



GOVERNMENT OF BERMUDA

Ministry of Public Works

Works and Engineering

Instructions to Bidders
Project No. 61-56-75
Repair of Pilot's Staging Dock - Ballast Point Road, St
David's

Repair of Pilot's Staging Dock Ballast Point Road

Instructions to Bidders

Date: July 10, 2017

Project No. 61-56-75



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Part 1 GENERAL

1.1 Public Access To Information

- .1 Any information collected or used by or on behalf of the Government of Bermuda ("Government") under this solicitation document is subject to the Public Access to Information Act 2010 ("Act").
- .2 The information belongs to a class of information that might be made available to the general public under the Act.
- .3 The person who gives information to the Government in response to this solicitation document consents to the collection and use of the information and waives any right to challenge any decision made by the Government to disclose the information.
- .4 Any questions regarding the collection, use, or disclosure of the information should be directed to the public authority that issued this solicitation document.

1.2 Time

- .1 The Tenders submission must be delivered no later than Monday August 14, 2017 at 3:00 pm AST.
- .2 Late submission will not be considered.
- .3 The Key dates for the Procurement Process are as follows:

Activity	Date
Request for Tenders issued	July 10, 2017
Deadline for Written Clarifications and Questions from Bidders (Clause 2.2.2)	August 7, 2017
Government responding and issuing Q and A, Addenda (if applicable) (Clause 2.2.3)	August 9, 2017
Deadline for Tenders Submissions (Clause 1.2.1)	August 14, 2017, 3:00 PM AST time
Evaluation of Tenders (Part 5)	August 15, 2017 to August 17, 2017
Contract Award (Part 6)	August 17, 2017 (estimated)
Completion of Work by successful bidder	September 31, 2017 (estimated)

- .4 The Government may change the timeline for the Procurement Process without prior notice, and will notify bidders in writing promptly of any change by addenda, that will be posted on www.gov.bm procurement notices website.

1.3 Brief Description of Scope of Works



- .1 The Government of Bermuda, Ministry of Public Works, Works and Engineering (the Government) requests experienced Contractors for the Ballast Point Road, St David's – Repairs to Pilot's Staging Dock as outlined in the Scope of Work (drawing S-1).

1.4 Eligibility and Qualifications Requirements

- .1 This opportunity is open to suitably experienced Contractors who can clearly demonstrate previous experience with this type of work.
- .2 The Certificate of Confirmation of Non-Collusion is a mandatory requirement from all bidders. Any forms of agreement submitted which do not include a signed copy of this Certificate will be wholly rejected and will not be included in the evaluation process.
- .3 If it is later found that the undertakings made below have been breached at any stage of the process, the Contractors will be expelled from the process immediately. In the event that this is discovered after a contract award, legal action may be taken against the Contractors and/or any party involved in the matter. False submissions may also exclude the bidder, and any other person or company involved in collusion, from involvement in future contracts with the Government of Bermuda.
- .4 All corporate tenderers must include, with their tenders, a copy of the company's Certificate of Incorporation as evidence of the fact that the company is an existing registered company at the date of tender. Failure to provide the certificate of incorporation will render the tender void.
- .5 Tenders submitted by a joint venture of two or more firms as partners shall comply with the following requirements:
- .6 The Tender, and in the case of a successful Tenderer, the Form of Agreement shall be signed so as to be legally binding on all partners;
- .7 One of the partners shall be nominated as being in charge; and this authorisation shall be evidenced by submitting a power of attorney signed by legally authorised signatories of all the partners;
- .8 The partner in charge shall be authorised to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture, and the entire execution of the Contract including payment shall be done exclusively with the partner in charge;
- .9 All partners of the joint venture shall be liable, jointly and severally, for the execution of the Contract in accordance with the Contract terms and a relevant statement to this effect shall be included in the authorisation mentioned under .2 above as well as in the Form of Tender and the Form of Agreement (in the case of a successful Tenderer); and
- .10 A copy of the Agreement entered into, by the joint venture partners, shall be submitted with the Tender.

1.5 Cost of Tendering



- .1 The Bidder shall bear all costs associated with the preparation and submission of his Tender and the Government will in no case be responsible or liable for these costs, regardless of the outcome of the Tendering process.

1.6 Site Inspections

- .1 Prior to the tender closing, it is strongly suggested that the Bidder visit and inspect the site and surrounding areas where the works is to be performed.
- .2 The Bidder shall be deemed to have satisfied themselves as to the form and nature of the site, the quantities and nature of the works and materials necessary for the completion of the works, and in general to have obtained all necessary information as to the risks, contingencies and other circumstances which may influence or affect his Tender.
- .3 Bidders will be granted permission by the Government, upon application, to enter upon the site of the works for the purpose of inspection but only upon the express condition that such person will release and indemnify the Government from and against all liability in respect of personal injury, loss of or damage to property and any other loss.
- .4 Bidders shall make their own assessment of existing facilities, conditions and difficulties which will attend the execution of the works called for by the proposed contract; including local conditions, constraints due to maintenance of traffic, labour conditions, uncertainty of weather, difficulties with access, and all other reasonable contingencies. Bidders shall satisfy themselves by personal examination of the site of the proposed Works and by such other means as they choose as to actual conditions and requirements, and as to the quantities required.
- .5 The Bidder shall make and will be deemed to have made the fullest inquiries in Bermuda as to the availability of skilled and unskilled labour which he may require in the execution of the Contract and shall employ, to the extent practicable and reasonable, staff and labour from sources within Bermuda.
- .6 No subsequent claim will be allowed or considered for any work that may be required for the proper execution and completion of the Works, due to failure by the Contractors to examine the site and make proper allowances for the conditions to be encountered.

Part 2 TENDER DOCUMENTS

2.1 Content of the Tender Documents

- .1 The set of solicitation documents issued for the purpose of Tendering includes the following documents, together with any Addenda thereto issued in accordance with Clause 2.3.



- .1 Letter of Invitation
- .2 Instructions to Bidders
- .3 Annex A – Form of Tender
- .4 Annex B – Specifications
- .5 Annex C – Drawings
- .6 Annex D – FIDIC Short Form of Contract (Green) and Contract Particular Conditions.

- .2 The bidder is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the Tender documents. Failure to comply with the requirements of the Tender submission will be at the bidder's own risk.

2.2 Clarification of Tender Documents

- .1 A prospective bidder requiring any clarification of the tender documents shall notify the Government in writing, by email or by facsimile at the Government's address indicated below.
- .2 The Government will respond in writing by email or by facsimile to any request for clarification which they receive earlier than **7 calendar days** prior to the deadline for the submission of Tenders.
- .3 Written copies of the Government's response, where necessary (including a description of the inquiry but without identifying its source), will be sent to all prospective bidders who have provided contact details and posted on www.gov.bm procurement notice site.
- .4 No questions will be answered if received earlier than **3 calendar days** prior to the deadline for the submission of Tenders.

2.3 Amendment of Tender Documents

- .1 At any time prior to the deadline for submission of Tenders, the Government may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Tender documents by the issuance of an Addendum.
- .2 The Addendum will be posted on the www.gov.bm procurement notice site.
- .3 In order to afford prospective bidders reasonable time in which to take an Addendum into account in preparing their Tenders, the Government may, in its sole discretion, extend the deadline for the submission of Tenders in accordance with Clause 4.2.

Part 3 PREPARATION OF TENDER RESPONSE



3.1 Language of the Tender

- .1 The Tender prepared by the Bidder and all correspondence and documents relating to the Tender shall be written in the English language.

3.2 Documents Comprising the Tender

- .1 The following items shall be included in your Tenders, as a minimum. Additional supporting items may be included.
 - .1 Form of Tender
 - .2 Confirmation of Addenda Received
 - .3 Company Information, including Copy of Certificate of Incorporation
 - .4 Information on Eligibility and Qualifications as set out in Clause 1.3 of firms and personnel for Works and Services
 - .5 Fixed Price Schedule
 - .6 Unit Rate Price Schedule
 - .7 Method Statement
 - .8 Health and Safety Plan
 - .9 Project Schedule
 - .1 Provide a schedule of planned work activities, including milestones.
 - .2 Indicate proposed Commencement Date and Time for Completion.
 - .10 Proposed Equipment List for the works as stated.
 - .11 Certificate of Confirmation of Non-Collusion
 - .12 Any other materials required to be completed and submitted in accordance with the instructions to bidders embodied in the tender document.
 - .13 The Bidder shall use the forms found in *Annex B: Form of Tender*, for their submission, without exception.
 - .14 One copy of the above is to be returned in accordance with Clause 4.1.
 - .15 **Insurance** The Tenderer shall submit evidence with its Tender, such as a copy of a certificate or a letter from its insurers, confirming Third Party Insurance has been retained for the amount shown in the Appendix to the Agreement and for the duration of the Works.



3.3 Tender Prices

- .1 The Bidder shall provide a detailed schedule of values supporting the proposed **Lump Sum Price** for the Scope of Works.
- .2 Items against which no price is entered by the Bidder will not be paid for by the Government when executed and shall be deemed covered by the other **lump sum prices** in the Form of Tender.
- .3 The lump sum price shall include all labour, materials, equipment, tools, and expenses necessary to perform the Scope of Works. Include overhead and profit in the rates and prices listed. The price shall include, indicate separately, the cost of any work permits, and taxes.
- .4 All duties, taxes and other levies payable by the Contractors under the Contract, or for any other cause, as of the closing date for submission of Tender, shall be included in the rates and prices and total Tender.
- .5 Include an estimated schedule for progress payments, if any.
- .6 If this solicitation is amended, all terms and conditions that are not amended remain unchanged.
- .7 Unless stated otherwise in the Tender documents, the Contract shall be for the specific works as detailed in the tender documents and based on the completed Form of Tender.

3.4 Currencies of Tender

- .1 The fixed rates shall be quoted in Bermuda dollars.
- .2 Other currencies are available for payments and the exchange rate will be set to correspond with the date and time of tender closing.

3.5 Period of Tender Validity

- .1 All prices offered shall remain firm for one hundred and twenty (120) calendar days from the deadline for Tenders noted in the Letter of Invitation, unless the deadline is modified by an amendment to this solicitation.
- .2 In exceptional circumstances, prior to expiry of the original Tender validity period, the Government may request that the Tender validity period be extended. The request and the responses thereto shall be made in writing by email or by facsimile. A Bidder may refuse the request and withdraw his Tender. A Bidder agreeing to the request will not be required nor permitted to modify his Tender.
- .3 This validity period shall apply to all Tenders received regardless of whether a different validity period is specifically stated within a Tender.

3.6 Format and Signing of Tenders



- .1 The Bidder shall prepare one original set of the documents comprising the Tender as described in Clause 3.2 of these Instructions to Bidders.
- .2 The Tender shall be typed or written in indelible ink and shall be signed by a person or persons duly authorised to bind the Bidder to the Contract. All pages of the Tender where entries or amendments have been made shall be initialled by the person or persons signing the Tender.
- .3 The completed Tender shall be without alterations, interlineations or erasures, except those to accord with instructions issued by the Government, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialled by the person or persons signing the Tender.
- .4 Only one Tender may be submitted by each Bidder. No Bidder may participate in the Tender of another for the same Contract in any relation whatsoever.

3.7 Safety and Health

- .1 All works must be carried out in strict accordance with the Bermuda Occupational Safety and Health Act, 1982 and the Occupational Safety and Health Regulations of 2009.

3.8 Alcohol, Smoke and Drug-Free Policy

- .1 All Government buildings and work sites are designated as alcohol, smoke and drug-free.

3.9 Confidentiality Agreement:

- .1 The selected firm and key individuals may be required to sign a project confidentiality agreement limiting information that may be discussed outside the team.

Part 4 SUBMISSION OF TENDER

4.1 Submission of Tender

- .1 The sealed tender package shall be deposited in the Tender Box located at:
Ministry of Public Works
Department of Works and Engineering
3rd Floor, Post Office Building
56 Church Street
Hamilton HM 12, Bermuda
- .2 The following information shall be written on the outside of the tender envelope:

Tender Submission
Do Not Open Before 3:00 p.m., August 14th 2017
Repairs of Pilot's Staging Dock - Ballast Point Road, St David's
Attention: Mr. Jeremy Burnham



- .3 If the envelope is not sealed and marked as instructed above, the Ministry will assume no responsibility for the misplacement or premature opening of the proposal submitted.
- .4 A tender opened prematurely for this cause will be rejected by the Ministry and returned to the bidder.
- .5 Tenders may be withdrawn at any time by written notice only provided such notice is received at the office of the Ministry prior to the date/time set as the closing time for receiving Tenders.

4.2 Deadline Extension for Submission of Tenders

- .1 The Government may, at its discretion, extend the deadline for submission of Tender by issuing an amendment in which case all rights and obligations of the Government and the Bidders previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

4.3 Late Tenders

- .1 Any Tender received by the Government after the deadline for submission of Tenders will be rejected and considered as nonresponsive.

4.4 Modifications and Withdrawal of Tenders

- .1 The Bidder may modify or withdraw his Tender after Tender submission, provided that the modification or notice of withdrawal is received in writing by the Government prior to the prescribed deadline for submission of Tenders.
- .2 The Bidder's modification or notice of withdrawal shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause 4.1 for the Submission of Tenders with the envelope additionally marked "MODIFICATION" or "WITHDRAWAL" as appropriate. For a modification it shall also be accompanied by an additional Non-collusion certificate.
- .3 Subject to Clause 4.4, no Tender shall be modified subsequent to the deadline for submission of Tenders.

Part 5 TENDER OPENING AND EVALUATION

5.1 Tender Opening

- .1 The Government will examine the Tenders to determine whether they are complete, whether the documents have been properly signed and whether the Tenders are generally in order. Tenders for which an acceptable notice of withdrawal has been submitted pursuant to Clause 4.4 shall not be opened.
- .2 The tender opening will be held in public.
- .3 The tender opening will be recorded with the bidders' names and tender prices.



5.2 Process to be Confidential

- .1 Information relating to the examination, clarification, evaluation and comparison of Tenders and recommendations concerning any award of contract shall not be disclosed to Bidders or other persons not officially concerned with such process.
- .2 Any effort by a Bidder to influence the Government in the process of examination, clarification, evaluation and comparison of Tenders, and in decisions concerning any award of Contract, shall result in the rejection of the Tender.

5.3 Clarification of Tenders

- .1 To assist in the examination, evaluation and comparison of Tenders, the Government may ask Bidders individually for clarification of their Tenders.
- .2 The request for clarification and the response shall be in writing or by facsimile, but no change in the price or substance of the Tender shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Government during the evaluation of the Tenders in accordance with Clause 5.5.2.

5.4 Preliminary Examination – Determination of Responsiveness

- .1 Prior to the detailed evaluation, the Government will determine whether each tender is substantially responsive to the requirement of the tender document.
- .2 For the purpose of this clause, a substantially responsive Tender is one which conforms to all the terms, conditions and specifications of the Tender documents without material deviation or reservation.
- .3 A material deviation or reservation is one which affects or could affect, in any substantial way, the scope, quality, or performance of the Services or which limits, in any substantial way, the Government's rights or the Bidder's obligations under the Contract and rectification of which deviation or reservation would affect unfairly the competitive position of other tenderers presenting substantially responsive tenders..
- .4 A Tender determined as not substantially responsive will be rejected by the Government.

5.5 Correction of Errors

- .1 The Government will examine the responses to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed, and whether the bids are generally in order.
- .2 Arithmetical errors will be rectified on the following basis:
 - .1 Where there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If the Bidder does not accept the correction of



errors, its Bid will be rejected. If there is a discrepancy between words and figures the amount in words will prevail;

- .2 Where there is a discrepancy between the amounts in figures and in words, the amounts in words will govern; and
- .3 Where there is a discrepancy between the individual lump sums and the total amounts derived for the sum of the individual lump sum, the individual lump sum as quoted will govern, and the total amount will be corrected.

5.6 Evaluation and Comparison of Tenders

.1 Review Process

- .1 Each Tender will be reviewed by an evaluation committee to determine if it meets the Tender requirements.
- .2 Failure to meet the requirements for the Request for Tenders may be cause for rejection of the Tender.
- .3 Final selection of a company will be determined following review of all work Tenders, cost Tenders and/or formal oral presentations.
- .4 Tenders price alone will not be the sole determining factor in be selection of the Contractors for this work.
- .5 The Ministry will consider the Tender costs for all Tender items identified herein together with the Bidder's qualifications, references, and understanding of the scope of work to form the basis for its decision on who will be selected.
- .6 The Ministry reserves the right to reject any or all Tenders and to determine which Tender is, in the Ministry's judgment, the most responsive.
- .7 The evaluation committee may, at its sole option, ask for interviews or oral presentations by any Bidder (s) participating in this process (creation of a short list). Attendance at any such interview will be at the Bidder's expense.

.2 Evaluation Criteria

- .1 Tenders will be evaluated to determine the best value offered to the Government of Bermuda based on the following criteria:
 - .2 Phase 1 - Tenders Responsiveness - Pass/Fail
 - .1 Required documentation: Tenders will be reviewed to determine if all required documentation was included with Tender submittal as described in this Request for Tenders.



.2 Each Tender will be reviewed by an evaluation committee to determine if it meets the Tender requirements. Failure to meet the requirements for the Request for Tenders may be cause for rejection of the Tender.

.3 Phase 2 - Tenders Review and Evaluation

.1 The Tenders will be evaluated with the following high level criteria headings and weighting: Quality 60%; Price 30%; Utilisation of Bermudian resources 10%, according to the Tenders Evaluation/Weighting Criteria below.

.2 The evaluation committee may seek written clarification from any or all prospective Contractors in order to better understand and evaluate the Tender.

.4 Phase 3 - Presentations/Oral Interviews

.1 Tenders determined to have scored in the competitive range **may** be invited to present oral presentations for the purpose of introducing key members of the evaluation team, and allowing the Ministry to fully understand the prospective Contractor's ability to meet the evaluation criteria. Oral presentations will not be scored separately. Instead the Ministry may modify Tender scores and resulting rankings based on the oral presentation.

.2 The project manager identified in the Tender must be the lead presenter in the oral presentation. This process may not be used as an opportunity to submit missing documentation or to make substantive revisions to the original Tender.

.5 Phase 4 - Cost Tenders

.1 After the technical and oral presentations, cost Tenders will be evaluated.

5.7 Tender Evaluation/Weighting Criteria

ITEM	EVALUATION CRITERIA	WEIGHTING
1	Mandatory Requirements	
1.1	Form of Tender Completed and signed	Pass/Fail
1.2	Certification of Confirmation of Non-Collusion form signed	Pass/Fail
2	Experience & Capability:	



2.1	Has the bidder provided documentation that clearly demonstrates their understanding of the works and their ability to deliver the requirements of the tender?	/20
2.2	Has the bidder provided documentation that clearly confirms their personnel have the experience and qualifications to performing this type of work?	/10
2.3	Has the bidder provided documentation that clearly demonstrates that the bidder has the availability and capacity to perform the services to meet the schedule described in the tender documents?	/10
2.4	Were the bidder's referees positive about their experience of working with the bidder?	/10
2.5	Has the bidder performed well for the Government in previous projects?	/10
2T	Total Score - Section 1	60%
3	Financial Analysis	
3.1	Tender price (include all costs)	/20
3.2	The bidder is in a stable financial position.	/5
3.3	The bidder has no outstanding Government debt.	/5
3T	Total Score - Section 2	30%
4	Social, Environmental & Economic criteria	
4.1	Percentage of workforce that is Bermudian or has Bermudian status.	/5
4.2	Does the bidder provide documentation or other evidence that they are providing apprenticeships/training positions or that they are willing to offer them?	/5
4T	Total Score - Section 3	10%

The final award recommendation will be based on the highest scoring Tender as determined by total points and rank using criteria and weights as stated above.

Part 6 AWARD OF CONTRACT

6.1 Awarding the Contract

- .1 Subject to Clause 5.6, the Government will award the Contract to the Bidder whose Tender has been determined to be substantially responsive to the Tendering documents and who, in the opinion of the Government, has offered the best overall submission. This may not be the lowest priced tender received.



- .2 The Government may award contracts to multiple Bidders pursuant to this Invitation to Tender. Additionally, a Bidder may be awarded multiple works packages.
- .3 Prior to expiration of the period of the tender validity, the Government shall award a single or multiple contract(s) to the qualified Bidders with the highest total score based on the evaluation method indicated herein.
- .4 The Government does not bind itself to accept the lowest or any proposal and reserves the right to reject any proposal and, and to annul the tendering process and reject all tenders, at any time prior to award of contract, without thereby incurring any liability to the affected tenderer or tenderers, or being under any obligation to inform the affected tenderer or tenderers of the grounds for the Government's action.
- .5 Where multiple works packages are available, the Government does not bind himself to accept the lowest Tender of each package. The Government reserves the right to award the works packages in their entirety to a single Contractor or to separate Contractors.
- .6 The Government may declare the Tendering process void when it is evident that there is a lack of competition or there has been collusion.
- .7 All Tenders may be rejected if substantially higher than the budget.

6.2 Notification of Award

- .1 Prior to the expiration of the period of Tender Validity prescribed in clause 3.5 of these instructions to bidders the Government will notify the successful Bidder by email and/or by registered letter that its Tender has been accepted.
- .2 This letter, hereinafter, and in the Conditions of Contract called "Letter of Acceptance", shall name the sum which the Government will pay to the Contractors in consideration of the execution, completion and maintenance of the Works by the Contractors as prescribed by the Contract, hereinafter, and in the Conditions of Contract, called "the Contract Price".
- .3 The successful tender together with the letter of acceptance will constitute the formation of a binding Contract, unless and until a form agreement is executed.
- .4 The Government will promptly notify the unsuccessful Bidders that their Tenders have been unsuccessful.

6.3 Signing of Contract Agreement

- .1 At the same time that the Government notifies the successful Bidder(s) that that its Tender has been accepted, the Government will send the successful bidder the form of agreement provided in the tendering documents, incorporating all agreement between the parties.



