BIDDING DOCUMENTS

Open National Bidding for Works

Rehabilitation of the Boat Ramp at Le Batelage, Souillac

Procurement Reference: MT/ONB/2022-23 A6

Ministry of Tourism
5th Floor, Air Mauritius Centre,
John Kennedy Street,
Port Louis
Tel: 211 7930
Fax: 2087063

Section I: Instruction to Bidders

1. Introduction

The **Ministry of Tourism** also referred as the Public Body/Employer, invites eligible local contractors to submit their bid for the works described in detail hereunder. Any resulting contract shall be subject to the terms and conditions referred to in this document.

The scope of works for the project includes the following:

- Demolition and carting away of the existing boat ramp as shown on the design drawings;
- Removal of existing hardcore fillings and storage of same on site for reuse;
- Provision of adequate hoarding to secure the site;
- Excavation works for the reinforced concrete retaining wall and formation level for the boat ramp. Carting away of soil materials to be carried out as required;
- Construction of the reinforced concrete retaining wall which includes provision of cofferdams (type and methodology to be submitted by contractor to engineer for approval) and pumping out of water as required;
- Provision of compacted hardcore fillings for the ramp, as per specifications;
- Construction of the reinforced concrete boat ramp as per drawings;
- Sit around for existing Badamier tree to be reinstated and seater to be made good;
- Construction of stone revetment (~ 20m) to prevent shore erosion;
- Construction of a boat storage area consisting of rock material base and coral sand top;
- Provision of concrete finishes to the boat ramp as approved by engineer;
- Making good of any damaged structure resulting from the construction works
- Carting away all existing debris in the construction area whilst ensuring that no debris shall have access to the sea during the rehabilitation works.

Other works as more fully described in the drawings, specifications and other parts of the Bid document.

Participation is limited to citizens of Mauritius or entities incorporated in Mauritius. Joint Ventures should be among entities incorporated in Mauritius

1.1 Clarification if any, may be requested from the Ministry of Tourism, on the e-procurement system

1.2 Bidders are advised to carefully read the complete Bidding document, including the Particular Conditions of Contract in Section IV, before preparing their bids. The standard forms in this document may be retyped for completion but the Bidder is responsible for their accurate reproduction.

2. Validity of Bids

The bid validity period shall be **ninety <u>90 days</u>** from the date of bid submission deadline.

3. Works Completion Period

The Intended Completion period is ***One Hundred and Twenty (120)*** *days* from start date of works.

4. Site Visit

Bidders or their designated representatives are invited to attend a site visit on **Wednesday 3rd August 2022 at 10hrs30 at Le Batelage, Souillac**. The purpose of the site visit is to clarify issues and to answer questions on any matter that may be raised at that stage.

5. Sealing and Marking of Bids

Bidders shall submit their bids online. No bids submitted physically shall be accepted.

Where Bid Security and/or bulky documents referred to in the preceding paragraph have to be submitted physically, they shall be forwarded to the Office of the Public Body before the deadline date and time scheduled for Bid Submission (bid preparation and hash submission). The Address for these submissions is : Ministry of Tourism, 5th floor, Air Mauritius Centre, Port Louis

6. Submission of Bids

Bid submission (Bid preparation and hash submission) must be executed online before the start date and time specified for bid closing:

Bid Closing:

Start Date and Time (Mauritian): ***Monday 22nd August 2022 at 13 hrs30***

End Date and Time (Mauritian): ***Monday 22nd August 2022 at 16 hrs00***

7. Bid Opening

Bids will be opened by the **Ministry of Tourism at the Conference Room, 5th floor, Air Mauritius Centre, John Kennedy Street, Port Louis** as per key Activity Schedule on e-PS. Bidders or their representative may attend the Bid Opening, if they choose to do so.

8. Evaluation of Bids

The Ministry of Tourism shall have the right to request for clarification during evaluation. Offers that are substantially responsive shall be compared on the basis of evaluated cost to determine the lowest evaluated bid.

9. Eligibility Criteria

To be eligible to participate in this bidding exercise, Bidder should:

(a) have the legal capacity to enter into a contract to execute the works;

(b) be duly registered with the CIDB under the grade that would allow him to perform the value of works for which he is submitting his bid. (Note 1)

(c) not be insolvent, in receivership, bankrupt, subject to legal proceedings for any of these circumstances or in the process of being wound up;

(d) not have had his business activities suspended;

(e) not be under a declaration of ineligibility by the Government of Mauritius in accordance with applicable laws at the date of the deadline for bid submission or appearing on the ineligibility lists of African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank Group and World Bank Group;

(f) not have a conflict of interest in relation to this procurement requirement; and

(g) have a Business Registration Card.

(h) Any other requirements by the Ministry of Tourism.

Note 1 Sub-contractors undertaking works are also subject to registration with CIDB as applicable to Contractors.

10. Qualification and Experience Criteria

Bidders should have the following minimum qualifications and experience:

(a) valid registration certificate with the CIDB under the grade that will enable the contractor to perform the works quoted for, under the following class(es): **Building Construction Works and** specialization **N/A**

(b) experience in two works of a similar nature including construction of cofferdams over the last 5 years, each of value not less than **Four Million and Seven Hundred Thousand (4.7M) Rupees.**

(c) Contract Manager having as minimum qualification: A diploma in construction related field and 5 years' experience in the construction sector; or any equivalent qualifications acceptable to the Ministry of Tourism.

(d) minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the Bidder of **One Million and Two Hundred Thousand (1,200,000) Rupees**.

11. Contents of bid

The Bid shall comprise the following:

(a)All templates as provided on e-Procurement System and attachments required

(b) Scanned copies of report on the financial standing of the Bidder for the last three years, such as certified copies of Financial Statements or Audited Accounts as filed at the Registrar of Companies before the deadline set for submission of bids

(c)Scanned copy of Valid Registration certificate with the CIDB, as applicable

(d) Scanned copy of signed C.V of Contract Manager;

(e)Scanned copy of documentary evidence of liquid assets and/or credit facilities (Note 1);

(f) Any other documents deemed necessary as per the requirements of this bidding document

Note 1

Bidders to demonstrate access to, or availability of, financial resources such as liquid assets, lines of credit, and other financial means, other than any contractual advance payments to meet the overall cash flow requirements for the contract and its current commitments. Documentary evidence may comprise but not limited to Bank certificate, Certificate from Auditors, Certificate from a Professional Accountant registered with MIPA, Certificate from Insurance companies.

12. Joint Venture

Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements:

i. the Bid shall include all the information required as per the Qualification Information form for each joint venture partner;

ii. the Bid shall be signed so as to be legally binding on all partners;

iii. the Bid shall include a copy of the agreement entered into by the joint venture partners defining the division of assignments to each partner and establishing that all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms; **alternatively**, a Letter of Intent to execute a joint venture agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement;

iv. one of the partners shall be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and

v. the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

13. Prices and Currency of Payment

Bidders should quote for the whole works. Prices for the execution of works shall be quoted and fixed in Mauritian Rupees. Items for which no rate or price is entered by Bidders, shall not be paid for by the Ministry of Tourism when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities/ Activity schedule.

Bids shall cover all costs of labour, materials, equipment, overheads, profits and all associated costs for performing the works, and shall include all duties. The whole cost of performing the works shall be included in the items stated, and the cost of any incidental works shall be deemed to be included in the prices quoted. Bidders are required to submit their bid prices **exclusive of VAT**.

14. Bid Securing Declaration

Bidders are required to subscribe to a Bid Securing Declaration in the Bid Submission Form.

15. Margin of Preference

Margin of Preference shall **NOT apply**.

16. Award of Contract

The Bidder having submitted the lowest evaluated responsive bid and qualified to perform the works shall be selected for award of contract. Award of contract shall be by issue of a Letter of Acceptance in accordance with terms and conditions contained in Section IV: General Conditions of Contract and Particular Conditions of Contract.

17. Performance Security and signing of contract

Within **twenty-eight (28) days** of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish a Performance Security, in the amount equal to 10% of the Bid price (exclusive of VAT), in accordance with the conditions of contract, using for that purpose the Performance Security Form included in Section V Contract Forms.

The contract agreement shall be signed within 28 days after the successful bidder receives the letter of acceptance unless the parties agree otherwise.

Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the contract within the required time may constitute sufficient grounds for the annulment of the award.

18. Notification of Award and Debriefing

Prior to the expiration of the period of bid validity, the Public Body/Employer shall, for contract amount above Rs 15 million, notify the selected bidder of the proposed award and accordingly notify unsuccessful bidders. Subject to Challenge and Appeal, the Public Body/ Employer shall notify the selected Bidder, in writing, by a Letter of Acceptance for award of contract. Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

The Ministry of Tourism shall after award of contract, exceeding Rs 1 million and up to Rs 15 million, promptly inform all unsuccessful bidders in writing of the name and address of the successful bidder and the contract amount.

Furthermore, the Ministry of Tourism shall attend to all requests for debriefing for contract exceeding Rs 1 million, made in writing within 30 days the unsuccessful bidders are informed of the award.

19. Advance Payment

The Ministry of Tourism shall provide an Advance Payment on the Contract Price as stipulated in the General Conditions of Contract. The Advance Payment shall be guaranteed by an Advance Payment Security as per the format contained in Section V.

The Advance Payment shall be limited to 10% percent of the Contract Price, less any provisional and contingencies sums.

20. Integrity Clause

The Public Body commits itself to take all measures necessary to prevent corruption and ensures that none of its staff, personally or through his/her close relatives or through a third party, will in connection with the bid for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

21. Rights of Public Body

The Ministry of Tourism reserves the right:

(a) to accept or reject any bid or to cancel the bidding process and reject all bids at any time prior to contract award without incurring any liability to the Ministry of Tourism.

22. Challenge and Appeal

Unsatisfied bidders shall follow procedures prescribed in Regulations 48, 49 and 50 of the Public Procurement Regulations 2008 to challenge procurement proceedings and award of procurement contracts or to file application for review at the Independent Review Panel.

(a) The address, Tel. & Fax No.& Email address to file Challenges in respect of this procurement is:

The Permanent Secretary
Ministry of Tourism
5th Floor, Air Mauritius Centre,
John Kennedy Street,
Port Louis
Tel: 211 7930
Fax: 2086776
Email: mtou@govmu.org

(b) The address to file Application for Review is:

The Chairperson
Independent Review Panel,
5th Floor,
Belmont House
Intendence Street
Port Louis
Tel : +230 2602228
Emal : irp@govmu.org

Section II: Response Templates

1. Bid Submission Form (to be filled on the e-PS)

Bidders are required to fill in the Bid Submission Form as a response template which contains a copy of the Bid Securing Declaration as part of the template. This template is applicable for a procurement where the Ministry of Tourism may either require a Bid Security or just a Bid Securing Declaration.

The total amount at the Bill of Quantity/Detailed Activity Schedules shall be automatically transferred from the Price Schedules to the Bid Submission Form in the appropriate text box. Bidders should ensure that the price carried forward to the Bid Submission Form is as per the total from the Bill of Quantities/Detailed Activity Schedule.

2. Qualification Information (to be filled on the e-PS)

Bidders have to fill in the response templates provided in the e-procurement system in respect of the data required hereunder.

The response templates cater for all the criteria and sub-criteria and also allow bidders to upload some data as per the table format hereunder.

The information to be filled in the templates shall be used for the purpose of post-qualification or for verification of prequalification as provided for in ITB Clause 6.

1. Individual Bidders or Individual Members of Joint Ventures

1.1 Constitution or legal status of Bidder: [*attach copy]*

Place of registration: [*insert]*

Principal place of business: [*insert]*

1.2 Bidder shall provide *[insert number]* of works of a nature and amount similar to the Works performed as Contractor over the last 5 years.

Project/Contract name and country	Name of client and contact person	Type of work performed and year of completion	Value of contract (national currency)
(a) (b)			

1.3 Proposed subcontracts and firms involved. Refer to General Conditions of Contract Clause 7.

Sections of the Works	Value of subcontract	Subcontractor (name and address)	Experience in similar work
(a) (b)			

[Bidders have to ascertain that sub-contractors executing works are duly registered with the CIDB in accordance with CIDB Act 2008.

1.4 Name, address, and telephone, telex, and facsimile numbers of banks that may provide references if contacted by the Ministry of Tourism. (Bidders to provide/upload)

2. Additional Requirements

2.1 Bidders should provide/upload any additional information requested in the Bidding Document.

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Activity Schedules (available on the e-PS) for Bidders to Fill and Upload

4. Form of Key Financial Information extracted from Audited Accounts/ Financial Statements (to be uploaded on the e-PS)

Financial data in the currency reported in the Audited Accounts/Financial Statements	**Historical Information**			**Remarks By BEC**
	Previous years	**Last year**	**Current year**	
Statement of Financial Position (Information from Balance Sheet)				
A. Current Assets				
B. Current Liabilities				
Working capital ratio or current ratio(A/B)				
Quick ratio or Acid Test ratio (Current Asset net of stock / B)				
C. Total Assets				
D. Total Liabilities				
Net Worth(C-D)				
Cash in hand and at Bank				
Bank Overdrafts				
Other Liquid Assets				
Information from Income statement				
Key Profitability Indicators in the currency reported in the Audited Accounts/Financial Statements	**Previous years**	**Last year**	**Current year**	
Turnover				
Profit /(Loss)Before Tax				
Taxation				
Net Profit /(Loss) After Tax				
(Net profit After tax)x 100 (Turnover)				
Certified by Bidder that information are true extract from Audited Accounts/Financial Statements Name: Signature: Capacity: Date:				

Section III: Statement of Requirements

Scope of Works

The project consists of the following:

The scope of works for the project includes the following:

- Demolition and carting away of the existing boat ramp as shown on the design drawings;
- Removal of existing hardcore fillings and storage of same on site for reuse;
- Provision of adequate hoarding to secure the site;
- Excavation works for the reinforced concrete retaining wall and formation level for the boat ramp. Carting away of soil materials to be carried out as required;
- Construction of the reinforced concrete retaining wall which includes provision of cofferdams (type and methodology to be submitted by contractor to engineer for approval) and pumping out of water as required;
- Provision of compacted hardcore fillings for the ramp, as per specifications;
- Construction of the reinforced concrete boat ramp as per drawings;
- Sit around for existing Badamier tree to be reinstated and seater to be made good;
- Construction of stone revetment (~ 20m) to prevent shore erosion;
- Construction of a boat storage area consisting of rock material base and coral sand top;
- Provision of concrete finishes to the boat ramp as approved by engineer;
- Making good of any damaged structure resulting from the construction works
- Carting away all existing debris in the construction area whilst ensuring that no debris shall have access to the sea during the rehabilitation works.

Other works as more fully described in the drawings, specifications and other parts of the Bid document.

Access to site

Access to the site for construction will be near the office of the coast guards/police officers and leisure facilities (food/restaurant facilities present on site), careful consideration is to be given and maintained with respect to health and safety of users', officials and civilians' movements.

Contractor to make sure of a proper flow of vehicles movement along this drive way during loading and unloading of materials and during execution of the works.

Provision of hoarding and security net

Appropriate hoarding as per drawing to be provided for the security of the end users, existing building, vehicles circulation and for site office and stack of materials.

Hoarding to be provided to the satisfaction of the Project Architect and Project structural Engineer.

Appropriate security net and other security means to be provided along the facades and scaffoldings.

General Notes

All necessary precautions such as security nets among others have to be installed all along the scaffolding for security of the adjoining facilities. It is to be noted that these adjoining premises will be operational during the construction works.

Contractor to take note

(i) Any damage of existing services and property during execution of works shall be reinstated or replaced to the satisfaction of the Architect/ Engineer at no additional cost.

(ii) To ensure cleanliness throughout the circulation and construction areas.

(iii) Contractor to ensure that no disturbances are caused to the premises during execution of the movement of materials and works.

(iv) Contractor to make his own arrangement for power supply and provision of water on site.

Special conditions (IF ANY, TO BE LISTED HERE):

(i) Referring to the above notes, the Contractor may have to carry out works during weekends, public holidays and during odd hours and same should be allowed in the bid price.

SPECIFICATIONS

The Government of Mauritius Standard Specifications issued by the Ministry of National Infrastructure & Community Development shall form part of the contract documents (Refer Appendix I).

All materials used in this project should be to the approval of the Architect and Engineer.

With reference to the "Standard Specifications", kindly note that: -
An Approved Testing Authority is further defined as: -

(i) Materials Testing Laboratory of the Ministry of National Infrastructure and Community Development
(ii) Mauritius Standard Bureau
(iii) The Laboratory of the University of Mauritius
(iv) Or any approved material testing laboratory

Preliminaries and General Costs

1.Ordering of Materials fitting an equipment

The selected Contractor shall place orders at the very beginning of the contract for materials, fittings and items of equipment required for this work.

Non-availability of these items will not be considered as an excuse for delay on the works.

2. Discrepancies

Should the Contractor at any time discover discrepancies between drawings, scope of works or any other documents or in dimensions, instructions, he shall immediately refer same to the Architect who shall decide the course to be followed. Failure on the part of the Contractor to comply with this Clause may invalidate any subsequent claim made by him.

3. Contractor to visit site

Contractor shall visit the site before tendering and ascertain the nature of the ground and subsoil to be excavated, the contours thereof and acquaint himself with local conditions, site conditions, site restriction, working space available, means of access, limitation and restrictions to access, risk of damage to adjacent properties, roads, etc.
The contractor will have to carry out any other survey that in his opinion is necessary for him to submit a proper proposal. This survey shall also include the services underground or above that may run on site and he shall allow in his offer for their deviation if required.

4. Area to be occupied by Contractor

The area of the site which may be occupied by the Contractor for his use as storage or for erection of workshops etc, shall be defined on this site by the Architect.

5. Access to Site and Temporary Roads

Means of access to the site shall be agreed with the Architect/Engineer prior to the commencement of the work and Contractor must allow here for building any temporary access roads, gantries for the transport and lifting of all materials, plants and workmen required for the complete execution of the works, including the provision of temporary culverts, crossing bridges or other means of gaining access to the site. Upon the completion

of the works the Contractor shall leave such temporary, access roads, culverts etc. undisturbed unless ordered otherwise by the Architect. No claims will be entertained for such temporary services left on site or for their removal and restoration on the site to the original condition.

6. <u>Maintenance of Roads</u>

The Contractor shall allow for maintaining and keeping public and private roads free from mud debris, etc, arising from the works throughout the duration of the contract.

