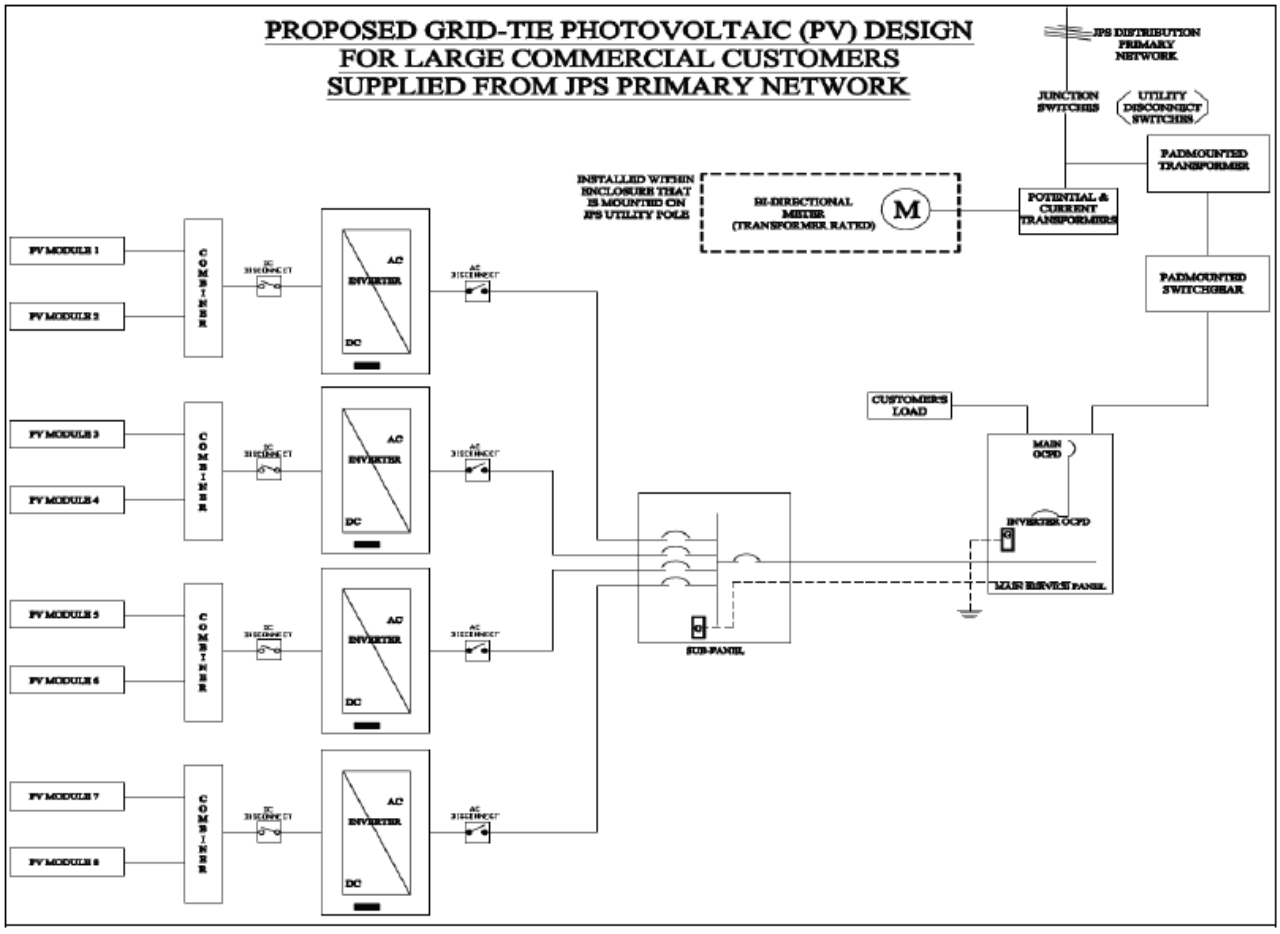
APPENDIX 5


PROPOSED GRID-TIE PHOTOVOLTAIC (PV) DESIGN
FOR LARGE COMMERCIAL CUSTOMERS
SUPPLIED DIRECTLY FROM DISTRIBUTION
TRANSFORMER BANK
JPS UTILITY POLE WITH DISTRIBUTION TRANSFORMER BANK AND CURRENT TRANSFORMER
BI-DIRECTIONAL METER (TRANSFORMER RATED)
M
UTILITY DISCONNECT SWITCH(600A) (OWNED BY JPS)
CUSTOMER'S LOAD
MAIN OCPD
INVERTER OCPD
MAIN SERVICE PANEL
SUB-PANEL
PV MODULE 1
PV MODULE 2
PV MODULE 3
PV MODULE 4
PV MODULE 5
PV MODULE 6
PV MODULE 7
PV MODULE 8
COMBINER
DC DISCONNECT
AC DISCONNECT
AC
INVERTER
DC

APPENDIX 6


PROPOSED GRID-TIE PHOTOVOLTAIC (PV) DESIGN
FOR LARGE COMMERCIAL CUSTOMERS
SUPPLIED DIRECTLY FROM DISTRIBUTION
TRANSFORMER BANK
JPS UTILITY POLE WITH DISTRIBUTION TRANSFORMER BANK AND CURRENT TRANSFORMER
BI-DIRECTIONAL METER (TRANSFORMER RATED)
M
UTILITY DISCONNECT SWITCH (600A) (OWNED BY JPS)
CUSTOMER'S LOAD
MAIN OCPD
INVERTER OCPD
MAIN SERVICE PANEL
SUB-PANEL
PV MODULE 1
PV MODULE 2
PV MODULE 3
PV MODULE 4
PV MODULE 5
PV MODULE 6
PV MODULE 7
PV MODULE 8
COMBINER
AC
INVERTER
DC

APPENDIX 7


PROPOSED GRID-TIE PHOTOVOLTAIC (PV) DESIGN
FOR LARGE COMMERCIAL CUSTOMERS
SUPPLIED FROM JPS PRIMARY NETWORK
JPS DISTRIBUTION PRIMARY NETWORK
JUNCTION SWITCHES
UTILITY DISCONNECT SWITCHES
PADMOUNTED TRANSFORMER
INSTALLED WITHIN ENCLOSURE THAT IS MOUNTED ON JPS UTILITY POLE
BI-DIRECTIONAL METER (TRANSFORMER RATED)
M
POTENTIAL & CURRENT TRANSFORMERS
PADMOUNTED SWITCHGEAR
CUSTOMER'S LOAD
MAIN OCPD
INVERTER OCPD
MAIN SERVICE PANEL
SUB-PANEL
PV MODULE 1
PV MODULE 2
PV MODULE 3
PV MODULE 4
PV MODULE 5
PV MODULE 6
PV MODULE 7
PV MODULE 8
COMBINER
DC DISCONNECT
INVERTER
AC
DC
AC DISCONNECT

Annex 1 – Mutual Confidentiality Agreement

Ministry of Science, Energy and Technology – Request for Bids: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies, Kingston, Jamaica

CONFIDENTIALITY AGREEMENT

THIS CONFIDENTIALITY AGREEMENT ("Agreement") is made this _____ day of _____ , 2021 ("Effective Date") between the following parties:

The Government of Jamaica represented by the Ministry of Science, Energy and Technology having a registered office at, PCJ Building, 36 Trafalgar Rd., Kingston, Jamaica.

and

[COMPANY NAME] a [STATE/JURISDICTION], [COMPANY TYPE] having its principal place of business at [ADDRESS],

each of the above may be considered a "Party" or the "Parties".