GOVERNMENT OF BERMUDA

Ministry of Public Works

Works and Engineering

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David's

- .2 Within 14 days of receipt of the Form of Agreement, the successful Tenderer shall sign the Form and return it to the Employer.

END OF INSTRUCTIONS TO BIDDERS



Form of Tender

(Note: all sheets form part of the tender)
(To be completed by bidder)

TO: Permanent Secretary, Ministry of Public Works

1. We declare that this tender is made without any connection, comparison of figures or arrangements with or knowledge of any other corporation, firm or person making a tender for the same work and is in all respects fair and without collusion or fraud.
2. We confirm that we have submitted a bona fide tender, intended to be competitive and we have not fixed or adjusted our Price by or under or in accordance with any agreement or arrangement with any other bidder.
3. Having examined the tender documents, the Conditions of Contract, the Site, the Drawings and Specifications, and Addenda Nos. ____ to ____ inclusive for the execution of the above named Project, we, the undersigned, offer to execute and complete the whole of the said works and remedy any defects therein in conformity with the Conditions of Contract, Specifications, Drawings, and Addenda for the lump sum of

_____ (words)

_____ (figures)

Contract Period:calendar weeks
Proposed Start Date: 2017
Proposed Completion Date:2017

Tenders will only be accepted in respect of the entire scope of works and not on individual elements.

4. We acknowledge that the Request for Tenders form is part of our Tender submittal.
5. We undertake, if our Tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to the Tender.
6. We confirm that our Tender shall remain open for acceptance by the Government of Bermuda for a period of one hundred and twenty (120) calendar days from the date of this undertaking and shall not withdraw this Tender during this period.
7. Unless and until a formal Agreement is prepared and executed this Tender, together with your written acceptance thereof, shall constitute a binding contract between us.
8. We understand that you are not bound to accept the lowest or any tender that you may receive.
9. We confirm having received and complied with addenda number _____ to _____ (if any).
10. We confirm that we, the undersigned, are conducting business as a proper legal entity and are not delinquent in making payments for outstanding debts to the Government for Social Insurance



contributions, Payroll Tax or other debt recorded by the Accountant General Debt Collection section.

- 11. Unless and until a formal agreement is prepared and executed, this Tender, together with your written acceptance thereof, shall constitute a binding contract between us.
- 12. We undertake to commence the work within **FOURTEEN (14) calendar days** of the date of the acceptance of this tender.
- 13. We consent to the collection and use of any information we give to the Government in response to this solicitation document and waive any right to challenge any decision made by the Government to disclose the information.

Dated this _____ day of _____, 2017.

SIGNED:

(signature) _____ in the capacity of _____

(block letters) _____

Duly authorized to sign tenders for and on behalf of:

(firm) _____

(address) _____

WITNESS:

(signature) _____ in the capacity of _____

(block letters) _____



Acknowledgement Letter for Standard Form of Agreement between Government & Contractor

This is to certify that I, _____ (name), in the position of _____ hereby acknowledge that I am aware of the terms and conditions of the attached "**Conditions of Contract for the Short Form of Contract, First Edition 1999**", published by the Federation Internationale des Ingenieurs-Conseils (FIDIC)" and as modified by the **Particular Conditions**.

I acknowledge that the following documents have been provided in the Tender Package and at the date of this submission I have no issues with the terms and conditions of this agreement.

1. **Conditions of Contract for the Short Form of Contract, First Edition 1999**, published by the Federation Internationale des Ingenieurs-Conseils (FIDIC).
2. **Conditions of Contract for the Short Form of Contract, First Edition 1999**, published by the Federation Internationale des Ingenieurs-Conseils (FIDIC) as modified by the **Particular Conditions**.

Dated this _____ day of _____, 2017.

SIGNED:

(Signature) _____ in the capacity of _____

(Block letters) _____

Duly authorized to sign tenders for and on behalf of:

(Firm) _____

(Address) _____



Form COP24

CERTIFICATE OF CONFIRMATION OF NON-COLLUSION

Notes for the tenderer/bidder

The essence of Open Tendering is that the Government of Bermuda shall receive bona fide competitive Tenders from all persons tendering. In recognition of this principle, all companies submitting a tender will be required, by way of the signature of the Company Principle, state their agreement to the statements below, which indicates that the tender has been submitted without any form of collusion.

The Certificate of Confirmation of Non-Collusion is a mandatory requirement from all bidders. Any bids submitted which do not include a signed copy of the Certificate will be wholly rejected and will not be included in the evaluation process.

If it is later found that the undertakings made below have been breached at any stage of the process, the bidder will be expelled from the process immediately. In the event that this is discovered after a contract award, legal action may be taken against the bidder and/or any party involved in the matter.

False submissions may also exclude the bidder, and any other person or company involved in collusion, from bidding for future contracts tendered by the Government of Bermuda.

Confirmation of non-collusion

I/We certify that this is a bona fide Tender, intended to be competitive and that I/We have not fixed or adjusted the amount of the Tender or the rates and prices quoted by or under or in accordance with any agreement or arrangement with any other person.

I/We confirm that we have not received any additional information, other than that contained within the tender pack, or supplementary information provided to all bidders.

I/We also certify that I/We have not done and undertake that I/We will not do at any time any of the following acts:

- (a) communicating to a person other than the tender administrator the amount or approximate amount of my/our proposed Tender (other than in confidence in order to obtain quotations necessary for the preparation of the Tender for insurance) or
- (b) entering into any agreement or arrangement with any other person that he shall refrain from tendering or as to the amount of any Tender to be submitted; or
- (c) offering or agreeing to pay or give or paying any sum of money, inducement, gift /hospitality or valuable consideration directly or indirectly to any person in relation to this tender.

Signed

(1) _____ Status _____ Date _____

(2) _____ Status _____ Date _____

for and on behalf of



COMPANY INFORMATION/QUALIFICATIONS AND REFERENCES

Name of Company: _____

THE COMPANY SHALL COMPLETE THE FOLLOWING STATEMENTS:

1. Principal(s) and Director(s) of the Company:

Physical Address:

Email: _____

Website: _____

2. Company Insurance Details:

Workers Compensation Insurance carried: BD\$ _____
Professional Indemnity Insurance carried: BD\$ _____
Commercial Grade Liability Insurance carried: BD\$ _____

3. Company Payroll Tax No.: _____

4. Company Social Insurance No.: _____

5. Company Banking Details:

Name and address of primary bankers:



6. Do you have any involvement with other entities that may be seen as a conflict of interest? If so, please provide details:

1. The Company has been engaged in business, under the present business name for _____ years.

2. Experience in work of a nature similar to that covered in the proposal documents extends over a period of _____ years.

3. The following contracts have been satisfactorily completed in the last three (3) years for the persons, companies or authorities indicated:

	Year	Type of Work	Contract Amount	Location and for Whom Performed
(a)				
(b)				
(c)				

4. The following person may be contacted for information concerning the work listed above (list a reference for each contract named):

	Name	Title	Address	Telephone
(a)				
(b)				
(c)				

5. The following contracts are no longer current but have been satisfactorily completed in the last five (5) years for the persons, companies or authorities indicated:

	Year	Type of Work	Contract Amount	Location and for Whom Performed
(a)				
(b)				
(c)				



GOVERNMENT OF BERMUDA

Ministry of Public Works

Works and Engineering

Form of Tender
Project No. 61-56-75
Repair of Pilot's Staging Dock - Ballast Point Road, St
David's



12.

Total Number of Staff	
Number of Bermudians	
Number of Non-Bermudians	
Percentage of Bermudians	

13. All of the above statements as to experience, financial qualifications are submitted in conjunction with the proposal, as a part thereof and the truthfulness and accuracy of the information is guaranteed by the Company.

14. Attach a copy of the Company's Certificate of Incorporation.

Signed: _____

Print Name: _____

Title: _____

Company: _____

Date: _____



UNIT RATE SCHEDULE

(TO BE COMPLETED BY THE CONTRACTOR)

All prices (in Bermuda dollars) in the schedule are to be inclusive of materials and related accessories, storage, transport, plant and equipment assembly, placement, access, overhead and profit. These rates may be used for determining additions to, and deletions from, the contract sum.

	<u>ITEM</u>	<u>UNIT</u>	<u>RATE</u>
1.0	<u>Labour</u>		
1.1	Unskilled labour	per hour	\$ _____
1.2	Skilled labour	per hour	\$ _____
1.3	Supervisor	per hour	\$ _____
1.4	Welder	per hour	\$ _____
1.5	Project Manager	per hour	\$ _____
2.0	<u>Equipment</u>		
2.1	Barge	per hour	\$ _____
3.0	<u>Other Items not listed above</u>		
3.1	A393 mesh – supplied and installed	per ft	\$ _____
3.2	T20 rebar – supplied and installed	per ft	\$ _____
3.3	T16 rebar – supplied and installed	per ft	\$ _____
3.4	Formwork to soffit	per ft ²	\$ _____
3.5	Formwork to sides	per ft ²	\$ _____

All unit rates above shall be considered fully inclusive of delivery, preparation, placing and finishing. For variations to the contract not covered in the preceding price break down rates or the above schedule of unit rates, the price may be determined on the basis of the base material and installation cost plus ____% for overhead and ____% for profit and applied separately to the base cost.

END OF FORM OF TENDER

Part 1. **GENERAL**

1.1 Scope of Work

- A. Additional specific scope information may be given in bidding requirement documents which shall be read in conjunction with the following:
- B. The work shall be as defined by the drawings and other contract documents which are intended to provide for and comprise everything necessary for the proper and complete execution of the works, in every part, notwithstanding that every item necessary may not be shown on the drawings nor mentioned in the specification.
- C. Work specifically to be excluded will be marked as "not in contract" or a similar designation.

1.2 Intention

- A. The Contractor shall abide by and comply with the true intention and meaning of the drawings and specifications taken as a whole, and shall not perform any work knowing it involves any errors or omissions, should any exist.
- B. Items mentioned in the specification but not shown on the drawings or vice versa, are to be executed as if occurring in both.
- C. Should any error or discrepancy appear or should any doubt exist or dispute arise as to the true intention or meaning of the drawings or of the specifications, or should any portion of be obscure or ambiguous, the Contractor shall apply to the Engineer's Representative who shall provide a correction or explanation thereof.
- D. All written or figured dimensions shall supersede scaled dimensions.

1.3 The Site

- A. The site shall be all the area(s) marked on the site plan, designated for the use of the Contractor, and may temporarily include areas within contract limits off site (e.g. for utility lines) as indicated.
- B. The site is to be maintained throughout the duration of the contract, and debris and waste should not be allowed to accumulate, but should be removed at regular intervals and disposed of in a lawful manner.

1.4 Protection

- A. The Contractor shall take all necessary precautions to adequately protect the site, the works, any existing property, landscaping, features or goods stored on the site, and all property surrounding the site, from damage arising out of the works.

- B. Any damage arising out of the works should immediately be made good by skilled tradesmen under the employment of the Contractor.
- C. Materials and equipment stored on, adjacent to, or offsite, shall be adequately protected from the weather, damage and theft at all times.

1.5 Overtime

- A. Unless it is otherwise stated in bidding requirement documents, the contract is intended to be performed in normal working hours. Any additional work required to meet contract time limits that the Contractor considers necessary, shall be at his own expense, and shall have the prior written approval of the Engineer's Representative.

1.6 Laws, Permits and Regulations

- A. The Contractor shall obtain and pay for all licenses and permits, other than the general Building Control permit, and all fees and charges for connecting outside services. He shall comply with all laws, acts, regulations and code requirements applicable to the work.
- B. The Contractor shall notify the relevant officer prior to the permanent covering up of work.

1.7 Use of Explosives

- A. Except as may be specifically authorized in writing by the Engineer's Representative, the Contractor shall not allow the use of explosives on the site.
- B. When the use of explosives is authorized, the Contractor will be responsible for obtaining any necessary permits from the Police and any other permits necessary.

1.8 Existing Conditions

- A. The Contractor shall cooperate with the occupants of existing buildings to minimize conflict and to facilitate the Owner's use.
- B. The Contractor shall conduct his operations to ensure the least inconvenience to the general public.
- C. Information pertaining to existing conditions has been obtained through investigation and has been gathered with reasonable care, but is not warranted, and may be of a schematic nature. The Contractor is to verify all levels and dimensions on site prior to ordering or construction.
- D. The Contractor shall be alert to any indication of or evidence of existing conditions not indicated on the drawings. If the Contractor encounters unexpected existing site conditions, he shall take all necessary precautions to

minimize damage, and shall notify the Engineer's Representative immediately, including during the bidding period.

1.9 Emergency Arrangements

- A. The Contractor shall, during the period of the Contract, maintain arrangements whereby he can quickly call out labour outside normal working hours for work required to maintain safety to persons or property. The Contractor shall, prior to commencing the works, supply the Engineer's Representative with the name, address and telephone number of a contact who shall be responsible for organising emergency work. Such work shall be put in hand immediately upon the request of the Engineer's Representative.
- B. Claims for additional time or costs for emergency arrangement will be dealt with under the relevant Section of the contract.
- C. Should the Contractor fail to deal with such emergency work as it arises, the Engineer's Representative shall be at liberty to engage others to carry out the work and the Owner may recover the costs attributable thereto from the Contractor.

1.10 Noise and Nuisance

- A. The Contractor shall employ the best practicable means to meet the Public Health Act and the Health and Safety Requirements to minimise the noise and vibration resulting from his operations, and shall have regard to current standards.
- B. The Contractor shall ensure that all vehicles, plant and machinery are fitted with effective exhaust silencers, and are operated to minimise noise emissions.
- C. Only 'sound reduced' compressors or other approved alternatives are to be used. Any pneumatically operated percussion tools shall be fitted with approved mufflers or silencers which shall be kept in good repair.
- D. Any machinery which is in intermittent use shall be shut down in intervening periods of non-use or, where this is impracticable, throttled back to a minimum.

1.11 Burning of Trash

- A. The Contractor shall not burn trash or other material for disposal on or adjacent to the site. All trash and debris shall be removed from site and disposed of lawfully, unless otherwise stated.

1.12 Making Good

- A. The Contractor shall make good all work disturbed to match the existing work, unless directed otherwise by the Engineer's Representative.

**** End of Section ****

Part 1. **GENERAL**

1.1 Definition

- A. A unit price is an amount proposed by the Contractor and stipulated in the Schedule of Rates (If requested) as a price per unit of net measurement for a described item of work
- B. Unit prices shall be inclusive of all necessary costs of materials, labour, equipment, establishment charges, overheads and fees including all insurances, taxes, freight, duties and other miscellaneous charges.
- C. Unit prices are to be for in-place (net) measured quantities and therefore shall include allowances for waste, bulking factors, handling, fixings etc., and shall be for work of a character and quantity envisaged under the contract.

1.2 Use

- A. Only one unit price shall be given for each item required; add/omit rates for the same item will not be entertained.
- B. Unit prices shall be the first option used in valuing variations both additions to, and deductions from, the Contract Sum, by Change Order where the quantities of the work required by the Contract Documents are amended.
- C. Where the nature or character of work differs from that described in a Unit price, the Unit price shall form the basis of the valuation.
- D. Fair rates shall be used for the valuing of variations where Unit prices are not applicable.
- E. Day work or cost / charge shall only be used for valuing variations which are incapable of being measured and priced.
- F. The Contractor's unit prices and other cost information will be treated confidentially and used only for the assessment of tenders and for the administration of the contract should the tender be accepted. Schedules will be returned to unsuccessful bidders if requested.

1.3 Bills of Quantities

Where Bills of Quantities are used, the terms and method of measurement will be defined in the bidding documents

**** End of Section ****

Part 1. **GENERAL**

1.1 Form of Application

- A. As soon as practicable after being notified of selection for the award of the Contract, the Contractor shall furnish in writing to the Engineer's Representative an itemised cost breakdown of the various trades and sections which comprise the contract, totalled to equal the contract sum: this analysis to be used as a basis for Progress Payment applications.
- B. The cost breakdown shall be, and if not objected to by the Engineer's Representative before the first Progress Payment will be deemed to be, a true reflection of the costs (including overhead and fee) to the Contractor of the respective elements in the contract sum.

1.2 Frequency of Application

- A. Payments will be made at the frequency indicated in the Appendix to the Conditions of Contract as indicated on the Bid Form.

1.3 Effect of Progress Certificates

- A. The inclusion of any value against an item in a Progress Payment is not of itself conclusive evidence that any work, materials or goods to which it relates are in accordance with the Contract or Specification.

1.4 Materials or Goods not yet Incorporated into the Works

- A. The Engineer's Representative will only certify payment for materials or goods not yet incorporated into the works that are on or adjacent to the site always provided that the materials or goods are in accordance with the contract, adequately protected from the weather and other casualties, and have not been prematurely delivered to site.
- B. Under exceptional circumstances, payment may be made for materials or goods stored off-site. When this is the case such materials or goods, in addition to other requirements, shall be covered by insurance and properly identified as belonging to the project.
- C. The Contractor shall furnish original suppliers' (except in-house supply) invoices etc. to substantiate material and shipping costs and customs duties, and payments will be net (i.e. excluding overhead and fee).

1.5 Retention

- A. The Owner may deduct and retain, an amount calculated as a percentage (at a rate stated in the Appendix to the Conditions of Contract as indicated on the Bid Form) of the total value of work included for payment under the contract.
- B. Following the issue of the Certificate of Substantial Completion, the retention percentage deductible shall be reduced to a rate stated in the Appendix to the

Conditions of Contract. The reduced rate shall be a minimum dependent on the extent of defective or incomplete work

- C. Substantial Completion means the acceptance by the Owner and the Department of Planning and other regulatory agencies of the works as being suitable for occupation, and the approval by the Owner of the Contractor's written list (known as the deficiencies or punch list) of items to be completed during the Warranty Period.
- D. During the Warranty Period, retention in excess of the minimum will be released to the Contractor on rectification of defects with the balance due released on Final Payment

1.6 Issue of Certificate

- A. The Engineer's Representative shall, within 7 days of receiving an application for payment, issue a certificate to the Owner for such amount as he determines to be properly due, stating in writing to the Contractor his reasons for any amounts withheld.
- B. No progress payment certificate will be issued for a total amount less than BDA\$10,000.00, unless otherwise stated in bidding requirement documents, or as agreed with the Owner.

**** End of Section ****

Part 1. **GENERAL**

1.1 Definition

- A. An alternate is an option during the time of bidding. (For product substitutions during the contract see Section 01631).
- B. An alternate will be stated on the Bid Form (or revised Bid Form if an alternate is approved by addendum) for an amount to be added to or deducted from the base bid which the Owner may choose to accept
- C. An alternate may be either changes to the scope of work, or in products, materials, equipment, systems or installation methods described in the bidding documents.

1.2 Policy

- A. Contractors shall price the specification and scope of work called for by the bidding documents, and shall only price alternates when they are either called for, or added by addendum.
- B. Prices for alternates shall include for changes for other work affected.

1.3 Contractor's Request for an alternate

- A. A written request to submit an alternate may be made by a contractor during the bidding period, a minimum of ten calendar days prior to the date for receipt of bids.
- B. Complete data must be provided with any request, to substantiate compliance with requirements, together with all relevant supporting literature, performance and test data, and samples if applicable.
- C. Any approval to allow the pricing of an alternate will be made by addendum to all contractors, and a revised Bid Form issued.

1.4 Acceptance of an Alternate

- A. Should the Engineer's Representative approve an alternate for use in the contract, the Contractor shall coordinate related work including that of sub-contractors if applicable, and modify or adjust adjacent work as required to ensure that work affected is complete and fully integrated into the project.

Part 1. **GENERAL**

1.1 Records

- A. The Contractor shall maintain all records required by the Contract Documents, including details relating, but not limited to, ground conditions encountered, weather conditions including temperature, relative humidity and precipitation, daily labour return sheets showing the number of operatives (by trade) employed on the site and the activities in which they were engaged, records of visitors to the site and complete accident reports.

1.2 Drawings

- A. During the course of construction, the Contractor shall maintain an accurate record of all deviations and changes between the works indicated on the drawings and the actual construction on site.
- B. Prior to Substantial Completion of the works, the Contractor shall prepare and deliver to the Engineer's Representative, two sets of Record Drawings of all of the work as constructed, including electrical, HVAC and plumbing installations.
- C. Record Drawings shall be provided in the form of one set of negatives and one set of prints. For this purpose, transparencies of the original drawings will be furnished by the Engineer's Representative to the Contractor.
- D. Should the Contractor fail in his obligation to supply such Record Drawings, the Owner shall have the right to employ the Engineer's Representative or any other competent person to produce the said drawings and to recover the costs of such services from the Contractor. (see also Section 01700 Part 1.3)

1.3 Photographs

- A. Before commencement of and during the progress of the works, at intervals not exceeding one month, record photographs shall be taken of such subjects as may be reasonably directed by the Engineer's Representative.
- B. The negatives, and two copies of 811 x 1011 prints shall be handed to the Engineer's Representative, at which point copyright shall be vested in the Owner. Each print shall be marked on the back with the date of exposure and a brief description of the subject.
- C. The Contractor may keep copies of progress photographs for his records, but such copies shall not be used for any purpose whatsoever without the Owner's written consent.

1.4 Conduct

- A. The Contractor shall treat the details of the Contract Documents as confidential, and shall not publish or disclose them in any trade or technical paper or elsewhere without the prior written consent of the Owner.

- B. During the progress of the works the Contractor shall be responsible for the conduct of his workmen, and shall, upon the direction of the Engineer's Representative cease to employ on the works any person who may, in the opinion of the Engineer's Representative, be incompetent or misconduct himself.

1.5 Site Superintendent

- A. The Contractor shall keep up on the site a competent superintendent, and any instructions given to him by the Engineer's Representative or his representatives shall be deemed to have been given to the Contractor.