7. <u>Plant, Tools, Scaffolding etc…</u>

The Contractor shall provide all necessary plants, tools, scaffolding, cofferdams and vehicles for the efficient and expedious execution of the works and at or before completion clear same from building and site and make all good.

Prior to construction, the Contractor shall submit working drawings, showing the materials and proposed method of construction of the cofferdams. The Contractor shall construct cofferdams high enough to prevent overspill. If needed, the contractor shall brace the cofferdams to withstand pressure without buckling, or may secure the cofferdams in place to prevent tipping or movement. The cofferdams shall be as watertight as necessary for the safe and proper construction of the substructure work inside them. With the exception of construction of a concrete foundation seal placed under water, the interior dimensions of cofferdams shall be designed to allow sufficient clearance for the construction. The Contractor shall be responsible for the righting and resetting of cofferdams that have tilted or moved laterally, as required for construction. Because the potential for washout is high, the cofferdams shall be carefully monitored, and must not be left unattended for any 24-hour period by the Contractor. Weather reports must be monitored. If a storm event is expected, the site must be stabilized in preparation for it.

8. <u>Setting Out</u>

The Contractor shall set out the works in accordance with the dimensions and levels shown on the approved drawings and shall be responsible for the correctness of all dimensions and levels so set out by him. He will be required to rectify all errors arising from inaccurate setting out at his own cost and expense. In event of error or discrepancy in the dimensions or levels marked out on the drawings being discovered, such errors or discrepancies shall be reported by the Contractor to the Architect for his immediate consideration.

No work connected with such errors shall be continued by the Contractor until he has received written instructions from the Architect to adjust such discrepancies.

9. **Discharge of Workmen**

The Contractor shall only employ qualified foremen, artisans and labourers on the works. If, in the opinion of the Architect any person employed by the Contractor misconducts himself or is likely to cause or has caused strikes, quarrels or delays, or is incompetent the Contractor, when so directed by the Architect in writing shall at once remove such person from the works site.

10. Government Ordinance and Regulations

The Contractor must also make himself acquainted with current ordinance and any Government regulations regarding the movement housing security and control of labour camps, passes for transport etc... and allowance must be made in his Tender for compliance therewith in so far as they are practicable. It is important that the Contractor before tendering shall obtain from the relevant Authority the fullest information regarding all such regulation and/or restrictions which may affect the organisation of work, supply and control of labour, etc... and allow accordingly in his Tender. No claim for want of knowledge in this connection will be entertained.

11. Water, Light and Power, telephone

The Contractor shall provide at his own risk and cost the water, light and power required for use in the work and make them available free of charge to sub-contractor and others.

The Contractor will be required to arrange for the installation of a temporary connection to the main water supply and to provide himself with all necessary temporary water piping and storage tanks as required or directed, remove same and make good disturbed surfaces at completion to the satisfaction of the Architect and pay all charges for meter hire and water consumed until the completion of works.

The Contractor shall provide and maintain a temporary telephone service on site for the full period of the contract at his own costs.

12. Watching and Lighting

The Contractor, from commencement of the contract, shall provide all watching lighting and protection of the works, materials and public through fares as may be necessary for the safety of the works, and for the protection of the public and his own employees.

13. Sheds for Storage of Materials

The Contractor shall provide and maintain to the satisfaction of the Architect and clear away on completion of the works water tight sheds for the storage and protection of all materials required for the proper execution of the work. He shall

also provide storage sheds as may be required by sub contractors nominated sub-contractors and nominated suppliers and remove same when ordered.

14. <u>Foreman's Office</u> The Contractor shall provide a temporary office for the use of the foreman on the site in a position to be agreed by the Architect.

15. <u>Sanitation for work People</u> Adequate sanitary accommodation for his work people etc... shall be arranged and maintained by the Contractor to a standard satisfactory to the Ministry of Health or Health and Sanitation Department of the Local Authority/District Council and/or Labour Inspector.

The Contractor shall provide satisfactory housing for the watchman and water-borne latrine, accommodation for the labour employed on site. Whether by himself or by nominated sub-contractors and/or suppliers and arrange for and pay all charges in connection therewith and allow for removing same and leaving ground clean and free from pollution to the entire satisfaction of the Architect.

16. <u>Sign Board</u> The sign boards for the display of the General and sub-contractor's names shall be approved size and design with neat and uniform lettering.

17. <u>Testing of Material</u> The Architect/Engineer shall make such tests of the samples of any materials as he may at his discretion deemed desirable, and the cost of such tests shall be added to the Contract Sum unless the result of such tests causes the Architect/Engineer to reject any samples or materials as not being in his opinion in accordance with the specification in which case the Contractor shall pay for such tests and the cost thereof shall be recovered there from the Contractor by deduction from the Contract Sum.

18.<u>Protection and Delivery</u> The Contractor shall allow for covering up and protection of work liable to damage, including temporary roofs, gutters, drains etc. If necessary, case up, cover, or in other suitable way protect all finished work liable to injury to the satisfaction of the Architect until completion of the contract. On completion the whole of the works shall be delivered up clean, complete and perfect in every respect to the satisfaction of the Architect.

19. <u>Employer's facilities</u> The Contractor is to allow for the costs of facilities on site but not limited to the following:

(i). **Office for Supervisory Staffs**

The Contractor shall provide effect and maintain where directed on the site an approved weather and sunproof temporary office for use of the Supervisory staffs floor size of 6m" x 3m and shall provide the following:

(a) A long suitable table size 80" X 30" (2440 mm X 915 mm)
(b) 8 Chairs
(c) 1 pin Board

(ii) **Survey and Testing Equipment**

As may be necessary on site.

20. Removal of Plant and Rubbish

The Contractor shall, upon completion of the works, at his own expense remove and clear away all plant, rubbish and unused materials and shall leave the whole of the site in a clean and tidy state to the satisfaction of the Architect. He shall also remove all rubbish and dirt from the site as it accumulates at the discretion of the Architect.

21. Hoardings

The Contractor is to provide for all necessary hoardings, as appropriate, along the boundaries allocated to him in order to secure the site.

22. Restrictions

Allow for the cost of restrictions including but not limited to the following:

(a)**Limitation of Workmen:**
The Contractor shall keep all persons including those employed by Sub-contractors under control and within the boundaries of the area allocated to him.

(b) **Limitation of construction activity**
The Contractor shall be required to limit the construction activity, Temporary buildings, storage of equipment and materials etc within the boundaries of the area allocated to him.

23. <u>Personnel Required</u>

(1) One Contract Manager having as minimum qualification: A diploma in construction related field and 5 years experience in the construction sector; or any equivalent qualifications acceptable to the Ministry of Tourism. The duties of the Contract Manager shall be amongst others to attend site meetings, coordination meetings and site visits.

(2) One Professional Civil Engineer registered with the Council of Registered Professional Engineer of Mauritius (CRPE) with a minimum of 5 years' relevant experience **for the design, certification and monitoring of the cofferdam structures and other associated works.**

(3) One Site agent on site on a full-time basis with a minimum of 5 years' relevant experience and holding at least a diploma in Building and Civil Engineering or any similar qualification from a recognised institution.

(4) One General Foreman on site on a full time basis, with minimum 10 years' relevant experience.

24. PRELIMINARY PARTICULARS

(i) PUBLIC BODY

The term "PUBLIC BODY" shall mean

Ministry of Tourism
5th Floor, Air Mauritius Centre,
John Kennedy Street,
Port Louis

ii) PROJECT MANAGER

The term "PROJECT MANAGER" shall mean
Ministry of National Infrastructure & Community Development

(ii) ARCHITECT

The term "ARCHITECT" shall mean

Ministry of National Infrastructure & Community Development

(iii) ENGINEER

The term "ENGINEER" shall mean

Ministry of National Infrastructure & Community Development

(iv) QUANTITY SURVEYOR

The term "QUANTITY SURVEYOR" shall mean

Ministry of National Infrastructure & Community Development

B. DRAWINGS

Structural drawings as per list below:

Survey Plan for existing Boat Ramp - DRG No. AG92/SV03
Demolition Plan - DRG No. AG92/ST06
Proposed Layout - DRG No. AG92/ST07
Section A – A - DRG No. AG92/ST08
Sections B – B & C – C - DRG No. AG92/ST09
Structural Notes - DRG No. AG92/ST10

C. Supplementary Information/client requirements

The type and methodology of the construction of Reinforced Concrete retaining wall (including cofferdam construction) is to be submitted by the Contractor to the Project Engineer for approval.

ACTIVITY SCHEDULE

BIDDERS SHALL PRICE ALL ACTIVITIES IN THE ACTIVITY SCHEDULE ONLINE. A COPY OF THESE ACTIVITY SCHEDULES MAY ALSO BE DOWN LOADED IN EXCEL FORMAT ALONG WITH THE COPY OF THE BIDDING DOCUMENT FROM THE SYSTEM.

GUIDANCE NOTES ON PRICING OF ACTIVITY SCHEDULE

This is a lump sum tender and shall be based strictly on the information provided in the drawings, specifications, scope of works and other conditions laid in the bid document and not according to this Activity Schedule.

1. The prices in the Activity Schedule may be used if judged appropriate for the preparation of interim valuations.

2. Prices in the Activity Schedule **shall not** be used for adjusting the lump sum tender price for extra works or omissions.

3. Any inconsistencies detected in the prices shall be resolved by the Project Manager.

4. The bidder is responsible for ensuring that works are included in his bid price, whether or not an item is given.

5. In the case of the bidder leaving unpriced any items, he will be deemed to have considered that the prices of the remaining items are sufficient to enable him to perform the services and obligations described in the items not priced without extra charge.

List of Activity Schedules for this project to be filled online are as hereunder.

- Activity Schedule 1 - Preliminaries and General Cost
- Activity Schedule 2 - Rehabilitation of the Boat Ramp at Le Batelage, Souillac
- Activity Schedule 3 - Any other works
- Activity Schedule 4 - Contingency Sum
- Activity Schedule 5 - Summary

Activity Schedule 1- Preliminaries and General Cost

ITEM NO	DESCRIPTION	Unit of Measure	QTY
A	**Preliminaries & General Costs**	-	-
A.1	The Contractor is to allow for costs related to Preliminaries and General Conditions of Contract requirements including the following but not limited to setting out of works, site management, Contractor's office, overheads, tools, plants, scaffolding ,store, stacking and storage of materials, Employer's facilities, insurances, bonds, watchmen, light, electricity, , signboard, protection, security of workmen, etc… and works on site, temporary hoardings and gantries, pumping and dewatering, police requirements etc Note: The bidder is advised to visit and inspect the site for which he is bidding prior to submission of his offer as no claims will be allowed on the grounds of ignorance of the Conditions under which the works will be executed. In particular, the bidder must decide for himself the existing ground levels, detection, deviation and protection of existing services, the nature of the ground and subsoil to be excavated at his own risks and costs and shall be responsible to construct the foundation to the full satisfaction of the Engineer.	Sum	***1***
A.1.1	Allow for providing special care so as not to interfere unnecessarily with or so as to accommodate any services installations that may be met with & including for health, safety & security requirements for the users third parties in adjoining properties and roads at all times in accordance with laws & regulations.	Sum	***1***
A.1.2	Allow for protection and/or deviation of services underground or above that may run on site	Sum	***1***
A.1.3	Allow for hoarding, as appropriate, along the boundaries of the site allocated to the contractor, in order to secure the site	Sum	***1***
A.1.4	Allow for temporary gate	Sum	***1***
A.1.5	Keep site free from water	Sum	***1***

Activity Schedule 2 –Rehabilitation of the Boat Ramp at Le Batelage

ITEM NO	DESCRIPTION	Unit of Measure	QTY
B	**CONSTRUCTION OF NEW BOAT RAMP**	-	
–	**NOTE: ALL WORKS TO BE EXECUTED IN ACCORDANCE TO DRAWINGS, SPECIFICATIONS AND TO THE APPROVAL & SATISFACTION OF THE PROJECT ENGINEER**	-	
B.1	**DEMOLITION WORKS**	-	
B.1.1	Demolish existing boat ramp structure to be carted away. Contractor to take note that existing hardcore filling onsite to be carefully removed, stored on site and reused for the construction of new boat ramp	Sum	1
B.2	**SUBSTRUCTURE**	-	0
–	All works below underside of screed, including excavations, cutting and filling in all types of soil including rock excavations and foundations and any other works, relevant to completion of sub-structural works.	-	0
B.2.1	Excavation	Sum	1
B.2.2	RC bases, footings, ground beams, etc..	Sum	1
B.2.3	Reinforced concrete wall	Sum	1
B.2.4	Fillings in floor	Sum	1
B.2.5	RC ramp	Sum	1
B.3	**MISCELLANEOUS WORKS**	-	**0**
B.3.1	New Sit-around at existing Badamier tree to be reinstated and seater to be made good	Sum	1
B.3.2	Construction of stone revetment to prevent shore erosion	Sum	1
B.3.3	Construction of a boat storage area consisting of rock material base and coral sand top	Sum	1
B.3.4	Beams, upstand beams, cornices and the like	Sum	1
B.3.5	Making good of any damaged structure resulting from construction works and carting away all existing debris within the construction area	Sum	1

Activity Schedule 3- Any other works

ITEM NO	DESCRIPTION	Unit of Measure	QTY
1	Any other works/items not listed in the Detailed Activity Schedule but which are deemed to be carried out as per specifications and drawings for successful completion of the project should be inserted here as sum. Bidders shall submit a breakdown of the quote giving list of items description, unit, quantity and amount in the template Detailed Activity Schedule for Works (Additional Items) (Ver.1.0) along with its bid online	Sum	1
2	Any other item not mentioned but deemed necessary to make the Electrical and Mechanic installations complete and functional, including any discrepancy between B.O.Q, specifications, drawings should be inserted here as sum. Bidders shall submit a breakdown of the quote giving list of items description, unit, quantity and amount in the template Detailed Activity Schedule for Works (Additional Items) (Ver.1.0) along with its bid online	Sum	1

Activity Schedule 4- Contingency Sum

Sn	Description	Unit of Measure	QTY
1	Allow the contingency sum of Rupees Five Hundred and Seventy Five Thousand (Rs575,000) to be used at the discretion of the employer & deducted in whole or part, if not required.	Sum	1

-
-
-
-
-
-

Activity Schedule 5 – Summary

S/N	Brought forward from	Amount (Excluding VAT)
1	**PRELIMINARIES AND GENERAL COSTS**	
2	**CONSTRUCTION OF NEW BOAT RAMP**	
3	**ANY OTHER WORKS**	
4	**CONTINGENCY SUM**	

Section IV: General Conditions of Contract and Particular Conditions Of Contract

Any resulting contract shall be placed by means of a Letter of Acceptance and shall be subject to the General Conditions of Contract (GCC), **(Ref: W/GCC10/10-20**)[1]*, for the Procurement of Works (available on website *ppo.govmu*.org) except where modified by the Particular Conditions of Contract below.

Procurement Reference Number: **MT/ONB /2022-23/A6**

.

Ref: **W/GCC10/10-20**

GENERAL CONDITIONS OF CONTRACT

(WORKS)

General Conditions of Contract

Table of Clauses

General Conditions of Contract

A. General

1. Definitions 1.1 Boldface type is used to identify defined terms.

(a) The Accepted Contract Amount means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

(b) The Activity Schedule is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity.

(c) The Adjudicator is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC 23.

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

(e) Compensation Events are those defined in GCC Clause 41 hereunder.

(f) The Completion Date is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 53.1.

(g) The Contract is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.

(h) The Contractor is the party whose Bid to carry out the Works has been accepted by the Employer.

(i) The Contractor's Bid is the completed bidding document submitted by the Contractor to the Employer.

(j) The Contract Price is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.

(k) Days are calendar days; months are calendar months.

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

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

(n) The Defects Liability Certificate is the certificate issued

by Project Manager upon correction of defects by the Contractor.

(o) The Defects Liability Period is the period **named in the PCC** pursuant to Sub-Clause 33.1 and calculated from the Completion Date.

(p) Adjudicator means the single person appointed under Clause 23.

(q) Drawings means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

(r) The Employer is the party who employs the Contractor to carry out the Works, **as specified in the PCC**.

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

(t) "In writing" or "written" means hand-written, type-written, printed or electronically made, and resulting in a permanent record;

(u) The Initial Contract Price is the Contract Price listed in the Employer's Letter of Acceptance.

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

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

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

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

(z) PCC means Particular Conditions of Contract

(aa) The Site is the area **defined as such in the PCC**.

(bb) Site Investigation Reports are those that were included in the bidding documents and are factual and interpretative

reports about the surface and subsurface conditions at the Site.

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

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

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

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

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

(hh) The Works are what the Contract requires the Contractor to construct, install, and turn over to the Employer, **as defined in the PCC**.

2. Interpretation

2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

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

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

(a) The Agreement,

(b) Letter of Acceptance,

(c) Contractor's Bid,

(d) Particular Conditions of Contract,

(e) General Conditions of Contract,

(f) Specifications,

(g) Drawings,

(h) Bill of Quantities,[2] and

(i) any other document **listed in the PCC** as forming part of the Contract.

3. Contract Agreement

3.1 The language of the Contract and the law governing the Contract are **stated in the PCC**.

3.2 The parties shall enter into a Contract Agreement within 28 days after the contractor receives the Letter of Acceptance unless they agree otherwise.

4. Project Manager's Decisions

4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.

5. Delegation

5.1 Otherwise specified in the PCC, the Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations and the contractor shall be liable for the non-performance or improper performance of the obligations of the subcontractor.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as **referred to in the PCC.** The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

[2] *In lump sum contracts, delete "Bill of Quantities" and replace with "Activity Schedule."*

9. Personnel and Equipment

9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

9.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Employer's and Contractor's Risks

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

11. Employer's Risks

11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks:

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

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

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

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

11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to

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

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

(c) the activities of the Contractor on the Site after the

Completion Date.

12. Contractor's Risks

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

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the PCC** for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works, Plant, and Materials;
(b) loss of or damage to Equipment;
(c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
(d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval within 21 days after issue of letter of Acceptance. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

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

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

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

13.6 The policies which are in the joint names of the Contractor and the Employer shall contain a clause to include a waiver of subrogation of the Contractor's rights to the insurance carrier against the Employer.

14. Site Data

14.1 The Contractor shall be deemed to have examined any Site Data **referred to in the PCC**, supplemented by any information available to the Contractor.

15. Contractor to Construct the

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

Works

16. The Works to Be Completed by the Intended Completion Date

16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

17. Approval by the Project Manager

17.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.