RECITALS

WHEREAS, the Parties intend to enter into discussions to explore the possibilities and potential for a business relationship between themselves.

WHEREAS, in the course of such discussions certain, trade secrets, confidential and proprietary information may be disclosed by each of the Parties to the other Parties; and

WHEREAS, each Party is willing to make such disclosure only pursuant to the terms of this Agreement.

NOW THEREFORE, because of the above Recitals which are incorporated in this Agreement and as an inducement to and in consideration of the disclosure of such confidential, trade secrets and proprietary information by one Party to another Party, the Parties agree as follows:

1. For purposes of this Agreement:

a. "Disclosing Party" shall mean the Party hereto that is disclosing Confidential Information to the other Party or Parties; and

b. "Receiving Party" shall mean the Party hereto that is receiving Confidential Information from the Disclosing Party.

2. For purposes of this Agreement, “Confidential Information” shall mean any information that is owned or controlled by the Disclosing Party and not generally available to the public, including but not limited to performance, sales, financial, contractual and marketing information, and ideas, technical data and concepts. It also includes information of third parties in the possession of the Disclosing Party and being disclosed hereunder that the Disclosing Party is obligated to maintain in confidence. Confidential Information subject to this Agreement may be in intangible form, such as unrecorded knowledge, ideas or concepts or information communicated orally or by visual observation, or may be embodied in tangible form, such as a Document. Confidential Information disclosed orally shall be followed within ten days by delivery to the Receiving Party by the Disclosing Party of a brief written summary of the Confidential Information so disclosed. The term "document" includes written memoranda, drawings, training materials, specifications, notebook entries, photographs, graphic representations, firmware, computer information or software, information communicated by other electronic or magnetic media, or models. Confidential Information shall not include information that:

a. is already known to Receiving Party and was properly obtained by Receiving Party prior to the effective date of this Agreement;

b. is already in the public domain or becomes available to the public other than through a negligent act or omission or willful misconduct of the Receiving Party;

c. is acquired in good faith from a third party and at the time of acquisition the Receiving Party had no knowledge or reason to believe that such information was wrongfully obtained or disclosed by the third party; or

d. is independently developed by Receiving Party from information not defined as "Confidential Information" in this Agreement.

3. In consideration of the disclosure of the Confidential Information by Disclosing Party to Receiving Party, except as otherwise provided in this Agreement, Receiving Party agrees that the Confidential Information shall be kept strictly confidential and shall not be sold, traded, published or otherwise disclosed to anyone in any manner whatsoever, including by means of photocopy or other reproduction or electronic transmission, without the Disclosing Party's prior written consent.

4. Receiving Party agrees that it will disclose, use or permit the use of the Confidential Information of Disclosing Party only for the purpose of the discussions between the Parties including evaluation of the information and any business relationships proposed. Unless consented to in writing by the Disclosing Party, the Receiving Party agrees that it will not use the Confidential Information to compete with the Disclosing Party in any manner, or for any financial benefit or gain adverse to the Disclosing Party.

5. Notwithstanding anything in this Agreement to the contrary, Receiving Party may disclose Confidential Information without Disclosing Party's prior written consent under the following circumstances and no others:

a. when such disclosure by Receiving Party is required under applicable law or by subpoena or other court or governmental order, decree, regulation or rule; provided, however, that if disclosure is required under this provision, Receiving Party shall advise Disclosing Party of the requirement to disclose Confidential Information prior to such disclosure and as soon as reasonably practicable after Receiving Party becomes aware of such required disclosure; and further provided that upon the request of the Disclosing Party, the Receiving Party agrees to cooperate in good faith with and at the expense of the Disclosing Party in any reasonable and lawful actions which the Disclosing Party takes to resist such disclosure, limit the information to be disclosed or limit the extent to which the information so disclosed may be used or made available to third parties.

b. when such disclosure is made to officers, directors and employees of the Receiving Party and its affiliates and their respective attorneys and accountants who have a need to know to assist the Receiving Party in the discussions and negotiations with the Disclosing Party. For purposes of this Agreement, "affiliate" shall mean any person or entity controlling, controlled by or under common control with Receiving Party.

6. Receiving Party agrees that it shall be responsible for ensuring that all persons to whom the Confidential Information is disclosed under this Agreement shall keep such information confidential and shall not disclose or divulge the same to any unauthorized person or in any unauthorized manner. Receiving Party also agrees that it shall be responsible for ensuring that all persons to whom the Confidential Information is disclosed under this Agreement return such information to the Disclosing Party or destroy it in accordance with the terms of this Agreement.

7. Nothing contained in this Agreement shall be construed as granting or conferring any right or license, express or implied, in or to any Confidential Information disclosed to the Receiving Party, including without limitation any patent, trademark and/or copyright. No disclosure of any Confidential Information hereunder shall be construed as a public disclosure of such information by any Party for any purpose whatsoever.

8. The Confidential Information shall remain the property of the Disclosing Party, and the Disclosing Party may request the return thereof at any time upon giving written notice to a Receiving Party. Within 10 days of the receipt of such notice, the Receiving Party shall return all of the original Confidential Information that was provided in written or document form and shall destroy or cause the destruction of all copies and reproductions (both written and electronic) of such information in its possession and in the possession of all persons to whom it was disclosed by Receiving Party except those specified in paragraph 5 a. of this Agreement. Receiving Party also shall destroy or cause the destruction of abstracts, notes, memoranda or other Documents containing any Confidential Information. Notwithstanding the foregoing, each Party may maintain a single confidential copy in the office of its general counsel of the Confidential Information as a

record of the material provided hereunder, and shall not be deemed to have retained or failed to destroy any Confidential Information which is in electronic form if such information is deleted from local hard drives so long as no attempt is made to recover such information from servers or back-up sources.

9. The Parties agree that, in the event of a breach or threatened breach of the terms of this Agreement by a Receiving Party, Disclosing Party shall be entitled to seek an injunction prohibiting any such breach or disclosure of any Confidential Information. In addition to injunctive relief, Disclosing Party shall have all other rights and remedies afforded it by law. The Parties acknowledge that the Confidential Information is valuable and unique and that disclosure in breach of this Confidentiality Agreement may result in irreparable injury to Disclosing Party.

10. Disclosing Party represents and warrants that it has the authority to enter into this Agreement and to disclose the Confidential Information to the Receiving Party. Disclosing Party believes in good faith that the Confidential Information to be provided by it hereunder will not be materially misleading, but the Disclosing Party makes no other representation or warranties, express or implied, as to the quality, accuracy, completeness or reliability of the information so disclosed. Disclosing Party, its directors, officers and employees shall have no liability whatsoever with respect to the use of or reliance upon the Confidential Information by the Receiving Party.

11. Nothing in this Agreement nor the furnishing of Confidential Information pursuant hereto shall be construed in any way as obligating any Party to enter into any further agreement, negotiation or transaction with the other or to refrain from entering into an agreement, negotiation or transaction with any other person, including without limitation any person engaged in the same or similar line of business as the other Party hereto.

12. This Agreement shall expire two years from the Effective Date. Any Party may terminate this Agreement at any time by providing written notice to the other Parties. Notwithstanding any such termination, all rights and obligations hereunder shall survive with respect to the Confidential Information disclosed prior to the date of such termination.

13. No amendments, changes or modifications to this Agreement shall be valid except if the same are in writing and signed by a duly authorized representative of each of the parties hereto.

