

Ebeye Solid Waste Management Project

Procurement of Works

BIDDING DOCUMENT

for

Procurement

of

Works: Closure of Ebeye Existing Open Dump Site and Construction of New Ebeye Sanitary Landfill

- Single-Stage: Two-Envelope -

Issued on: 14 May 2026

Invitation for Bids No.: W2

OCB No.: W2: Closure of Ebeye Existing Open Dump Site and Construction of New Ebeye Sanitary Landfill

Employer: Ministry of Public Works, Infrastructure and Utilities

Country: Republic of Marshall Islands

Preface

This Bidding Document for the Procurement of Works has been prepared by *the Ministry of Finance and Treasury (MOFT), the Executing Agency* and is based on the Standard Bidding Document for the Procurement of Works–Small Contracts (*SBD Works-Small*) issued by the Asian Development Bank dated *December 2021*. The Bidding Document also conform with standards of the Ministry of Infrastructure Development (or any other concerned ministry).

ADB's *SBD Works-Small* has the structure and the provisions of the Master Procurement Document entitled "Bidding Documents for the Procurement of Works–Small Contracts", prepared by multilateral development banks and other public international financial institutions except where ADB-specific considerations have required a change.

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A. General

1. **Scope of Bid**
 - 1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of the Works as specified in Section 6 (Employer's Requirements). The name, identification, and number of contracts of this bidding are provided in the BDS.
 - 1.2 Throughout this Bidding Document,
 - (a) the term "in writing" means communicated in written form and delivered against receipt;
 - (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and
 - (c) "day" means calendar day.
2. **Source of Funds**
 - 2.1 The Borrower or Recipient (hereinafter called "Borrower") indicated in the BDS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "ADB") toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.
 - 2.2 Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called "Financing Agreement") and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.
3. **Fraud and Corruption**
 - 3.1 ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders, Suppliers, and Contractors, agents, subcontractors, subconsultants, service providers, sub suppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB
 - (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
 - (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
 - (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

- (iv) “collusive practice” means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
 - (v) “abuse” means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;
 - (vi) “conflict of interest” means any situation in which a party has interests that could improperly influence that party’s performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and
 - (vii) “integrity violation” is any act, as defined under ADB’s Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB’s Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB’s Anticorruption Policy, including failure to adhere to the highest ethical standard.
- (b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
 - (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;
 - (d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB’s Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate¹ in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and
 - (e) will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers, and contractors, consultants, manufacturers, service providers and other third

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

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

- 3.2 All Bidders, consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:
- (a) being available to be interviewed and replying fully and truthfully to all questions asked;
 - (b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;
 - (c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;
 - (d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);
 - (e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and
 - (f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.
- 3.3 All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contracts with its subconsultants, Subcontractors and other third parties engaged or involved in ADB-related activities, such subconsultants, Subcontractors and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.
- 3.4 The Employer hereby puts the Bidder on notice that the Bidder or any Joint Venture partner of the Bidder (if any) may not be able to receive any payments under the Contract if the Bidder or any of its Joint Venture partners, as appropriate, is, or is owned (in whole or in part) by a person or entity subject to applicable sanctions.
- 3.5 Furthermore, Bidders shall be aware of the provisions of GCC 28.3 and 73.2 (i).

4. Eligible Bidders

- 4.1 A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5 – or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture. In the case of a Joint Venture:
- (a) all partners shall be jointly and severally liable; and
 - (b) the Joint Venture shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.
- 4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed Subcontractors or Suppliers for any part of the Contract including related services.
- 4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if any of, including but not limited to, the following apply:
- (a) they have controlling shareholders in common; or
 - (b) they receive or have received any direct or indirect subsidy from any of them; or
 - (c) they have the same legal representative for purposes of this bid; or
 - (d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
 - (e) a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a Joint Venture, except for alternative offers permitted under ITB 13 of the Bidding Document. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3 (a)-(d) above, this does not limit the participation of a Bidder as a Subcontractor in another Bid or of a firm as a Subcontractor in more than one Bid; or
 - (f) a Bidder, Joint Venture partner, associates, parent company, or any affiliated entity, participated as a Consultant in the preparation of the design or technical specifications of the works that are the subject of the Bid; or
 - (g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the contract; or
 - (h) a Bidder would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for

the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or

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

- 4.4 A firm will not be eligible to participate in any procurement activities under an ADB-financed, -administered, or -supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporarily suspended or debarred firm will be rejected and such bid may be in breach of debarment conditions, thereby subject to further ADB's investigation.
- 4.5 Government-owned enterprises in the Employer's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not a dependent agency of the Employer.
- 4.6 A Bidder shall not be under suspension from Bidding by the Employer as the result of the execution of a Bid-Securing Declaration.
- 4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.
- 4.8 Bidders shall be excluded if, by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods from, or payments to, a particular country, person or entity in respect of goods or services originating in that country. Where the Borrower's country prohibits payments to a particular person or entity or for particular goods or services by such an act of compliance, that firm shall be excluded.

5. Eligible Materials, Equipment and Services

- 5.1 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 above and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment, and services.

- 5.2 For purposes of ITB 5.1 above, “origin” means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Document

6. **Sections of Bidding Document**
- 6.1 The Bidding Document consists of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITB 8.
- PART I Bidding Procedures**
- Section 1 Instructions to Bidders (ITB)
 - Section 2 Bid Data Sheet (BDS)
 - Section 3 Evaluation and Qualification Criteria (EQC)
 - Section 4 Bidding Forms (BDF)
 - Section 5 Eligible Countries (ELC)
- PART II Requirements**
- Section 6 Employer’s Requirements (ERQ)
- PART III Conditions of Contract and Contract Forms**
- Section 7 General Conditions of Contract (GCC)
 - Section 8 Particular Conditions of Contract (PCC)
 - Section 9 Contract Forms (COF)
- 6.2 The IFB issued by the Employer is not part of the Bidding Document.
- 6.3 The Employer is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the Employer in the IFB.
- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.
7. **Clarification of Bidding Document, Site Visit, Pre-Bid Meeting**
- 7.1 A prospective Bidder requiring any clarification on the Bidding Document shall contact the Employer in writing at the Employer’s address indicated in the BDS or raise his inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received prior to the deadline for submission of bids, within a period given in the BDS. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 22.2.

- 7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself, on its own risk and responsibility, 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 Site shall be at the Bidder's own expense.
- 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the meeting.
- 7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.
- 7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
- 8. Amendment of Bidding Document**
- 8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.
- 8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.
- 8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to ITB 22.2.

C. Preparation of Bids

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

- 10. Language of Bid** 10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.
- 11. Documents Comprising the Bid** 11.1 The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Bid containing the documents listed in ITB 11.2 and the other the Price Bid containing the documents listed in ITB 11.3, both envelopes enclosed together in an outer single envelope.
- 11.2 The Technical Bid shall comprise the following:
- (a) Letter of Technical Bid;
 - (b) Bid Security or Bid-Securing Declaration, in accordance with ITB 19;
 - (c) alternative Bids, at Bidder's option and if permissible, in accordance with ITB 13;
 - (d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2;
 - (e) documentary evidence in accordance with ITB 17, establishing the Bidder's qualifications to perform the contract;
 - (f) Technical Proposal in accordance with ITB 16;
 - (g) any other document required in the BDS.
- 11.3 The Price Bid shall comprise the following:
- (a) Letter of Price Bid;
 - (b) completed Price Schedules, in accordance with ITB 12 and ITB 14, or as stipulated in the BDS;
 - (c) alternative price Bids, at Bidder's option and if permissible, in accordance with ITB 13;
 - (d) any other document required in the BDS.
- 11.4 In addition to the requirements under ITB 11.2, Bids submitted by a Joint Venture shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement.
- 12. Letters of Bid and Schedules** 12.1 The Letters of Technical Bid and Price Bid, and the Schedules, and all documents listed under Clause 11, shall be prepared using the relevant forms furnished in Section 4 (Bidding Forms). The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested and as required in the BDS.

- 13. Alternative Bids**
- 13.1 Unless otherwise indicated in the BDS, alternative Bids shall not be considered.
- 13.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the BDS, as will the method of evaluating different times for completion.
- 13.3 When specified in the BDS pursuant to ITB 13.1, and subject to ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Document must first price the Employer's design as described in the Bidding Document and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.
- 13.4 When specified in the BDS, Bidders are permitted to submit alternative technical solutions for specified parts of the Works. Such parts will be identified in the BDS and described in Section 6 (Employer's Requirements). The method for their evaluation will be stipulated in Section 3 (Evaluation and Qualification Criteria).
- 14. Bid Prices and Discounts**
- 14.1 The prices and discounts quoted by the Bidder in the Letter of Price Bid and in the Schedules shall conform to the requirements specified below.
- 14.2 The Bidder shall submit a bid for the whole of the works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section 4 (Bidding Forms). In case of admeasurement contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities. Unit rates and prices for all items of the Works described in the Bill of Quantities shall be expressed in positive values. If unit rates and prices are expressed in negative values, the bid will be rejected.
- 14.3 The price to be quoted in the Letter of Price Bid shall be the total price of the Bid, excluding any discounts offered. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.
- 14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Price Bid, in accordance with ITB 12.1.
- 14.5 The prices shall be either fixed or adjustable as specified in the BDS.
- (a) In the case of Fixed Price, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price will be treated as nonresponsive and rejected.
- (b) In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport, and

contractor's equipment in accordance with the provisions of the Conditions of Contract. A Bid submitted with a fixed price will be treated as nonresponsive and be rejected. The Bidder shall furnish the indexes and weightings for the price adjustment formulas in the Tables of Adjustment Data included in Section 4 (Bidding Forms) and the Employer may require the Bidder to justify its proposed indexes and weightings. Any bid that omits indexes and weightings shall be subject to clarification with the Bidder.

- 14.6 If so indicated in ITB 1.1, bids are being invited for individual contracts or for any combination of contracts (packages). Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 14.4, provided the Bids for all contracts are submitted and opened at the same time.
- 14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

15. Currencies of Bid and Payment

- 15.1 The currency(ies) of the Bid and payment shall be as specified in the BDS.
- 15.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the prices shown in the appropriate form(s) of Section 4, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.

16. Documents Comprising the Technical Proposal

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

17. Documents Establishing the Qualifications of the Bidder

- 17.1 To establish its qualifications to perform the Contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding information sheets included in Section 4 (Bidding Forms).
- 17.2 Domestic Bidders, individually or in Joint Ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility in accordance with ITB 35.

18. Period of Validity of Bids

- 18.1 Bids shall remain valid for the bid validity period specified in the BDS. The bid validity period starts from the date fixed for the bid submission deadline date prescribed by the Employer in accordance with ITB 22.1. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.

- 18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended 28 days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its Bid.
- 19. Bid Security/Bid-Securing Declaration**
- 19.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS.
- 19.2 If a Bid-Securing Declaration is required pursuant to ITB 19.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if the Bid-Securing Declaration is executed.
- 19.3 If a bid security is specified pursuant to ITB 19.1, the bid security shall be, at the Bidder's option, in any of the following forms:
- (a) an unconditional bank guarantee (hard copy of the bank guarantee or in the form of SWIFT message MT760), or
 - (b) an irrevocable letter of credit, or
 - (c) a cashier's or certified check.
- all from a reputable bank from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Employer. The form must include the complete name of the Bidder. The bid security shall be valid for 28 days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.
- 19.4 Unless otherwise specified in the BDS, any Bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 19.1, shall be rejected by the Employer as nonresponsive.
- 19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of substantially nonresponsive Technical Bids shall be returned before opening the Price Bids. The bid security of unsuccessful Bidders at Price Bid evaluation shall be returned promptly upon the successful Bidder's furnishing of the performance security pursuant to ITB 45.
- 19.6 If a bid security is specified pursuant to ITB 19.1, the bid security of the successful Bidder shall be returned promptly once the successful Bidder has signed the Contract and furnished the required performance security.
- 19.7 The bid security may be forfeited or the Bid-Securing Declaration executed, if

- (a) notwithstanding ITB 24.3, a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, except as provided in ITB 18.2; or
- (b) the successful Bidder fails to
 - (i) sign the Contract in accordance with ITB 44;
 - (ii) furnish a performance security in accordance with ITB 45;
 - (iii) accept arithmetical corrections in accordance with ITB 34; or
 - (iv) furnish a domestic preference security, if applicable, in accordance with ITB 45.

19.8 If the bid security is required as per ITB 19.1, the bid security of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security shall be in the name of any or all of the Joint Venture partners. If the Bid-Securing Declaration is required as per ITB 19.1, the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.

20. Format and Signing of Bid

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

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

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

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

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

- (a) Bidders submitting Bids by mail or by hand shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and each copy of the Price Bid, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL - TECHNICAL BID," "ORIGINAL - PRICE BID," and "COPY NO... - TECHNICAL BID," and "COPY NO.... - PRICE BID." These envelopes, the first containing the originals and the others containing copies, shall then be enclosed in one single envelope per set. If permitted in accordance with ITB 13, alternative Bids shall be similarly sealed, marked and included in the sets. The rest of the procedure shall be in accordance with ITB 21.2 and ITB 21.3.
- (b) Bidders submitting Bids electronically shall follow the electronic bid submission procedures specified in the BDS.

21.2 The inner and outer envelopes shall

- (a) bear the name and address of the Bidder;
- (b) be addressed to the Employer as provided in BDS 22.1; and
- (c) bear the specific identification of this bidding process indicated in the BDS 1.1.

21.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB 25.1.

21.4 The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB 25.7.

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

22. Deadline for Submission of Bids

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

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

23. Late Bids

23.1 The Employer shall not consider any Bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

24. Withdrawal, Substitution, and Modification of Bids

24.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2 (except for withdrawal notices, which do not require copies). The corresponding substitution or

modification of the Bid must accompany the respective written notice. All notices must be

- (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except for withdrawal notices, which do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
- (b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

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

25. Bid Opening

25.1 The Employer shall open the Technical Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidders' designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 21.1, shall be as specified in the BDS. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening. If the Technical Bid and Price Bid are submitted together in one envelope, the Employer may reject the entire Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.

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

25.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 25.1. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

25.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original and Modification, will remain unopened in accordance with ITB 25.1.

- 25.5 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:
- (a) the name of the Bidder;
 - (b) whether there is a modification or substitution;
 - (c) the presence of a bid security or a Bid-Securing Declaration, if required; and
 - (d) any other details as the Employer may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Technical Bid are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB 23.1.

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

- 25.7 At the end of the evaluation of the Technical Bids, the Employer will invite bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice for the opening of Price Bids.

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

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

- 25.10 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded:
- (a) the name of the Bidder;
 - (b) whether there is a modification or substitution;
 - (c) the Bid Prices, including any discounts and alternative offers; and
 - (d) any other details as the Employer may consider appropriate.

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

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

E. Evaluation and Comparison of Bids

- 26. Confidentiality**
- 26.1 Information relating to the examination, evaluation, comparison, and post qualification of Bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until on the publication of Contract award.
- 26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
- 26.3 Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it may do so in writing.
- 27. Clarification of Bids**
- 27.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Price Bids, in accordance with ITB 33.
- 27.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.
- 28. Deviations, Reservations, and Omissions**
- 28.1 During the evaluation of bids, the following definitions apply:
- (a) "Deviation" is a departure from the requirements specified in the Bidding Document;
 - (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
 - (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

29. Examination of Technical Bids

29.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted.

29.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the offer shall be rejected.

- (a) Letter of Technical Bid;
- (b) written confirmation of authorization to commit the Bidder;
- (c) Bid Security or Bid-Securing Declaration, if applicable; and
- (d) Technical Proposal in accordance with ITB 16.

30. Responsiveness of Technical Bid

30.1 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB 11.

30.2 A substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

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

30.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section 6 (Employer's Requirements) have been met without any material deviation, reservation, or omission.

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

31. Nonmaterial Nonconformities

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

31.2 Provided that a Technical Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid.

Failure of the Bidder to comply with the request may result in the rejection of its Bid.

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

32. Qualification of the Bidder

32.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether Bidders meet the qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).

32.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1. Unless permitted in the BDS, the determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates.

32.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. The Employer reserves the right to reject the bid of any bidder found to be in circumstances described in GCC 73.2(c). A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.

33. Subcontractors

33.1 Unless otherwise stated in the BDS, the Employer does not intend for the contractor to execute any specific elements of the Works through nominated subcontractors.

33.2 If Subcontractors are proposed for any of the key activities listed in Section 3 (Evaluation and Qualification) Criteria 2.4.2, they shall be considered as "Specialist Subcontractors" and shall meet qualification requirements for the relevant key activities.

34. Correction of Arithmetical Errors

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

(a) Only for admeasurement contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.

(c) If there is a discrepancy between the bid price in the Summary of Bill of Quantities and the bid amount in item (c) of the Letter of Price Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Price Bid will be corrected.

(d) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related

to an arithmetic error, in which case the amount in figures shall prevail subject to (a), (b) and (c) above.

- 34.2 If the Bidder that submitted the lowest evaluated bid does not accept the correction of errors, its Bid shall be disqualified and its bid security may be forfeited or its Bid-Securing Declaration executed.
- 35. Conversion to Single Currency** 35.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS.
- 36. Domestic Preference** 36.1 Unless otherwise specified in the BDS, domestic preference shall not apply.
- 37. Evaluation and Comparison of Price Bids** 37.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.
- 37.2 To evaluate the Price Bid, the Employer shall consider the following:
- (a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts, or Schedule of Prices for lump sum contracts, but including Daywork items, where priced competitively;
 - (b) price adjustment for correction of arithmetic errors in accordance with ITB 34.1;
 - (c) price adjustment due to discounts offered in accordance with ITB 14.4;
 - (d) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 35;
 - (e) adjustment for nonmaterial nonconformities in accordance with ITB 31.3;
 - (f) assessment whether the bid is abnormally low in accordance with ITB 38; and
 - (g) application of all the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).
- 37.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
- 37.4 If this Bidding Document allows Bidders to quote separate prices for different contracts, and to award multiple contracts to a single Bidder, the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Price Bid, is specified in Section 3 (Evaluation and Qualification Criteria).
- 37.5 The Employer shall compare all substantially responsive Bids to determine the lowest evaluated Bid, in accordance with ITB 37.2.

38. Abnormally Low Bids

- 38.1 An abnormally low bid is one where the bid price, in combination with other elements of the bid, appears to be so low that it raises concerns as to the capability of the Bidder to perform the contract for the offered bid price.
- 38.2 When the offered bid price appears to be abnormally low, the Employer shall undertake a three-step review process as follows:
- (a) identify abnormally low costs and unit rates by comparing them with the engineer's estimates, other substantially responsive bids, or recently awarded similar contracts;
 - (b) clarify and analyze the bidder's resource inputs and pricing, including overheads, contingencies and profit margins; and
 - (c) decide whether to accept or reject the bid.
- 38.3 With regard to ITB 38.2 (b) above, the Employer will seek a written explanation from the bidder of the reasons for the offered bid price, including a detailed analysis of costs and unit prices, by reference to the scope, proposed methodology, schedule, and allocation of risks and responsibilities. This may also include information regarding the economy of the manufacturing process; the services to be provided, or the construction method to be used; the technical solutions to be adopted; and any exceptionally favorable conditions available to the bidder for the works, equipment or services proposed.
- 38.4 After examining the explanation given and the detailed the price analyses presented by the bidder, the Employer may:
- (a) accept the bid, if the evidence provided satisfactorily accounts for the low bid price and costs, in which case the bid is not considered abnormally low;
 - (b) accept the bid, but require that the amount of the performance security be increased at the expense of the bidder to a level sufficient to protect the Employer against financial loss. The amount of the performance security shall generally be not more than 20% of the contract price; or
 - (c) reject the bid if the evidence provided does not satisfactorily account for the low bid price, and make a similar determination for the next ranked bid, if required.

39. Unbalanced or Front-Loaded Bids

- 39.1 If the Bid, which results in the lowest evaluated Bid Price, is seriously unbalanced or front-loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed, as well as the pricing and sources of materials, equipment and labor.
- 39.2 After the evaluation of the information and detailed price analyses presented by the Bidder, the Employer may as appropriate:
- (a) accept the Bid; or
 - (b) accept the Bid, but require that the total amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event

of default of the successful Bidder under the Contract subject to ITB 45.2; or

- (c) reject the Bid and make a similar determination for the next ranked bid.

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

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

41. Notice of Intention for Award of Contract

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

F. Award of Contract

42. Award Criteria

42.1 The Employer shall award the Contract to the Bidder whose offer has been determined in line with ITB 35 to ITB 37 above to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

43. Notification of Award

43.1 Prior to the expiration of the period of bid validity and upon expiry of the standstill period specified in ITB 40.1, or upon satisfactory resolution of a complaint filed within standstill period, if applicable, the Employer shall transmit the Notification of Award through issuance of Letter of Acceptance using the form included in Section 9 (Contract Forms) to the successful Bidder, in writing, that its Bid has been accepted. At the same time, the Employer shall also notify all other Bidders of the results of the bidding.

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

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

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

- (a) name of each Bidder who submitted a Bid;

- (b) bid prices as read out at bid opening;
 - (c) name and evaluated prices of each Bid that was evaluated;
 - (d) name of Bidders whose bids were rejected and the reasons for their rejection; and
 - (e) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.
- 44. Signing of Contract**
- 44.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.
 - 44.2 Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
- 45. Performance Security**
- 45.1 Within 28 days of the receipt of notification of award through issuance of Letter of Acceptance from the Employer, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, subject to ITB 38 and ITB 39, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Employer. If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.
 - 45.2 Failure of the successful Bidder to submit the abovementioned performance security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event, the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.
 - 45.3 The above provision shall also apply to the furnishing of a domestic preference security, if so required.
- 46. Bidding-Related Complaints**
- 46.1 The procedures for dealing with Bidding-Related Complaints arising out of this bidding process are specified in the BDS.

Section 2: Bid Data Sheet

A. General

ITB 1.1	The number of the Invitation for Bids (IFB) is: Package W2
ITB 1.1	The Employer is: Ministry of Public Works, Infrastructure and Utilities
ITB 1.1	The name of the bidding process is: Closure of Ebeye Existing Open Dump Site and Construction of New Ebeye Engineered Sanitary Landfill The identification number of the bidding process is W2
ITB 2.1	The Borrower is: Republic of the Marshall Islands
ITB 2.1	The name of the Project is: Ebeye Solid Waste Management Project.

B. Contents of Bidding Documents

ITB 7.1	<p>For clarification purposes only, the Employer's address is: Attention: Mr. Walter Myazoe Jr. Secretary Ministry of Public Works, Infrastructure & Utilities PO Box 1727, Majuro, MH 96960 Tel. +692-6258911/8931 E-mail: walter.myazoe@rmigov.mh</p> <p>Requests for clarification should be received by the Employer no later than: 10 days before the bid submission deadline (i.e. 5 June 2026).</p>
ITB 7.4	<p>A Pre-Bid meeting <i>will</i> take place. Date: 1 June 2026 Time: 2:00 pm (local time) Place: Office of the Head of PMU, Project Management Unit (PMU) Ministry of Public Works, Infrastructure & Utilities PO Box 1727, Majuro, MH 96960</p> <p>A site visit conducted by the Employer will be organized on 2 June 2026 at 10:00 am (local)</p>

C. Preparation of Bids

ITB 10.1	The language of the Bid is: <i>English</i>
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ITB 11.2 (g)	The Bidder shall submit with its Technical Bid the following additional documents: None
ITB 11.3 (b)	In accordance with ITB 12 and ITB 14, the following schedules shall be submitted with the bid, including the priced Bill of Quantities: <u>including the priced Bill of Quantities, which shall include all items, including those identified as Additive Items</u> ”
ITB 11.3 (d)	The reference clause number for the existing provision under ITB 11.3 (d) is revised to ITB 11.3 (e) . ITB 11.3 (d) is now read as: “The Price Schedules shall include pricing for all items in the Bill of Quantities, including those identified as Additive Items.”
ITB 11.3 (e)	The Bidder shall submit with its Price Bid the following additional documents: None
ITB 12.1	The units and rates in figures entered into the Bill of Quantities and Daywork Schedule should be typewritten or if written by hand, must be in print form. Bill of Quantities and Daywork Schedule not presented accordingly may be considered nonresponsive.
ITB 13.1	Alternative bids <i>shall not</i> be permitted.
ITB 13.2	Alternative times for completion <i>shall not</i> be permitted.
ITB 13.4	Alternative technical solutions shall be permitted for the following parts of the Works: <i>None</i>
ITB 14.5	The prices quoted by the Bidder <i>shall be</i> subject to adjustment as per Clause 54 of the Conditions of Contract.
ITB 14.2 (a)	Additive Items. Certain items in the Bill of Quantities are identified as “Additive Items.” Bidders shall provide unit rates and prices for all such items. Additive Items shall not be included in the Bid Price for purposes of bid evaluation and comparison. The Employer may, at its discretion and subject to availability of funds, include any or all Additive Items in the Contract at the unit rates and prices provided in the Bill of Quantities.
ITB 15.1	The prices shall be quoted by the bidder and shall be paid in: <i>United State Dollar (USD) only.</i>
ITB 18.1	The bid validity period shall be <i>120</i> days.
ITB 19.1	The Bidder shall furnish a scanned copy of the original Bid-Securing Declaration.

ITB 19.2	The ineligibility period will be 5 years.
ITB 19.4	No further instruction.
ITB 20.1	In addition to the original Bid, the number of copies is: two copies
ITB 20.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: <i>An organizational document, board resolution or its equivalent, or power of attorney specifying the representative's authority to sign the Bid on behalf of, and to legally bind, the Bidder. If the Bidder is an intended or an existing Joint Venture, the power of attorney should be signed by all partners and specify the authority of the named representative of the Joint Venture to sign on behalf of, and legally bind, the intended or existing Joint Venture. If the Joint Venture has not yet been formed, also include evidence from all proposed Joint Venture partners of their intent to enter into a Joint Venture in the event of a contract award in accordance with ITB 11.2.</i>
ITB 20.2	The Bidder shall submit an acceptable authorization within 7 (seven) days.

D. Submission and Opening of Bids

ITB 21.1	Bidders shall submit their Bids by mail or by hand.
ITB 21.1 (b)	Electronic bidding submission procedures shall be: Not applicable
ITB 22.1	For <u>bid submission purposes</u> only, the Employer's address is: Attention: Mr. Walter Myazoe Jr. Ministry of Public Works, Infrastructure & Utilities PO Box 1727, Majuro, MH 96960 Republic of the Marshall Islands The deadline for bid submission is: Date 15 June 2026 Time: 5:00 pm (Republic of Marshall Islands time)
ITB 25.1	The opening of the Technical Bid shall take place at: Ministry of Public Works, Infrastructure & Utilities PO Box 1727, Majuro, MH 96960 Republic of the Marshall Islands Date: 15 June 2026 Time: 5:00 pm (Republic of Marshall Islands time)

ITB 25.1	Electronic bid opening procedure shall be as follows: Not applicable.
ITB 25.5	The Letter of Technical Bid shall be initialed by the 3 (<i>three</i>) representatives of the Employer attending the Bid opening.
ITB 25.10	The Letter of Price Bid and Schedules shall be initialed by the 3 (three) representatives of the Employer attending the Bid opening.

E. Evaluation and Comparison of Bids

ITB 32.2	The qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates <i>shall not</i> be permitted.
ITB 33.1	The Employer <i>does not intend</i> for the contractor to execute any specific elements of the Works through nominated subcontractors.
ITB 35.1	The prices shall be quoted by the bidder and shall be paid in: <i>United State Dollar only</i> .
ITB 36.1	Domestic preference <i>shall not</i> apply.
ITB 37.2 (h)	Additive Items. For purposes of bid evaluation and comparison, only the Base Bid shall be considered. Items identified as "Additive Items" in the Bill of Quantities shall be excluded from the determination of the Lowest Evaluated Bid. Bidders shall, however, provide prices for all Additive Items, and such prices shall form part of the Contract and may be used by the Employer at its discretion, subject to availability of funds.
ITB 41.1	<p>Standstill provisions shall apply. The duration of standstill period will be <i>14 (fourteen)</i> days from the date of notice of intention for award of contract.</p> <p>The Employer shall, at the start of the standstill period, notify in writing each Bidder that submitted a bid, of its intention to award a contract to the successful Bidder at the end of standstill period. The notification using the form included in Section 9 (Contract Forms) shall include the following information:</p> <ul style="list-style-type: none"> (a) the name of each Bidder who submitted a Bid; (b) the bid prices as read out at bid opening; (c) the name and evaluated prices of each Bid that was evaluated; (d) the name of Bidders whose bids were rejected and the reasons for their rejection; (e) the name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded; and (f) a statement of the reason(s) the bid of the unsuccessful Bidder to whom the notification is addressed was unsuccessful, unless the price information under (e) of this paragraph already reveals the reason.

F. Award of Contract

ITB 46.1	<p>The procedures for Bidding-Related Complaints are referenced in the Procurement Regulations for ADB Borrowers (Appendix 7). The Bidder should submit its complaint following these procedures, in writing, to:</p> <p>Title/position: Secretary</p> <p>Employer: Ministry of Public Works, Infrastructure and Utilities</p> <p>E-mail address: walter.myazoe@rmigov.mh</p>
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Section 3: Evaluation and Qualification Criteria

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1. Evaluation

In addition to the criteria listed in ITB 37.2 (a)–(f), other relevant factors are as follows:

For the avoidance of doubt, the evaluated bid price shall be based on the Base Bid only. Items identified as “Additive Items” in the Bill of Quantities shall be excluded from bid evaluation and comparison.

1.1 Adequacy of Technical Proposal

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

Assignment of scores to criteria and subcriteria: To assess the acceptability of a bidder's Technical Proposal the Employer shall assign a numeric score to each of the criteria and sub-criteria, for which a maximum and minimum required scores are provided in the Table below.

Bidder's submission	Maximum Score assigned	Minimum Score required
Personnel	Not Applicable	Not Applicable
Equipment	Not Applicable	Not Applicable
Site Organization	10	5
(a) Sufficiency of Site staff	2	
(b) Line of instruction and reporting	3	
(c) Discouraging multiple responsibilities at key level	2	
(d) Backstop support from Head office	3	
Method Statement	40	20
(a) Ability to meet the Employer's objective	3	
(b) completion within the Time for Completion	2	
(c) Managing Site specific conditions and issues	3	
(d) Coordination of Site access	2	

(e) Conducting various surveys	2	
(f) Experience with excavation in coordination with tides.	4	
(g) Methodology for coordinating on-going waste disposal operations with the construction project.	3	
(h) Managing Environmental safeguard and compliance	4	
(i) Managing Safety aspects at site	4	
(j) Waste transport methodology	3	
(k) Activities' synchrony with Bidder's Mobilization Schedule and Construction Schedule	4	
(l) Quality assurance and Quality control (QA/QC) management	3	
(m) Site Development	3	
Mobilization Schedule	10	5
(a) Activities' synchrony with Bidder's Method Statement and Construction Schedule	4	
(b) Mobilization of Equipment	2	
(c) Mobilization Schedule for third parties for survey and investigation/ testing.	4	
Construction Schedule	20	10
(a) completion within the Time for Completion	5	
(b) Sequencing of various sub-activities.	5	
(c) Compatibility with Mobilization Schedule.	5	
(d) Schedule of handing over of various components/ deliverables.	5	
Local Labor Participation	10	5
Environmental, Health and Safety Management Plan	20	15

The technical factors for Approach and Methodology listed in the previous table shall be scored based upon the following narrative evaluation criteria:

Score	Narrative Evaluation Criteria
Excellent (90-100)	Significantly exceeds the requirements. Exceptional demonstration by the bidder showing it has the relevant experience, ability, understanding, skills, and resources required to properly deliver the project on time. Response identifies factors that could offer potential added value. Excellent supporting evidence provided.
Good (80-89)	Marginally exceeds the requirements. Above-average demonstration by the bidder showing that it has the relevant experience, ability, understanding, skills, and resources required to deliver the project on time. Good supporting evidence provided.
Acceptable (70-79)	Satisfies the requirements. The bidder has demonstrated that it has the relevant experience, ability, understanding, skills, and resources required to deliver the project on time. Sufficient supporting evidence provided.
Some Reservation (50-69)	The submission does not fully meet the requirements, and the bidder has not sufficiently demonstrated that it has the relevant experience, ability, understanding, skills, and resources necessary to deliver the project on time. Insufficient supporting evidence provided.
Unacceptable (0-49)	Feature is absent. Does not comply and/or provides scarce information demonstrate that the bidder has the ability, understanding, skills, and resources required to deliver the project on time.

Qualification conditions: A bidder's technical proposal shall be declared qualified provided:

1. It meets required required minimum scores against respective criteria;
2. It meets at least 70% of the aggregate maximum score.

Price Bids of Bidders whose Technical Bids passed the minimum technical score will be opened and further evaluated. The lowest evaluated bid will be determined as the most advantageous and substantially responsive bid.

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

1.2 Completion Time

Not applicable.

1.3 Technical Alternatives

Not applicable.

1.4 Specialist Subcontractors

Only the specific experience of Specialist Subcontractors for key activities specified in criterion 2.4.2 Construction Experience in Key Activities will be considered. The experience of Specialist Subcontractors in contracts of similar size and nature, and their financial resources shall not be added to those of the Bidder for purposes of qualification of the Bidder.

1.5 Quantifiable Nonconformities and Omissions

Subject to ITB 14.2 and ITB 37.2, the evaluated cost of quantifiable nonconformities including omissions, is determined as follows:

Pursuant to ITB 31.3, the cost of all quantifiable nonmaterial nonconformities shall be evaluated, including omissions in Daywork where competitively priced but excluding omission of prices in the Bill of Quantities. Additive items identified in the Bill of Quantities shall not be considered omissions for purposes of bid evaluation. The Employer will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of bids.

1.6 Domestic Preference

Domestic preference shall not apply.

1.7 Other Criteria

1.7.1 Environmental, Health and Safety Management Plan (EHSMP)

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

1.7.2 Sustainable Procurement

The following sustainable procurement technical requirements will be evaluated on a pass/fail basis.

- Existence of Company's Ethics Charter; and
- Existence of company procedures for the Management of Waste and Hazardous Materials.

1.7.3 Life Cycle costs (for Financial Evaluation)

Not applicable.

1.8 Multiple Contracts

Not applicable.

2. Qualification

2.1 Eligibility

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

2.1.1 Nationality

Nationality in accordance with ITB 4.2.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI – 1; ELI – 2 with attachments
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2.1.2 Conflict of Interest

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

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

Bidder required to meet conditions of ITB 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1, ELI - 2 with attachments
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2.1.5 United Nations Eligibility

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

2.2.1 History of NonPerforming Contracts

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Non-performance of a contract ^a did not occur as a result of contractor default since 1 January 2020.	Must meet requirement	Must meet requirement	Must meet requirement ^b	Not Applicable	Form CON-1

^a Nonperformance, as decided by the Employer, shall include all contracts where (a) nonperformance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Nonperformance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Nonperformance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

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

2.2.2 Suspension Based on Execution of Bid-Securing Declaration

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

2.2.3 Pending Litigation and Arbitration

Not applicable.

2.2.4 Declaration: Environmental, Health and Safety Past Performance

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
No contract(s) have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, health and safety and sexual exploitation, abuse and harassment contractual obligations in the past five years.	Must make the declaration. If the bidder proposes Specialist Sub-contractor/s to meet EQC 2.4.2, those Specialist Sub-contractor/s must also make the declaration	Not applicable	Each partner must make the declaration. If the bidder proposes Specialist Sub-contractor/s to meet EQC 2.4.2, those Specialist Sub-contractor/s must also make the declaration	Not applicable	Form CON-2

2.3 Financial Situation

2.3.1 Historical Financial Performance

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Submission of audited financial statements or, if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, for the last 3 years (2023, 2024, 2025) to demonstrate the current soundness of the Bidder's financial position. As a minimum, the Bidder's net worth for the last year, calculated as the difference between total assets and total liabilities should be positive.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form FIN - 1 with attachments

2.3.2 Average Annual Construction Turnover

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Minimum average annual construction turnover of US\$ 5,200,000, calculated as total certified payments received for contracts in progress or completed, within the last 3 (three) years.	Must meet requirement	Must meet requirement	Must meet 40% of the requirement	Must meet 60% of the requirement	Form FIN - 2

2.3.3 Financial Resources

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

Criteria	Compliance Requirements			Documents	
	Single Entity	Joint Venture			Submission Requirements
All Partners Combined		Each Partner	One Partner		
<p>For Single Entities: The Bidder must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its current contract commitments defined in FIN - 4, meet or exceed the total requirement for the Subject Contract of US\$ 650,000</p>	Must meet requirement	Not applicable	Not applicable	Not applicable	Form FIN – 3 and Form FIN – 4
<p>For Joint Ventures: (1) One partner must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its own current contract commitments defined in FIN - 4, meet or exceed its required share of US\$ 260,000 from the total requirement for the Subject Contract.</p> <p>AND</p>	Not applicable	Not applicable	Not applicable	Must meet requirement	Form FIN – 3 and Form FIN – 4
<p>(2) Each partner must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its own current contract commitments defined in FIN - 4, meet or exceed its required share of US\$ 162,500 from the total requirement for the Subject Contract.</p> <p>AND</p>	Not applicable	Not applicable	Must meet requirement	Not applicable	Form FIN – 3 and Form FIN – 4
<p>(3) The joint venture must demonstrate that the combined financial resources of all partners defined in FIN - 3, less all the partners' total financial obligations for the current contract commitments defined in FIN - 4, meet or exceed the total requirement for the Subject Contract of US\$ 650,000.</p>	Not applicable	Must meet requirement	Not applicable	Not applicable	Form FIN – 3 and Form FIN – 4

2.4 Construction Experience

2.4.1 Contracts of Similar Size and Nature

Criteria	Compliance Requirements			Documents	
	Requirement	Single Entity	Joint Venture		
All Partners Combined			Each Partner	One Partner	
Participation as a contractor, Joint Venture partner, or Subcontractor, in at least one contract that has been satisfactorily and substantially completed within the last 5 (five) years and that is similar to the proposed works, where the value of the Bidder's participation exceeds US\$ \$2,200,000 (in a single contract) The similarity of the Bidder's participation shall be based on <ol style="list-style-type: none"> 1. Excavation of legacy solid waste: 5,000 cubic meters 2. Earthworks to provide engineered fill: 5,000 cubic meters. 3. Installation of drainage geo-composite sheets and leachate collection pipes , similar to the proposed work. 4. Design and construction of a pre-fabricated building of 200 square meters. 	Must meet requirement	Not applicable	Not applicable ^c	Must meet requirement	Form EXP – 1 ^d

- Substantial completion shall mean that the works completion certificate or the works taking-over certificate has been issued and by the client and the works are put to use irrespective of release of payments from the Client.
- For contracts under which the Bidder participated as a Joint Venture partner or Subcontractor, only the Bidder's share, by value, shall be considered to meet this requirement.
- For contracts implemented by a Joint Venture contractor, if the Bidder comprises the same Joint Venture, the 'Single Entity' requirements will apply.
- In addition to the submission requirement Form EXP – 1, the Bidder shall provide the following supporting documents:
 1. Signed Contract Agreement, and
 2. Certificate of Completion of the Works, Taking-Over Certificate (or equivalent) or Performance Certificate,

in sufficient detail to verify the contract name, value and completion time (or substantial completion). If the documents are other than in English, an accurate certified translation of these documents in English shall be provided.