17.2 The Contractor shall be responsible for design of Temporary Works.

17.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

17.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

18. Health and Safety

18.1 The Contractor shall be responsible for the health and safety of all activities on the Site.

18.2 The Contractor shall comply with the relevant legislations regarding health and safety on site, including the Occupational Safety and Health (Safety of Scaffold) Regulations 2013.

18.3 The contractor shall send to the Project Manager details of any accident as soon as practicable after its occurrence and shall maintain records and submit reports concerning health, safety and welfare of persons and damage to property, as the Project Manager may reasonably require.

19. Discoveries

19.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

20. Possession of the Site

20.1 The Employer shall, after receiving the Performance security, the insurance covers and the Program for the Works all as per requirements, give possession of all parts of the Site to the Contractor within seven days for execution of works in accordance to the Program for the Works. If possession of a part is not given by the date **stated in the PCC or as thereafter reviewed and agreed by the parties,** the Employer shall be deemed to have delayed the start of the relevant activities, and

this shall be a Compensation Event.

21. Access to the Site

21.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

22. Instructions

22.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

22.2 The Contractor shall permit persons appointed by the Employer to inspect the Site and/or the accounts and records of the Contractor and its sub-contractors relating to the performance of the Contract, and to have such accounts and records audited by auditors appointed by the Employer if required by the Employer. The Contractor's attention is drawn to Sub-Clause 57.1 which provides, inter alia, that acts intended to materially impede the exercise of the inspection and audit rights provided for under Sub-Clause 22.2 constitute a prohibited practice subject to contract termination.

23. Appointment of the Adjudicator

23.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority **designated in the PCC**, to appoint the Adjudicator within 14 days of receipt of such request.

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

24. Procedure for Disputes

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

24.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

24.3 The Adjudicator shall be paid by the hour at the **rate specified in the PCC,** together with reimbursable expenses of the types **specified in the PCC**, and the cost shall be divided equally

between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.

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

B. Time Control

25. Program

25.1 Within the time **stated in the PCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.

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

25.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period **stated in the PCC.** If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount **stated in the PCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.

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

26. Extension of the Intended Completion Date

26.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event (as defined in GCC 41) occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

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

27. Acceleration

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

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

28. Delays Ordered by the Project Manager

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

29. Management Meetings

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

29.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

30. Early Warning

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

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

C. Quality Control

31. Identifying Defects

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

32. Tests

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

33. Correction of Defects

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

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

34. Uncorrected Defects

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

D. Cost Control

35. Contract Price

35.1 In the case of an admeasurement contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the

Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

35.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to prepare interim valuations of works done.

Any errors or inconsistencies including front loading detected in the Activity Schedule at any time during the execution of the project shall be resolved as directed as by the Project Manager.

36. Changes in the Contract Price

36.1 In the case of an admeasurement contract:

(a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.

(b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.

(c) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

36.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

37. Variations

37.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.

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

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

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

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

37.6 In the case of an admeasurement contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Sub-Clause 38.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

38. Cash Flow Forecasts

38.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

39. Payment Certificates

39.1 The Contractor shall submit to the Project Manager monthly statements, with supporting documents of the estimated value of the work executed less the cumulative amount certified previously.

39.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor within 21 days after receiving the statement and supporting documents.

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

39.4 The value of work executed shall comprise:

(a) In the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or

(b) In the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.

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

39.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information. An interim certificate shall not be deemed to indicate the Project Manager's acceptance, approval, consent or satisfaction of the work.

39.7 Unless otherwise specified in the ~~S~~PCC Interim Payment may be made for Plant and Material delivered on site ready for incorporation within reasonable period of time in the permanent works, subject to the Contractor transferring ownership to the Employer and providing, where applicable, the right of the transfer of ownership vested upon the Contractor by its supplier.

Notwithstanding the transfer of ownership the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor until taking over of the works or part thereof in which such Plant and Materials are incorporated and shall make good at its own cost any loss or damage that may occur to the works or part thereof from any cause whatsoever during such period prior to the taking over.

40. Payments

40.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 21 days of the date of each certificate but not later than 42 days after the Project Manager has received a statement with supporting documents from the Contractor. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment irrespective of the date on which any interim payment is issued. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest at the legal rate for each of the currencies in which payments are made. The contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

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

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

40.4 Items of the Works for which no rate or price has been entered in

shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

40.5 The contractor (if VAT Registered) shall be paid VAT upon submission of a VAT invoice.

41. Compensation Events

41.1 The following shall be Compensation Events:

(a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.

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

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

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

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

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

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

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

(i) The advance payment is delayed.

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

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

(l) In situations of Force Majeure which makes the contractor's performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances. Such events shall be

limited to:

(a) reason of any exceptionally adverse weather conditions (as specified in the BDS) and

(b) reason of civil commotion, strike or lockout affecting any of the trades employed upon the Works or any of the trades engaged in the preparation, manufacture or transportation of any of the goods or materials required for the Works.

41.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

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

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

42. Tax

42.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 44.

43. Currencies

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

44. Price Adjustment

44.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the PCC.** If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective

price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency:

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

where:

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

A_c and B_c are coefficients[3] **specified in the PCC,** representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency "c;" and

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

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

45. Retention

45.1 The Employer shall retain from each payment due to the Contractor the proportion **stated in the PCC** until Completion of the whole of the Works.

45.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 53.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" Bank/Insurance guarantee.

46. Liquidated Damages

46.1 The Contractor shall pay liquidated damages to the Employer at the rate per day **stated in the PCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the PCC.** This amount may be included as a deduction in the contract price and payment certificate. Payment of liquidated damages shall not affect the Contractor's liabilities.

46.2 If the Intended Completion Date is extended after liquidated

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

damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 40.1.

47. Bonus

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

48. Advance Payment

48.1 The Employer shall make advance payment to the Contractor of the amounts **stated in the PCC** by the date **stated in the PCC,** against provision by the Contractor of an Unconditional Bank/Insurance Guarantee in a form and by a bank/insurance company acceptable to the Employer in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.

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

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

49. Securities

49.1 The Performance Security shall be provided to the Employer within 28 days of the receipt of the Letter of Acceptance and shall be issued in an amount **specified in the PCC,** by a local bank or local insurance company and denominated in the types and proportions of the currencies in which the Contract Price is payable.

The Performance Security shall be valid until a date 21 days from the date of issue of the Defects Liability Certificate. The employer shall return the performance security within 21 days after receipt of a copy of the Defects Liability Certificate.

49.2 (a)Where the contractor has benefitted from the application of the Margin of Preference for employment of local manpower, it shall:

(i) in the execution of the contract, fulfill its obligation of maintaining local manpower force for 80 % or more of the man-days deployed in the execution of the Works with which it satisfied the criteria of eligibility for being awarded the contract in application of the Margin of Preference; and

(ii) concurrently with the above performance security, provide a preference security to guarantee it will fulfill its obligation in that respect.

(b) For contracts above Rs 100M, the preference security shall be in the form of an "on demand" bank/insurance guarantee for an amount in a convertible currency equivalent to the difference between its bid price and the bid price of the lowest bid if the Margin of Preference was not applicable. It shall be issued by a commercial bank/insurance company located in the Republic of Mauritius.

(c) For contracts up to 100M, the public body shall either retain money from progressive payments to constitute the preference security or request a security in the form of a bank/insurance guarantee at the selected bidder's option.

(d) The preference security shall be valid until the Contractor has completed the Works and a Completion Certificate has been issued by the Employer's Representative as per GCC 53.

(e) The cost of providing the security shall be borne by the Contractor.

49.3 Where a Preference Security is applicable:

(i) the Employer's Representative shall monitor the employment of local manpower throughout the execution of the contract and shall from time to time request a report from the contractor on the percentage of total men-days deployed using local manpower.

(ii) the Contractor shall submit the local manpower employment reports as often as it is reasonably requested by the Employer's Representative.

(iii) the Employer's and Contractor's representatives shall consult each other to ensure that the Contractor's obligation towards local manpower employment is met during the Works execution.

(iv) At the time of works completion, the Contractor shall submit a certified audited report to the Employer to substantiate the actual percentage of local manpower employed throughout the execution of the works.

(v) The preference security shall be forfeited by the employer in case of failure on the part of the contractor to employ at least 80% of the local manpower in the execution of the Works.

50. Dayworks

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

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

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

51. Cost of Repairs

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

52. Labour Clause

52.1 (a) The rates of remuneration and other conditions of work of the employees of the Contractor shall not be less favourable than those established for work of the same character in the trade concerned-

(i) by collective agreement applying to a substantial proportion of the workers and employers in the trade concerned;

(ii) by arbitration awards; or

(iii) by Remuneration Regulations made under the Employment Relation Act 2008.

(b) Where remuneration and conditions of work are not regulated in a manner referred to at (a) above, the rates of the remuneration and other conditions of work shall be not less favourable than the general level observed in the trade in which the contractor is engaged by employers whose general circumstances are similar.

52.2 No Contractor shall be entitled to any payment in respect of work performed in the execution of the contract unless he has, together with his claim for payment, filed a certificate:

(a) stating the rates of remuneration and hours of work of

the various categories of employees employed in the execution of the contracts;

(b) stating whether any remuneration payable in respect of work done is due;

(c) containing such other information as the Chief Executive Officer of the Public Body administering the contract may require to satisfy himself that the provisions under this clause have been complied with.

52.3 Where the Chief Executive Officer of the Public Body administering the contract is satisfied that remuneration is still due to an employee employed under this contract at the time the claim for payment is filed under subsection 4.3, he may, unless the remuneration is sooner paid by the Contractor, arrange for the payment of the remuneration out of the money payable under this contract.

52.4 Every Contractor shall display a copy of this clause of the contract at the place at which the work required by the contract is performed.

E. Finishing the Contract

53. Completion

53.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is completed.

53.2 The Certificate of Completion shall be issued within 14 days from date of completion of the works.

54. Taking Over

54.1 The Employer shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

55. Final Account

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

56. Operating and Maintenance Manuals

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

56.2 If the Contractor does not supply the Drawings and/or manuals by the dates **stated in the PCC** pursuant to GCC Sub-Clause 55.1**,** or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the PCC** from payments due to the Contractor.

57. Termination

57.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

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

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

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

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

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

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

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

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

(h) if the Contractor, in the judgment of the Employer, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to GCC Clause 57.1.

57.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 56.2 above, the Project Manager shall decide whether the breach is fundamental or not.

57.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

57.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as

soon as reasonably possible.

58. Fraud / Corruption and Integrity Clause

58.1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 57 shall apply as if such expulsion had been made under Sub-Clause 57.5 [Termination by Employer].

58.2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Clause 9.

58.3 For the purposes of this Sub-Clause:

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

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

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

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

(v) "obstructive practice" is

(a) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

(b) acts intended to materially impede the exercise of an inspection and audit rights provided for under Sub-Clause 22.2.

58.4 The Contractor shall take steps to ensure that no person acting for it or on its behalf will engage in any type of fraud and corruption

during the contract execution:

Transgression of the above is a serious offence and appropriate actions will be taken against such contractors.

59. Payment upon Termination

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

59.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

60. Property

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

61. Release from Performance

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

A. General	
GCC 1.1 (r)	The Public Body/Employer is: **Ministry of Tourism** **5th Floor, Air Mauritius Centre** **John Kennedy Street** **Port Louis**
GCC 1.1 (v)	The Intended Completion Date for the whole of the Works shall be One **Hundred and Twenty (120) Days** from start of works
GCC 1.1(y)	The Project Manager(s) shall be the representative of The Ministry of National Infrastructure and Community Development as shall be designated by Public Body
GCC 1.1 (aa)	The Site is located at Souillac and is defined in drawings No. **DRG. No. AG92/SV03**
GCC 1.1 (dd)	"The Start Date shall be **fourteen (14)** ***days after handing over of site.***
GCC 1.1 (hh)	The scope of works for the project includes the following: - Demolition and carting away of the existing boat ramp as shown on the design drawings; - Removal of existing hardcore fillings and storage of same on site for reuse; - Provision of adequate hoarding to secure the site; - Excavation works for the reinforced concrete retaining wall and formation level for the boat ramp. Carting away of soil materials to be carried out as required; - Construction of the reinforced concrete retaining wall which includes provision of cofferdams (type and methodology to be submitted by contractor to engineer for approval) and pumping out of water as required; - Provision of compacted hardcore fillings for the ramp, as per specifications; - Construction of the reinforced concrete boat ramp as per drawings; - Sit around for existing Badamier tree to be reinstated and seater to be made good; - Construction of stone revetment (~ 20m) to prevent shore erosion; - Construction of a boat storage area consisting of rock material base and coral sand top; - Provision of concrete finishes to the boat ramp as approved by engineer; - Making good of any damaged structure resulting from the construction works - Carting away all existing debris in the construction area whilst ensuring that no debris shall have access to the sea during the rehabilitation works. Other works as more fully described in the drawings, specifications and other parts of the Bid document. **The duration of the construction works shall be 120 Days from the date of start of works.**

GCC 2.2	Sectional Completions are: **Not Applicable**
GCC 2.3(i)	The following documents also form part of the Contract: **Performance Security, Insurance Policies and addenda (if any).** **The Performance Security and Insurance Policies shall be submitted within 21 days as from the date of receipt of Letter of Acceptance, for verification by the Quantity Surveyor before the handing over of site.**
GCC 3.1	The language of the contract is English The law that applies to the Contract is the law of Mauritius.
GCC 5.1	The Project manager may delegate any of his duties and responsibilities.
GCC 8.1	Schedule of other contractors: **Not Applicable**
GCC 13.1	Except for the cover mentioned in (d)(i) hereunder, the other insurance covers shall be in the joint names of the Contractor and the Employer and the minimum insurance amounts shall be: (a) for the Works, Plant and Materials: (for *the full amount of the works including removal of debris, professional fee etc...)* (b) for loss or damage to Equipment: (*for the replacement value of the equipment that the contractor intends to use on site until the taking over by the Employer.* (c) for loss or damage to property **Ten (10) Million**(except the Works, Plant, Materials, and Equipment) in connection with Contract *for an amount representing the value of the properties that are exposed to the action of the contractor in the execution of the works. It will extend to the property of the Procuring Entity as well.* **This insurance shall be for a limit per occurrence of not less than the amount stated above, with <u>no limit</u> in number of occurrences.** (d) for personal injury or death: (i) of the Contractor's employees: *[The Contractor shall take an adequate insurance cover for its employees for any claim arising in the execution of the works]*. (ii) of other people **Ten (10) Million)**: [*This cover shall be for an adequate amount for Third Party extended to the Employer and its representatives]*. **This insurance shall be for a limit per occurrence of not less than the amount stated above, with <u>no limit</u> in number of occurrences.** (e) for loss or damage to materials on-site and for which payment have been included in the Interim Payment Certificate, where applicable. The Contractor shall choose to take the insurance covers indicated above as separate covers or a combination of the Contractor's All Risks coupled with

	the Employer's liability and First Loss Burglary, after approval of the Employer. All insurance covers shall be of nil or the minimum possible deductibles at sole expense of the contractor.
GCC 13.3	If the Contractor does not provide any of the policies and certificates required, this may constitute a breach of the contractor's obligations under the bid conditions and may entail forfeiture of bid security or performance security or any action by the Employer under the Bid Securing Declaration
GCC 13.7	Add the following new sub clause "13.7 – In the Event works are carried out beyond the Intended Completion Date or the Intended Completion date is extended, the contractor shall extend the Insurance policies to cover for the extended period and defects liability period. Failure on the part of the contractor to comply with the above condition may entail: (a) Non- certification of payment (b) Termination of contract (c) Forfeiture of the Performance security.
GCC 14.1	Site Data are: **There are no Site Investigation Reports for this project. Bidders are however advised to visit the site prior to submission of bid. They should acquaint themselves with the nature of the site, extent of the work, means of access, general nature of the soil and all other matters which may influence their bid.** **No claim due to ignorance of these factors as mentioned in the preceding paragraph shall be entertained from the contractor**
GCC 20.1	The Site Possession Date(s) shall be: **within Fourteen (14) days from submission and approval of Performance Security, Preference Security where applicable and Insurance covers. The area of the site which may be occupied by the Contractor for his use as site office or for erection of workshop etc. shall be approved by the Project Manager or his representative.**
GCC 23.1 & GCC 23.2	Appointing Authority for the Adjudicator: **No Adjudicator shall be appointed for this Contract.**
GCC 24.	In case a dispute of any kind arises between the Employer and the Contractor in connection with, or arising out of, the contract or the execution of works or after completion of works and whether before or after repudiation or other termination of Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Employer's Representative, the matter in dispute shall, in the first place, be referred in writing to the employer's representative, with a copy to the other party. The Employer and the Contractor shall make every effort to resolve the dispute amicably by direct informal negotiation. If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Public Body or the Contractor may give notice to the other party

	of its intention to refer the matter to *"*the competent courts of Mauritius"
GCC 24.3	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: **Not applicable.**
GCC 24.4	**Not Applicable**
B. Time Control	
GCC 25.1	The Contractor shall submit for approval a detailed Program for the Works **within 14 days from the date of handing over of site.** Delete the words "*In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule*" in line 5 of clause 25.
GCC 25.3	Delete the words "*In the case of a lump sum contract, the contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager*" in line 7 of clause 25.3 The period between Program updates is **Thirty (30) days.** The amount to be withheld for late submission of an updated Program is ***Rs*** **25,000 in the next payment certificate.**
C. Quality Control	
GCC 33.1	The Defects Liability Period is: **365 calendar days.**
GCC 34.1	Delete sub-clause 34.1 and replace by the following: Should any defect arise during the contractual period and up to the end of the Defects Liability Period and the Contractor fails to correct the Defect within the time specified in the Project Manager's notice, this shall constitute a breach of the Contractor's obligations under the contract. The Project Manager shall assess the cost of having the defect corrected and recover the money from monies due to the contractor or from the Performance Security.
D. Cost Control	
GCC 35.2	Delete "is" and replace by "may be "after line 3 in clause 35.2
GCC 35.3	Add new sub clause "35.3-Where a work is implied in the drawings or specifications or description of works and not itemized in the Activity Schedule, any such work shall be deemed to have been priced elsewhere in the contract price"
GCC 35.4	Add new sub clause"35.4 -Any prices in the activity schedule shall be fully

	inclusive for the finished works described under the respective work item and drawings and/ or specifications and scope of works"
GCC 36.2	Delete sub Clause 36.2 entirely
GCC 37.1	Delete ", and, in the case of lump sum contract, also in the activity schedule, "in line 1 of sub clause 37.1
GCC 37.2	Add "Omissions and additions shall be measured and valued at fair rates and prices, having regards to current market prices. The contractor shall supply all information required by the Project Manager to enable him to value a variation" after line 6 of clause 37.2
GCC 38.1	Delete the words ", or in the case of a lump sum contract, the Activity Schedule," in line 1 of clause 38.1
GCC 39.4	Replace the words "...value of completed activities in the Activity Schedule." in line 2 & 3 of clause 39.4(b) by "percentage value of activities in the Activity Schedule subject to clause 35.2".
GCC 39.7	**Interim Payment for materials on site only is applicable.** The payment will be 80% of the Project Manager's determination of the cost of plants and materials delivered on site.
GCC 40.1	Amend clause 40.1 by replacing 21 days by 7 days and 42 days by 28 days
GCC 41.1 (l)	The term "exceptionally adverse weather conditions" is hereby defined as any one of the following events: (1) 100 mm rainfall or above recorded in one day at the nearest rain station; (2) An official declaration of "Torrential Rain" by the Meteorological Department of Mauritius; and (3) Cyclone warning Class III or IV.
GCC 43.1	The currency of the Employer's country is: **Mauritian Rupees.**
GCC 44.1	The Contract is **not** subject to price adjustment.
GCC 45.1	GCC Clause 45 is not applicable.
GCC 46.1	The liquidated damages for the whole of the Works are **Rs 3,100 per day**. The maximum amount of liquidated damages for the whole of the Works is **3%** of the Contract price.
GCC 47.1	The Bonus for the whole of the Works is **not applicable**.