14. Each Party agrees that they will not, during the term of this Agreement and for one year after the termination thereof, solicit, direct or attempt to induce or induce any employee or agent of any other Party hereunder to leave the employ of the other Party, except that any Party may hire an employee of the other Party who initiates contact with that Party or who responds to a general advertisement for employment.

15. This Agreement shall be governed by and construed under the laws of the District of Columbia. It represents the full and complete agreement of the Parties hereto with respect to the disclosure of the Confidential Information; and it supersedes and cancels all prior communications, understandings and agreements between the parties with respect to the disclosure of information for the purposes previously recited, whether oral, expressed or implied.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives on the date first written above.

The Government of Jamaica	Bidder
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____

[NAME OF LEGAL ENTITY]

By: _____

Name: _____

Title: _____

Annex 2 – RFB Notice of Site Visit Acknowledgement Form

Ministry of Science, Energy and Technology – Request for Bids: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies, Kingston, Jamaica

Date
Company Name
Company Address
Contact Name — Phone Number:
Contact Title — Fax Number:
Proposer's Ref. # — e-mail Address:

Reference: University Hospital of the West Indies.

We acknowledge the receipt of the above referenced RFB which was received on

_____.
(Date)

In recognition of the scope of the RFB and all responsibilities to be undertaken under the RFB, we declare the following:

We hereby acknowledge that we have thoroughly reviewed all the terms and conditions of the RFB and hereby confirm that, we intend on attending the referenced mandatory site visit to be held on (***Date and*** **Time**)

Company Name: _____

Signature: _____

Name and Title: _____

Annex 3 - SCHEDULE OF PRICING

Ministry of Science, Energy and Technology – Request for Bids: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies, Kingston, Jamaica

University Hospital of the West Indies

To (Government): Ministry of Science, Energy and Technology

From (Bidder):

Pursuant to and in compliance with the Request for Bids (RFB) titled "Request for Bidss: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies, Kingston, Jamaica" (Date), the undersigned offers to design, procure and install all materials and supplies necessary or incidental to the above referenced project, complete in every respect, in strict accordance with the RFB documents and to perform all other obligations imposed by the contract agreement, for the pricing indicated in the following
Schedule of Pricing:

Schedule of Pricing (Solar PV System)			
Bid Item	**Description**	**Unit**	**Total Amount ($USD)**
1	Engineering, Procurement, Construction, testing and commissioning of 808kWp Solar PV Systems, including. Operation and Maintenance for a period of 1 year and a Defects Liability Period of 2 years. .	Lump sum	
3	**BID TOTAL**		

Schedule of Pricing (Inverter Type Energy Efficient Air Conditioning)			
Bid Item			
1	Engineering, Procurement, Construction, testing and commissioning of 143 Inverter Type Air Conditioning Units including. Operation and Maintenance for a period of 1 year and a Defects Liability Period of 2 years...	Lump sum	
3	**BID TOTAL**		

The undersigned Bidder understands that the Bid is valid for 90 or more days after the Bid due date.

Dated this_____day of_____2021

Signed Name_____

Printed Name_____

Title_____

Duly authorized to sign Bid for and on behalf of

COMPANY NAME (IN BLOCK CAPITALS) Business

Address of Bidder

Telephone Number of Bidder

Annex 4 – Proposal Checklist

Ministry of Science, Energy and Technology – Request for Bids: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV and Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies, Kingston, Jamaica

Proposal Checklist			
Proposal requirement number	**Required content with bid submittal**	**RFB section reference**	**Check if Included**
Due prior to Proposal	Receipt confirmation		N/A
Due prior to Proposal	Notice of Site Visit Acknowledgement Form	Annex 2	N/A
1	Binding offer cover letter	4.1	☐
2	Mutual confidentiality agreement	Annex 1	☐
3	Draft Payment Schedule	Appendix A	☐
4	Technical Works	Section C	☐
5	Project Preliminary Execution Plan	5.1a	☐
6	Schedule of pricing	Annex 3	☐
7	HSE Management System	5.1a	☐
8	Proposal checklist	Appendix D	☐
9	Roof Structure Assessment Report	Exhibit E	☐
10	Any other information required in the RFB		☐

Appendix A – Milestone Payment Schedule

Ministry of Science, Energy and Technology – Request for Bids: Engineering, Procurement, Construction, Initial Operation and Maintenance of Rooftop Solar PV systems at the University Hospital of the West Indies, Kingston, Jamaica

Milestone Payment Schedule			
Milestone	**Description of Milestone**	**% of Contract Price**	**Cumulative Payments (%)**
1	Submission of Revised/Updated Workplan	10	10
2	Submission of Designs/Specification for Approval	10	20
3	Delivery Duty Paid and Storage	30	50
4	Installation & Tests	24	74
5	Commissioning	14	88
6	First 6 months of Operation & Maintenance and first 6 months of Defects Liability Period	3	91
7	Operation & Maintenance and Defects Liability Period for months 7 to 12	3	94
8	Defects Liability Period for months 13 to 18	3	97
9	Defects Liability Period for months 19 to 24	3	100

The percentages shall be applied to the bid total of the Solar PV System taking into account the discounts offered in the Letter of Offer.

Ministry of Science, Energy and Technology – Request for Bids: Engineering, Procurement, Construction, Initial Operation and Maintenance of Energy Efficient Air Conditioning Systems at the University Hospital of the West Indies, Kingston, Jamaica

Milestone Payment Schedule			
Milestone	**Description of Milestone**	**% of Contract Price**	**Cumulative Payments (%)**
1	Submission of Revised/Updated Workplan	10	10
2	Submission of Designs/Specification for Approval	10	20
3	Delivery Duty Paid and Storage	30	50
4	Installation & Tests	24	74
5	Commissioning	14	88

6	First 6 months of Operation & Maintenance and first 6 months of Defects Liability Period	3	91
7	Operation & Maintenance and Defects Liability Period for months 7 to 12	3	94
8	Defects Liability Period for months 13 to 18	3	97
9	Defects Liability Period for months 19 to 24	3	100

The percentages shall be applied to the bid total of the Inverter Type Energy Efficient Air Conditioning taking into account the discounts offered in the Letter of Offer.

Appendix B Evaluation Criteria Rooftop Solar PV Phase

Qualification Topic	**Company**				
Technical Ability		**Pass/Fail**			
1. A preliminary description of the proposed work plan and schedule.					
2. Provide copy of current contractor's license issued by The Government of Jamaica.					
3. Provide a staffing plan showing ability to execute the project by the contractor.					
4. Provide company Health & Safety Plan					
Past Performance		**Pass/Fail**			
1. Provide Information regarding any instance, current or during the last five (5) years, in which the Bidder defaulted on a contract with The Government of Jamaica.					
2. Provide evidence having successfully installed at least four (4) commercial Solar PV system of at least 50kWp capacity each within the last 2 years.					
Financial Strength					

Qualification Topic	Company				
1. Contractors should provide proof of having revenue of at least 500,000.00 for each of the past three (2-3) years (2020 excluded), and a net worth of $500,000, with verifiable evidence including: o Audited financial statements o Bank references o Supplier references. o Tax Compliance Certificate					
2. Contractor shall provide current and appropriate business insurances, including liability insurance, workers' compensation insurance, and commercial vehicle insurance. Coverage should include: ● General liability - $1,000,000 per occurrence, $2,000,000 aggregate, and ● Workers' compensation - $1,000,000 each accident, each employee, policy limit ● Insurance policies should name the Provider and any intermediaries as additional insured(s) and certificate holder(s)					
Key Staff		**Pass/Fail**			
1. Contractor shall provide Qualifications and experience of at least 3 Electric Engineers for key site management, with: Site –Supervisors, project (solar at least 5 years of experience with Engineer and project management Minimum, and deliveries of EPC contracts in Jamaica.					
2. Contract Manager with five years' experience in works of a comparable nature and volume,					

Qualification Topic	Company				
including no less than three years as Manager.					
Total Evaluation					

In order to qualify the Bidder **must** pass ALL of the Past Performance and Financial Strength criteria and pass 3 out of 4 criteria for the Technical Ability and ALL criteria of Key Staff.