- In case the contract value stated in the supporting document is other than USD, for the purpose of the determination of the value of the work(s) completed the exchange rate prevailing on the day of issuance of the relevant supporting document shall be considered.

2.4.2 Construction Experience in Key Activities

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

Table A

Criteria Requirement	Compliance Requirements		Documents
	Single Entity	Joint Venture	Submission Requirements
For the above or other contracts executed during the period stipulated in 2.4.1, a minimum construction experience in the following key activities:	Must meet requirement	Must meet requirement	Form EXP – 2 ^a
Construction of engineered landfill or similar environmental containment facility (e.g., lined waste facility, tailings facility, wastewater lagoon with liner system) in a single contract	Must meet requirement	At least one partner must meet requirement	Form EXP-2

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

2.4.2. (b) The Employer accepts any of the following activities to be subcontracted. They may be complied with by the Bidder or by its proposed Specialist Subcontractor.

If the key activity is to be undertaken by a Specialist Subcontractor, the Employer shall require evidence of the subcontracting agreement from the Bidder.

Table B

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
For the above or other contracts executed during the period stipulated in 2.4.1, a minimum construction experience is required in the following key activities:	Must meet requirement	Must meet requirement	Form EXP – 2 ^a
Construction/installation of leachate collection system , including perforated HDPE piping and drainage layer/geocomposite, in a landfill	The bidder or the proposed Specialist Subcontractor Must meet requirement	Any of the JV partner or the proposed Specialist Subcontractor Must meet requirement	Form EXP – 2

or similar facility of at least 7,500 square meter in size.			
Construction in coastal, high-groundwater, or soft/unstable ground conditions , including experience with ground improvement, working over waste, or geosynthetic reinforcement systems (e.g., geogrid bridging) of at least 7,500 square meter in size.	The bidder or the proposed Specialist Subcontractor Must meet requirement	Any of the JV partner or the proposed Specialist Subcontractor Must meet requirement	Form EXP – 2
Provision and installation of weighbridge of minimum 50 Tons capacity in a single contract	The bidder or the proposed Specialist Subcontractor Must meet requirement	Any of the JV partner or the proposed Specialist Subcontractor Must meet requirement	Form EXP – 2
Design, supply, installation, testing, and commissioning of a submersible leachate (or similar wastewater) pump system (indicatively ~75 GPM @ 15 ft TDH), including sump, controls, and all associated works for conveyance.	The bidder or the proposed Specialist Subcontractor Must meet requirement	Any of the JV partner or the proposed Specialist Subcontractor Must meet requirement	Form EXP – 2

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

2.4.3 Specific Experience in Managing Environmental, Health and Safety Aspects

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
: Experience of implementing environmental and social safeguards, including engagement with local communities for routine maintenance and construction activities	The bidder or the proposed Specialist Subcontractor Must meet requirement	Any of the JV partner or the proposed Specialist Subcontractor Must meet requirement	Form EXP – 3

2.5 Organizational Environmental, Health and Safety System

2.5.1 Environmental, Health and Safety Certification

Criteria	Compliance Requirements		Documents
Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
<p>Availability of a valid ISO certification or recognized equivalent (equivalency to be demonstrated by the Bidder), applicable to the worksite.</p> <p>Environmental management certificate ISO 14001:2014</p> <p>1. Health and Safety certificate ISO 45001</p> <p>In lieu of ISO certification, the Bidder shall demonstrate ISO certification equivalency as follows:</p> <p>1. Environmental Management (ISO 14001 Equivalent).</p> <ul style="list-style-type: none"> ○ The Bidder shall demonstrate Project-Specific Environmental Management Plan (EMP) aligned with: <ul style="list-style-type: none"> ▪ RMI EPA requirements ▪ ADB IEE mitigation measures ○ The Bidder shall provide evidence of experience with: <ul style="list-style-type: none"> • Waste handling procedures • Spill prevention and response • Erosion and sediment control <p>2. Health & Safety (ISO 45001 Equivalent)</p> <ul style="list-style-type: none"> ○ Site-Specific Health and Safety Plan (HSP) including: <ul style="list-style-type: none"> • Hazard 	<p>Must meet requirements</p>	<p>One member must meet requirements</p>	<p>Form EXP – 4</p>

<ul style="list-style-type: none"> identification (JHA/JSA) <ul style="list-style-type: none"> • PPE requirements • Toolbox meetings • Incident reporting procedures ○ Evidence of: <ul style="list-style-type: none"> • Past safe work performance • Training records (even informal) 			
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2.5.2 Environmental, Health and Safety Documentation

Criteria	Compliance Requirements		Documents
Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
<p>Availability and adequacy of Environmental, Health and Safety (EHS) management systems demonstrating the Bidder's capacity to implement the Works in accordance with the EMP and ADB SPS (2009).</p> <p>The Bidder shall provide evidence of an established Environmental, Health and Safety (EHS) management system, including health and safety procedures (e.g., HSE Manual, Health and Safety Plan, Injury and Illness Prevention Plan or equivalent), appropriate to the nature and scale of the Works</p> <p>The Bidder shall demonstrate that such EHS systems have been implemented on at least one construction project of similar nature or complexity</p>	<p>At least one member must meet requirement</p>	<p>At least one member must meet requirement</p>	<p>Copy or summary of EHS manual, policy, or procedures</p> <p>Technical Proposal</p> <p>Brief description of project(s) (may be included in Form EXP 5)</p>

2.5.3 Environmental, Health and Safety Dedicated Personnel

Criteria	Compliance Requirements		Documents
Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
Availability of qualified Environmental, Health and Safety personnel to implement the EMP and CEMP during construction.	Must meet requirements	At least One member must meet requirements	CV (Form PER-1)

Section 4: Bidding Forms

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Letter of Technical Bid

-Note-

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

Date:

OCB No.:

Invitation for Bid No.:

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

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.
- (c) We offer to execute in conformity with the Bidding Documents the following Works: *[insert narrative]*
- (d) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of *[insert bid validity period as specified in ITB 18.1 of the BDS]* days starts from the date fixed for the bid submission deadline in accordance with ITB 22.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (e) Our firm, including any Subcontractors or Suppliers for any part of the Contract, have nationalities from eligible countries in accordance with ITB 4.2.
- (f) We, our directors, key officers, key personnel, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3.

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

- (i) Parties involved in the conflict of interest: _____
- (ii) Details about the conflict of interest: _____

- (g) We are not participating, as a Bidder, either individually or as partner in a Joint Venture, in more than one Bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers submitted in accordance with ITB 13.
- (h) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Asian Development Bank or a debarment imposed by the Asian Development Bank in accordance with the Agreement for

Mutual Enforcement of Debarment Decisions between the Asian Development Bank and other development banks.¹

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

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

- (i) Name of the multilateral development bank: _____
 (ii) Reason for the ongoing investigation / allegations: _____

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

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

- (i) Name of Institution: _____
 (ii) Period of the temporary suspension, debarment, ineligibility, or national or international sanction [*start and end date*]: _____
 (iii) Reason for the temporary suspension, debarment, ineligibility, or national or international sanction: _____

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

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

- (i) Nature of the offense, violation, proceedings, investigation, and/or monitorship or enforcement actions: _____
 (ii) Court, area of jurisdiction and/or the enforcement agency: _____
 (iii) Resolution [*i.e. dismissed; settled; or convicted/duration of penalty*]: _____
 (iv) Other relevant details [*please specify*]: _____

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

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

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

- (i) Nature of the restriction: _____
- (ii) Jurisdiction of the restriction: _____
- (iii) Other relevant details: _____

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

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

Name of Recipient	Address	Reason	Amount
.....
.....

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

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

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

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

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

- (t) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the

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

³ Use one of the two options as appropriate.

works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.

- (u) If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 6 (Employer's Requirements) and our technical proposal, or as otherwise agreed with the Employer.
- (v) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded, and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Letter of Price Bid

-Note-

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

Date:

OCB No.:

Invitation for Bid No.:

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

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.
- (c) We offer to execute in conformity with the Bidding Documents the following Works: *[insert narrative]*
- (d) The total price of our Bid, excluding any discounts offered in item (d) below is:

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

The total bid price from the Summary of Bill of Quantities for admeasurement contracts or Activity Schedule for lump sum contracts should be entered by the bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.

- (e) The discounts offered and the methodology for their application are as follows: *[insert discounts and methodology for their application if any]*
- (f) Our Bid shall be valid for a period of *[insert bid validity period as specified in ITB 18.1 of the BDS]* days starts from the date fixed for the bid submission deadline in accordance with ITB 22.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

- (g) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents.
- (h) We understand that this bid, together with your written acceptance thereof included in your notification of award through the issuance of Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed.
- (i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (j) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our site, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.
- (k) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.
- (l) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.
- (m) We confirm and stand by our commitments and other declarations made in connection with the submission of our Letter of Technical Bid.
- (n) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded; and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Bid Security

Not Applicable

Bid-Securing Declaration

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

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

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

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

We, the undersigned, declare that:

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

We accept that we will automatically be suspended from being eligible for bidding in any contract with the Borrower for the period of time of five (5) years starting on the date that we receive a notification from the Employer, if we are in breach of our obligation(s) under the bid conditions, because we

- (a) have withdrawn our Bid during the period of bid validity specified in the Letter of Technical Bid and Letter of Price Bid; or
- (b) do not accept the correction of errors in accordance with the Instruction to Bidders (hereinafter “the ITB”); 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, if required, (ii) fail or refuse to furnish the Performance Security, in accordance with the ITB, or (iii) fail or refuse to furnish the Domestic Preference Security, if required.

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

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

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

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

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

Dated on _____ day of _____, _____

Corporate Seal *[where appropriate]*

Affiliate Company Guarantee

Not Applicable

Technical Proposal

Personnel

Form PER – 1: Proposed Personnel

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

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

-- Note --

All titles of positions will be as listed in Section 6 (Employer's Requirements) and covered in "2.5.3" of Section 3 (Evaluation and Qualification Criteria).

Form PER – 2: Resume of Proposed Personnel

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

Position		
Personnel information	Full Legal Name	Date of birth
	Known as	Place of Birth
	Nationality	Citizenship
	Type of Government ID	ID number
	Attach a copy of ID to this form	
	Professional qualifications	
Present employment	Name of employer	
	Address of employer	
	Telephone	Contact (manager / personnel officer)
	Fax	E-mail
	Job title	Years with present employer

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

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

Equipment

Form EQU: Equipment

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

Item of Equipment	
Equipment Information	Name of manufacturer
	Capacity
	Model and power rating
	Year of manufacture
Current Status	Current location
	Details of current commitments
Source	Indicate source of the equipment
	<input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured

Omit the following information for equipment owned by the Bidder.

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

Site Organization

The Bidder shall provide a Site organization chart illustrating the proposed management structure and reporting lines. The organization chart shall include the names of all Key Personnel. The Site organization shall be developed with focus on the following aspects:

- (a) Adequacy of the staff in terms of numbers and suitability in respect of the responsibility;
- (b) Clarity in reporting requirements and line of instructions;
- (c) Discouragement of the multiple responsibilities;
- (d) Backstop support and monitoring by the head office for timely action on resolving any issue.

Method Statement

The Bidder shall provide its method statements for carrying out the following activities. The method statement shall describe the proposed approach, the level of staffing and experience, the safe system of work, and the equipment or materials to be used to manage risk or activity in accordance with the Employer's Requirements.

The proposed Method statement shall focus and include but not limited to the following:

- (a) Bidder's understanding of the Employer's requirements and its ability to meet the contract objective;
- (b) Ensuring completion of the works within the stipulated Time for Completion;
- (c) Bidder's ability to Manage Site specific conditions and issues;
- (d) Establishing coordination of Site access and dealing with activities requiring multiple expertise;
- (e) Bidder's approach to conducting various surveys and investigations;
- (f) Bidder's Management skills and plan to deal with storm water, drainage, subsurface aspects and leachates;
- (g) Ensure efficient Landfill Gas management to avoid any risk;
- (h) Ensure compliance with Environmental safeguard rules and regulations;
- (i) Bidder's ability to Manage Safety aspects at site, emergency response and reporting;
- (j) Ensure adequate Waste transport methodology;
- (k) Method statement shall be consistent with Bidder's Mobilization Schedule and Construction Schedule;
- (l) Compliance with Quality assurance and Quality control (QA/QC) management; and
- (m) Bidder's approach for Cleaning, Site Development and handing over at the completion of the works.

Mobilization Schedule

The Bidder shall set out a Mobilization Schedule sufficient in detail demonstrating achievement of the contract objectives in defined time. The proposed Mobilization schedule shall include but not limited to the following:

- (a) Deployment of all major resources commensurate with the major milestone proposed under the Construction schedule;
- (b) Mobilization equipment consistent with construction schedule;
- (c) Deployment schedule of the manpower and the sub-contractor/ third-party if proposed in the bid.

Construction Schedule

The Bidder shall set out a Construction Schedule covering construction of all major activities to be undertaken, including identification of major milestones and critical path. The proposed Construction schedule shall demonstrate bidder's understanding of the Employer's requirements and include but not limited to the following:

- (a) Overall completion of the contract activities including all major milestones;
- (b) Interdependence of major activities and critical path highlighting activities imposing constraints on the construction sequence;
- (c) Consistency and compatibility among the schedule of all major activities, delivery schedule of equipment and mobilization schedule of manpower and third party/ subcontractor inputs;
- (d) Schedule of completion, testing and commissioning, and handing over of various components under the contract.

Environmental, Health and Safety Management Plan (EHSMP)

The Bidder shall submit an outline Environmental, Health and Safety Management Plan (EHSMP) commensurate with the risks and impacts of the proposed works and activities. These strategies and plans shall describe in detail the actions, materials, equipment, management processes etc. that will be implemented by the Contractor, and its subcontractors.

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

Environmental, Health and Safety Code of Conduct

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

Note to Bidder

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

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

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

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

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

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

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

REQUIRED CONDUCT

Contractor's Personnel shall:

1. carry out his/her duties competently and diligently;
2. comply with this EHS Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
3. maintain a safe working environment including by:
 - (a) ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
 - (b) wearing required personal protective equipment;
 - (c) using appropriate measures relating to chemical, physical and biological substances and agents; and
 - (d) following applicable emergency operating procedures.
4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;

- 5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
- 6. report violations of this EHS Code of Conduct; and
- 7. not retaliate against any person who reports violations of this EHS Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor’s Personnel or the project’s Grievance Redress Mechanism.

RAISING CONCERNS

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

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

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

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

FOR CONTRACTOR’S PERSONNEL:

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

Name of Contractor’s Personnel: [*insert name*]

Signature: _____

Date: [*day month year*]: _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: [*day month year*]: _____

Bidder's Qualification

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

Form ELI – 1: Bidder’s Information Sheet

Bidder’s Information			
		Information of the Bidder	If the Bidder is a subsidiary or branch, information of any parent company/companies
Names	Full legal name(s)		
	Full trading name(s) (if any)		
Addresses	Registered address(es)		
	Trading address(es)		
	Postal address(es) (if different from trading address)		
Type of organization			
Country of constitution/incorporation/registration			
Year of constitution/incorporation/ registration			
Corporate or registration number			
In case of a Joint Venture, legal name of each partner			
Bidder’s authorized representative <small>(name, address, telephone number(s), fax number(s), e-mail address)</small>			
<p>Attached are copies of the following documents.</p> <ol style="list-style-type: none"> 1) In case of a single entity, articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2. 2) Authorization to represent the firm or Joint Venture named above, in accordance with ITB 20.2. 3) In case of a Joint Venture, a letter of intent to form a Joint Venture or Joint Venture agreement, in accordance with ITB 4.1. 4) In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5. 			

Form ELI - 2: Joint Venture Information Sheet

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

Joint Venture / Specialist Subcontractor Information		
Bidder's legal name		
	Information of Joint Venture Partner or Specialist Subcontractor	If any Joint Venture Partner or Specialist Subcontractor is a subsidiary or branch, information of any parent company/companies
Names	Full legal name(s)	
	Full trading name(s) (if any)	
Addresses	Registered address(es)	
	Trading address (es)	
	Postal address (es) (if different from trading address)	
Type of organization		
Country of constitution/incorporation/ registration		
Year of constitution/incorporation/ registration		
Corporate or registration number		
Joint Venture Partner's or Specialist Subcontractor's authorized representative information (name, address, telephone number(s), fax number(s), e-mail address)		
Attached are copies of the following documents. <ol style="list-style-type: none"> 1) Articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2. 2) Authorization to represent the firm named above, in accordance with ITB 20.2. 3) In the case of a government-owned enterprise, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5. 		

Form CON - 1: Historical Contract Nonperformance

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

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

Joint Venture Partner: _____

Table 1: History of Nonperforming Contracts			
<p>Choose one of the following:</p> <p><input type="checkbox"/> No nonperforming contracts.</p> <p><input type="checkbox"/> Below is a description of nonperforming contracts involving the Bidder (or each Joint Venture partner if Bidder is a Joint Venture).</p>			
Year	Description	Amount of Nonperformed Portion of Contract (US\$ equivalent)	Total Contract Amount (US\$ equivalent)
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for nonperformance: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>	<i>[insert amount]</i>
Table 2: Pending Litigation and Arbitration			
Not Applicable			

Form CON – 2: EHS Performance Declaration

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

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

Joint Venture Partner: _____

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

Specialist Subcontractor: _____

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

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

Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US\$ equivalent)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street/city/country] Reason(s) for suspension or termination: [indicate main reason(s) e.g. discharge over environmental limit, workers did not have required health and safety permits to undertake high risk work, work carried out was not adhered to approved construction methodology and quality control plan]	[insert amount]
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Employer: [insert full name]	[insert amount]

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

Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

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

Joint Venture Partner: _____

Financial Data for Previous 3 (three) Years [US\$ Equivalent]		
Year 1:	Year 2:	Year ___:

Information from Balance Sheet

Total Assets (TA)			
Total Liabilities (TL)			
Net Worth =TA – TL			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital = CA - CL			

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

Total Revenues			
Profits Before Taxes			
Profits After Taxes			

- Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last **3 (three)** years, as indicated above, complying with the following conditions.
- 1) Unless otherwise required by Section 3 of the Bidding Document, all such documents reflect the standalone financial situation of legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries, or affiliates.
 - 2) Historical financial statements must be audited by a certified accountant.
 - 3) Historical financial statements must be complete, including all notes to the financial statements.
 - 4) Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

Form FIN - 2: Average Annual Construction Turnover

Each Bidder must fill out this form.

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

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

Joint Venture Partner: _____

Annual Turnover Data for the Last 3 (three) Years (Construction only)			
Year	Amount Currency	Exchange Rate	US\$ Equivalent
Average Annual Construction Turnover			

Form FIN – 3: Availability of Financial Resources

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

- (a) its current contract commitments, and
- (b) the subject contract.

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

Joint Venture Partner: _____

Financial Resources		
No.	Source of financing	Amount (US\$ equivalent)
1	Working Capital (to be taken from FIN - 1)	
2	Unutilized Cash (or Overdraft) Credit Line ^a	
3	Other Financial Resources not covered under 1 and/or 2 above	
	Total Available Financial Resources	

^a To be substantiated by a letter [stating categorically the amount of Unutilized Cash (or Overdraft) Credit Line] from the bank, issued not before 3 months prior to the deadline for bid submission.

Form FIN- 4: Financial Resources Requirement

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

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

Joint Venture Partner: _____

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

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

^b Remaining contract period to be calculated from 28 days prior to bid submission deadline.

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

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

Form FIN - 5A: For Single Entities

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

Form FIN - 5B: For Joint Ventures

For Joint Ventures: (A)	Total Available Financial Resources from FIN – 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 4 (C)	Available Financial Resources Net of CCC $D = (B - C)$	Requirement for the Subject Contract (E)	Results: Yes or No [D must be greater than or equal to E] (F)
One Partner:					
_____ (Name of Partner)				
Each Partner:					
_____ (Name of Partner 1)				
_____ (Name of Partner 2)				
_____ (Name of Partner 3)				
All partners combined	$\Sigma D =$ Sum of available financial resources net of current contract commitments for all partners		$\Sigma D =$ _____	

- Note -

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

Form EXP – 1: Contracts of Similar Size and Nature

Fill up one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement or Certificate of Completion of the Works.

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

Contract of Similar Size and Nature		
Contract No of	Contract Identification	
Award Date	Completion Date	
Total Contract Amount	US\$	
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer’s Name Address Telephone/Fax Number E-mail		
Description of the Similarity in Accordance with Criterion 2.4.1 of Section 3 (Evaluation and Qualification Criteria)		

Form EXP - 2: Construction Experience in Key Activities

Fill up one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement or Certificate of Completion of the Works.

Each Bidder must fill out this form.

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

Specialist Subcontractor: _____

Contract with Similar Key Activities		
Contract No of	Contract Identification	
Award Date	Completion Date	
Total Contract Amount	US\$	
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's Name Address Telephone Number Fax Number E-mail		
Description of the Key Activities in Accordance with Criterion 2.4.2 of Section 3 (Evaluation and Qualification Criteria)		

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

Fill out one form per contract.

Bidder must fill out this form. In case of a Joint Venture, at least one of the Joint Venture Partner must fill out this form and provide the Joint Venture Partner’s name:

Joint Venture Partner: _____

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

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Subcontractor <input type="checkbox"/>
Total Contract Amount			US\$	
Details of relevant experience				

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

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

Form EXP – 4: Environmental, Health and Safety Certification

Please provide the following information:

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

1. Environmental management certificate ISO 14001
2. Health and Safety certificate ISO 45001

Schedules

Schedule of Payment Currencies

Not Applicable

Table(s) of Adjustment Data

Index Code	Index Description	Source of Index	Base Value and Date	Weighting (coefficient)
Non Adjustable				A = 0.20
----- <i>To be entered by the Bidder</i>	----- <i>To be entered by the Bidder</i>	----- <i>To be entered by the Bidder</i>	----- <i>To be entered by the Bidder</i>	0.80
Total				1.00

-- Notes --

- "Base Date" means the date 28 days prior to the deadline for submission of bids.
- The "Source of Index" should be issued or published within the country to which the equipment/material relates.

Bill of Quantities

Construction of New Landfill site and associated infrastructure at Ebeye Landfill

No	ITEM	UNIT	QUANTIT Y	RATE (USD)	AMOUNT (USD)
2	Mobilization				
2.1	Mobilize equipment and materials, Technical Specification Section 01 50 00	LS	1		
2.2	Set up site office and worker accommodations, Technical Specification Section 01 50 00	LS	1		
2.3	Establish temporary utilities (power, water), Technical Specification Section 01 50 10	LS	1		
2.4	Provisional Sum for Safeguard Compliance, per Initial Environmental Examination	LS	1		
3	Earth Work Building and Entry Road				
3.1	Excavate 3,000 m ³ legacy waste (20m x 40m footprint), transport to and build stockpile. Technical Specification Section 31 23 20	m ³	3,000		
3.2	Place 3,000 m ³ engineered fill for building/road area, Technical Specification Section 31 20 00 and 31 23 23	m ³	3,000		
3.3	Paving Entrance Road, excluding Weighbridge Concrete Foundation, Technical Specification Section 32 12 16	m ²	440		
4	Prefabricated Building				
4.1	A/E Design Services, Technical Specification Section 13 34 19	LS	1		
4.2	Prefabricated Building Supply and Delivery Technical Specification Section 13 34 19	LS	1		

4.3	Foundation Construction, Technical Specification Section 13 34 19	LS	1		
4.4	Methane Foundation Membrane, Technical Specification Section 07 21 29	LS	1		
4.5	Methane Interception Trench, Technical Specification Section 07 21 29	LS	1		
4.6	Methane Monitoring System, Technical Specification Section 07 21 29	LS	1		
4.7	Utility Connections, Technical Specification Section 13 34 19	LS	1		
4.8	Installation and Fit-out, Technical Specification Section 13 34 19	LS	1		
4.9	Testing and Handover, Technical Specification Section 13 34 19	LS	1		
5	Demolition				
5.1	Demolish existing operations building, incinerator, and small building, Technical Specification Section 02 41 00	LS	1		
6	Phase 1: Legacy Waste Excavation and Stockpiling				
6.1	Excavate 1,150 m ³ legacy waste for peripheral road, initial stripping, transport to and build stockpile, Technical Specification Section 31 23 20	m ³	1,150		
6.2	Excavate 13,000 m ³ legacy waste (south side), , transport to and build stockpile, Technical Specification Section 31 23 20	m ³	10,453		
6.3	Installation of Three (3) Temporary Drive-Point Wells, Technical Specification Section 33 49 13	LS	1		
6.4	Leachate Sampling Event from Leachate, Technical Specification Section 33 49 13	LS	1		

6.5	Laboratory analysis of composite leachate sample, Technical Specifications Section 33 49 13	LS	1		
7	Phase 1: Liner System Installation (South Side)				
7.1	Peripheral Road Fill, 4,586 m ³ , Technical Specification Section 31 20 00 and 31 32 19	m ³	4,586		
7.2	Saturated Bridge Design Technical Specification Section 31 05 19	m ²	3,472		
7.3	Global Bridge Design Technical Specification Section 31 05 23	m ²	7,600		
7.4	Install 7,600 m ² GCL and 80mil HDPE liner, Technical Specification Section 07 32 19	m ²	7,600		
7.5	Install 6,621 m ² drainage geo-composite, Technical Specification Section 07 32 19	m ²	6,621		
7.6	Install 522 m of 6-inch HDPE leachate collection headers, Technical Specification Section 33 31 13	m	522		
7.7	Non-perforated Riser Installation, 5 risers each 5 meters long, Technical Specification Section 33 31 13	each	11		
7.8	Landfill Gas Passive Vent, 165 meter of trench, with 0.5 meter by 0.5 meter gravel filled section, Technical Specification Section 31 23 23 10	m	165		
7.10	Placement of nonwoven geotextile and initial waste lift, Technical Specification Section 31 25 23	m ²	7,600		
8	Phase 2: Legacy Waste Relocation and Liner Completion				
8.1	Excavate 14,150 m ³ from temporary stockpile and transport to new lined landfill and place following initial filling procedures,	m ³	11,603		

	Technical Specification Section 31 23 23 20				
8.2	Excavate 10,007 m ³ of legacy waste (north side) and transport to new lined landfill and place following initial filling procedures, Technical Specification Section 31 23 23 20	m ³	8,397		
9	Phase 2: Liner System Installation (North Side)				
9.1	Peripheral Road Fill, 3,319 m ³ , Technical Specification Section 31 20 00 and 31 23 23	m ³	3,319		
9.2	Saturated Bridge Design, Technical Specification Section 31 05 19	m ²	0		
9.3	Install Global Bridge Design, Technical Specification Section 31 05 19	m ²	5,500		
9.4	Install 5,500 m ² GCL and 80 mil HDPE liner, Technical Specification Section 07 32 13	m ²	5,500		
9.5	Install 4,792 m ² drainage geo-composite, Technical Specification Section 31 71 19	m ²	4,792		
9.6	Install 378 ft of 6-inch HDPE leachate collection headers, Technical Specification Section 33 31 13	m	378		
9.7	Non-perforated Riser Installation, 6 risers each 5 meters long, Technical Specification Section 33 31 13	each	6		
9.9	Landfill Gas Passive Vent, 120 m, Technical Specification Section 31 23 23 10	m	120		
9.10	Placement of nonwoven geotextile and first waste lift, Technical Specification Section 31 25 23	m ²	5,500		

10	Drainage Infrastructure				
10.1	Install 550 m drainage channel on peripheral road, Technical Specification Section 33 42 36	m	550		
10.2	Drop Inlet, Technical Specification Section 33 40 00	LS	1		
10.3	Box Culvert, 15 m long, Technical Specification Section 33 41 00	LS	1		
11	Pitless Weighbridge System				
11.1	Weighbridge 20 ton System & Scalehouse Supply and Delivery, Technical Specification Section 13 56 13	LS	1		
11.2	Civil Works, Technical Specification Section 13 56 13	LS	1		
11.3	Electrical and Wiring Works, Technical Specification Section 13 56 13	LS	1		
11.4	Installation and calibration, Technical Specification Section 13 56 13	LS	1		
11.5	Testing, Commissioning and Training, Technical Specification Section 13 56 13	LS	1		

12	Security Fencing				
12.1	Install 570 m anti-climb security fence, including entry and exit gates, Technical Specification Section 31 32 13	m	570		
12.2	Entry and exit gates, Technical Specification Section 31 32 13	each	2		
13	Sedimentation Basin				
13.1	Construct 16m x 26m x 1.5m Sedimentation basin, including inlet and outlet structures, no basin liner, Technical Specification Section 31 25 00	LS	1		
14	Submersible Leachate Pump System				
146.1	Leachate Pump Station Design, 75 gpm, TDH 15 feet, Technical Specification Section 33 46 16	LS	1		
14.2	Pump and Control Panel Supply and Delivery, Technical Specification Section 33 46 16	LS	1		
14.3	Electrical Works, Technical Specification Section 33 46 16	LS	1		
14.4	Installation and Commissioning, Technical Specification Section 33 46 16	LS	1		
15	Facility Lighting				
15.1	Solor Powers Area Lighting, Technical Specification Section 26 56 00	Each	17		
16	Demobilization				

16.1	Remove equipment and materials, Technical Specification Section 02 41 00	LS	1		
16.2	Site cleanup and final inspection, Technical Specification Section 02 41 00	LS	1		
17	Project Signage, Technical Specifications Section 01 58 16	LS	1		
	TOTAL				

Additive Items (Not Included in Bid Evaluation)

Bidders shall provide prices for all Additive Items. These items shall not be included in the Bid Price for purposes of bid evaluation. The Employer may, at its discretion and subject to availability of funds, include any or all Additive Items in the Contract.

No	ITEM	UNIT	QUANTIT Y	RATE (USD)	AMOUNT (USD)
18	Deisel Fueling System				
18.1	500 gallon Fuel Tank and Accessories, Supply and Delivery, Technical Specification Section 23 13 29	LS	1		
18.2	Site Preparation and Foundation, Technical Specification Section 23 13 29	LS	1		
18.3	Electrical and Piping Installation, Technical Specification Section 23 13 29	LS	1		
18.4	Testing and Commissioning, Technical Specification Section 23 13 29	LS	1		
19	Seawater Fire Pump System				
19.1	Seawater Pump Station Design, 550 gpm, 75 psi, Technical Specification Section 21 35 14.10	LS	1		

19.2	Fire Pump Supply and Delivery, Technical Specification Section 21 35 14.10	LS	1		
19.3	Civil Construction, Technical Specification Section 21 35 14.10	LS	1		
19.4	Electrical and Control Works, Technical Specification Section 21 35 14.10	LS	1		
19.5	Installation and Commissioning, Technical Specification Section 21 35 14.10	LS	1		

Section 5: Eligible Countries

This section contains the list of eligible countries.

Eligible countries are limited to all ADB members listed at www.adb.org/about/members, other than any restrictions arising from ITB 4.8.



**Ministry of Works Ministry of Public Works, Infrastructure and Utilities
Republic of Marshall Islands**

**Bidding Document of the Procurement of Works
Small Contracts (SBD Works)**

**Technical Requirements
(Section 6, Volume IIa)**

Ebeye Solid Waste Management Project

Executing Agency	Funding Agency	Implementing Agency	Beneficiary Institution
Ministry of Finance, Banking and Postal Services	Asian Development Bank (ADB)	Ministry of Public Works, Infrastructure and Utilities	Kwajalein Atoll Local Government

Document Structure

Volume I	Project Description and Description of Works
Volume II_a	Specific Technical Specifications
Volume II_b	Technical Specification of mobile and semi-mobile Equipment
Volume III	Technical Designs (General Master Layouts, Architectural, Structural, MEP)
Volume IV	BOQ and Supporting Documents

Supporting Documents

Attachment_1	Property related Document
Attachment_2	Geotechnical investigation Report
Attachment_3	Topography related Documents
Attachment_4	Technical Calculation Report
Attachment_5	Codes and Standards
Attachment_6	Initial Environmental Examination

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Abbreviations

ADB	Asian Development Bank
BATNEEC	Best Available Technology Not Entailing Excessive Costs
B/C	Benefit to Cost Ratio
CAPEX	Capital Expenditure
CHP	Combined Heating Power generation plant
DED	Detail Engineering Design
DS	Dry Substance
EHS	Environmental, Health and Safety
EIB	European Investment Bank
EL	Elevation Level (absolute ground-level)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESWMP	Ebeye Solid Waste Management Project
EUR	Euro equals €
FNPV	Financial Net Present Value
FS	Feasibility Study
GRM	Grievance Redress Mechanism
HDPE	High Density Poly Ethylene
IFI	International Financing Institution
IT	Information Technology
ITP	Inspection and Test Plan
MaSl	Metres above sea level
MbSl	Metres below sea level
NGO	Non-Governmental Organization
NOL	Non-objection letter
O&M	Operation & Maintenance
OPEX	Operational Expenditure
PCU	Project Coordination Unit
PMU	Project Management Unit
POW	Programme of Work
RMI	Republic of Marshall Islands
SWM	Solid Waste Management
ToR	Terms of Reference
USD	US Dollar equal to US\$
VES	Vertical Electrical Sounding (Goelectrical Resistivity Investigation)
WRF	Waste Recovery Facility

Abbreviations of Units

c	Cohesion [in kPa]
cm	centimetre
d	day
f	Angle of internal friction [in °]
ha	Hectare = 10,000 m ²
J	Joule = 1 W.s
kf	Permeability [in cm/s]
kg	kilogram
kg/PE	Kilogram per Population Equivalent (equal to per Capita)
kJ	Kilojoule = 1 kW.s
km	kilometer
kN	kilo Newton
kPa	kilo Pascal (1 kPa = 1000 Pa = 0,1 N/cm ²)
kW	Kilowatt (10 ³ Watt)
kWh	kilowatt-hour = 3600 kJ = 3600 kW.s
mS/cm	milliSiemens per cm – unit for electrical conductivity (= dS/m)
m	meter
ml	milliliter
mm	millimeter
m ²	square meter
mm ²	square millimetre
m ³	cubic metre
N	Newton
Mg	Megagramme = Metric Ton = 10 ³ kg = 10 ⁶ grammes
no.	number
PE	Population Equivalent
%	Percentage
°C	Celsius
vw	Volumetric weight [in kN/m ³]
w	natural moisture [in]
y	Year = a

Chemical Elements and Organic Compounds

As	Arsenic
C	Carbon
Ca	Calcium
Cd	Cadmium
Cl	Chlorine

CO ₃	Carbonate
Cu	Copper
Hg	Mercury
K	Potassium
Mg	Magnesium
Mn	Manganese
Mo	Molybdenum
N	Nitrogen
Na	Sodium
NKjel	Total nitrogen by Kjeldahl
NO, NO ₂	Nitrogen monoxide, nitrogen dioxide (NO _x)
NO ₂ -N	Nitrite-nitrogen
NO ₃ -N	Nitrate nitrogen
NH ₄ -N	Ammonia-nitrogen
O ₃	Ozone
P	Phosphorus
Pb	Lead
Zn	Zinc
AOX	Sum parameter for water soluble "absorbable organic halogens" in which 'A' stands for absorbable, 'O' for organic and 'X' for the halogens chlorine, bromine and iodine
BOD5	Biochemical oxygen demand
BTEX	Acronym for Benzene, Toluene, Ethyl benzene and Xylene
COD	Chemical oxygen demand
CH ₄	Methane
PAH	Poly aromatic hydrocarbons
PCB	Poly chlorinated biphenyl
PCT	Poly chlorinated terphenyl
PM10 / PM2,5 / PM1	Suspended particulate matter < 10 / 2,5 / 1 µm
POPs	Persistent Organic Pollutants
SS	Suspended solids
T°C	Temperature
TOC	Total organic carbon
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TN	Total nitrogen
TOD	Total Oxygen Demand
TP	Total phosphorus
TPH	Total Petroleum Hydrocarbons
TSP	Total Suspended Particulates

VOC Volatile Organic Compounds

Standards and Codes

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AFNOR	French Industrial Standards
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CA	Contracting Authority
CCTV	Closed Circuit Television
CQS	Corporate Quality System
DVL	Design Verification Load
EN	European Standards
IBC	International Building Code
IEC	International Electro-technical Commission
ISO	International Organization for Standardization
NF	French Standards
PISC	Project Implementation Support Consultant = the Engineer
SDR	Standard Dimension Ratio
SLF	Sanitary Landfill
SPT	Standard Penetration Test
SWL	Service Working Load
UTE	Union Technique de l'Electricité
UL	Underwriting Laboratories

UNITS

c	Cohesion [in kPa]
cm	centimetre
f	Angle of internal friction [in °]
ha	Hectare = 10,000 m ²
J	Joule = 1 W.s
kf	Permeability [in cm/s]
kg	kilogramme
kJ	Kilojoule = 1 kW.s
km	kilometre
kN	kilo Newton
kPa	kilo Pascal (1 kPa = 1000 Pa = 0,1 N/cm ²)
kW	kilowatt
kWh	kilowatt-hour = 3600 kJ = 3600 kW.s
mS/cm	MilliSiemens per cm – unit for electrical conductivity (= dS/m)

m	metre
mm	millimetre
m ²	square metre
mm ²	square millimetre
m ³	cubic metre
N	Newton
Mg	Megagramme = Metric Ton = 10 ³ kg = 10 ⁶ grammes
no.	number
PE	Population Equivalent
%	Percentage
°C	Celsius
vw	Volumetric weight [in kN/m ³]
w	natural moisture [in]
y	Year = a

CHEMICAL ELEMENTS AND ORGANIC COMPOUNDS

As	Arsenic
C	Carbon
Ca	Calcium
Cd	Cadmium
Cl	Chlorine
CO ₃	Carbonate
Cu	Copper
Hg	Mercury
K	Potassium
Mg	Magnesium
Mn	Manganese
Mo	Molybdenum
N	Nitrogen
Na	Sodium
NKjel	Total nitrogen by Kjeldahl
NO, NO ₂	Nitrogen monoxide, nitrogen dioxide (NO _x)
NO ₂ -N	Nitrite-nitrogen
NO ₃ -N	Nitrate nitrogen
NH ₄ -N	Ammonia-nitrogen
O ₃	Ozone
P	Phosphorus
Pb	Lead
Zn	Zinc

AOX	Sum parameter for water soluble "absorbable organic halogens" in which 'A' stands for absorbable, 'O' for organic and 'X' for the halogens chlorine, bromine and iodine
BOD5	Biochemical oxygen demand
BTEX	Acronym for Benzene, Toluene, Ethyl benzene and Xylene
COD	Chemical oxygen demand
CH4	Methane
PAH	Poly aromatic hydrocarbons
PCB	Poly chlorinated biphenyl
PCT	Poly chlorinated terphenyl
PM10 / PM2,5 / PM1	Suspended particulate matter < 10 / 2,5 / 1 µm
POPs	Persistent Organic Pollutants
SS	Suspended solids
T°C	Temperature
TOC	Total organic carbon
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TN	Total nitrogen
TOD	Total Oxygen Demand
TP	Total phosphorus
TPH	Total Petroleum Hydrocarbons
TSP	Total Suspended Particulates
VOC	Volatile Organic Compounds

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 00 00 – GENERAL REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- This Section establishes general administrative, procedural, and technical requirements applicable to all Work under the Contract.
- This Section governs:
 - Contract interpretation and precedence.
 - Roles and responsibilities of Owner, Engineer, and Contractor.
 - Coordination, scheduling, and sequencing of the Work.
 - Quality control, safety, and environmental protection.
 - Temporary facilities, utilities, and site logistics.
 - Submittals, substitutions, testing, and inspections.
 - Record documents and project closeout.
- Requirements of this Section apply to all Divisions and Sections of the Specifications unless explicitly modified elsewhere.