GCC 48.1	The Advance Payments shall be: ***10 % maximum of the contract price less contingency sum*** **and shall be paid to the contractor no later than** ***seven (7) days from the date of issue of certificate. The Advance Payment shall be recovered through contractor's running account bills at the rate of 12.5 % of the gross value of works done including materials on site***
GCC 49.1	The Performance Security amount is **10 %** of the contract price in the form of a **Bank Guarantee** as per the format in **Section VIII**. and shall be valid up to a date twenty-eight after the end of the Defects Liability Period (DLP). Where the Performance Security expire before the date **twenty-one (21) days** after the end of the DLP, the contractor shall extend the Performance Security to cover the period up to the latest date of the DLP plus **twenty-one (21) days**. Failure to extend the validity of the Performance Security **twenty-one (21) days** prior to its expiry may entail forfeiture of the full amount of the Performance Security. **Note:** The Contractor shall execute all work required to remedy defects or damage, as may be notified to him by or on behalf of the employer, on or before the expiry date of the DLP or any extended date if a defect or damage cannot be remedied by the expiry date, all at the risk and cost of the contractor
E. Finishing the Contract	
GCC 56.1	The date by which operating and maintenance manuals are required is: **The date of completion.**
GCC 56.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 56.1 is : **Rs. 25,000.**
GCC 57.2 (g)	The maximum number of days is: **60 days**
GCC 59.1	The percentage to apply to the value of the work not completed, representing the Employer's additional cost for completing the Works, is **20*%***.

Section V- Contract forms

Performance Security

.....*Bank/Insurance Company's Name and Address of Issuing Branch or Office*.....

Beneficiary: .....*Name and Address of Public Body*.....

Date.....

PERFORMANCE GUARANTEE No.: .....

We have been informed that .....*[name of the Contractor]* ..... (hereinafter called "the Contractor") has entered into Contract No.....*[reference number of the Contract]* ..... dated..... with you, for the execution of .....*[name of Contract and brief description of Works]* .....(hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance security is required.

At the request of the Contractor, we ..... *[name of Bank/Insurance Company]* .....hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ..... *[amount in figures (amount in words)]* ..... such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire and returned to us not later than twenty- one days from the date of issuance of the Defects Liability Certificate, calculated based on a copy of such Certificate which shall be provided to us, or on the.....day of ....., ..., whichever occurs first. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

……..*Seal of bank/Insurance Guarantee and*

***Signature(s)*.....**

Advance Payment Security

[Bank's/ Insurance Company's Name, and Address of Issuing Branch or Office]

Beneficiary: ..... ***[Name and Address of Employer]*** **.....**
Date: .....
Advance Payment Guarantee No.: .....

We have been informed that . . .. . ***[name of the Contractor]*** . . . . . (hereinafter called "the Contractor") has entered into Contract No. . . . . ***[reference number of the Contract]*** . . . . . dated . . . . with you, for the execution of . . . . . ***[name of contract and brief description of Works]*** . . . . . (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum . . . . . ***[name of the currency and amount in figures]*** [1]. . . . . (. . .. . ***[amount in words]*** . . . . .) is to be made against an advance payment guarantee.

At the request of the Contractor, we . . .. . ***[name of the Bank/Insurance Company]*** . . . . . hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of . . .. . ***[name of the currency and amount in figures] ****. . . . . (. . . . . ***[amount in words]*** . . . . .) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number . . .. . ***[Contractor's account number]*** . . . at .. . ***[name and address of the Bank/Insurance Company]*** . . . . . .

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the . . . day of . . . . , ... [2], whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

. . . . . ***[Seal of Bank/Insurance Company and Signature(s)]*** . . . . . .

Note –

2. *All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.*

3. *1 The Guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*

4. *2 Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the mployer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.*

Letter of Acceptance

[on letterhead paper of the Employer***]***

. . . . . ***[date]***. . . . . .

To: . . . . . ***[name and address of the Contractor]*** . . . . . .

Subject: . . . . . ***[Notification of Award Contract No]***. . . . . .

This is to notify you that your Bid dated . . . . ***[insert date]*** . . . . for execution of the . . . . . ***.[insert name of the contract and identification number, as given in the Appendix to Bid]*** . . . . . for the Accepted Contract Amount of the equivalent of . . . . . ***.[insert amount in numbers and words and name of currency]***, Exclusive of VAT as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by *(insert name of Public Body).*

You are requested to furnish the Performance Security within 21 days in accordance with the General Conditions of Contract, using for that purpose of the Performance Security Form included in Section VI (Contract Forms) of the Bidding Document.

Authorized Signature: .....

Name and Title of Signatory: .....

Name of Agency: .....

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the . . . . . .day of . . . . . ., ..., between . . . . . ***[name of the*** Employer***]***. . . . . (hereinafter "the Employer"), of the one part, and . . . . . ***[name of the Contractor]***. . . . .(hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as . . . . . ***[name of the Contract]***. . . . . .should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents**.**

(a) the Letter of Acceptance

(b) the Bid

(c) the Addenda Nos . . . . . ***[insert addenda numbers if any]***. . . . .

(d) the Appendix to the General Conditions of Contract

(e) the General Conditions of Contract;

(f) the Specification

(g) the Drawings*;* and

(h) the completed Schedules,

3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

5. (a) **Notwithstanding anything to the contrary in this agreement**, [Name of appointed Contractor] agrees to indemnify and hold harmless the *Ministry of Education, Tertiary Education, Science & Technology* from any claim brought by or on behalf of third parties against it, its préposés and/or agents, for any loss or damage caused to third parties or on their behalf by the acts and omission of [Name of appointed Contractor] or

its employees, préposés and/or agents during the execution of the works pursuant to the agreement.

(b) **Notwithstanding anything to the contrary in this agreement**, the *Ministry of Education, Tertiary Education, Science & Technology* shall be entitled to claim from [Name of appointed Contractor] such loss and damages caused to it by the acts or omissions of [Name of appointed Contractor], its employees, préposés and/or agents.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Mauritius on the day, month and year indicated above.

Signed by:	Signed by: .....
for and on behalf of the Employer	for and on behalf the Contractor
in the presence of:	in the presence of: .....
Witness, Name, Signature, Address, Date	Witness, Name, Signature, Address, Date

Appendix I– Standard Specifications

GOVERNMENT OF MAURITIUS

STANDARD SPECIFICATIONS

MINISTRY OF WORKS
PHOENIX

STANDARD SPECIFICATIONS

INDEX

CONCRETE BLOCKLAYER

Concrete blocks

Concrete blocks for walling shall comply with B.S 2028 Type A (for load bearing walls) and of compressive strength not less than:

Cavern of 12 blocks ……..500 lbs/sq.in
Gross area
Lowest individual block ….375 lbs/sq.in
Gross area
Blocks for non load bearing walls are to be class B blocks.

Blocks shall be hollow two-hole type and shall be cured for not less than 28 days before they are used in the works. The Contractor shall supply a certificate from the supplier for each consignment of block received to the effect that the blocks meet the requirements and strength of the latest relevant B.S. Any block for which a certificate cannot be produced will be condemned and must be removed from site. All blocks supplied shall be of the same height and blocks of similar dimensions will not be accepted. Half length blocks and specials shall also be provided as specified or required to break bond.

Mortar

Mortar to be used for all Type A blockwall shall be composed of 1 part of cement to 3 parts of sand. Mortar for Type B blockwork shall be composed of one part of Portland cement, one part lime, and five parts of sand. All mortar shall be measured in specially prepared gauge boxes and thoroughly mixed dry or clean and water tight mixing platforms, with water added from a fine rose until all parts are completely incorporated and brought to a proper consistency.

All mortar must be used within thirty minutes of mixing. No partially or Wholly set mortar will be allowed to be used or re-mixed.

Setting and jointing

All blocks shall be lightly wetted immediately before being bedded and jointed to minimise absorption of water from the mortar.

Blocks are to be well buttered with mortar as previously specified. The blocks shall be laid fir-faces on the outside face, in stretcher bond with 10mm, thick, full, flused up and grouted solid joints. The joints shall not vary by more than 3mm and four consecutive joints shall not exceed 38mm and four consecutive joints shall not exceed 38mm. Joints shall be raked out where surfaces of walling are to be plastered.

Laying of blocks

All walls throughout the work shall be carried up evenly in courses, no part being allowed to be carried up more than 900 mm. higher at one time than any other part and in such cases the joining shall be made in long steps so as to prevent cracks arising and all walls shall be levelled around at each floor.
All put log holes shall be carefully, properly and completely filled up on completion of walling work.

All walling shall be properly protected while mortar is setting.

Walls shall be kept thoroughly wet for at least three days or for such longer period of time as the Architect may direct. Walls exposed to the sun shall be protected with a sacking which shall be kept wet.

Fair Face Blocks

Where walling is to be finished fairfaced, the blocks are to be selected free from defects. Joints shall be raked out as works proceed and pointed with a neat flush joint.

The work shall be carried out regularly with all horizontal joints truly horizontal and no part shall be more than 900mm above adjacent work during construction.

Sample Panel

The Contractor shall include in his tender for erecting a sample panel on site of 200mm blockwork, not less than 1 square metre in area and built off a suitable concrete foundation. The sample, when approved, to form the standard for all concrete blockwork in the contract. The sample area and concrete foundation to be removed when ordered and the surface of the ground made good. Horizontal and vertical joints shall be10mm finished thickness, and raked out 12mm deep where face of wall is to be rendered and in other cases to be left finished flush or as otherwise instructed. The joint grooves between blocks shall be completely filled with cement, lime mortar. No portion of the wall during construction to be more than 900mm above adjoining work. All work to be executed truly level, perpendicular and properly bonded together without continuous upright joints.

Cement, sand and lime

Cement and aggregates for this trade except where separately specified for precise concrete blocks shall be as specified for “concretor” and lime shall be dry hydrated lime to B.S 890 Class B.

Air bricks

Form and leave neat holes in walls and supply and build in approved loucred pattern concrete air bricks where shown. The opening shall be rendered on all sides, the bottom sloped towards external face.

Bedding and pointing

Bedding and pointing of timber door and window frames shall be in cement mortar. Where frames are in metal they shall be bedded and pointed in mastic. Lugs or ties shall be built into walls as described.

Fixing blocks and and leaving holes

Provide and build into walls all necessary flying blocks and leave out or cut away as necessary holes for pipes, conduits and the like and make good after fixing by other trades and specialists.

Build in lugs and the like

Form or leave mortices in walls for, and build in lugs and all necessary fixing for metal windows and doors, door frames and lining, sanitary fittings, rainwater pipes, clips and bearer of various types.

When building up the walls the openings shall be made about 200mm wider than the external dimensions of the doors frames, and when the latter are placed, complete with lugs, the walling completed in concrete mix type C.

Damp-proof course

Where indicated on drawings provide 2-ply felt damp-proof course. Felt to be of a manufacture approved by the Architect and to be laid on a 25mm thick bed of cement mortar (1:3 mix) on walls.

The damp-proof courses to stand the full thickness of walls, partitions and beams in one width and to be overlapped 6" at all jointings and corners.

Measurements

The Contractor must allow in his prices for block walling for plumbing angles, all straight waste, split courses necessary for bond, bonding at angles, intersections and juctions of walling at angles, intersections and juctions of walling of different thicknesses, cutting and fitting to columns, cutting and pinning to beam, cutting and fitting around end of oils and lintols, cutting and pinning ends of structural timber.

The rates of blockwork must also include for fixing all door, window and like openings, forming reveals to same and for cutting and waste to walling in short lengths to millions and jamb of openings.

The rates of blockwork must also include for hoisting and building off beams and slab at any level, all necessary scaffolding and for work built overhead.

Mason

Cement and sand

Cement and sand for this trade shall be as specified for contractor.

Mortar for masonry work

Mortar for bedding and jointing of stonework shall comprise 1 part of cement to 3 parts of sand by volume.

Stonework in walls

All stones for use in walling shall be blue basalt stone carefully selected according to the type of walling required. Walls to be built to the thickness shown on the drawings and the stones wall be well bonded and all voids filled in solid with mortar, bond stones to be used on every 120mm vertically and 2700mm horizontally.
Mortar joints shall be raked to depth of 12mm from face of stonework ready for painting. Walls exposed to sun shall be protected with sacking which shall be kept thoroughly wet for at least three days or for such longer period of time as the Architect may direct.

Stone cladding works

All stones for used in claddings shall be Blue Basalts demolition stones carefully selected and to Architect's approval. Claddings to be of the thickness shown on drawings and be well bonded with all voids sealed in solid cement mortar. All wall surface to received proper cementetious waterproofing prior to application of stone cladding and to be to Architect's approval..

Pointing — All joints whall be raked out as described in Clause 3 and pointed with cement and sand (1:3) with approved pigment added. The pointing will either be recessed, weather struck or flush.

Cleaning of stonework — The contractor shall protect the stonework from mortar droppings and wire brush and wash down all walls on completion.

Carpenter and Joinery

1. Timber generally — All timbers used in the works unless otherwise specified shall be one of the following:

(a) For constructional work keruing, gurjun, mahogany or approved local treated pine.

(b) For joinery work, mahogany, tekoma, teak

The timber shall be sound, selected, well seasoned vacuum impregnated With Tanalith Salts type C at the rate of 64 kgs per cu.m. of timber, free from all defects and shall be worked to the full sizes indicated on the drawings.

In all cases samples of the timber for use in the building shall be submitted to the Architect for approval prior to use.

2. Treatment of timber — The ends and backs of all doors, frames of all timbers built in, rosting or Indirect contact with walling or concrete where not exposed to view, shall be coated with two coats of creosote, solignum or other approved preservative.

3. Replacement of defective timber — Should any of the timber warp, shrink, wind or fly to any appreciable extent within 6 months of completion of the works, the same shall be removed and new fixed in it s place at the contractor's sole expense together with all other work that may be affected.

4. Preparation of timber — The preparation of the timber shall commence simultaneously with the beginning of the work generally and shall proceed continuously until the whole of the woodwork is prepared and stacked on the site, and properly protected from the weather.

5. Constructional timber — All constructional timber shall be properly jointed and framed together with dowels, bolts or spiked as indicated on the drawings.

6. Workmanship — All carpentry shall be executed with workmanship of the best quality. All carpenter's work shall be left with sawn surface except where specified to be wrot.

All carpenter's work shall be accurately set out and in strict accordance with the drawings and shall be framed together and securely fixed in the best possible manner with properly maderjoints. Provide all brads, nails, screws.etc as necessary and as directed and approved.

All timber shall be as long as possible and practicable, in order to eliminate joints.

Actual dimensions of scantlings for carpentry shall not vary from the specified dimensions by more than 3 mm in deficiency or excess.

7. Protect floors

All timber bearded floors to be protected with sawdust after laying. The sawdust to be cleared away on completion.

8. Joinery work generally

All joiner's work generally to be cast and framed together as soon as is practicable after the commencement of the building, but shall not be wedged or glued until the building is ready for fixing same.

All work to be properly tenoned, shouldered, wedged, pinned, bradded etc. as directed by and to the satisfaction of the Architect and all properly glued up with best quality approved glue.

Oval or round brads or nails shall be used for fixing on face work, heads properly punched in and the holes filled with putty or as otherwise described.

9. Finish to

All exposed faces of woodwork shall bet wrot, which shall mean bringing up the surface after planning with sand paper to a smooth satin-like finish.

10. Workmanship

All joinery work shall be executed with workmanship of the best quality in strict accordance with the detailed drawings.

All joiner's work shall be accurately set out on boards to full size for information and guidance of artisans before commencing the respective work. All joints, ironwork and other work connected therewith fully declinated which said setting out will be required to be submitted to the Architect and approved before such respective works are commenced.

All mouldings shall be accurately and truly run and all work planned and finished to the approval of the Architect. All arises to be slightly rounded.

Should any of the joinery work shrink, warp, wind or develop other defects within six months after the completion of the works, the same will be removed and now fixed in its place, together with all other work which may be affected thereby, at the contractor's cost and expense.

All plugs described as fixing for joinery etc. unless otherwise stated shall be formed by raw plastic Philplug screwfix or other approved patent material. No woodplugs shall be used.

Any fixed jonery which in the opinion of the Architect is liable to become bruised or damaged in any way shall be properly cased and protected by the contractor until the completion of the works.

11. Door frames

Door frames and linings shall be constructed to the sizes and details shown on the drawings. Door frames shall be fitted with three fixing irons to each side of the frame and one at the head. Frames for double

doors shall have two fixing at the head. The fixing irons shall consist of 300mm long heep iron not less than 3 mm thick bent up 75mm at one

end and twice screwed to the frame and the other end built into walls or cast into the lintols to a depth of 225mm (where lintols are less than 225mm deep the straps shall be cut off to the full depth of the lintol). 6mm diameter metal dowels shall be fixed to each end of the frame and let into the floor concrete to a depth of at least 50mm.

Door linings shall be screwed to wooden fixing slips let into the walls And lintols.