Evaluation Criteria Energy Efficient Air Conditioning Systems

Qualification Topic	Company				
Technical Ability		**Pass/Fail**			
1. A preliminary description of the proposed work plan and schedule.					
2. Provide copy of current contractor's license issued by The Government of Jamaica.					
3. Provide a staffing plan showing ability to execute the project by the contractor.					
4. Provide company Health & Safety Plan					
Past Performance		**Pass/Fail**			
1. Provide Information regarding any instance, current or during the last five (5) years, in which the Bidder defaulted on a contract with The Government of Jamaica.					
2. Provide evidence having successfully installed at least 1MBTU energy efficient air conditioning commercial system of within the last 2 years.					
Key Staff		**Pass/Fail**			
1. Contractor shall provide Qualifications and experience of a key site supervisor, and technical personnel with: Site - Supervisors, project (at least 5 years of experience with Engineer and project					

Qualification Topic	Company				
management Minimum, and deliveries of EPC contracts.					
Minimum Technical Requirement					
1. Energy Efficiency Performance Standards compliant (EER) meet minimum standard (Required) 2018 IECC Section C403.3.1 EER ≥12.					
2. Equipment Voltage and Frequency compatible with facility's existing power supply.					
Total Evaluation					

In order to qualify the Bidder **must** pass ALL of the Past Performance and Financial Strength criteria and pass 3 out of 4 criteria for the Technical Ability and ALL of Key Staff and Minimum Technical Requirement.

Appendix C Listing of Existing Non-Inverter Type Split Air-Conditioned Units

Room ID	Make	Model	Quantity	Capacity (Btu)	Type
A&E Consultant	MILLER	MDX3-009ECRI	1	9,000	Non-Inverter
A&E Consultant	MILLER	MDX3-009ECRI	1	9,000	Non-Inverter
A&E Consultant	MILLER	MDX3-009ECRI	1	9,000	Non-Inverter
A&E Consultant	MILLER	M5X3·012ECRI	1	12,000	Non-Inverter
A&E Consultant	MILLER	M5X3-012ECRI	1	12,000	Non-Inverter
A&E Consultant	MILLER	M5X3·012ECRI	1	12,000	Non-Inverter
A&E Classroom	Prizm		1	36,000	Non-Inverter
A&E Classroom	Prizm		1	36,000	Non-Inverter
A&E Treatmentroom	Panasonic	cu-4cv2lsp	1	48,000	Non-Inverter
A&E X-Ray	Trane	2TIA0050ADOOOAA	1	48,000	Non-Inverter
A&E Grief	Multizoone	H10C4MR43	1	18,000	Non-Inverter
OR. R.l, Hutson	Miller	MOX3·0012ECR1	1	12,000	Non-Inverter
OR, P. Singh	Miller.	MDX3·0012ECR1	1	12,000	Non-Inverter
OR.William-Johnson MOX3-012ECR1	Miller		1	12,000	Non-Inverter
Customer Service	Tempstar	38TCT012708	1	12,000	Non-Inverter
Maintenace Mclean	Prizm		1	12,000	Non-Inverter
Maintence Public Health	Tropicool		1	23,500	Non-Inverter
Wardl2 Assessment office	EDIJTSY	KF·25W	1	9,000	Non-Inverter
Pharmacy Out Patient	N/A		1	18,000	Non-Inverter
Pharmacy Out Patient Room	Panasonic		1	18,000	Non-Inverter
Pharmacy out patient Amy morgan's Off	Panasonic	CU·C93KE	1	18,000	Non-Inverter
CEO Conference Rm	TGM		1	12,000	Non-Inverter
Stores	Comfortstar		1	60,000	Non-Inverter
Stores Ms. B. Anderson	Windmill		1	18,000	Non-Inverter
CT Scan Old	Toshiba		1	18,000	Non-Inverter
X-Ray Room 5	Trane		1	18,000	Non-Inverter

Room ID	Make	Model	Quantity	Capacity (Btu)	Type
X-Ray Room 6	Trane		1	18,000	Non-Inverter
Dark Room	Toshiba		1	18,000	Non-Inverter
Mammogram Room	Lamda		1	12,000	Non-Inverter
Mammogram Waiting Room	Trane		1	5,000	Non-Inverter
Dr. Cornwall-shaw	Prizm		1	12,000	Non-Inverter
Secretary X-Ray	TROPICOOL		1	9,000	Non-Inverter
Storage X-Ray	Prizm		1	12,000	Non-Inverter
Mammogram Examination	Trane		1	5,000	Non-Inverter
Community Mental Health	Classic		1	10,000	Non-Inverter
Ward 21	Classic		1	10,000	Non-Inverter
X-Ray Seminar Neville Moule	Trane		1	24,000	Non-Inverter
X--Ray Seminar Neville Moule	Trane		1	24,000	Non-Inverter
Room 58	Fedders		1	9,000	Non-Inverter
Beside X-Ray Seminar	Prizm		1	24,000	Non-Inverter
Pharmacy Director	Toshiba	RAS-24BAX	1	24,000	Non-Inverter
Pharmacy Clinical Director	Toshiba	RAS-24BAX	1	24,000	Non-Inverter
Pharmacy Lunch Room	Toshiba	RAS-24BAX	1	24,000	Non-Inverter
Pharmacy StoreRoom	Comfortstar		1	60,000	Non-Inverter
Nursing admin	Prizm		1	24,000	Non-Inverter
Nursing admin Sis. Sinclair	Lamda		1	12,000	Non-Inverter
Nursing admin conference Room	Prizm	AU-24C53F230T5(a5)	1	24,000	Non-Inverter
Nursing Admin. Admin Asst.	Tropicool		1	9,000	Non-Inverter
Nursing Ad min.Senior Director	Tropicool		1	12,000	Non-Inverter
Nursing Admin. Night Director	Trane	TIK509MBOODA	1	*18,000*	Non-Inverter
Nursing	Prizm	AU-12Cs3f-150P5{a5)	1	*18,000*	Non-Inverter
Cashier	Lennox	LXGMDMH009100T4	1	*18,000*	Non-Inverter
Ward 8	Prizm		1	*18,000*	Non-Inverter