1.02 CONTRACT DOCUMENTS

- The Contract Documents consist of:
 - Contract Agreement.
 - Conditions of Contract (General and Particular).
 - Specifications (Division 01 and technical Sections).
 - Drawings.
 - Addenda issued prior to bid.
 - Modification Addenda issued after Contract award.
- The Contractor shall review all Contract Documents and promptly notify the Engineer of errors, omissions, or conflicts.

1.03 CONTRACT INTERPRETATION AND PRECEDENCE

- In the event of discrepancy, the order of precedence shall be:
 - Contract Agreement and Conditions of Contract.
 - Addenda and Contract Modification Addenda.
 - Specifications (Division 01 governs over technical Sections).
 - Drawings.
- Figured dimensions govern over scaled dimensions.
- Specifications govern over Drawings with respect to materials, quality, and performance.

1.04 ROLES AND RESPONSIBILITIES

- Owner:
 - Provides access to the Site as defined in the Contract.
 - Administers the Contract in accordance with the Conditions of Contract.
- Engineer:

- Acts as Owner's technical representative.
- Reviews submittals, RFIs, test results, and substitution requests.
- Observes the Work for general conformance with the Contract Documents.
- Contractor:
 - Is fully responsible for means, methods, techniques, sequences, procedures, and safety of construction.
 - Provides all labor, materials, equipment, and supervision necessary to complete the Work.
 - Coordinates Subcontractors, suppliers, and deliveries.
 - Ensures compliance with all Contract Documents, permits, and applicable laws.

1.05 SITE CONDITIONS

- The Contractor is deemed to have examined the Site and surrounding conditions and to have informed itself of:
 - Physical conditions and access constraints.
 - Existing facilities and ongoing operations.
 - Climatic, tidal, and environmental conditions.
 - Availability of utilities, materials, labor, and transportation.
- Claims based on lack of site familiarity shall not be accepted.

1.06 CODES, STANDARDS, AND REGULATIONS

- Comply with all applicable laws, codes, standards, permits, and approvals.
- Where referenced standards conflict with Contract Documents, the more stringent requirement shall apply.

1.07 COORDINATION AND SCHEDULING

- Coordinate all Work to ensure orderly progress and compatibility between trades.
- Prepare and maintain a construction schedule in accordance with Division 01 requirements.
- Coordinate deliveries, storage, and installation to avoid damage, delay, or interference with ongoing operations.

1.08 TEMPORARY FACILITIES AND UTILITIES

- Provide all temporary facilities and utilities required to perform the Work, including:
 - Temporary offices and storage.
 - Temporary power, water, lighting, and communications.
 - Temporary access, staging areas, and safety controls.
- Maintain temporary facilities in safe and serviceable condition.
- Remove temporary facilities upon completion of the Work unless otherwise directed.

1.09 MATERIALS, EQUIPMENT, AND WORKMANSHIP

- Provide new materials and equipment unless otherwise specified.

- Install materials in accordance with manufacturer's instructions and accepted submittals.
- Perform Work using skilled and experienced labor appropriate to the task.

1.10 QUALITY CONTROL

- Implement a quality control program to ensure compliance with the Contract Documents.
- Perform inspections and tests required by the Specifications.
- Cooperate with the Engineer and independent testing agencies.

1.11 SAFETY AND HEALTH

- The Contractor is solely responsible for jobsite safety.
- Comply with applicable occupational safety and health regulations.
- Provide appropriate personal protective equipment (PPE).
- Protect workers, visitors, and the public from hazards associated with the Work.

1.12 ENVIRONMENTAL PROTECTION

- Prevent pollution, contamination, and nuisance conditions.
- Control dust, noise, odors, runoff, and waste.
- Manage fuels, oils, chemicals, and hazardous materials in accordance with permits and best practices.
- Immediately report spills or environmental incidents and implement corrective actions.

1.13 PROTECTION OF WORK AND PROPERTY

- Protect completed and partially completed Work from damage.
- Protect existing facilities, utilities, and adjacent properties.
- Repair damage caused by the Contractor at no additional cost to the Owner.

1.14 SUBMITTALS AND SUBSTITUTIONS

- Submit documents in accordance with Section 01 33 00 – Submittal Procedures.
- Requests for substitutions shall comply with Section 01 25 00 – Substitution Procedures.
- Unauthorized substitutions are not permitted.

1.15 TESTING AND INSPECTION

- Testing and inspection requirements are specified in the technical Sections.
- Provide access, assistance, and coordination for testing and inspections.
- Correct and retest nonconforming Work at no additional cost to the Owner.

1.16 RECORD DOCUMENTS

- Maintain accurate record (“as-built”) documents at the Site.
- Record deviations in alignment, elevations, materials, and installed equipment.
- Submit final record documents at Project closeout.

1.17 CLEANING

- Maintain the Site in an orderly condition.
- Remove debris regularly and dispose of waste legally.
- Perform final cleaning prior to inspection and acceptance.

1.18 PROJECT CLOSEOUT

- Comply with Closeout Procedures as outlined in contract.
- Submit warranties, guarantees, O&M manuals, training records, and record documents.
- Complete all punch list items prior to final acceptance.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END SECTION

SECTION 01 10 00 SCOPE OF WORK

The small works construction contract will serve to develop the following components for the site:

- Prior to the major landfill construction activities, the Prefabricated building and entrance road will be constructed. The initial work associated with this work is the excavation of legacy waste beneath a 20-meter by 40-meter footprint. This work will require excavation of approximately 3,000 cubic meters of legacy waste. This waste will be disposed of at the temporary legacy waste stockpile, which is discussed below
- Excavation of approximately 24,221 cubic meters of legacy waste in a two-phase effort.
 - The Phase 1 effort will include preparing the peripheral road through removing approximately 1,150 cubic meters of legacy waste, excavating approximately 10,453 cubic meters of legacy waste on the south side of the landfill and hauling and placing 11,603 cubic meters of waste into a temporary stockpile on the north side of the landfill.
 - The south side of the landfill begins at a line 65 meters west and parallel to the property's northern boundary that is adjacent to the existing operations building. The temporary legacy waste stockpile will be placed on the north side the landfill site, except for a footprint of 30 meters by 75 meters to include the existing operations building and existing entrance road to allow for on-going operations. The estimated storage volume of the stockpile is 14,200 cubic meters for the south side legacy waste and 1,000 cubic meters for ongoing disposal operations. The temporary stockpile shall be made available for use for on-going disposal operations.
 - The phase 2 effort will include excavating the temporary legacy waste stockpile on the north side of the landfill and transporting it into the newly constructed lined landfill cell on the south side of the landfill. The capacity of the phase 1 liner construction will be approximately 39,250 cubic meters.
- Placement of 11,413 square meters of engineered reinforced fill over the legacy waste to remain in place (Global Bridge Design), with approximately 6,848 cubic meters of soil backfill material for the entire landfill footprint (for both Phase 1 and 2). The engineered reinforced fill will consist of the following:
 - Place 30 cm of soil and compact.
 - Install a reinforcing geogrid (Geogrid #2).
 - Place and compact an additional 30 cm thickness of soil to reach final grade of liner floor.
- Placement of 3,472 square meters of Soft Spot mitigation consisting of engineered reinforced fill over the saturate legacy waste to remain in place (Saturated Zone Bridging Design), with approximately 625 cubic meters of rock, approximately 3,472 sqm of nonwoven geotextile, 750 cubic meters of backfill soil material for the landfill "Soft Spot" footprint. The engineered reinforced fill will consist of the following:

- Place and set 30 cm of rock over saturated legacy waste (Soft Spot), currently estimated to be 25 m by 50 m in area. Estimated volume of rock is 625 cum.
 - Place thick nonwoven geotextile (minimum 16–24 oz/yd²) over rock layer, to extend 3 m beyond rock footprint, currently estimated at 31m by 56 m or 3,472 sqm.
 - Install a reinforcing geogrid (Geogrid#0) over thick nonwoven geotextile layer covering approximately 3,472 sqm.
 - Place 30 cm of soil and compact, over Geogrid #0 to cover approximately 3,472 sqm. Estimated volume is 375 cum.
 - Install a reinforcing geogrid (Geogrid#1) over soil layer covering approximately 3,472 sqm.
 - Place an additional 30 cm of soil and compact, over Geogrid#1 to cover approximately 3,472 sqm. Estimated volume is 375 cum.
- Placement of approximately 7,905 cubic meters of engineered fill to bring the peripheral road to design grade.
 - Placement of approximately 3,000 cubic meters of engineered fill beneath the building and entrance road area.
 - Installation of approximately 13,100 square meters of a liner system, consisting of geosynthetic clay liner and 80mil high density polyethylene liner, with texture on both sides. This work will be completed in two phases in coordination with the legacy waste excavation. The first phase will install approximately 7,600 square meters on the south portion of the landfill and the second phase will install approximately 5,500 square meters on the north side of the landfill.
 - Installation of approximately 11,413 square meters of drainage geo-composite on the liner floor, covering both phase 1 and 2 liner installations.
 - Installation of approximately 900 feet of 6 inch diameter corrugated HDPE pipe, serving as the leachate collection headers. These headers will be directly plumbed to the drainage geo-composite (Draintube or equivalent).
 - Placement of an operational layer over the liner systems, consisting of 16oz/yrd² non-woven geotextile over the 13,100 m² lined landfill cell. As part of the installation of this nonwoven geotextile, special waste placement procedures will be utilized for the first lift over the geotextile.
 - Installation of approximately 550 meters of drainage channel on the Peripheral Road.
 - Demolition of existing 20 meters by 17-meters operations building, 4 meter by 4 meter incinerator and 8 meter by 5-meter building.
 - Installation of a new 570-meter-long anti-climb security fence around the landfill property.
 - Installation of a 16 meter by 26 meter sedimentation basin with associated inlet and outlet structures.

- Installation of approximately 260 linear meters of landfill gas interception trench and passive vent.
- Installation of a scale house and 20-ton pitless weight bridge.
- Installation of 17 solar powered area lighting.
- Design and construction of a prefabricated administration and maintenance building, with an area of a maximum of 200 square meters.
- Design and Installation of 75 gpm, TDH 15 feet, Submersible Leachate Pump Station.
- Design and Installation of 500-gallon Diesel Fuel Storage System.
- Design and Installation of 550 gpm, TDH 70 psi Seawater Fire Pump System.
- Installation of three (3) temporary small-diameter drive-point wells within saturated legacy waste at the base of the landfill excavation; development and stabilization of the sampling wells; collection of leachate samples from each well; preparation of one composite sample; measurement of specified field parameters; laboratory analysis of the composite sample using a California Title 27 groundwater-equivalent analytical suite including required QA/QC; abandonment of the wells following sampling; and preparation of a monitoring report summarizing field activities, analytical results, and observations.
- The design, supply, installation, maintenance, and removal of project information signage for an Asian Development Bank (ADB)-financed project.

Construction work shall comply with the technical requirements set forth in these project specifications. Where specific requirements are not detailed herein, the Contractor shall conform to the latest edition of the following standards, which are incorporated by reference:

1. Construction Specifications Institute (CSI) MasterFormat®—Divisions 01–50, as published by the Construction Specifications Institute.
2. Unified Facilities Guide Specifications (UFGS), as maintained by the U.S. Department of Defense through the Whole Building Design Guide (WBDG) website at <https://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs>.

In cases of conflict between project-specific specifications and the above-referenced standards, the more stringent requirement shall apply.

END SECTION

SECTION 01 25 00 – SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

- This Section establishes administrative and procedural requirements for requesting approval of substitutions for products, materials, systems, equipment, or methods specified in the Contract Documents.
- Substitutions shall be permitted only when:
 - Specifically allowed by the Contract Documents; or
 - Proposed in strict accordance with this Section and approved in writing by the Engineer.
- Substitutions shall not reduce the quality, durability, performance, safety, or service life of the Work.

1.02 RELATED SECTIONS

- Section 01 00 00 – General Requirements.
- Section 01 11 00 – Summary of Work
- Section 01 33 00 – Submittal Procedures
- Technical Sections specifying products and performance requirements.

1.03 DEFINITIONS

- Substitution: A proposed replacement for a specified product, manufacturer, system, or method that differs from the basis-of-design or named acceptable products.
- Comparable Product: A product demonstrated to be equal or superior in all specified performance, quality, durability, and regulatory criteria.
- Approved Equal: A substitution approved in writing by the Engineer prior to procurement or installation.

1.04 GENERAL REQUIREMENTS

- Approval of a substitution is at the sole discretion of the Engineer, acting on behalf of the Owner.
- Substitutions shall not:
 - Require changes to the Contract Time or Contract Price unless approved by formal Change Order.
 - Relieve the Contractor of responsibility for meeting all Contract requirements.
 - Result in non-compliance with permits, environmental approvals, or regulatory requirements.
- The Contractor assumes full responsibility for:
 - Compatibility with adjacent Work.
 - Coordination with other trades.
 - Revisions to drawings, details, calculations, and O&M documentation required by the substitution.
 - Additional testing, certifications, or approvals required.

1.05 SUBSTITUTIONS PRIOR TO BID (IF APPLICABLE)

- Requests for substitutions prior to bid shall be submitted in writing in accordance with Instructions to Bidders.
- Approved substitutions issued prior to bid shall be documented by Addendum.

1.06 SUBSTITUTIONS AFTER CONTRACT AWARD

- Substitutions after Contract award shall be considered only for the following reasons:
 - Product unavailability despite timely and documented procurement efforts.
 - Documented discontinuation of a specified product.
 - Demonstrated advantage to the Owner in durability, performance, or life-cycle cost.
 - Regulatory or permitting constraints that preclude use of specified product.
- Cost savings alone shall not be sufficient justification for substitution.
- Substitution requests based on Contractor preference, convenience, or lack of familiarity with specified products will not be accepted.

1.07 SUBSTITUTION REQUEST PROCEDURE

- Submit substitution requests as a separate action submittal in accordance with Section 01 33 00.
- Submit requests sufficiently in advance to allow review without delaying the Work.
- Requests submitted after procurement or installation will not be considered.
- Each substitution request shall include, at a minimum:
 - Identification of the specified product, manufacturer, and Specification Section.
 - Description of the proposed substitute, including manufacturer, model, and country of origin.
 - Detailed technical comparison demonstrating equivalency or superiority for each specified requirement.
 - Independent test data, certifications, and compliance documentation.
 - Impact on:
 - Structural design
 - Hydraulic or electrical performance
 - O&M requirements
 - Warranties and service life
 - Environmental and corrosion resistance
 - Impact on:
 - Construction schedule
 - Shipping and logistics
 - Contract Price and Contract Time
 - Statement that the substitution:
 - Requires no changes to other Work; or
 - Identifies all required changes and associated costs.

1.08 BASIS-OF-DESIGN PRODUCTS

- Where a basis-of-design product is specified, substitutions must demonstrate:
 - Equal or superior performance in all specified criteria.

- Compatibility with design assumptions, calculations, and details.
- No reduction in durability, corrosion resistance, or service life.
- Minor dimensional differences that require redesign, re-detailing, or re-analysis shall be grounds for rejection.

1.09 REVIEW AND APPROVAL

- Engineer review period shall be as specified in Section 01 33 00.
- Engineer's possible actions:
 - Approved – Substitution may be used.
 - Approved as Noted – Substitution may be used subject to conditions.
 - Revise and Resubmit – Additional information required.
 - Rejected – Substitution not acceptable.
- Approval of a substitution does not:
 - Relieve the Contractor of responsibility for errors or omissions.
 - Transfer design responsibility to the Engineer.
 - Waive compliance with other Contract requirements.

1.10 CHANGES TO CONTRACT

- Approved substitutions that result in changes to Contract Price or Contract Time shall be executed by Change Order in accordance with the Conditions of Contract.
- No adjustment shall be made for substitutions that reduce Contractor costs unless specifically negotiated and approved.

1.11 WARRANTIES AND O&M

- Substituted products shall be provided with warranties equal to or greater than those specified.
- Contractor shall revise O&M manuals, spare parts lists, and training materials to reflect approved substitutions.

1.12 UNAUTHORIZED SUBSTITUTIONS

- Products installed without written approval shall be considered unauthorized.
- Engineer may require removal and replacement of unauthorized substitutions at no cost to the Owner.
- Testing, rework, and schedule impacts resulting from unauthorized substitutions shall be borne by the Contractor.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END SECTION

SECTION 01 31 13 COORDINATION WITH UTILITIES

PART 1 - GENERAL

1.01 SUMMARY

Section includes requirements for coordination with existing and new utility services during all phases of construction.

1.02 RELATED SECTIONS

- Section 21 30 00 Seawater Fire Pump System
- Section 31 20 00 – Earthwork
- Section 33 46 16 Submersible Leachate Pump System
- Section 33 00 00 – Utilities

1.03 DEFINITIONS

- Utility: Any public or private service including water, sewer, electrical, telecommunications, and stormwater infrastructure.

1.04 SUBMITTALS

- Utility Coordination Plan:
 - Identification of all existing utilities in the work area.
 - Proposed methods for protecting existing utilities.
 - Schedule of utility service interruptions.
 - Notification Records:
 - Copies of notifications sent to utility owners and local authorities.

1.05 QUALITY ASSURANCE

- Comply with applicable Republic of the Marshall Islands regulations governing utility work.
- Coordinate all work with local utility providers and landowners as applicable.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 UTILITY LOCATING

- Before commencing work, verify location of all existing utilities within the project area.
- Use hand excavation to expose utilities where required.

3.02 UTILITY PROTECTION

- Protect all utilities from damage during construction.
- Provide support or bridging for exposed utilities as required.
- Immediately notify utility owner and Engineer of any damage.

3.03 SERVICE INTERRUPTION

- Coordinate all planned service interruptions with utility owners.
- Provide a minimum 7-day notice to affected parties.
- Minimize duration of utility service interruptions.

3.04 UTILITY RELOCATION

- Relocate utilities as indicated on Drawings or as directed by the Engineer.
- Perform relocation work in accordance with utility owner standards.

3.05 FIELD QUALITY CONTROL

- Inspect utility protection measures daily.
- Record and report any issues immediately to the Engineer.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

- Coordination with utilities shall be measured as a lump sum.

4.02 BASIS OF PAYMENT

- Payment will be made at the lump sum price for coordination with utilities, including locating, protection, relocation, and service interruption management.

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

- This Section includes administrative and procedural requirements for preparation, submission, review, approval, and distribution of submittals, including:
 - Shop Drawings.
 - Product Data.
 - Samples.
 - Test and Inspection Reports.
 - Certificates.
 - Manufacturer’s Instructions.
 - Operation and Maintenance (O&M) Data.
 - Training Plans and Records.
 - As-Built / Record Documentation (as required by Section 01 77 00 and technical Sections).
 - Submittal register, tracking, and closeout controls.
- Requirements of this Section apply to all Divisions 01 through 33 (and others included in the Contract Documents).

1.02 RELATED SECTIONS

- Section 01 00 00 – General Requirements
- Section 01 11 00 – Summary of Work
- Section 01 25 00 – Substitution Procedures
- Technical Sections specifying submittals, testing, and commissioning.

1.03 REFERENCES

- CSI MasterFormat (current edition)
- CSI Practice Guide: Submittals (as guidance)
- Applicable ASTM/ISO standards referenced in technical Sections.

1.04 DEFINITIONS

- Submittal: Written or graphic information prepared or assembled by Contractor and submitted to Engineer for review.
- Shop Drawings: Drawings, diagrams, schedules, and other data prepared by Contractor, Subcontractor, manufacturer, or supplier to illustrate how specific portions of Work will be fabricated/installed.
- Product Data: Published information (catalog cuts, brochures, performance data, installation instructions) for products and materials.
- Samples: Physical examples of materials, finishes, and workmanship.
- Action Submittal: Submittal requiring Engineer’s review response (e.g., “Reviewed,” “Revise and Resubmit”).
- Informational Submittal: Submitted for record or information; no formal “approval” intended, unless stated otherwise.

1.05 ADMINISTRATIVE REQUIREMENTS

- General:
 - Provide submittals in accordance with this Section and requirements in each technical Section.
 - Do not proceed with Work requiring a submittal until submittal has been reviewed and is in an acceptable status for construction.
 - Submittals are not Contract Document modifications. Submit substitutions only under Section 01 25 00.
- Submittal Register:
 - Within 14 calendar days of Notice to Proceed, submit a complete Submittal Register identifying all required submittals, by Specification Section and paragraph.
 - Include planned submission dates, lead times (fabrication and shipping), and required installation dates.
 - Update register monthly and with each major revision.
- Coordination and Sequencing:
 - Coordinate submittals to avoid delays, especially for long-lead items and shipped materials.
 - Submit grouped packages when coordination is required (e.g., geosynthetics system package, leachate piping and appurtenances package, electrical and controls package).
- Digital and Hardcopy:
 - Provide electronic PDF submissions unless otherwise directed.
 - Provide hardcopies only when specifically requested or when required for field use (e.g., large-format drawings).
- Language and Units:
 - Submit in English.
 - Provide dimensions and units consistent with Contract Documents.

1.06 CONTRACTOR'S QUALITY CONTROL OF SUBMITTALS

- Review and approve each submittal internally before submitting to Engineer.
- Verify: field measurements, quantities, interface requirements, installation requirements, and compliance with Contract Documents.
- Stamp each submittal with Contractor's review stamp/signature indicating review and coordination has been completed. Submittals without Contractor stamp may be returned without review.

1.07 SUBMITTAL TYPES AND REQUIREMENTS

- Shop Drawings:
 - Include project name, contract number (if applicable), Specification Section, submittal number, revision number, date, and Contractor or Subcontractor or Supplier name.
 - Show dimensions, tolerances, materials, anchorage, interfaces, and relationship to adjacent Work.
 - Identify deviations from Contract Documents clearly and separately; request approval for deviations.
- Product Data:
 - Mark each product option clearly to indicate proposed selection(s).

- Provide compliance data for specified standards, performance, and materials.
- Include installation instructions and limitations (UV, corrosion, temperature, storage).
- Samples:
 - Provide two (2) samples unless otherwise specified.
 - Clearly label samples with source, product designation, and intended use location.
 - Approved samples establish the minimum acceptable standard for Work.
- Test and Inspection Reports / Certificates:
 - Provide certified test results and factory quality documentation required by technical Sections.
 - Provide independent laboratory reports where specified.
 - Provide calibration certificates for testing equipment where relevant.
- O&M Data and Training Submittals:
 - Submit O&M manuals per Section 01 78 23.
 - Submit training plans, agendas, and attendance records prior to training events; submit completion records at closeout.

1.08 SUBMITTAL IDENTIFICATION AND NUMBERING

- Use a consistent numbering system:
 - Format: [Spec Section]-[Sequential No.]-[Revision]
 - Example: 01 33 00-005-R1
 - Maintain continuity across revisions.
- Each submittal shall include:
 - Project and Contract identification.
 - Submittal title and description.
 - Specification Section and paragraph reference(s).
 - Manufacturer, model, and product designation.
 - Proposed deviations (if any), clearly highlighted.

1.09 SUBMITTAL REVIEW TIMES

- Engineer review period (unless otherwise noted):
 - 10 business days for standard submittals.
 - 15 business days for complex or multi-discipline packages (e.g., geosynthetics systems, electrical controls).
 - Review time starts upon receipt of complete, properly formatted submittal.
- Resubmittals: 10 business days unless complexity warrants longer.
- Review times do not include time for:
 - Corrections due to incomplete submittals.
 - Manufacturer/Supplier responses.
 - Shipping, customs clearance, or logistics delays.

1.10 ENGINEER'S ACTIONS

- Engineer will take one of the following actions on Action Submittals:
 - Reviewed – No Exceptions Taken (R): Proceed with Work.
 - Reviewed – As Noted (RN): Proceed with Work, incorporating notes.
 - Revise and Resubmit (RR): Do not proceed; resubmit with corrections.

- Rejected (REJ): Do not proceed; submit alternate compliant item.
- Informational submittals may be marked “Received” or similar; such marking does not authorize deviations.
- Engineer’s review is for general conformance with design intent and Contract Documents; it does not relieve Contractor of responsibility for:
 - Means, methods, techniques, sequences, and procedures.
 - Safety precautions and programs.
 - Errors or omissions in submittals.
 - Coordination of Work, field verification, and compliance.

1.11 DISTRIBUTION

- After review, distribute accepted submittals to affected Subcontractors, suppliers, and field supervision.
- Maintain one complete, current set of accepted submittals at the Site available to Engineer at all times.

1.12 RESUBMITTALS

- Clearly identify all changes from prior submittal; cloud revisions and provide revision narrative.
- Remove or clearly mark superseded pages; do not resubmit unchanged documents unless requested.

1.13 CLOSEOUT SUBMITTALS

- Provide final closeout submittals including:
 - O&M manuals, spare parts lists, and warranties.
 - Training completion records.
 - Final test/commissioning reports.
 - Record drawings and as-built documentation per Section 01 77 00.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 SUBMITTAL PREPARATION AND SUBMISSION

- Prepare submittals in accordance with technical Sections and this Section.
- Package coordinated submittals together where interface review is required.
- Submit using the agreed project transmittal method; include a transmittal form listing:
 - Submittal number and title.
 - Specification reference.
 - Action requested.
 - List of included documents and page counts.
 - Distribution list.

3.02 CONTRACTOR RESPONSIBILITIES PRIOR TO INSTALLATION

- Verify accepted submittals are current and match delivered products.
- Confirm storage and handling comply with manufacturer instructions and Contract Documents.
- Ensure field crew has access to the accepted submittal and installation instructions at time of installation.

3.03 FIELD CHANGES

- If field conditions require changes affecting submittals, notify Engineer and submit revised submittal prior to proceeding.

END SECTION

SECTION 01 50 00 MOBILIZATION

PART 1 – GENERAL

1.1 SUMMARY

- This Section includes requirements for mobilization of equipment, materials, and personnel to the Ebeye Landfill construction project site.
- Work includes:
 - Transport of labor, equipment, and materials to Ebeye Island.
 - Setup of temporary facilities, staging areas, and storage areas.
 - Coordination of lodging, transportation, and support services.

1.2 SUBMITTALS

- Mobilization Plan including:
 - Equipment and Material Shipping Schedule.
 - Personnel Mobilization and Housing Plan.
 - Inventory of Equipment and Materials.

1.3 QUALITY ASSURANCE

- Contractor shall ensure compliance with all local regulations regarding importation and transport of equipment and materials.
- Contractor shall coordinate with local authorities and project representatives regarding staging areas, lodging arrangements, and local transportation.

1.4 MEASUREMENT AND PAYMENT

- Measurement: Mobilization shall be measured as a lump sum item.
- Payment: Payment will be made at the Contract lump sum price for completed mobilization, including all labor, equipment, materials, shipping, and setup costs. Partial payment may be made in accordance with project milestones as approved by the Engineer.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

3.1 GENERAL

- Mobilize all necessary personnel, equipment, and materials in accordance with the approved Mobilization Plan.
- Ensure all equipment is in good working condition and meets project specifications.

3.2 LOGISTICS AND TRANSPORT

- Arrange for shipping of equipment and materials to Ebeye Island considering limited and infrequent flights and cargo availability.
- Arrange for secure lodging for personnel considering limited accommodation availability on Ebeye Island.
- Coordinate transport from port/airport to project site.

3.3 SITE SETUP

- Establish staging areas for equipment and materials.
- Set up temporary facilities as required for project execution.
- Maintain work area in a clean and organized condition throughout mobilization and project setup.

3.4 DEMOBILIZATION

- At project completion, remove all temporary facilities, equipment, and unused materials.
- Restore staging areas and access routes to original or approved conditions. Submit a Demobilization Plan prior to final demobilization activities.

END SECTION

SECTION 01 50 10 – TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 SUMMARY

- This Section establishes requirements for providing, maintaining, and removing temporary facilities, utilities, services, and controls necessary for execution of the Work.
- Temporary facilities and controls include, but are not limited to:
 - Temporary offices, storage, and laydown areas.
 - Temporary utilities and services.
 - Temporary access, traffic control, and security.
 - Environmental protection controls.
 - Safety and emergency facilities.
 - Temporary protection of existing facilities and completed Work.
- Requirements of this Section apply to all phases of the Work.
- Costs associated with temporary facilities and controls shall be considered incidental to the Work and included in the Contract Price, including mobilization, unit prices, and lump sum items, unless explicitly stated otherwise in the Contract Documents. No separate payment will be made for temporary facilities and controls.

1.02 RELATED SECTIONS

- Section 01 00 00 – General Requirements
- Section 01 33 00 – Submittal Procedures
- Technical Sections requiring temporary facilities or protection.

1.03 CODES, STANDARDS, AND REGULATIONS

- Comply with all applicable national and local laws, regulations, and permits.
- Temporary facilities shall comply with applicable safety, environmental, and public-health requirements.

1.04 CONTRACTOR RESPONSIBILITIES

- Provide all temporary facilities and controls required to perform the Work, unless specifically indicated otherwise in the Contract Documents.
- Temporary facilities and controls shall:
 - Be suitable for intended purpose.
 - Not interfere with permanent construction.
 - Be maintained in a safe, clean, and operable condition.
- Costs associated with temporary facilities and controls shall be considered incidental to the Work and included in the Contract Price, including mobilization, unit prices, and lump sum items, unless explicitly stated otherwise in the Contract Documents. No separate payment will be made for temporary facilities and controls.

1.05 SUBMITTALS

- Submit the following in accordance with Section 01 33 00:
 - Site layout plan showing temporary facilities, access routes, storage areas, and controls.

- Traffic control plan, if applicable.
- Environmental control measures where required by permits.

PART 2 – PRODUCTS

2.01 TEMPORARY FACILITIES

- Temporary Offices:
 - Provide weather-resistant structures with adequate lighting, ventilation, and furnishings.
 - Maintain offices in sanitary condition.
- Temporary Storage and Laydown Areas:
 - Provide secure, organized areas for materials and equipment.
 - Protect materials from weather, corrosion, and damage.
 - Store hazardous materials in accordance with regulations.
- Sanitary Facilities:
 - Provide sanitary facilities meeting public-health requirements.
 - Service facilities regularly.

2.02 TEMPORARY UTILITIES AND SERVICES

- Temporary Power:
 - Provide temporary electrical service as required.
 - Protect wiring and equipment from moisture and physical damage.
- Temporary Water:
 - Provide potable water for personnel and construction needs.
 - Prevent contamination of existing water systems.
- Temporary Communications:
 - Provide communication systems adequate for coordination and emergency response.

2.03 TEMPORARY ACCESS AND TRAFFIC CONTROL

- Provide temporary access roads, walkways, and working platforms as required.
- Implement traffic control measures, signage, and barriers to protect workers and the public.
- Maintain access for emergency vehicles at all times.

2.04 SAFETY AND EMERGENCY FACILITIES

- Provide fire protection equipment, first-aid kits, and emergency response facilities.
- Maintain clear emergency egress routes and assembly areas.

2.05 ENVIRONMENTAL CONTROLS

- Provide controls to prevent pollution and environmental damage, including:
 - Erosion and sediment control.
 - Dust and odor control.
 - Noise mitigation.
 - Spill prevention and containment.

- Store fuels, oils, and chemicals in secondary containment.

2.06 TEMPORARY PROTECTION

- Protect existing facilities, utilities, vegetation, and completed Work from damage.
- Provide temporary coverings, fencing, and barriers as required.

PART 3 – EXECUTION

3.01 INSTALLATION AND MAINTENANCE

- Install temporary facilities and controls prior to commencement of related Work.
- Maintain facilities and controls in proper working order throughout construction.
- Adjust and relocate temporary facilities as Work progresses.

3.02 REMOVAL

- Remove temporary facilities, utilities, and controls upon completion of the Work or when no longer required.
- Restore affected areas to original or specified condition.
- Dispose of materials and waste in accordance with regulations.

END SECTION

SECTION 01 58 16 – PROJECT SIGNAGE (ADB-FINANCED PROJECT)

PART 1 – GENERAL

1.1 SUMMARY

- This Section includes requirements for the design, supply, installation, maintenance, and removal of project information signage for an Asian Development Bank (ADB)-financed project.
- The signage shall provide clear and accurate information to the public regarding the Project and acknowledge financing in accordance with applicable requirements of the Asian Development Bank.

1.2 CONTRACTOR RESPONSIBILITIES

- The Contractor shall be fully responsible for the design, supply, installation, maintenance, and removal of project signage.
- The signage shall provide relevant information to the public, including proper identification of:
 - The Project
 - The Employer
 - The Contractor
 - The Bank

1.3 TIMING AND DURATION

- The Contractor shall install one or more sign boards at the Site as soon as practicable after the Commencement Date.
- Sign boards shall remain in place at all times until Taking-Over of the Works.
- Any sign board that is damaged, defaced, or becomes unreadable shall be promptly repaired or replaced at the Contractor's cost.

1.4 SUBMITTALS

- The Contractor shall submit the sign board design to the Project Manager for review in accordance with Sub-Clause 21.2.
- Submittals shall include:
 - Layout, dimensions, colors, and graphics
 - Logo placement and proportions
 - Structural support details
 - Proposed locations and number of sign boards
 - Material specifications

1.5 QUALITY ASSURANCE

- Signage shall comply with ADB branding and visibility requirements.
- Logos and graphics shall comply with applicable ADB branding guidelines and shall not be altered without approval.
- All content shall be clearly legible from a reasonable viewing distance.

PART 2 – PRODUCTS

2.1 GENERAL REQUIREMENTS

- Provide signage that is durable, weatherproof, and suitable for coastal and marine environments.
- Materials shall resist corrosion, ultraviolet degradation, and salt exposure.

2.2 SIGN BOARD CONTENT

Each sign board shall include, as a minimum:

- Borrowing Country's flag and/or logo
- Project and Contract title
- Accepted Contract Amount
- Time for Completion
- Name and logo of the Asian Development Bank (in accordance with branding guidelines)
- Employer's name
- Contractor's name
- Engineer's name
- Complaint handling contact information (email and/or phone number)

2.3 DESIGN REQUIREMENTS

- General: Number and locations of sign boards shall be proposed by the Contractor and approved by the Project Manager.
- Layout: General layout and color scheme shall be proposed by the Contractor.
- Dimensions: Minimum size: 2.5 meters × 2.5 meters
- Typography: Font type and size shall ensure readability from a reasonable distance.
- Language: Signage shall be in English and national and/or local language.
- Materials: Sign boards shall be constructed of durable, weatherproof materials suitable for the full construction period.

2.4 STRUCTURAL SUPPORT

- Provide supports and anchorage adequate to resist wind and environmental loads.
- All structural components shall be corrosion-resistant.

2.5 BRANDING AND LOGOS

- Logos shall be displayed prominently and in accordance with ADB branding requirements.
- Logos shall not be distorted, recolored, or modified without approval.

PART 3 – EXECUTION

3.1 INSTALLATION

- Install signage at locations approved by the Project Manager, including at least the main site entrance.

- Signs shall be securely fixed, plumb, and stable.

3.2 MAINTENANCE

- The Contractor shall maintain all signage in good condition throughout the construction period.
- Damaged, faded, or illegible signage shall be replaced immediately at the Contractor's expense.

3.3 RESTRICTIONS

- No signage other than approved project signage shall be installed without prior approval of the Project Manager.
- The Contractor shall not display any signage that may:
 - Provide misleading information about the Project
 - Conflict with project objectives or public messaging
- No national symbols or flags other than those of the Borrowing Country shall be displayed without express approval of the Project Manager.

3.4 REMOVAL

- Sign boards shall be removed upon Taking-Over of the Works or as directed by the Project Manager.
- The Contractor shall restore the site to its original condition.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Project signage shall be measured as a lump sum item, including design, supply, installation, maintenance, and removal.

4.2 PAYMENT

- Payment shall be made under:
 - Item: Project Signage (ADB Requirements) – Lump Sum
- Payment shall include full compensation for all materials, labor, approvals, installation, maintenance, and removal.

END SECTION

DIVISION 02 – EXISTING CONDITIONS

SECTION 02 41 00 DEMOLITION

PART 1 – GENERAL

1.01 SUMMARY

- This Section includes requirements for the demolition and removal of existing small buildings, sheds, the incinerator, and miscellaneous structures located within the designated landfill area. Work includes:
 - Demolition of above-ground and below-ground structures.
 - Salvage or reuse of suitable materials.
 - Size reduction of demolition debris using mechanical means to prepare for landfilling.
 - Coordination with new landfill construction activities.
 - Dust and erosion control measures.
 - Structural assessment and hazardous materials management.