12. Doors

Doors shall be provided and fixed to the sizes and details shown on the drawings. Doors shall be free from all blemishes and shall be rubbed down to a satin-like finish. Frames, ledged and braced or ledged and braced doors shall be made to the sizes shown on the drawings and the nailing in construction shall be driven from the face and clenched at the back. The heads of nails shall be punched and the holes filled with petty.

The flush doors are to be equal in all respects to the samples of each type to be submitted to the Architect for approval. The coves of all doors shall be pressure bonded and stacked for inspection before the faces are fixed. The plywood facings shall be of the same species on both sides of each door unless otherwise stated.

Facings shall be free from lifting at edges, blisterings or sinking or raising of the surface due to defects in the base of materials.

13. Hardboard

Hardboard shown on drawings for linings, ceilings and joinery shall be of approved manufacture.

14. Veneered plywood

All veneered plywood or blockboard is to be counter-veneered on the reverse side. Plastic faced material shall also be counter-veneered if and where necessary.

15. Formica

Formica shall be as supplied by Messrs Formica Ltd. De la Rue House, 84 Regent Street, London W.I., England or similar approved, of approved colour and pattern and fixed with an approved adhesive in accordance with the manufacturer's instructions.

16. Ironmongery

Butts and hinger shall be of sizes and types specified and fixed with the full number of screws and on no account shall nails be used.

All locks and ironmongery shall be fixed before the woodwork or metal work is painted. Handles shall be removed carefully stored and re-fixed after the completion of painting. Locks shall be oiled and left in perfect working order. All locks to include two keys and all keys shall be labelled with door references marked on plastic labels before handing to the Architect on completion.

17. Plugging and screwing

Where items are described as plugged or plugged and screwed this shall mean plugging, plugging and screwing to concrete blockwalling, concrete walling, stone walling to the approval of the Architect.

18. Prices of timber work

The Contractor is to include in his prices of all members for fitted ends, nitres, housings, returned ends, etc. and for short-lengths not exceeding 300mm.

The prices for all joinery items are to include for slightly rounding all arises and extra cost of labours crossgrain.

Where hardwood is described as screwed, prices are to include for pollating with a natching hardwood.

Allowance is to be made in the prices for angles, ramps, nitres, ends, etc. on timber worked on solid and shall include for all necessary non-ferrous metal screws.

The prices for all timber described as select quality are to allow for keeping clean for light coloured finishes, polishings, etc.

Ironmonger, stitch and metalworker

1. Ironmongery

All ironmongery and furniture to be approved by the Architect as to quality and type and locks to be fixed to the correct hand.

2. Oiling of locks, etc.

All locks, ironmongery and hinges including the moving parts of metal doors and windows to be well oiled, and all necessary adjustment made before handing over the works.

3. Metal windows and doors

All metal windows and doors shall be hot dipped galvanized after manufacture and shall be from a manufacturer approved by the Architect.

They shall be of sizes and types shown on the drawings and shall be ordered by the Contractor and windows shall have bronze fittings with projecting hinges unless otherwise specified complete with building in lugs and glazing pins. Metal doors and windows bent or damaged during construction of the building shall be replaced at the contractor's expense.

4. Cyclone bolts — All openings sashes of metal windows shall be fitted with two cyclone bolts consisting of an extruded brass case with stamped brass sheet 115mm long complete with socket or wedge,

5. Louvre windows — Louvre frames to be anodized aluminium with clips of the size specified suitable for taking 6mm thick glass blades screwed to concrete jambs with 38mm screws.

Mullions to be formed by coupling 56mm x 6mm thick anodized Aluminium mullion strips bolted through to the box mullions, and fix to lintol and cill by means of retaining brackets screwed to rawplugs in concrete with No. 4 38mm screws.

Weather strips to be in anodized aluminium and to be screwed to rawlplugs in concrete at head and cill with 38mm screws.

Workmanship — Workmanship and materials shall be of the best quality.

Prices of all doors, windows and louvers shall also include for all necessary cutting and pinning, plugging and screwing to concrete or block openings and for making good of finishes.

Pavior

1. Cement, sand and aggregate — Cement, sand and aggregates for this trade shall be as specified for "concretor".

Coral sand shall have three washings.

2. Preparation of surface to receive screedings and pavings — The surface of the concrete shall be hacked to form a good key, well washed and brushed perfectly clean with a wire brush to remove all impurities, dust etc damped and grouted with a mixture of cement and water in the form of slurry, using 2.75 kgs of cement per sq.m. of surface area, before screeds are laid.

3. Plain screeded pavings — Floors to have plain screeded finish shall be laid in areas not exceeding 10 sq.m at one time using teak 6mm x 19mm stop fillets. Screeds to be minimum of 19mm and to be composed of one part of cement to 3 parts of sand. The surface to be finished to a polished surface with a steel trowel. The screeds or pavings shall be kept wet with sand, sacking or similar for at least seven days after completion.

4. Coloured screeded pavings

Coloured screedings shall be laid in a similar manner as for plain screeding with addition of approved liquid colouring mixed in with the mortar strictly in accordance with the manufacturer's directions and to approved shade, and kept wet for seven days after completion.

5. Expansion joints

At the entrance of each room directly under the door, fix a teak strip 6mm x 19mm deep for full width of opening to form an expansion joint between adjoining screeds.

6. Granolithic paving

Shall be laid in areas not greater than 10 sq.m. at one time using teak 6mm x 19 mm fillets. Granolithic paving shall be composed of two parts by volume of cement to five of blue basalt chippings to pass a 6mm square mesh free from dust and containing not more than 10% grit. Granalothic paving to be well watered and kept damp for seven days after laying.

7. Polishing of granolithic pavings

When laid the Granolithic paving shall be rubbed down with a carborundum stone to give polished surface.

8. Non-slip surfaces to pavings

Surfaces of internal pavings and steps where required to be made non-slippery shall be created with coarse carborundum average 11.4 kgs per m^2 lightly trowelled in while the paving is still green.

Surfaces of external pavings or steps where required to be made non slippery shall have parallel lines 12mm deep and 9mm wide in the surfaces of the paving or concrete.

9. Quarry tiling

Quarry tiles shall be to the quality, sizes and colour as selected by the Architect, laid to areas indicated on the drawings. The tiles shall be set square jointed bedded and pointed in cement mortar (1 part of cement to 3 parts of sand).

Tiles shall be soaked in water 24 hours before laying and shall be thoroughly scrubbed to remove all traces of cement after laying and protected with sawdust or sacking and not used for at least 10 to 14 days.

The surface shall be polished on completion of the contact.

10. Polishing paved surfaces

Types of floors described in clauses 4 and 7 shall be cleaned on completion of the works and treated with two coats of floor polish each coat rubbed well in and polished.

11. Roof screed

Roof slabs shall be finished with a cement/sand screed 1:3 mix laid to falls and crossfalls and minimum thickness 19mm. unless specified otherwise in bill of quantities to which shall be added an approved waterproofing liquid used in strict accordance with the manufacturers' written instructions. Screeds shall be carried down rainwater outlets and finished neatly against the downpipe. The screed shall be kept wet for at least seven days after completion.

12. Prices of pavings and screeds tiles etc.

Prices for pavings or screeds are to include for preparation of the concrete base, all necessary hacking, grouting with cement grout, any extra thickness consequent upon the concrete surfaces not being finished to true and level, laying in bays and all necessary formwork and dividing strips and cutting the finished screed or paving for at least seven days.

Prices for tiling shall also include for all straight and raking cutting, fair edges and fair joint, prices for tile skirtings shall further include for angles, ends, nitres and for short lengths not exceeding 300mm.

Plasterer and wall tiler

Generally

The renderings are to be carried out so that the finished surfaces appear Without visible joints or patches. The rendering of wall surfaces, reveals of openings and cills are to be carried out in one operation and each day's work stopped at a suitable point where it can be picked up again on the following day without noticeable joints. The quality and mixing of the materials are to be constant throughout so that there is no variation in colour or texture. The finished coat to be brushed down and left clean to be received decoration. In any continuous face of a wall the rendering shall be carried out continuously and day to day breaks made to coincide with architectural breaks in order to avoid unslightly junctions.

Preparation of surfaces for rendering

All faces of concrete work shall be well hacked to form a good key and in the case of block or stone walls the joints shall be raked out. All surfaces for rendering shall be well wetted with a hose before rendering is applied

Cement

Cement shall be as specified in "concretor".

Sand

Sand shall be as specified in Fine Aggregates in "Concretor" but in Addition shall be in accordance with B.S. 1199 and shall if CORAL SAND have three washings in lieu of 2 for internal work.

Lime

Lime shall be either in the form of quick lime and obtained from an approved source and properly stacked on site or in the form of dry hydrated lime and conform to the requirements of B.S 890 Class B "Quick lime or Hydrated Lime for Corse Stuff and Building Mortar".

Rendering

The mix for rendering both internally and externally shall be 1 part of Cement to 1 part of lime to 5 parts of sand plus an approved mortar plasticizer used strictly in accordance with the manufacturers' written instructions.

Application of Rendering

All external surfaces shall be rendered in two coats unless otherwise instructed.

The first coat of rendering shall be applied with wooden float to an even thickness of not less than 10mm and not more than 15mm. As soon as the first coat starts to set it shall be closely combed to a depth of 3mm to 6mm and kept damp for at least two days after which time the final coat shall be two days after which time the ifnal coat shall be applied to an even thickness of not less than 6mm and not more than 25mm.

All rendered surfaces shall be kept damp for at least two days after the final coat has been applied.

Finishes to renderings

Rendered surfaces shall be finished as directed by the Architect in the following manner:

(a) Wood floor finish: Finish surfaces with a wood float to an even and slightly/rough textured finish.

(b) Sponge finish: Finish rendered surfaces with a steel trowel and while the rendering is still green dab the surfaces with a damp sponge until they present a fairly sanded textured finish.

© Trowel finish: Finish rendered surfaces with a steel trowel to a smooth and even surface, free from trowel marks.

Tyrolean Finish

Tyrolean rendering shall consist of a 12mm backing coat of one part of cement with 10% of lime by volume added to four parts of sand, trowelled up to a true surface left as open as possible (no combing or scratching required) followed by a tyrolean finishing coat of white cement (snowcrete or other equal, and sand of a suitable mix applied with a spraying machine and built up in three coats to a total thickness of 8mm approximately to the approval of the Architect.

Sample panel

The Contractor shall prepare samples of plastering tyrolean finish, bush-hammered finish as directed until the quality texture and finish required is obtained and approved by the Architect, after which all plastering, tyrolean and bush hammered finish expected in the work shall conform to the respective approved samples.

Arrises

Vertical and horizontal arrises shall be formed to beams, columns, openings and the like and shall be pencil rounded. Particular care shall be taken to ensure that the rendering is strong and sound at the corners.

Cracks, blisters, etc

The Contractor shall make good all cracks, blisters and other defects and leave the whole of the plaster, tyrolean, bush-hammered finish perfect at completion. When making good defects the plaster shall be cut out to a rectangular shape with edges undercut to form dove-fitted key and all finish flush with face of surrounding plaster all at the contractor's own expense.

Plinths

Form plinths is external rendering as shown on drawings.

Wall tiling

Wall tiling unless otherwise stated shall be of glazed earthenware tiles of The dimensions and colours specified and shall conform to B.S 1281 and shall be of approved manufacture true to shape and free from blemishes. The backing coat for wall tiling shall be in cement: sand mortar (1:2 dx) , not less than 9mm and not more than 15mm thick, the surface of which shall be closely combed while the mortar is still green and left for a period of 24 hours.

The tiles shall be soaked in water for 30 minutes and bedded with an Adhesive of the approved manufacture.

All tiles shall be laid perfectly level, the joints to run straight horizontally And vertically and to be pointed in neat cement to an approved colour.

Internal and external angles and rounded edges tiles are to be of the same manufacture, colour and thickness as the foregoing.

Prices of plasters,

Prices of plastering are to include for preparation of the surface, hacking of concrete, raking out joints of blockwork, grouting, forming temporary rules, fair edges and arrises, rounded external angles, vee joints, working to rebates making good to window or door frames, around pipes, holder-bats, sanitary fittings, narrow widths and small quantities.

Prices for rendering on walls shall also include for any extra labour involved in working to breaking columns, beams, cills, etc, all of which have been included in the general term of walls.

Prices for wall tiling shall include for all operations required in proper execution of the work out and waste and fixing as described.

Glazier

Quality of glass

All the glass to be of the best quality obtained free from all defects and Imperfections and shall be to the approval of the Architect.

Windows and doors

Glaze all windows and doors in minimum 6 mm thick laminated glass unless specified otherwise.

Translucent glass

Windows requiring obscure vision shall be glazed with translucent glass of an approved texture or pattern, the thickness to be not less than that mentioned above unless specified otherwise.

Putty

Putty for glazing to wood shall be made of pure whiting and raw linseed oil and to be used fresh. Putty for glazing to metal shall be steel sash putty of approved manufacture.

All putty shall be delivered on site in the original manufacturer's sealed cans or drums and used direct therefrom, with the addition only of pure linseed oil if necessary. No mineral or other cils shall be used in the putties except genuine linseed oil.

The rebates of metal window shall be painted one coat before puttying.

Glazing

All glass to be cut accurately in one piece, to fit easily into their rebates and to be well puttied, back puttied and secured with springs in the case of fixing to wood or with metal clips in the case of metal. Care must be taken to ensure that the putty does not show beyond the sight lines of panes and that the putty is neatly cut off internally and neatly splayed off externally all mitres and angles left clear and sharp.

Glass blades for window

Blades for louvre windows shall be laminated 6mm thick glass of louvre selected glazing quality Grade 'A' to B.S 952 and of approved manufacture.

Fire resistant glass

Fire resistant glass to be fire resisting glazing of 60 mins integrity meeting BS 476:part 22.Each glass sheet to be provided with a visible "acid etching" giving the trade name in the corner of the pane and mark with BS 476:part 22.Fire resistant certificate to be produce at approval stage,

The two long edges of the blades shall be flat smooth polished with no sharp arrises and the two others clean cut. The contractor shall, when requested to do so, produce certificates of proof of manufacture and quality of the glass blades he proposes to use.

Glazing work at completion

All glass broken, cracked or scratched during the progress of the works to be reinstated at the sole cost of the contractor and all glazing to be left clean and perfect at the completion of the contract.

Painter & Decorator

Generally

All work shall be carried out in strict accordance with schedule of colours to be obtained from the Architect.

Samples of colours if requested by the Architect shall be painted on the walls 1.00m x 1.00m square and approval obtained from the Architect before proceeding with the work.

Materials, paint, Varnishes, etc

All oil paints, emulsion paints, varnish and other materials shall be of an approved manufacture and shall be used strictly in accordance with the manufacturers' printed instructions, the contractor will only be allowed to use materials which are brought to the site in sealed cans not exceeding one gallon capacity, bearing the name of the manufacturer and properly labelled as to quality. Exterior quality paints only shall be used, both internally and externally. All cans of paint must be kept well stirred before and during use. The only addition to the paint which will be allowed shall be approved pure turpentine and this shall be added only in accordance with the Architect's instructions. All coats of paint applied over each other shall be from the same manufacture and the type recommended by the manufacturers.

Well before commencing the painting work the contractor shall submit to the Architect for approval a list of all the brands of paint and finishings including the necessary primers and undercoats he intends to use and immediately upon being so approved orders shall be placed and total requirements obtained for the works.

Once approved no other brand of materials shall be used without the express permission of the Architect in writing.

Preparation of Surfaces

All surfaces to be painted shall be thoroughly cleaned down and surfaces of wood to be sand-papered and to be twice knotted and stopped before applying the priming coat which shall be regarded as additional to the undercoat. All surfaces of ironwork to be thoroughly cleaned of all scale, and every particle of rust, dirt or grease removed by scrapers' and wire brushes, or other approved method. Galvanized, sheradised or zinc sprayed metal to be painted shall be treated with mordant solution. Copper pipes specified to be painted shall be rubbed down with coarse emery, cleaned with a solution of one part acetone to two parts of benzel and left to dry.

Wood Preservative

Treat all timber built in or in contact with walling and concrete with 2 coats of approved type of wood preservative.

Galvanised metal Surfaces

Clean down, treat with degreasing solution, prime with yellow chromate or other approved primer, and paint two undercoats and one gloss finishing coat oil paint.

Ironwork

Clean down, removing every trace of rust and paint 1 coat of red lead primer, 2 coats of undercoat and one gloss finishing coat.

Rendered surfaces

Brush down to remove dirt and dust, prime with alkali resistant primer as specified by the suppliers of the emulsion paint to be used and paint three coats of approved plastic emulsion paint (external quality) both internally and externally strictly in accordance with manufacturers' instructions. The walls are not to be pumiced down.

Cleaning on completion

All floors to be twice washed, all marks of paint to be sponged off, windows cleaned, the work generally to be touched up after all the other trades are finished and the whole of the building left clean and perfect on completion to the satisfaction of the Architect.

Laboratory furniture and wall cupboard, workbench

All laboratory furniture are to be finished with one coat polyurethane lacquer of approved manufacturer. The first coat is to be gloss lacquer thinned with 10% white spirit and applied to all surfaces including the back of fittings, inside of drawers, and doors, etc. All exposed surfaces are to be finished with a further cost of semi-gloss lacquer. Hardwood bench tops are to be finished with two coats or linseed oil.

Plumber

General

All materials and workmanship shall comply with the latest editions of The British Standards's Specification, Codes of Practice, By Laws and Regulations of all Statutory Authorities concerned.

The Contractor shall include for producing all working drawings, details, builder's work and holes drawings necessary to carry out the work and as required by the Architect. The drawings shall be based upon the Architects diagrammatic drawings and shall be submitted, in duplicate progressively at least two months prior to the programmed commencement of work coordination and approval of the Architect. All alterations to drawings, whether due to co-ordinations or otherwise, shall be carried out by the contractor. The contractor shall provide the Architect with four copies of each approved drawings in addition to those required for his own use.

At completions of the contract, the Contractor shall provide the Architect With one complete set of negatives indicating the "As installed" installation and three prints of the said drawings complete with all operational and maintenance instructions, value charts, and test certificates. These drawings shall be provided to the Architect at practical completion of the works, failing which the Architect reserves the right to withhold an appropriate portion of the first retention money.

All work shall be tested in sections as required and before being covered up, for the Architect and statutory authorities. Before any test is carried out, a minimum of seven days notice shall be given to the Architect.

Where access is indicated to soil, waste and rainwater pipe fittings, the Contractor shall ensure that all access doors and rodding eyes are so positioned as to be accessible. Before testing, all access doors shall be removed, inspected, the washer greased and then reassembled by the Contractor.

Lead in flats flashings, aprons etc.