1.6 Sub-Contractors

- A. All sub-contractors shall be employed by the Contractor upon terms and conditions consistent with those of the General and Supplementary Conditions of Contract for Construction.
- B. The Specification generally avoids delineating responsibility of subtrades (e.g. with regard to builder's work, interface of mechanical and electrical). The Contractor is responsible for all co-ordination and timing of the work of his sub-contractors. The Contractor shall provide all general and special attendances required and shall be responsible for the satisfactory fulfillment of his sub-contracts.
- C. If the Owner has a reasonable objection to any subcontractor proposed by the Contractor, the Contractor shall propose another to whom the Owner has no reasonable objection. If the changing of sub-contractor causes an increase to the bid amount, the increase will only be accepted if the Contractor has acted promptly and responsively, and has provided adequate information for approval.
- D. The Contractor shall only use the sub-contractors listed for the work for which they were proposed and accepted, and shall not change the list without the written approval, of the Engineer's Representative.
- E. Nominated sub-contractors will be dealt with by the provisions of the the Bermuda Supplementary Conditions when necessary.

1.7 Suppliers and Installation

- A. Prior to starting installation of each major component of the work, the Contractor shall hold a pre-installation conference, attended by each entity involved or affected by planned installation, including technical representatives of product manufacturers and others recognized as expert or otherwise capable of influencing success of the installation.
- B. The Contractor shall comply with the manufacturer's instructions and recommendations where the extent is more detailed or stringent than requirements contained directly in the Contract Documents.

Part 2. **PRODUCTS**

Not applicable.

Part 3. **EXECUTION**

3.1. Anchoring Work

- A. Work to be fixed in place shall be securely and properly located by measured line and level and isolated from non-compatible materials sufficiently to prevent deterioration.
- B. Individual units of work shall be mounted at industry-recognised mounting heights, if not otherwise indicated; uncertainties shall be referred to the Engineer's Representative before proceeding.

3.2. Cleaning and Protection

- A. Installed elements of work shall be cleaned at the time of installation, and provided with sufficient maintenance and protection during construction to ensure freedom from damage and deterioration until the time of Substantial Completion.

**** End of Section ****

Part 1. **GENERAL**

1.1 Utilities and Services

- A. The Contractor shall make all reasonable enquiries and take all reasonable measures to ascertain locations of, and protect, existing mains, services and utilities, and shall ensure continuity of service to existing buildings.
- B. Should any known service passing through the site require adaptation, the Contractor shall carryout such removal, relocation or disconnection as may be required, and shall give sufficient notice to the Engineer's Representative, Owner and others relevant prior to interruption of services.

1.2 Setting Out and Dimensions

- A. Upon taking possession of the site, the Contractor shall verify all levels, angles, grades, rises and dimensions shown on the drawings.
- B. Should any setting out discrepancies or errors be discovered on the drawings, the Contractor shall immediately inform the Engineer's Representative and cease all work which is directly influenced by such discrepancies or errors pending resolution by the Engineer's Representative
- C. The Contractor shall be solely responsible for the accurate setting out of the works and shall employ a qualified surveyor whenever necessary. Any damages which may be incurred as a result of the incorrect setting out of the works shall be the responsibility of the Contractor's
- D. The Contractor shall be responsible for the maintenance of all bench marks on the site.

1.3 Maintenance of Public Roads

- A. The Contractor shall protect and maintain all existing roads, footpaths and tracks within the site boundary, and keep them in a clean and serviceable condition and make good any damage or soiling prior to handing over the site to the Owner on completion.
- B. The Contractor shall be responsible for keeping all roads, footpaths and tracks adjacent to or in the vicinity of the site free from physical damage and mud and other materials deposited by vehicles connected with the works, whether used by the Contractor or not
- C. In the event that the Contractor should fail to make good damage or soiling so caused, the Owner shall have the power to employ a separate contractor to repair or cleanse the roads damaged or soiled, and the cost of such works shall be recoverable from the Contractor.

1.4 Use and Protection of the Site and Environs

- A. The Contractor shall erect temporary barriers, adequate for security and stability, around the construction site for the duration of the contract until Substantial Completion whereupon it shall be removed. The Contractor shall confine his operations (and those of his sub-contractors and suppliers etc.) to within the barriers, except for related off-site work such as roads and utilities which shall be protected in an appropriate manner.
- B. The Contractor shall not pollute, nor cause to be polluted, any watercourse, body of water, surface water sewer, or drain discharging into any of these during the progress of the works, by allowing sand, gravel, cement, sewage or other impurities to escape from the works. The Contractor shall take all necessary preventative measures to ensure that such contamination does not occur.

**** End of Section ****

Part 1. **GENERAL**

1.1 Parties to the Contract

- A. The "Owner" means the Government of Bermuda, represented by the Minister of Works and Engineering.
- B. The "Contractor" means the person or entity (or his heirs or executors) with whom the Owner has entered into a contract or agreement to carry out the works, including his sub-contractors, suppliers and any person acting on his behalf.

1.2 Contract Administrator

- A. When this Specification is used in conjunction with a contract containing the Bermuda Supplementary Conditions, the 'Contract Administrator' will be selected and stated in the Appendix.
- B. The Contract Administrator will normally be "the Engineer's Representative". The designation "Engineer's Representative" is used throughout the specification to represent the Contract Administrator. When the Contract Administrator is different (i.e. Surveyor or Engineer), this will be defined for the particular project.

The "Engineer " means the Chief Engineer, the Ministry of Public Works, Post Office Building, 56 Church Street, Hamilton HM 12, PO Box HM 525 Hamilton HMCX, and who is a person employed by the Owner and who is lawfully entitled to practice Engineering in the Islands of Bermuda and is registered as an Engineer or his authorised representatives.

1.3 Terms

- A. the "Works" or the "Work" means the construction and services required by the Contract Documents, and includes all labour, materials, equipment and services provided or to be provided to fulfill the Contractor's or his sub-contractors' and suppliers' obligations, or part thereof.
- B. "Notice" shall mean written notice.
- C. "Approval" shall mean written approval.
- D. "Indicated" is used to assist the reader in locating particular information on drawings by notes, graphics or schedules, or written into other portions of contract documents and terms such as "shown", "noted",
- E. "scheduled" and "specified" have the same meaning.
- F. "Directed, Requested, Approved, Accepted, etc" imply "by the Engineer's Representative", unless otherwise indicated.

- G. "Approved by Engineer's Representative" in no case releases the Contractor from the responsibility to fulfill the requirements of the Contract Documents.
- H. "Furnish" or "Supply Only" shall include delivery to the site, unloading, unpacking, and similar subsequent requirements prior to installation.
- I. "Install" or "Fix Only" includes, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.
- J. "Provide" means furnish and install complete and ready for intended use.
- K. "Remove" means remove from site, unless otherwise stated, and make good where disturbed. K "Bid" means the same as tender.
- L. "Sawn" (in carpentry or formwork) means the same as a rough; "wrot" (or wrought) means planed or finished.
- M. "Aggregates" are the components of a graded mixture of screenings.
- N. "The Owner" may be referred to on Engineering contracts as the Employer.
- O. "An Installer" is the operator or entity actually carrying out the installation.

1.4 Abbreviations

- A. Where abbreviations or acronyms are used in Contract Documents, they mean the recognised name or entity in the building construction industry; uncertainties shall be referred to the Engineer's Representative before proceeding.
- B. "N.I.C." means Not in Contract, and indicates work forming part of the overall project, but which is to be carried out by others under a separate contract either prior to, subsequent to or concurrently with the main contract. The Contractor shall not include for work so described.

**** End of Section ****

Part 1. **GENERAL**

1.1 Responsibility

- A. It is the Contractor's responsibility to hold all operational site meetings related to the execution of the work (unless it is specifically stated otherwise in bidding requirement documents).

1.2 Scope

- A. The Contractor shall schedule and administer a pre-construction meeting, as well as periodic progress meetings (minimum fortnightly unless stated otherwise), and specially called meetings as necessary, to include the following:
1. Preparing agenda.
 2. Distributing written notice in advance.
 3. Making physical arrangements.
 4. Presiding at meetings.
 5. Recording the minutes including significant proceeding and decisions.
 6. Reproducing minutes and copying within three days to all participants (including three copies to the Engineer's Representative) and to other parties affected.
- B. Representatives at meetings of the Contractor, sub-contractors and suppliers shall be qualified and authorised to act on behalf of the entity they represent.
- C. The Engineer's Representative and Owner's representatives may attend meetings to ascertain that work is expedited in accordance with Contract Documents and schedules.
- D. The Engineer's Representative has the right of approval of the minutes.

1.3 Pre-Construction Meeting

- A. The pre-construction meeting shall be within fifteen days prior to the Contractor commencing site operations, in a central venue convenient to all parties, designated by the Contractor.
- B. The following shall be in attendance:
1. The Contractor's representative.
 2. The resident Project Representative and/or the Contractor's superintendent.
 3. The Owner's representative (optional).
 4. The Engineer's Representative and professional consultants.
 5. Major sub-contractors and suppliers.
 6. Others as appropriate.
- C. The suggested agenda is:
1. Distribute and discuss construction schedules including critical work sequencing.
 2. Discuss major equipment deliveries and priorities.

3. Discuss project co-ordination and designation of responsible personnel.
4. Confirm procedures for field decisions, proposal requests, submittals, Change Orders, and applications for payments, and general correspondence handling.
5. Discuss and indentify locations of fencing, storage areas, site huts, toilets etc., temporary power, water and telephone, site access, condition of site, spoil banks etc.
6. Arrange the location, time and date of subsequent meetings.

1.4 Progress Meetings

- A. Progress meetings shall be held in the site office of the Contractor.
- B. The following shall be in attendance:
 1. The resident Project representative and/or the Contractor's superintendent
 2. The Engineer's Representative and his professional consultants as required.
 3. Major sub-contractors and suppliers as appropriate to the agenda.
 4. Others as appropriate.
- C. The suggested agenda is:
 1. Review and approve previous minutes.
 2. Review of work since previous meeting, including field observations etc.
 3. Schedule review: including problems, corrective measures, revisions, off-site fabrication, delivery schedules and co-ordination.
 4. Submittal review.
 5. Quality control.
 6. Pending changes, effect on schedule.
 7. Other business.

1.5 Engineer's Representative's Option to Hold Meetings

- A. At his discretion the Engineer's Representative may assume the responsibility for holding site meetings, if he considers the Contractor unable to meet, or is deficient in meeting, the requirements of this Section.

**** End of Section ****

Part 1. **GENERAL**

1.1 Scope

- A. A Construction or Progress Schedule shall be submitted prior to commencing work on site, indicating a time bar for each significant category of work and sequencing times for submittals, and inspections.
- B. Status of alternates (if any, see Section 01030) sufficient for distribution to all relevant parties shall be issued promptly after award of the contract.
- C. A Schedule of Values in the form of an elemental analysis of the contract sum shall be submitted (see Section 01027) and shall be based on the values in the Bid Form, if provided.
- D. Applications for Payment at intervals specified (see Section 01027).
- E. Physical samples of mock-ups of materials, equipment or workmanship to establish standards as required by technical sections showing where applicable variations in colour, pattern or texture, average condition and extreme range of variations.
- F. The required security, performance bond or indenture submitted prior to the execution of the contract.
- G. A copy of each type of insurance policy submitted prior to commencing work on site.
- H. Copies of prints of the photographs as required (see Section 01040 Part 1.3).
- I. Copies of all warranties, guarantees, operating instructions and the like submitted prior to Substantial Completion.
- J. Copies of maintenance instructions, tools and operating manuals required by technical specifications presented prior to Substantial Completion.
- K. Copies of the "Certificate of Use and Occupancy" and other Government approvals, (including the Fire Department and Department of Health) submitted prior to the issue of a Certificate of Substantial Completion.
- L. Copies of keys for doors, panels, cabinets, valves, equipment etc. submitted upon Substantial Completion.
- M. Record Drawings as required (see Sections 01040 Part 1.2 and 01070 Part 1.3)
- N. Shop Drawings
 - 1. Initial submittal: one opaque blue/black line print and one correctable, reproducible transparency. The transparency will be processed and

returned. After approval, print the processed transparency for job use and distribution.

2. Final Submittal: after approval, submit 3 prints; if the drawing is required for maintenance manuals submit 5 prints; with final submittal, include additional prints as necessary for job use and distribution. The Engineer's Representative will retain 2 prints, and will return the remainder. One print shall be maintained as mark-up copy for Record Drawings.
- O. Product Data (facsimiles not acceptable)
1. Mark each copy to indicate the actual product to be provided; show selections from among options in the manufacturer's printed product data. Submit 4 copies to Engineer's Representative; submittal is for information and record purposes only. Where the product data is required for maintenance manuals, submit 2 additional copies which will be returned. Maintain one additional copy at the project site for reference purposes.
 2. The Contractor shall not proceed with the installation of manufactured products until a copy of the related product data is in the installer's possession on site.
- P. Form of payment application
1. As soon as practicable after being notified of selection for the award of the Contract, the Contractor shall furnish in writing to the Engineer's Representative an itemised cost breakdown of the various trades and sections which comprise the contract, totalled to equal the contract sum: this analysis to be used as a basis for Progress Payment applications.
 2. The cost breakdown shall be, and if not objected to by the Engineer's Representative before the first Progress Payment will be deemed to be, a true reflection of the costs including overhead and fee) to the Contractor of the respective elements in the contract sum.

**** End of Section ****

Part 1. **GENERAL**

1.1 Site Accommodation

- A. Site office: The Contractor shall erect, maintain and remove on completion, for his own general use and that of visiting personnel for the entire construction period, a suitable, secure, structurally sound and weather tight office, adequately sized and furnished, and shall arrange the provision of electricity, water and fax telephone machine and pay all charges in connection therewith.
- B. Site compound: The Contractor shall maintain a secure compound for the storage of his materials and shall include therein a weather tight storage shed for the protection of goods and materials which may be damaged by exposure to the elements.
- C. Site latrine: The Contractor shall provide adequate latrines for the use of his workers and all other persons lawfully visiting the site. The Contractor shall conform with the requirements of the Ministry of Health and Social Services in this respect, and shall maintain the facilities in a sanitary condition at all times.

1.2 Site Services

- A. Water for the works: The Contractor shall provide all water necessary for the works and for the needs of his workers, and pay all charges in connection therewith. All water shall be fresh and free from impurities. Drinking water, and water for construction materials shall be potable.
- B. Electricity for the works: The Contractor shall make all necessary arrangements for the provision of such temporary power as is required for the carrying out the works, temporary metering and pay all charges in connection therewith.

1.3 Temporary Fences

- A. The Contractor shall provide hoardings, screens, planked footways, guardrails, gantries and the like necessary to ensure a safe and secure site, including off-site utility trenches or the like, and clear away upon completion of the work.

1.4 Fire Protection

- A. The Contractor shall take all necessary precautions to prevent loss or damage by fire and provide and maintain suitable fire extinguishers etc. all as required by safety regulations.

1.5 Signs and Notices

- A. The Contractor shall erect and maintain all necessary traffic control signs to ensure the safe movement of vehicles about the site.
- B. The Contractor shall erect and maintain a Publicity Notice Board containing the name of the Owner, the name of the project and the Planning Authority Permit Number. Space should be available for the Contractor's name board, and that of his subcontractors, and all consultants connected with the project. No other advertising of any description is permitted on the site.

**** End of Section ****

Part 1. **GENERAL**

1.1 Environmental Measures

- A. Meet or exceed the requirements of all Bermuda environmental legislation and regulations, including all amendments up to project date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

Part 2. **EXECUTION**

1.2 Fires

- A. Fires and burning of rubbish on site will not be permitted.

1.3 Disposal of Wastes

- A. Discharge of solid, liquid or gaseous materials into the surrounding environment will not be permitted. The contractor will be responsible for collection and disposal of all waste materials in accordance with the latest editions of the Ministry of Public Works Waste Management Plan.
- B. Do not bury rubbish and waste materials on site.

1.4 Work in or Adjacent to Water

- A. Works performed in and around water will be carried out in accordance with regulations of Bermuda authorities having jurisdiction.
- B. Install temporary enclosures, screens, traps or other devices to prevent any excess concrete or other construction materials, waste materials or debris falling into the water.
- C. Remove immediately any solid object inadvertently dropped into the water. On conclusion of construction, dispose of all debris to prevent its entry into the water.
- D. Re-fuelling of machinery must take place at a safe distance from the water under methods approved by the Engineer.

1.5 Drainage

- A. Provide temporary drainage and pumping as necessary to keep site free from water.
- B. Do not pump water containing suspended materials into waterways, sewer or drainage systems.

- C. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Bermuda authority requirements.

1.6 Environmental Protection

- A. When, in opinion of Engineer, negligence of Contractor results in damage or destruction of local flora and or fauna, or other environmental or aesthetic features beyond work areas as shown on contract drawings, the Contractor shall be responsible, at his expense, for complete restoration including replacement to satisfaction of Engineer.

1.7 Pollution Control

- A. Control emissions from equipment and plant to Bermuda authorities' emission requirements.
- B. Prevent extraneous materials from contaminating air, land or water, by vacuum, temporary enclosures, screens, traps or other devices.
- C. Spills of deleterious substances should be immediately contained and cleaned up in accordance with provincial regulatory requirements. Spills should be reported forthwith to the Engineer.

1.8 Storage and Handling of Fuels and Dangerous Fluids

- A. Locate fuel storage facility a minimum of 100m from any water body in an area approved by the Engineer and construct impermeable dykes so that any spillage is contained.
- B. Prevent spillage of gasoline, diesel fuel and other oil products into the water and on land. Clean up spills promptly at own cost in accordance with Bermuda regulatory requirements. Report any fuel spills immediately to Engineer.
- C. Proper use of primers, grouts, bonding adhesives and other hazardous substances will be undertaken to prevent their entry into the water. Substances are to be stored and mixed on protected surfaces away from site to prevent their entry into waterways and contamination of soils.
- D. Collect and dispose of used oil filter cartridges and other products of equipment maintenance at industrial waste facility to satisfaction of Engineer.

**** End of Section ****

Part 1. **GENERAL**

1.1 Definition

- A. A substitute is a contractor's alternative to a named product, proposed during the contract

1.2 Where Substitution Is Not Permitted

- A. No substitute product will be allowed for the following.
 - 1. For products specified by naming only one product and manufacturer.
- B. Under the circumstances in 1.2 A above the Contractor has the option at the time of bidding to request approval of an alternate (see Section 01030), and unless he does so, he shall be deemed to have allowed for a named product.

1.3 Where Substitution Is Permitted

- A. For products proposed as "equal" or "equivalent", (or similar wording), to named products that have such wording appended; the Contractor shall make a substitution submittal (see Part 1.5 of this Section).
- B. For products which the Contractor is unable to procure, or unable to procure in time, for reasons beyond his control; the Contractor shall make a substitution submittal (see Part 1.5 of this Section).

1.4 Where Substitution Is Not Required

- A. For products specified by referenced standard; the Contractor may select products meeting that standard, by any manufacturer but shall prefer a locally available product.
- B. For products specified by naming several products or manufacturers; the Contractor may use any of those named which comply with the specification.

1.5 Substitution Submittals

- A. A written request must be made allowing reasonable time for review and reasonable time for ordering should there be approval.
- B. Complete data must be provided with any request, to substantiate compliance with requirements, together with all relevant supporting literature, performance and test data, and samples if applicable.
- C. The request must state what, if any, effect the substitution has on dimensions, other trades or contracts, scheduling and costs.

1.6 Acceptance of a Substitute

- A. Should the Engineer's Representative approve a substitute as being equal, for use in the contract, the Contractor shall co-ordinate related work, including that of sub-contractors if applicable, and modify or adjust adjacent work as required to ensure that work affected is complete and fully integrated into the project.
- B. Should the Engineer's Representative approve a substitute that is NOT equal, for use in the contract, the Contractor shall co-ordinate related work, including that of sub-contractors if applicable, and modify or adjust adjacent work as required to ensure that work affected is complete and fully integrated into the project, and any cost saving of the unequal product shall accrue to the Owner.
- C. The Engineer's Representative's response to the contractor's submittal must be made with reasonable promptness and be made in writing.

**** End of Section ****

Part 1. **GENERAL**

1.1 Contractor's Procedures at Substantial Completion

- A. The Contractor shall comply with the Contract Conditions and complete the following before requesting the Engineer's Representative to inspect the work, or a designated portion of the work, for certification of Substantial Completion:
 - B. The Contractor shall submit executed warranties, workmanship bonds, maintenance agreements, inspection certificates and similar required documentation for specific units of work, enabling the Owner's unrestricted occupancy and use.
 - C. The Contractor shall submit record documentation, maintenance manuals, tools, spare parts, keys and similar operational items.
 - D. The Contractor shall complete final cleaning, and remove temporary facilities and tools.
 - E. The Contractor shall submit copies of "Certificate of Use and Occupancy" and other Government approvals, including Fire and Health.

1.2 Inspection Procedures

- A. Upon the receipt of the Contractor's request, the Engineer's Representative will either proceed with inspection or advise the Contractor of pre-requisites not fulfilled. Following initial inspection, the Engineer's Representative will either prepare the certificate of Substantial Completion, or advise the Contractor of work which must be performed prior to issuance of the certificate. The Engineer's Representative will repeat the inspection when requested to ensure that the work has been substantially completed. Results of the completed inspection will form the initial "punch-list" for final acceptance.
- B. The Engineer's Representative will re-inspect the work upon receipt of the Contractor's notice that, except for the items whose completion has been delayed due to circumstances that are acceptable to the Engineer's Representative, the work has been completed, including punch-list items from earlier inspections and defective work arising during the Warranty Period. Upon completion of re-inspection, and at the end of the Warranty Period, the Engineer's Representative will either recommend final acceptance and final payment, or will advise the Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, this procedure will be repeated.

1.3 Record Documentation

- A. The Contractor shall maintain two complete set of either blue-or black-line prints of the contract drawings and shop drawings for record mark-up purposes throughout the contract time, and mark-up these drawings during the course of the work to show both changes and the actual installation~ in sufficient detail to form a complete record for the Owner's purposes. He shall give particular attention to work which will be concealed and difficult to measure and record later, and work which may require servicing or replacement during the life of the project. He shall require the entities marking prints to sign and date each mark-up, and shall bind prints into manageable sets, with durable paper covers, appropriately labeled, and shall transfer the information onto an additional set of reproducible transparent drawings.
- B. The Contractor shall provide two sets of 3-ring vinyl-covered binders containing required maintenance manuals, properly identified and indexed, including operating and maintenance instructions extended to cover emergencies, spare parts, warranties, inspection procedures, diagrams, safety, security, and similar appropriate data for each system or equipment item.