1.02 RELATED SECTIONS

- Section 01 50 10 – Temporary Facilities and Controls
- Section 31 20 00 – Earthwork – General
- Section 31 32 19 Filter Fabric (Geotextile) for Soil Separation
- National Building Code Republic of Marshall Islands 2021 Edition, as applicable.

1.03 DEFINITIONS

- Demolition Debris: Non-hazardous construction and demolition waste, including concrete, wood, metal, roofing, insulation, and other non-putrescible materials.
- Size Reduction: The mechanical process of reducing demolition debris to less than 150 mm (6 inches) to facilitate compaction in the new landfill cell.

1.04 SUBMITTALS

- Demolition Plan, including:
 - Demolition sequence and equipment.
 - Safety and environmental controls (see 3.02 and 3.06 for detail).
 - Coordination with landfill construction phases.
 - Detailed engineering survey and means and methods for each structure, stamped by a qualified engineer.
- Waste Management Plan, detailing:
 - Onsite material segregation.
 - Methods for size reduction.
 - Material quantities and landfill disposal approach.
 - Procedures for identification, removal, and disposal of hazardous materials, including asbestos and lead paint if discovered
- Photographic documentation of pre- and post-demolition conditions.
- Utility Disconnection Log documenting all capping and isolation, signed by the relevant utility authority.

- Stakeholder Notification Plan specifying notifications to local authorities, site neighbors, and weekly summary of community engagement.

1.05 QUALITY ASSURANCE

- Contractor shall comply with local environmental and safety regulations, including RMI EPA guidelines and the Marshall Islands Building Code.
- Provide proof of operator qualifications for heavy equipment and demolition tasks.
- Conduct pre-demolition hazardous material survey, and if hazardous materials are identified, submit a removal and disposal plan per RMI and international requirements.
- Demolition means, methods, and sequence must be reviewed and certified by a qualified professional engineer.

1.06 PROJECT CONDITIONS

- Coordinate with landfill phasing. Demolition activities shall not interfere with liner installation or leachate system placement.
- Protect adjacent utilities and structures.
- Provide temporary access and traffic control as required.
- Monitor and control dust, noise, vibration, and air quality. Provide regular reports.
- Coordinate with site safety officer and environmental monitor.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- Hydraulic excavators with demolition and pulverizer attachments.
- Concrete breakers or mobile crushers.
- Front-end loaders, dozers, and haul trucks for debris handling.
- Dust suppression equipment (e.g., water tankers, misting systems).
- Personal protective equipment (PPE) for personnel handling hazardous materials.
- Equipment for monitoring vibration and dust (if required by environmental control plan).

2.02 MATERIALS

- Temporary fencing and barriers.
- Geotextile fabric (for temporary staging area, if needed).
- Polyethylene sheeting or tarps for covering debris.
- Absorbent materials and spill containment kits for hazardous material response (where required).

PART 3 – EXECUTION

3.01 PREPARATION

- Disconnect and cap utilities before demolition; document completion with utility providers.
- Erect safety barriers and signage.
- Implement erosion and sediment controls.
- Perform a detailed structural survey for each structure prior to demolition to identify hazardous conditions and weak points.
- Conduct hazardous materials inspection and commence abatement activities per approved plan, if required, before commencing general demolition.
- Notify RMI EPA, local authorities, and stakeholders at least 72 hours prior to starting work, per Stakeholder Notification Plan.

3.02 DEMOLITION

- Follow approved demolition sequence.
- Carefully dismantle structures using mechanical means to prevent debris from interfering with ongoing landfill construction.
- Separate and stage metal and reusable materials for salvage (if applicable).
- Remove hazardous materials and components (e.g., asbestos, lead, oils from incinerator) in accordance with the approved plan and legal requirements prior to general demolition.
- Demolish in stages, maintaining structural stability and reducing risk of uncontrolled collapse as per engineered means and methods.
- Monitor vibration, dust, and noise, and implement controls as needed to minimize off-site impacts.

3.03 SIZE REDUCTION AND PROCESSING

- Use crushers or pulverizers to reduce all concrete, wood, and other rigid debris to a maximum size of 150 mm.
- Remove large metal objects, hazardous components, or uncrushable items prior to reduction.
- Transport size-reduced debris directly to the lined cell as per coordination plan.
- Segregate materials unsuitable for landfill (e.g., hazardous waste, bulk metals) for proper offsite disposal or recycling.

3.04 CLEANUP AND DISPOSAL

- Remove all demolition debris from the site, except that which is to be landfilled.
- Dispose of debris only within the approved lined landfill cell.
- Restore staging and work areas upon completion.
- Ensure that all hazardous waste is stored, transported, and disposed per RMI EPA and international standards.

3.05 METHOD OF MEASUREMENT AND PAYMENT

- Payment will be made on a lump sum basis for the complete demolition, processing, and placement of debris into the landfill.
- Price includes all labor, equipment, size reduction, environmental controls, and coordination.
- No additional payment will be made for hazardous material management, utility capping, or stakeholder notification; these are considered incidental to the work.

3.06 SAFETY AND ENVIRONMENTAL CONTROLS

- Maintain site safety in accordance with the approved Health and Safety Plan.
- Monitor dust and noise, minimize impacts, and report exceedances per the Environmental Control Plan.
- Provide adequate first-aid and emergency response equipment onsite.
- Implement vibration controls and monitoring where demolition occurs near sensitive structures or utilities

END SECTION.

DIVISION 03 – CONCRETE

SECTION 03 30 00 CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SUMMARY

- Section Includes:
 - Cast-in-place concrete for slabs, foundations, walkways, and curbs.
 - Reinforcement, formwork, and concrete accessories.

1.2 REFERENCES

- ACI 301 – Specifications for Structural Concrete B.
- ACI 318 – Building Code Requirements for Structural Concrete C.
- ASTM C33 – Standard Specification for Concrete Aggregates D.
- ASTM C150 – Standard Specification for Portland Cement E.
- ASTM C94 – Ready-Mixed Concrete F.
- ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars

1.3 SUBMITTALS

- Product Data for concrete mix designs, admixtures, reinforcement, and curing compounds.
- Certificates:
 - Compliance with mix design.
 - Compliance with reinforcement grade.
 - Test Reports: Compressive strength test results.

1.4 QUALITY ASSURANCE

- Contractor shall engage a qualified independent testing laboratory.
- Perform slump, air content, and compressive strength tests as per ASTM standards.

1.5 DELIVERY, STORAGE, AND HANDLING

- Transport ready-mix concrete in compliance with ASTM C94.
- Protect cement and aggregates from moisture contamination.

1.6 PROJECT CONDITIONS

- Concrete temperature must be maintained between 10°C and 32°C.
- Provide protection against precipitation and high humidity.

PART 2 – PRODUCTS

2.1 FORM MATERIALS

- Plywood, steel, or other approved materials free of defects.

2.2 REINFORCEMENT

- ASTM A615, Grade 60, deformed bars.
- Ties, chairs, spacers, and other accessories compatible with reinforcing steel.

2.3 CONCRETE MATERIALS

- Portland Cement: ASTM C150, Type I.
- Fine and Coarse Aggregates: ASTM C33, locally available coral aggregate is acceptable if it meets strength and durability criteria.
- Water: Potable, free from deleterious materials.
- Admixtures: ASTM C494, as approved by Engineer.

2.4 CONCRETE MIX DESIGN

- Minimum Compressive Strength:
 - Slabs and Walkways: 21 MPa (3,000 psi) at 28 days.
 - Foundations: 28 MPa (4,000 psi) at 28 days.
- Maximum Water-Cement Ratio: 0.50.
- Slump: 75 mm ± 25 mm (3 in. ± 1 in.), unless otherwise specified.

2.5 CURING MATERIALS

- Curing Compound: ASTM C309 compliant.

PART 3 – EXECUTION

3.1 FORMWORK

- Install formwork to dimensions, lines, and grades indicated.
- Apply form-release agent before placing reinforcement.

3.2 PLACING REINFORCEMENT

- Position reinforcement per approved shop drawings.
- Maintain required clearances.

3.3 PLACING CONCRETE

- Place concrete using methods that avoid segregation.
- Consolidate concrete with mechanical vibrators.
- Protect concrete from premature drying and temperature extremes.

3.4 FINISHING

- Provide surface finish per project drawings: 1
 - Walkways: Broom finish.
 - Slabs: Trowel finish.

3.5 CURING

- Apply curing compound immediately after finishing.
- Maintain moisture and temperature conditions for minimum of 7 days.

3.6 FIELD QUALITY CONTROL

- Perform slump and air content testing at point of discharge.
- Take test cylinders for compressive strength testing.

3.7 PROTECTION

- Protect concrete from physical damage and excessive moisture loss during curing.

PART 4 – METHOD OF MEASUREMENT AND PAYMENT

4.1 METHOD OF PAYMENT

If not part of a specific bid item,

- Concrete work will be measured by volume (cubic meter) or lump sum as indicated in the contract.
- Payment includes formwork, reinforcement, concrete supply, placement, finishing, curing, and quality control testing.

END SECTION

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 07 21 29 METHANE GAS BARRIER SYSTEM

PART 1 - GENERAL

1.1 SUMMARY This section covers the installation of a methane gas barrier system, including:

- Installation of a methane impermeable membrane beneath a 12 m x 25 m building footprint.
- Installation of a passive gravel vent trench system around the building perimeter.
- Installation of methane gas monitoring probes above and below the membrane.

1.2 RELATED DOCUMENTS

- Los Angeles County Building Code, Title 26, Sections 110.3, 110.4, and 110.5
- Methane Mitigation Standards and Policy No. 30, County of Los Angeles Department of Public Works

1.3 REFERENCES

- ASTM D412: Tensile Properties of Plastics
- ASTM D543: Chemical Resistance of Plastics
- ASTM D1149: Ozone Resistance
- ASTM D882: Tensile Properties of Thin Plastic Sheeting
- ASTM E96: Water Vapor Transmission

1.4 SUBMITTALS

- Product data for methane barrier membrane
- Vent trench layout and cross section details
- Monitoring probe specifications
- Installation and quality control plan
- Manufacturer's certification of membrane compatibility
- Engineer's certification of compliance

1.5 QUALITY ASSURANCE

- Installation to be performed by a qualified contractor experienced in methane barrier systems.
- Membrane installation to be observed by a third-party quality assurance inspector.

PART 2 - PRODUCTS

2.1 METHANE IMPERMEABLE MEMBRANE

- Material: High-density polyethylene (HDPE) or spray-applied liquid membrane
- Minimum thickness: 80 mils (2.0 mm)
- Approved systems: Liquid Boot, Geo-Seal, EPRO, or equivalent
- Seaming: Heat-welded or chemically bonded per manufacturer's guidelines

2.2 GRAVEL VENT TRENCH

- Trench depth: 0.6 m
- Trench width: 0.3 m
- Fill material: Clean, washed gravel (25–50 mm)
- Perforated pipe: 100 mm dia. HDPE SDR-17, slotted, wrapped in filter fabric
- Location: Around full building perimeter, offset 1 m from footing

2.3 MONITORING PROBES

- Type: Gas sampling probes with access risers
- Materials: PVC or HDPE risers with threaded caps
- Locations:
 - One probe below membrane near center
 - One probe above membrane in gravel vent layer
 - Additional probes at building corners as needed

PART 3 - EXECUTION

3.1 PREPARATION

- Compact subgrade to 95% maximum dry density
- Remove sharp debris and smooth surface

3.2 MEMBRANE INSTALLATION

- Place membrane over prepared subgrade, overlapping seams 150 mm min.
- Seal seams per manufacturer instructions
- Terminate membrane at footing walls using mechanical fasteners and sealant
- Conduct smoke test or vacuum test for leaks

3.3 GRAVEL VENT TRENCH INSTALLATION

- Excavate around perimeter to specified depth and width
- Install perforated pipe in trench base
- Place gas probe at mid-length of one trench
- Backfill with gravel to grade, compact lightly

3.4 MONITORING PROBE INSTALLATION

- Drill boreholes to designed depths
- Install sampling tubes and risers
- Cap and label probes
- Record as-built locations

3.5 FIELD QUALITY CONTROL

- Pressure test or smoke test to verify membrane integrity
- Inspect trench pipe for grade and slope
- Inspect probe installation

3.6 PROTECTION

- Protect membrane from UV exposure and construction damage
- Place protection board or geotextile over membrane prior to slab

3.7 MEASUREMENT AND PAYMENT

- For methane impermeable membrane beneath a 12 m x 25 m building, lump sum payment.
- For passive gravel vent trench system around the building perimeter, lump sum payment.
- For methane gas monitoring probes above and below the membrane, lump sum payment

END SECTION

SECTION 07 32 13 GEOSYNTHETIC CLAY LINER (GCL)

PART 1 - GENERAL

1.1 SUMMARY This section covers the supply and installation of geosynthetic clay liner (GCL) panels for use as part of a composite liner system in landfill, lagoon, or containment facility construction.

1.2 RELATED DOCUMENTS

- GRI-GCL3: Standard Specification for GCLs
- ASTM D5887, D5890, D5891, D4632, D6243

1.3 REFERENCES

- ASTM D5887: Hydraulic Conductivity of GCLs
- ASTM D5890: Swell Index
- ASTM D5891: Fluid Loss
- ASTM D4632: Grab Tensile Strength
- ASTM D6496: Peel Strength
- ASTM D4833: Puncture Resistance
- ASTM D6243: Internal Shear Strength

1.4 SUBMITTALS

- Manufacturer's data sheets and certifications
- Certified test reports from each batch
- Shop drawings including roll layout and overlap details
- Installation qualifications and project experience

1.5 QUALITY ASSURANCE

- Manufacturer shall be ISO 9001 certified
- GCL must comply with GRI-GCL3 standards
- Installation contractor must demonstrate experience on similar projects

PART 2 - PRODUCTS

2.1 MATERIAL COMPOSITION

- Core: Sodium bentonite clay, granular preferred
- Encapsulation: Needle-punched geotextiles
- Top: Nonwoven polypropylene (~270 g/m²)
- Bottom: Woven polypropylene (~110 g/m²)
- Bonding: Needle-punched fibers (no adhesives)
- Edge Treatment: 300 mm bentonite edge strips for overlap sealing

2.2 PHYSICAL AND HYDRAULIC PROPERTIES |

Property	Requirement	Test Method
Bentonite Mass	$\geq 4,000 \text{ g/m}^2$	Manufacturer QC
Hydraulic Conductivity	$\leq 1 \times 10^{-11} \text{ m/s}$	ASTM D5887
Swell Index	$\geq 24 \text{ ml/2g}$	ASTM D5890
Fluid Loss	$\leq 18 \text{ ml}$	ASTM D5891
Tensile Strength (MD/CD)	$\geq 1,000 / 1,200 \text{ N}$	ASTM D4632
Peel Strength	$\geq 240 \text{ N/m}$	ASTM D6496
CBR Burst Strength	$\geq 2,500 \text{ N}$	ASTM D4833 or AS 3706.4
Elongation	$\geq 40\%$	ASTM D4632
Internal Shear Strength	$\geq 45 \text{ kPa @ } 30 \text{ kPa}$	ASTM D6243
Roll Size	Width: 3–4 m; Length: ~30 m	Manufacturer Spec

2.3 SETTLEMENT PERFORMANCE

- GCL products must be certified by the manufacturer to tolerate tensile strains up to 3–4% without compromising hydraulic performance.

PART 3 - EXECUTION

3.1 SITE PREPARATION

- Subgrade must be smooth, compacted, and free of debris
- Remove sharp objects and rocks > 25 mm
- Final inspection by engineer prior to GCL installation

3.2 HANDLING AND STORAGE

- Store on pallets in shaded, dry area
- Protect from UV exposure and mechanical damage
- Handle in accordance with manufacturer recommendations

3.3 DEPLOYMENT

- Install panels per layout plan (perpendicular or parallel to slope)

- Layout plan shall provide a total of 12 meters of panel overlap along the short dimension of the landfill and a panel overlap of at least 300 mm along the long dimension of the landfill footprint.
- Position overlaps uphill to prevent water infiltration
- Avoid wrinkles and folds

3.4 SEAMING AND JOINTING

- Overlap bentonite edge strips for self-sealing joints
- Seal around penetrations using bentonite or compatible patches

3.5 HYDRATION CONTROL

- Avoid premature hydration - Do not install in wet weather
- Cover and confine GCL prior to hydration to ensure low permeability
- Replace any prematurely hydrated panels

3.6 COVER AND PROTECTION

- Cover with geomembrane, drainage layer, and/or protective soil per design
- Complete cover within 7 days of installation
- Avoid direct traffic on uncovered GCL

3.7 QUALITY CONTROL

- Inspect for defects, tears, punctures
- Record roll numbers and installation locations
- Monitor overlap quality and hydration protection

3.8 MEASUREMENT AND PAYMENT

- Basis: Square meters installed, including overlaps and waste

3.9 TOLERANCES AND ACCEPTANCE

- Maximum overlap misalignment: 50 mm
- Replace damaged or hydrated panels

3.10 APPROVED PRODUCTS

- Needle-punched sodium bentonite GCLs meeting GRI-GCL3
- Alternatives require submittal of test data and approval

END OF SECTION

SECTION 07 32 19 HDPE GEOMEMBRANE LANDFILL LINER 80 MIL

PART 1 – GENERAL

1.1 Summary

This section includes furnishing and installing an 80 mil HDPE geomembrane liner as part of the landfill containment system.

1.2 References

- ASTM D4439 – Terminology for Geosynthetics
- ASTM D638 – Tensile Properties
- ASTM D5397 – Environmental Stress Crack Resistance (ESCR)
- ASTM D6693 – Tensile Properties (Narrow Strip)
- GRI-GM13 – Standard Specification for HDPE Geomembranes
- Project-specific CQA Plan

1.3 Submittals

- Manufacturer's product data sheet
- Material quality certifications
- Panel layout and seam drawings
- Installer qualifications and weld logs
- CQA test results and as-builts

1.4 Quality Assurance

- Installer must have a minimum of 5 years of HDPE liner installation experience.
- All seaming technicians shall be certified.
- Field testing shall be conducted by a qualified third-party per the approved CQA plan.

PART 2 – PRODUCTS

2.1 Geomembrane Material

- Material: High-Density Polyethylene (HDPE)
- Thickness: 80 mil (2.0 mm)
- Color: Black with carbon black for UV resistance
- Conformance to GRI-GM13
- Texture: Textured on both sides (double-sided textured)

2.2 Geomembrane Properties (per GRI-GM13)

Property	Value	Test Method
Tensile Strength at Break	≥ 28 kN/m	ASTM D6693
Elongation at Break	≥ 700%	ASTM D6693
Puncture Resistance	≥ 600 N	ASTM D4833
Tear Resistance	≥ 250 N	ASTM D1004
ESCR (10% strain)	≥ 500 hours	ASTM D5397
Carbon Black Content	2.0 – 3.0%	ASTM D1603
Minimum average asperity height	≥ 0.25 mm	Textured geomembrane shall conform to GRI-GM13 requirements for double-sided textured HDPE.
Carbon Black Dispersion	Category 1 or 2	ASTM D5596

PART 3 – EXECUTION

3.1 Subgrade Preparation

Ensure subgrade is free of sharp objects, properly compacted, and graded. Geotextile cushion may be required where specified.

3.2 Deployment

Unroll geomembrane panels carefully to avoid damage. Allow for thermal expansion. Anchor and align panels per approved layout.

3.3 Seaming

Use hot wedge or extrusion welding methods. Minimum overlap 100 mm. Perform trial seams daily. Test seams using air pressure or vacuum box methods.

3.4 Penetrations and Structures

Install prefabricated boots and collars. Seal penetrations using extrusion weld. All pipe details shall be approved prior to installation.

3.5 Repairs

All defects >10 mm must be patched with compatible HDPE. Patches must have rounded corners and be welded and tested per standard practice.

3.6 Testing and Inspection

Conduct 100% visual inspection. Perform non-destructive seam tests (air channel or vacuum box). Destructive seam tests at 150 m intervals.

3.7 Protection

Do not expose liner to heavy equipment traffic without cover. Place soil or ballast layers promptly to prevent wind uplift and UV exposure.

3.8 Measurement and Payment

Payment is made based on square meters of liner installed and accepted, including seams, repairs, and testing.

END SECTION

DIVISION 13 – SPECIAL CONSTRUCTION

SECTION 13 34 19 PREFABRICATED ADMINISTRATIVE AND MAINTENANCE BUILDING

PART 1 – GENERAL

1.1 SUMMARY

This section includes the design, supply, installation, and commissioning of a prefabricated administrative and maintenance building at a landfill site. Work includes turnkey architectural and engineering services, coordination with the building manufacturer, utility connections, foundation design and construction, interior fit-out, and final handover.

The size of the building will be 200 square meters. The design basis and indicative preliminary layout are provided in Part IV.

1.2 RELATED DOCUMENTS

- Republic of the Marshall Islands National Building Code (2021)
- ICC International Building Code (2018)

1.3 SUBMITTALS

- Architectural, structural, MEP, and utility design drawings
- Shop drawings, cut sheets, and finish schedules
- As-built drawings and utility diagrams
- Product data and warranty documentation
- Operations & Maintenance (O&M) manuals
- Training materials and session records

1.4 QUALITY ASSURANCE

- Architect/Engineer must be licensed and experienced in modular design
- Building supplier must provide references for similar installations
- Electrical, plumbing, and structural components shall comply with RMI NBC

PART 2 – PRODUCTS

2.1 STRUCTURAL AND ARCHITECTURAL COMPONENTS

- Wall Panels: 3” thick composite panels with exterior 26 ga. steel, 2” polyisocyanurate insulation, and interior vinyl-finished gypsum bonded to tempered hardboard.

- Roof Decking: Type B or acoustical (BA, BIA) steel deck with rigid insulation and optional sound-absorbing batts.
- Doors: 20 ga. galvanized steel, 36" x 84" with closers, ANSI A1567 hinges, and optional tempered glass panel.
- Windows: Fixed 3'8" x 3' insulated tempered glass, installed 42" above floor.
- Flooring: 1/8" x 12" x 12" vinyl composition tile (VCT).
- Front of Building Façade: Exterior stone panel rainscreen facade mounted to one side of the prefabricated building, including subframing, brackets, anchors, fasteners, thermal breaks, air/water barrier (AWB), flashings, sealants, and accessories for a complete, weathertight system suitable for coastal, high-humidity, salt-spray, and cyclone-prone environments of the Republic of the Marshall Islands (RMI).

2.2 CLIMATE CONTROL SYSTEM

- Cooling Capacity: 2.5–3.0 tons (30,000–36,000 BTU/hr)
- System Type: Inverter split/multi-split or VAV+DOAS
- Filtration: MERV 8+
- SEER: ≥ 16
- Controls: Programmable thermostat with humidity sensor

2.3 PLUMBING SYSTEM

- Water Supply: CPVC, uPVC, or PEX pipe with brass/stainless fittings
- Storage Tank: Optional elevated/pressurized tank sized for daily demand
- Fixtures: Low-flow units with full restroom/shower integration
- Drainage: uPVC/cast iron piping with traps, vents, and cleanouts
- Water Heating: Electric or solar heater sized per occupancy

2.4 ELECTRICAL SYSTEM

- Voltage: 380V/220V, 3-phase, 50 Hz
- Distribution Boards: MDB and panels for lighting, power, and HVAC
- Wiring/Conduits: Embedded or surface-mounted PVC with bakelite boxes
- Lighting: LED fixtures with 300–500 lux and emergency lighting
- Fire Alarm: Smoke/heat detection, manual call points, alarm bell, and control panel
- Earthing/Lightning Protection: Ground rods and surge protection system
- Provide diesel powered emergency electrical generator. The electrical generator shall be properly sized to provide continuous electrical service for the building. Work includes furnishing, installing, testing, and commissioning a packaged, diesel engine-driven emergency standby generator set with weatherproof, sound-attenuated enclosure; integral sub-base double-wall fuel tank; generator circuit breaker; starting system; controls; remote annunciation; accessories; concrete pad and anchorage; exhaust and ventilation interfaces; grounding; and all incidentals required for a complete and operational system.

- Provide factory-assembled, UL 1008 listed automatic transfer switches (ATS) to transfer emergency loads between the normal utility source and the standby generator source, complete with microprocessor controller, power switching mechanism, enclosure, accessories, wiring, and appurtenances for a complete and

2.5 COMMUNICATION SYSTEMS

- Data/Telecom: Cat6 structured cabling
- Provide equipment to allow for Starlink internet connection. This service will provide backup internet service to the RMI Telecommunication internet service provider.

PART 3 – EXECUTION

3.1 SITE PREPARATION

- Excavate, grade, and level building footprint
- Construct reinforced cast-in-place concrete foundation

3.2 BUILDING PLACEMENT

- Deliver and place prefabricated modules
- Anchor, weatherproof, and integrate per manufacturer specifications
- Coordinate penetrations and connections for HVAC, water, sewer, power, and data

3.3 UTILITY INSTALLATION

- Trench and lay piping/conduits to connect to site infrastructure
- Install all plumbing, HVAC, and electrical systems
- Conduct pressure and continuity testing for systems prior to final connection

3.4 INTERIOR FIT-OUT

- Install interior partitions, cabinetry, finish carpentry, and fixtures
- Complete restrooms, kitchenette, and locker areas
- Paint and finish surfaces per specifications

3.5 TESTING AND COMMISSIONING

- Electrical: Load and continuity test, breaker verification
- Plumbing: Pressure and drainage flow tests
- HVAC: Airflow, temperature, and RH control tests
- Fire Alarm: Complete functional test

3.6 DELIVERABLES

- As-built drawings and connection diagrams
- Manufacturer warranties (≥12 months)
- Final inspection certifications
- O&M manuals and spare parts list
- Facility operator training (minimum 1 session)

3.7 MEASUREMENT AND PAYMENT

- Payment Basis
 - A/E Design Services - Lump Sum
 - Prefabricated Building Supply, Per Building- Lump Sum
 - Foundation Construction -Lump Sum
 - Utility Connections - Lump Sum
 - Installation and Fit-out - Lump Sum
 - Testing and Handover - Lump Sum

PART 4 – Design Basis

Summary Table for Administrative and Maintenance Building Space Needs

Area, sq meter	Low	High	Comment
Administrative Portion	87.5	114	Anticipating a 10 meter wide by 20- meter-long footprint.
Maintenance Portion	112.2	164.7	
Total	199.7	278.7	

Administrative Portion of Building Description of Use

Element	Purpose	Size	Furniture Details
Reception Area	A welcoming space for visitors, contractors, and customers	9 to 14 sq meter.	<p>Include a reception desk, seating area, chairs and some space for visitors to wait comfortably.</p> <p>Provide access to electrical and communications systems.</p>
Private Office for Site Manager	A private office with enough space for a desk, a meeting table for 3 people, and shelving/storage.	11 to 14 sq meter.	<p>Include good acoustics for confidentiality. Provide desk, credenza, 4 chairs and a small meeting table.</p> <p>Provide access to electrical and communications systems.</p>
Work Space for Two Administrative Staff	Desk space for each staff member, with space for personal files, phones, and computers.	11 to 14 sq meter (Total, 5.5 to 7 sq m each workspace)	<p>Include workstation, chairs</p> <p>Provide access to electrical and communications systems.</p>
Workspace for One Engineer/Environmental Officer	Desk space for the engineer or environmental officer,	11 to 14 sq meter	Desk and storage for office equipment, plus

Element	Purpose	Size	Furniture Details
	with a computer, files, and possibly some technical equipment		space for potential documents or drawings.
Meeting/Break Room (for 10 people)	A place for team meetings or breaks	18.5 to 23 sq meter	<ul style="list-style-type: none"> • Table & Chairs: A table that can seat 10 comfortably, with enough clearance for movement around the room. • Wall-Mounted Monitor with Credenza: provide access room to the monitor and credenza. • Kitchenette Area: provide space for a small fridge, sink, and countertop space. • Circulation Area: Enough space for people to move freely while not crowding the kitchen area.
File Storage	A dedicated space for file cabinets, shelving, and/or lockers.	5 to 7 sq meters	Provide shelving or a filing system that's easily accessible.
Two Restrooms (with Showers and Changing Space):	Private, functional restroom spaces with ample room for changing and showering	22 to 28 sq meters Total (11 to 14 sq meters each)	<ul style="list-style-type: none"> • Restroom: Toilets, sinks, and mirrors. • Showers: A small, efficient shower stall. • Changing Space: Space for changing, with hooks, benches, or cubby storage. • Each restroom should have a good flow and provide privacy and comfort
Hallway and access	Provide access through building to all elements	1.118 meter wide for length of Administrative portion of Building	Provide hallway access suitable for commercial building
Area, sq meter	Low	High	
Administrative Portion	87.5	114	

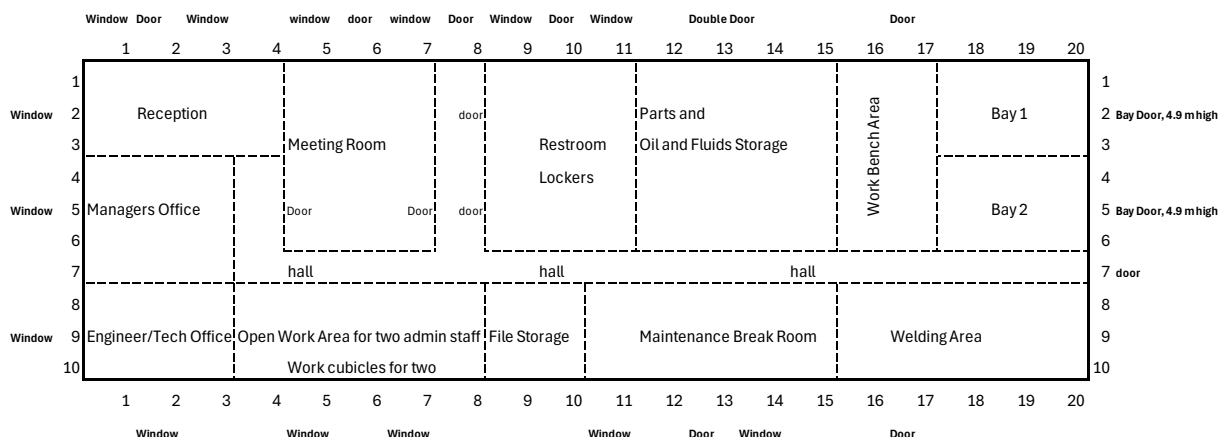
Maintenance Portion Description of Use

Element	Purpose	Size	Furniture Details
Vehicle and Equipment Service Bays	Space to park and service vehicles and heavy equipment.	16 to 21 sq meter total (8 to 10.5 sq meter each)	<ul style="list-style-type: none"> • Two bays, with sufficient space to allow for the servicing and maintenance of

Element	Purpose	Size	Furniture Details
			<p>multiple vehicles (e.g., a front-end loader, dump trucks, etc.) simultaneously.</p> <ul style="list-style-type: none"> • Height clearance is critical . Provide at least 3.7-4.3 meter depending on the equipment. • Access to large overhead doors (around 4.2 to 4.9 meter) to accommodate vehicles.
Workbenches and Tool Storage Area	Space for maintenance work on smaller parts, tools, and machinery.	18.6 to 27.8 sq meter	<ul style="list-style-type: none"> • A designated area with workbenches for mechanics to perform tasks like engine repairs, welding, and electrical work. • Tool storage with shelves, cabinets, and racks for both hand tools and more specialized equipment. • Storage for smaller components like belts, filters, hoses, gaskets, etc.
Parts Storage Area	Space for storing spare parts, fluids, and other maintenance materials.	13.9 to 27.8 sq meter	<ul style="list-style-type: none"> • Shelving or racking to store parts in an organized manner (oil, filters, lubricants, tires, etc.). • A dedicated area to store hazardous materials (e.g., oils, solvents, etc.) according to safety regulations.
Oil and Fluid Change Area	Space for draining and replacing oils and fluids in machinery	9.3 to 13.9 sq meter	<ul style="list-style-type: none"> • Proper drains, storage for used fluids, and waste disposal equipment. • Ideally located near the service bays for efficiency.
Welding and Fabrication Area	A dedicated space for welding and metalwork	13.9 to 23.2 sq meter	<ul style="list-style-type: none"> • Proper ventilation, fire-resistant materials, and storage for welding

Element	Purpose	Size	Furniture Details
			equipment and supplies. <ul style="list-style-type: none"> Space for fabrication of metal parts or repairs to machinery.
Employee Area (Break Room, Locker Rooms)	Comfortable space for staff	18.5 to 23 sq meter	<ul style="list-style-type: none"> A break room with seating, small kitchen area, and water dispenser. Lockers for workers to store personal belongings.
Two Restrooms (with Showers and Changing Space):	Private, functional restroom spaces with ample room for changing and showering	22 to 28 sq meters Total (11 to 14 sq meters each)	<ul style="list-style-type: none"> Restroom: Toilets, sinks, and mirrors. Showers: A small, efficient shower stall. Changing Space: Space for changing, with hooks, benches, or cubby storage. Each restroom should have a good flow and provide privacy and comfort
Area, sq meter	Low	High	
Maintenance Portion	112.2	164.7	

**Indictative Preliminary Layout
 Prefabricated Administrative and Maintenance Building**



END OF SECTION

SECTION 13 56 13 PITLESS WEIGHBRIDGE SYSTEM 20-TON

PART 1 - GENERAL

1.1 SUMMARY

This section covers the supply, installation, testing, and commissioning of a 20-ton pitless weighbridge system, including design and installation of civil and electrical works, calibration, and delivery of all accessories and documentation for full operational readiness.

1.2 RELATED DOCUMENTS

- Manufacturer's product literature
- Civil and electrical drawings
- Applicable national and local electrical codes

1.3 REFERENCES

- ISO 9001: Quality Management Certification
- IP68: Environmental rating for load cells
- National standards for weighing accuracy and calibration

1.4 SUBMITTALS

- Product data sheets and technical specifications
- Installation and as-built drawings
- Calibration certificates
- Operation and maintenance manual
- Software license and user guide

1.5 QUALITY ASSURANCE

- Equipment to be factory-calibrated and certified
- Installation to be performed by qualified personnel

PART 2 - PRODUCTS

2.1 WEIGHBRIDGE PLATFORM

- Type: Pitless (surface-mounted) weighbridge
- Capacity: 20 tons (20,000 kg)
- Platform Size: Minimum 3 m (W) × 12 m (L); options up to 18 m length
- Material:
 - Main Beams: IWF 600 steel
 - Cross Beams: IWF 250 steel
 - Deck Plate: 12 mm thick steel plate
 - Surface Finish: Painted or optionally galvanized
 - Deck Surface: Heavy-duty steel, skid-resistant

2.2 LOAD CELLS

- Quantity: Typically 4
- Type: Digital double-ended shear beam strain gauge
- Capacity: ≥ 5 tons per cell
- Protection Rating: IP68 (waterproof and dustproof)
- Accuracy: $\pm 0.05\%$ of rated capacity
- Resolution: 2–5 kg
- Overload Capacity: 150% safe, 300% ultimate

2.3 DIGITAL INDICATOR AND ELECTRONICS

- Display: LCD or LED
- Functions: Tare, zero, gross/net
- Communication: USB, RS232, or Ethernet
- Optional: Printer for weight tickets
- Power: 220–230 V AC, 50 Hz, single-phase
- Accessories: Junction box, surge protector, grounding system

2.4 SOFTWARE AND DATA MANAGEMENT

- Integrated software for data logging and reporting
- Customizable fields per client requirements

PART 3 - EXECUTION

3.1 CIVIL WORKS

- Concrete Pad: Reinforced concrete foundation
- Leveling tolerance: ± 5 mm - Ramps:
- Steel or concrete
- Minimum 3 m length per side, 1:10 slope - Drainage:
- Surface drainage to prevent pooling or flooding

3.2 ELECTRICAL WORKS

- Supply and install conduits, wiring, junction boxes
- Grounding and surge protection
- Connection of weighbridge to control and display units

3.3 INSTALLATION AND INTEGRATION

- Equipment Handling: Unload, position, and align weighbridge
- Load Cell Installation: Mount and wire with protection
- Calibration: Use certified test weights and submit report
- Integration: Ensure communication with PC/network system

3.4 TESTING AND COMMISSIONING

- Operational Test: Verify leveling, accuracy, and responsiveness
- Software Test: Demonstrate tare, print, and reporting
- Submit: Signed commissioning report and calibration certificate

3.5 DELIVERABLES

- Technical documentation and certifications
- O&M manuals
- Training for local operators (minimum 1 session)

3.6 MEASUREMENT AND PAYMENT

- Weighbridge System Supply, payment by Unit
- Civil Works, payment by lump sum
- Electrical Works and Wiring, payment by lump sum
- Installation and Calibration, payment by lump sum
- Testing, Commissioning and Training, payment by lump sum

END OF SECTION

DIVISION 21 – FIRE SUPPRESSION

Section 21 35 14.10 Seawater Fire Pump System (550 GPM, 70 PSI)

PART 1 – GENERAL

1.1 SUMMARY

This section covers the design, supply, installation, testing, and commissioning of a seawater-compatible fire pump system rated at 550 gallons per minute (GPM) at 70 psi. Scope includes pump procurement, electrical and civil works, control systems, installation, all suction and discharge piping, appurtenances, valves, strainers, tapping works, trenching, bedding, backfilling, corrosion protection, and all related items required to connect the fire pump to the Ebeye seawater distribution system and to convey seawater to the pump suction header and final commissioning.

The Ebeye seawater distribution main approaches the Ebeye Landfill site to within approximately 110 meters of the landfill boundary, at the point where the boundary intersects the Causeway Road. The main is constructed of 6-inch-diameter, Schedule 80 polyvinyl chloride (PVC) pipe.

The island's seawater supply system is served by three pumping stations, which collectively provide an average production capacity of approximately 5,013 m³/day (about 58 L/s, or 915 gpm) to meet Ebeye's toilet-flushing and fire-suppression demands. The northernmost pumping station, located approximately 360 meters from the landfill site, has an observed average production rate of approximately 1,988 m³/day (about 23 L/s, or 365 gpm). This proximity and available capacity make it a suitable source for supplying the proposed landfill seawater fire pump system.