The lead used shall be best milled sheet lead of approved manufacture. No solder to be used in laying of lead except where quite unavoidable and no continuous strip of lead to be more than 2.00m long. Overlaps to be not less than 75mm. Lead flashings, aprons, soakers and other lead work where required to be fixed shall be secured with copper nails. Leadwork shall comply with the following weights.

	Per sq.ft
Lead gutters & flats	29.3 kgs
Flashings and aprons	24.4 kgs
Soakers	19.5 kgs

Soil ventilating pipes

Soil ventilating pipes shall be not less than 63mm interval diameter cast iron pipes conforming to B.S.S and fitted with the necessary junctions and bends. All joints shall be made with a gasket of tarred hemp and caulked with a mixture of neat cement just moist. The pipes shall be secured to the wall with approved holderbats which shall be securely fixed to the wall with rawlbolts.

Ventilating pipes shall be carried at least 900mm above eaves level and shall be fitted with approved coated wire balloon.

Rising Main

The Contractor shall include for all charges for tapping and connection to public water main, including all necessary excavations and reinstatement of public roads.

Galvanised pipes and fittings for water services

All internal and external water services, fittings, wastes, overflows and the like shall be in screwed and socketted galvanized wrought iron or steel tubes and tubulars, the former complying with BS 788 for water (medium) and the latter with BS 1387 for B class. Pipes above ground level shall be fixed to walls with approved type galvanised malleable iron built in clips, brackets, holderbats or pipe clips, the spacing of which shall not exceed 900mm.

The jointing of galvanized piping and fittings shall be made with proprietary brands of jointing paste or compound complying with BS 1260 and if these are not obtainable by a method to be approved by the Architect.

Unless otherwise specified or detailed on drawings the internal diameter of service pipes shall comply with the following:

Diameter of supply or feed pipe	No. of tappings shall not exceed
13mm	2-13mm
19mm	4-13mm
25mm	-13mm or 2 – 19mm
31mm	10-13 mm or 2 – 25mm
38mm	16-13mm or 6 – 19mm
	3 – 25mm or 2 – 31mm

Water taps

All bib, pillar, globe and stop taps shall be of the screw down pattern and comply in every respect with BS 1010. The size specified or shown on the drawing shall mean the maximum bore of the seating.

Stopcocks and boxes

Brass stopcocks shall be provided at the immediate entry of the water services into the building and at the other points as indicated on the drawings and shall be of a pattern approved by the Architect.

Stopcock boxes where required externally shall be constructed of 150mm earthernware pipe out to the required length and fixed vertically over the stopcock on two concrete blocks and the earth well consolidated round the sides. Top of pipe to be fitted with 225mm x 25mm, thick precast concrete cover reinforced with 13mm chicken wirenetting and fitted with a lifting ring.

Testing of water services

The whole of the water services laid or fixed by the contractor shall be tested at the contractor's expense in the presence of the Architect and shall comply with his requirements and any defects made good to his satisfaction. In the absence of instructions regarding the test it shall be an air pump and pressure gauge test the pressure applied at 35 to 53 grms per cm^2 for one hour at the end of which period the loss in pressure shall not be greater than $1/50^{th}$ of lb. per 225 $mm^{2.}$

Waste pipes

Waste from sinks and shower to be in 38mm bore pipe and from lavatory basins to be 31mm. All wastes to be carried through external walls to discharge over gulley gratings. All wastes pipes shall be at each change of direction of pipe be fitted with a tee, one end with screwed plug for cleaning purposes. The external gulley to be connected to the nearest manhole. Wastes from urinals to be taken in 50mm diameter cast iron pipe with trap at urinal end and connected by 50mm pipe externally to the nearest manhole. All laid to fall.

Overflow pipes

Overflow pipes are to be fitted to all w.c distant tanks and baths and in each case the overflow pipe shall be 6mm longer in diameter than the water supply to the unit. Overflow pipes to w.c cisterns shall be taken through an external wall to finish 150mm beyond the face of the wall.

Supply of sanitary ware

Baths, w.cs, basins, sinks and other sanitary units shall be of approved manufacture and shall comply with the relevant B.S.S. They shall be of the type and designs shown on the drawings or to the Architect's instructions. The whole of the units shall be properly fixed and connected to the water service complete with wastes and overflows as described.

Rainwater pipes

Rainwater pipes shall be approved rigid P.V.C rainwater unless otherwise described. Pipes shall be properly fixed to walls with approved clips at distance to be directed by the Architect.

Drain pipes for soil drainage

All pipes for soil drainage which include the conveyance of discharges from wcs, basins, sinks, drains, baths and showers shall salt-glazed earthernware pipes, bends, junctions and tapers complying in all respects with B.S no. 63 for "British Standard

Pipes" and must be stencilled with the registered mark of the B.S.I. Other fittings shall comply with the dimensions laid down in B.S 539. If the above type of pipe is unobtainable then best Commercial Quality may be used on conditions prior approval of the Architect is obtained.

Drain pipes for water drainage

Pipes conveying storm or surface water shall be second quality distinguished by a black band.

Laying of drain pipes

The pipes to be laid in straight runs to even and regular falls, and put together with great care, the spigot of one pipe shall have one lap of tarred gaskin wrapped round it and then placed into the socket of the pipe previously laid. After the adjustment the gaskin shall be caulked lightly home but not so as to occupy more than one quarter of the socket depth. The socket shall then be completely filled with cement mortar (1:1) and a fillet shall be formed round the joint, with a trowel forming an angle of 45 degrees with the barrel of the pipe. The joint inside to be struck with a scraper, so as to give a perfectly clear and unobstructed water way.

Fall in drains

All pipes except where otherwise shown shall be 125mm internal diameter laid to a fall of 1:50.

Concrete bed to drains

Concrete (1:3:6) shall be laid 150mm thick to form bed for drains where the soil is found to be soft. After the pipes have been tested, it shall be haunched up on both sides to a height of $3/4^{th}$ of the internal diameter of the pipe.

Concrete cover to drains

All pipes passing under buildings or under roadways shall, in addition to a 150mm concrete bed under, be completely surrounded in concrete of the same thickness of (1:3:6 mix).

Gully traps

Provide trapped gullies, complete with gratings in positions shown on drawings, set on concrete and surrounded in concrete, and jointed to drain as described.

Manholes

Manholes are to be constructed in the positions shown on the drawings. The internal dimensions of the manholes shall vary according to their depth and shall be as follows:

Depth of manhole from top of invert to finished ground level	Internal dimensions of manhole shall not be less then
Up to 600mm	600 x 450mm
Up to 900 mm	750 x 600mm
Up to 1200 mm	825 x 675mm
Up to 1500mm	900 x 750mm

Exceeding 150mm in depth the Contractor shall apply to the Architect for details.

Manholes shall be constructed in concrete (1:3:6) cast in situ hacked for key and finished above the benching with 6mm thick rendering of cement and sand mixed in the proportions of 1 to 2. The thickness of the concrete walls shall vary according to the depth and shall be as follows:

Depth of manhole from top of invert to finished	thickness of concrete to manhole walls shall not be less than
Up to 600mm deep	100mm thick
Exceeding 600mm but not Exceeding 1500mm	150mm thick

Exceeding 1500mm in depth the Contractor shall apply to the Architect for details.

The floor of manholes shall be 150mm thick and the channels and benching shall be formed above the level of the floor in fine concrete (1:2:4) average 225mm thick with a polished fall and carried up 450mm above invert level and channels. The cement for benching to be sulphate resisting cement. Step irons shall comply with B.S 1247 and shall be placed at intervals of 450mm vertically with 300mm offset between alternate steps.

Manhole covers other than those in roadways shall be 600 x 450mm cast iron medium weight with frame set flush in 125mm concrete cover slab Mix C,, the building shall be bedded in grease and shall be of an approved heavy iron pattern and the contractor shall apply to the Architect for details including the construction of the manhole.

Soakaways

Construct soakaways not less than 6m away from the building in position approved by the Architect. Water from rainwater pipes to be first taken into a trapped gulley below rainwater pipes to be first taken into a trapped gulley below rainwater pipes and thence by 100mm diameter pipe to soakaway. The soakaway to be 900mm x 900mm x 1500mm deep filled with stones and finished with a 300mm layer of 38mm macadam.

Cast concrete kerb around gulley and soakaway in mix B concrete 100mm thick and 225mm deep to project 125mm above ground level. Render kerbs with a 1:3 cement and sand and finish with slightly rounded edges.

Septic tank

Septic tanks shall be constructed in position shown on the site plan not less than 15m. away from the building, in accordance with detail drawing.

Intercepting chamber

Intercepting chamber shall be constructed as described for man-holes with an approved saltglazed eathernware intercepting trap with rodding arm fitted with standard jointed stopper set and surrounded in concrete mix C and jointed to drain.

Fresh air inlet

Build into the side of the intercepting chamber a 100mm diameter cast iron pipe with bend to terminate not less than 750mm above ground level jointed to an approved 100mm galvanized fresh air inlet valve with cast brass flap and hinged mica flap.

Drain testing

All drainage runs shall be tested before tracks are filled up and afterwards when the drainage system is complete in the presence of the Architect. The contractor shall supply all necessary equipment and labour for carrying out the tests. The air test shall be carried out by plugging all openings with standard air test apparatus to one end. The air pressure in pipes to be built up by means of a suitable pump until a head of 100mm is reached and the test continued until approved by the Architect. The maximum loss allowed shall be a fall of 25mm over a period of 5 minutes after pumping has ceased. If the fall exceeds 25mm a smoke test shall be immediately carried out to locate defects and all such defects shall be made good and further tests carried out at no extra cost to the Employer.

ROADS AND FOOTPATHS

Site clearance

All roots, tree stumps, rocks and similar obstructions in the line of The excavation of the road or footpath shall be removed from the site having due regard to Clause No. 1 of the Excavator section of this specification.

Macadam finished roads

Excavate to a depth of 225mm below the required finished level of the road, and to the full width directed. All excavated materials shall be spread and levelled on the site or removed from the site as directed by the Architect.

Tarmacadam roads, Drives playground, etc.

Remove top soil to a minimum depth of 225mm and compact formation level by a 8-10 ton roller. Where formation is composed of clayed soil (to be decided by the Architect) apply a

Operation 1

layer of coral sand 38mm thick and compact again.

Operation 2

Hardcore filling consisting of angular shapes blue basalt spalls 150mm x 100mm x 75mm type B to be placed on the compacted surface after operation 1, blinded with 63mm aggregate and compacted with the 8-10 ton roller by successive passes until a well interlocked mass is obtained.

Operation 3

Spread 25mm aggregate on the compacted hardcore filling after operation 2 at the rate of 16-18 sq. metre of surface per cu.metre, blinded with 19mm aggregate at the rate of 40-50 sq.metre of surface per cu.metre and compacted with the 8-10 ton roller until no movement of the 19mm aggregate is possible.

Operation 4	Spray bitumen of 6/70 penetration at a temperature of 300ºF (using a bitumen sprayer) at the rate of 2 sq.metre per gallon, followed immediately by 9mm aggregate at the rate of 150 sq. metre of surface per cu.metre and rock sand at the rate of 300 sq. metre of surface per cu. metre compact with a 8-10 ton roller after the surface has been smoothed up by hand and brass brooms. NOTE: The surface to be finished to the level decided by the Architect on site.
Kerbing in stone	Edges of all roads requiring stone edging; the level kerbing shall be made of selected rocks with level and square exposed edges of full thickness of the hardcore and finished flush with the road surface.
Kerbing in concrete	To edges of all playground and paved areas except where otherwise indicated provide 300mm wide and 225mm deep concrete curbs, cast in situ to full widths and depths of 1:2:4 concrete, with smooth trowel finish to exposed edges and finished flush with and to follow falls of paved areas. At inter-sections of curbs and at intervals of 30 metres in straight run provide 13mm wide butt jointed expansion rail to back of kerbs to within 50mm of top of curb and where filled filling to be banked at a slope not exceeding 1 in 3.

EXCAVATION

2.1 Inspection of Site

The Contractor is deemed to have visited the Site and to have ascertained the nature of the material to be excavated.

2.2 Dealing with water

The contractor's attention is drawn to the depths below ground level of the foundations and the consequent possibility of having to deal with water. Unless otherwise specified the contractor will be required by pumping or other means to keep the exactions dry during construction.

Shoring of existing structure

The contractor's attention is drawn to the requirements for shoring parts of the structure of the existing building during construction and the consequent need to carry out the excavation in stages. He is not allowed to excavate within the proximity of the existing structure without the drawings and/or instructions by the Engineer to do so.

2.3 Excavation Dimensions:

The excavation are to be executed to the widths and depths shown on the Drawings or to greater depths if instructed by the Engineer to obtain satisfactory foundations.

If the contractor excavates to any widths or depths greater than those shown on the Drawings, or as instructed by the Engineer he shall at his own expense fill in such widths or depths beyond that instructed or shown with concrete Grade "D" to the satisfaction of the Engineer.

2.4 Rock

"Rock" means any hard material, which in the opinion of the Engineer can be removed only by use of compressors or by wedging and the Engineer's opinion shall be final. Decomposed rock, tuff or other material which can be removed by pick, traxcavator or other mechanical plant will not be classed as rock. All material classified as rock may, if approved by the Engineer, be used as hardcore filling and the measured quantities of imported filling will be adjusted accordingly. All rock so used must be broken to the required size as hereafter described before being used.

2.5 Blasting:

No blasting will be permitted.

2.6 Bottom of excavations to receive foundations:

The Contractor shall report to the engineer when secure bottoms to the excavations have been obtained. Any concrete or other work executed before the excavations have been inspected and approved, shall if so directed, be removed and now work substituted after the excavations have been approved, all at the Contractor's expense. The surface of the bottoms to excavations shall be levelled or graded to falls as required, with 50mm layer of concrete Grade "D" blinding (maximum 20mm gauge aggregate) and finished to a smooth surface with a wood float.

2.7 Hardcore filling:

Hardcore for filling under float, etc, shall be good hard stone ballast to the approval of the Engineer, broken to pass not greater than a 150mm ring or to be 75% of the finished thickness of the layers being completed whichever is the lesser and graded so that it can be easily and thoroughly compacted by rolling.

The filling is to be laid in layers each of a consolidated thickness not exceeding 225mm and well watered and rolled with a vibrating roller (minimum 14 tons) or a ten ton roller. Where rollings impossible, compaction shall be by hard or mechanical tampers. The top surface of the hardcore shall be levelled or graded to falls as required and blinded with similar material broken to 25mm gauge and surfaced with a 25mm layer of stone dust, well watered and rolled to receive concrete as described.

2.8 Materials found in excavations

No material found in the excavation is to be used in the works without the written permission of the Engineer.

CONCRETE WORK

3.1 Architect/Engineer

For the purpose of the concrete structure the Structural Engineer shall be deemed invested with the duties and be the representative of the Architect.

3.2 Code of Practice

All workmanship, materials, tests and performance in connection with the reinforced concrete work shall be in conformity with the latest edition of the British Standard Code of Practice (C.P. 110 "The Structural use of Concrete") where not inconsistent with these Preambles.

3.3 Supervision

A competent person approved by the Engineer shall be employed by the Contractor whose duty will be to supervise all excavation operations, making and erection of formwork, sending and fixing of reinforcement and all stages in the preparation and placing of the concrete. All cubes shall be made and side test carried out under his direct supervision, in consultation with the Engineer.

3.4 Contractor's plant equipment and construction procedures:

Not less than 30 days prior to the installation of the contractor's plant and equipment for processing, handling, transporting, storing and proportioning ingredients and for mixing, transporting and placing of concrete, the contractor shall submit drawings for approval by the Engineer, showing the proposed general plant arrangement, together with a general description of the equipment he proposes to use.

After completion of the installations, the operation of the plant and equipment shall be subject to the approval of the Engineer.

Where these Preambles, the Bills of Quantities or the Drawings require specific procedures to the followed, such requirements are not to be construed as prohibiting the use by the Contractor of alternative procedures if it can be demonstrated to the satisfaction of Engineer, that equal results will be obtained by the use of such alternatives.

Approval of plant and equipment or their operation, or of any construction procedure, shall not operate to waive or modify any provisions or requirements contained in these preambles governing the quality of the materials or of the finished work.

3.5 Levels and Foundations:

The foundations of the works shall be carried down to depths as may be directed by the Engineer and they must be cut as nearly to the size of the concrete as possible and the vacant spaces between the concrete and the solid ground, excepting where otherwise shown, must be carefully filled in as instructed by the Engineer.

All temporary timbering shall be removed but should any timber be left in or should any other work be done beyond that specified, it will be at the Contractor's own cost.

3.6 **Tolerances:**

On all setting out dimensions of 7.5m and over a maximum non-cumulative tolerance of plus or 6mm will be allowed, and for those under 6m the allowable maximum non-cumulative tolerance will be plus or minus 3mm. On the cross sectional dimensions of structural members, unless otherwise required by the Drawings, a maximum tolerance of plus or minus 3mm will be permitted.

The top surface of concrete floor slabs and beams shall be within 6mm of the normal level and line shown on the Drawings. Walls and columns shall be truly plumb and non-cumulative tolerance of 3mmin each storey and not more than 12mm out of plumb in their full height will be permitted. The contractor shall be responsible for the cost of all corrective measures required by the Engineer to rectify work which is not constructed within the tolerances set out above.

3.7 **Materials generally:**

All materials which have been damaged, contaminated or have deteriorated or do not comply in any way with the requirements of these Preambles shall be rejected and shall be removed immediately from the site at the Contractor's own expense.

No materials shall be stored or stacked on suspended floors without the Engineer's prior approval.

3.8 **Samples and Testing:**

Every facility shall be provided to enable the Engineer to obtain samples and carry out tests on the materials and construction. If these tests show that any of the materials or construction do not comply with the requirements of these Preambles, the Contractor will be responsible for the costs of the tests and the replacement of defective materials and/or construction.

3.9 **Cement:**

Cement unless otherwise specified shall be Portland Cement of a Brand approved by the Engineer and shall comply with the requirements of B.S. 12, and a manufacturer's certificate of Test in accordance with B.S. 12 shall besupplied for each consignment delivered to the site.

Cement may be delivered to the site either in bags or in bulk.

If delivered in bags each bag shall be properly sealed and marked with the manufacturer's name and shall be stored in a weatherproof shed of adequate dimensions with a raised floor. Each consignment shall be kept separate and marked so that it may be used in the sequence in which it is received. Any bag found to contain cement which has set or partly set. shall be completely discarded and not used in the works. Bags shall not be stacked more than 1.5m in height.