Room ID	Make	Model	Quantity	Capacity (Btu)	Type
Ward 8	EDIJTSY	KF-25W	1	*18,000*	Non-Inverter
Ward 10	Lennox		1	*18,000*	Non-Inverter
Ward 10	Lennox	MSG-09CR	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	MSG-09CR	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	MSG-09CR	1	*18,000*	Non-Inverter
Ward 10	Lennox	MSG-09CR	1	*18,000*	Non-Inverter
Ward 10	Lennox	KF-32A-12GW/C-C-50	1	*18,000*	Non-Inverter
Ward 10	Lennox	MSG-09CR	1	*18,000*	Non-Inverter
Ward 10	Lennox	MSG-09CR	1	*18,000*	Non-Inverter
Echo-Cardiogram	Panasonic	CU-SC180KW	1	*18,000*	Non-Inverter
ECG	Prizm	AU-36C53F33036	1	*18,000*	Non-Inverter
ECG	Prizm	AU-24C53F230T5	1	*18,000*	Non-Inverter
Gyno	Lennox	13ACX-060-230-15	1	*18,000*	Non-Inverter
Gyno	Lennox	13ACX-060-230-15	1	*18,000*	Non-Inverter
Chemo	EDIJTSY	KF-66W	1	*18,000*	Non-Inverter
Chemo	EDIJTSY	KF-66W	1	*18,000*	Non-Inverter

Room ID	Make	Model	Quantity	Capacity (Btu)	Type
Chemo	EDIJTSY	KF-25W	1	*18,000*	Non-Inverter
Chemo	EDIJTSY	KF-25W	1	*18,000*	Non-Inverter
Administration	Prizm	AU-24C53F230T5	1	*18,000*	Non-Inverter
Dr. Whyte (CEO)	Lamda		1	*18,000*	Non-Inverter
Admin	Pioneer		1	*18,000*	Non-Inverter
Admin	Windy		1	*18,000*	Non-Inverter
MISl	Prizm		1	*18,000*	Non-Inverter
Appointment Office	N/A		1	*18,000*	Non-Inverter
Billings	Toshiba		1	*18,000*	Non-Inverter
Billings	Prizm		1	*18,000*	Non-Inverter
Billings	Prizm	GW-36CF	1	*18,000*	Non-Inverter
Billings	Toshiba	GW-36CF	1	*18,000*	Non-Inverter
Social Work Medical Records Ms.	Lennox	KF-25A-09GW/cc-so:	1	9,000	Non-Inverter
Social Work Medical Records Ms.	Westpoint		1	12,000	Non-Inverter
Social Work Dama Ii Beason	Lennox	KF-25A-09GW/CC-50	1	9,000	Non-Inverter
ENT Clinic consulting Room2	Tropicool	TC024FC	1	24,000	Non-Inverter
ENT Clinic consulting Room2	Windy		1	18,000	Non-Inverter
ENT Clinic consulting Room2	Westpoint	WSZ-189.LE	1	18,000	Non-Inverter
Medical Records Library Container	Topwin	KF-70W	1	7,000	Non-Inverter
Medical Records Library	Chigo	9189215XL0108-C	1	*18,000*	Non-Inverter
ECG	Panasonic	CU-SC180KN	1	18,000	Non-Inverter
Medical Records Support Office	Comfort maker	CMSA09SWBC	1	9,000	Non-Inverter
Midwifery Director's Office	Yonan		1	12,000	Non-Inverter
Midwifery	Miller	918921jxL0108/C	1	*18,000*	Non-Inverter
Labour Ward Left Delivery	Windy		1	18,000	Non-Inverter
CHARES Administration Office	Lennox		1	18,000	Non-Inverter
CHARES Conference Room	Lennox		1	18,000	Non-Inverter

Room ID	Make	Model	Quantity	Capacity (Btu)	Type
CHARES Conference Room	Lennox		1	18,000	Non-Inverter
CHARES Doc Room	Prizm		1	12,000	Non-Inverter
Ward 12	Prizm		1	12,000	Non-Inverter
Nurse Co-ordinator O&G	Tropicool		1	12,000	Non-Inverter
ECG	Panasonic		1	18,000	Non-Inverter
ECG	FUSI		1	9,000	Non-Inverter
Ward 8/Ward 4 class	Panasonic		1	24,000	Non-Inverter
Ward8/Ward4 class	Panasonic		1	24,000	Non-Inverter
Ward3 Class	Panasonic		1	24,000	Non-Inverter
Ward 3 Class	Panasonic		1	24,000	Non-Inverter
Ward 1 Class	Comfortstar		1	36,000	Non-Inverter
Ward 6 Assessment Office	EDIJTSY	KF-25W	1	9,000	Non-Inverter
Ward 6 Pharmacy	Tropicool		1	18,000	Non-Inverter
Ward 5 Intern. Room	Panasonic	CU-C12JKD	1	12,000	Non-Inverter
Anaesthetics	Fusi		1	9,000	Non-Inverter
Operating Theatre Nurse Lounge	Lennox	LXGMDHH01810074	1	18,000	Non-Inverter
Operating Theatre Class Room	Lennox	LXGMDSH018100T4	1	18,000	Non-Inverter
Orthopedic Office	Westpoint		1	18,000	Non-Inverter
Orthopedic Office	Panasonic		1	*18,000*	Non-Inverter
Dr. Vaughn's Office	Samsung	AX090VEOK	1	9,000	Non-Inverter
Dr. Palmer	Samsung	AX090VEOK	1	9,000	Non-Inverter
Opthomology Docs Room	EDIJTSY	KF-51W	1	18,000	Non-Inverter
Opthomology nurse lounge	EDIJTSY	KF-51W	1	18,000	Non-Inverter
Junk Room	Pioneer		1	13,000	Non-Inverter
Dr. Coulbournes	Pioneer		1	18,000	Non-Inverter
Milestone Office	Prizm	AS-18C53F-120CS(a5)	1	18,000	Non-Inverter
Dietetics	Westpoint	WSZ-249.LE	1	24,000	Non-Inverter

Room ID	Make	Model	Quantity	Capacity (Btu)	Type
Dietetics	Westpoint	WSZ-249.LE	1	24,000	Non-Inverter
HDU Doc	Westpoint	WSZ-129 .. L.E	1	12,000	Non-Inverter
HOU Secretary	Westpoint	WSZ-129 .. L.E	1	12,000	Non-Inverter
HDU Doc Office	Westpoint	WSZ-129 .. L.E	1	12,000	Non-Inverter
Eye Clinic Examjnation Room	Trane		1	*18,000*	Non-Inverter
Eye Clinic	Trane		1	*18,000*	Non-Inverter
Eye Clinic	Westpoint		1	12,000	Non-Inverter
Eye Clinic	Westpoint		1	18,000	Non-Inverter
Eye Clinic	Westpoint		1	24,000	Non-Inverter

Exhibit A Site Plan University Hospital of the West Indies, showing locations of buildings with the proposed roof-mounted solar PV systems.