1.4 Final Cleaning

- A. At the time of project close out, the Contractor shall clean or re-clean the works to the condition expected from a normal, commercial building cleaning and maintenance programme, and complete the following cleaning operations before requesting the Engineer's Representative's inspection for certification of Substantial Completion.
 - 1. Remove non-permanent protection and labels.
 - 2. Polish glass.
 - 3. Clean exposed finishes.
 - 4. Touch-up minor finish damage.
 - 5. Clean or replace mechanical systems filters.
 - 6. Remove debris.
 - 7. Broom-dean unoccupied spaces.
 - 8. Sanitise plumbing and food service facilities, and chlorinate potable water supply system.
 - 9. Clean light fixtures and replace burned-out lamps.
 - 10. Sweep and wash paved areas.
 - 11. Test potable water for contamination not more than 48 hours in advance of Substantial Completion.
 - 12. Wax resilient flooring, vacuum carpeting and wash ceramic tile work.

1.5 Repair Of Defective Work

- A. Where damage to materials is minor, repair rather than replacement will be acceptable provided the end product is aesthetically and functionally equivalent to adjacent non damaged surfaces as determined by the Engineer's Representative. If unsatisfactory the Engineer's Representative may require that repaired materials be replaced with new.

**** End of Section ****

Part 1. **GENERAL**

1.1 **Warranty Period**

- A. The Contractor shall submit to the Engineer's Representative all manufacturers' written guarantees, warranties, maintenance and operating instructions for all materials and equipment for which such items are normally issued by the manufacturer.
- B. The Contractor shall, for the period indicated in the Appendix to the Conditions of Contract following Substantial Completion, repair or replace, in a manner satisfactory to the Engineer's Representative, any and all work furnished and/or installed under the Contract which may become defective due to improper materials or workmanship during the Warranty Period.
- C. The Contractor shall bear all expense necessary to repair or remove and replace in an approved manner any other work which may become damaged or disturbed in making such repairs to the Works.
- D. Part 1.1.A of this Section does not apply to repairs or replacement of materials or equipment furnished by the Owner unless the defects are sustained during their installation by the Contractor or by subsequent damage caused by the Contractor or people for whom he is responsible.

1.2 **Bonds and Financial Capability**

- A. The provisions for bonds and financial capability are as indicated in the tender documents.

**** End of Section ****

Part 1. General

1.1 Location

- A. The location of selective demolition to the building structure will normally be indicated on the drawings as required to accommodate new construction.
- B. Other work such as cutting concrete floors, roof deck and masonry walls for piping and ducts, and for above grade piping, ducts, and conduit will be required where it can be reasonably seen from the respective mechanical, electrical and other drawings that it is required.

1.2 Co-ordination

- A. This Section shall be read in conjunction with related Sections elsewhere in the Specification.

1.3 Schedule

- A. The Contractor shall, if requested, submit a schedule indicating the proposed methods and sequence of operations for selective demolition work to the Engineer's Representative for review prior to commencement of work, including co-ordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.
- B. Where demolition is to be carried out within occupied buildings, the Contractor shall provide a detailed sequence of demolition and removal work to ensure the uninterrupted progress of the Owner's site operations, and shall co-operate with the Owner's continuing occupation of portions of the existing building, and with the Owner's partial occupancy of completed new areas.
- C. The Contractor shall provide a minimum of 48 hours notice to the Owner of demolition activities which will make an impact on the Owner's normal operations.

1.4 Condition of structure

- A. The Owner assumes no responsibility for the condition of items or structures to be demolished.

1.5 Protection

- A. The Contractor shall provide temporary barricades and other forms of protection as required to protect the Owner's personnel and the general public from injury due to selective demolition work.
- B. Where applicable, the Contractor shall provide protective measures to provide free and safe passage of the Owner's personnel and the general public to and from occupied areas of the building.
- C. Where necessary, the Contractor shall provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of the structure or element to be demolished, and adjacent facilities or work to remain.
- D. The Contractor shall protect from damage any existing finish work that is to remain and becomes exposed during demolition operations, including protecting floors with suitable coverings when necessary.
- E. The Contractor shall make provision for the continuity of utility services to occupied areas of the site and shall permanently or temporarily cap off or relocate utility service lines as required.

1.6 **Explosives**

- A. The use of explosives will not be permitted without the written consent of the Engineer's Representative and without the obtaining of all necessary Government or other permits.

1.7 **Temporary signage**

- A. During demolition or alteration work in buildings used by the general public, the Contractor shall provide signs directing building users to necessary services of the facility, in addition to signs apologising for disruption.
- B. Temporary signs shall be produced by a recognized sign maker and shall be in black block letters on a white background painted on 3/4" plywood.
- C. Wording on temporary signs shall be approved by the Engineer's Representative.

Part 2. Products

Not applicable.

Part 3. Execution

3.1. Order of work

- A. The Contractor shall perform selective demolition work in a systematic manner (see also Part 1.3 of this Section).

3.2. Concrete and masonry

- A. Concrete and masonry shall be demolished in small sections, cut at junctions with construction to remain, using a power-driven masonry saw or hand tools where possible and not power-driven impact tools.
- B. Debris should be promptly removed.

3.3. Foundations

Not applicable.

3.4. Services

- A. If unexpected mechanical, electrical or structural elements are encountered, the Contractor shall submit details of such to the Engineer's Representative.

3.5. Asbestos and other hazardous materials

- A. If hazardous materials are encountered during demolition or other operations, the Contractor shall cease work in the affected area and submit a report to the Engineer's Representative; any work in such an area shall comply with applicable regulations concerning removal, handling, protection against exposure and environmental pollution, and disposal.
- B. Burning of any removed materials is not permitted on the site.

Part 1. General

1.1 Protection

- A. The Contractor shall provide the protection necessary to prevent damage to existing properties, and shall protect existing trees and vegetation which are to remain.

1.2 Site clearing

- A. The Contractor shall not perform any clearing operations until receipt of specific instructions in writing to proceed, from the Engineer's Representative. Trees or shrubs outside the excavations or elsewhere which are to remain shall be protected from injury during construction operations.
- B. The areas affected by the works shall be cleared of all existing structures, fences, walls, debris, or other garbage as directed by the Engineer's Representative.
- C. The Contractor shall remove trees, shrubs, grass and other vegetation, or obstructions interfering with the installation of new construction, to be deposited on site or as specifically indicated. Removal includes digging out stumps and roots completely and backfilling with approved material and compacting to the same density as that of the surrounding soil.

1.3 Stripping topsoil

Not applicable.

1.4 Disposal

- A. All materials arising from site clearance (excluding topsoil - see Part 1.3.C of this Section) which are surplus to or unsuitable for use in the works shall be disposed of by the Contractor to approved tipping areas or as directed by the Engineer's Representative.
- B. The Owner reserves the right of ownership of any Bermuda stone in existing structures or that can be quarried for building blocks. Any additional works in this connection, extra to normal requirements, will be the subject of a Change Order.

Part 1. General

1.1 Scope

A. Work includes, but is not limited, to the following:

- a. Preparation of the sub-grade for buildings, walks, and pavements.
- b. All trenches within site lines.
- c. Excavation and backfilling required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical appurtenances.
- d. Rough grading and excavation to landscaped work, unless otherwise stated.
- e. Shoring and bracing excavations as required.
- f. Finish grading

1.2 Excavation in rock

Not applicable.

1.3 Classifications

- A. Unauthorised excavation consists of the removal of materials beyond the indicated sub-grade elevations or dimensions without the approval of the Engineer's Representative. The Contractor responsible for re-filling any unauthorised excavation, as well as any remedial work directed by the Engineer's Representative.
- B. Filling of unauthorised excavation under footings, foundation bases, or retaining walls, shall be with grade 15 concrete to bring elevations to proper position. Elsewhere, the Contractor shall backfill and compact as specified for authorised excavations of same classification, unless otherwise directed by the Engineer's Representative.

1.4 Sub-surface data

Not applicable.

1.5 Existing utilities

- A. The Contractor shall locate the existing underground utilities in areas of work. If utilities are to remain, the Contractor shall provide adequate means of support and protection during earthwork and subsequent operations.

- B. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, the Contractor shall consult the utility owner immediately for directions, and co-operate with the Owner and utility companies in keeping respective services and facilities in operation. The Contractor shall repair damaged utilities to the satisfaction of the utility owner.
- C. Disused soil and surface water drains within 3' (900mm) of formation level, and such larger sewers and culverts at greater depths as the Engineer's Representative specifies, shall be removed and the trenches backfilled with suitable material.
- D. Disused drains and pipes which are not to be taken up shall be filled with grade 7 concrete. The Contractor shall allow for breaking into the drain or pipe at suitable intervals between manholes where necessary to ensure that the pipe is completely filled and for any grouting deemed necessary by the Engineer's Representative as a result of this inspection.
- E. The Contractor shall provide a minimum of 48-hours notice to the Engineer's Representative, and must receive written notice to proceed before interrupting any utility.
- F. Existing underground utilities indicated to be removed shall be demolished and completely removed from site; the Contractor shall co-ordinate with the utility companies for shut-off of services if lines are active.

1.6 **Explosives**

- A. The use of explosives will not be permitted without the written consent of the Engineer's Representative, and will be subject to the obtaining of all required permits.

1.7 **Protection of persons and property**

- A. The Contractor must barricade open excavations and post with warning lights.
- B. The Contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

Part 2. Products

2.1 Soil material

Not applicable.

2.2 Granular material for trenches

Not applicable.

2.3 Granular material for structure foundations

- A. Gravel for structure foundations shall be angular pit run crushed natural stone, free from shale, clay, friable materials, and debris, graded within the following limits:
(Metric equivalent is BS 410)

SIEVE SIZE	% PASSING
2"	100
1"	95
3/4"	95 to 100
5/8"	75 to 100
3/8"	55 to 85
No.4	35 to 60
No.16	15 to 35
No.40	10 to 25
No.200	5 to 10

- B. Pea gravel shall be clean natural stone; free from clay, shale and organic matter; 1/4" to 1/2" (6mm to 13mm).
- C. Sand for structure foundations shall be natural sand or sand derived by crushing gravel or stone; free from silt, clay, loam, friable or soluble materials, and organic matter, graded within the following limits:

SIEVE SIZE	% PASSING
No.4	100
No.14	10 to 100
No.48	15 to 90
No.100	4 to 90
No.200	0 to 5

Part 3. Execution

3.6. Method of work

- A. All excavation shall be carried out in approved and orderly manner.

3.7. Leveling

- A. The Contractor shall establish and identify the required lines, levels, contours and datum.
- B. The Contractor shall maintain bench marks, monuments and other reference points, and shall inform the Engineer's Representative if disturbed or destroyed and shall be responsible for reestablishing.

3.8. Grading

Not applicable.

3.9. Excavating foundations

Not applicable.

3.10. Excavating utility trenches

Not applicable.

3.11. Disposal

- A. All unsuitable material arising from excavation which is surplus to or unsuitable for use in the works shall be disposed of by the Contractor to an approved spoil area or as directed by the Engineer's Representative.
- B. The Owner reserves the right of ownership of any Bermuda stone that can be quarried for building blocks met with during excavation.

3.12. Laying and compaction of filling

Not applicable.

3.13. Compaction trials and methods

Not applicable.

3.14. Completion of formation

Not applicable.

3.15. Leveling and raking of topsoil

Not applicable.

Part 1. **General**

1.1 **Standard specifications**

- A. Unless otherwise stated in the Specification the latest edition of the following standard specifications shall apply:

AASHTO T104-77	Magnesium Sulphate Soundness Test
BS 8110: 1985	Structural Use of Concrete
BS 812:	Testing Aggregates
BS 882: 1983	Aggregates from Natural Sources for Concrete
BS 1377: 1990	Soil Testing
BS 12: 1988	Specification for Portland Cement
BS 4027: 1980	Sulphate-Resisting Cement
BS 3148: 1980	Testing of Water for Concrete
BS 4449: 1988	Carbon Steel Reinforcing Bars for Concrete
BS 4482: 1985	Cold Reduced Steel Wire for Reinforcement for Concrete
BS 970: Parts 1&4	Valve Steels
BS 4483: 1985	Steel Fabric for Reinforcement
BS 1521: 1972	Waterproof Building Paper
BS 1881:	Testing concrete
BS 8666: 2000	Reinforcement Bending Dimensions
BS 8007: 1987	Design of Concrete Structures for Retaining Aqueous Liquids
BS 1305	Batch Type Concrete Mixers
BS 3963	Mixing Performance of Concrete Mixers
BS 5328	Concrete
BS 146	Cement
BS 729	Galvanising

1.2 **Concrete grades**

- A. Concrete grades in this specification, e.g. grade 7,10 etc. are defined in Section 03300

Part 2. **Products**

2.1 **Materials Generally**

- A. Materials, articles, samples and test certificates may conform with standards other than the British Standards referred to in this Specification provided the alternative standard is at least equivalent. In the event of a conflict of interpretation between the alternative standard and the British Standard, then the requirements of the British Standard shall prevail.

- B. Materials used in the works shall be new, of the qualities and kinds specified herein and equal to approved samples. Delivery shall be made sufficiently in advance to enable further samples to be taken and tested if required. No materials shall be used until approved, and materials not approved shall be immediately removed from the site.
- C. Materials shall be transported, handled and stored on the site or elsewhere in such a manner as to prevent damage, deterioration or contamination.

Part 1. **General**

1.1 **Scope**

- A. Formwork including all temporary or permanent forms required for forming the concrete, together with all temporary construction required for its support.

1.2 **Quality assurance**

- A. Formwork shall be fixed in its correct position and securely braced to withstand, without appreciable displacement; deflection or movement of any kind, the loading from the construction and the movement of persons, materials and plant including any effects of vibrating the concrete.
- B. All formwork shall be so constructed that there shall be no loss of material from the concrete, and all joints shall be sufficiently tight to prevent leakage of cement grout and to avoid the formation of fins or other blemishes. After hardening, the concrete shall be in the position and of the shape, dimensions and surface finish described in the contract.
- C. When requested by the Engineer, a statement of method and design calculations shall be submitted for approval not less than 7 days prior to any formwork erection.

Part 2. **Products**

2.1 **Surface finishes**

- A. The surface finishes for formed surfaces shall be as specified on the drawings to the following requirements:

Type	Quality
FI	This finish shall be obtained by the use of properly designed formwork or moulds of closely jointed sawn boards or sheet ply. The surfaces may be imprinted with the grain of the sawn boards or sheet ply and their joints. In addition, small blemishes caused by entrapped air or water will be accepted, but the surface shall be free from voids, honeycombing and other large blemishes.
F2	This finish shall be obtained by the use of properly designed forms of closely jointed wrought boards or film faced ply. The surfaces may be imprinted with the slight grain of the timber and their joints. Small blemishes caused by entrapped air or water will be accepted, but

the surface shall be free from voids, honeycombing and other large blemishes.

- F3 The finish shall be achieved only by the use of high quality concrete and by using properly designed forms having a hard, smooth surface. The concrete surfaces shall be smooth, with true clean arrises. Only very minor surface blemishes will be accepted and there shall be no staining nor discolouration from the release agent.
- F4 This finish shall be obtained by first producing a type F2 finish on thoroughly compacted high quality concrete, cast in properly designed forms. The surface shall then be improved by carefully removing all fins and other projections, thoroughly washing down and then filling the most noticeable surface blemishes with a cement and fine aggregate paste. Every effort shall be made to match the colour of concrete. The Contractor shall ensure that the finished concrete surface is not permanently stained nor discoloured by the choice of the release agent used.
- F5 This finish shall be obtained by first producing a type F3 finish and then, while the concrete is still green, filling all surface blemishes with a fresh, specially prepared cement and fine aggregate paste. Every effort shall be made to match the colour of the concrete. After the concrete has been properly cured, the faces shall be rubbed down to produce a smooth and even surface.
- F6 This finish shall be achieved by lining the formwork with the material specified by the Engineer to achieve the specified finish. This material shall leave no stain on the concrete and shall be so jointed and fixed to its backing that it imparts no blemishes. It shall be of the same type and obtained from only one source through anyone structure. The Contractor shall make good any imperfections in the resulting finish as required by the Engineer Internal ties and embedded metal parts will only be allowed with the specific approval of the Engineer.

B. The surface finishes for unformed surfaces shall be as specified on the drawings to the following requirements:

Type	Quality
U1	The concrete shall be uniformly leveled, tamped or screeded to produce a plain or ridged surface as described on the drawings or elsewhere. No further work shall be applied to the surface unless it is used as the first stage for a Type U2 or U3 finish.
U2	After the concrete has hardened sufficiently the concrete Type U1 surface shall be floated by hand to produce a uniform surface free from screed marks.
U3	When the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, a Type U1 surface shall be power-floated and power-toweled under firm pressure to produce a dense, smooth uniform surface free from trowel marks.
U4	The concrete shall be finished to U3 level and then brushed to produce permanent non-slip ridges.

- C. Any remedial treatment to surfaces shall be agreed with the Engineer following inspection immediately after removing the form work and shall be carried out without delay.
- D. Any concrete, the surface of which has been treated before being inspected by the Engineer, shall be liable to rejection.
- E. In no cases shall any concrete finishes be of a lower standard than the minimum specified in A or B above.

Part 3. **Execution**

3.1 Preparation

- A. The inside surfaces of forms shall, except for permanent formwork, be coated with an approved material to prevent adhesion of the concrete. Release agents shall be applied strictly in accordance with the manufacturer's instructions and shall not come into contact with the reinforcement. The same release agent shall be used for all concrete surfaces which will be visible on completion of the works.
- B. Immediately before concreting, all forms shall be thoroughly cleaned out. Openings for inspection of the inside of the formwork and for the escape of

water used for washing out shall be formed so that they can be conveniently closed before placing the concrete.

- C. Before placing the concrete, bolts and fixings shall be in position, and cores and other devices used for forming openings, holes, pockets, recesses and other cavities shall be fixed to the formwork. No holes shall be cut in any concrete unless approved by the Engineer.
- D. Vertical props shall be supported on wedges, or other measures shall be taken whereby the props can be gently lowered vertically when commencing to remove the formwork. Props for an upper storey shall be placed directly over those in the storey immediately below and the lower prop shall bear on work sufficiently strong to carry the load.
- E. Before any concrete is placed, all formwork shall be inspected and approved by the Engineer who must be notified by the Contractor 24 hours prior to concreting. Approval does not relieve the Contractor of the responsibility for the structural adequacy of formwork and supports.

3.2 Installation

- A. Connections shall be constructed to permit easy removal of the formwork and shall be either nailed, screwed, bolted, clamped, wired or otherwise secured to be strong enough to retain the correct shape during consolidation of the concrete.
- B. Where internal metal ties are permitted, they or their removable parts shall be extracted without damage to the concrete and the remaining holes filled with drypack. No permanently embedded metal parts shall have less than 2" (50mm) cover to the finished concrete surface or 3" (75mm) cover where the structure is water retaining or exposed to sea-water.
- C. If the formwork for a column is erected to the full height of the column, one side shall be left open and shall be built-up in sections as placing of the concrete proceeds.
- D. Forms for beams, slabs and similar members shall be designed and constructed so that the sides may be removed without disturbing the soffit shutters or supports thereto.
- E. Where concrete is to be placed directly against an un-excavated surface, the Contractor shall seal the face of the excavation to ensure that no water required for the hydration of the cement is drawn out of the concrete mix. The method of sealing the face of the excavation shall be subject to the approval

of the Engineer. Approval does not relieve the Contractor of the responsibility for the adequacy of the method.

3.3 Removal

- A. The Engineer shall be informed in advance when the Contractor intends to strike any Formwork.
- B. Formwork shall be constructed so that the side forms of members can be removed without disturbing the soffit forms, and if props are to be left in place when the soffit forms are removed, such props shall not be disturbed during striking.
- C. Formwork shall be removed by gradual easing without jarring or damage to the concrete. Formwork shall be removed only in the presence of a competent supervisor when the concrete has attained sufficient strength.
- D. Where it is intended that formwork is to be reused it shall be cleaned and made good to the satisfaction of the Engineer.

3.4 Removal times

- A. The time at which the formwork is struck shall be the Contractor's responsibility, but the minimum periods between concreting and the removal of forms shall be as follows:

Type of Formwork	Minimum Period before striking
Vertical formwork to columns, walls, and large beams	12 hours
Soffit formwork to slabs	4 days
Props to slabs	10 days
Soffit formwork to beams	10 days
Props to beams	14 days

- B. Notwithstanding any approval given by the Engineer, the Contractor shall be held responsible for, and shall make good any damage arising from the removal or premature removal of the formwork.

Part 1. **General**

1.1 **Galvanising**

- A. After being cut and/ or bent to the dimensions shown on the drawings or given in the bar schedules, all bar reinforcement and steel fabric unless indicated otherwise on the drawings shall be prepared and hot-dip galvanised in accordance with the requirements of BS 729 with a chromatin post-treatment. The temperature of the molten zinc bath shall not exceed 500°C. Soft annealed iron tying wire shall also be hot-dip galvanised and similarly treated. Steel reinforcement shall be clean, free from loose rust and millscale at the time of galvanising. Unless instructed otherwise by the Engineer, reinforcement shall not be straightened nor bent after galvanising.
- B. Steel bars to be used for reinforcement supports and spacers shall be hot-dip galvanised and treated in accordance with BS 729 as above. With the prior approval of the Engineer the Contractor may cut and bend this steel on site provided 2 coats of an approved metallic zinc-rich paint is applied to the cut end of the steel and to those areas where damage occurs to the galvanising coating.