If delivered in bulk the cement shall be stored in a waterproof site either provided by the cement supplier or by the contractor but in either case the site shall be to the approval of the Engineer.

3.10 **Aggregates:**

Aggregates shall conform with the requirements of B.S. 882 and the sources and types of all aggregates are to be approved in al respects by the Engineer before work commences.

The grading of aggregates shall be one within the limits set out in B.S. 882 and as later specified and the grading, once approved, shall be adhered to throughout the works and not varied without the approval of the Engineer. Fine aggregate shall be clean, crushed rock sand and coral sand, of hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. Coral sand shall be washed in running water to the satisfaction of the Engineer. It shall be graded within the limits of zone 1 or 2 of table 2 of B.S 882.

Coarse aggregate for concrete Grade 'A', 'B' and 'C' shall be crushed blue basalt stones to the approval of the Engineer. It shall be hard, clean and roughly cubical in shape, non porous, free from dust, decomposed stone, clay, earthy matter, foreign substances or friable, thin, elongated or laminated pieces. It shall be graded within the limits of Table 1 of B.S. 882 for its respective nominal size. If in the opinion of the Engineer the aggregate meets with the above requirements but is dirty or adulterated in any manner it shall be screened and/or washed with clean water, if he so instructs at the Contractor's expense.

Aggregates shall be delivered to the site in their prescribed sizes or gradings and shall be stock-piled separately on paved areas or boarded platforms in separate units to avoid intermixing, excessive segregation and contamination with other materials. On no account shall aggregates be stock-piled on the ground. Fine aggregates shall be allowed to drain until it has reached a uniform moisture content before it is used.

3.11 **Water**

The water used for mixing concrete shall be from an approved source, clean, fresh and free from harmful matter.

3.12 **Admixtures;**

No admixtures except the ones specified for waterproof concrete shall be allowed. The Contractor may use an approved "plasticizer" which will be added to the mixing water in the proportion recommended by the manufacturer and strictly in accordance with their written instructions, to achieve better workability. No additional cost will be paid for the use of the plasticiser.

CONCRETE STRENGTHS

1.1 **Grades of Concrete:**

Grades 'A', 'B' and 'C' concrete shall have the following minimum strengths as given by Works Cube Test:

	Grade A	Grade B	Grade C
Min. crushing) at 7 days	21	17	14
strength in) at 28 days	30	25	20
N/mm)			

Grade 'D' and 'E' concrete shall be of the following nominal mixes and may be moistured either by volume or by weight. No cube tests will be required for Grades 'D' and 'E' concrete. These grades will be used for un reinforced concrete, with a minimum slump of 50mm.

Grade	**D**	**E**
Nominal mix by	1.10	1.10 (with plums not exceeding 20% by total volume of concrete)
Max. gauge of coarse aggregate	40mm*	40mm*

(* or 20mm for blinding concrete where described).

1.2 **Maturing of Concrete Materials**
Cement

The quantity of cement shall be measured by weight. Where delivered in bags, each batch of concrete is to use one or more whole bags of cement.

Aggregate

- For Grades 'A', 'B' and 'C' concrete, aggregates may be measured by weight in weigh batching machine as described hereafter.

- For Grades 'D' and 'E' concrete, aggregates shall be measured by weight or by volume. Where measured by volume, approved gauge boxes of such a size as will give the correct proportions shall be used.

1.3 **Weigh batching machine**

Weigh batching machine shall be of an approved type and shall be properly maintained and checked for accuracy at weekly intervals.

1.4 **Concrete Mixes 'A', 'B' and 'C'**

As specified above.

The Contractor shall have two alternatives to achieve the specified concrete strengths.

1.5 **Alternative 1 Design Mix**

Contractor can use minimum amount of cement by weight per cubic metre of finished concrete as set out below, if he provides strict with CP 110 Clause 6.5. Requirements for design mixer.

Target mean strength. Evidence of suitability of proper mix proportions.

Trial mixes.

4.5.4 Additional Trial Mixes

The copies of this circular is available from the Engineer ‘s office on request by the contractor.

The minimum cement content by weight shall be

Minimum cement content per cubic metre of finished concrete	450 kg	360 kg	250 kg

4.6 Alternative 2

If the contractor fails to receive the requirements of alternative 1 and/or prefers nominal volumetric mix, he shall use the following:

	Mix A 1:13/16:2	**Mix B** 1:1 ¾:3	**Mix C** 1:2 ½:4
Cement	1 bag of 50 kg	1 bag of 50 kg	1 bag of 50 kg
Crushed rock sand	1 cu. ft	1¼ cu.ft	1 7//5 cu.ft
Coral sand 10mm to 5mm	½ cu. ft	7/8 cu.ft	14 cu.ft
Graded aggregates 20mm to 10mm	5/8 cu.ft	7/8 cu.ft	1¼ cu. ft
Graded aggregates	1 7/8 cu.ft	3 cu. ft	3 ¾ cu ft
Maximum water			
Cement ratio	5	.56	.60
Maximum slump	50mm	50mm	50mm

Average works strength obtained from work care of nominal volumating mixes shall be 10% higher than the minimum concrete strengths specified.

4.7 Ready Mix Concrete

Ready mixed concrete may be used subjects to the approval of the Engineer.

When it is used the contractor shall ensure that all the requirements of these specifications are complied with. The Engineer may at his discretion waive temporarily the requirements of preliminary trial mixes as required under the heading of trial mixes laid down for alternatives design mix.

Further to requirements the contractor shall ensure that supply and delivery of ready mixes concrete comply with the recommendations of M.S. 1926.

The concrete shall be transported to the site in approved containers and shall be continuously agitated until it is delivered on site. The Contractor shall ensure that no water is added after it is delivered.

For plant mixed concrete the contractor shall check that the delivery note for each batch shows the time when water it first added to the concrete materials, and the time interval between the delivery and the mixing of water is 20 minutes less than the final setting time of cement.

Samples of workscube shall be taken at the place where concrete is finally placed in the structural members.

4.8 **Waterproof Concrete**

Where "waterproof concrete" is specified, sealocrate or other approved waterproofing material and plasticizing agent shall be added to the mixing water in the proportion recommended by the manufacturers and strictly in accordance their written instructions. Waterproof concrete shall be grade B mix and shall meet all the strength requirements of the specified grade, except that the fine aggregate shall consist solely of rock sand.

4.9 **Changing proportion of Aggregates**

The Engineer may any time during the contract, require the proportions of fine to coarse aggregates to be altered in order to produce a mix of greater strength or improved workability and provided that the total proportions of aggregate to cement remains unchanged, no claim for additional cost will be considered.

4.10 Testing Equipment

The Contractor shall provide the following equipment for carrying out control tests on the site:

a) Straight edges 3m and 1.2m long for testing the accuracy of the finished concrete;

b) A graduated glass cylinder for use in the silt test for organic impurities in the sand;

c) Slump test apparatus;

d) Six inch steel cube moulds with base plates and tamping rods to B.S. 1881.

4.10 **Work Cube Tests**

Work cubes are to be made at intervals as required by the Engineer and the Contractor shall provide a continuous record of the concrete work. The cubes shall be made in approved 150mm moulds in strict accordance with the Code of Practice.

Six cubes shall be made on each occasion, three from different batches, of the concrete at the place where it is deposited.

Each cubes shall be made on each occasion, three from different batches, of the concrete at the place where it is deposited.

Each cube shall be marked with a distinguishing number (numbers to run consecutively) and the code on which it is made. A record shall be kept on site giving the following partitioning.

6. Cube No.
7. Date Mode
8. Location in

(d) 7-day Test

Date
Strength

(e) 28-day Test

Date
Strength

Cubes shall be forwarded by the Contractor to an approved Testing Authority, in time to be tested two at 7 days and two at 28 days. The remaining two cubes shall be tested when necessary.

Copies of all work cube Test results shall be forwarded to the Engineer and one shall be retained on the site.

If the prescribed concrete strengths are not attained and maintained throughout the carrying out of the contract, the Contractor will be required to increase the proportion of cement and/or substitute better aggregates so as to give concrete which does comply with the requirements of the contract. The Contractor may be required to remove and replace at his own cost any concrete which fails to attain the required strength as ascertained by Work Cube Tests.

The Contractor must allow in his rates for all expenses in connection with the preparation, conveyance to the Testing Laboratory, and testing of cubes.

CONSTRUCTION JOINTS

1.1 Position of Construction Joints:

Construction joints shall be permitted only at the locations shown on the Drawings or as instructed on the site by the Engineer. In general they shall be perpendicular to the lines of Principal and shall be located at points of minimum shear, viz vertically at, or near, mid-spare or slabs and beams.

1.2 Maximum distance between Construction Joints

Suspended slabs are generally to be east using alternative bays not exceeding 12m in length. At least 40 hours shall elapsed between the adjacent bays/shall be in positions to be agreed with the Engineer.

Beams shall be cast with the slab. Mass concrete shall be cast in alternate bays in lengths not exceeding 7.5m and in depths not exceeding 1.5m. Adjacent sections shall not be cast within 48 hours of each other.

Under no circumstances shall concrete be allowed to fail off but shall be deposited against stopping-boards.

5.3 Preparation of Construction Joints

Before placing new concrete against concrete already set, the face of the old concrete shall be thoroughly backed, roughened and cleaned, and baitance and loose material removed therefrom. Immediately before placing the new concrete the surface shall be saturated with water. A layer of mortar not less than 25mm in thickness and consisting of 1 part of cement to 1½ parts of fine aggregate shall be applied to the face of the old concrete. All exposed construction joints shall be treated with epory resin in accordance with the manufacturer's instructions.

EXPANSION/CONTRACTION JOINT

Joints fillers and sealants shall be of an approved type unless shown on the drawings. Reinforcement or other embedded items bonded to the concrete shall not extend continuously through any expansion/construction joint.

WATERBARS

1.1 Type

Waterbars shall be P.V.C waterbars of an approved type and shall be provided in the positions indicated on the drawings.

1.2 Joints

Joints shall be heat welded in accordance with the manufacturer's instructions and where the waterbar is to be fixed vertically, metal clips as manufactured by the supplier of the waterbar or of other approved design shall be provided to suspend the waterbar from the reinforcement.

1.3 Additional Water Bar

Where waterproof concrete is used the Contractor shall adhere strictly to the position and type of construction joints as detailed on the Drawings. Any deviation from this procedure or the provision of additional construction joints will require the prior approval of the Engineer and any additional waterbars which may be required will be at the Contractor's expense.

1.4 Formwork to Water Bars

Formwork shall be designed with sufficient timber formers and blocking pieces to support the waterbar and to ensure that it is not displaced during concreting. In the case of horizontal joints in vertical walling and similar members of the formwork shall be so constructed as to permit the starter or upstand of concrete surrounding the lower half of the waterbar to be poured in the same operation as the slab

or other member from which it springs. Formwork to walls or similar members where a water bar is positioned at the bags of the lift shall have sufficient openings not less than 300mm square at approximately 225mm above the level of the waterbar to permit checking that the waterbar is correctly positioned and not displaced during concreting.

No concreting will be permitted to portions where upstand startup from an integral part until the formwork to the starter has been fixed and approved.

8. EMBEDDED CONCRETE

All sleeves , inputs, anchors and embedded items required for adjoining work or for its support shall be approved by the Engineer and shall be placed prior to concreting and shall be used after an interval of time approved by the Engineer.

All contractors whose work is related to the concrete or must be supported by it shall be given ample time and opportunity to furnish embedded items before concrete is placed.

Expansion joint material, waterstops, and other embedded items shall be positioned accurately and rigidly. Voids in sleeves etc. shall be filled temporarily with readily removable material to prevent concrete entering into them.

9. MIXING & PLACING OF CONCRETE

9.1 Concrete Mixer:

The concrete shall be mixed only in approved power driven mixers of a type and capacity suitable for the work. Mixers shall be of a capacity sufficient to take one whole bag of cement per batch. Smaller size mixers shall not be used. The mixer shall be equipped with an accurate water measuring device which shall be checked weekly for accuracy. All materials shall be thoroughly mixed dry before the water is added and the mixing of each batch shall continue for a period of not less than two minutes after the water has been added and until there is a uniform distribution of the materials and the mass is uniform in colour.

The entire contents of the mixed drum shall be discharged before recharging. The volume of mixed materials shall not exceed the rated capacity of the mixer. Whenever the mixer is started,10% extra cement shall be added to the first batch and no extra payment will be made on this account.

9.2 Concrete Consistency:

As a check on concrete consistency slump tests may be carried out and shall be in accordance with B.S 1881. The Contractor shall provide the necessary apparatus and allow for the costs of such tests. The slump of the concrete made with the specified water content, using dry materials, shall be determined and the water to be added under wet conditions shall be so reduced as to give approximately the same slump.

9.3 Conveying of concrete:

The concrete shall be mixed as near to the place where it is required as is practicable to avoid rehandling and flowing, and only as much as be required for a specified section of the work shall be much as is required for a specified section of the work shall be mixed at one time, such section being concerned and finished is one operation without delay. All concrete must be efficiently skilled and used in the works within twenty (20) minutes of mixing. It shall be discharged from the mixer direct either into receptacles or barrows and shall be distributed by approved means which do not cause segregation or loss of ingredients or otherwise repair the quality of the concrete. Approved mechanical means of handling will be provided they are not longer than 6m and their slope do not exceed 1 vertical to 2 horizontal is not less than 1 vertical to 3 horizontal.

9.4 Depositing of concrete

Placing of concrete in supported elements e.g slab, bed shall not be started until the concrete previously placed in top parts of columns is no longer plastic and has been in place at least for two hours.

Concrete shall be placed from a height not exceeding 1.3m directly into its permanent position and shall not be worked along the shutters to that position. Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs with beams and similar members. The Engineer shall allow concrete to be placed for walls exceeding 150mm thickness from a height approved system of formwork is used.

In addition contractor will ensure that the concrete shall be deposited continuously such that no concrete shall be deposited on concrete which had hardened sufficiently to cause the formation of seams or places of weakness within the section. Placing shall be carried out at such a rate that the concrete which is being integrated with fresh concrete is still plastic.

Concrete in columns may be placed in a height of 3m with careful placing and vibration to achieve satisfactory results. Where the height of the column exceeds 3m suitable openings must be left in the shutters on that this maximum lift is not exceeded.

Concrete shall be placed continuously until completion of the part of the work between construction joints as specified hereinafter or of a part of approved extent. At the completion of a specified or approved part a construction joint of the form and in the positions hereinafter specified shall be made. A record of all such joints must be made by the contractor and a copy supplied to the Engineer.

9.5 Placing concrete under water

When required concrete shall be deposited under water by an approved method in such a way that the fresh concrete enters the mass of previously placed concrete from within, causing water to be displaced with minimum disturbance at the surface of the concrete.

9.6 Precautions of mixing and placing:

Any accumulation of set concrete on the reinforcement shall be removed by wire brushing before further concrete is placed. The contractor shall provide runways for concreting to the satisfaction of the Engineer. Under no circumstances will the runways be allowed to rest on the reinforcement.

Care shall be taken that the concrete is not disturbed or subjected to vibrations and shocks during the setting period.

Mixing machines, platforms and barrows shall be cleaned before commencing mixing and be cleaned on every cessation of work.

Where concrete is laid on hardcore, concrete blocks or other absorbent materials, the base shall be suitably and sufficiently wetted before the concrete is deposited.

10. Compaction

Compaction:

At all times during which concrete is being placed, the contractor shall provide adequate trained and experienced labour to ensure that the concrete is compacted in the forms to the satisfaction of the Engineer.

10.1 Depth of Compaction:

Concrete shall be placed neither at a rate greater that will permit satisfactory compaction nor to a depth greater than 750m before it is completed.

10.2 Vibration of Concrete:

During and immediately after placing, the concrete shall be thoroughly compacted by means of continuous tamping, spading, slicing rodding, forking and vibration. Vibration is required for all concrete of grades 'A', 'B' and 'C'.

Care shall be taken to fill every part of the forms, to work the concrete under and ground the reinforcement without displacing it and to avoid disturbing recently placed concrete which has begun to set.

Any water accumulating on the surface of newly placed concrete shall be removed and no further concrete shall be placed thereon until such water be removed.

10.3 Internal Vibrators:

Internal vibrators shall have a frequency of not less than 7,000 cycles per minute and shall have a rotating eccentric weight of at least 2 kg. With an eccentricity of not more than 12mm. Such vibrators shall visibly affect the concrete within a radius of 22mm from the vibrator.

Vibrators shall not be used to move concrete from place to place in the formwork.

At least one internal vibrator shall be operated for every two cubic metres of concrete placed per hour and at least the spare vibrator shall be maintained on site in case of break-down during concreting operations.

10.4 External Vibrators

External formwork vibrators shall be of the high frequency less amplitude type applied with the principal direction of vibration in the horizontal plane. They shall be attached directly in the forms at not more than 1.2m centers.

In addition to internal and external vibration the upper surface of suspended floor slabs shall be levelled with a tamping vibrating speed prior to finishing. Vibrating elements shall be of the low frequency high amplitude type operation at speed of not less than 3,000 r.p.m.

11.Curing and Protection

11.1 Periods and means of curing and protection:

Care must be taken that no concrete is allowed to become prematurely dry and the fresh concrete must be carefully protected within two hours of placing from rain, sun and wind by means of massive sacking, polythone sheeting, or other approved means. The protective layer and the concrete itself must be kept continuously wet for at least seven days after the concrete has been placed. The Contractor must allow for the complete covering of all fresh concrete for a period of 7 days. Heasian or polythene sheeting shall be in the maximum widths obtainable and shall be secured against wind. The Contractor will not be permitted to use old cement bags, hessian or other material in small piece.

11.2 Protection of foundation concrete

Concrete in foundations and other underground work shall be protected from admixture with falling earth curing and after placing.

11.3 Executive loads before curing

Traffic or loading shall not be allowed on the concrete except with the written permission of the engineer.

12. Faulty Concrete

Any concrete which fails to comply with these preambles or which shows signs of setting before it is placed shall be taken out and removed from the site. Where concrete is found to be defective after it was set, the concrete shall be out and replaced in accordance with the Engineer's instructions. On no account shall any faulty, honeycombed, or otherwise defective concrete be repaired or matched until the Engineer has made an inspection and issued instructions for the repair. The whole of the cost whatsoever, which may be occasioned by the need to remove faulty concrete shall be borne by the contractor.

13. Reinforcements

13.1 Type of Reinforcement:

The steel reinforcement shall comply with the latest requirement of the following British Standards:

Round mild, medium tonsile and to B.S 765 (Imperial units) high tonsile and steel bars.