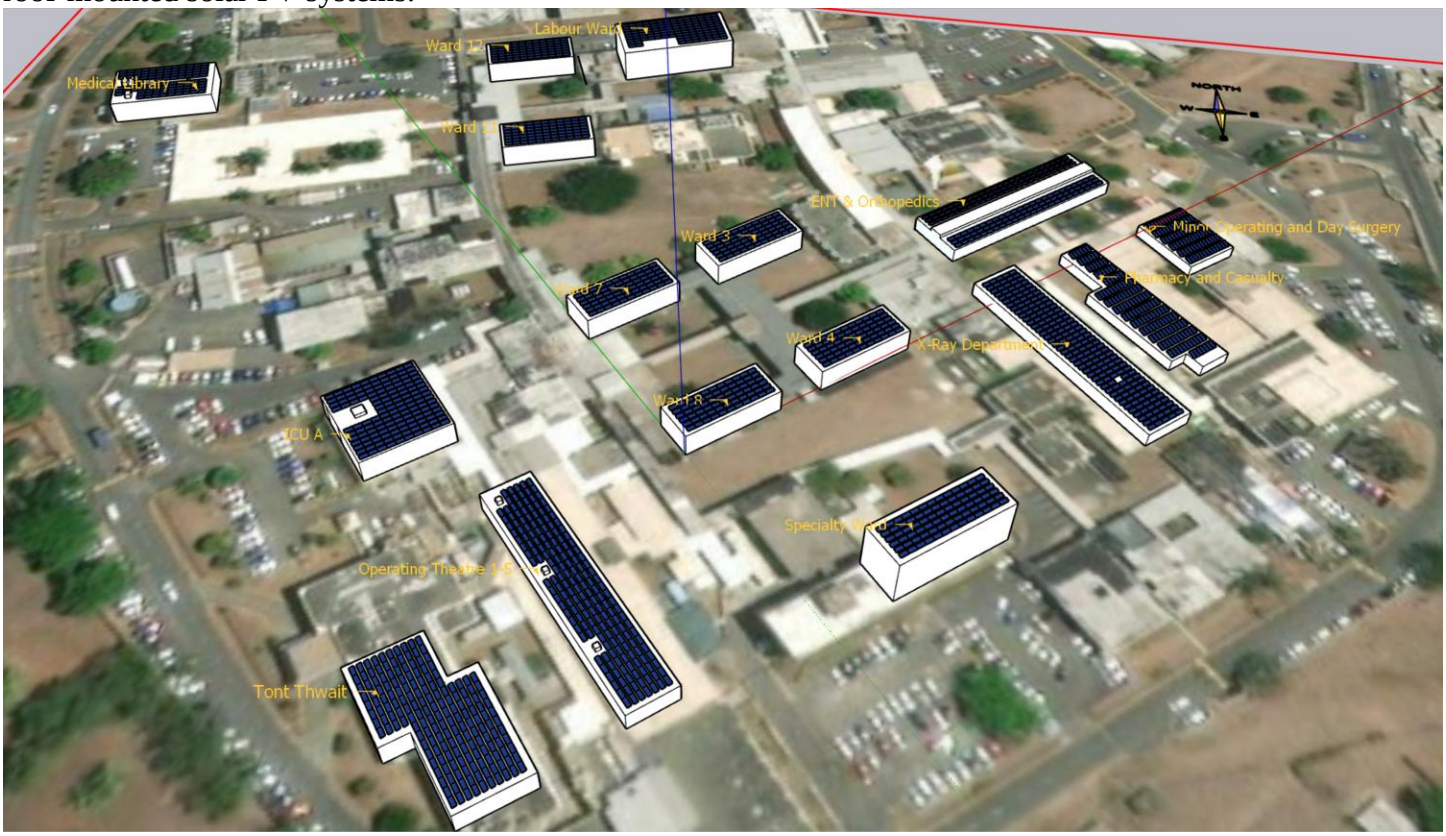


Exhibit A1. Tony Thwaite Wing: Proposed layout for roof-mounted solar PV modules

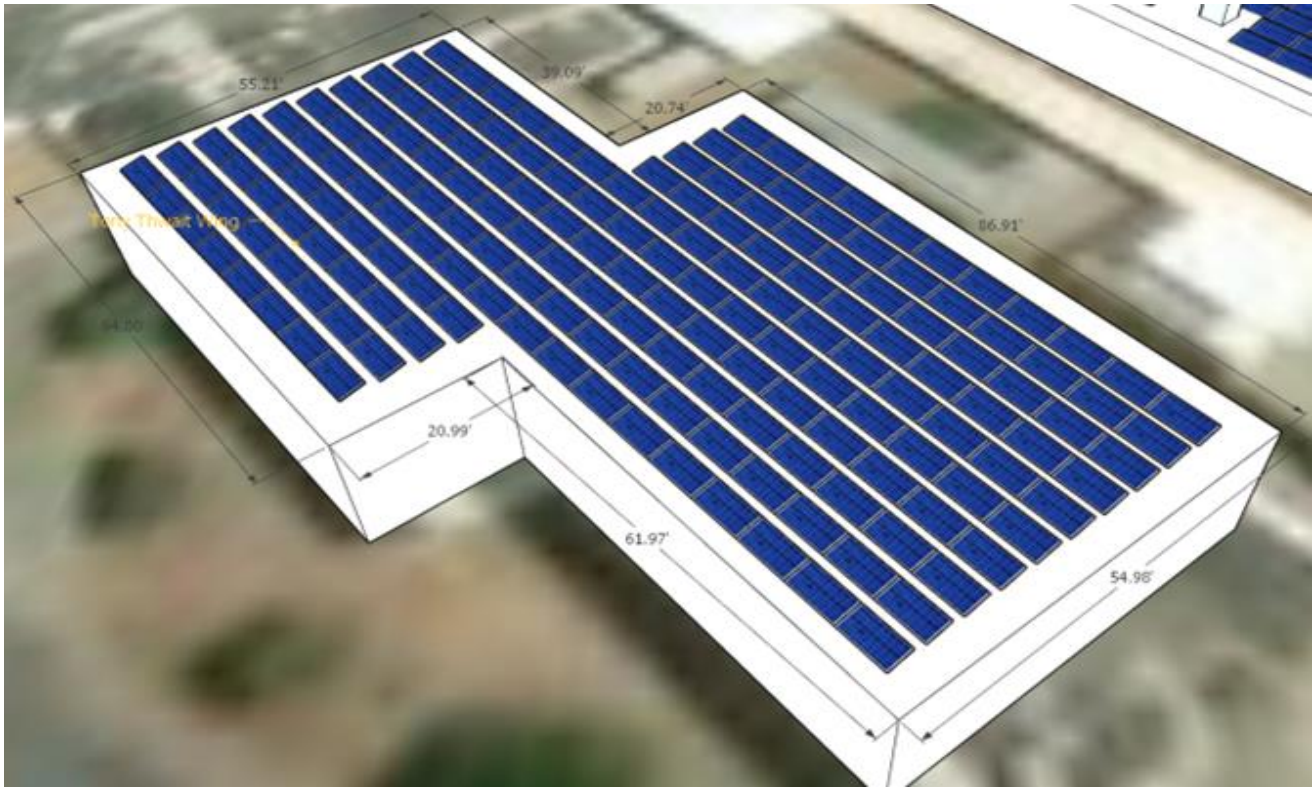


Exhibit A2. Ward 3, 4, 7 and 8: Proposed layouts for roof-mounted solar PV modules.



Exhibit A3. E.N.T. & Orthopedics Ward, Minor Operating and Surgery Depart., Pharmacy and Casualty and X-Ray Department: Proposed layouts for roof-mounted solar PV modules.



Exhibit A4. Ward 11, Ward 12 and Labour Ward: Proposed layouts for roof-mounted solar PV modules.



Exhibit A5. ICU A: Proposed layouts for roof-mounted solar PV modules.



Exhibit A6. Medical Library: Proposed layouts for roof-mounted solar PV modules.