Part 2. **Products**

2.1 **Reinforcing steel**

- A. Steel used for concrete reinforcement shall comply with the following British Standard Specifications:

BS	Bar Description
4449	Carbon Steel Bars for the Reinforcement of Concrete
4483	Steel fabric for the Reinforcement of Concrete

- B. Reinforcement shall have the following minimum specified characteristic strengths:

Hot rolled mild steel bars	250N/sqmm
High yield steel bars	410N/sqmm

- C. High yield steel reinforcement shall be Type 2 deformed bars.

2.2 Colour coding reinforcing steel

- A. The supplier shall colour code wire weld metric fabric in accordance with the following chart.

MESH TYPE	Cross-Sectional Area		Type	Colour Code
	mm ² /m	mm ² /m		
	Main wires	Transverse wires		
Square Mesh Fabric	393	393	A 393	Black
	252	252	A 252	Yellow
	193	193	A 193	Brown
	142	142	A142	Purple
	98	98	A98	Orange
Structural Fabric	1131	252	B1131	Blue
	785	252	B785	Green
	503	252	B503	Red
	385	193	B385	White
	283	193	B283	White, Black and White
Wrapping Fabric	196	193	BI96	Yellow, Brown and Yellow
	98	98	D98	
	49	49	D49	

Conversion factor: 1 mm²/m = 0.000472 in²/ft.

- B. The colour code markings shall be applied on opposite end bars of each sheet of fabric. The mark shall cover at least a 6" (150mm) length of bar.

2.3 Storage of reinforcement

- A. The Contractor shall pay particular attention to the conditions of transport, shipment and storage to avoid contamination by chlorides. Reinforcement shall be stored under a waterproof shelter and supported above the surface of the ground or any water lying on the ground. Any damage which occurs to the galvanised coating in the course of transit or fixing in the works shall be renovated by the application of an approved metallic zinc-rich paint as instructed by the Engineer.

2.4 Condition prior to fixing

- A. At the time of fixing in position and concreting, all reinforcement shall be free from pitting, loose rust, millscale, paint, oil, grease, adhering earth, salts or any other material that may impair the bond with the concrete, or that may cause corrosion of the reinforcement or disintegration of the concrete.
- B. Prior to concrete placement all reinforcement fixed in place shall be washed down with fresh water.

2.5 Concrete cover blocks

- A. Concrete cover blocks shall be as small as possible consistent with their purpose and of a shape acceptable to the Engineer. They shall be designed and fixed so that they will not overturn when the concrete is placed. They shall be made of concrete with 3/8" (10mm) maximum aggregate size and the mix proportions shall be such as to produce the same strength as that of adjacent concrete.
- B. Proprietary plastic cover supports may be used with the approval of the Engineer.

2.6 Fibre reinforcement

Not applicable.

Part 3. Execution

3.1 Fixing reinforcement

- A. The number, size, form and position of all members of the reinforcement shall be in accordance with the drawings, and bar bending schedules if provided.
- B. Reinforcement shall be accurately fixed and by approved means maintained in the position described on the drawings and elsewhere. Bars intended to be in contact at passing points shall be securely wired together at all such points with #16 gauge galvanised annealed soft iron tying wire and the ends of the tying wire shall be turned into the main body of the concrete. Spliced bars shall be placed in contact and wired to provide consistent cover.
- C. Links and the like shall tightly embrace the bars with which they are intended to be in contact and shall be securely wired.
- D. All steel fabric shall be lapped two meshes unless otherwise shown on the drawings and be bound securely to the supporting bars with galvanised soft-iron wire of #16 S.W.G.

- E. Reinforcement projecting from work being concreted or already concreted shall not be bent out of its correct position for any reason.
- F. The vertical distances required between successive layers of bars in beams and similar members shall be maintained by the provision of steel spacer bars inserted at such intervals that the main bars do not perceptibly sag between adjacent spacer bars. The diameter of such spacer bars shall be the greatest of the following:
 - 1. the maximum size of coarse aggregate plus 1/4" (6mm);
 - 2. the diameter of the largest bar being spaced;
 - 3. 1" (25mm).
- G. No concreting shall be carried out until the reinforcement has been inspected and approved by the Engineer. The Contractor shall notify the Engineer when the reinforcement is fixed in position as soon as it is final, but at least 24 hours prior to concreting.
- H. No adjustment of reinforcement is permitted after concrete placement has commenced.

3.2 Cutting and bending

- A. Bars shall not be cut nor bent on site without the prior approval of the Engineer; cutting and bending where permitted shall be in accordance with BS 8666.
- B. Neither the diameter nor the length of a bar shall be less than the diameter or length described in the bar schedule or elsewhere.
- C. The Contractor shall be responsible for checking and verifying the accuracy of the bar bending schedules, if provided, and reinforcement details prior to cutting and bending reinforcement.
- D. Bars shall be bent cold by machine or other approved means producing a gradual and even motion. Bars incorrectly bent shall not be re-bent and incorporated in the works and no reinforcement shall be bent when in position in the works, whether or not it is partially embedded in hardened concrete.
- E. Bends shall comply with the dimensions given in the bending schedule. Dimensions of bent bars and internal dimensions of links and the like shall not exceed the dimensions given on the bar schedule and elsewhere. Unless described otherwise, bending dimensions shall conform to BS 8666.

- F. The internal radii of bends shall be not less than 3 times the diameter of the bar for bars not greater than 3/4" (19mm) and 4 times the diameter for bars over 3/4" (19mm).

3.3 Welding reinforcement

- A. Reinforcement in structures shall not be welded except where permitted in the Contract. All welding procedures shall be subject to the prior approval of the Engineer in writing.

3.4 Support to reinforcement

- A. The distribution and design of reinforcement supports shall be to the approval of the Engineer. No support may be removed during concreting operations.

3.5 Cover to reinforcement

- A. The cover of concrete to the reinforcement does not include any applied finish, and shall be as described on the drawings. Cover shall be provided and maintained within a tolerance of + 1/8" (3mm) by means of pre-manufactured bar spacers. The use of pieces of block, stone, wood, metal or porous tile will not be allowed for this purpose.
- B. Where concrete cover to reinforcement is not described on the drawings it shall be in accordance with the following:

Condition	Cover
Completely protected against weather and aggressive conditions, except for a brief period of exposure to normal weather conditions during construction.	1 1/2" (38mm)
Exposed to driving rain, alternate wetting and drying, subject to heavy condensation of corrosive fumes and concrete continuously under water. Cast against and permanently exposed to earth.	2" (50mm)
Exposed to sea water or marsh water with abrasion.	3" (75mm)
Exposed ends of bars in a beam, slab or the like.	Twice the bar diameter or 2" (50mm) whichever is greater

3.6 Laps and joints

- A. Laps and joints shall be made only by the methods specified, for the length specified and at the positions shown on the drawings unless otherwise approved by the Engineer.
- B. Unless specified otherwise on the drawings, all laps in bars shall be a minimum of 50 bar diameters.

Part 1. **General**

1.1 Codes and standards

- A. All concrete work shall be in accordance with the British Standard Code of Practice BS 8110.

1.2 Testing and sampling

- A. The Contractor shall be responsible for providing qualified personnel and site equipment for all testing and sampling of concrete as instructed by the Engineer.
- B. Compliance with the specified characteristic compressive strength of the concrete shall be judged by tests made on 6" (150mm) cubes at an age of 28 days in accordance with BS 1881. Where the Contractor requires an early indication of the strength of the concrete, additional cubes may be taken and tested at 7 days at the option of the Contractor, and these results shall also be forwarded to the Engineer

- C. The tests will require the preparation of 4 cubes, each made from a single sample taken from a randomly selected batch of concrete. Cubes shall be labeled A,B,C,D for any particular sample and in a numerical order for the number of samples. A test result is defined as the mean compressive strength of two cubes tested at 28 days.

$$\text{i.e Test result X} = (\text{Comp strength cube A} + \text{Comp strength cube B})/2$$

$$\text{Test result Y} = (\text{Comp strength cube C} + \text{Comp strength cube D})/2$$

- D. The samples, where practicable, should be taken at the point of discharge from the mixer, or in the case of ready-mixed concrete at the point of discharge from the delivery vehicle. The samples shall be taken as representative, but not ones taken at the beginning or end of the discharge.
- E. The number, frequency and location of tests shall be decided by the Engineer, but the maximum quantity of concrete that four consecutive test results shall represent shall be limited to 13 yd³ (10 m³).
- F. Compliance with the specified characteristic compressive strength shall be assumed if the following conditions are met:
1. the average strength determined from any group of four consecutive test results exceeds the specified characteristic strength by:
 - a) 3 N/ sq mm for concretes of grade 20 and above, or,

- b) 2 N/sq mm for concretes of grade 7,10 and 15.
2. the strength determined from any test result is not less than the specified characteristic strength minus:
- a) 3 N/sq mm for concretes of grade 20 and above, or,
 - b) 2 N/sq mm for concretes of grade 7,10 and 15.

If only one test result fails to meet the second requirements then that test result may be considered to represent only the particular batch of concrete from which that test was taken provided the average strength of the group satisfies the first requirement.

If more than one test result in a group fails to meet the second requirement or if the average strength of any group of four consecutive test results fails to meet the first requirement then all the concrete represented by all such samples shall be deemed not to comply with the strength requirements.

- G. All test cubes shall be labeled as described herein, and shall, approximately 24 hours after casting, be transported to the Ministry of Public Works Quarry for curing and testing. Test results shall be forwarded to the Engineer.
- H. The Engineer may require the testing of additional cubes for special purposes including the time at which to strike formwork and the strength of concrete under hot weather conditions. These additional cubes shall be made and tested in accordance with BS 1881, but the methods of sampling shall be varied to suit the purpose for which they are required. Sampling where possible shall be at the point of placing and the cubes shall be stored so far as possible under the same conditions as the concrete in members to which they relate. The extra cubes shall be clearly identified at the time of making and shall not be used as part of the normal quality control or compliance procedures.
- I. The cement content of any batch of concrete shall be not less than the specified minimum value minus 5% of that value, not more than the specified maximum value plus 5% of that value, unless otherwise approved by the Engineer.
- J. On every- batch of concrete the workability shall be measured by either the standard slump test or the compacting factor test all in accordance with BS 1881 and shall be within the following limits:

1. Slump Test		
	Specified Value	Tolerance
	3/8"(10mm)	+ 1 3/8" (+35mm)
		- 3/8" (-10mm)
	1"(25mm)	+ 1 3/8" (+35mm)
		-1" (-25mm)
	2"(50mm)	± 1 3/8" (+35mm)
	3"(75mm) and over	± (1/3 specified slump + 3/8" (10mm)
2. Compaction Factor Test		
	± 0.03 where the required value is 0.90 or more;	
	± 0.04 where the required value is less than 0.90 but more than 0.8;	
	+ 0.05 where the required value is 0.8 or less.	

The slump shall be sampled in accordance with BS 1881:Part 102. If the concrete is delivered in a mixing or agitation truck the slump is measured in a sample obtained from the initial discharge. There shall be allowed a discharge of approximately 0.4 yd³ (0.3m³) of concrete (which shall not be placed until a satisfactory- test is achieved) and then the sample shall be taken.

If the first test result fails to meet the specified limits a second set of results shall be tested. Two failures constitute a rejection of that batch of concrete.

- K. Any additional tests required by the Engineer to comply with this specification as a result of failure of routine tests shall be performed at the expense of the Contractor.

Reports of each test taken shall be supplied to the Engineer and shall contain the following:

1. Name of project and the position of placement.
 2. Name of supplier.
 3. Date and time of delivery- to site.
 4. Time from sampling to commencement of test.
 5. Form of slump, whether true, shear or collapse.
 6. Measured true slump.
 7. Name of person carrying out test.
- L. Should any of the results of the specified works tests be unsatisfactory, the Engineer may take one of the following actions:
1. Reject the work and instruct replacement of the unsatisfactory work

2. Instruct the Contractor to carry out additional tests and/or works to ensure the soundness of the work
- M. The Contractor shall note that the target strength for the concrete mix design shall be substantially greater (in the order of 10 N/sq mm) than the specified characteristic compressive strength. To ensure that no more than 5% of the concrete falls below this value the Engineer may instruct the contractor to take one or both of the following steps in the event of test cubes failing to meet the required standard:
1. Alter his methods of making concrete and control quality to reduce variability;
 2. Alter the proportions of the concrete mix to increase the compressive strength.

1.3 Load tests of structures or parts of structures

- A. The Engineer shall instruct the Contractor to make a loading test on the works if in the opinion of the Engineer such a test is necessary. The test shall be in accordance with BS8110, and shall be carried out as soon as possible after the expiry of 28 days from the time of placing the concrete.
- B. The test loads to be applied shall be specified by the Engineer and shall be equal to the characteristic imposed load and shall be maintained in place for 24 hours. If any of the final dead load is not in position on the structure, compensating loads shall be added as directed.
- C. During the tests, struts and bracing strong enough to support the whole load should be placed in position leaving a gap under the members to be tested, and adequate precautions should be taken to safeguard persons in the vicinity of the structure.
- D. Measurements of deflection and crack width shall be taken immediately after the application of load, at the end of the 24 hour loaded period, after removal of the load and after a 24 hour recovery period.
- E. The maximum permissible deflection measured immediately after application of the test load shall be as specified by the Engineer, which for members spanning between two supports shall be not more than 1/500 of the effective span.
- F. If, within 24 hours of the removal of the test load the part of the works under test does not show a recovery of at least 85% of the maximum deflection shown during the 24 hours under load, the loading shall be repeated. The structure shall be considered to have failed to pass the test if the recovery

after the second loading is not at least 85% of the maximum deflection shown during the second loading.

- G. If the result of any test is not satisfactory, the Engineer shall instruct that the part of the works concerned shall be taken down or cut out and reconstructed to comply with the Specification, or that other measures shall be taken as directed. The Contractor shall conduct the test and shall take down or cut out and reconstruct the defective work or shall execute remedial measures as directed.

Part 2. **Products**

2.1 **Cement**

- A. Unless otherwise noted, cement shall comply with BS 12 and BS 146 or equal approved.
- B. Neither masonry cement nor high alumina cement shall be used in structural concrete.
- C. All cement shall be fresh when delivered to the site, and unless delivered in bulk, shall be in the original sealed bags or drums of the manufacturers. It shall be stored in a suitable weatherproof building of ample size, with raised floors giving adequate protection against the effects of moisture from any source. Manufacturers' certificates shall be submitted to the Engineer on request.
- D. Cements of different types shall not be mixed and consignments shall be used in the order of delivery.
- E. Cements shall be delivered in quantities that ensure there is no suspension nor interruption of the work of concreting at any time.
- F. If in the opinion of the Engineer any cement has become injuriously affected by damp or other causes, it shall at once be removed from the site. All cement shall remain stored at the sole responsibility of the Contractor.

2.2 **Aggregates**

- A. Generally:
1. Materials used as aggregate shall be obtained from a source known to produce aggregates satisfactory for concrete and shall be chemically inert, strong, hard, durable, of limited porosity, and free from adhering coatings, clay lumps, residues and organic or other impurities that may cause corrosion of the reinforcement or may impair the strength or

durability of the concrete. Aggregates shall be natural gravels or crushed stone complying with BS 882 or as specified by the Engineer.

B. Fine aggregate:

1. Fine aggregate shall be natural sand, excluding beach sand, or sand derived by crushing gravel or stone. It shall be clean, sharp, and free from coagulated lumps without any admixtures of clay or other foreign matter.
2. Sand derived from stone unsuitable for coarse aggregate shall not be used as fine aggregate.
3. The grading of fine aggregate shall be such that not more than 10% shall exceed 3/ 16" (5mm). For a natural sand or crushed gravel not more than 10%, and for crushed stone not more than 20% shall pass BS sieve No. 100. Between these limits the grading shall conform to the grading for either Zones 1,2 or 3 (BS 882) or Zone 4 if so instructed.

C. Coarse aggregate

1. Coarse aggregate shall be crushed or uncrushed gravel or crushed stone. It shall be clean and free from any clay admixtures and other foreign matter. The pieces shall be angular, or, except for concrete surfaces subject to abrasion, rounded in shape and shall have granular or crystalline or smooth (but no glossy), non-powdery surfaces. Friable, flaky and laminated pieces, mica and shale shall only be present in such quantities that do not adversely affect the strength and durability of the concrete.
2. After 24 hours immersion in water, a previously dried sample of the coarse aggregates shall not have gained in weight more than 10% or not more than 5% if for use in impermeable construction.
3. The grading of coarse aggregate is such that not more than 5% is larger than 3/4" (19mm) and not more than 10% is smaller than 3/16" (5mm) and not less than 25% nor more than 55% is smaller than 3/8" (10mm).

D. All-in aggregate

1. All-in aggregate shall only be used for concrete grade 15 or below, unless the Engineer gives written approval otherwise. All-in aggregate shall comply in all respects except grading with the requirements for fine and coarse aggregates, and except for grading tests shall be separated into two groups: material smaller than 3/ 16" (5mm) and material of 3/16" (5mm) and over. These materials shall be considered as fine and coarse aggregates respectively.

2. The grading of all-in aggregate shall be such that not more than 5% shall exceed 1- 1/2" (38mm) and not more than 6% shall pass B.S. sieve No. 100, and not less than 45% nor more than 75% is smaller than 3/4" (19mm) and not less than 25% or more than 45% is smaller than 3/16" (5mm).

E. Storage of aggregates

1. Aggregates shall be handled and stored to minimise segregation and contamination. They shall be stored to size separately on hard standings or timber platforms, and kept clean and well drained and free from surface water in order that the materials are not be contaminated before use.

F. Testing of aggregates

1. Aggregates shall be tested in accordance with BS 812 and the results of such tests shall comply with the requirements of B,C,D & E the percentages being by weight.

2.3 Water

- A. Water shall be potable, clean, fresh and free from organic and inorganic matter in solution or suspension in the concrete. Water shall be obtained from an approved source and must not be obtained from a well, excavation, underground source or the sea.
- B. Only water of approved quality shall be used for washing out formwork, curing concrete, and similar purposes. Water for making concrete shall be tested in accordance with BS 3148.

2.4 Admixtures

- A. Suitable admixtures may only be used in structural concrete mixes with the prior approval of the Engineer. The amount added and the method of use shall be to the strict instructions of the manufacturer and the approval of the Engineer.

2.5 Building paper

- A. Building paper shall comply with BS 1521.

Part 3. Execution

3.1 Concrete grades

A. The concrete grade designations are given in Table C.1 below:

Grade	Characteristic strength		Lowest grade for compliance with use
	N/mm ²	psi	
7	7.0	1015	Blinding concrete
10	10.0	1450	Mass concrete
15	15.0	2175	Plain, unreinforced concrete
20	20.0	2900	Reinforced concrete
25	25.0	3625	Marine concrete

TABLE C.1- CONCRETE GRADE DESIGNATIONS

B. The characteristic strength of concrete is that 28 day cube strength below which not more than 5% of the test results may be expected to fall.

3.2 Quality of concrete mixes

A. For the specified grade of concrete the Contractor shall design the mix in accordance with BS 8110 and within the limits indicated in Table C.2 below:

Grade	Max. size aggregate	Min. cement content	Max. free W/C ratio	Characteristic strength (150mm cube)
	mm (in)	kg/m ³ (pcy)	by weight	N/mm ² (psi)
7	14 (9/16)	290 (490)	0.55	7 (1015)
10	20 (3/4)	330 (557)	0.55	10 (1450)
15	20 (3/4)	330 (557)	0.55	15 (2175)
20	20 (3/4)	340 (574)	0.50	20 (2900)
25	20 (3/4)	360 (607)	0.50	25 (3625)

TABLE C.2 -CONCRETE MIXES

B. The cement content of the mix shall not exceed 500 kg/m³ (844 pcy) without the approval of the Engineer.

C. The total chloride content of the concrete mix shall not exceed 0.35% of chloride ion by weight of cement for concrete made with ordinary Portland cement. The chloride content shall be measured in accordance with BS 1881.

- D. The total sulphate content of the mix shall not exceed 4.0% of sulphur trioxide by weight of cement. The sulphate content shall be measured in accordance with BS 1881.
- E. The Contractor shall demonstrate to the Engineer's satisfaction that the proposed mix will develop the required strength prior to the commencement of concreting, by either submitting a history of test results for the mix or by carrying out trial mixes in accordance with Part 3.4. G, H and I of this Section.

3.3 Workability

- A. The workability of the fresh concrete should be such that the concrete is suitable for the conditions of handling and placing so that after compaction it surrounds all reinforcement and fills the formwork, subject to the approval of the Engineer.
- B. The workability of the mix may be improved by the use of an admixture if approved by the Engineer.

3.4 Batching and mixing

- A. The weighing and water-dispensing mechanisms shall be maintained in good order. Their accuracy shall be maintained within the tolerances described in BS 1305 and checked against accurate weights and volumes when required by the Engineer
- B. The weights of cement and each size of aggregate as indicated by the mechanisms employed shall be within a tolerance of $\pm 2\%$ of the respective weights per batch agreed by the Engineer. The weights of the fine and coarse aggregates shall be adjusted to allow for the free water contained in them. The water added to the mix shall be reduced by the quantity of free water contained in the fine and coarse aggregates, which shall be determined by the Contractor by a method approved by the Engineer immediately before mixing begins, and further as the Engineer requires.
- C. Concrete shall be mixed in a batch type mixer manufactured in accordance with BS 1305 or in a batch type mixer that has been tested in accordance with BS 3963 and has a mixing performance within the limits of Table 6 of BS 1305.
- D. The cement and aggregates shall be thoroughly mixed in the required proportions and the water shall not be admitted to the drum of the mixer until all the cement and aggregate constituting the batch are in the drum. Mixing shall continue until the concrete is uniform in colour and for not less than two

- minutes after all the materials and water are in the drum. The entire contents of the drum shall be discharged before the materials for the succeeding batch are fed into the drum. No partly set or re-tamped concrete shall be used. Partly set or excessively wet concrete shall not be used on the works and shall be immediately removed.
- E. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before any fresh concrete is mixed. Unless otherwise agreed by the Engineer the first batch of concrete through the mixer shall then contain only two-thirds of the normal quantity of coarse aggregate. Mixing equipment shall be thoroughly cleaned before changing types of cement.
- F. During hot weather the Contractor shall ensure that the constituent materials of the concrete are sufficiently cool to prevent the concrete from stiffening in the interval between its discharge from the mixer and compaction in its final position.
- G. Trial mixes: where trial mixes are required, three separate batches of concrete shall be made using materials likely to be typical of the proposed supply and preferably under full scale production conditions. If circumstances make this inconvenient, the batches may be mixed in a laboratory unless this is specifically precluded by the Engineer. Sampling and testing should be in accordance with BS 1881 and BS 5328.
- H. The workability of each of the trial batches should be determined and three cubes made from each batch for test at 28 days. A further three cubes from each batch shall be made for testing at an earlier age if required. The trial mix proportions should be approved if the average strength of the nine cubes tested at 28 days exceeds the specified characteristic strength by 10 N/sq mm or the nine tests at a earlier age indicate that is likely to be exceeded by this amount
- I. During production the Engineer may require trial mixes to be made before a substantial change is made in the materials or in the proportions of the materials to be used.