To connect to this system, please coordinate with the Kwajalein Atoll Joint Utilities Resources Inc (KAJUR), Phone Number: (692) 329-3799, Mr. Julien Reimers and Mr. Ed Bobo, Email: jreimers@kajur.net and edbobo@kajur.net

All tie-in works, testing, approvals, and work sequencing for the suction pipeline shall be coordinated with KAJUR and performed only with their approval and oversight.

1.2 RELATED DOCUMENTS

- NFPA 20 – Standard for the Installation of Stationary Pumps for Fire Protection
- UL and FM Listings for Fire Pumps
- Local and marine environmental standards
- NFPA 24 – Standard for the Installation of Private Fire Service Mains
- AWWA and ASTM standards for HDPE, PVC, and stainless steel piping.

1.3 SUBMITTALS

- Design calculations for hydraulics, power, and structural requirements
- Shop drawings and product data sheets
- Control panel wiring diagrams

- Test certificates and commissioning documentation
- Operation and maintenance manuals
- Complete suction and discharge pipeline design, including hydraulic profile, valve schedule, and appurtenance details
- Trenching, bedding, and backfilling plan
- Corrosion protection and coating plan
- KAJUR connection approval and shutdown/tie-in plan

1.4 QUALITY ASSURANCE

- Pump shall be UL Listed and FM Approved for fire service
- Equipment and installation shall comply with NFPA 20
- Materials and coatings must be rated for seawater corrosion resistance
- All suction and discharge piping shall conform to NFPA 24 and AWWA standards

PART 2 – PRODUCTS

2.1 PUMP TYPE AND PERFORMANCE

- Type: Horizontal split-case or vertical turbine centrifugal fire pump
- Capacity: 550 GPM
- Discharge Pressure: 70 psi (approx. 4.8 bar)
- Shutoff Head: $\geq 100\%$ of rated head
- Operating Speed: 1750 or 2900 RPM

2.2 MATERIALS AND CONSTRUCTION

- Casing: Cast bronze or duplex stainless steel
- Impeller: Dynamically balanced bronze or stainless steel
- Shaft: 316 or duplex stainless steel with protective sleeves
- Bearings: Corrosion-resistant, grease-lubricated
- Seals: Mechanical or gland packing suitable for seawater
- Coatings: Marine-grade epoxy or powder coating
- Piping materials shall be seawater-compatible HDPE, Schedule 80 PVC, or duplex stainless steel, depending on location and hydraulic requirements
- Fasteners shall be 316 stainless steel

2.3 PUMP DRIVE AND MOTOR

- Motor Type: TEFC, premium efficiency, marine-grade insulation Power: 50–75 HP to meet duty point
- Voltage: 230/460V, 3-phase, 60 Hz (or site-matched)
- Alternate Drive: Diesel engine available for remote backup

2.4 ACCESSORIES AND FITTINGS

- Suction/Discharge Flanges: ANSI B16.1 Class 125 or higher
- Gauges: Pressure gauges on suction and discharge
- Coupling: Flexible with guard
- Baseplate: With vibration isolators
- Optional: Flow, temperature, and vibration monitoring system
- Tapping saddle and isolation valve for connection to the existing KAJUR 6-inch PVC main
- Minimum 4-inch suction pipeline sized by hydraulic calculation
- UL/FM-listed OS&Y suction isolation valve at pump room
- Duplex stainless-steel or bronze seawater basket strainer
- Check valves, blow-off valves, and air-release valves as required
- HDPE butt-fusion or electrofusion fittings for buried suction pipeline
- Thrust blocks or restrained-joint systems for all fittings

2.5 CONTROL PANEL

- NFPA 20 Compliant
- Enclosure: NEMA 4/4X, outdoor marine-rated
- Functions: Auto/manual start-stop, fault alarms, remote monitoring
- Indicators: Low suction pressure, overload, system ready

2.6 PIPING MATERIALS

- Acceptable Pipe Materials
 - Buried Suction Pipeline: HDPE DR11/DR17 per AWWA C906
 - Aboveground Suction: Schedule 80 PVC or HDPE
 - Pump Room Piping: Schedule 80 PVC or duplex stainless steel
 - Valves: Bronze, 316 SS, or PVC (UL/FM where applicable)
- Jointing Requirements
 - HDPE fusion-welded joints (butt or electrofusion)
 - PVC solvent-cement or flanged joints
- Coating and Corrosion Protection
 - Marine-grade epoxy coatings on metallic components
 - UV protection on aboveground piping

PART 3 – EXECUTION

3.1 SITE AND FOUNDATION WORKS

- Prepare site by excavation and compaction
- Construct reinforced concrete slab with anchor bolts
- Install roofed pump shelter with corrosion-resistant structure (if required)

3.2 INSTALLATION

- Set pump and motor with proper alignment
- Install suction and discharge pipework with supports and thrust blocks, including all excavation, trenching, pipe installation, bedding, thrust restraint, backfilling, compaction, corrosion protection, and pavement restoration required to construct the suction pipeline from the KAJUR seawater main to the pump station.
- Terminate electrical connections and control wiring
- Ensure proper torque and gasket installation for piping.
- Tie-in to the KAJUR main shall be performed only under KAJUR supervision.
- Minimum cover for buried piping shall be 900 mm, unless otherwise directed by KAJUR.
- Provide air-release valves at system high points and blow-off valves at low points.
- Provide concrete thrust blocks at all bends, tees, reducers, and valves.

3.3 TESTING AND COMMISSIONING

- Hydrostatic Test: Pressure-test piping and connections
- Performance Test: Verify flow rate and pressure at duty point
- Functional Test: Confirm auto/manual control, alarms, and remote interface
- Submit: Certificates, reports, and inspection documentation
- Hydrostatic testing shall include the complete suction pipeline from the KAJUR connection to the pump room isolation valve.
- Contractor shall flush the suction line prior to operating the fire pump.
- Joint inspection with KAJUR is required prior to final acceptance.

3.4 DELIVERABLES

- Shop and as-built drawings
- Certifications and warranty (min. 12 months post-commissioning)
- O&M manuals
- Training session for local staff
- Approved KAJUR tie-in documentation
- Hydrostatic testing and flushing reports

3.5 MEASUREMENT AND PAYMENT

Payment Basis:

- Pump Station Design - Lump Sum
- Fire Pump Supply – Lump Sum
- Civil Construction - Lump Sum
- Electrical and Control Works - Lump Sum
- Installation and Commissioning - Lump Sum

- Suction Pipeline Construction, Including Trenching, Bedding, Valves, and Tie-In – Lump Sum
- Supply and Installation of Strainers, Valves, and Fittings – Lump Sum

END OF SECTION

DIVISION 23 – MECHANICAL

SECTION 23 13 29 DIESEL FUEL STORAGE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

This section covers the supply, installation, testing, and commissioning of a 500-gallon double-walled diesel fuel storage tank system, including site preparation, fuel and electrical connections, interstitial monitoring, and regulatory compliance.

1.2 RELATED DOCUMENTS

- NFPA 30 and 30A: Flammable and Combustible Liquids Code
- UL 142: Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids
- National Electrical Code (NEC)
- Applicable local environmental and fire protection regulations

1.3 REFERENCES

- UL 142: Aboveground Steel Tanks
- NFPA 30A: Motor Fuel Dispensing Facilities and Repair Garages
- NEC: Bonding and Grounding of Fuel Systems

1.4 SUBMITTALS

- Product data and UL/NFPA certifications
- As-built installation drawings and pipe routing
- Electrical schematics
- Operation and maintenance manuals
- Warranty certificates (minimum 12 months)

1.5 QUALITY ASSURANCE

- Manufacturer shall be certified to fabricate UL 142-listed tanks
- Installers must be qualified and experienced in diesel fuel tank systems

PART 2 - PRODUCTS

2.1 DIESEL FUEL STORAGE TANK

- Capacity: 500 US gallons (approx. 1,893 liters)
- Construction: Double-walled carbon steel
- Inner and outer walls: Minimum 12-gauge thickness
- Coatings:
 - External: Marine-grade paint or powder coating
 - Internal: Fuel-compatible lining as required

- Secondary containment volume: $\geq 110\%$ of tank capacity
- Accessories: - 2.5" threaded fill cap with locking mechanism
- Emergency vent (4") and normal vent (2")
- 1" NPT pump feed fitting
- Lockable cabinet for pump/equipment
- Manual dip stick with inch/gallon markings
- Float gauge or electronic level sensor
- Optional: 12V, 24V, or 110V pump kits with nozzle and filtration

2.2 STRUCTURAL COMPONENTS

- Base: Channel iron or skid mount for forklift access
- Stacking brackets and forklift pockets for mobility and storage

PART 3 - EXECUTION

3.1 SITE PREPARATION AND FOUNDATION

- Install on firm, level, non-combustible base
- Reinforced concrete slab: Minimum 150 mm thick with #4 rebar @ 300 mm spacing
- Pad to extend 0.5 m beyond tank footprint and slope away from tank
- Provide anchors or tie-downs per local wind/seismic zone requirements

3.2 INSTALLATION REQUIREMENTS

- Offload and rig tank into designated position
- Install fuel pump system, hoses, nozzle, and related piping
- Secure electrical connections in NEMA 4 enclosures
- Ground and bond system per NEC and NFPA 30
- Install and test interstitial leak detection system (manual or electronic)
- Label all vents, fill points, and emergency shutoffs per code

3.3 ELECTRICAL AND FUEL PIPING

- Provide 12V, 24V, or 110V supply for pump kit
- Include circuit protection, conduit, and shut-off switches
- Connect flexible or rigid lines to downstream fuel dispensers/equipment
- Include shut-off valves, check valves, and filters as required

3.4 TESTING AND COMMISSIONING

- Perform hydrostatic or pressure test of all fittings
- Verify pump flow rate and emergency stop
- Confirm leak detection sensor or manual inspection port operation
- Submit commissioning report and certifications

3.5 OPERATION AND MAINTENANCE

- Provide manuals including inspection, operation, and interstitial monitoring
- Schedule periodic tank inspections and leak checks

3.6 ACCEPTANCE CRITERIA

- UL 142 and NFPA 30A compliance
- Verified leak-free seams and fittings
- Functioning interstitial monitoring and emergency venting

3.7 MEASUREMENT AND PAYMENT

- Fuel Tank and Accessories: Lump sum
- Site Preparation and Foundation: Lump sum
- Electrical and Piping Installation: Lump sum
- Testing and Commissioning: Lump sum

3.8 APPROVED PRODUCTS

- FuelCube FCP500 (Western International) or approved equal - 500-gallon, double-walled steel construction
- UL 142, NFPA 30A certified
- Lockable cabinet, forklift pockets, and marine-grade coating

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 26 56 00 SOLAR-POWERED STREET LIGHTS

PART 1 – GENERAL

1.1 SUMMARY

Section includes the supply, installation, and commissioning of standalone solar-powered LED street lighting systems, complete with photovoltaic (PV) modules, batteries, light poles, luminaires, control systems, and all associated accessories, tailored for coastal, high-humidity, and cyclone-prone environments typical of the Republic of the Marshall Islands (RMI).

- **Related Sections:**
 - Section 03 30 00 – Cast-in-Place Concrete (pole foundations)
 - Section 31 00 00 – Earthwork (trenching and backfill, if required)
 - Section 26 05 00 – Common Work Results for Electrical

1.2 REFERENCES

- Comply with the latest editions of the following standards and codes as applicable:
 - National Electrical Code (NEC) – NFPA 70
 - International Electrotechnical Commission (IEC) Standards, including IEC 61215 (PV modules) and IEC 62109 (PV inverters and charge controllers)
 - IEEE standards relevant to solar PV systems and lighting equipment
 - UL standards for electrical components such as UL 1703 (PV Modules), UL 1598 (Luminaires), and UL 1998 (Software in Programmable Components)
 - AASHTO LRFD Bridge Design Specifications (for pole foundation design under wind loads)
 - Local building codes for the Republic of the Marshall Islands and environmental regulations
 - IESNA Lighting Handbook for photometric criteria

1.3 SUBMITTALS

- **Product Data:**
 - PV module datasheets including efficiency, electrical characteristics, and warranty details.
 - LED luminaire data including lumen output, correlated color temperature (CCT), color rendering index (CRI), efficacy, and optical distribution characteristics.
 - Battery specifications including type, nominal capacity (Ah), depth of discharge, cycle life, and manufacturer warranty.
 - Controller specifications detailing charge/discharge profiles, dimming capabilities, communication protocols, and lighting schedules.
- **Shop Drawings**
 - Pole dimensions, mounting height, and anchor bolt layout.
 - Foundation design drawings accounting for RMI-specific soil conditions and cyclone wind loads.
 - Wiring diagrams for electrical connections and system layout.

- Test Reports:
 - Photometric calculations and IES files demonstrating compliance with lighting levels and uniformity requirements.
 - Third-party certifications for PV modules, batteries, and controllers according to referenced standards.
- Operation & Maintenance (O&M) Manuals including detailed instructions for system operation, troubleshooting, battery maintenance, and warranty guidelines.

1.4 QUALITY ASSURANCE

- Installer Qualifications:
 - Installer shall have a minimum of 3 years' experience installing solar-powered lighting systems in coastal environments.
 - Installer shall be certified or trained by at least one equipment manufacturer.
- Regulatory Compliance: All electrical components shall be listed or certified by UL or an equivalent internationally recognized testing laboratory.
- Warranty:
 - PV modules shall have a minimum 20-year performance warranty guaranteeing at least 80% output power.
 - Batteries shall have a minimum 5-year warranty for performance and capacity.
 - Poles and structural hardware shall be hot-dip galvanized and finished with a marine-grade powder coating with minimum 10-year corrosion resistance warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

- Deliver materials in manufacturer's original, labeled packaging.
- Store all components in a clean, dry, and ventilated area protected from salt spray, moisture, and mechanical damage.
- Maintain adequate spacing and elevation above ground to avoid wetting or contamination.

1.6 TRAINING

- Provide on-site training for Owner's staff covering operation, routine maintenance, troubleshooting, and safety.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- Provide components from manufacturers with a minimum of 10 years of experience supplying solar street lighting equipment for coastal environments. Products from multiple manufacturers are acceptable if they meet specifications.
- Typical manufacturers (basis of design):

- PV Modules: REC Solar, Canadian Solar, SunPower, or equivalent certified to IEC 61215 and IEC 61730.
- LED Luminaires: Philips, Cree, Osram, or equivalent with marine-grade enclosures and suitable photometric distributions.
- Batteries: Trojan, Exide, or equivalent deep-cycle VRLA AGM or Lithium-ion designed for solar applications.
- Controllers: Morningstar, OutBack Power, or equivalent with programmable lighting control and weather-resistant enclosures.
- Light Poles: Valmont, Galvanized Steel tubular poles with marine-grade powder coating.

2.2 PHOTOVOLTAIC (PV) MODULES

- Crystalline silicon, monocrystalline or polycrystalline modules with minimum 18% module efficiency.
- Frame: Anodized aluminum with corrosion resistance suitable for salty coastal environments.
- Warranty: 20-year linear power output guarantee.

2.3 LED LUMINAIRES

- Provide LED luminaires with minimum 120 lumens per watt efficacy, CCT between 4000K and 5000K, and CRI > 70.
- IP65 or higher rating for resistance to water and dust ingress.
- Marine-grade finish and corrosion-resistant materials.
- Optical distribution shall be Type III or Type V for street lighting.

2.4 BATTERIES

- Deep-cycle VRLA AGM or Lithium-ion battery suitable for daily cycling, minimum 1500 cycles at 80% DOD.
- Built-in temperature compensation capability.
- Capacity sized to guarantee at least 5 days of autonomy under no sun conditions.

2.5 CONTROLLERS

- MPPT (Maximum Power Point Tracking) charge controllers with programmable lighting schedules and dimming.
- Weatherproof enclosure with NEMA 4X or IP66 rating.
- Integrated data-logging and remote monitoring capability preferred.

2.6 LIGHT POLES AND MOUNTING HARDWARE

- Hot-dip galvanized steel poles designed per AASHTO LRFD for wind speeds exceeding 150 mph, including cyclone loading.
- Marine-grade powder coating with minimum 4 mil thickness.
- Anchor bolts and mounting hardware of stainless steel or corrosion-resistant alloy.

PART 3 – EXECUTION

3.1 EXAMINATION

- Verify site conditions are suitable including soil condition, final grading, and utility services before proceeding.
- Confirm foundation design and installation meet cyclone wind-load requirements.

3.2 INSTALLATION

- Install poles per manufacturer's instructions and related Sections 03 30 00 and 31 00 00 for concrete foundation and earthworks.
- Mount PV modules with proper tilt angle to maximize solar exposure, secure from wind uplift.
- Connect electrical wiring according to approved shop drawings and comply with NEC and local electrical codes.
- Install luminaires on poles at specified heights and orientations to provide uniform street lighting.

3.3 FIELD QUALITY CONTROL

- Perform insulation resistance tests and continuity verifications on electrical circuits prior to energizing.
- Conduct IR thermography inspection of energized components to detect hot spots.
- Verify proper operation of MPPT controllers and lighting schedules.
- Perform photometric measurements on site to ensure lighting levels meet design criteria.

3.4 COMMISSIONING

- Provide commissioning report documenting system performance.
- Train Owner's personnel on system operation, routine maintenance, and fault diagnosis.
- Submit final as-built drawings, test reports, and warranty documentation.

3.5 PROTECTION

Protect installed equipment from damage due to construction operations or environmental factors until final acceptance.

3.6 WARRANTY

- Furnish manufacturer's warranties for PV modules, batteries, controllers, luminaires, and poles as specified in Part 1.
- Installer's warranty covering workmanship and installation defects for a minimum of 1 year from date of acceptance.

4.01 MEASUREMENT

Solar-powered street lighting systems shall be measured by the number of complete, installed, tested, and commissioned solar street light units, each consisting of:

- Light pole and foundation;
- Photovoltaic (PV) module(s);
- LED luminaire;
- Battery system;
- Charge controller and control system;
- All wiring, conduits, connectors, mounting hardware, and accessories;
- Testing, commissioning, and training;
- All incidentals necessary to provide a fully functional system.

Partial installations or individual components will not be measured separately.

4.02 PAYMENT

Payment shall be made at the Contract unit price per solar-powered street light and shall constitute full compensation for furnishing, installing, testing, commissioning, and warranting the complete system, including:

- Procurement, shipping, handling, and storage of all materials;
- Pole foundations, anchor bolts, and concrete works;
- Electrical connections, wiring, and controls;
- All temporary facilities, utilities, access, and traffic control;
- Compliance with environmental, safety, and regulatory requirements;
- On-site testing, photometric verification, commissioning, and training;
- Preparation and submission of as-built drawings, O&M manuals, and warranties;
- All labor, equipment, tools, overhead, profit, and incidentals.

No separate payment will be made for individual components, temporary facilities, testing, training, or documentation unless explicitly identified as a separate bid item in the Contract Documents.

END SECTION

DIVISION 31 – EARTHWORK

SECTION 31 05 19 – GEOGRID REINFORCEMENT FOR LEGACY WASTE AND SOFT-SPOT MITIGATION

PART 1 – GENERAL

1.01 SUMMARY

This Section specifies furnishing, delivering, and installing geogrid reinforcement systems to stabilize legacy waste and saturated soft-spot zones beneath the landfill liner system.

Two reinforcement systems are included, as shown on the Drawings and as directed by the Engineer. These systems are described as follows:

- The Global Bridge Design, consisting of engineered fill and geogrid reinforcement, will be installed in areas where the landfill liner system is installed over legacy waste.
- The Saturated Zone Bridge Design, consisting of seated rock, geotextile, engineered fill and two separate layers of geogrid reinforcement, will be installed only within designated soft-spot zones, as shown in the Drawings, or over saturated legacy waste, as confirmed by the Engineer. In all cases, the Saturated Zone Bridge Design will be installed below the Global Bridge Design system.
- The general arrangement of the Global Bridge Design and Saturated Zone Bridge Design is shown below for the case of the two reinforcement system designs being constructed on top of one another:

Bridge Design

0.30 m soil fill	Global Bridge Design , directly beneath landfill liner systems and above legacy waste
GeoGrid 2 Global Reinforcement	
0.30 m soil fill	
0.30 m soil fill	Saturate Zone Bridging Design, placed directly over saturated legacy waste in groundwater
GeoGrid 1- Primary Reinforcement For Saturated Zone	
0.30 m soil fill	
GeoGrid 0 & Filter Fabric Underlay	
0.50 m seated rock	

Where native soil exists, the landfill liner system will be installed over compacted native soil.

The saturated legacy waste (Soft Spot), currently estimated to be 25 m by 50 m in area, is located near the southern boundary of the landfill site. A diagram showing the general location is presented below:

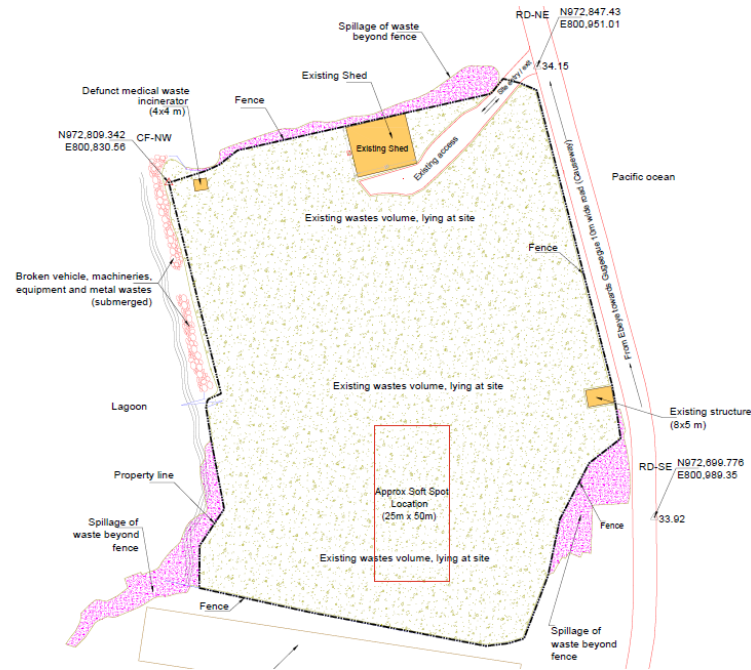


Figure 1 - Approximate Soft Spot Location

1.02 RELATED SECTIONS

- Section 01 33 00 – Submittal Procedures
- Section 02 41 00 – Demolition (Legacy Waste Disturbance)
- Section 31 00 00 – Earthwork
- Section 31 23 33 – Trenching and Backfilling
- Section 31 25 23 – Geotextile Protective Layer and Initial Waste Placement
- Section 33 46 16 – Leachate Collection Piping

1.03 REFERENCES

- ASTM D6637/D6637M – Tensile Properties of Geogrids
- ISO 10319 – Wide-Width Tensile Test for Geosynthetics
- ASTM D4759 – Specification Conformance of Geosynthetics
- ASTM D4873 – Identification, Storage, and Handling of Geosynthetics
- ASTM D5262 – Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics

1.04 DEFINITIONS

- Global Bridge Design. This refers to a completed soil/geogrid bridging system that consists of:
 - 300 mm engineered fill soil separation layer, above legacy waste or above the Saturate Zone Bridge Design and below Geogrid 2
 - Geogrid 2;
 - 300 mm engineered soil fill separation layer, above Geogrid 2 and below Liner System

- Saturate Zone Bridge Design. This refers to a completed soil/geogrid bridging system that consists of:
 - 500 mm seated rock layer over saturated legacy waste;
 - Non-woven geotextile over rock placement, using same non-woven geotextile material as specified in Section 31 25 23;
 - Geogrid 0 over the non-woven geotextile layer;
 - 300 mm engineered soil fill separation layer, above Geogrid 0 and below Geogrid 1.
 - Geogrid 1 over the 300 mm of engineered fill soil;
 - 300 mm engineered fill soil separation layer, above Geogrid 1 and below Geogrid 2.

1.05 SUBMITTALS

- Submit the following in accordance with Division 01:
- Product Data: For each Geogrid type, submit:
 - Manufacturer's technical datasheets for each geogrid type, indicating:
 - Ultimate tensile strength in the principal strength direction (kN/m);
 - Long-term design tensile strength (LTDS);
 - Reduction factors applied (installation damage, creep, durability) and supporting test standards;
 - Recommended overlaps, anchorage, and installation limitations.
 - Manufacturer's certification that the supplied geogrids meet or exceed the specified LTDS requirements.
 - Roll identification and labeling in accordance with ASTM D4873, including manufacturer, product name, roll number, lot number, and roll dimensions
- Quality Control Test Reports.
 - Factory quality control (FQC) test results for tensile strength per ASTM D6637 or ISO 10319, not more than 12 months old at time of submittal.
 - Proposed reduction factors and basis for values if different from defaults specified in this Section.
- Installation Plan:
 - Sequence of placement of rock, geotextile, geogrids, and engineered fill.
 - Equipment types, ground pressures, and methods to comply with traffic and compaction restrictions.
 - Proposed methods for securing overlaps and preventing geogrid displacement.

1.06 QUALITY ASSURANCE

- Geogrid manufacturer shall have a minimum of 10 years documented experience producing high-strength geogrids for landfill, embankment, or reinforced-soil applications.
- Geogrids shall be produced from virgin polymer resins with documented quality control programs.
- Acceptance Testing:
 - The Engineer may direct sampling and testing in accordance with ASTM D4759 for specification conformance.
 - Minimum frequency: One sample per 10,000 m² of each geogrid type delivered, or per lot, whichever results in more frequent testing, unless otherwise approved.

- Tested ultimate strength shall be within ± 10 percent of the specified minimum ultimate strength corresponding to the specified LTDS.
- Materials failing to meet the specified requirements shall be rejected and replaced at no additional cost.

PART 2 – PRODUCTS

2.01 GENERAL

- Geogrids shall be uniaxial polyester (PET) or approved equivalent low-creep polymer, coated for durability in landfill environments and suitable for long-term exposure to moisture and landfill leachate.
- Geogrids shall exhibit low creep characteristics appropriate for long-term landfill loading with a minimum 120-year design life.
- Tensile testing for specification conformance shall be in accordance with ASTM D6637/D6637M or ISO 10319 in the principal strength direction

2.02 GEOGRID TYPES AND STRENGTH REQUIREMENTS

A. Geogrid 0 – Lower Reinforcing Geogrid (Soft-Spot Zone Only)

- Location: Installed directly above the nonwoven geotextile layer covering the seated rock layer, which is installed over saturated legacy waste within designated soft-spot zones only or as directed by the Engineer.
- Function:
 - Local reinforcement and load distribution at the interface between the nonwoven geotextile/rock layer and overlaying engineered fill;
 - Confinement of the rock layer;
 - Not intended to span large voids.
- Type: Ultra-High-Strength Uniaxial PET Geogrid.
- Minimum Long-Term Design Tensile Strength (LTDS): ≥ 460 kN/m in the principal strength direction.
- Geogrid shall exhibit low creep characteristics appropriate for long-term landfill loading (120 year service life).

B. Geogrid 1 – Upper Reinforcing Geogrid (Primary Bridging Layer, Soft-Spot Zone Only)

- Location: Installed above engineered soil fill approximately 300 mm above the nonwoven geotextile/seated rock layer in the designated soft-spot zones or in areas as determined by the engineer.
- Function:
 - Primary tensile reinforcement for localized void-spanning and punch-through mitigation;
 - Control of localized differential deformation in saturated legacy waste.
- Type: Ultra-High-Strength Uniaxial PET Geogrid.
- Minimum Long-Term Design Tensile Strength (LTDS): ≥ 460 kN/m in the machine (primary) direction.
- Geogrid shall exhibit low creep characteristics appropriate for long-term landfill loading (120 year service life).

C. Geogrid 2 – Global Reinforcement Beneath Liner (All Legacy Waste Areas)

- Location: As part of the Global Bridge Design system, Geogrid 2 is installed beneath the landfill liner system where it will be installed over areas of legacy waste that is left in place, including soft-spot and non-soft-spot areas.
- Function:
 - Promote uniform settlement;
 - Distribute operational loads beneath the liner system;
 - Provide secondary control of differential settlement.
- Type: Very-High-Strength Uniaxial PET geogrid.
- Minimum Long-Term Design Tensile Strength (LTDS):
≥ 205 kN/m in the principal strength direction.
- Geogrid shall exhibit low creep characteristics appropriate for long-term landfill loading (120 year service life).

D. Summary of Geogrid Requirements

Geogrid	Application	LTDS (kN/m)	Type	Notes
0	Lower reinforcement, soft-spot zone	≥ 460	Uniaxial PET	Over geotextile on seated rock
1	Upper bridging, soft-spot zone	≥ 460	Uniaxial PET	Primary bridging layer
2	Global reinforcement beneath liner	≥ 205	Uniaxial PET	All legacy waste areas under liner

2.03 ORIENTATION

- Uniaxial geogrids shall be installed with the primary (machine) direction oriented perpendicular to the anticipated direction of localized void or soft-spot span, as shown on the Drawings or directed by the Engineer.

2.04 DETERMINATION OF ULTIMATE TENSILE STRENGTH

- The Contractor shall determine the minimum required ultimate tensile strength for each geogrid layer by applying appropriate reduction factors as follows:

$$LTDS = \frac{T_{ult}}{RF_{ID} \times RF_{CR} \times RF_D}$$

Where:

- LTDS = Long-Term Design Tensile Strength
- T_{ult} = Ultimate Tensile Strength of Product
- RF_{ID} = installation damage reduction factor,
- RF_{CR} = creep reduction factor,
- RF_D = durability/environmental reduction factor.
- Reduction factors shall be supported by:
 - Laboratory testing per referenced standards, or
 - Manufacturer provided values with documentation, subject to Engineer approval.

2.05 DELIVERY, STORAGE, AND HANDLING

- Identify, store, and handle geogrids in accordance with ASTM D4873.
- Each roll shall be clearly labeled with manufacturer name, product name, roll number, lot number, and roll dimensions.
- Rolls shall be wrapped to protect against sunlight, moisture, mud, and physical damage during shipment, storage, and handling.
- Store rolls on a smooth surface, off the ground, and protect from damage until installation.

PART 3 – EXECUTION

3.01 SUBGRADE AND SEATED ROCK LAYER PREPARATION

- Seated rock layers (soft-spot zones only or other areas as confirmed by the Engineer) shall be placed to the limits shown and brought to a stable working surface.
- Rock Size and Seating:
 - Rock shall conform to the gradation specified on the Drawings or in Section 31 00 00.
 - No attempt shall be made to compact rock where groundwater or saturated legacy waste prevents effective compaction; however, rock shall be “seated” by at least one pass of low-ground-pressure equipment to provide as smooth a surface as practical.
 - Finished seated rock surface shall not vary more than 50 mm in 3 m.
- Place non-woven geotextile over rock placement, using same geotextile material as specified in Section 31 25 23 - Geotextile Protective Layer and Initial Waste Placement. Geotextile shall be placed without wrinkles or tears and shall be overlapped in accordance with Section 31 25 23.

3.02 GEOGRID INSTALLATION

- Place geogrids smooth, taut, and free of wrinkles or folds.
- Overlaps shall be per manufacturer’s recommendations, but not less than 0.6 m, unless otherwise approved.
- Overlaps shall be shingled in the direction of fill placement.
- Secure geogrids at overlaps and terminations using sandbags, pins, or other methods recommended by the manufacturer to prevent displacement during fill placement.
- No construction traffic shall be permitted directly on exposed geogrids.
- Low ground pressure (5.9 psi) equipment shall be used when geogrid has less than 0.9 meters of cover.

3.03 ENGINEERED FILL PLACEMENT

- Place engineered fill in maximum loose lifts of 300 mm above each geogrid layer unless otherwise approved.
- Fill shall be end-dumped and spread in a manner that avoids dragging or displacement of geogrids.

- Engineered fill shall conform to Type A Material requirements in Section 31 23 00 and shall be compacted to the specified density using non-vibratory methods where required by this Section.
- Thickness of engineered fill above Geogrid 1 may be modified as required to achieve liner subgrade elevations, subject to Engineer approval.

3.04 COMPACTION AND TRAFFIC RESTRICTIONS

A. Saturated Zone Bridge Design System (Soft-Spot Zones)

- Use low-ground-pressure, non-vibratory equipment only.
- Maximum allowable ground pressure: 5.9 psi (40 kPa).
- Vibratory compaction is prohibited.

B. All Saturated Legacy Waste Areas

- Vibratory compaction is prohibited over saturated legacy waste, regardless of location.
- Compaction shall be limited to static or non-vibratory methods approved by the Engineer.

C. All Filling Operations above a Geogrid

- When filling operations as less than 0.9 m above a geogrid, use low-ground-pressure equipment only. Maximum allowable ground pressure: 5.9 psi (40 kPa).
- Do not turn equipment on the geogrid or perform sudden braking that could cause geogrid displacement.

3.05 PROTECTION

- The Contractor shall protect installed geogrids from damage due to construction activities, exposure, or environmental conditions.
- Geogrids shall not be exposed to sunlight for longer than the manufacturer's recommended maximum exposure period prior to cover.
- Damaged or displaced geogrids shall be removed and replaced, or repaired in accordance with the manufacturer's recommendations and Engineer approval, at no additional cost to the Owner.

PART 4 – DESIGN INTENT (INFORMATIONAL)

The geogrid reinforcement system is intended to:

- Mitigate localized loss of support and punch-through within saturated legacy waste (Saturated Zone Bridging Design, Geogrid 0 and 1);
- Promote uniform settlement beneath the landfill liner system (Global Bridging Design, Geogrid 2);
- Provide a reinforced working platform that accommodates long-term settlement of legacy waste without inducing excessive localized strain in the liner system.

PART 5 – MEASUREMENT AND PAYMENT

5.01 MEASUREMENT

- General
 - Measurement for geogrid reinforcement systems shall be based on the horizontal plan-area footprint (square meters) of completed bridging systems installed in accordance with the Drawings and Specifications and as directed or confirmed by the Engineer.
 - Two distinct and independent bridging systems are defined in this Section: the Global Bridge Design and the Saturated Zone Bridge Design. Each bridging system shall be measured and paid for independently based on its respective plan-area footprint, regardless of whether the systems are installed separately or stacked vertically within the same horizontal footprint.
 - Measurement shall be independent of settlement, thickness variation, or subsurface deformation occurring during or after construction.
 - No separate measurement will be made for individual geogrid layers, rock thickness, geotextiles, or engineered fill placed as part of either composite bridging system.
- Global Bridge Design
 - The Global Bridge Design shall be measured by the square meter (m²) of completed Global Bridge Design installed beneath the landfill liner system over areas of legacy waste left in place, as shown on the Drawings and Specifications or as confirmed by the Engineer.
 - Measurement shall be based solely on the horizontal plan-area footprint of the installed system.
- Saturated Zone Bridge Design
 - The Saturated Zone Bridge Design shall be measured by the square meter (m²) of completed Saturated Zone Bridge Design installed within designated soft-spot zones or over saturated legacy waste, as shown on the Drawings and Specifications or as confirmed by the Engineer.
 - Measurement shall be based solely on the horizontal plan-area footprint of the installed system.
 - Where the Engineer directs installation of Saturated Zone Bridge Design beyond the limits shown on the Drawings due to field-confirmed saturated or unstable conditions, such additional areas shall be measured by plan area and paid at the applicable Contract unit price.
 - No adjustment shall be made for settlement-induced changes in elevation or layer thickness.

5.02 PAYMENT

- Basis of Payment
 - Payment for geogrid reinforcement systems shall be made at the respective Contract unit prices for the following bid items:
 - Global Bridge Design (per m²)
 - Saturated Zone Bridge Design (per m²)
 - The Contract unit prices are composite prices and shall constitute full compensation for furnishing, delivering, installing, and completing the respective bridging systems.
- Items Included in Payment
 - The Contract unit prices shall include, but not be limited to, the following:

- Furnishing all geogrids (Geogrid 0, Geogrid 1, and Geogrid 2) meeting the specified Long-Term Design Tensile Strength (LTDS) requirements;
 - Application, documentation, and certification of installation damage, creep, and durability reduction factors;
 - Furnishing, delivery, placement, and seating of rock in saturated zone bridge areas;
 - Furnishing and installation of nonwoven geotextile over seated rock layers;
 - Furnishing, placement, and compaction of all engineered fill soil layers associated with the bridging systems;
 - Handling, storage, placement, overlap, cutting, securing, protection, and replacement of geogrids;
 - Compliance with all equipment ground-pressure limits, traffic restrictions, and non-vibratory compaction requirements;
 - Coordination of sequencing between rock, geotextile, geogrids, and engineered fill;
 - Protection of installed systems until covered;
 - All labor, equipment, tools, materials, overhead, profit, and incidentals necessary to complete the Work.
- Items Not Paid Separately
 - No separate payment will be made for:
 - Determination or justification of reduction factors;
 - Submittals, certifications, or quality control documentation;
 - Temporary works, access limitations, or construction sequencing required to protect the geogrids;
 - Settlement, deformation, or regrading required due to legacy waste behavior;
 - Replacement of damaged materials resulting from the Contractor's operations.
 - All such costs shall be included in the Contract unit prices.

END SECTION

SECTION 31 20 00 EARTHWORK – GENERAL

PART 1 - GENERAL

1.01 SUMMARY

- Section Includes:
 - Placement and compaction of fill and backfill.
 - Preparation of subgrade for liner system and building foundations.
 - Grading for stormwater management including sedimentation basin and drainage channel system.
- Please refer to specifications for engineered fill and excavation of legacy waste and road backfill under roads, which take precedent over these specifications.

1.02 REFERENCES

- ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- ASTM D2487 – Standard Practice for Classification of Soils.
- Republic of Marshall Islands Earthmoving Regulations 1994.

1.03 DEFINITIONS

- Legacy Waste: Previously disposed waste material at the existing dump site.
- Structural Fill: Engineered fill material placed and compacted to support structures and liners.

1.04 SUBMITTALS

- Earthwork Plan including excavation, stockpiling, and fill placement methods.
- Quality Control Test Results for compaction and material classification.

1.05 QUALITY ASSURANCE

- Contractor shall comply with RMI Earthmoving Regulations and submit an Earthmoving Permit.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

- Structural Fill:
 - Well-graded sand and gravel.
 - Maximum particle size: 75 mm.
 - Plasticity Index (PI): <15.
- Backfill Material:
 - Suitable onsite or imported material free of organic matter and debris.

PART 3 - EXECUTION

3.01 EXCAVATION

- Excavate soil to required subgrade elevations for liner system, buildings, and sedimentation basin.

- Dispose of unsuitable material offsite as directed by the Engineer.