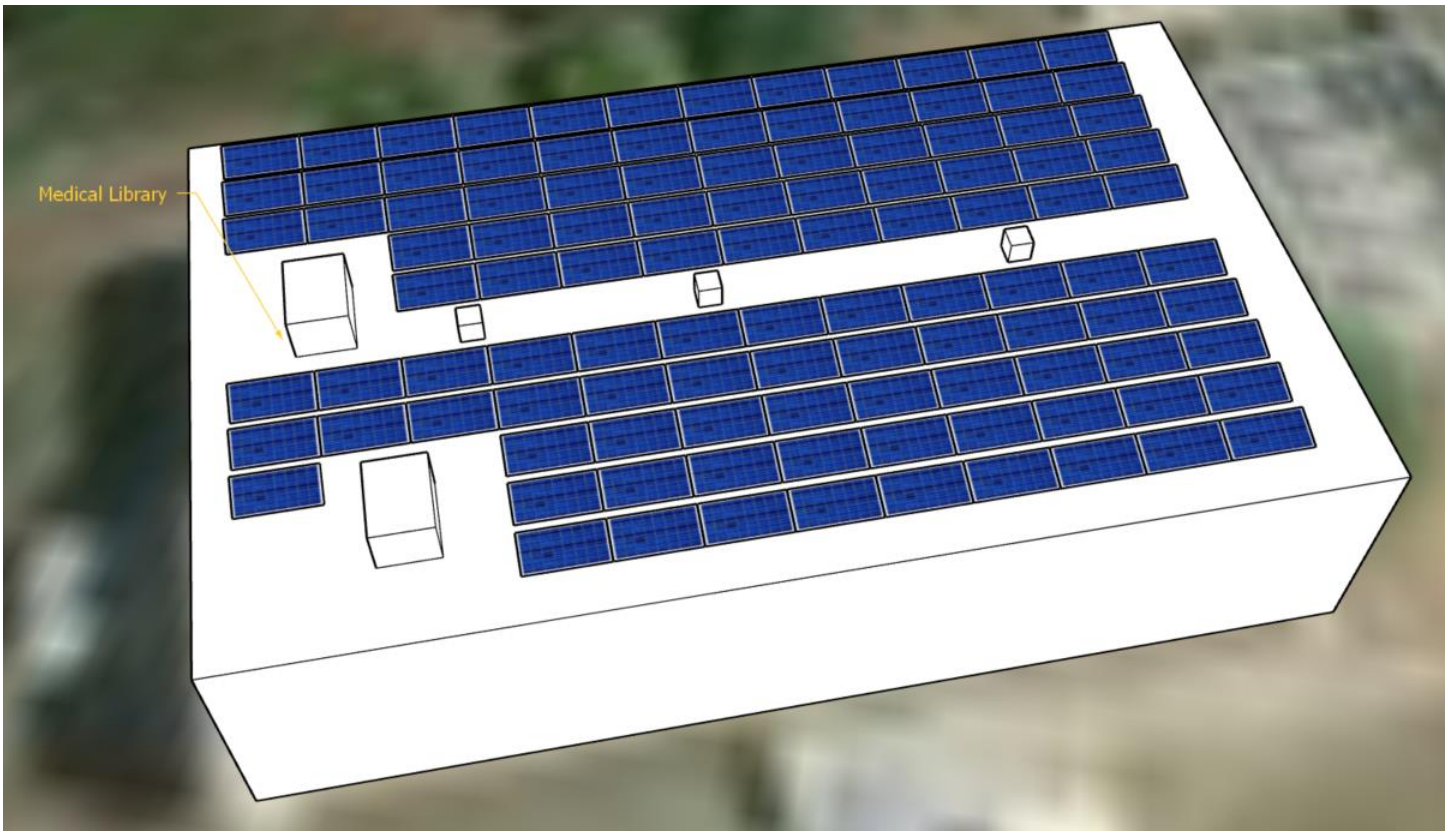


Exhibit A7. Specialty Ward: Proposed layouts for roof-mounted solar PV modules.

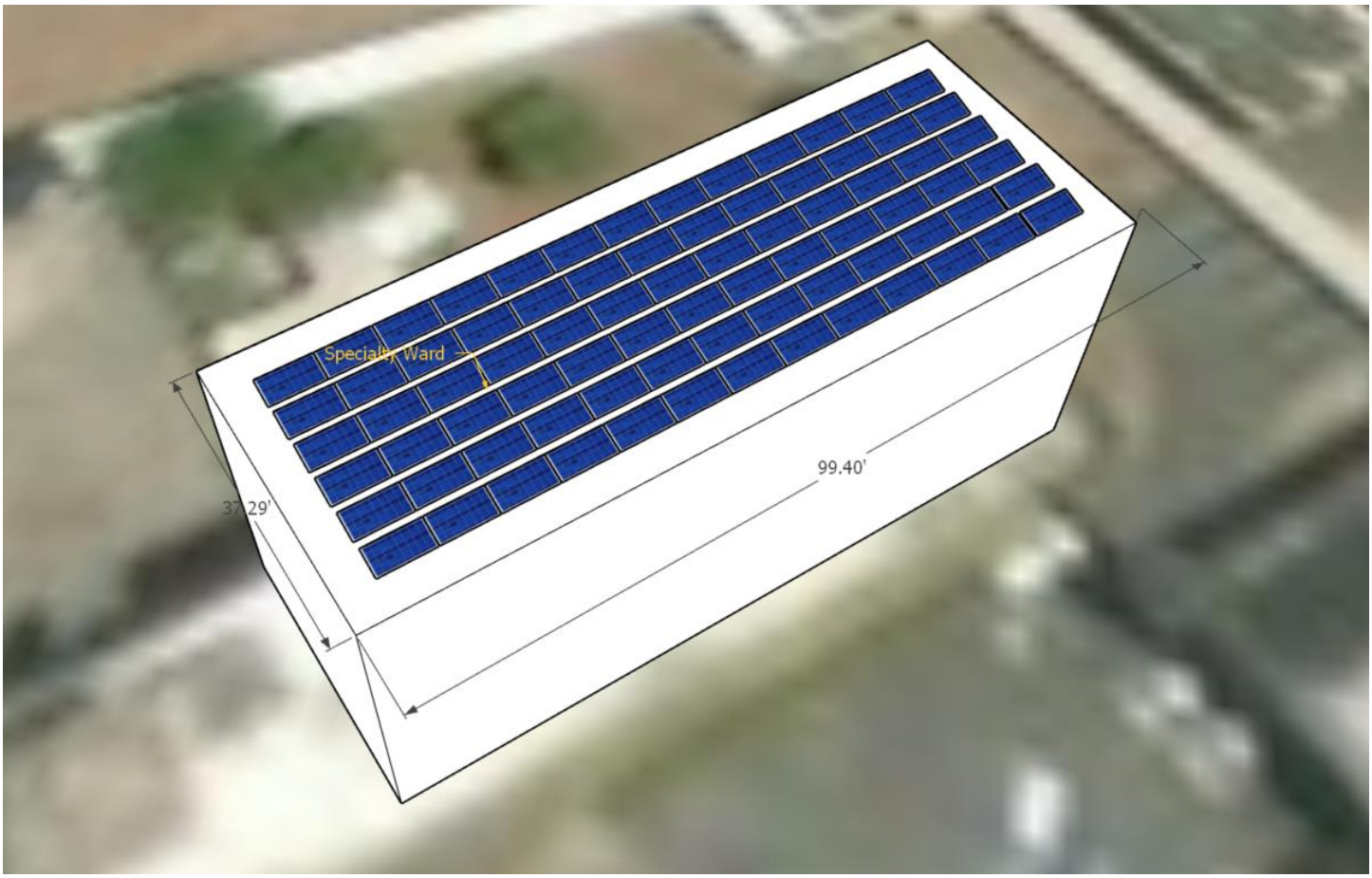
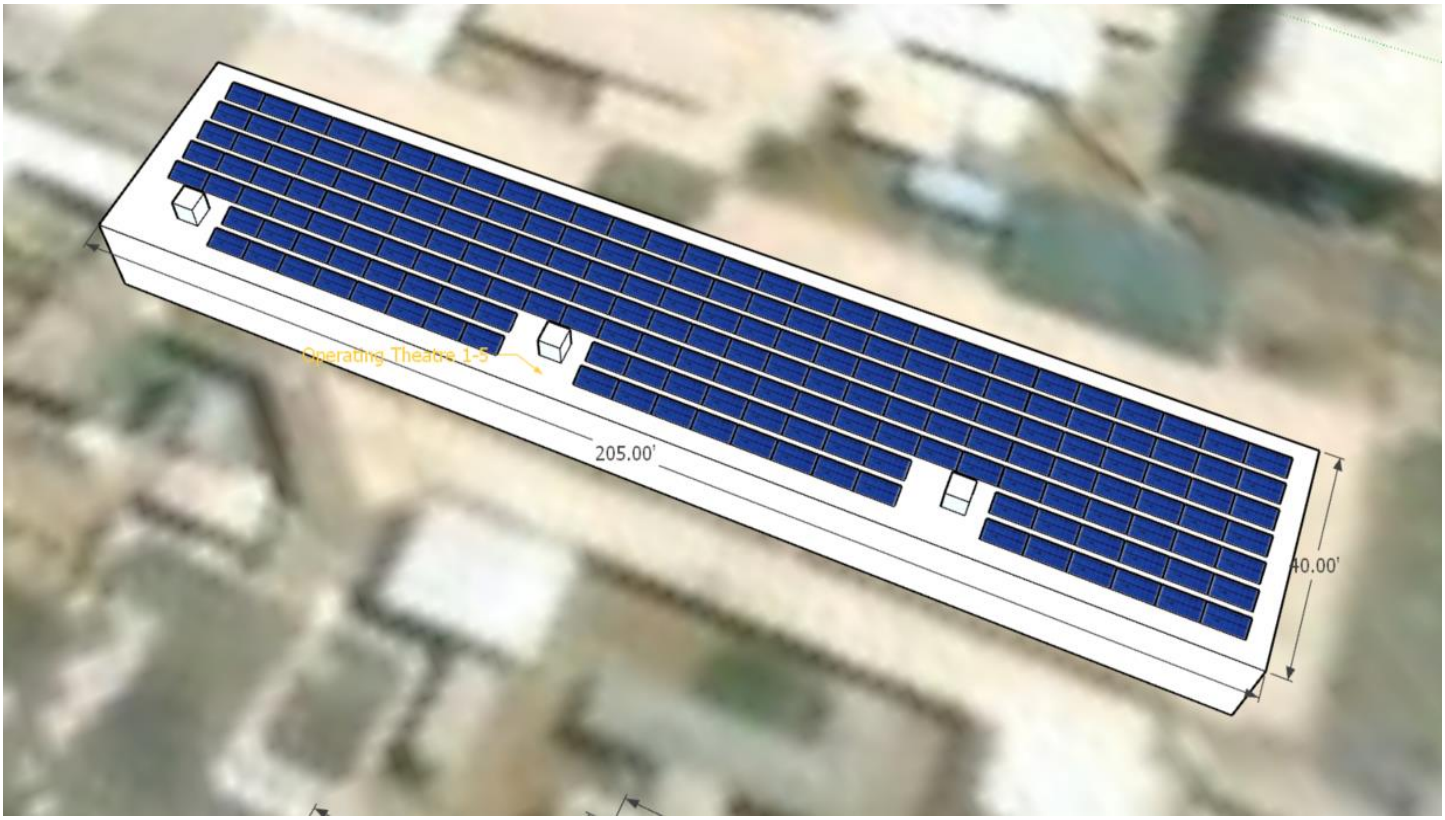