3.5 Ready-mixed concrete

- A. Ready mixed concrete as defined in BS 5328, batched off the site, may be used only with the agreement of the Engineer and shall comply with all requirements of the Specification and Contract.
- B. The concrete shall be carried in purpose made agitators operating continuously, or truck mixers. The concrete shall be compacted and in its final

position within 1 1/2 hours of the introduction of cement to the aggregates, unless a longer time is agreed by the Engineer. The time of such introduction shall be recorded on the Delivery Note together with the weight of the constituents of each mix, water/cement ratio strength admixtures and any other pertinent information. The following information shall be added to the delivery ticket on site; the time of completion of discharge; the location in the works of the batch of concrete, and the quantity of any water added to the mix on site and the name of authorising officer. Copies of all Delivery Notes for each day's work are to be bound and delivered to the Engineer to form part of his site records.

- C. When truck mixed concrete is used, no water may be added to the mix at the site, without the express approval of the Engineer, and in no circumstances shall water be added in transit.
- D. Mixing shall continue for not less than 100 revolutions at a rate of not less than 7 revolutions per minute.
- E. Any ready-mix truck containing concrete which has been rejected by the Engineer for whatever reason shall be removed from the site and deposited elsewhere. Under no circumstances will any addition of material such as cement, aggregate or water and remixing of the original batch be allowed.

3.6 Transporting concrete

- A. Concrete shall be transported in such a manner as to avoid the contamination, segregation or loss of constituent materials. The method of transporting shall be subject to the approval of the Engineer.

3.7 Placement of concrete

- A. Mixing and distributing equipment shall be clean before commencing mixing and distribution of the concrete and such equipment shall be kept free from set concrete. The method of placing concrete shall be to the approval of the Engineer.
- B. Before proceeding to place the concrete, the formwork shall be realigned, if necessary, and all formwork, and reinforcement contained in it, shall be clean and free from standing water.
- C. Concrete shall not be placed in any part of the structure until the approval of the Engineer has been given. A minimum of 24 hours notice shall be given prior to any concrete placement.

- D. If concreting is not started within 24 hours of approval being given, approval shall again be obtained from the Engineer. Concreting shall then proceed continuously over the area between construction joints or to the approved extent. If stopping of concrete placing is unavoidable elsewhere, a construction joint shall be formed where the work stopped. Fresh concrete shall not be placed against in-situ concrete which has been in position for more than 30 minutes unless a construction joint is formed in accordance with Part 3.10. of this Section. When in-situ concrete has been placed for more than 4 hours no further concrete shall be placed against it for a further 20 hours.
- E. Concrete, when deposited, shall have a temperature of not less than 41 ° F (5° C) and no more than 86° F (30° C). It shall be compacted in its final position within 30 minutes of discharge from the mixer.
- F. Except where otherwise agreed by the Engineer, concrete shall be placed in a single operation to the full thickness of slabs, beams and similar members. Concrete shall be placed directly in its permanent position and shall not be worked along the forms to that position.
- G. Concrete shall not be dropped into place from a height exceeding 3' (1.0m). When trunking or chutes are used they shall be kept clean and used in such a way as to avoid segregation. In general, trunking or chutes shall not be more than 20° from vertical.
- H. Should the Contractor require placing concrete by pumping he shall first obtain permission from the Engineer and shall submit complete details of the proposal for approval.
- I. All cement slurry and other material used to lubricate pump pipes shall be run to waste and not deposited in the works.
- J. Should continuous pumping of concrete be suspended, all concrete remaining in the pump and pipes for longer than 30 minutes shall be run to waste and not deposited in the works.
- K. No concrete shall be placed in flowing water. Underwater concrete shall be placed in position by tremies, or by pipeline from the mixer. Full details of the method proposed shall be submitted to the Engineer and his approval obtained before placing begins. Where the concrete is placed by a tremie, its size and method of operation shall be in accordance with (U.K.) Civil Engineering Code of Practice , "Foundations". Forms shall be provided in all faces of concrete placed between tides, the top face being closed immediately after completion of placing and before subsequent submersion. During and after concreting underwater, pumping or dewatering operations in

the immediate vicinity shall be suspended until the Engineer permits them to be continued.

3.8 Effects of the weather

- A. During hot weather the Contractor shall ensure that the constituent materials of the concrete are sufficiently cool to prevent the concrete from stiffening in the interval between its discharge from the mixer and compaction in its final position. Alternatively the Contractor may incorporate in a mix a plasticiser of a make and in a proportion which has been shown by laboratory tests and full scale trial to be to the satisfaction of the Engineer, to eliminate detrimental effects of high temperature without introducing any other detrimental effect, and for which he takes full responsibility in these two respects.
- B. The following may be used to keep the temperature of concrete below the above limitations:
1. Chilling of concrete water by heat exchange coils or by addition of broken ice, provided that the water is free from ice at the time of entry into the mixer;
 2. Cooling of coarse aggregate by watering, provided that the water content of the aggregate so cooled is uniform;
 3. Reclaiming of aggregate from stockpiles by the tunnel method to avoid using the surface layer of the stockpile, with shade and wind protection of conveyor elevating to batching plant;
 4. Night work provided that 1,2 and 3 are proved inadequate or unsatisfactory in their results and provided also that the Engineer has no other reason for refusing permission for night work and subject to Section 01010 Part 1.5.
- C. The Engineer shall have the power to order the suspension of concrete production and/or laying when the shade temperature exceeds 86°F (30°C) if he is not satisfied that the precautions being taken or intended by the Contractor are adequate to:
1. Prevent the temperature of the concrete rising above 86° F (30° C) or;
 2. Avoid any detrimental effect in the use of a plasticiser. This power of the Engineer shall not relieve the Contractor of his responsibilities.
- D. Concrete shall not be laid during heavy or prolonged rain. Suitable protection shall be readily available to protect the concrete after placement during adverse weather conditions.

3.9 Compaction

- A. All concrete shall be compacted to produce a dense homogenous mass. Unless otherwise agreed by the Engineer, it shall be compacted with the assistance of immersion (poker) vibrators. Vibration shall continue until all the air bubbles have dispersed and the tone of the vibrator becomes constant and in a manner that does not promote segregation. Sufficient vibrators in serviceable condition shall be on site so that spare equipment is always available in the event of breakdowns.
- B. Immersion vibrators shall be capable of producing not less than 10,000 cycles per minute, and in the opinion of the Engineer be of suitable diameter to deliver an effective radius of action.
- C. Vibration shall not be applied by way of the reinforcement and contact with all reinforcement and inserts shall be avoided, so far as is practicable.
- D. Concrete shall not be subjected to vibration between 2 and 24 hours after compaction.

3.10 Construction joints

- A. Construction joints shall be square and shall be vertical or horizontal, as required, except that in an inclined or curved member the joint shall be at right angles to the axis of the member.
- B. The position and detail of any construction joints not described in the contract shall be subject to the approval of the Engineer, and shall be arranged to minimise the possibility of the occurrence of shrinkage cracks.
- C. Construction joints not shown on the drawings and elsewhere shall with the approval of the Engineer be in accordance with the following:-
 - 1. A joint shall be formed horizontally at the top of a foundation and 3" (75mm) below the lowest soffit of the beams meeting at the head of a column. A joint shall be formed in the rib of a large "T" or "L" beam 1" (25mm) below the soffit of the slab. Concrete in a haunch or a splay on a beam or a brace, and in the head of a column where beams meet, shall be placed without a joint at the same time as that in the beam or beams and brace. Concrete in the splay at the junction of a wall and a slab shall be placed without a joint at the same time as that in the slab. Concrete in an upstand, or starter, at the bottom of a wall or at the bottom of a lift of a column shall, if so shown on the drawings, be placed at the same time as the slab or other work from which the upstand projects.

2. Concrete in a beam shall be placed without a joint, but if the provision of a joint is unavoidable, the joints shall be vertical and within the middle third of a span. A joint in a slab shall be vertical and parallel to the principal reinforcement.
- D. The upper surface of lifts of concrete walls and columns shall be horizontal and if the formwork extends above the joint on the exposed face it shall be cleaned of adhering concrete before the next lift is placed. The concrete placed immediately above a horizontal construction joint shall contain only two-thirds the normal quantity of coarse aggregate, shall not be the first batch through the mixer, and shall be thoroughly compacted and worked against the existing concrete.
 - E. Where sections of the work are carried out in lifts, the reinforcement projecting above the lift being cast shall be adequately supported to prevent movement of the bars during the casting and setting of the concrete.
 - F. All laitance, loose material and cement paste shall be removed by wire brushing while the concrete is still green, to expose, but not dislodge, the coarse aggregate, and no further roughening shall then be required. Where this is not possible, it shall be removed by mechanical means without damaging the aggregates, provided the concrete has been in position for more than 24 hours. The roughened surface shall then be washed with clean water and a 1:1 slurry of cement and concretes and shall, wherever possible, be well worked in immediately before the fresh concrete is placed.

3.11 Structure joints

- A. Expansion joints, contraction joints, hinges or other permanent structure joints shall be provided in the positions and of the form described in the drawings or elsewhere in the documents.

3.12 Protection of concrete

- A. Approved means shall be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, deleterious groundwater, mixing with earth or other materials, flotation and other influences that may impair the strength and durability of the concrete.

3.13 Finish to floor slabs

Not applicable.

3.14 Lintels

Not applicable.

3.15 Early loading

- A. Concrete shall at no time be subjected to loading, including its own weight, which will produce a compressive stress in it exceeding $\frac{1}{3}$ of the compressive strength at the time of loading.
- B. The strength of the concrete and the stresses produced by the loads shall be assessed only by the Engineer Materials and plant shall not be stacked on any newly constructed floor without the permission of the Engineer
- C. If the imposition of a load is anticipated, which in the opinion of the Engineer exceeds the design load, props shall be provided in an approved manner after removal of the formwork and before the imposition of the load. Props for an upper storey shall be placed directly over those in the storey immediately below and the lowest prop shall bear on work sufficiently strong to carry the load.

3.16 Equipment loading

- A. If it is proposed to use climbing tower cranes, or any type of plant or equipment which places any load on the reinforced concrete structure, then the Contractor shall submit full details of such plant or equipment to the Engineer for approval before installation.
- B. The loads from such plant or equipment shall be imposed on completed sections of the structure where the concrete has attained the minimum 28-day crushing strength.
- C. If necessary and acceptable, the Engineer may agree to strengthening the structure to take loadings imposed by plant or equipment The Contractor shall be responsible for reinstating all damage caused.

3.17 Fixtures, indentations and voids

- A. No openings, chases, holes or voids other than those indicated on the drawings shall be formed in the concrete without the approval of the Engineer.

- B. Details of any fixtures to be permanently built into the concrete shall be submitted to the Engineer for his approval. Fixing lugs, Lewis bolts, timber plugs and all other fixtures must comply with the requirements of the Engineer and must be of a character and size to avoid any weakening or chemical contamination of the structural concrete.

Part 1. **General**

1.1 Curing generally

- A. Notwithstanding the provision for special sequences of casting as directed by the Engineer, the Contractor shall at all times ensure proper curing of the works.
- B. Immediately after compaction, concrete shall be protected from the sun, wind and rain, and be prevented from drying out by one of the following methods for a period of at least 4 days:
 - 3. Water spraying or ponding.
 - 4. Wet coverings of hessian or sand.
 - 5. Covering with waterproof paper or polythene sheet
 - 6. Applying an approved coloured curing compound in strict accordance with the manufacturer's instructions.
- C. If the concrete being cured is exposed to the sun, the curing compound shall be a proprietary product containing white pigment or be an aluminised compound. The curing compound shall be kept clear of any construction joint surfaces and be compatible with floor finishes, adhesives for tiles, etc.

Part 1. **General**

1.1 Precast members

- A. A detailed method statement, drawings and method of manufacture shall be submitted to the Engineer for approval two weeks before work is started. When the method has been approved no changes shall be made without the consent of the Engineer.
- B. The Contractor shall inform the Engineer before commencement of manufacture and casting of each type of member.
- C. A copy of all 28 day cube test results relating to members cast off the site shall be sent to the Engineer as soon as they become available. Where the Engineer requires tests to be carried out, no members to which the tests relate shall be dispatched to the site until the tests have been satisfactorily completed.
- D. Members shall be lifted or supported only at points shown on the drawings or approved by the Engineer and shall be handled and placed without impact.

Part 1. General

1.1 Scope

- A. Sealants (non fire-rated types and excluding tile sealants) in the following locations:
 - a) Expansion joints between structural members;
 - b) Joints between metal frames and adjacent materials;
 - c) Joints between dissimilar materials;
 - d) Open joints where materials or workmanship does not allow a neat, finished waterproof condition;
 - e) Behind all escutcheon plates and pipe penetrations in high moisture areas;
 - f) Around electrical boxes and pipe penetrations etc. in sound-rated partitions (those with acoustical insulation);
 - g) Top and bottom of interior gypsum board partitions both sides;
 - h) Other locations indicated on the drawings.

1.2 Submittals

- A. The Contractor shall submit the manufacturer's descriptive literature for each material including preparation and installation instructions and intended uses.
- B. The Contractor shall submit samples of the full range of colours for each type of sealant for selection by the Architect.

1.3 Quality control

- A. The Contractor shall provide test samples of all types of required sealants on all types of surfaces to be sealed, at least 2 months prior to site application of sealants, to indicate adhesion and weather-tight characteristics.

1.4 Delivery, storage and handling

- A. Materials shall be delivered to the site in original, unopened containers or bundles with labels legibly intact.
- B. The Contractor shall store materials to prevent their deterioration or damage due to moisture temperature changes, contaminants or other causes. Materials that have exceeded the manufacturer's recommended shelf life shall not be used.

1.5 Environmental conditions

- A. The Contractor shall not proceed with the installation of sealants when ambient and substrate temperature conditions are beyond the limits permitted by the sealer manufacturers, nor when joint substrates are wet or otherwise contaminated.

1.6 Joint width conditions

- A. The Contractor shall not proceed with the installation of joint sealants when joint widths are greater or less than allowed by sealant manufacturers for the applications indicated.

Part 2. Products

2.1 Materials

- A. Silicone sealant (structural joints, expansion control joints, precast panel joints and door, louvre and window frames) shall be as follows:
- i. Ready-to-use form with no premixing.
 - ii. Approved products are:
 - a) General Electric "Silicone Sil-Prof Sealant".
 - b) Dow Corning "790 Building Sealant".
 - c) Pecora "864 One-Part Architectural Silicone Sealant".
- B. Urethane sealant joints in concrete paving shall be as follows:
- i. Two-part self-levelling sealant.
 - a) Approved products are:
 - b) Pecora "Urexpan Nr-200"
 - c) Sonneborn "Sonolastic Paving Joint Sealer"
 - d) Tremco "TIIC 900"
 - e) Sika "Sikaflex 2C-SL"
- C. Latex caulk (interior use) shall be as follows:
- i. Approved products are:
 - a) Pecora "AC-20 One-Part Acrylic Latex Caulk"
 - b) Sonneborn "Sonolac Acrylic Latex Caulk"
 - c) Tremco "Acrylic Latex 834 Caulk"

- D. Mildew-resistant silicone rubber sealant (interior joints in wet areas) shall be as follows:
 - i. One-part elastomeric sealant
 - ii. Approved products are:
 - a) General Electric "#1702 Sanitary Sealant"
 - b) Dow-Corning "786 Sealant".
- E. Joint backing rod shall be as follows:
 - i. Closed cell polyurethane rod designed for use with cold applied joint sealants and of sizes required for joint designs.
 - ii. Approved products are:
 - c) Dow Chemical "Ethafoam"
 - d) Sonneborn "Sonofoam"
 - a) Hercules "Backer Rod"
 - b) Industrial- Thermal Polymers "Blue Rod"
- F. Compressible joint fillers (for movement joints) shall be as follows:
 - a) Flexcell as manufactured by Expandite Ltd. with bitumastic coating.
 - b) Architect's approved equivalent.

Part 3. Execution

3.1. General

- A. Sealant shall only be applied to clean, smooth and dry surfaces when the temperature is between 50 degrees and 80 degrees Fahrenheit.
- B. Where primer or sealant may stain adjacent areas, joints shall be masked prior to application. Masking tape shall not be removed until after joints have been tooled and initial cure of sealant has taken place.

3.2. Cleaning

- A. Concrete and masonry shall be sandblasted, ground or wire brushed, with all dust removed from surfaces to be primed or sealed and all joints raked out.

3.3. Backing material

- A. The Contractor shall verify the compatibility of backing materials with sealant before installation.
- B. The Contractor shall use backer rods 50% wider than the width of the joint, so that sufficient pressure is exerted by material to provide substantial resistance to displacement.
- C. Sealant joint depth shall be half the joint width; where joints are too shallow to permit this, then approved non-adhering tape shall be used to isolate the bottoms of the joints in lieu of backer rods.
- D. Compressible joint fillers shall be installed prior to pouring concrete and shall be stopped short of face of joint to allow for back-up rod and sealant.

3.4. Release agent

- A. The Contractor shall provide release agent or bond-breaker strip in the joint to be sealed on top of the backer material, to prevent adhesion.

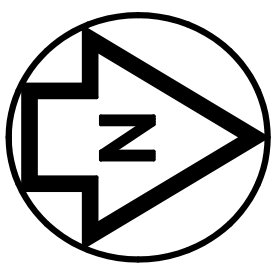
3.5. Sealant application

- A. Sealants requiring site mixing shall be prepared in accordance with the manufacturers' instructions, including time factors, and only enough sealant shall be mixed that can be used within the recommended application time.
- B. Materials shall be applied in accordance with the manufacturers' instructions using approved applicators to produce beads of proper width and depth.
- C. Within the manufacturers' specified time period, sealant joints shall be tooled in continuous strokes to produce even surfaces.

3.6. Clean up and making good

- A. Upon completion of the sealant installation the Contractor shall clean surrounding areas and protect sealants from damage and repair or replace damaged or defective sealant to produce aesthetic and weather-tight installations.