3.02 FILL AND BACKFILL

- Place fill in lifts not exceeding 300 mm in loose thickness.
- Compact each lift to minimum 95% of maximum dry density per ASTM D1557.
- Protect liner system area from contamination during earthwork operations.

3.03 SUBGRADE PREPARATION

- Grade subgrade to smooth, uniform surface free of irregularities.
- Proof roll subgrade to identify unstable areas.

3.04 GRADING

- Establish grading to direct stormwater towards the sedimentation basin.
- Maintain positive drainage away from buildings and landfill liner system.

3.05 FIELD QUALITY CONTROL

- Perform compaction testing at frequency specified by the Engineer.
- Re-compact areas not meeting required density.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

When not covered by other specifications:

- Earthwork will be measured by cubic meter.

4.02 BASIS OF PAYMENT

- If not part of specific bid item, payment will be made at the unit price per cubic meter for:
 - Excavation.
 - Fill placement and compaction.
 - Grading and subgrade preparation.

END OF SECTION

SECTION 31 23 23.10 BACKFILL UNDER ROADWAYS

PART 1 – GENERAL

1.1 SCOPE This Section covers the material requirements, placement, and compaction of soil material to be placed as subgrade under the service road on Ebeye Island.

1.2 REFERENCES

- ASTM D2487- Standard Classification of Soils for Engineering Purposes
- ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
- AASHTO M145 – Classification of Soils and Soil-Aggregate Mixtures
- ASTM C136 – Sieve Analysis of Fine and Coarse Aggregates
- ASTM D4318 – Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D1556 – Density and Unit Weight of Soil in Place by the Sand-Cone Method

1.3 SUBMITTALS Submit the following for approval prior to use:

- Material source and description
- Gradation analysis
- Proctor compaction curve
- Test results for plasticity and corrosivity (pH and chlorides)
- Field density test procedures

PART 2 – PRODUCTS

2.1 SUBGRADE MATERIAL Materials shall meet the following requirements:

A. Type A Material (Imported or Processed Fill)

- Well-graded crushed coral, crushed rock, or blended coral-soil mixture
- Max particle size: 50 mm (2 inches)
- Liquid Limit (LL): $\leq 25\%$
- Plasticity Index (PI): $\leq 6\%$
- Gradation (ASTM C136):
 - 100% passing 50 mm
 - 60–100% passing 19 mm
 - 30–65% passing 4.75 mm
 - 10–35% passing 0.425 mm
 - 0–12% passing 0.075 mm
- Minimum CBR: 20% at 95% compaction (ASTM D1883)
- Minimum pH: 7.5 (coral materials must not be excessively acidic) - Chloride content: < 500 ppm (to reduce corrosion risk to pipes)

B. Type B Material (Coral Fill - Acceptable for Lower Layers)

- Select coral fill with minimal fines
- Max particle size: 75 mm (3 inches)
- Plasticity Index: Non-plastic
- Gradation:
 - 100% passing 75 mm

- 50–90% passing 19 mm
- <15% passing 0.075 mm
- Free of organics, roots, and debris

2.2 GEOTEXTILE SEPARATION FABRIC

- Geotextile shall be non-woven, needle-punched, polypropylene fabric
- Minimum grab tensile strength: 400 N (ASTM D4632)
- Apparent opening size (AOS): 0.3 mm max (ASTM D4751)
- Permittivity: $\geq 1.0 \text{ sec}^{-1}$ (ASTM D4491)
- UV resistance: $\geq 70\%$ strength retained after 500 hours (ASTM D4355)
- Installed over native subgrade prior to placement of first lift.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION

- Excavate to design grade, removing soft or unsuitable material.
- Proof roll the subgrade using loaded truck or roller; remove and recompact any yielding areas.

3.2 PLACEMENT

- Place subgrade material in horizontal lifts not exceeding 200 mm (8 inches) loose thickness.
- Each lift shall be moisture conditioned and compacted before placing the next.

3.3 COMPACTION

- Compact each lift to 95% of maximum dry density per ASTM D698.
- Field density tests shall be performed at a minimum of 1 test per 200 m² per lift.

3.4 GEOTEXTILE INSTALLATION

- Place geotextile directly on prepared subgrade with minimum 300 mm overlaps
- Overlaps shall be sewn or pinned with U-shaped staples at 1 m intervals
- Do not expose geotextile to sunlight for more than 14 days before covering

3.5 QUALITY CONTROL

- Submit compaction test results for each lift.
- Moisture content during compaction: within $\pm 2\%$ of optimum.

3.6 MEASUREMENT AND PAYMENT

- Payment by completed in place backfill shall be paid by in bank cubic meter, as established by station-to-station average end area volume calculation. The height of fill shall be measured at each station and shall be the average of at least three equally space points.

END SECTION

SECTION 31 23 23.20 LEGACY WASTE EXCAVATION AND STOCKPILING

PART 1 – GENERAL

1.1 SUMMARY

- This Section includes requirements for excavation of legacy waste from the existing dump site, transportation of excavated waste, and construction of a temporary stockpile area with proper placement and compaction.
- Work includes:
 - Excavation of legacy waste material.
 - Transportation of legacy waste to temporary stockpile location
 - Placement and compaction of legacy waste stockpile.
 - Excavation of legacy waste material from temporary stockpile.
 - Transportation of legacy waste from temporary stockpile location to new lined landfill.
 - Placement and compaction of legacy waste in new landfill, per Section 31 25 23.

1.2 REFERENCES

- ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- Local environmental and health safety regulations applicable to waste handling and temporary storage.

1.3 SUBMITTALS

- Work Plan describing methods, equipment, sequencing, and health and safety measures.
- Waste Handling and Transportation Plan.
- Stockpile Management Plan including waste placement and compaction procedures.
- Traffic Control Plan (if applicable).

1.4 QUALITY ASSURANCE

- Contractor to employ personnel experienced in waste excavation, handling, and stockpiling.
- Maintain compliance with local environmental protection and safety standards.

1.5 MEASUREMENT AND PAYMENT

- Measurement: Excavation and stockpiling shall be measured by cubic meter (m³) of legacy waste excavated and stockpiled, as determined by pre- and post-excavation topographic surveys of the excavation site and be verified by the Engineer.
- Payment: Payment will be made at the Contract unit price per cubic meter (m³) for completed and accepted excavation, transportation, and stockpiling of legacy waste. Payment shall be full compensation for:
 - Labor, equipment, and materials necessary to complete the work.
 - Dust control, temporary access, and stockpile maintenance.
 - Compliance with health, safety, and environmental regulations.

PART 2 – PRODUCTS

2.1 MATERIALS

- Not applicable. This section involves handling of existing waste material only.

PART 3 – EXECUTION

3.1 SITE PREPARATION

- Install safety barriers, fencing, and signage as required.
- Prepare haul routes between excavation area and stockpile location, ensuring safe access and egress.

3.2 EXCAVATION OF LEGACY WASTE

- Excavate legacy waste to depths and limits indicated on the Drawings or as directed by the Engineer.
- Use appropriate equipment including excavators, loaders, and dump trucks suitable for handling mixed waste materials.
- Segregate non-waste material (soil or debris not classified as waste) if encountered, as directed.

3.3 TRANSPORTATION

- Transport excavated waste to stockpile location using covered trucks or approved methods to minimize spillage and odor.
- Implement dust and spill control measures during transport.

3.4 STOCKPILE CONSTRUCTION

- Place legacy waste in the designated stockpile area as shown on Drawings.
- Construct stockpile in horizontal layers with layer thickness not exceeding 1.0 meter.

- Compact each layer using track-mounted equipment to achieve maximum waste density practicable without excessive breakdown of waste material.
- Maintain stockpile height and slope stability in accordance with the Stockpile Management Plan.

3.5 MAINTENANCE AND MONITORING

- Regularly inspect stockpile for stability, erosion, and drainage.
- Repair and maintain access roads and haul routes as necessary.
- Maintain dust control and environmental protection measures throughout the work.

END SECTION

SECTION 31 23 23.30 PASSIVE LANDFILL GAS VENT SYSTEM (ANCHOR TRENCH TYPE)

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

- Construction of passive landfill gas vent system integrated with liner anchor trench.
- Installation of perforated corrugated HDPE gas vent pipe within gravel-filled trench.
- Integration of vent system with liner system anchorage and stress-relief geometry.
- Provision of vent outlet structures and protective measures.

B. System Description:

- Passive venting of landfill gases from legacy waste through a perforated pipe embedded in a gravel trench located at bottom of the liner anchor trench.
- System also functions as a liner anchorage and stress-relief transition zone.

1.02 RELATED SECTIONS

- Section 31 05 19 – Geogrid Reinforcement for Legacy Waste & Soft-Spot Mitigation.
- Section 31 25 23 – Geotextile Protective Layer and Initial Waste Placement.
- Section 33 31 13 – Corrugated HDPE Leachate Collection Pipe.

1.03 REFERENCES

A. ASTM International:

- ASTM D3350 – HDPE Material.
- ASTM F405 – Corrugated HDPE Pipe.
- ASTM D4751 – Geotextile Opening Size.
- ASTM D4491 – Geotextile Permittivity.

B. EPA Guidance:

- 40 CFR Part 258 – Solid Waste Disposal Facility Criteria.
- EPA Landfill Gas Emissions Guidance.

C. ISO:

- ISO 9001 – Quality Management.

1.04 SUBMITTALS

A. Product Data:

- HDPE perforated pipe specifications.
- Aggregate gradation and source.

- Geotextile specifications.

B. Shop Drawings:

- Anchor trench layout and dimensions.
- Pipe alignment and outlet configuration.
- Liner termination and stress-relief “wave” detail.

1.05 QUALITY ASSURANCE

A. Installer Qualifications:

- Minimum 3 years’ experience in landfill liner and gas systems.

B. Pre-Construction Meeting:

- Required to coordinate liner, trench, and vent installation.

1.06 DELIVERY, STORAGE, AND HANDLING

- Protect pipe and geosynthetics from UV exposure and damage.
- Store aggregate to prevent contamination with fines.

1.07 PROJECT CONDITIONS

A. Site Conditions:

- Coastal atoll with high groundwater and saline environment.
- Settlement-prone legacy waste.

B. Constraints:

- No damage to liner system
- Limited aggregate availability

PART 2 – PRODUCTS

2.01 PERFORATED GAS VENT PIPE

A. Material:

- High-density polyethylene (HDPE), ASTM D3350 compliant.

B. Type:

- Perforated pipe (corrugated or Schedule 80 solid-wall as shown in design).

C. Diameter:

- DN150 (150 mm / 6-inch nominal).

D. Perforations:

- Slots or holes providing minimum 1% open area.
- Located on lower half of pipe unless otherwise specified.

E. Pipe Strength:

- Suitable for shallow burial and landfill loading conditions.

2.02 GRAVEL BACKFILL (VENT MEDIA)

A. Material:

- Clean, washed, crushed stone.

B. Gradation:

- 25–75 mm (1"–3") preferred.

C. Requirements:

- Free of fines, organics, and salt contamination.

D. Function:

- Provide high permeability gas pathway.
- Prevent clogging of perforations.

2.03 GEOTEXTILE (OPTIONAL BUT RECOMMENDED)

A. Type:

- Nonwoven geotextile.

B. Properties:

- Minimum 12 oz/yd².
- High permittivity and clogging resistance.

C. Use:

- Wrap gravel trench or line trench walls where native soils may intrude

2.04 LINER SYSTEM INTERFACE

A. Liner Components:

- GCL + 80 mil HDPE geomembrane.

B. Requirements:

- Liner shall terminate in anchor trench per design.
- Stress-relief "wave" (1%–3% slope length) shall be formed between trench and slope.

2.05 VENT OUTLET STRUCTURE

A. Vertical Riser:

- HDPE or PVC vent pipe extending above grade at least 2.5 m.

B. End Fitting:

- Two 90-degree fittings shall be used at the end of the vertical vent outlet such that the open end is facing the ground surface. The intent is to prevent rain infiltration into the vent.
- An insect screen shall be fitted on open end of the vertical vent pipe.

C. Protection:

- Bollards or protective casing if exposed.

PART 3 – EXECUTION

3.01 EXCAVATION OF ANCHOR TRENCH

A. Dimensions:

- As shown on drawings (typical depth ~0.5 m below liner anchor trench, width ~.75 m, which is same width as anchor trench).

B. Subgrade Preparation:

- Smooth, free of sharp objects.
- Stable and compacted.

3.02 PIPE INSTALLATION

A. Placement:

- Install perforated DN150 pipe at mid-point of passive vent trench.
- Maintain continuous alignment.

B. Orientation:

- Perforations facing downward or laterally.

3.03 GRAVEL PLACEMENT

A. Place gravel around pipe to:

- Minimum 0.5 m depth (as shown in detail)

B. Placement Method:

- Carefully place to avoid pipe displacement.
- Do not drop from excessive height.

3.04 GEOTEXTILE INSTALLATION (IF USED)

A. Line trench or wrap gravel:

- Ensure full coverage and overlap (minimum 300 mm).

B. Prevent soil intrusion into gravel.

3.05 LINER ANCHORAGE

A. Place liner into trench:

- Maintain proper embedment.
- Avoid wrinkles or tension.

B. Backfill anchor trench:

- Compact in layers to secure liner.

C. Form stress-relief “wave”:

- 1%–3% of slope length between trench and liner slope.

3.06 CONNECTIONS AND OUTLETS

- Connect horizontal vent pipe to outlet riser.
- Ensure unobstructed gas pathway

3.07 FIELD QUALITY CONTROL

A. Installation Inspection:

- Verify trench dimensions.
- Confirm pipe placement and alignment.
- Check gravel cleanliness.

B. Functional Check:

- Ensure vent pathway is continuous and not blocked.

3.08 PROTECTION

A. Protect system during:

- Backfilling.
- Liner installation.
- Waste placement.

B. Replace damaged components immediately

3.09 ACCEPTANCE CRITERIA

System shall:

- Provide continuous passive gas venting.
- Maintain liner integrity and anchorage.
- Prevent clogging or intrusion.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Passive Landfill Gas Vent (Anchor Trench Type)

- Measurement shall be on a linear meter (m) basis along the centerline of the installed trench.
- Measurement shall include the full length of trench where:
 - Perforated gas vent pipe is installed .
 - Gravel backfill is placed.
 - Geotextile placement..
 - Liner anchorage is constructed.
- Measurement shall be taken horizontally, regardless of slope.

B. Vent Riser

- Measured per each (EA) installed.
- Includes vertical pipe, fittings, and protective features.

C. No Separate Measurement

The following items shall not be measured separately, but shall be included in the unit price for the Passive Gas Vent System:

- Excavation and preparation of anchor trench.
- Supply and installation of perforated HDPE pipe.
- Gravel (vent media), placement, and compaction .
- Geotextile.
- Liner placement within anchor trench.
- Formation of stress-relief “wave”.
- Connections to outlet structures .
- Temporary works and protection.
- Testing, inspection, and quality control .

4.02 PAYMENT

A. Passive Landfill Gas Vent (Anchor Trench Type)

- Payment shall be made at the Contract Unit Price per linear meter (m).
- The unit price shall constitute full compensation for:
 - Labor, materials, tools, and equipment.
 - Excavation and trench preparation.
 - Supply and installation of perforated DN150 HDPE pipe .
 - Supply and placement of gravel vent media.
 - Supply and installation of geotextile.
 - Liner anchorage within trench.
 - Construction of stress-relief geometry.
 - All connections and integration with the liner system.
 - Protection of installed components.
 - All incidentals necessary to complete the work.

B. Vent Riser

- Payment shall be made at the Contract Unit Price per each (EA).
- Includes:
 - Vertical riser pipe.
 - Fittings and screen.
 - Protective bollard.
 - Connection to horizontal vent pipe.
 - Anchoring and protection.

C. Exclusions

The following items, if included elsewhere in the Contract, shall not be paid under this Section:

- Liner system (paid under geosynthetics sections).
- Earthworks beyond trench limits.
- Leachate collection piping (Section 33 31 13).

D. No Additional Payment

No separate or additional payment will be made for:

- Dewatering within trench.
- Rework due to improper installation.
- Replacement of damaged materials.
- Coordination with other trades.
- Delays or inefficiencies.

END SECTION

SECTION 31 25 00 – SEDIMENTATION BASIN

PART 1 – GENERAL

1.01 SUMMARY

A. Work includes construction, installation, and commissioning of the sedimentation basin in accordance with the Drawings for control of stormwater runoff and sediment-laden flows generated during landfill construction and operations.

B. The sedimentation basin shall:

- Reduce suspended solids prior to discharge to protect downstream marine and coastal environments.
- Provide flow attenuation during storm events.
- Function during construction and operations as indicated in the Contract Documents.

C. The basin shall be installed and made operational prior to commencement of upstream earth-disturbing activities.

D. The Contractor shall not modify basin geometry, elevations, or hydraulic features unless directed in writing by the Engineer.

E. Related Work:

- Section 31 10 00 – Site Clearing
- Section 31 23 00 – Earthwork
- Section 33 40 00 – Storm Drainage
- Section 31 50 00 – Erosion and Sediment Control

1.02 REFERENCES

Comply with latest editions of:

- ASTM D698 – Moisture-Density Relations of Soil
- ASTM D1557 – Modified Proctor Compaction
- ASTM D2487 – Soil Classification
- NRCS Conservation Practice Standard – Sediment Basin (Code 350)
- USEPA Stormwater BMP Guidance
- ADB Environmental Safeguards Requirements
- Applicable FSM and Pohnpei State regulations

1.03 CONSTRUCTION REQUIREMENTS

A. Construct the sedimentation basin strictly in accordance with the Drawings, including lines, grades, dimensions, slopes, and details.

B. The Contractor shall ensure that:

- Flow enters, is detained, and exits the basin as intended.
- Short-circuiting, erosion, and uncontrolled discharge do not occur.

C. Any discrepancies between Drawings and field conditions shall be reported to the Engineer prior to construction.

1.04 SUBMITTALS

A. Shop Drawings:

- Basin layout and grading plan (construction interpretation only)
- Inlet and outlet structure details
- Erosion protection measures

B. Quality Control Submittals:

- Compaction test results
- Material source approvals
- Proposed vegetation/seed mix (if applicable)

C. Closeout:

- As-built drawings showing final elevations and basin configuration

1.05 QUALITY ASSURANCE

A. Earthworks:

- Minimum 95% Modified Proctor (ASTM D1557)
- Testing frequency: minimum one test per lift per 500 m³ or as directed

B. Inspection:

- Basin shall be inspected by the Engineer prior to commissioning

1.06 ENVIRONMENTAL REQUIREMENTS

A. Prevent discharge of untreated sediment-laden water to lagoon or shoreline.

B. Install temporary erosion and sediment controls prior to and during construction.

C. Maintain basin functionality at all times during construction activities.

1.07 MEASUREMENT AND PAYMENT

A. Measurement and payment shall be as specified in Division 01 or the Bill of Quantities.

PART 2 – PRODUCTS

2.01 SOIL MATERIALS

A. Structural Fill:

- Suitable for embankment construction
- Free of organics, debris, and oversized material (>50 mm)
- Capable of achieving specified compaction

2.02 RIPRAP / ENERGY DISSIPATION

A. Rock:

- Angular, durable
- Nominal size: 150–300 mm

B. Filter Layer:

- Granular filter or geotextile separator (if shown on Drawings)

C. Placement:

- Minimum thickness: 300 mm or as shown on Drawings

2.03 OUTLET STRUCTURE

A. Pipe:

- HDPE or PVC as shown on Drawings

B. Appurtenances:

- Trash rack or screen where indicated
- Outlet protection (riprap or equivalent)

PART 3 – EXECUTION

3.00 CONSTRUCTION SEQUENCING

A. Install basin and associated controls before upstream earthworks begin.

B. Maintain basin functionality throughout construction.

3.01 SITE PREPARATION

A. Clear and grub basin footprint.

B. Strip topsoil (minimum 150 mm) and stockpile for reuse.

C. Proof-roll subgrade; notify Engineer of unsuitable conditions.

3.02 EXCAVATION AND GRADING

A. Excavate to lines and grades shown on Drawings (± 0.1 m tolerance).

B. Maintain stable slopes during construction.

C. Do not over-excavate below design grade unless directed.

D. Remove unsuitable materials as directed.

3.03 EMBANKMENT AND BASIN CONSTRUCTION

A. Place fill in controlled lifts (≤ 200 mm loose thickness).

- B. Moisture condition and compact to specified requirements.
- C. Shape basin floor and side slopes to match Drawings.

3.04 INLET CONSTRUCTION

- A. Construct inlet structures as shown on Drawings.
- B. Install energy dissipation measures to prevent erosion.

3.05 OUTLET STRUCTURE INSTALLATION

- A. Install outlet pipe and associated structures as shown on Drawings.
- B. Ensure proper alignment and grade for positive drainage.
- C. Provide outlet protection to prevent scour.

3.07 EROSION CONTROL AND STABILIZATION

- A. Stabilize all disturbed areas within 5 days of final grading using:
 - Hydroseeding, OR
 - Erosion control matting, OR
 - Other approved methods

3.08 TESTING AND INSPECTION

- A. Perform compaction testing in accordance with Section 1.05.
- B. Verify basin geometry, elevations, and drainage.
- C. Document as-built conditions.

3.09 COMMISSIONING

- A. Verify basin performance by:
 - Observing flow through basin
 - Confirming proper drainage
 - Checking for erosion or short-circuiting
- B. Obtain Engineer approval prior to use.

3.10 OPERATION AND MAINTENANCE

- A. Remove sediment when accumulation reaches approximately 25–30% of capacity or as directed.
- B. Inspect basin:
 - Weekly during active construction
 - After major rainfall events

- C. Maintain inlet and outlet structures free of blockage.
- D. Ensure access for maintenance equipment is maintained.
- E. Dispose of sediment in accordance with approved project procedures.

3.11 PROTECTION DURING CONSTRUCTION

- A. Protect completed basin from damage by construction activities.
- B. Maintain basin capacity and functionality at all times.
- C. Remove sediment buildup that reduces effectiveness.

END OF SECTION

SECTION 31 25 23 GEOTEXTILE PROTECTIVE LAYER AND INITIAL WASTE PLACEMENT

PART 1 – GENERAL

1.01 WORK INCLUDED

- Furnish and install a thick nonwoven geotextile (minimum 16–24 oz/yd²) over the drainage geocomposite layer to serve as a protection layer in lieu of the traditional 300 mm soil operations layer.
- Inspect the underlying liner system consisting of geosynthetic clay liner (GCL), 80 mil high-density polyethylene (HDPE) geomembrane, and drainage geocomposite.
- Provide installation quality control and supervision.
- Manage procedures for initial waste placement to prevent damage to the liner system.

1.02 RELATED WORK

- Refer to Division 31 Earthwork for earthmoving, grading, and site preparation.

1.03 REFERENCES

- ASTM D4491 – Standard Test Method for Water Permeability of Geotextiles by Permittivity.
- ASTM D4833 – Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- ASTM D5261 – Measuring Mass per Unit Area of Geotextiles.
- ASTM D4632 – Grab Breaking Load and Elongation of Geotextiles.
- ASTM D4355 – Deterioration of Geotextiles from Exposure to Ultraviolet Light.
- ASTM D5818 – Exposure and Retrieval of Samples to Evaluate Installation Damage.
- GRI-GT12 – Standard Specification for Nonwoven Geotextiles Used in Drainage Systems.
- Manufacturer’s installation guidelines for drainage geocomposite (e.g., DRAINTUBE) and geotextile.
- Additional referenced standards and project specifications as applicable.

1.04 SUBMITTALS

- Product Data: Submit manufacturer’s product data, physical and mechanical properties (mass per unit area, puncture resistance, tensile strength, permittivity), along with certifications that materials meet specified requirements.
- Installation Plan: Submit a detailed installation plan outlining placement methods, inspection protocols, and handling procedures, including measures for protection from UV, storage, and handling.
- Waste management plan for initial waste placement, addressing removal of large/sharp items during the first lift.
- Quality Control Reports: Submit inspection and testing results confirming compliance with specified requirements.

1.05 STORAGE AND HANDLING

- Deliver geotextile rolls labeled with manufacturer's name, product identification, lot number, roll number, and dimensions.
- Store geotextile rolls off the ground on pallets or dunnage, covered to protect from moisture, dirt, puncture, and UV exposure.
- Do not use damaged or wet geotextile.

PART 2 – PRODUCTS

2.01 GEOTEXTILE PROTECTIVE LAYER

- Material: Nonwoven geotextile fabric composed of polypropylene or polyester fibers, weight between 16 and 24 oz/yd² or 542 gram/m² (ASTM D5261).
- Physical Properties:
 - Grab tensile strength: ≥370 lb (ASTM D4632).
 - Elongation: >50% at break (ASTM D4632)
 - Trapiziodal tear strength: 145 lb (ASTM D4533)
 - Puncture resistance: ≥900 lb (ASTM D6241).
 - UV resistance: ≥70% retained strength after 500 hours exposure (ASTM D7238).
 - Permittivity: ≥0.5 sec⁻¹ (ASTM D4491).
- Acceptable Manufacturer includes:
 - TenCate Mirafi N-series
 - Propex Geotex
- Quality: Provide materials free of defects, degradation, or damage.

2.02 DRAINAGE GEOCOMPOSITE

- As specified in Section 31 71 19– Drainage Geo-composite (e.g., DRAINTUBE or approved equal), the drainage geo-composite is a separate design element for facilitating leachate flow to the collection headers. The 16 to 24 oz/yd² geotextile protective layer is a separate design element for protecting the drainage geo-composite, corrugated HDPE leachate collection pipe and liner system during initial waste placement.
- Prior to placing 16 to 24 oz/yd² geotextile protective layer, the drainage geo-composite must be clean, undamaged, and free of sharp debris.

2.02 CORRUGATED HDPE LEACHATE COLLECTION PIPE

- As specified in Section 33 31 13– Corrugated HDPE Leachate Collection Pipe, the HDPE leachate collection piping is a separate design element for facilitating leachate flow to the collection sump. The 16 to 24 oz/yd² geotextile protective layer is a separate design element for protecting the HDPE leachate collection piping and liner system during initial waste placement.
- Prior to placing 16 to 24 oz/yd² geotextile protective layer, the HDPE leachate collection piping must be clean, undamaged, and free of sharp debris.

PART 3 – EXECUTION

3.01 EXAMINATION

- Inspect liner system, drainage geocomposite for damage, cleanliness, and proper placement prior to geotextile installation.

- Report any non-conformance to Engineer before proceeding.

3.02 INSTALLATION

- Place geotextile fabric in continuous sheets over the drainage geocomposite without wrinkles or folds.
- Overlap geotextile edges a minimum of 12 inches (300 mm) or as recommended by manufacturer.
- Secure geotextile to prevent displacement by wind or construction activities.
- Avoid heavy equipment movement directly on geotextile during installation; protect with temporary covering if necessary.
- Coordinate installation with drainage geocomposite placement to ensure proper integration.

3.03 INITIAL WASTE PLACEMENT

- Prior to the first waste lift, implement a waste stream control program to remove large and sharp objects (e.g., scrap metal, rigid plastics, timber with nails, C&D debris) that could puncture the liner system.
- Use low ground pressure (LGP) equipment, 5.9 psi or less (e.g., small dozers D4–D5 or tracked loaders) during placement of the initial lift.
- Place the initial lift of soft, non-puncturing waste to a minimum thickness of 0.5 m prior to allowing heavier equipment operations or compaction over the liner system.
- Steel-tracked compactors or heavy dozers shall not traffic directly on the geotextile. Movement of heavy equipment shall occur only after a protective waste thickness is established.
- Continuously observe the working face during the first lift for exposure or damage to the geotextile; immediately repair as needed.
- Document all instances of damage and repair in the Construction Quality Assurance (CQA) records.

3.04 QUALITY CONTROL

- Verify geotextile type, mass per unit area, and other specified properties through manufacturer's certifications and field acceptance testing as required.
- Inspect overlaps, anchorage, and overall integrity of the installed geotextile prior to waste placement.
- Provide daily reports noting areas installed, weather conditions, protection measures, and any repairs performed.

3.05 MEASUREMENT AND PAYMENT

- Geotextile: Measured in square meters of the installation area, not the area of materials. The installation area includes all overlaps of materials.
- Payment shall be on a per square meter of installation area and will cover:
 - Supply, placement, and protection of the geotextile until covered by waste.
 - The processing, transportation and placement of the initial waste lift of 0.5 m thickness over the protective geotextile.

END SECTION

SECTION 31 32 19 FILTER FABRIC (GEOTEXTILE) FOR SOIL SEPERATION

PART 1 - GENERAL

1.1 SUMMARY.

This section covers the supply and installation of nonwoven filter fabric (geotextile) for use in landfill drainage systems and soil separation applications, including pipe wrap, gravel interfaces, and fines filtration.

1.2 RELATED DOCUMENTS

- ASTM D4751: Apparent Opening Size (AOS)
- ASTM D4491: Permittivity
- ASTM D4632: Grab Tensile Strength
- ASTM D4833: Puncture Resistance
- ASTM D4355: UV Resistance

1.3 REFERENCES

- ASTM D4533: Trapezoidal Tear Strength
- ASTM D3786: Burst Strength
- ASTM D5261/D3776: Mass per Unit Area
- ASTM D4972: pH Compatibility (if applicable)

1.4 SUBMITTALS

- Manufacturer's data sheets and certifications
- Independent lab test results for AOS, permittivity, tensile strength, puncture resistance
- Physical fabric sample for review
- Installation detail drawings for complex applications (e.g., burrito wrap for pipes)

1.5 QUALITY ASSURANCE

- Manufacturer shall certify $\geq 85\%$ polymer content by weight
- Installer shall protect fabric from UV and mechanical damage prior to burial

PART 2 - PRODUCTS

2.1 MATERIAL COMPOSITION

- Material: Synthetic polymer (polypropylene, polyester, or polyethylene)
- Form: Nonwoven, needle-punched or heat-bonded Resistance: Chemically inert, rot-proof, UV-resistant, biologically stable

2.2 PHYSICAL AND MECHANICAL PROPERTIES

Property	Specification Range / Typical Value	Test Method
Apparent Opening Size (AOS)	0.15 – 0.25 mm (#40 – #70 sieve)	ASTM D4751
Permittivity	$\geq 1.0 \text{ sec}^{-1}$	ASTM D4491
Grab Tensile Strength	150 – 205 lbs (670 – 910 N)	ASTM D4632
Elongation at Break	$\leq 50\%$	ASTM D4632
Trapezoidal Tear Strength	75 – 85 lbs (330 – 380 N)	ASTM D4533
Puncture Resistance	80 – 105 lbs (360 – 470 N)	ASTM D4833
Burst Strength	300 – 500 psi (2.1 – 3.5 MPa)	ASTM D3786
UV Resistance	$\geq 70 - 90\%$ strength retained after 500 hrs	ASTM D4355
Weight	6 – 8 oz/yd ² (200 – 270 g/m ²)	ASTM D5261 / D3776

2.3 FILTER DESIGN CRITERIA

- To prevent soil particle loss: O95 (AOS) < 2 × d85 (soil particle size)
- To avoid clogging: O95 (AOS) > 2 × d15 (soil particle size)

PART 3 - EXECUTION

3.1 INSTALLATION GUIDELINES

- Lay fabric directly on soil or gravel interface, free from folds and wrinkles
- Overlap panels by minimum 300 mm (12 inches)
- Protect from damage by equipment, UV exposure, and wind displacement

3.2 PIPE WRAP INSTALLATION

- Wrap fabric around perforated pipe in burrito-style
- Maintain 300 mm overlap, secure edges with ties or adhesive

3.3 COVER AND PROTECTION

- Place protective gravel or soil layer promptly

- Fabric must be covered within 3 days of installation unless otherwise approved

3.4 MEASUREMENT AND PAYMENT

- If not covered by other specifications or as a component of a completed work item,
 - Payment basis: Per square meter installed, inclusive of overlaps, waste, and handling
- Special configurations (e.g., around pipe, structures) are incidental unless noted

3.5 TOLERANCES AND ACCEPTANCE CRITERIA

- Maximum overlap deviation: ± 50 mm
- Reject fabric with tears, punctures > 20 mm, or contamination

3.6 APPROVED PRODUCTS

- Mirafi 160N or approved equivalent nonwoven geotextile
- Alternatives must be pre-approved via submitted test data, certifications, and physical sample

END OF SECTION

SECTION 31 71 19 DRAINAGE GEO-COMPOSITE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

This section covers the supply and installation of a drainage geo-composite system, consisting of mini-drains integrated between geotextile layers, for use beneath landfill liners, leachate collection systems, and other subsurface drainage applications.

1.2 RELATED DOCUMENTS

- ASTM D7931/D7931M-21a
- ASTM D4751, D4632, D4833 (Geotextile properties)
- Manufacturer's installation manual

1.3 REFERENCES

- ASTM D7931: Determination of Allowable Flow Rate of Geo-composites
- ASTM D4751: Apparent Opening Size (AOS)
- ASTM D4632: Grab Tensile Strength and Elongation
- ASTM D4833: Index Puncture Resistance

1.4 SUBMITTALS

- Product data sheets and test results
- Shop drawings and roll layout plans
- Installation certifications
- Seam connection and mini-drain fitting details

1.5 QUALITY ASSURANCE

- Manufacturer must provide performance testing per ASTM D7931
- Installation crew to have documented experience with drainage geo-composite systems

PART 2 - PRODUCTS

2.1 MATERIAL COMPOSITION AND STRUCTURE

- Core: Perforated polypropylene mini-drains (16 mm, 20 mm, or 25 mm diameter)
- Geotextiles: Needle-punched nonwoven polypropylene or polyester
- Spacing: Mini-drains spaced at 0.25 m, 0.5 m, 1.0 m, or 2.0 m, per hydraulic design
- Roll Size: ~3.98 m wide x 75 m long (or as specified)

2.2 PERFORMANCE REQUIREMENTS

- Hydraulic Flow Rate: Determined per ASTM D7931 with site-specific inputs (normal stress, gradient, fluid type, and temperature)
- Minimum Overlap: 0.3 m between adjacent panels
- Seaming: Geotextile seams via overlapping, sewing, or thermal bonding; mini-drain connections via approved fittings

2.3 PHYSICAL PROPERTIES

Property	Requirement	Test Method
AOS (Apparent Opening Size)	Site-specific (typically 70–100 sieve)	ASTM D4751
Tensile Strength	≥ Site-specific	ASTM D4632
Puncture Resistance	≥ Site-specific	ASTM D4833
Drainage Core Spacing	0.25 m – 2.0 m	Manufacturer data
Drainage Core Diameter	16–25 mm	Manufacturer data

PART 3 - EXECUTION

3.1 SITE PREPARATION

- Subgrade shall be smooth, compacted, and free of sharp objects
- Grade to required elevations per plans.

3.2 HANDLING AND STORAGE

- Store rolls on pallets in dry areas away from UV and physical damage
- Do not drag rolls over rough surfaces

3.3 INSTALLATION

- Geo-composite will be installed on floor of lined landfill and not on perimeter slopes.
- Unroll geo-composite with drains oriented in the direction of flow
- Maintain minimum 0.3 m overlap between adjacent rolls
- Install seams and connectors as per manufacturer's recommendations
- Protect installed sections from equipment and environmental exposure

3.4 SEAMING AND CONNECTIONS

- Join geotextile layers by overlapping, stitching, or bonding
- Use manufacturer-approved fittings for mini-drain connections

3.5 PROTECTION AND COVER

- Cover within 14 days of installation
- Prevent direct traffic over exposed geo-composite
- Use soil or geotextile protective layers as required

3.6 QUALITY CONTROL

- Inspect roll integrity, seams, overlaps, and connections
- Record installation details (roll numbers, locations)
- Perform field hydraulic testing if specified

3.7 DESIGN CONSIDERATIONS

- Factor of Safety: Apply ≥ 1.5 to allowable flow rate
- Chemical Compatibility: Materials shall be compatible with site leachate and environment
- Confirm system performance under slope and overburden loading

3.8 MEASUREMENT AND PAYMENT

- Basis of Payment: Per square meter of installed drainage geo-composite system, inclusive of overlaps, connectors, waste, and handling

3.9 APPROVED PRODUCTS

- DRAINTUBE or pre-approved equivalent
- Alternatives require submittal of test data and approval by Engineer

END OF SECTION

DIVISION 32 – EXTERIOR IMPROVEMENTS

SECTION 32 12 16 ASPHALT PAVING AND ROAD BASE

PART 1 – GENERAL

1.01 SUMMARY

- This Section covers construction requirements for:
 - Asphalt Concrete Pavement (ACP) with aggregate base.
 - Unsurfaced Paved Road Base using compacted, crushed aggregate.
- Include with Bid Package: Ensure all relevant plans, details, and typical sections referenced as “shown on drawings” are provided as attachments.

1.02 REFERENCES

- ASTM D1557 – Moisture-Density Relations
- ASTM D6938 – In-Place Density and Moisture Testing
- AASHTO M 320 – Performance Graded Asphalt Binder
- National Building Code, Republic of Marshall Islands, 2021 Edition
- AASHTO T 99/T 180 – Proctor Compaction

1.03 SUBMITTALS

- Product Data for:
 - Asphalt binder
 - Aggregate base material
- Job mix formula (JMF) for asphalt paving
- Test results: gradation, compaction, density

1.04 QUALITY ASSURANCE

- Asphalt paving contractor must have at least 5 years’ verifiable experience in similar work.
- Provide documentation of experience with referenced standards.
- Perform field density tests per ASTM D6938.
- Perform Marshall Mix design for asphalt.

PART 2 – PRODUCTS

2.01 MATERIALS – ROAD BASE

- Crushed coral or basalt aggregate meeting:
- Max size: 37.5 mm (1-1/2")
 - PI: 6–12
 - CBR ≥ 80%

- Gradation per ASTM D2940
- Water: Clean and free from harmful substances.

2.02 MATERIALS – ASPHALT PAVEMENT

- Asphalt Binder: PG 64-10 or other binder suitable for tropical marine environments (submission required).
- Mineral Aggregate: Clean, durable, crushed stone or coral aggregate.
- Asphalt Mix:
 - Type: Hot Mix Asphalt (HMA)
 - Nominal max aggregate size: 12.5 mm (1/2")
 - Air Voids: 3–5%
 - Stability: ≥ 8 kN (Marshall)
 - Voids in Mineral Aggregate (VMA): $\geq 14\%$
- Asphalt mix verification test results must be submitted for approval prior to paving.