Exhibit A8. Operating Theater: Proposed layouts for roof-mounted solar PV modules.


Operating Theatre 1-5
205.00'
40.00'

Section J.

Contract Agreement

THIS AGREEMENT is made the _____ day of _____, _____,

BETWEEN

(1) _____, a corporation incorporated under the laws of _____ and having its principal place of business at _____ (hereinafter called "the Project Owner "), and (2) _____, a corporation incorporated under the laws of _____ and having its principal place of business at _____ (hereinafter called "the Contractor").

WHEREAS the Project Owner desires to engage the Contractor to design, provide, test, deliver, install, complete and commission certain Facilities, viz. _____ ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GC Clause 2)

The following documents shall constitute the Contract between the Project Owner and the Contractor, and each shall be read and construed as an integral part of the Contract:

(a) This Contract Agreement.
(b) Letter of Acceptance (Section E), Appendix 1,
(c) Contractor's Bid (Section C, forms filled by the Contractor in its offer), Appendix 2,
(d) Special Conditions of Contract (Section G), Appendix 3,
(e) General Conditions of Contract (Section F), Appendix 4,
(f) The Scope of Work (Section D), Appendix 5,
(g) Scope of Work and Technical Specifications for Rooftop Solar PV Installations (Section I, including all the appendixes in its case completed by the contractor), Appendix 6,
(h) Annexes (Section H), Appendix 7.

1.2 Order of Precedence (Reference GC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GC Clause 11)

The Project Owner hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of: _____, _____ as specified in Section I, Appendix C Schedule of Pricing and_____, _____, or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment

The terms and procedures of payment according to which the Project Owner will pay the Contractor are given in the Section I Appendix E (Milestone Payment Schedule) hereto.

The Project Owner may instruct its bank to issue an irrevocable and confirmed letter or credit available to the Contractor in a bank in the country of the Contractor. The credit shall be for an amount of _____; and shall be subject to the Uniform Customs and Practice for Documentary Credits 1993 Revision, ICC Publication No. 600.

Article 3. Effective Date

3.1 Effective Date (Reference GC Clause 1)

The Effective Date from which the Time for Completion of the Facilities shall be counted is the date when all of the following conditions have been fulfilled:

(a) This Contract Agreement has been duly executed for and on behalf of the Project Owner and the Contractor;

(b) The Contractor has submitted to the Project Owner the performance security and the advance payment guarantee, if applicable;

(c) The Project Owner has paid the Contractor the advance payment

(d) The Contractor has been advised that the documentary credit referred to in Article 2.2 above has been issued in its favor.

(e) The Contractor has submitted the Health and Safety Management Plan (HSMP) specified in Section I, clause 6.2.13.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the conditions listed under 3.1 are not fulfilled within three (3) months from the date of this Contract notification because of reasons not attributable to the Contractor, the Parties shall discuss and agree on an equitable adjustment to the Contract Price and the Time for Completion and/or other relevant conditions of the Contract.

Article 4. Communications

4.1 The address of the Project Owner for notice purposes, pursuant to GC 4.1 is: _____.

4.2 The address of the Contractor for notice purposes, pursuant to GC 4.1 is: _____.

Article 5. Appendices

5.1 The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

5.2 Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Project Owner and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Project Owner

_____

[Signature]

_____

[Title]

in the presence of _____

Signed by, for and on behalf of the Contractor

_____

[Signature]

_____

[Title]

in the presence of _____

APPENDICES

1. Letter of Acceptance (Section E),
2. Contractor's Bid (Section C, forms filled by the Contractor in its offer),
3. Special Conditions of Contract (Section G),
4. General Conditions of Contract (Section F),
5. The Scope of Work (Section D),
6. Scope of Work and Technical Specifications for Rooftop Solar PV Installations (Section I, including all the appendixes in its case completed by the contractor),
7. Annexes (Section H).