DRAWINGS:
S-0 COVER & LOCATION PLAN
S-1 NOTES
S-2 DOCK PLAN & REINFORCEMENT DETAILS

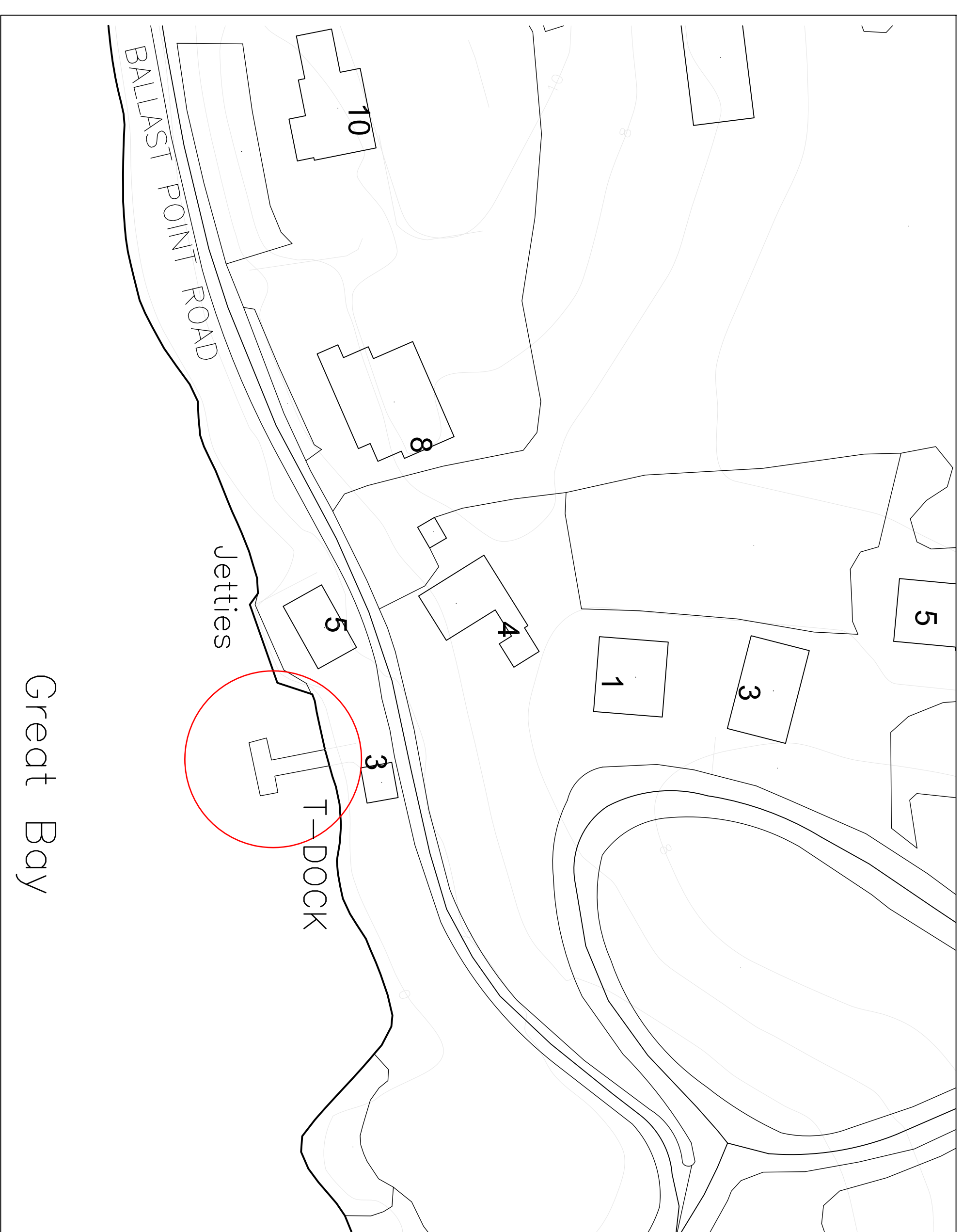


MINISTRY OF PUBLIC WORKS AND ENGINEERING
DEPARTMENT OF WORKS AND ENGINEERING
T DOCK CONCRETE WALKWAY
BALLAST POINT ROAD, ST. DAVID'S

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LOCATION PLAN

THE MINISTRY OF
PUBLIC WORKS

P.O. Box HM525, Hamilton, HM CX, Bermuda
Phone: (441)295-5151

DEPARTMENT OF
WORKS AND ENGINEERING
Fax: (441)294-9087

Structures Section

ISSUED FOR: TENDER 05/17

AMENDMENTS: NO REVISION	BY APP DATE

SCALE:

SURVEY
PREPARED BY: DATE:

DESIGN
PREPARED BY: DATE: 02/2017
R. GRAHAM-WARD
CHECKED BY: DATE: 02/2017

DRAWING
PREPARED BY: DATE: 02/2017
R. GRAHAM-WARD
CHECKED BY: DATE: 02/2017

APPROVED BY: DATE:

PROJECT NUMBER:

PROJECT NAME:

**T DOCK
BALLAST POINT ROAD**

CONCRETE DECK
ST.DAVID'S

SHEET TITLE:
COVER & LOCATION PLAN

SHEET NUMBER: S-0 REVISION

NOTES

1.0 GENERAL

- 1.1 THESE NOTES APPLY TO STRUCTURAL DRAWINGS
- 1.2 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- 1.3 ALL WORK IS TO BE DONE IN ACCORDANCE WITH THE MINISTRY OF WORKS AND ENGINEERING STANDARD SPECIFICATIONS.
- 1.4 ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATIONS FOR THIS PACKAGE. WHERE A DISCREPANCY EXISTS BETWEEN THE DRAWINGS AND SPECIFICATIONS IT SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
- 1.5 DO NOT SCALE THE DRAWINGS. DIMENSIONS ARE TO BE USED AS A GUIDE ONLY. CONTRACTOR TO FIELD MEASURE FOR ALL DIMENSIONAL REQUIREMENTS.
- 1.6 ALL DETAILS AND ARRANGEMENTS OF EXISTING CONDITIONS, DIMENSIONS, ETC. TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
- 1.7 CONTRACTOR TO MAKE GOOD ANY DAMAGES CAUSED ON SITE, REPAIRING TO MATCH EXISTING OR AS APPROVED BY THE MINISTRY OF WORKS AND ENGINEERING.

2.0 SCOPE OF WORK

- 2.1 UNLESS NOTED OTHERWISE THE CONTRACTOR SHALL SUPPLY ALL THE NECESSARY MATERIALS TO COMPLETE THE WORK.
- 2.2 THE WORK INVOLVES REMOVAL AND DISPOSAL OF THE TWO EXISTING CONCRETE WALKWAY SLABS/BEAMS AT T-DOCK, ST. DAVID'S AND THE INSTALLTION OF TWO NEW SLABS/BEAM ION THE EXISTING FOUNDATIONS AS PER THE DETAILS ON THE DRAWINGS.

3.0 CONCRETE

- 3.1 ALL CONCRETE IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- 3.2 CONCRETE MIX DESIGNS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- 3.3 CONCRETE STRENGTH TO BE A MINIMUM OF 45 MPa
- 3.4 CLEAR CONCRETE COVER TO BE 50mm (TYP).

- 3.5 REINFORCING CHAIRS TO BE PLASTIC, OR CONCRETE.

- 3.6 NO ADDITIVES TO BE USED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. NO WATER SHALL BE ADDED TO THE MIX ON SITE WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

- 3.7 THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING QUALIFIED PERSONNEL FOR ALL TESTING AND SAMPLING OF CONCRETE AS DESCRIBED IN THESE NOTES AND THE STANDARD SPECIFICATION. THE CUBES OR CYLINDERS SHALL BE TESTED AT THE CONTRACTOR'S EXPENSE AND THE RESULTS OF ALL TESTS SHALL BE SUBMITTED TO THE ENGINEER. TESTING AND SAMPLING FOR EACH POUR SHALL BE CARRIED OUT AT THE RATE OF 4 CYLINDERS OR CUBES FOR EVERY 10 CUBIC METERS OF CONCRETE IN THAT POUR.

- 3.8 THE CONTRACTOR SHALL GIVE A MINIMUM OF 24 HOURS NOTICE TO THE ENGINEER PRIOR TO POURING ANY CONCRETE.

4.0 REINFORCING STEEL

- 4.1 REINFORCING STEEL SHALL CONFORM TO CAN/CSA G30.18-M92(R1998) GRADE 400 DEFORMED BILLET STEEL WITH A MINIMUM COMPRESSIVE STRENGTH OF 400 MPa (OR APPROVED EQUAL).

- 4.2 REINFORCING STEEL TO BE GALVANISED IN ACCORDANCE WITH PART 1.1, SECTION 03200 OF THE SPECIFICATION.

- 4.3 REBAR AT ENDS OF CONCRETE LINTELS, STAIRS, PAD FOOTINGS, BEAMS AND SLABS ARE TO HAVE STANDARD 90° BENDS. ANY REBAR WHICH IS CUT AND BENT ON SITE SHALL HAVE TWO APPLICATIONS OF A 'ZINC' RICH PAINT APPLIED TO THE ENDS AND DAMAGED AREAS TO THE APPROVAL OF THE ENGINEER.

5.0 INSPECTION AND TESTING

- 5.1 CONTRACTOR TO PROVIDE 24 HOURS NOTICE FOR THE INSPECTION OF ALL REINFORCING, INCLUDING MASONRY REINFORCING PRIOR TO POURING CONCRETE.

- 5.2 CONCRETE TO BE TESTED BASED ON SPECIFICATION REQUIREMENTS. TESTING TO BE DONE BY SUPPLIER.

ISSUED FOR: TENDER 05/17

AMENDMENTS:

NO. REVISION BY APP DATE

NO.	REVISION	BY	APP DATE

SCALE:

SURVEY

PREPARED BY: DATE:

DESIGN

PREPARED BY: DATE: 02/2017

R.GRAHAM-WARD 02/2017

CHECKED BY: DATE: 02/2017

J.SAMARASEKERA 02/2017

DRAWING

PREPARED BY: DATE: 02/2017

R.GRAHAM-WARD 02/2017

CHECKED BY: DATE: 02/2017

J.SAMARASEKERA 02/2017

APPROVED BY: DATE: 02/2017

J.SAMARASEKERA 02/2017

PROJECT NUMBER:

PROJECT NAME:

**T DOCK
BALLAST POINT ROAD**

**CONCRETE DECK
ST DAVIDS**

SHEET TITLE:

NOTES

SHEET NUMBER: S-1

REVISION

ACAD 2002

THE MINISTRY OF
PUBLIC WORKS

P.O. Box HM625 Hamilton HMCK, Bermuda
Phone: (441)295-5151

DEPARTMENT OF
WORKS AND ENGINEERING
Fax: (441)294-9087

Structures Section

ISSUED FOR: TENDER 05/17

AMENDMENTS:

NO	REVISION	BY	APP	DATE

SCALE:	DATE:

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J. SAMARASEKERA
PROJECT NUMBER:

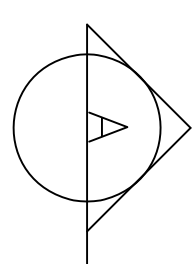
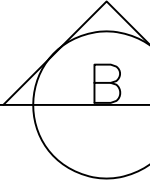
PROJECT NAME:
T DOCK
BALLAST POINT ROAD

CONCRETE DECK
ST.DAVID'S
SHEET TITLE:

DOCK PLAN & REINF DETAILS
SHEET NUMBER: REVISION

S-2

5265mm



1 PLAN VIEW
SCALE 1:10

T16 @ 200MM C/C EW BOTTOM

A393 MESH REINFORCEMENT TOP

5265mm

A393 REINFORCEMENT MESH
POLYSULPHIDE SEALING
COMPOUND ON TOP
20mm THK FIBREBOARD
T-20 STAINLESS STEEL
DOWELS (475mm LONG)
SPACED @ 600mm C/C
EMBEDDED W/ HILTI HIT-HY
200-A (Grip equivalent) 175mm
100-FASTENING CONCRETE PIER.
COAT EXISTING WITH A PIER.
INDUSTRIAL GREASE AGENT ON
THE NEW CONCRETE SIDE.

EXISTING CONCRETE PIER
TO BE REPAIRED AS
INSTRUCTED BY THE
CLIENT REPRESENTATIVE.

2 SECTION A
SCALE 1:10

50mm CONC. COVER (TYP)

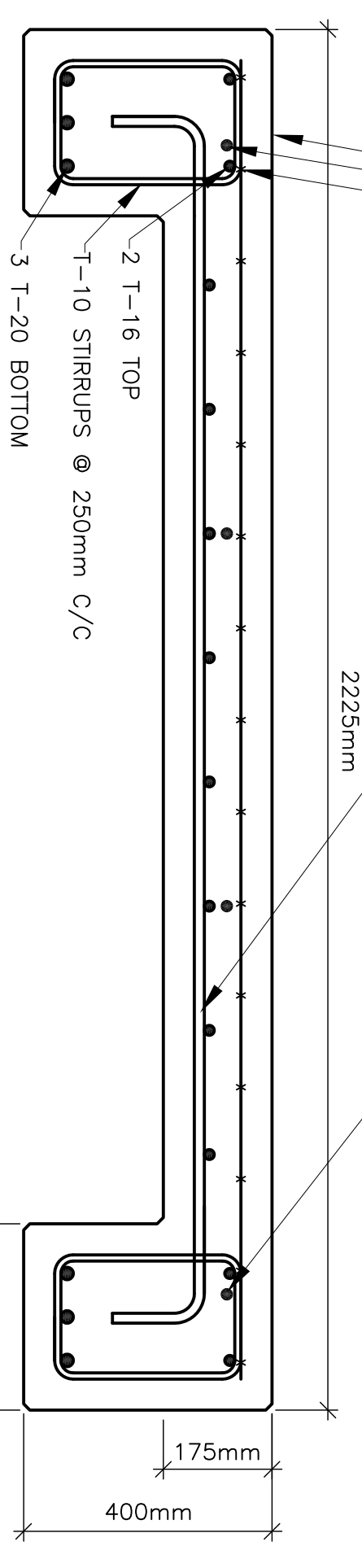
T-20 STAINLESS STEEL DOWELS SPACED @ 600mm
C/C EMBEDDED 175mm INTO EXISTING CONC PIER

A393 REINFORCEMENT MESH
T-16 REBAR SPACED @ 200mm C/C
LONGITUDINAL AND TRANSVERSE

2225mm

EXISTING CONCRETE PIER
TO BE REPAIRED AS
INSTRUCTED BY THE
CLIENT REPRESENTATIVE.

3 SECTION B
SCALE 1:10





GOVERNMENT OF BERMUDA

Ministry of Public Works

Department of Works and Engineering

Short Form of Contract

For

Repair of Pilot's Staging Dock Ballast Point Road, St David's

JULY 2017

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AGREEMENT

 OFFER

 ACCEPTANCE

APPENDIX

CONDITIONS OF CONTRACT

 1.0 Short Form of Contract - GENERAL CONDITIONS

 2.0 Short Form of Contract - PARTICULAR CONDITIONS

 A. References from Clauses in the GENERAL CONDITIONS

 B. Additional Clauses to be Added to the GENERAL CONDITIONS

AGREEMENT

The Employer is the Ministry of Public Works,
PO Box HM 525, Hamilton, HM CX, Bermuda

The Contractor is

The Employer desires the execution of certain Works known as
Repair of Pilot's Staging Dock - Ballast Point Road, St David's

OFFER

The Contractor has examined the documents listed in the Appendix which forms part of this Agreement and offers to execute the Works in conformity with the Contract for the sum of

(in words) _____

(in figures) _____

Or such other sum as may be ascertained under the Contract.

This offer, of which the Contractor has submitted two signed originals, may be accepted by the Employer by signing and returning one original of this document to the Contractor before
(insert date) _____

The Contractor understands that the Employer is not bound to accept the lowest or any offer received for the Works.

Signature: _____ Authorised to sign on behalf of the Contractor
Name: _____ Date: _____
Capacity: _____

ACCEPTANCE

The Employer has by signing below, accepted the Contractor's offer and agrees that in consideration for the execution of the Works by the Contractor, the Employer shall pay the Contractor in accordance with the Contract. This Agreement comes into effect on the date when the Contractor receives one original of this document signed by the Employer.

Signature: _____ Authorised to sign on behalf of the Ministry of Public Works
Name: _____ Date: _____
Capacity: _____

APPENDIX

This Appendix forms part of the Agreement.

[Note: with the exception of the items for which the Employer's requirements have been inserted, the Contractor shall complete the following information before submitting his offer.]

Sub-Clause	Item	Data
1	General Provisions	
1.1.1	Documents forming the Contract listed in order of priority (delete if not applicable)	Document Identification
	(a) The Agreement	_____
	(b) Letter of Acceptance	_____
	(c) Client's Request for Proposal	_____
	(d) Addenda	_____
	(e) Particular Conditions	_____
	(f) General Conditions	_____
	(g) The Specification	_____
	(h) The Drawings	_____
	(i) The Contractor's tendered design	_____
1.1.9	Time for Completion	_____ days
1.4	Law of the Contract	Laws of Bermuda
1.5	Language	English
2	The Employer	
2.1	Provision of Site	On the Commencement Date
3	Employer's Representatives	Mr Jeremy Burnham
3.1	Authorised Person	Chief Engineer
3.2	Name and address of Employer's representative (if known)	Chief Engineer Ministry of Public Works, 56 Church Street, Hamilton, HM12

Sub-Clause	Item	Data
4	The Contractor	
4.4	Performance Security (if any):	
4.4	Amount	<u>Not applicable</u>
4.4	Form	<u>Not applicable</u>
5	Design by Contractor	
5.1	Requirements for Contractor's design (if any)	<u>Not applicable</u>
7	Programme	
7.2	Time for submission	<u>Within 14 days of the Commencement Date</u>
7.2	Form of programme	<u>Microsoft Project – Electronic & Paper formats</u>
7.4	Amount payable due to failure to complete	<u>\$ 500 per day up to a maximum of 10% of sum stated in the Agreement</u>
9	Remedying Defects	
9.1	Period for notifying defects	<u>365 days calculated from the date stated in the notice under Sub-Clause 8.2</u>
10	Variation Procedure	
10.2	Day work rates	<u>Attach hourly rates for labour materials and equipment (details)</u>
11	Valuation of the Works	
11.1	Lump sum price	<u>(details)</u>
11.1	Lump sum price with schedules of rates	<u>Not applicable (details)</u>
11.1	Lump sum price with bill of quantities	<u>Not applicable (details)</u>
11.1	Remeasurement with tender bill of quantities	<u>Not applicable (details)</u>
11.1	Cost reimbursable	<u>Not applicable (details)</u>
11.2	Percentage of value of Materials and Plant	Materials <u>80%</u> Plant <u>90%</u>

Sub-Clause	Item	Data
11.3	Percentage of retention	10%
11.5	Period for notifying defects	365 days calculated from the date stated in the notice under Sub-Clause 8.2
11.7	Currency of payment	Bermuda Dollars
11.8	Rate of interest	0.5 % per annum
14	Insurances	
14.1(a)	The Works, Materials, Plant and fees	The sum stated in the Agreement plus 15%
14.1(a)	Contractor's Equipment	Full replacement cost
14.1(b)	Third party injury to persons and damage to property	\$ 1,000,000.00
14.1(c)	Workers	\$ 1,000,000.00
	Other Cover	
	Exclusions	None
15	Arbitration	
15.3	Rules	Bermuda Arbitration Act 1986 In accordance with the Bermuda Arbitration Act 1986
15.3	Appointing authority	Bermuda Arbitration Act 1986
15.3	Place of Arbitration	Bermuda

CONDITIONS OF CONTRACT

1.0 Short Form of Contract - GENERAL CONDITIONS

The conditions of contract are the **Conditions of Contract for the Short Form of Contract, First Edition 1999**, published by the Federation Internationale des Ingenieurs-Conseils (FIDIC).

The General Conditions of Contract are amended by the Particular Conditions of Contract.

SHORT FORM of Contract

GENERAL CONDITIONS

First Edition 1999
ISBN 2-88432-024-5

FEDERATION INTERNATIONALE DES INGENIEURS-CONSEILS
INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS
INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE
FEDERACION INTERNACIONAL DE INGENIEROS CONSULTORES



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General Conditions

1 General Provisions

1.1

Definitions

In the Contract as defined below, the words and expressions defined shall have the following meanings assigned to them, except where the context requires otherwise:

The Contract

1.1.1 "**Contract**" means the Agreement and the other documents listed in the Appendix.

1.1.2 "**Specification**" means the document as listed in the Appendix, including Employer's requirements in respect of design to be carried out by the Contractor, if any, and any Variation to such document.

1.1.3 "**Drawings**" means the Employer's drawings of the Works as listed in the Appendix, and any Variation to such drawings.

Persons

1.1.4 "**Employer**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the Contractor) any assignee.

1.1.5 "**Contractor**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the Employer) any assignee.

1.1.6 "**Party**" means either the Employer or the Contractor.

Dates, Times and Periods

1.1.7 "**Commencement Date**" means the date 14 days after the date the Agreement comes into effect or any other date agreed between the Parties.

1.1.8 "**day**" means a calendar day.

1.1.9 "**Time for Completion**" means the time for completing the Works as stated in the Appendix (or as extended under Sub-Clause 7.3), calculated from the Commencement Date.

Money and Payments

1.1.10 "**Cost**" means all expenditure properly incurred (or to be incurred) by the Contractor, whether on or off the Site, including overheads and similar charges, but does not include profit.

Other Definitions

1.1.11 "**Contractor's Equipment**" means all apparatus, machinery, vehicles, facilities and other things required for the execution of the Works but does not include Materials or Plant.

1.1.12 "**Country**" means the country in which the Site is located.

1.1.13 "**Employer's Liabilities**" means those matters listed in Sub-Clause 6.1.

1.1.14 "**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.

1.1.15 **"Materials"** means things of all kinds (other than Plant) intended to form or forming part of the permanent work.

1.1.16 **"Plant"** means the machinery and apparatus intended to form or forming part of the permanent work.

1.1.17 **"Site"** means the places provided by the Employer where the Works are to be executed, and any other places specified in the Contract as forming part of the Site.

1.1.18 **"Variation"** means a change to the Specification and /or Drawings (if any) which is instructed by the Employer under Sub-Clause 10.1.

1.1.19 **"Works"** means all the work and design (if any) to be performed by the Contractor including temporary work and any Variation

1.2

Interpretation

Words importing persons or parties shall include firms and organisations. Words importing singular or one gender shall include plural or the other gender where the context requires.

1.3

Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. If an ambiguity or discrepancy is found in the documents, the Employer shall issue any necessary instructions to the Contractor, and the priority of the documents shall be in accordance with the order as listed in the Appendix.

1.4

Law

The law of the Contract is stated in the Appendix.

1.5

Communications

Wherever provision is made for the giving or issue of any notice, instruction, or other communication by any person, unless otherwise specified such communication shall be written in the language stated in the Appendix and shall not be unreasonably withheld or delayed.

1.6

Statutory Obligations

The Contractor shall comply with the laws of the countries where activities are performed. The Contractor shall give all notices and pay all fees and other charges in respect of the Works.

2 The Employer

2.1

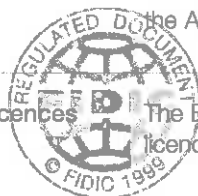
Provision of Site

The Employer shall provide the Site and right of access thereto at the times stated in the Appendix.

2.2

Permits and Licences

The Employer shall, if requested by the Contractor, assist him in applying for permits, licences or approvals which are required for the Works.



2.3 Employer's Instructions The Contractor shall comply with all instructions given by the Employer in respect of the Works including the suspension of all or part of the Works.

2.4 Approvals No approval or consent or absence of comment by the Employer or the Employer's representative shall affect the Contractor's obligations.

Employer's Representatives

3.1 Authorised Person One of the Employer's personnel shall have authority to act for him. This authorised person shall be as stated in the Appendix, or as otherwise notified by the Employer to the Contractor.

3.2 Employer's Representative The Employer may also appoint a firm or individual to carry out certain duties. The appointee may be named in the Appendix, or notified by the Employer to the Contractor from time to time. The Employer shall notify the Contractor of the delegated duties and authority of this Employer's representative.

The Contractor

4.1 General Obligations The Contractor shall carry out the Works properly and in accordance with the Contract. The Contractor shall provide all supervision, labour, Materials, Plant and Contractor's Equipment which may be required. All Materials and Plant on Site shall be deemed to be the property of the Employer.

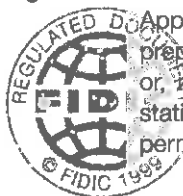
4.2 Contractor's Representative The Contractor shall submit to the Employer for consent the name and particulars of the person authorised to receive instructions on behalf of the Contractor.