PART 3 – EXECUTION

3.01 ROAD BASE INSTALLATION

- Prepare subgrade in accordance with project specifications.
- Place base in lifts not exceeding 150 mm (6 in) loose depth.
- Compact each lift to $\geq 95\%$ Modified Proctor Density (ASTM D1557).
- Shape and grade to ± 10 mm tolerance from design grade.
- If tolerances are not achieved:
 - Contractor must promptly notify the Owner's Representative.
 - Propose and implement a corrective action plan at no added cost.

3.02 ASPHALT PAVING

- Thoroughly clean base layer before paving.
- Apply tack coat (bituminous emulsion) at 0.25–0.50 L/m².
- Place asphalt mix with mechanical paver in maximum 75 mm compacted lifts.
- Compact with minimum three passes of a steel-drum roller, while mix temperature is 90–140°C.
- Finish surface to:
 - Grade tolerance: ± 6 mm
 - Cross slope: 2% unless otherwise specified on drawings
- No surface segregation, bleeding, or flushing
- If any acceptance criteria are not satisfied, contractor must propose corrective actions for approval within 3 days.
- Failure to meet density or finish requirements may result in withheld payment or removal and replacement at contractor's expense.

3.03 UNSURFACED ROAD BASE (FOR NON-PRIME ROADS)

- Compact crushed coral/crushed aggregate to 98% Modified Proctor Density.
- Shape crown for drainage at 2–3% slope.
- Maintain surface until project handover.

3.04 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- Comply with site-specific environmental controls as per approved plan.
- Implement safety and traffic controls during construction.
- Maintain public and site safety in accordance with contract requirements and local regulations.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- Asphalt paving: measured in square meters (m²) of completed and accepted work.
- Aggregate Base: Covered by Section 31 23 23

4.02 PAYMENT

- Progress payments to include all materials, labor, equipment, compaction, testing, QA/QC, environmental, and safety compliance unless otherwise specified.
- Deductions or withheld payments may be enforced for work not meeting acceptance or corrective action criteria.

END SECTION

SECTION 32 31 13 CHAIN LINK FENCES AND GATES

PART 1 – GENERAL

1.01 SUMMARY

This Section includes materials and installation for:

- Remove existing chain link fencing, salvage components if approved by the Engineer.
- Perimeter chain link security fence around landfill.
- Anti-climb provisions including mesh size and barbed wire strands.
- Two (2) double swing gates for entrance and exit roads.
- Fence and gate systems designed and constructed to meet requirements of local Ebeye Island (Republic of the Marshall Islands) environmental, building, and landfill security regulations, and relevant Ministry guidance, as applicable.

1.02 REFERENCES

- ASTM A123 – Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- ASTM A153 – Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- ASTM F567 – Installation of Chain-Link Fence
- ASTM F668 – Polyvinyl Chloride (PVC) Coated Chain-Link Fence Fabric
- ASTM F900 – Industrial and Commercial Swing Gates
- ASTM A392 – Zinc-Coated Steel Chain-Link Fence Fabric
- Relevant local building codes and landfill operational requirements for Ebeye Island, Republic of the Marshall Islands.

1.03 SUBMITTALS

- Product data for all fence components and gate hardware
- Shop drawings indicating fence layout, gate swing, post spacing, and elevations
- Manufacturer's certification of compliance with ASTM standards and local regulations

1.04 QUALITY ASSURANCE

- Installer Qualifications: Minimum 5 years of experience in fence construction
- Fence layout to be verified by surveyor prior to construction

1.05 DELIVERY, STORAGE, AND HANDLING

- Deliver all materials in manufacturer's original, unopened containers
- Store to prevent corrosion, warping, or damage. Strictly protect all metallic and coated components from salt spray and humid marine conditions prior to installation.

1.06 SITE CONDITIONS

- Verify final fence alignment and gate locations on site with Engineer
- Fence to be located clear of utilities and within designated property boundary

PART 2 – PRODUCTS

2.01 CHAIN LINK FABRIC

- Fabric: 9-gauge galvanized steel wire, 2-inch mesh size, anti-climb
- Height: 2.4 meters (8 feet), plus 3 strands barbed wire (total height ~3.0 m)
- Finish (required): Black or green Polyvinyl Chloride (PVC) coating over hot-dip galvanizing as per ASTM F668, over galvanized fabric per ASTM A392, Class 2 (2 oz zinc per ft²).
- PVC coating is mandatory for increased corrosion protection in the island's marine environment.

2.02 POSTS AND RAILS

- Line Posts: 2.375" OD SS40 galvanized steel pipe
- Terminal Posts (Corner, Gate, End): 2.875" OD SS40 galvanized steel pipe
- Top Rail: 1.66" OD galvanized steel
- Bracing: Bottom tension wire and diagonal truss rods at corner and gate posts
- Post Spacing: Maximum 10 feet on center

2.03 BARBED WIRE

- Three (3) strands of 12.5-gauge galvanized barbed wire
- 4-point barbs spaced 5 inches apart
- Mounted at 45-degree angle outward using pressed steel arm brackets
- All barbed wire, arms, and attachments: Must be hot-dip galvanized and additionally fitted with a marine-grade corrosion-resistant coating or manufactured from stainless steel, per project requirements.

2.04 FITTINGS, HARDWARE & ACCESSORIES

- All fence hardware, fittings, gate hinges, latches, drop rods, padlock hasps, and anchoring devices shall be manufactured from corrosion-resistant materials suitable for coastal/marine environments. Acceptable materials include Type 316 or 304 stainless steel, or hot-dip galvanized steel with a minimum 86 µm (3.4 mil) zinc coating, or approved equivalents. Fasteners, clamps, and additional hardware shall similarly conform.

2.05 GATES

- Two (2) Double Swing Gates:
 - One for entrance road; one for exit road
 - Opening width: 6.0 meters (3.0 m leaf x 2) per gate
 - Frame: 2.375" OD galvanized pipe, welded and braced
 - Chain link infill: Match fence
 - Hardware: Hinges, drop rods, padlock hasps, and lockable latches, all as per corrosion resistance requirements above
 - Gate wheels: Heavy-duty, corrosion-resistant wheels are required for each leaf to ensure stability and smooth operation.

2.06 CONCRETE FOOTINGS

- Ready-mix concrete, minimum 3,000 psi
- Footing size: 300 mm diameter x 900 mm depth (minimum), deeper if required by Engineer

2.07 MARINE CORROSION PERFORMANCE REQUIREMENTS

2.07.1 General

- All fence, gate, post, rail, brace, fitting, fastener, and accessory components shall be specifically designed, manufactured, and installed for long-term service in a tropical marine environment subject to salt spray, high humidity, wind-driven rain, and airborne chlorides, such as Ebeye Island, Republic of the Marshall Islands.
- Materials and coatings shall be selected to provide a minimum design service life of 25 years with routine maintenance.
- No substitutions or value engineering that reduce corrosion resistance shall be permitted without written approval of the Engineer.

2.07.2 Galvanized Steel Components

- Hot-Dip Galvanizing After Fabrication. All steel posts, rails, braces, gate frames, barbed wire arms, and fabricated steel components shall be hot-dip galvanized after cutting, drilling, and welding in accordance with ASTM A123.
- Minimum Coating Thickness. Galvanized coatings shall have a minimum average thickness of 86 μm (3.4 mils) or greater, suitable for severe marine exposure.
- Field Repairs. Any damage to galvanizing caused by handling, welding, cutting, or installation shall be repaired in accordance with ASTM A780, using zinc-rich repair materials compatible with marine exposure.

2.07.3 Duplex and Ground-Line Protection (Mandatory)

- Ground-Line Corrosion Protection. All steel fence and gate posts shall receive an additional corrosion barrier from 300 mm above finished grade to the bottom of the concrete footing, using one of the following approved systems:
 - Bituminous or epoxy mastic coating suitable for buried steel, or
 - Factory-applied polymer or powder coating over galvanizing (duplex system)
- Concrete Interface Detailing. Top of concrete footings shall be finished smooth and sloped away from posts to shed water. Posts shall be fitted with weathertight caps to prevent moisture ingress.

2.07.4 Stainless Steel Components

- Required Grade. Unless explicitly approved otherwise by the Engineer, all fence fittings, bands, clamps, tension bars, brace bands, fasteners, bolts, nuts, washers, gate hinges, latches, drop rods, padlock hasps, and gate hardware shall be Type 316 stainless steel.
- Type 304 stainless steel is not acceptable for primary fasteners or hardware in this marine environment.
- Finish. Stainless steel components shall have a smooth mill or passivated finish suitable for exterior marine exposure.

2.07.5 Barbed Wire and Barbed Wire Assemblies

- **Materials.** Barbed wire arms, brackets, fasteners, and attachments shall be Type 316 stainless steel or hot-dip galvanized after fabrication and protected with a duplex coating system (galvanizing plus factory-applied polymer or powder coating).
- **Barbed Wire.** Barbed wire shall be heavy-galvanized or zinc-aluminum alloy coated and compatible with stainless or galvanized support arms to minimize galvanic corrosion.

2.07.6 PVC-Coated Chain Link Fabric and Accessories

- **Coating System.** PVC coating on chain link fabric shall be UV-stabilized, continuous, and factory-applied over hot-dip galvanized wire in accordance with ASTM F668.
- **Cut Ends and Repairs.** All cut ends, abrasions, or field-modified areas of PVC coating shall be sealed using manufacturer-approved repair materials to prevent moisture intrusion and under-film corrosion.
- **Tie Wires.** Tie wires shall be PVC-coated to match the fabric or Type 316 stainless steel.

2.07.7 Dissimilar Metals and Galvanic Corrosion Control

- **Compatibility.** Direct contact between dissimilar metals (e.g., stainless steel and galvanized steel) shall be minimized.
- **Isolation.** Where dissimilar metal contact is unavoidable, provide dielectric isolation materials such as non-conductive washers, sleeves, gaskets, or coatings to prevent galvanic corrosion.

2.07.8 Storage, Handling, and Installation

- **Pre-Installation Protection.** All fence materials shall be stored off the ground and protected from salt spray, standing water, and mechanical damage prior to installation.
- **Installation Damage.** Any component damaged during installation that compromises corrosion protection shall be repaired or replaced at no cost to the Owner.

2.07.9 Performance Verification

- **Submittals.** Product submittals shall clearly identify:
 - Base material
 - Galvanizing standard and coating thickness
 - Stainless steel grade
 - PVC coating type and thickness
 - Duplex coating systems (if provided)
- **Rejection.** Materials not meeting these marine corrosion performance requirements shall be rejected.

PART 3 – EXECUTION

3.01 EXAMINATION

- Verify post locations and gate clearances before digging
- Confirm no underground utilities within post installation zones

3.02 INSTALLATION – POSTS AND FABRIC

- Install posts plumb and set in concrete footings
- Allow concrete to cure minimum 48 hours before attaching fabric
- Install top rail continuously along fence line
- Stretch chain link fabric between terminal posts; secure to posts and rails with ties
- Attach tension wire at bottom of fence to discourage intrusion
- Install barbed wire arms and strands at top, angled outward

3.03 INSTALLATION – GATES

- Install gate posts with concrete footings as per drawings
- Mount gates level, swing freely with appropriate clearance
- Install latches and hardware; ensure gates can be padlocked
- Install heavy-duty, corrosion-resistant gate wheels on each gate leaf as per manufacturer's recommendations.

3.04 CLEANING AND PROTECTION

- Remove construction debris and unused materials
- Protect fence from damage until Final Acceptance
- Replace any damaged sections before turnover

3.05 METHOD OF MEASUREMENT AND PAYMENT

- Payment will be made at the unit price per linear meter of fence and per gate installed
- Price includes all labor, materials, equipment, and incidentals required for complete installation

END SECTION

DIVISION 33 – UTILITIES

SECTION 33 31 13 - CORRUGATED HDPE LEACHATE COLLECTION PIPE AND INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY This section covers the materials, fabrication, and installation of corrugated high-density polyethylene (HDPE) pipe with smooth interior (Type S) for leachate collection and removal systems in Subtitle D-compliant landfills. The system includes perforated lateral drains, solid-wall headers, and associated fittings and connections to drainage geocomposites (e.g., DRAINTUBE™).

1.2 RELATED DOCUMENTS

- ASTM F2648: Corrugated HDPE Pipe Specifications
- AASHTO M294 Type S
- ASTM D2321: Standard Practice for Underground Installation
- Manufacturer's installation manual

1.3 REFERENCES

- ASTM F2648: Corrugated HDPE Pipe with Smooth Interior
- AASHTO M294: Type S Pipe
- ASTM D2321: Pipe Bedding and Backfill
- ASTM D698: Standard Proctor Compaction

1.4 SUBMITTALS

- Manufacturer's certifications and technical data for pipe and fittings.
- Shop drawings showing layout and elevations.
- Photographic documentation of installation.
- As-built pipe layout with connections and slopes.

1.5 QUALITY ASSURANCE

- Pipe and fittings shall meet ASTM or AASHTO specifications.
- Installer shall have experience with landfill drainage systems.

PART 2 - PRODUCTS

2.1 PIPE MATERIAL

- Pipe Type: Dual-wall corrugated HDPE with smooth interior (Type S).
- Diameter: Nominal 6-inch (150 mm); larger sizes as needed.
- Pipe Stiffness: ≥ 320 kPa (46 psi) at 5% deflection.
- UV Resistance: UV-stabilized for temporary exposure.
- Chemical Resistance: Compatible with landfill leachate.

2.2 FITTINGS AND CONNECTIONS

- Tees, elbows, wyes, reducers, and end caps to be HDPE, injection-molded or fabricated .
- Fabricated tees for laterals: upward angle of 3.5:1 (~15.9°).
- Sealing: Watertight mechanical gaskets, extrusion welding, or butt fusion - DRAINTUBE™ minitube connections: Grommets or flexible couplers.

2.3 PIPE BEDDING

- Bedding: ASTM D2321 Class I or II (clean gravel <12 mm) or approved drainage geocomposite (e.g., DRAINTUBE™).
- Cushion Layer: ≥ 400 g/m² nonwoven geotextile between pipe and liner if installed directly above geomembrane .
- Minimum Embedment:
 - 150 mm bedding below pipe - 300 mm cover above pipe prior to waste placement or approved drainage geocomposite (e.g., DRAINTUBE™) .

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- Lay pipe with minimum slope of 1% toward sump.
- Avoid sharp bends; use fittings for changes >10° .
- Use proper supports to avoid sagging; ensure full bedding contact.
- Prevent clogging: Cap open ends, protect perforations and grommet connections.
- Non-perforated riser pipe shall be wrapped in filter fabric or sock to allow slippage during settlement. Terminal end at road level shall be capped with a removable cap and a steel casing concrete filled bollard shall be installed and pipe shall be loosely anchoring to bollard.

3.2 TESTING AND INSPECTION

- Visual inspection of joints and bedding before backfill.
- Use light or water to verify continuity and slope.
- Submit photographic and test documentation.

3.3 PERFORATION SCHEDULE

- Pipe Size: 6-inch (150 mm) nominal diameter.
- Hole Type: Circular (preferred) or slots.
- Hole Diameter: 10 mm ± 1 mm.
- Hole Pattern: - 3 rows per pipe (120° spacing around circumference).
- 100 mm center-to-center along pipe length.

- Centered at springline and below (not at crown).
- Open Area: $\geq 1.5\%$ of pipe surface.
- Sump Sections: May increase to 4 rows to enhance intake.
- Solid-wall pipe to be used outside collection zones.
- Quality Control:
 - Smooth edges, burr-free .
 - Mark ends of perforated sections .
 - Wrap with geotextile or filter sock in gravel zones.

3.4 MEASUREMENT AND PAYMENT

- For perforated HDPE pipe on landfill floor, payment shall be by linear meter of installed HDPE pipe (perforated or solid).
- For HDPE nonperforated risers, payment shall be by lump sum.
- Price includes fittings, connections, bedding, and protective wrap.

3.5 APPROVED PRODUCTS

- Corrugated HDPE Type S pipe meeting ASTM F2648 or AASHTO M294 .
- Compatible fittings and connectors .
- Filter wrap: Nonwoven geotextile or prefabricated sock.

END OF SECTION

SECTION 33 40 00 DROP INLETS AND STORM DRAINAGE STRUCTURES

PART 1 – GENERAL

1.01 SUMMARY Furnish and install storm drainage structures, including:

- Precast concrete drop inlets.
- Cast-in-place base slabs and aprons.
- Frames, grates, and access covers.
- Connections to peripheral drainage ditches and box culverts.
- Transitions to the sedimentation basin.

This Section interfaces with Section 33 41 00 – Reinforced Concrete Box Culverts.

1.02 SYSTEM DESCRIPTION

The drainage system consists of a peripheral drainage ditch (approximate slope 0.002), drop inlet structures, box culvert conveyance system, and sedimentation basin discharge. All components shall function together as a continuous, integrated hydraulic system without ponding or flow interruptions.

1.03 DESIGN REQUIREMENTS

- The system shall convey design flows under low-gradient conditions while maintaining hydraulic continuity.
- Due to the low slopes, all structures and connections shall align precisely with culvert invert elevations to prevent ponding or backwater effects.
- All elevations and alignments shall be field-verified by a licensed surveyor prior to placement of base slabs and inlets.

1.04 REFERENCES

- ASTM C478 – Standard Specification for Circular Precast Reinforced Concrete Manhole Sections (or latest equivalent for drop inlets).
- ASTM A48 – Standard Specification for Gray Iron Castings.
- AASHTO M306 – Standard Specification for Drainage, Sewer, Utility, and Related Castings.
- ACI 318 – Building Code Requirements for Structural Concrete.
- ASTM C150 – Standard Specification for Portland Cement (Type HS sulfate-resistant where required).

1.05 SUBMITTALS

- Shop Drawings: Submit detailed drawings showing drop inlet geometry, reinforcement, openings, knockouts, pipe/culvert interface elevations, and hydraulic transitions.

- Product Data: Submit manufacturer's data for frames, grates, sealants, non-shrink grout, and flexible joint sealants, including proof of compliance with referenced standards.
- Concrete Mix Designs: Submit mix designs for precast and cast-in-place concrete, including sulfate-resistant cement where applicable.
- Manufacturer's Certificates: Certify compliance of precast drop inlets with ASTM standards and watertight connections.
- Certification for epoxy-coated or corrosion-resistant reinforcement.

1.06 QUALITY ASSURANCE

- Precast drop inlets shall be manufactured by a firm regularly engaged in such work with a minimum of five years' experience.
- Installer shall have a minimum of three years' experience installing similar drainage structures in marine or low-gradient environments.
- All work shall conform to the Contract Drawings and this Section.

1.07 DELIVERY, STORAGE, AND HANDLING

- Handle and store precast units to prevent damage to edges, surfaces, and joint interfaces
- Protect frames, grates, and accessories from damage and corrosion during storage.

1.08 WARRANTIES

Provide a one-year warranty on materials and workmanship from the date of Substantial Performance, covering defects in materials, installation, and hydraulic performance.

1.09 SEQUENCING AND COORDINATION

Coordinate installation of drop inlets with Section 33 41 00 to ensure precise hydraulic alignment at all connections prior to backfilling.

PART 2 – PRODUCTS

2.01 PRECAST DROP INLETS

- Reinforced concrete structures conforming to ASTM C478 (or equivalent).
- Minimum wall thickness: 150 mm.
- Minimum compressive strength: 28 MPa at 28 days.
- Minimum interior dimensions: 1.0 m × 1.0 m plan area and 1.5 m depth, or as indicated on the Drawings.
- Provide openings or formed knockouts precisely aligned with box culvert inverts. Include cast-in or formed connections suitable for watertight sealing.

2.02 BASE SLAB

- Cast-in-place reinforced concrete.
- Minimum thickness: 200 mm.
- Reinforcement: No. 4 bars at 150 mm on center each way, or as indicated.
- Minimum compressive strength: 28 MPa at 28 days.

2.03 FRAMES AND GRATES

- Material: Ductile iron or gray iron conforming to ASTM A48 Class 35B and AASHTO M306.
- Loading: Traffic-rated for HL-93 or H-20 loading minimum.
- Provide bicycle-safe grate pattern unless otherwise indicated.
- Frames and grates shall be compatible with the drop inlet top section.

2.04 CONNECTION TO BOX CULVERT

- The drop inlet outlet shall match the box culvert invert elevation within ± 5 mm.
- Provide a smooth, step-free hydraulic transition.
- Connections shall be fully watertight (tested to minimum 3 m head of water).
- Sealing: Non-shrink grout plus flexible sealant compatible with concrete and designed for submerged/marine conditions.

2.05 MARINE/ATOLL DURABILITY

- Use sulfate-resistant cement (Type HS per ASTM C150) for all concrete exposed to saline or sulfate-bearing groundwater.
- Reinforcement: Epoxy-coated or corrosion-resistant steel.
- Concrete cover: Minimum 75 mm over reinforcement.
- Water-cement ratio for cast-in-place concrete: maximum 0.45.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install drop inlets plumb and level on the prepared cast-in-place base slab.
- Align precisely with the box culvert inlet as indicated on the Drawings.

3.02 HYDRAULIC ALIGNMENT

- Ensure continuous invert alignment from the drainage ditch through the drop inlet to the box culvert.
- Maximum deviation from design invert elevations: ± 5 mm.
- Contractor shall provide independent survey verification of all inverts before and after backfill. Any deviation exceeding ± 5 mm shall be corrected by removal and replacement at the Contractor's expense.

3.03 BACKFILL

- Use clean granular material approved by the Engineer.
- Place and compact in lifts to a minimum of 95% of Modified Proctor density (ASTM D1557).

3.04 FIELD QUALITY CONTROL

- Verify elevations, alignment, and watertightness of each drop inlet and connection.
- Perform concrete compressive strength testing per ASTM C39.
- Test connections for watertightness prior to backfill.
- Submit as-built survey of all inverts and alignments to the Engineer.

3.05 MEASUREMENT AND PAYMENT

Drop inlets shall be measured by the unit (each) installed complete in place, including base slab, frames, grates, connections, excavation, backfill, and all incidentals. Payment shall be at the Contract unit price per drop inlet, which shall constitute full compensation for all work.

END OF SECTION

SECTION 33 41 00 REINFORCED CONCRETE BOX CULVERTS

PART 1 – GENERAL

1.01 SUMMARY Furnish and install reinforced concrete box culverts to convey flow from the drop inlets to the sedimentation basin, including:

- Precast (preferred) or cast-in-place box culvert sections (800 mm × 2000 mm).
- Bedding and foundation preparation.
- Joints and sealing.
- Headwalls and outlet protection.

This Section interfaces with Section 33 40 00 – Drop Inlets and Storm Drainage Structures.

1.02 SYSTEM INTEGRATION

The box culvert shall align hydraulically with the upstream drop inlets and discharge

1.03 DESIGN CRITERIA

- Interior dimensions: 800 mm height × 2000 mm width.
- Approximate total length: 12 m (or as indicated on the Drawings).
- Slope: 0.002 to 0.006 (minimum 0.002).
- Loading: Traffic-rated for HL-93 or H-20 loading.

1.04 PROJECT/SITE CONDITIONS

- Marine/atoll environment with exposure to saline groundwater and high humidity.
- Potential soft, saturated, or coral-derived soils.
- Low hydraulic gradient requiring precise grade control.

1.05 REFERENCES

- ASTM C1577 – Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers.
- AASHTO LRFD Bridge Design and Construction Specifications.
- ACI 318 – Building Code Requirements for Structural Concrete.
- ASTM C150 – Portland Cement (Type HS sulfate-resistant).

1.06 SUBMITTALS

- Shop Drawings: Detailed fabrication and installation drawings showing section layout, joint details, reinforcement, invert elevations, and connections.
- Product Data and Certifications: Manufacturer's certificates for precast sections, joint gaskets/sealants, and epoxy-coated reinforcement.

- Concrete mix designs.
- Proposed method for soft ground treatment (if required).

1.07 QUALITY ASSURANCE

- Precast manufacturer shall be regularly engaged in production of ASTM C1577 box sections.
- Installer qualifications: Minimum three years' experience with similar low-slope box culvert installations.

1.08 DELIVERY, STORAGE, AND HANDLING

Handle precast sections to prevent damage to joints and surfaces. Store on firm, level ground.

1.09 WARRANTIES

One-year warranty on materials and workmanship, including joint integrity and hydraulic performance.

PART 2 – PRODUCTS

2.01 BOX CULVERT SECTIONS

- Precast reinforced concrete monolithic box sections conforming to ASTM C1577. Cast-in-place construction requires prior written approval of the Engineer.
- Minimum compressive strength: 35 MPa at 28 days.

2.02 MARINE/ATOLL DURABILITY

- Cement: Sulfate-resistant (Type HS per ASTM C150).
- Water-cement ratio: ≤ 0.45 for precast; ≤ 0.40 preferred.
- Reinforcement: Epoxy-coated or corrosion-resistant steel.
- Concrete cover: Minimum 75 mm over all reinforcement.

2.03 BEDDING

- Minimum 150 mm of clean granular bedding material.
- Compact to $\geq 95\%$ Modified Proctor density

2.04 SOFT GROUND TREATMENT Where unstable or soft soils are encountered (as determined by the Engineer):

- Over-excavate and replace with approved granular material, or
- Install geotextile separator and geogrid reinforcement as approved. Maximum allowable differential settlement: ± 10 mm

2.05 JOINTS

- Provide watertight joints using rubber gaskets (ASTM C1677 or equivalent) or preformed flexible joint sealants (ASTM C990).
- Include secondary non-shrink grout seal where indicated.

2.06 HEADWALLS AND OUTLET PROTECTION

- Reinforced concrete headwalls as indicated. Outlet protection: Minimum 300 mm thick riprap or concrete apron designed to prevent scour and undermining.

PART 3 – EXECUTION

3.01 INSTALLATION

Install box culvert sections true to line, grade, and slope as indicated on the Drawings.

3.02 LOW SLOPE CONTROL

- Maintain continuous invert slope with no sags or reverse slopes. Minimum slope 0.002.
- Invert tolerance: ± 5 mm at each joint and at maximum 3 m intervals.
- Provide survey verification of inverts at each joint prior to joint sealing and backfill. Deviations exceeding tolerance require correction at Contractor's expense.

3.03 BACKFILL

- Use approved granular material.
- Place in lifts not exceeding 150 mm and compact to $\geq 95\%$ Modified Proctor density.

3.04 ROADWAY INTEGRATION

Restore roadway structure over the culvert to match existing or indicated pavement section. The culvert shall support design traffic loads without settlement.

3.05 SYSTEM CONNECTIONS

- Upstream: Match drop inlet invert precisely and provide smooth, watertight transition using materials specified in Section 33 40 00.
- Downstream: Provide smooth hydraulic transition to the sedimentation basin.

3.06 EROSION CONTROL

Install riprap, aprons, or other protection to prevent scour and undermining at the outlet and headwalls.

3.07 FIELD QUALITY CONTROL

- Verify alignment, elevations, and joint integrity.
- Test joints for watertightness prior to backfill.
- Submit as-built survey documenting all inverts and alignments.

3.08 MEASUREMENT AND PAYMENT

Box culverts shall be measured by the linear metre installed complete in place, including sections, joints, bedding, backfill, headwalls, and outlet protection. Payment at the Contract unit price per linear metre shall include all labour, materials, and incidentals.

END OF SECTION

SECTION 33 42 36 STORMWATER TRENCH DRAINS

PART 1 – GENERAL

1.1 SUMMARY

Section includes precast concrete open channel trench drain systems with ductile iron grates for stormwater conveyance.

1.2 RELATED SECTIONS

- Section 31 00 00 – Earthwork
- Section 33 42 00 – Stormwater Conveyance
- Section 03 30 00 – Cast-in-Place Concrete (for base or collar pours)

1.3 REFERENCES

- ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- ASTM C857/C858 – Minimum Requirements for Precast Concrete Underground Structures
- EN 124 – Gully Tops and Manhole Tops for Vehicular and Pedestrian Areas
- AASHTO HB-17 – Standard Specifications for Highway Bridges

1.4 DEFINITIONS

- Trench Drain: Precast modular channel for collecting and conveying surface stormwater.
- D400 Grate: Ductile iron heavy duty grate, rated for 40-ton wheel loads.

1.5 SUBMITTALS

- Product Data: Manufacturer's data sheets for trench drains, reinforcement, and grates.
- Shop Drawings: Layout, elevations, joints, and accessory details.
- Quality Certificates: Concrete mix reports, grate load tests.
- Installation Photos and As-built Drawings.
- Hydraulic Calculations and Compliance Certificates.

1.6 QUALITY ASSURANCE

- Manufacturer Qualifications: Minimum 3 years' experience; certified to supply EN 124 Class D400 products.
- Mock-Up: Provide 2m trench section for inspection if required.
- Pre-Installation Meeting: Contractor, Engineer, Supplier to review methods and sequencing.
- Testing: Perform watertightness and load bearing tests per project requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- Deliver units undamaged; store to prevent cracking or deflection.
- Protect grates and gaskets from corrosion and dirt.

1.8 WARRANTY

- Provide manufacturer's standard warranty (minimum 1-year defects warranty).

PART 2 – PRODUCTS

2.1 PRECAST CONCRETE TRENCH DRAIN UNITS

- Nominal Depth: 750 mm; External Width: 1300 mm; Bottom Width: 350–450 mm.
- Wall Thickness: ≥ 100 mm; Unit Length: 1 or 2 m.
- Reinforcement: ASTM A615 Grade 60 rebar or welded wire mesh.
- Concrete: 25 MPa min. at 28 days; air entrained 4–7%.
- Jointing: Tongue-and-groove with EPDM or neoprene gaskets.

2.2 GRATE COVERS

- Ductile iron, EN 124 Class D400 or AASHTO H-20 rated, slip-resistant coating.
- Mechanically anchored, flush with surface; removable for maintenance.

2.3 GASKETS & SEALANTS

- EPDM or neoprene rubber for watertight end joints.
- Approved acid/abrasion-resistant epoxy lining, if specified.

2.4 ACCEPTABLE MANUFACTURERS

- ABT TrenchFormer TFX 1300 with D400 grate cover
- ACO PowerDrain 1300 Series
- MEA MEADRAIN EN 1300
- FP McCann Precast Concrete Channel Drains

PART 3 – EXECUTION

3.1 EXAMINATION

- Verify subgrade is stable and at correct alignment and elevation before channel placement.

3.2 INSTALLATION

- Trench Width: Minimum 150 mm wider than unit either side.
- Bedding: 50 mm compacted sand or approved leveling layer.
- Slope: Set units for minimum longitudinal slope of 0.002.
- Jointing: Install with compression gaskets; check for watertightness.
- Backfill: Compact to 95% Standard Proctor.
- Grates: Anchor and align flush with finished grade; provide access every 30 m.

3.3 FIELD QUALITY CONTROL

- Inspect for defects, alignment, and joint integrity before backfilling.
- Conduct water tightness and load tests per Section 1.6 and engineer direction.
- Document and submit required field tests and photographs.

3.4 PROTECTION AND CLEANING

- Protect open channels and grates during construction.
- Remove debris; repair damage per manufacturer's recommendations.

3.5 Measure and Payment Method

- For drainage channel, payment shall be by linear meter.
- Payment shall cover all contractor costs for product, installation, necessary parts and earthwork. The installation shall be coordinated with the liner, road and yard improvements of the project.

END SECTION

SECTION 33 46 16 SUBMERSIBLE LEACHATE PUMP SYSTEM (75 GPM, 15 FT TDH)

PART 1 - GENERAL

1.1 SUMMARY

This section covers the design, supply, installation, testing, and commissioning of a submersible leachate pump system rated at 75 gallons per minute (GPM) at 15 feet total dynamic head (TDH), including sump construction, pump system, control panel, and all associated civil, mechanical, piping, and electrical works required to convey leachate from the sump to the existing KAJUR wastewater collection system.

The Ebeye wastewater collection system approaches the Ebeye Landfill site to within approximately 50 meters of the landfill boundary, at the point where the boundary intersects the Causeway Road. The collection pipe is constructed of 6-inch-diameter, Schedule 80 polyvinyl chloride (PVC) pipe and facilitates gravity flow to a lift station located approximately 200 meters to the south. The lift station has a production rate of 1,635 m³/day (18.9 L/s or 300 gpm) and typically has 5 to 6 duty cycles per day.

To connect to this system, please coordinate with the Kwajalein Atoll Joint Utilities Resources Inc (KAJUR), Phone Number: (692) 329-3799, Mr. Julien Reimers and Mr. Ed Bobo, Email: jreimers@kajur.net and edbobob@kajur.net

All tie-in works, design approvals, shutdown coordination, and inspections related to connecting the leachate force main to the KAJUR system shall be performed only with KAJUR's approval and direction.

1.2 RELATED DOCUMENTS

- NEC (National Electrical Code)
- Manufacturer's pump and control panel documentation
- Relevant landfill design specifications and environmental regulations
- ASTM and AWWA standards for pressure piping used for leachate force mains
- KAJUR wastewater collection design requirements

1.3 REFERENCES

- ANSI/HI standards for pump performance
- ASTM A240: Stainless Steel Materials
- ASTM D2321: Underground Installation
- ASTM D1785: PVC Pipe for Pressure Applications
- AWWA C900/C905 PVC pressure pipe standards

1.4 SUBMITTALS

- Pump data sheets and certifications
- Electrical and civil drawings
- Shop drawings and O&M manuals
- Test certificates and commissioning reports
- Mechanical piping drawings showing the complete leachate force main from sump discharge to the KAJUR connection point

- Hydraulic calculations for force main sizing, velocities, friction loss, and pump selection
- Valve and appurtenance schedule
- Detailed trenching, bedding, and backfilling plan
- KAJUR connection approval documentation

1.5 QUALITY ASSURANCE

- Pumps must be factory-tested and certified
- Installers must have experience with landfill pump systems
- All piping materials shall be suitable for leachate service and resistant to chemical, biological, and corrosive exposure
- All connections to the KAJUR system must comply with KAJUR standards and be witnessed by KAJUR staff

PART 2 - PRODUCTS

2.1 SUBMERSIBLE PUMP

- Type: Submersible centrifugal pump for landfill leachate
- Flow Rate: 75 GPM - TDH: 15 ft
- Material: 300 series stainless steel for wetted components
- Impellers: Abrasion- and leachate-resistant
- Seals: Mechanical seals suitable for leachate service
- Mounting: Guide rail or wheeled carrier system with level sensor holder
- Strainer: Integral stainless steel - Discharge: 1.5" or 2" NPT - Check Valve: Stainless steel disc type
- Provide discharge adapter, guide-rail base elbow, and quick-disconnect coupling compatible with pump manufacturer's system

2.2 MOTOR AND POWER

- Enclosure: Submersible, sealed
- Voltage: 230V or 460V, 1- or 3-phase, 50/60 Hz
- Power Rating: 1.5 – 3 HP (depending on efficiency)
- Cable: Submersible-rated, jacketed, NEC-compliant
- Protection: Overload and thermal protection

2.3 CONTROL PANEL AND AUTOMATION

- Enclosure: NEMA 4X rated
- Motor Starter: With overload and short circuit protection
- Control Voltage Transformer (if needed)
- Level Control: Float switch or ultrasonic sensor
- Alarms: High-level visual/audible alarm and SCADA interface
- Optional: Variable Frequency Drive (VFD)

2.4 PIPING AND APPURTENANCES (NEW EXPANDED SCOPE)

Provide a complete leachate force main system, including:

- Force main pipe: PVC Schedule 80, HDPE DR11, or other corrosion-resistant pressure pipe sized by hydraulic calculation
- Fittings: Long-radius bends, tees, couplings, and adapters compatible with force main material
- Valves:
 - Check valve at pump discharge
 - Ball or plug isolation valve
 - Cleanout/flush connection
- Air release/vacuum valve at force main high point
- Thrust blocks or restrained joints at all changes in direction
- Connection assembly to the KAJUR wastewater main, including tapping saddle, wye/tee, and bolted fittings (as approved by KAJUR)
- Corrosion-resistant pipe supports, anchors, and wall penetrations

PART 3 - EXECUTION

3.1 CIVIL WORKS

- Foundation and Pad for Control Panel: Concrete slab or reinforced base sized to support the control panel enclosure and allow safe access.
- Enclosure Installation: Placement and anchoring of the NEMA Type 4/12 control panel enclosure per manufacturer specs.
- Access and Clearance: Provision of adequate clearance around the panel for maintenance and ventilation as per electrical codes. Grating, safety rails, ladder (as required)
- Drainage: Grade surrounding area to prevent stormwater ingress
- Excavate, trench, install, bed, and backfill the leachate force main from the sump discharge piping to the KAJUR sewer connection point.
- Minimum cover: 900 mm unless otherwise directed by KAJUR.
- Provide thrust blocks at bends, tees, and valves.
- Provide corrosion protection on metallic components exposed to leachate or soil.

3.2 ELECTRICAL WORKS

- Conduits and cabling per NEC
- Grounding and bonding as required
- Install and terminate control panel and power connections

3.3 INSTALLATION

- Handle and align pump per manufacturer instructions
- Install guide rails or wheeled carrier system
- Route and secure power cable with strain relief
- Install level sensor and calibrate controls
- Install all discharge piping, isolation valves, check valves, and appurtenances from pump outlet to force main.

- Install complete force main piping system per approved drawings.
- Install connection to KAJUR pipeline under KAJUR supervision.

3.4 TESTING AND COMMISSIONING

- Hydrostatic Test: For piping and joints
- Pump Test: Verify flow rate and TDH
- Electrical Test: Verify protection and control functions Submit: Test reports and calibration certificates
- Hydrostatic testing shall include the full length of the leachate force main.
- Force main flushing shall be conducted prior to pump operation.
- Acceptance inspection must be completed with KAJUR staff present.

3.5 DELIVERABLES

- Shop and as-built drawings
- O&M manuals
- Spare parts list
- Training session
- Warranty documentation (≥12 months)
- Force main test results and KAJUR tie-in acceptance documentation

3.6 MEASUREMENT AND PAYMENT

- Pump Station Design: Lump sum
- Pump and Control Panel Supply: Per unit Civil Works: Lump sum
- Electrical Works: Lump sum
- Installation and Commissioning: Lump sum
- Leachate Force Main Piping Supply and Installation: Lump sum
- Tie-in Assembly and KAJUR Connection Works: Lump sum

3.7 APPROVED PRODUCTS

Manufacturer	Model/Series	Flow Range	Notes
GunnCo	P2K Series (e.g., P2K-75)	~75 GPM	300 SS, multi-stage, 230/460V
EPG Companies	SurePump Series 14	45–95 GPM	Stainless steel construction

END OF SECTION

SECTION 33 49 13 TEMPORARY DRIVE-POINT LEACHATE MONITORING WELLS

PART 1 – GENERAL

1.01 SUMMARY

Work includes:

- Installation of three (3) temporary small-diameter drive-point wells within saturated legacy waste at the base of the landfill excavation.
- Development and stabilization of each well.
- Collection of individual leachate samples from each well.
- Preparation of one (1) composite (blended) sample from the three wells.
- Field measurement of specified parameters at each well.
- Laboratory analysis of the composite sample using a California Title 27 groundwater-equivalent analytical suite.
- QA/QC sampling.
- Abandonment of wells.
- Preparation of monitoring report.