4.3 Subcontracting The Contractor shall not subcontract the whole of the Works. The Contractor shall not subcontract any part of the Works without the consent of the Employer.

4.4 Performance Security If stated in the Appendix, the Contractor shall deliver to the Employer within 14 days of the Commencement Date a performance security in a form and from a third party approved by the Employer.

Design by Contractor

5.1 Contractor's Design The Contractor shall carry out design to the extent specified, as referred to in the Appendix. The Contractor shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt the Employer shall notify any comments or, if the design submitted is not in accordance with the Contract, shall reject it stating the reasons. 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.

5.2

Responsibility for Design

The Contractor shall remain responsible for his tendered design and the design under this Clause, both of which shall be fit for the intended purposes defined in the Contract and he shall also remain responsible for any infringement of any patent or copyright in respect of the same. The Employer shall be responsible for the Specification and Drawings.

6 Employer's Liabilities

6.1

Employer's Liabilities

In this Contract, Employer's Liabilities mean :

- a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country,
 - b) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country,
 - c) riot, commotion or disorder by persons other than the Contractor's personnel and other employees, affecting the Site and/or the Works,
 - d) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly, except to the extent to which the Contractor may be responsible for the use of any radio-active material,
 - e) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
 - f) use or occupation by the Employer of any part of the Works, except as may be specified in the Contract,
 - g) design of any part of the Works by the Employer's personnel or by others for whom the Employer is responsible, and
 - h) any operation of the forces of nature affecting the Site and/or the Works, which was unforeseeable or against which an experienced contractor could not reasonably have been expected to take precautions.
 - i) Force Majeure,
 - j) a suspension under Sub-Clause 2.3 unless it is attributable to the Contractor's failure,
 - k) any failure of the Employer,
 - l) physical obstructions or physical conditions other than climatic conditions, encountered on the Site during the performance of the Works, which obstructions or conditions were not reasonably foreseeable by an experienced contractor and which the Contractor immediately notified to the Employer,
 - m) any delay or disruption caused by any Variation,
 - n) any change to the law of the Contract after the date of the Contractor's offer as stated in the Agreement,
- losses arising out of the Employer's right to have the permanent work executed on, over, under, in or through any land, and to occupy this land for the permanent work, and
damage which is an unavoidable result of the Contractor's obligations to execute the Works and to remedy any defects.



7 Time for Completion

- 7.1 Execution of the Works** The Contractor shall commence the Works on the Commencement Date and shall proceed expeditiously and without delay and shall complete the Works within the Time for Completion.
- 7.2 Programme** Within the time stated in the Appendix, the Contractor shall submit to the Employer a programme for the Works in the form stated in the Appendix.
- 7.3 Extension of Time** Subject to Sub-Clause 10.3, the Contractor shall be entitled to an extension to the Time for Completion if he is or will be delayed by any of the Employer's Liabilities.
- On receipt of an application from the Contractor, the Employer shall consider all supporting details provided by the Contractor and shall extend the Time for Completion as appropriate.
- 7.4 Late Completion** If the Contractor fails to complete the Works within the Time for Completion, the Contractor's only liability to the Employer for such failure shall be to pay the amount stated in the Appendix for each day for which he fails to complete the Works.

8 Taking-Over

- 8.1 Completion** The Contractor may notify the Employer when he considers that the Works are complete.
- 8.2 Taking-Over Notice** The Employer shall notify the Contractor when he considers that the Contractor has completed the Works stating the date accordingly. Alternatively, the Employer may notify the Contractor that the Works, although not fully complete, are ready for taking over, stating the date accordingly.
- The Employer shall take over the Works upon the issue of this notice. The Contractor shall promptly complete any outstanding work and, subject to Clause 9, clear the Site.

9 Remedying Defects

- 9.1 Remedying Defects** The Employer may at any time prior to the expiry of the period stated in the Appendix, notify the Contractor of any defects or outstanding work. The Contractor shall remedy at no cost to the Employer any defects due to the Contractor's design, Materials, Plant or workmanship not being in accordance with the Contract.

The cost of remedying defects attributable to any other cause shall be valued as a Variation. Failure to remedy any defects or complete outstanding work within a reasonable time of the Employer's notice shall entitle the Employer to carry out all necessary work at the Contractor's cost.

9.2

Uncovering and Testing The Employer may give instruction as to the uncovering and/or testing of any work. Unless as a result of any uncovering and/or testing it is established that the Contractor's design, Materials, Plant or workmanship are not in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 10.2.

10 Variations and Claims

10.1

Right to Vary The Employer may instruct Variations.

10.2

Valuation of Variations Variations shall be valued as follows:

- a) at a lump sum price agreed between the Parties, or
- b) where appropriate, at rates in the Contract, or
- c) in the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation, or failing which
- d) at appropriate new rates, as may be agreed or which the Employer considers appropriate, or
- e) if the Employer so instructs, at daywork rates set out in the Appendix for which the Contractor shall keep records of hours of labour and Contractor's Equipment, and of Materials used.

10.3

Early Warning A Party shall notify the other as soon as he is aware of any circumstance which may delay or disrupt the Works, or which may give rise to a claim for additional payment. The Contractor shall take all reasonable steps to minimise these effects.

The Contractor's entitlement to extension to the Time for Completion or additional payment shall be limited to the time and payment which would have been due if he had given prompt notice and had taken all reasonable steps.

10.4

Right to Claim If the Contractor incurs Cost as a result of any of the Employer's Liabilities, the Contractor shall be entitled to the amount of such Cost. If as a result of any of the Employer's Liabilities, it is necessary to change the Works, this shall be dealt with as a Variation.

10.5

Variation and Claim Procedure The Contractor shall submit to the Employer an itemised make-up of the value of Variations and claims within 28 days of the instruction or of the event giving rise to the claim. The Employer shall check and if possible agree the value. In the absence of agreement, the Employer shall determine the value.



11 Contract Price and Payment

11.1
Valuation of the Works The Works shall be valued as provided for in the Appendix, subject to Clause 10.

11.2
Monthly Statements The Contractor shall be entitled to be paid at monthly intervals:

- a) the value of the Works executed,
- b) the percentage stated in the Appendix of the value of Materials and Plant delivered to the Site at a reasonable time,

subject to any additions or deductions which may be due.

The Contractor shall submit each month to the Employer a statement showing the amounts to which he considers himself entitled.

11.3
Interim Payments Within 28 days of delivery of each statement, the Employer shall pay to the Contractor the amount shown in the Contractor's statement less retention at the rate stated in the Appendix, and less any amount for which the Employer has specified his reasons for disagreement. The Employer shall not be bound by any sum previously considered by him to be due to the Contractor.

The Employer may withhold interim payments until he receives the performance security under Sub-Clause 4.4 (if any).

11.4
Payment of First Half of Retention One half of the retention shall be paid by the Employer to the Contractor within 14 days after issuing the notice under Sub-Clause 8.2.

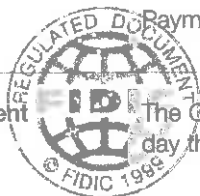
11.5
Payment of Second Half of Retention The remainder of the retention shall be paid by the Employer to the Contractor within 14 days after either the expiry of the period stated in the Appendix, or the remedying of notified defects or the completion of outstanding work, all as referred to in Sub-Clause 9.1, whichever is the later.

11.6
Final Payment Within 42 days of the latest of the events listed in Sub-Clause 11.5 above, the Contractor shall submit a final account to the Employer together with any documentation reasonably required to enable the Employer to ascertain the final contract value.

Within 28 days after the submission of this final account, the Employer shall pay to the Contractor any amount due. If the Employer disagrees with any part of the Contractor's final account, he shall specify his reasons for disagreement when making payment.

11.7
Currency Payment shall be in the currency stated in the Appendix.

11.8
Delayed Payment The Contractor shall be entitled to interest at the rate stated in the Appendix for each day the Employer fails to pay beyond the prescribed payment period.



12

Default

12.1

Default by Contractor

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Employer or fails to proceed expeditiously and without delay, or is, despite a written complaint, in breach of the Contract, the Employer may give notice referring to this Sub-Clause and stating the default.

If the Contractor has not taken all practicable steps to remedy the default within 14 days after the Contractor's receipt of the Employer's notice, the Employer may by a second notice given within a further 21 days, terminate the Contract. The Contractor shall then demobilise from the Site leaving behind Materials and Plant and any Contractor's Equipment which the Employer instructs in the second notice is to be used until the completion of the Works.

12.2

Default by Employer

If the Employer fails to pay in accordance with the Contract, or is, despite a written complaint, in breach of the Contract, the Contractor may give notice referring to this Sub-Clause and stating the default. If the default is not remedied within 7 days after the Employer's receipt of this notice, the Contractor may suspend the execution of all or parts of the Works.

If the default is not remedied within 28 days after the Employer's receipt of the Contractor's notice, the Contractor may by a second notice given within a further 21 days, terminate the Contract. The Contractor shall then demobilise from the Site.

12.3

Insolvency

If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract immediately. The Contractor shall then demobilise from the Site leaving behind, in the case of the Contractor's insolvency, any Contractor's Equipment which the Employer instructs in the notice is to be used until the completion of the Works.

12.4

Payment upon Termination

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

- a) any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b) any sums to which the Employer is entitled,
- c) if the Employer has terminated under Sub-Clause 12.1 or 12.3, the Employer shall be entitled to a sum equivalent to 20% of the value of those parts of the Works not executed at the date of the termination,
- d) if the Contractor has terminated under Sub-Clause 12.2 or 12.3, the Contractor shall be entitled to the Cost of his suspension and demobilisation together with a sum equivalent to 10% of the value of those parts of the Works not executed at the date of termination.



The net balance due shall be paid or repaid within 28 days of the notice of termination.

13 Risk and Responsibility

13.1

Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Employer's notice under Sub-Clause 8.2. Responsibility shall then pass to the Employer. If any loss or damage happens to the Works during the above period, the Contractor shall rectify such loss or damage so that the Works conform with the Contract.

Unless the loss or damage happens as a result of an Employer's Liability, the Contractor shall indemnify the Employer, the Employer's contractors, agents and employees against all loss or damage happening to the Works and against all claims or expense arising out of the Works caused by a breach of the Contract, by negligence or by other default of the Contractor, his agents or employees.

13.2

Force Majeure

If a Party is or will be prevented from performing any of its obligations by Force Majeure, the Party affected shall notify the other Party immediately. If necessary, the Contractor shall suspend the execution of the Works and, to the extent agreed with the Employer, demobilise the Contractor's Equipment.

If the event continues for a period of 84 days, either Party may then give notice of termination which shall take effect 28 days after the giving of the notice.

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

- a) any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b) the Cost of his suspension and demobilisation,
- c) any sums to which the Employer is entitled.

The net balance due shall be paid or repaid within 28 days of the notice of termination.

14 Insurance

14.1

Extent of Cover

The Contractor shall, prior to commencing the Works, effect and thereafter maintain insurances in the joint names of the Parties:

- a) for loss and damage to the Works, Materials, Plant and the Contractor's Equipment,
- b) for liability of both Parties for loss, damage, death or injury to third parties or their property arising out of the Contractor's performance of the Contract, including the Contractor's liability for damage to the Employer's property other than the Works, and
- c) for liability of both Parties and of any Employer's representative for death or injury to the Contractor's personnel except to the extent that liability arises from the negligence of the Employer, any Employer's representative or their employees.



14.2
Arrangements

All insurances shall conform with any requirements detailed in the Appendix. The policies shall be issued by insurers and in terms approved by the Employer. The Contractor shall provide the Employer with evidence that any required policy is in force and that the premiums have been paid.

All payments received from insurers relating to loss or damage to the Works shall be held jointly by the Parties and used for the repair of the loss or damage or as compensation for loss or damage that is not to be repaired.

14.3
Failure to Insure

If the Contractor fails to effect or keep in force any of the insurances referred to in the previous Sub-Clauses, or fails to provide satisfactory evidence, policies or receipts, the Employer may, without prejudice to any other right or remedy, effect insurance for the cover relevant to such default and pay the premiums due and recover the same as a deduction from any other monies due to the Contractor.

15 Resolution of Disputes

15.1
Adjudication

Unless settled amicably, any dispute or difference which arises between the Contractor and the Employer out of or in connection with the Contract, including any valuation or other decision of the Employer, shall be referred by either Party to adjudication in accordance with the attached Rules for Adjudication ("the Rules"). The adjudicator shall be any person agreed by the Parties. In the event of disagreement, the adjudicator shall be appointed in accordance with the Rules.

15.2
Notice of Dissatisfaction

If a Party is dissatisfied with the decision of the adjudicator or if no decision is given within the time set out in the Rules, the Party may give notice of dissatisfaction referring to this Sub-Clause within 28 days of receipt of the decision or the expiry of the time for the decision. If no notice of dissatisfaction is given within the specified time, the decision shall be final and binding on the Parties. If notice of dissatisfaction is given within the specified time, the decision shall be binding on the Parties who shall give effect to it without delay unless and until the decision of the adjudicator is revised by an arbitrator.

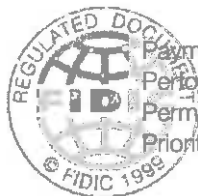
15.3
Arbitration

A dispute which has been the subject of a notice of dissatisfaction shall be finally settled by a single arbitrator under the rules specified in the Appendix. In the absence of agreement, the arbitrator shall be designated by the appointing authority specified in the Appendix. Any hearing shall be held at the place specified in the Appendix and in the language referred to in Sub-Clause 1.5.



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2.0 Short Form of Contract - PARTICULAR CONDITIONS

Preamble

These Particular Conditions supplement the General Conditions, and shall modify, delete and/or add to the General Conditions. Where any clause, paragraph, or sub-paragraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such clause, paragraph, or sub-paragraph shall remain in effect and the supplemental provisions shall be considered as added thereto. Where any clause, paragraph, or sub-paragraph in the General Conditions is amended, deleted or superseded by any of the following paragraphs, the provisions of such clause, paragraph, or sub-paragraph, not so amended, deleted or superseded shall remain in effect.

Clause numbers herein refer to the same clause numbers as in the General Conditions.

A. References from Clauses in the GENERAL CONDITIONS

2.0 The Employer

2.2

Permits and Licences

2.2.1

Add the following Sub-Clauses:

Where the work of the Contractor is subject to the approval or review of an authority, department of Government, or agency other than the Engineer, such applications for approval or review shall be the responsibility of the Contractor, but shall be submitted through the offices of the Employer and unless authorised by the Engineer in writing, such applications for approval or review shall not be obtained by direct contact by the Contractor with such other authority, department of Government or agency.

2.2.2

The Contractor shall ensure that a valid work permit is in place for all non- Bermudian staff working in Bermuda.

4.0 The Contractor

4.5

Facilities

Add the following Sub-Clauses:

The Contractor shall make his own arrangements for all local accommodation he may require for offices, yards, stores, labour, etc., all buildings and all services in connection therewith which are required for the efficient execution of the Works. The Contractor shall pay proper regard to the prevention of obstruction of public roads and walkways and the avoidance of nuisance to the public and to residents.

4.6

Electricity, Water and Gas

The Contractor shall be responsible for the provision of all, power water and other services that he may require for the Works and shall pay and bear all costs associated therewith.

<p>4.7 Protection of Utilities</p>	<p>The Contractor shall carry out the Works so that there is the minimum of interruption to the supply of water, telephone, electricity and other services through existing mains and services. Work involving interference with existing works of any kind shall only be carried out with the permission of and during such times and in such a manner as are agreed in writing by the Engineer or competent Authority.</p>
<p>4.8 Reporting of Errors</p>	<p>The Contractor shall examine and compare the Contract Documents and shall report any errors, inconsistencies, or omissions he may find to the Engineer immediately.</p>
<p>4.9 Damage to Persons and Property</p>	<p>The Contractor shall, immediately on occurrence of any incident involving loss or injury at or about the Site, or in connection with the execution of the Works, report such incident to the Engineer or the Engineer's Representative. The Contractor shall also report such incident to the appropriate Authority whenever such report is required by Law.</p>
<p>4.10 Rates, Wages, Hours and Conditions of Labour</p>	<p>The Contractor shall pay to all Foremen, Craftsmen, and Labourers not less than the rates of wages for the various Foremen, Craftsmen, and Labourers that prevail in Bermuda, and comply with such requirements relating to hours of work and conditions of labour as are or may be laid down from time to time by the Laws of Bermuda.</p>
<p>4.11 Facilities for Staff and Labour</p>	<p>The Contractor shall provide such accommodation and amenities as he may consider necessary for all his expatriate staff and labour, employed for the purposes of or in connection with the Contract.</p> <p>The Contractor shall comply with all local statutes and regulations and any amendments thereto with regard to the health and safety of his employees and others, and shall provide adequate latrines for his workers on the Site to conform with the requirements of the Department of Health.</p>
<p>4.12 Display of Notices</p>	<p>The Contractor shall post notices to inform the workers of their conditions of work in conspicuous places at the establishments and work places concerned.</p>
<p>4.13 Alcoholic Liquor and</p>	<p>The Contractor shall not, otherwise than in accordance with the Statutes, Ordinance and Government Regulations or Orders for</p>

Drugs the time being in force, import, sell, give, barter, or otherwise dispose of any alcoholic liquor, or drugs, or permit, or suffer any such importation, sale, gift, barter, or disposal by his sub-contractors, agents, or employees.

4.14 Arms and Ammunition The Contractor shall not give, barter, or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same aforesaid.

4.15 Festivals and Religious Festivals The Contractor shall in all dealings with labour in his employment have due regard to all recognised festivals, public holidays, days of rest, and religious or other customs.

4.16 Epidemics In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders, and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

4.17 Supply of Drinking Water The Contractor shall so far as is reasonably practicable having regard to local conditions provide on the site, to the satisfaction of the Engineer's Representative, an adequate supply of drinking water and other water for the use of the Contractor's staff and work people.

15.0 Resolution of Disputes

15.1 Adjudication Delete Clause 15.1 in its entirety.

15.2 Notice of Dissatisfaction This clause is deleted in its entirety and replaced by:

If a dispute arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, a notice of dissatisfaction shall be issued by either Party to the other Party. Where such notice is given both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of dissatisfaction was given, even

if no attempt at an amicable settlement has been made.

**15.3
Arbitration**

This clause is deleted in its entirety and replaced by:

Unless settled amicably, any dispute shall be finally settled by arbitration, unless otherwise agreed by both Parties:

- (a) the dispute shall be finally settled in accordance with the Bermuda Arbitration Act 1986
- (b) the dispute shall be settled by arbitrators appointed in accordance with the said Act, and
- (c) the arbitration shall be conducted in the English language.

The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute. Nothing shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence nor did arguments previously put before the Engineer to obtain his decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the Engineer shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works, by mutual agreement. The obligations of the Parties and the Engineer shall not be altered by reason of any arbitration being conducted during the progress of the Works.

B. Additional Clauses to be added to the GENERAL CONDITIONS

**16.0
Arithmetical Accuracy
of Proposal**

The Client accepts no responsibility for the arithmetical or other accuracy of the Consultant's Proposal. Should it transpire after the Agreement has been executed that there are arithmetical mistakes in the accepted Proposal which would have increased or decreased the total amount of the Proposal had such mistakes not been made, the items affected will be paid for in accordance with the actual measurements of Services performed and with the unit prices inserted against the said items.

**17.0
Taxation**

The Contractor shall be required to pay Bermudian Taxes on all Contractor's Equipment (except as described in the Fifth Schedule, Section 2 of the Customs Tariff Act 1970) materials

and other things of whatsoever nature brought into Bermuda for the purpose of Contract.

**18.0
Bribery**

Any commission, advantage, gift, gratuity, reward, or bribe given, promised, or offered by or on behalf of the Contractor or his agent or servant or any person on his or their behalf to any officer, servant, representative, or agent of the Employer or of the Engineer or to any person on their behalf or on behalf of any of them in relation to the obtaining or to the execution of this or of any other Contract with the Employer shall in addition to any criminal liability which may be thereby incurred subject the Contractor to the cancellation of this and of all other contracts which he may have entered into with the Employer and also to the payment of any loss or damage resulting from such cancellation.

**19.0
Debt Recovery**

The Employer shall be entitled upon a certificate in writing of the Engineer to deduct the amounts so certified from any monies or otherwise due to the Contractor under this or any other contract or to recover the said amounts as a debt due or partly the one and partly the other as the Employer shall deem advisable.

**20.0
Strikes and Lock-Outs**

The Contractor shall forthwith notify the Engineer of the commencing of any strike or lock-out and the Engineer on account of any delay caused thereby may, after consultation with the Employer, grant such extension of time as he considers reasonable without prejudice to the right of the Employer to exercise after the expiration of such reasonable extension of time the rights and powers under these Conditions in case of default by the Contractor.

**21.0
Members and Staff of
Employer and Engineer
not Personally Liable**

Neither the members nor the staff of the Employer or the Engineer shall be in any way personally bound or liable for the acts or obligations of the Contractor under the Contract or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein contained.

**22.0
Details to be**

The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the

Confidential

purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the previous consent in writing of the Employer or the Engineer. If any dispute arises as to the necessity or disclosure for the purpose of the Contract the same shall be referred to the decision of the Employer whose award shall be final.

**23.0
Rights and Remedies
Not Waived**

In no event shall the making by the Employer of any payment to the Contractor constitute or be construed as a waiver by the Employer of any breach of Contract, or any default which may then exist, on the part of the Contractor, and the making of any such payment by the Employer while any such breach or default exists shall in no way impair or prejudice any right or remedy available to the Employer in respect of such breach or default.

**24.0
Patents**

All concepts, products or processes produced by or resulting from the Services rendered by the Consultant in connection with the Project, or which are otherwise developed or first reduced to practice by the Consultant in the performance of his Services, and which are patentable, capable of trademark or otherwise, shall be and remain the property of the Consultant.

The Client shall have permanent non-exclusive royalty-free license to use any concept, product or process, which is patentable, capable of trademark or otherwise produced by or resulting from the Services by the Consultant in connection with the Project and for no other purpose or project.