1.02 PURPOSE

This work is intended to characterize leachate chemistry in saturated legacy waste and support environmental management planning.

1.03 REFERENCES

- California Code of Regulations (CCR), Title 27
- 40 CFR 258 (Appendix I & II)
- EPA SW-846 Test Methods
- EPA 200, 300, 400, 500 Series Methods
- Standard Methods for the Examination of Water and Wastewater (SM)

1.04 SUBMITTALS

- Installation Plan
- Laboratory accreditation documentation
- Health and Safety Plan (including landfill gas monitoring procedures)
- Final Monitoring Report

PART 2 – MATERIALS AND INSTALLATION

2.01 DRIVE-POINT WELLS

- Quantity: Three (3)
- Diameter: 0.5–1.5 inch internal diameter
- Materials:
 - Schedule 40 PVC or stainless steel
 - Hardened steel drive-point tip
 - Slotted screen (0.010–0.020 inch slots)
 - Flush threaded joints
- Screen Length: 0.3–1.0 m
- The well shall have a cap and be protected following installation and until formal abandonment.

2.02 INSTALLATION

- Install using slide hammer or hydraulic driver.
- Advance minimum 0.5 m into saturated waste or until refusal.
- No drilling fluids permitted.
- Record:
 - Total depth
 - Refusal depth
 - Observed waste characteristics
 - Liquid depth

2.03 DEVELOPMENT

- Allow equilibration for a minimum of 30 minutes.
- Purge a minimum of three well volumes where feasible.
- Measure field parameters during purging. Once field parameters have stabilized, collect sample. Sampling can proceed prior to field parameter stabilization with approval from the engineer.

2.04 ABANDONMENT

- Proceed with abandonment once approved by the engineer.
- Remove casing from waste column.
- Backfill borehole with bentonite chips.
- Restore surface condition.

PART 3 – FIELD SAMPLING

3.01 FIELD MEASUREMENTS (Each Well Individually)

- pH – EPA 150.1 or SM 4500-H⁺
- Temperature – SM 2550
- Specific Conductance – EPA 120.1
- ORP – SM 2580
- Dissolved Oxygen – SM 4500-O
- Turbidity – EPA 180.1
- Liquid elevation

3.02 COMPOSITE SAMPLE

- After purging, collect stabilized samples from each well.
- Combine equal volumes from each well into one composite container.
- Gently homogenize without aeration.
- Preserve and store in accordance with laboratory requirements.

PART 4 – LABORATORY ANALYSIS

4.01 GENERAL

- Laboratory shall be National Environmental Laboratory Accreditation Program (NELAP) certified or ISO/IEC 17025 accredited.
- Methods shall meet or exceed specified EPA method numbers.

4.02 ANALYTICAL PARAMETERS (Composite Sample Only)

A. General Chemistry

Parameter	Method
TDS	EPA 160.1
TSS	EPA 160.2
Alkalinity	SM 2320B
COD	EPA 410.4
BOD5	EPA 405.1
TOC	EPA 415.3
TKN	EPA 351.2
Ammonia	EPA 350.1
Nitrate/Nitrite	EPA 353.2

Parameter	Method
Total Phosphorus	EPA 365.1

B. Major Anions

Parameter	Method
Chloride	EPA 300.0
Sulfate	EPA 300.0

C. Metals (Total and Dissolved)

Method: EPA 200.8 or SW-846 6020B (ICP-MS)

Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury (7470/7471), Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc.

D. VOCs

Method: SW-846 8260C (Full Target Compound List)

E. SVOCs

Method: SW-846 8270E (Full Target Compound List)

F. Pesticides and PCBs

- Pesticides – 8081B
- PCBs – 8082A

G. Dissolved Gas Indicators

- Dissolved Methane – SM 2720C
- Dissolved Hydrogen Sulfide – EPA 376.2

4.03 QA/QC

- 1 Field Duplicate (composite sample)
- 1 Trip Blank (VOC only)
- 1 Equipment Blank (if reusable equipment used)

4.04 SAMPLE CONTAINERS, PRESERVATION & HOLDING TIMES

The Contractor shall coordinate bottle types with the laboratory. Minimum requirements:

Analysis	Container	Preservation	Holding Time
VOCs (8260)	2 x 40 mL VOA vials	HCl, 4°C	14 days
SVOCs (8270)	1 L amber glass	4°C	7 days extract / 40 days analysis
Metals (Total)	500 mL HDPE	HNO ₃ to pH<2	6 months (Hg 28 days)
Metals (Dissolved)	500 mL filtered HDPE	HNO ₃ to pH<2	6 months
General Chemistry	1 L HDPE	4°C	7–28 days (parameter dependent)
TOC	250 mL glass	HCl to pH<2	28 days
Anions (300.0)	250 mL HDPE	4°C	28 days
Methane	40 mL glass	No headspace, 4°C	14 days
H ₂ S	250 mL	Zinc acetate, 4°C	7 days

Laboratory instructions shall supersede if stricter.

PART 5 – REPORTING

Final report shall include:

- Installation logs
- Field measurements per well
- Composite methodology
- Laboratory report
- QA/QC summary
- Electronic data deliverable

PART 6 – BILL OF QUANTITIES

Temporary Drive-Point Leachate Monitoring Program

Item No.	Description	Unit	Quantity
1	Installation of Three (3) Temporary Drive-Point Wells, including materials, development, field documentation, and abandonment	LS	1
2	Leachate Sampling Event, including purging, field measurements at each well, preparation of one composite sample, sample preservation, containers, chain-of-custody, and shipping	LS	1
3	Laboratory Analysis of One Composite Sample using specified California Title 27–equivalent analytical suite, including QA/QC (field duplicate, trip blank, equipment blank if required), data validation, and reporting	LS	1

Note:

1. Item 1 includes:
 - Installation of three (3) drive-point wells
 - Well development
 - Gas monitoring during installation
 - Well abandonment and site restoration
2. Item 2 includes:
 - Field parameter measurement at each well
 - Composite preparation
 - All sample containers and preservatives
 - Shipping and cold-chain logistics
3. Item 3 includes:
 - All laboratory analytical costs for the composite sample
 - Required QA/QC analyses
 - Electronic and PDF laboratory deliverables

END OF SECTION

Section 7: General Conditions of Contract

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A. General

1. Definitions

1.1 Boldface type is used to identify defined terms.

- (a) The **Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.
- (b) The **Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.
- (c) The **Adjudicator** is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC 29.1 [Appointment of Adjudicator] hereunder.
- (d) **Bank** means the financing institutions named in the **Particular Conditions of Contract (PCC)**.
- (e) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.
- (f) **Compensation Events** are those defined in GCC 51.1 [Compensation Events] hereunder.
- (g) The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC 69.1 [Completion].
- (h) The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC 2.3 below.
- (i) The **Contractor** is the party whose Bid to carry out the Works has been accepted by the Employer.
- (j) The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Employer.
- (k) The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.
- (l) **Days** are calendar days; months are calendar months.
- (m) **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.
- (n) A **Defect** is any part of the Works not completed in accordance with the Contract.
- (o) The **Defects Liability Certificate** is the certificate issued by the Project Manager upon correction of defects by the Contractor.
- (p) The **Defects Liability Period** is the period calculated from the Completion Date where the Contractor remains responsible for remedying defects.

- (q) **Drawings** include calculations and other information provided or approved by the Project Manager for the execution of the Contract.
- (r) The **Employer** is the party who employs the Contractor to carry out the Works, as specified in the **PCC**.
- (s) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.
- (t) **Force Majeure** means an exceptional event or circumstance: which is beyond a Party's control; which such Party could not reasonably have provided against before entering into the Contract; which, having arisen, such Party could not reasonably have avoided or overcome; and, which is not substantially attributable to the other Party.
- (u) **In writing** or **written** means hand-written, type-written, printed, or electronically made, and resulting in a permanent record.
- (v) The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.
- (w) 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 **PCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.
- (x) **Letter of Acceptance** means the formal acceptance by the Employer of the Bid and denotes the formation of the Contract at the date of acceptance.
- (y) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.
- (z) **Party** means the Employer or the Contractor, as the context requires.
- (aa) **PCC** means Particular Conditions of Contract.
- (bb) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.
- (cc) The **Project Manager** is the person named in the **PCC** (or any other competent person appointed by the Employer 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.
- (dd) **Retention Money** means the aggregate of all monies retained by the Employer pursuant to GCC 55.1 [Retention].
- (ee) **Schedules** means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Bid, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.
- (ff) The **Site** is the area defined as such in the **PCC**.

- (gg) **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.
- (hh) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.
- (ii) The **Start Date** is given in the **PCC**. 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.
- (jj) 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.
- (kk) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.
- (ll) A **Variation** is an instruction given by the Project Manager which varies the Works.
- (mm) The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the **PCC**.

2. Interpretation

- 2.1 In interpreting these GCC, singular also means plural, male also means female or neuter, 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 **PCC**, 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) Contract Agreement,
 - (b) Letter of Acceptance,
 - (c) Letter of Bid,
 - (d) Particular Conditions of Contract,
 - (e) the List of Eligible Countries that was specified in Section 5 of the bidding document,
 - (f) General Conditions of Contract,
 - (g) Specifications,
 - (h) Drawings,
 - (i) Completed Activity Schedules or Bill of Quantities, and
 - (j) any other document listed in the **PCC** 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 **PCC**.
- 3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Employer's country when
- (a) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from, or any payments to, a particular country, person, or entity. Where the Borrower's country prohibits payments to a particular firm or for particular goods by such an act of compliance, that firm may be excluded.
- 4. Contract Agreement**
- 4.1 The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the attached Contract forms in Section 8. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.
- 5. Assignment**
- 5.1 Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party
- (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party; and
- (b) may, as security in favor of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.
- 6. Care and Supply of Documents**
- 6.1 The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.
- 6.2 Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.
- 6.3 The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.
- 6.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.
- 7. Confidential Details**
- 7.1 The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation.

- 7.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
- 7.3 Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this Clause.
- 8. Compliance with Laws**
- 8.1 The Contractor shall, in performing the Contract, comply with applicable Laws.
- 8.2 Unless otherwise stated in the Particular Conditions,
- (a) the Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer's Country or country where the Site is located] which (i) such authorities or undertakings require the Employer to obtain in the Employer's name, and (ii) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract;
- (b) the Contractor shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer's Country or country where the Site is located] which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under Subclause 8.2(a) hereof and that are necessary for the performance of the Contract. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to Subclause 8.1 hereof.
- 9. Joint and Several Liability**
- 9.1 If the Contractor is a Joint Venture of two or more persons, all such persons shall be jointly and severally liable to the Employer for the fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the Joint Venture. The composition or the constitution of the Joint Venture shall not be altered without the prior consent of the Employer.

- 10. Project Manager's Decisions** 10.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.
- 11. Delegation** 11.1 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.
- 12. Communications** 12.1 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.
- 13. Subcontracting** 13.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.
- 14. Other Contractors** 14.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as referred to in the **PCC**. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.
- 15. Personnel and Equipment** 15.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid to carry out the functions stated in the Schedule or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
- 15.2 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 7 days and has no further connection with the work in the Contract.
- 15.3 Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the execution of the Works, then that employee shall be removed in accordance with Clause 15.2 above.
- 16. Employer's and Contractor's Risks** 16.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.
- 17. Employer's Risks** 17.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer'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 Employer 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 Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
- 17.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer'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 an Employer's risk, or
 - (c) the activities of the Contractor on the Site after the Completion Date.
- 18. Contractor's Risks**
- 18.1 From the Starting Date until the Defects Liability 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 Employer's risks, are Contractor's risks.
- 19. Insurance**
- 19.1 The Contractor shall provide, in the joint names of the Employer 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 **PCC** 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.
- 19.2 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.
- 19.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance, which the Contractor should have provided and recover the premiums the Employer 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.
- 19.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.
- 19.5 Both parties shall comply with any conditions of the insurance policies.

- 20. Site Investigation Reports** 20.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **PCC**, supplemented by any information available to the Contractor.
- 21. Contractor to Construct the Works** 21.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.
- 22. The Works to Be Completed by the Intended Completion Date** 22.1 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 Project Manager, and complete them by the Intended Completion Date.
- 23. Designs by Contractor and Approval by the Project Manager** 23.1 The Contractor shall carry out design to the extent specified in the **PCC**. The Contractor shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt, the Employer shall notify any comments. The Contractor shall not construct any element of the permanent work designed by him within 14 days after the design has been submitted to the Employer or where the design for that element has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Contractor shall resubmit all designs commented on, taking these comments into account as necessary.
- 23.2 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..
- 23.3 The Contractor shall be responsible for design of Temporary Works.
- 23.4 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
- 23.5 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
- 23.6 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 this use.
- 24. Safety** 24.1 The Contractor shall be responsible for the safety of all activities on the Site.
- 25. Discoveries** 25.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.
- 26. Possession of the Site** 26.1 The Employer 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 **PCC**, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.
- 27. Access to the Site** 27.1 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.

28. Instructions, Inspections, and Audits

- 28.1 The Contractor shall carry out all instructions of the Project Manager, which comply with the applicable laws where the Site is located.
- 28.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and subconsultants to keep accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.
- 28.3 The Contractor shall permit ADB or its representative to inspect the Contractor's site, assets, accounts, records, and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by ADB. The Contractor shall maintain all documents and records related to the bid submission and execution of the Contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer. The Contractor shall provide any documents necessary for the investigation of allegations of corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations and require its employees or agents with knowledge of the Contract to respond to questions from ADB.
- 28.4 ADB's right to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract stated in Sub-Clause 28.3 and 74.2 (e) shall survive termination and/ or expiration of this Contract.

29. Appointment of the Adjudicator

- 29.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the **PCC**, to appoint the Adjudicator within 14 days of receipt of such request.
- 29.2 Should the Adjudicator resign or die, or should the Employer 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 Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority at the request of either party, within 14 days of receipt of such request.

30. Procedure for Disputes

- 30.1 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.
- 30.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.
- 30.3 The Adjudicator shall be paid by the hour at the rate specified in the **PCC**, together with reimbursable expenses of the types specified in the **PCC**, and the cost shall be divided equally between the Employer and the

Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.

- 30.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the **PCC**.

B. Staff and Labor

31. Forced Labor

- 31.1 The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor-contracting arrangements.

32. Child Labor

- 32.1 The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where national laws have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.

33. Workers' Organizations

- 33.1 In countries where national law recognizes workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the Contractor shall comply with national law. Where national law substantially restricts workers' organizations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where national law is silent, the Contractor shall not discourage the Contractor's Personnel from forming or joining workers' organizations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organizations and bargain collectively. The Contractor shall engage with such workers representatives. Worker organizations are expected to fairly represent the workers in the workforce.

34. Non-discrimination and Equal Opportunity

- 34.1 The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where national law provides for non-discrimination in employment, the Contractor shall comply with national law. When national laws are silent on nondiscrimination in employment, the Contractor shall meet this Subclause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.

C. Time Control**35. Program**

- 35.1 Within the time stated in the **PCC**, 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. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.
- 35.2 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.
- 35.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the **PCC**. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the **PCC** 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. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.
- 35.4 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.

36. Extension of the Intended Completion Date

- 36.1 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.
- 36.2 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.

37. Acceleration

- 37.1 When the Employer 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 Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.
- 37.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

- 38. Delays Ordered by the Project Manager** 38.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.
- 39. Management Meetings** 39.1 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.
- 39.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. 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.
- 40. Early Warning** 40.1 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.
- 40.2 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.

D. Quality Control

- 41. Identifying Defects** 41.1 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.
- 42. Tests** 42.1 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.
- 43. Correction of Defects** 43.1 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 **PCC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
- 43.2 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.

44. Uncorrected Defects

44.1 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.

E. Cost Control**45. Contract Price**

45.1 In the case of an admeasurement contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

45.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.

46. Changes in the Contract Price

46.1 In the case of an admeasurement contract:

- (a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25%, provided the change exceeds 1% of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.
- (b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15%, except with the prior approval of the Employer.
- (c) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

46.2 In the case of a lump sum contract, 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.

47. Variations

47.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.

47.2 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 and before the Variation is ordered.

47.3 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.

47.4 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.

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

47.6 In the case of an admeasurement contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in GCC 46.1 [Changes in the Contract Price] or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

48. Cash Flow Forecasts

48.1 When the Program, or, in the case of a lump sum contract, the 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.

49. Payment Certificates

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

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

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

49.4 The value of work executed shall comprise,

- (a) in the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or
- (b) in the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.

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

49.6 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.

50. Payments

50.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If

the Employer 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.

- 50.2 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.
- 50.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.
- 50.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

51. Compensation Events

- 51.1 The following shall be Compensation Events:
- (a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC 26.1 [Possession of the Site].
 - (b) The Employer 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 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 Employer, or additional work required for safety or other reasons.
 - (h) Other contractors, public authorities, utilities, or the Employer does 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 Employer's Risks.

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

51.2 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.

51.3 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.

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

52. Tax

52.1 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 54.1 [Price Adjustment].

53. Currencies

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

54. Price Adjustment

54.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the **PCC**. 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:

$$P_c = A_c + B_c \text{ Imc/loc}$$

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 coefficients¹ specified in the **PCC**, representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency “c;” and

I_{mc} is a consolidated index prevailing at the end of the month being invoiced and I_{oc} is the same consolidated index prevailing 28 days before Bid opening for inputs payable; both in the specific currency “c.”

54.2 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.

55. Retention

55.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the **PCC** until Completion of the whole of the Works.

55.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 69.1 [Completion], 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. The Contractor may substitute retention money with an “on demand” bank guarantee.

56. Liquidated Damages

56.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the **PCC** 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 **PCC**. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor’s liabilities.

56.2 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 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 50.1 [Payments].

57. Bonus

57.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the **PCC** 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.

58. Advance Payment

58.1 The Employer shall make advance payment to the Contractor of the amounts stated in the **PCC** by the date stated in the **PCC**, against provision by the Contractor of an unconditional bank guarantee in a form and by a bank acceptable to the Employer in amounts and currencies

¹ 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 formulas for all currencies, since coefficient A_c , for the nonadjustable portion of the payments, is a very approximate figure (usually 0.10 ~ 0.20) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency is added to the Contract Price.

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.

58.2 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.

58.3 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.

59. Securities

59.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the **PCC**, by a bank acceptable to the Employer, 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 from the date of issue of the Certificate of Completion in the case of a bank guarantee.

60. Dayworks

60.1 If applicable, the Dayworks 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.

60.2 All work to be paid for as Dayworks 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 2 days of the work being done.

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

61. Cost of Repairs

61.1 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.

F. Force Majeure

62. Definition of Force Majeure

62.1 In this Clause, "Force Majeure" means an exceptional event or circumstance,

- (a) which is beyond a Party's control;
- (b) which such Party could not reasonably have provided against before entering into the Contract;

- (c) which, having arisen, such Party could not reasonably have avoided or overcome; and
- (d) which is not substantially attributable to the other Party.

62.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies;
- (b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war;
- (c) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel;
- (d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity; and
- (e) natural catastrophes such as earthquake, hurricane, typhoon, or volcanic activity.

63. Notice of Force Majeure

63.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

63.2 The Party shall, having given notice, be excused from performance of its obligations for so long as such Force Majeure prevents it from performing them.

63.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

64. Duty to Minimize Delay

64.1 Each Party shall at all times use all reasonable endeavours to minimize any delay in the performance of the Contract as a result of Force Majeure.

64.2 A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

65. Consequences of Force Majeure

65.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC Subclause 30.1 [Procedure for Disputes] to

- (a) an extension of time for any such delay, if completion is or will be delayed, under GCC Subclause 36 [Extension of the Intended Completion Date]; and
- (b) if the event or circumstance is of the kind described in subparagraphs (a) to (d) of GCC Subclause 62.2 [Definition of Force Majeure] and, in the case of subparagraphs (b) to (d), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC Subclause 19 [Insurance].

65.2 After receiving this notice, the Project Manager shall proceed in accordance with GCC Subclause 10 [Project Manager's Decisions] to agree or determine these matters.

66. Force Majeure Affecting Subcontractor

66.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader Force Majeure events or circumstances shall not excuse the Contractor's nonperformance or entitle him to relief under this Clause.

67. Optional Termination, Payment and Release

67.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with GCC Subclause 73.5 [Termination].

67.2 Upon such termination, the Project Manager shall determine the value of the work done and issue a Payment Certificate, which shall include

- (a) the amounts payable for any work carried out for which a price is stated in the Contract;
- (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;
- (c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;
- (d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and
- (e) the Cost of repatriation of the Contractor's staff and labor employed wholly in connection with the Works at the date of termination.

68. Release from Performance

- 68.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises, which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance,
- (a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract; and
 - (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under GCC Subclause 67 [Optional Termination, Payment and Release] if the Contract had been terminated under GCC Subclause 67.

G. Finishing the Contract**69. Completion**

- 69.1 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.

70. Taking Over

- 70.1 The Employer shall take over the Site and the Works within 7 days of the Project Manager's issuing a certificate of Completion.

71. Final Account

- 71.1 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.

72. Operating and Maintenance Manuals

- 72.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the **PCC**.
- 72.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the **PCC** pursuant to GCC 72.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount stated in the **PCC** from payments due to the Contractor.

73. Termination

- 73.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.
- 73.2 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 Employer 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 Employer 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 Project Manager gives two consecutive Notices to update the Program and accelerate the works to ensure compliance with GCC Subclause 22.1 [The Works to Be Completed by the Intended Completion Date] and the Contractor fails to update the Program and demonstrate acceleration of the works within a reasonable period of time determined by the Project Manager;
- (g) the Contractor does not maintain a Security, which is required;
- (h) 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 **PCC**; and
- (i) if the Contractor, in the judgment of the Employer has engaged in integrity violations in competing for or in executing the Contract, pursuant to GCC 74.1 [Fraud and Corruption].

73.3 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 73.2 above, the Project Manager shall decide whether the breach is fundamental or not.

73.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

73.5 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.

74. Fraud and Corruption

74.1 If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, or other integrity violations, including the failure to disclose any required information which constitutes a fraudulent practice, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 73 {Termination} shall apply as if such termination had been made under Sub-Clause 73.2 (i).

74.2 ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders,

Suppliers, Contractors, agents, subcontractors, subconsultants, service providers, subsuppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, the ADB

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
- (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
 - (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
 - (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
 - (v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;
 - (vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and
 - (vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.
- (b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

- (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;
- (d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate² in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and
- (e) will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, to permit ADB or its representative to inspect the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

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

- (a) being available to be interviewed and replying fully and truthfully to all questions asked;
- (b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;
- (c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;
- (d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic

² Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

- (e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and
- (f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

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

74.5 The Contractor undertakes that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the bid, have been given or received in connection with the procurement process or in the contract execution.³

75. Payment upon Termination

75.1 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 **PCC**. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

75.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, 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.

76. Property

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

77. Release from Performance

77.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer 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

³ The undertaking also applies during the period of performance of the contract

before receiving it and for any work carried out afterward to which a commitment was made.

78. Suspension of ADB Loan or Credit

78.1 In the event that ADB suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made,

- (a) the Employer is obligated to notify the Contractor, with copy to the Project Manager, of such suspension within 7 days of having received ADB's suspension notice.
- (b) if the Contractor has not received sums due it within the 28 days for payment provided for in GCC 50.1 [Payments], the Contractor may immediately issue a 14-day termination notice.

79. Eligibility

79.1 The Contractor shall have the nationality of an eligible country as specified in Section 5 (Eligible Countries) of the bidding document. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

79.2 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as specified in Section 5 (Eligible Countries) of the bidding document and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment, and services.

79.3 For purposes of GCC 79.2, "origin" means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

Section 8: Particular Conditions of Contract

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

A. General	
GCC 1.1 (d)	The financing institutions is: Asian Development Bank (ADB)
GCC 1.1 (r)	The Employer is: Ministry of Public Works, Infrastructure and Utilities
GCC 1.1 (w)	The Intended Completion Date for the whole of the Works shall be: <i>21 months from the Start Date;</i>
GCC 1.1 (cc)	The Project Manager is: James F. Myazoe, Jr.
GCC 1.1 (ff)	The site for execution of works related to contract <i>package W2: Closure of Ebeye Existing Open Dump Site and Construction of New Ebeye Sanitary Landfill</i> is located at Ebeye Island and is defined in the Landfill drawings;
GCC 1.1 (ii)	The Start Date shall be: <i>the date of Possession of the Site given to the Contractor under Sub-clause 26.1</i>
GCC 1.1 (mm)	The Works consist of: : <i>Closure of Ebeye Existing Open Dump Site and Construction of New Ebeye Sanitary Landfill that includes civil works, electrical and mechanical works, amenities, leachate collection and handling system, passive methane venting system, access road, stormwater drainage system, prefabricated administrative and maintenance building, and new weighbridge. The Works may include a diesel fueling system and a seawater fire pumping station, which are identified as Additive Items in the Bill of Quantities and subject to inclusion at the Employer's discretion.</i> <i>The contractor shall be responsible to deliver the works covered as stated in the "Letter of Acceptance".</i>
GCC 2.2	Sectional Completions are: <i>Not Applicable</i>
GCC 2.3 (j)	The following documents also form part of the Contract: <ul style="list-style-type: none"> • <i>Initial Environmental Assessment/ Environmental Impact Assessment Report</i> • <i>Gender Analysis and Gender Action Plan</i> • <i>Climate Risk and Vulnerability Assessment Report</i>
GCC 3.1	The language of the contract is: <i>English</i> The law that applies to the Contract is the law of: Republic of the Marshall Islands
GCC 11.1	The Project Manager <i>may delegate</i> any of his duties and responsibilities.
GCC 14.1	Schedule of other contractors: <i>Not Applicable</i>

GCC 19.1	<p>The minimum insurance amounts and deductibles shall be:</p> <p>(a) for loss or damage to the Works, Plant and Materials: <i>1.1 times Accepted Contract Amount</i></p> <p>(b) for loss or damage to Equipment: <i>United State Dollar 100,000</i></p> <p>(c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract: <i>United State Dollar 100,000</i></p> <p>(d) for personal injury or death:</p> <p>(i) of the Contractor's employees: <i>As per applicable Law</i></p> <p>(ii) of other people: <i>United State Dollar 100,000</i></p>
GCC 20.1	<p>Site Investigation Reports are:</p> <ol style="list-style-type: none"> 1. <i>Topographic Survey and</i> 2. <i>Soil Investigation Report</i>
GCC 23.1	<p>The following shall be designed by the Contractor:</p> <ul style="list-style-type: none"> • <i>Prefabricated administrative and maintenance building</i> • <i>Leachate submersible pumping station.</i> • <i>Diesel fueling system</i> • <i>Seawater fire pumping station.</i>
GCC 26.1	<p>The Site Possession Date(s) shall be: <i>within 7 days after the signing the Contract</i></p>
GCC 29.1	<p>Appointing Authority for the Adjudicator: <i>to be decided during contract negotiations.</i></p>
GCC 30.3	<p>The Adjudicator shall be paid by the hour at the rate of: <i>to be decided during contract negotiations.</i></p>
GCC 30.4	<p>Institution whose arbitration procedures shall be used:</p> <p>(a) Contracts with foreign contractors:</p> <p>International arbitration shall be conducted in accordance with UNCITRAL rules of arbitration.</p> <p>The dispute shall be settled by an Arbitration Panel comprising of three Arbitrators,</p> <p>Each party will appoint their own arbitrator, and the third arbitrator (the Chairperson) shall be appointed by the Parties' arbitrators with mutual consent, failing which, by the Central Implementation Unit (CIU).</p> <p>Arbitration proceedings shall be conducted in RMI.</p> <p>The arbitration proceedings shall be conducted in the English language.</p> <p>The decision of the majority of arbitrators shall be final and binding upon both parties.</p>

	<p>The expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself. However, the fees and expenses paid to the presiding Arbitrators shall be equally shared between the parties.</p> <p>(b) Contracts with domestic contractors:</p> <p>Arbitration shall be conducted in accordance with the laws of the Employer's country.</p>
<p>GCC 34.2</p>	<p>The following sentence shall apply:</p> <p>Respectful Work Environment</p> <p>The Contractor shall ensure that its employees and Subcontractors observe the highest ethical standards and refrain from any form of bullying, discrimination, misconduct and harassment, including sexual harassment and shall, at all times, behave in a manner that creates an environment free of unethical behavior, bullying, misconduct and harassment, including sexual harassment. The Contractor shall take appropriate action against any employees or Subcontractors, including suspension or termination of employment or sub-contract, if any form of unethical or inappropriate behavior is identified.</p> <p>The Contractor shall conduct training programs for its employees and Subcontractors to raise awareness on and prevent any form of bullying, discrimination, misconduct and harassment including sexual harassment, and to promote a respectful work environment. The Contractor shall keep an up to date record of its employees and Subcontractors who have attended and completed such training programs and provide such records to the Employer or the Engineer at their first written request.</p>

<p>C. Time Control</p>	
<p>GCC 35.1</p>	<p>The Contractor shall submit for approval a Program for the Works within <i>14 days</i> from the date of the Letter of Acceptance.</p>
<p>GCC 35.3</p>	<p>The period between Program updates is <i>45 days</i>. The amount to be withheld for late submission of an updated Program is <i>United State Dollar USD 20,000</i>.</p>
<p>D. Quality Control</p>	
<p>GCC 43.1</p>	<p>The Defects Liability Period is: <i>365 days</i>.</p>
<p>E. Cost Control</p>	
<p>GCC 45.3</p>	<p>Additive Items. Items identified in the Bill of Quantities as "Additive Items" are not included in the Base Bid for purposes of bid evaluation. The Employer may, at its</p>

	<p>discretion and subject to availability of funds, instruct the Contractor to execute any or all Additive Items at the unit rates and prices included in the Bill of Quantities.</p> <p>The inclusion of Additive Items may occur at the time of contract award or at any time during contract execution, and shall be treated as a Variation in accordance with GCC Clause 47.</p>
GCC 53.1	The currency of the Employer's country is: <i>United States Dollars</i>
GCC 54.1	<p>Replace the Clause 54.1 in its entirety with:</p> <p>"Prices shall be adjusted for fluctuations in the cost of inputs only after 18 months from the Start date.</p> <p>The amounts which relates to the activities performed after 18 months from Start date certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the price adjustment factor to the payment amounts:</p> $P = A + B \frac{I_M}{I_0}$ <p>where:</p> <p>P is the adjustment factor for the portion of the Contract Price</p> <p>A and B are coefficients¹ specified in the Table of Adjustment Data representing the nonadjustable and adjustable portions of the Contract Price</p> <p>I_M is a consolidated index prevailing at the end of the month being invoiced and I₀ is the same consolidated index prevailing on the day 18 months after the Start date.</p> <p>The coefficients and indexes for adjustment of prices shall be as specified in the Table of Adjustment Data submitted together with the Letter of Bid."</p>
GCC 55.1	The proportion of payments retained is: 5%
GCC 56.1	<p>The liquidated damages for the whole of the Works are 0.05% per day.</p> <p>The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price.</p>
GCC 57.1	Not Applicable.
GCC 58.1	The Advance Payments shall be <i>10% of the Accepted Contract Amount</i> and shall be paid to the Contractor no later than <i>28 days of the receipt by the Employer of an acceptable unconditional bank guarantee</i> .
GCC 58.3	Repayment of the Advance Payments shall be: <i>at a rate of 15%</i> from each payment certificate.
GCC 59.1	The Performance Security amount is 10% of the Contract price.

¹ The sum of the two coefficients A and B should be 1 (one) in the formula. Since coefficient A, for the nonadjustable portion of the payments, is a very approximate figure (0.20) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments is added to the Contract Price.

G. Finishing the Contract	
GCC 69.1	Add the following at the end of the Sub-clause 69.1 <i>“The Employer’s approval of the operating and maintenance manuals and the as built drawings shall be the pre-requisite for the Project Manager to issue a certificate of completion of the works.”</i>
GCC 72.1	The date by which “operating and maintenance manuals” are required is no later the Contractor’s request to the Project Manager for issuance of the Completion certificate for the Works under GCC 69.1 The date by which “as built” drawings are required is no later the Contractor’s request to the Project Manager for issuance of the Completion certificate for the Works under GCC 69.1
GCC 72.2	The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in GCC 72.1 is <i>USD 50,000</i>
GCC 73.2 (h)	The maximum number of days is: <i>200 days</i>
GCC 75.1	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is <i>25%</i>

Section 9: Contract Forms

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Notice of Intention for Award of Contract

[on letterhead paper of the Employer]

[date of notification]

To: [name of the Bidder]
 Attention: [insert name of the Bidder's authorized representative]
 Address: [insert address of the Bidder's authorized representative]
 Telephone/Fax numbers: [insert telephone/fax numbers of the Bidder's authorized representative]
 E-mail Address: [insert e-mail address of the Bidder's authorized representative]

This is to notify you of our intention to award the contract [insert name of the contract and identification number, as given in the Bid Data Sheet]. You have [insert number of days as specified in ITB 41.1 of the BDS] days from the date of this notification to (i) request for a debriefing in relation to the evaluation of your Bid; and/or (ii) submit a bidding-related complaint in relation to the intention for award of contract, in accordance with the procedures specified in ITB 46.1.

The summary of the evaluation are as follows:

1. List of Bidders

Name of Bidder	Bid Price as Read Out at Opening	Evaluated Bid Price

2. Reason/s Why Your Bid Was Unsuccessful

.....

3. The Successful Bidder

Name of Bidder:	
Address:	
Accepted Contract Amount:	
Duration of Contract:	
Scope of the Contract Awarded:	
Amount Performance Security Required:	

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Letter of Acceptance

[on letterhead paper of the Employer]

[date]

To: [Name and address of the contractor]

Subject: Contract No. [please specify]

This is to notify you that your Bid dated [date] for execution of the [name of the contract and identification number, as given in the Bid Data Sheet] for the Accepted Contract Amount of the equivalent of [amount in words and figures and name of currency], representing the Base Bid only and excluding Additive Items as identified in the Bill of Quantities, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract and any additional security required as a result of the evaluation of your bid, using for that purpose the Performance Security Form included in Section 9 (Contract Forms) of the Bidding Document.

[Choose one of the following statements:]

We accept that [insert the name of adjudicator proposed by the Bidder] be appointed as the Adjudicator.

[or]

We do not accept that [insert the name of the adjudicator proposed by the Bidder] be appointed as the Adjudicator, and by sending a copy of this Letter of Acceptance to [insert name of the appointing authority], the Appointing Authority, we are hereby requesting such Authority to appoint the Adjudicator in accordance with GCC 29.1.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the [date] day of [month], [year], between [name of the Employer] (hereinafter "the Employer"), of the one part, and [name of the contractor] (hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as [name of the contract] should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (a) Letter of Acceptance,
 - (b) Letters of Technical Bid and Price Bid,
 - (c) Addenda Nos. [addenda number(s) to be inserted later, if any]
 - (d) Particular Conditions of Contract,
 - (e) List of Eligible Countries that was specified in Section 5 of the bidding document,
 - (f) General Conditions of Contract,
 - (g) Specifications,
 - (h) Drawings,
 - (i) Completed Activity Schedules or Bill of Quantities (The Bill of Quantities includes items identified as "Additive Items," which are excluded from the evaluated bid price and may be included in the Contract at the discretion of the Employer in accordance with the Contract),
 - (j) Table of Adjustment Data, and
 - (k) any other documents shall be added here: None
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of [name of the borrowing country] on the day, month and year indicated above.

Signed by
by.....
for and on behalf of the Employer

Signed
for and on behalf the Contractor

in the presence of:

in the presence of:

Witness, Name, Signature, Address, Date

Witness, Name, Signature, Address, Date

Performance Security

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

Beneficiary: [Name and address of the Employer]

Date:

Performance Guarantee No.:

We have been informed that [name of the contractor] (hereinafter called "the Contractor") has entered into Contract No. [reference number of the contract] dated [date] with you, for the execution of [name of contract and brief description of works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we [name of the bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [name of the currency and amount in words]¹ [amount in figures] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the [date] day of [month], [year]², and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

.....
[Signature(s) and seal of bank (where appropriate)]

- Note to Bidder -

If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.

¹ The guarantor shall insert an amount representing the percentage of the contract price specified in the contract and denominated either in the currency(ies) of the contract or in any freely convertible currency acceptable to the Employer. If the bank issuing the performance security is located outside the country of the employer, it shall have a correspondent financial institution located in the country of the Employer.
² Insert the date 28 days after the defect liability period. The Employer should note that in the event of an extension of the time for completion of the contract, the employer would need to request an extension of this guarantee from the guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [6 months][1 year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

Advance Payment Security

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

Beneficiary: [Name and address of the Employer]
Date:
Advance Payment Guarantee No.:

We have been informed that [name of the contractor] (hereinafter called "the Contractor") has entered into Contract No. [reference number of the contract] dated [date] with you, for the execution of [name of contract and brief description of works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum [name of the currency and amount in words]¹ [amount in figures] is to be made against an advance payment guarantee.

At the request of the Contractor, we [name of the bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [name of the currency and amount in words]² [amount in figures] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor:

- (a) used the advance payment for purposes other than the costs of mobilization and cash flow support in respect of the Works; or
- (b) has failed to repay the advance payment when it has become due and payable in accordance with the conditions of the Contract, specifying the amount payable by the Contractor.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number [contractor's account number] at [name and address of the bank].

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty percent (80%) of the Contract Price has been certified for payment, or on the [date] day of [month], [year]³, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

.....
[Signature(s) and seal of bank (where appropriate)]

-- Note to Bidder --

¹ The guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the Contract, or in any freely convertible currency acceptable to the Employer.
² Footnote 1.
³ Insert the expected expiration date of the time for completion. The Employer should note that in the event of an extension of the time for completion of the contract, the Employer would need to request an extension of this guarantee from the guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [6 months] [1 year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

If the bank issuing advance payment security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.