Hot rolled bars for the reinforcement of concrete	to B.S 1449 (metric units)
Cold twisted steel bars	to B.S 1144 (imported units)
Cold worked steel for the reinforcement of concrete	to B.S 4461 (metric units)
Fabric reinforcement	to B.S 1221

It shall be in Imperial or Metric sizes as detailed on the drawings.

13.2 Testing of Reinforcement

If required by the Engineer the contractor shall submit a test certificate of the rollings, and/or shall arrange for testing by MOW or other approved authority. Reinforcement shall be free from loose mill scale or rust, grease, paint or other substance likely to reduce the bond between the steel and concrete.

13.3 Fabric Reinforcement

It shall be of size and/or weight specified and shall be tied with other reinforcements with minimum 225mm laps, using no. 19 S.W.C annealed binding wire.

13.4 Fixing and Reinforcement:

Reinforcement shall be accurately bent to the shapes and dimensions shown on the Drawings and/or schedule and in accordance with B.S. 1478. Reinforcement must be cut and bent sold and no welded joints will be permitted unless so detailed. Reinforcement shall be accurately placed in position as shown on the drawings and shall be secured against displacement by using No. 18 S.W.C annealed binding wire or suitable clips at inter-sections and laps, and shall be supported by concrete or metal supports, steel chairs, spacers or metal hangers to ensure the correct position and cover before concreting and shall be kept in the same position during concreting. However such supports, chairs etc. shall have minimum 12mm cover made of concrete blocks where the concrete surface is exposed to weather and/or without finishes.

No laps shall be permitted except the acres shown on the drawings without the prior approval of the engineer.

13.5 Spacing Blocks:

Spacing blocks of approved size and shape made of concrete similar to that used in the surrounding construction and fixed to the reinforcement or formwork by No. 18 S.W.C wires set into the spacer blocks or other approved means shall be provided where necessary to ensure that the requisite cover is obtained. The contractor is to include for providing sufficient such spacer blocks in his prices for steel reinforcement when such supplier has been nominated.

Where composite blocks or minor forms from construction are just spare block are to be provided. These will generally consist of concrete blocks as described above made to fit the width of the rib less 3 mm of reinforcement bars used per on the top surface with wire ties at each

13.6 Concrete cover to reinforcement:

Unless otherwise instructed the concrete cover to rod reinforcement over main bars in any face shall be:

Foundations against each face	3 (75mm)
Foundations against blinding	2 (50mm)
Columns	1½ (38mm)
Beams	1 (25mm)
Slabs	½ (13mm)

13.7 Positions and correctness of reinforcement:

No concreting shall be commenced until the engineer has inspected the reinforcement in position and until he has approved the same. The contractor shall give two celar days notice of his intention to concrete.

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as above, it shall be the contractor's sole responsibility to ensure that the reinforcement complies with the details on the drawings or schedule and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover.

The contractor will be held entirely responsible for any failing or defect in any portion of the reinforced concrete structure and including any consequent claims, third party claims, etc, where it is shown that the reinforcement has been incorrectly positioned or is incorrect in size or quantity with respect to the detailed Drawings or schedules. Unless permitted by the Engineer, reinforcement shall not be after being embedded in hardened concrete.

13.8 Protection of exposed reinforcement

Where reinforcement projects frame concrete setting of the structure and this reinforcement is executed to remain exposed to more than a month it is to be with a cement to prevent rust staining on the finished concrete. This is to be brushed off the reinforcement prior to the continuation to converting.

The Contractor shall be responsible for the co-ordination with the Electrical and other sub-contractors for incorporating electrical conduit,pipes, fixing locks, chases, holes and the like in concrete members as required and must ensure that adequate notice is given to sub-contractors informing them when concrete members incorporating the above are to be poured. The contractor shall submit full details including position of these items to the Engineer for approval before the work is put in hand. All fixing blocks, chases, holes, etc, to be left in the concrete shall be accurately set out and cast with the concrete.

15. Position of electrical conduit

Unless otherwise instructed by the Engineer an electrical conduit to be positioned within the reinforced concrete shall be fixed inside the steel cages of beams and columns and between the top and bottom steel layers in slabs and similar members. No conduits are to be placed into concrete members having a dimension less than 100mm.

The proposed position of all electrical conduits 25mm and over in diameter which are to be enclosed in the concrete shall be shown accurately on a plan to be submitted to the Engineer, whose approval shall be obtained before any such conduit is placed.

16. Formwork

16.1 Materials and Design

Formwork shall be constructed of timber or steel or precast concrete or other approved material with sufficient strength to withstand pressure resulting from placing and vibration of the concrete and with rigidity to achieve the specified tolerances.

The design and Engineering of the formwork as well as its construction shall be the responsibility of the contractor. The Formwork shall be designed for the loads, laterial pressure, pressure due to cyclonic winds and other loads likely to be encountered on site.

Shops drawings for formwork including the location and reshoring shall be submitted for approval by the Engineer before erection.

16.2 Construction

All formwork shall have joints close enough to prevent leakage of liquid from the concrete and formwork shall be jacked or dedged and clamped or bolted to permit adjustments before concreting and to permit easing and removal of formwork without jarring the concrete. Formwork shall be securely braced and strutted against lateral deflections and vertical movements. Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the Contractor shall by consultation with the Engineer ensure that the supporting concrete structure is capable of carrying the load and/or is sufficiently propped from lower floors or portions of the frame to permit the load to be temporarily carried during construction.

Formwork shall be cambered to compensate for anticipated deflections prior to hardening of the concrete.

16.3 Preparation for Concreting

The Contractor's attention is drawn to the various surfaces textures and applied finishes required and the faces of the formwork next to the concrete must be of such material and construction and be sufficiently true to provide a concrete surface which will in each particular case permit the specified surface treatment or applied finish.

At construction points contact surface of the form squeating for flush surfaces shall overlap 300mm and shall hold right against the hardened concrete to prevent effects or loss of mortar.

Methods of fixing and positioning of the formwork which results in holes through the concrete and/or left in metal ties or similar in the concrete shall require Engineer's approval.

All surfaces which will be in contact with concrete shall be piled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type applied as a thin film before the reinforcement is placed. Surplus moisture shall be removed from the forms prior to placing of the concrete.

Temporary openings shall be provided at the base of columns, wall and seam forms and at any other points where necessary to facilitate cleaning, and inspection immediately before the pouring of concrete. Before the concrete is placed the shuttering shall be trued-up, and the interior of the form shall be completely cleared of all extraneous materials including accumulated water.

The reinforcement shall then be inspected for accuracy of fixing, immediately before placing the concrete the formwork shall be well wetted and inspection openings shall be closed.

16.4 Defective Formwork:

Defective formwork shall be removed or strengthened and improved by the contractor according to the instructions by the Engineer.

16.5 Formwork to Construction Joints etc.

Formwork forming the construction joints and expansion joint shall be rigid, tight to avoid loss of mortar and true in square.

Formwork shall be inspected and passed by the Engineer before placing reinforcement and concreting.

16.6 Stripping Formwork:

Formwork shall be removed without undue vibration or shock and without damage to the concrete. No formwork shall be removed without the prior consent of the Engineer and the minimum periods that shall elapse between the placing of the concrete and the striking of the formwork will be as follows:

Beam side walls and columns (unloaded)	2 days
Slab soffits (with props designed to left under)	7 days
Beam soffits (with props designed to left under)	10 days

Subject to work cubes achieving the specified strengths and the loads due to construction on them being lighter than the designed loads. The props can be removed for:

Slab ……..	……	……..	10 days
Beams	……	……..	21 days

If the Contractor wishes to take advantage of the shorter stripping times as permitted above for beam and slab soffits when propos are left in place, he must so design his formwork that sufficient props as agreed with the Engineer can remain in their original position without being moved in any way until expiry of the minimum time for removal of props. Stripping and re-propping will not be permitted**.**

Contractor shall be responsible for consequent damage arising from early stripping of form work.

16.7 Making good:

After removal of formwork all projections, etc, on the concrete surface shall be chipped off, and made good to the requirements of the Engineer. Any voids or honeycombing shall be treated as described in "faulty concrete".

16.8 Fair-face etc.

Where fair-face is specified the contractor shall make a sample of area formed by sides not less than 1.2m for approval by the Engineer and the Architect. Same will apply to Board Marked. Tamped and finishes.

16.9 Related Uniformed Surfaces

Top of walls or buttresses, horizontal offsets and similar unformed surfaces occurring immediately adjacent to formed surfaced shall be struck smooth after the concrete is placed and shall be floated to a texture reasonably insistent with that of the formed surfaces.

17. PRECAST CONCRETE

17.1 General Requirements

Unless otherwise approved by the Engineer, all precast concrete construction shall be carried out on the site and shall conform to requirements given elsewhere in these preambles.

The maximum size of coarse aggregate in precast concrete shall not exceed 20mm except for thickness less than 75mm where it shall not exceed 12mm.

The compacting of precast concrete shall conform with requirements given elsewhere in these preambles except for thin slabs where use of immersion type vibration is not practicable. The concrete in those slabs may be consolidated on a vibrating table or by any other methods approved by the Engineer.

17.2 Steam Curing

Steam curing of precast concrete will be permitted. The procedure for steam curing shall be subject to the approval of the Engineer.

The precast work shall be made under cover and shall remain under the same cover and shall remain under the same for seven days. During this period and for a further seven days the concrete shall be shielded by sacking or other approved material kept constantly wet. It shall then be stacked in the

open for at least a further seven days to season before being set in position. Where steam curing is used these times may be reduced subject to the approval of the Engineer.

17.3 Method of Handling:

Precast concrete units shall be constructed in individual forms. The method of handling the precast concrete units after casting, during curing and during transport and erection shall be subject to the approval of the Engineer, providing that such approval shall not relieve the Contractor of responsibility for damage to precast concrete units resulting from careless handling.

17.4 Repairs:

Repair of damage to the precast concrete units, except for minor abrasions of the edges which will not impair the installation and/or appearance of the units will not be permitted and the damaged units shall be replaced by the Contractor at his own expense.

17.5 Moulds

Except where precast work is described as "fair-face" the moulds are to be made of metal or are to have metal or plywood linings or are to be other approved moulds which will produce a smooth dense fair face to the finished concrete suitable to receive a painted finish direct and free from all shutted marks, holes, pittances, etc. In his prices for such precast work the Contractor shall include for all rubbing down to produce the finish required to the satisfaction and approval of the Engineer and the Architect.

Where precast work is to have an exposed aggregate as finish the moulds shall be constructed to the requirements given for moulds for "fair face" work. The method of achieving the exposed aggregate finish shall be the aggregate transfer or other approved methods. A sample showing the required finish and shape shall be approved by the Architect/Engineer.

The precast units shall be installed to the lines, grades and dimensions shown on the Drawings or as directed by the Engineer.

18. COMPOSITE FLOOR SLABS

18.1 Size, type and concrete mix for floor block:

Concrete hollow blocks for use in the composite floor slabs are to be size and shape as shown on the Drawings with 25mm wall thickness and are to be of adequate strength to support the concrete during placing and consolidation by vibration. Blocks are to be manufactured in accordance with the procedure specified in B.S 2028 and to be of a mix not weaker than 1:10 cement: combined aggregates using maximum 10mm size aggregate. No coral sand shall be used in making of concrete blocks.

Concrete blocks are to be cured for at least 28 days before use of the site. During the first seven days of curing, blocks are to be kept permanently damp and protected from exposure to sun and wind.

Concrete blocks are to be well wetted before the pouring of concrete.

18.2 Composite Floor Construction

The hollow block floor construction is generally to be as shown on the Engineer's Drawings.

Care shall be taken in placing blocks to ensure that they are set out in accordance with the details shown on the Drawings and that they run truly in line without encroaching on the width of the in-situ ribs.

The open ends of hollow blocks adjacent to the concrete to be placed in-situ are to be plugged or stopped previously with mortar or concrete to prevent the concrete from flowing into the void and the contractor is to include for this in his prices.

The Contractor should note that slip tiles are not to be used to the soffit of ribs and he is to take this into consideration in pricing the items of formwork to the soffit of hollow block floor construction.

Before concreting is carried out the blocks are to be thoroughly wetted.

Care should be taken during concreting that the width of ribs between the rows of blocks and of the solid in-situ concrete shown on the Drawings adjacent to supporting beams is not encroached upon by the blocks. It is essential that the concrete topping be poured at the same time as the ribs between hollow blocks.

18.3 Fixing of rib reinforcement

Reinforcement shall be positioned accurately with required cover in accordance with the Drawings and using the particular spacing blocks with wire ties as previously described. Spacer blocks shall be provided in ribs at not more than 1.2m centres. Care must be taken during concreting that the reinforcement is not displaced.

Where holes for services, etc. occur, the necessary holes or pockets shall be accommodated by the replacing of a hollow block by in-situ concrete or the widening of a rib all in accordance with the Engineer's instructions. Prices for holes, etc. through hollow block construction are to include the re-arrangement or substitution of the hollow block with solid concrete in addition to the actual formation of the hole.

19. NOTES CONCERNING MEASUREMENT AND PRICING

The Contractor must allow for all costs incurred during the progress of the Contract for complying with the provisions concerning the preparation and use graded mixes.

Prices for concrete shall include for mixing and depositing as described or indicated and for hoisting and depositing at the various levels required throughout the building, and shall also include for forming or hacking a satisfactory key for all faces receiving asphalt and plaster work. Prices for slabs shall also include for levelling off the surface as described under "compaction", and all temporary formwork to form construction joints at bay edges.

Prices for reinforced concrete shall, in addition, include for filling into, between or on formwork and thoroughly compacting between and around rods or fabric reinforcement and for forming all additional

construction joints between varying mixes. Where described as vibrated, prices must include for fully vibrating as described.

Formwork (use and waste only is measured net to the actual surface of the concrete to be supported and the prices for formwork shall include for extra material at joints, extra labour and waste for narrow widths, small quantities, overlaps, passings at angles, straight cutting and waste, splayed edges, notchings, etc and for fixing at the various levels including battons, struts and supports and for bolting, jacking, wedging, easing striking and removal. Prices for linear items such as boxings shall include for angles and ends. Strutting has been measured at varying levels to slab soffits only and prices for other items must include for strutting at any level.

Prices for steel rod reinforcement shall include for cutting to lengths and all labour in bending and cranking, forming hooked ends, handling, hoisting and fixing in position and for providing all necessary tying wire and supports. Prices for fabric reinforcement shall include for all straight cutting and waste, handling, hoisting and fixing in position, providing all necessary tying wire, and supports and all extra material in laps.

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19. **NOTES CONCERNING MEASUREMENT AND PRICING CONCRETE WORK**

Prior to construction, contractors submit working drawings, showing the materials and proposed method of construction to MaineDOT. Contractors must construct cofferdams deep enough to protect the bottom of the bridge abutment footings and high enough to prevent overspill. If needed, contractors may brace cofferdams to withstand pressure without buckling, or may secure cofferdams in place to prevent tipping or movement. Cofferdams must be as watertight as necessary for the safe and proper construction of the substructure work inside them. With the exception of construction of a concrete foundation seal placed under water, the interior dimensions of cofferdams must be designed to allow sufficient clearance for the construction. Contractors are responsible for the righting and resetting of cofferdams that have tilted or moved laterally, as required for construction. The following are brief descriptions of cofferdam types typically used to control water on bridge replacement projects. Any of the methods could serve as either a partial or complete diversion method to move water away from construction. Cofferdam Installation The sequence of activities is critical to minimizing environmental impacts. In general, the upstream cofferdam is installed first, then the downstream cofferdam. After completion of the work, the sequence is reversed and the downstream cofferdam is removed before the upstream. The following conditions apply during cofferdam use: - Stream flow shall be maintained at a rate similar to natural conditions. - Timing of the installation of cofferdams is critical to minimize impacts on fish and other aquatic life. - Cofferdams cannot be used across a streambed during times when fish passage is an issue. Sometimes cofferdams can be placed around the abutments to allow for fish passage during construction. - In-stream work windows are defined by the Environmental Office for most in-water work activities. - Because the potential for washout is high, the cofferdam must be carefully monitored, and must not be left unattended for any 24-hour period. Weather reports must be monitored. If a storm event is expected, the site must be stabilized in preparation for it. - Turbid water within the cofferdam should be pumped into a temporary sedimentation basin or tank truck, and should not be allowed to discharge directly to any protected natural resource. - Dual cofferdams (upstream and downstream) are generally necessary in situations that require blocking off the entire stream channel (Figure 1). - Refer to MaineDOT’s Dewatering BMP for guidance on dewatering activities
(**http://www.maine.gov/mdot/env/docs/bmp/BMP2008full.pdf**)

1. at least 7 days prior to starting any earth disturbance activities (including clearing and grubbing), the owner and/or operator shall invite all contractors, the landowner, appropriate municipal officials, the e&s plan preparer, the pcsm plan preparer, and a representative from the pike county conservation district to an on-site preconstruction meeting. 2. upon installation or stabilization of all perimeter sediment control bmps and at least 3 days prior to proceeding with the bulk earth disturbance activities, the permittee or co-permittee shall provide notification to the padep or authorized conservation district. 3. at least 3 days prior to starting any earth disturbance activities, or expanding into an area previously unmarked, the pennsylvania one call system inc. shall be notified at 1-800-242-1776 for the location of existing underground utilities. 4. all earth disturbance activities shall proceed in accordance with the sequence provided on the plan drawings. deviation from that sequence must be approved by the pike county conservation district or

by the padept prior to implementation. each step of the sequence shall be completed before proceeding to the next step, except where noted. 5. contractor shall stake out limit of disturbance (lod) indicated on the plan in the field. all work shall be within the lod. 6. contractor shall stage all work from the road and shall minimize disturbance of soil the maximum extent possible. 7. contractor shall provide diversion pumping and cofferdams necessary to perform all work in the dry. a. install sandbag dam at the upstream end of the workzone. b. pump water around the proposed workzone. the discharge shall be located in a stable area of the streambed according to the detail. c. install downstream sandbad bam as needed to minimize back flow into the workzone. d.deawter the workzone as needed with a pumped water filter bag per detail. 8. all sediment-laden water shall be discharged through a filter bag. with exception of clean pump water from diversion operations, no water shall be discharged directly to the stream. 9. soils stockpiled during culvert installation shall be surrounded by silt socks. 10. contractor shall install bmps (cofferdam and channel by-pass) as seen in figure 3.11 "temporary cofferdam and bypass around in-channel work area" 11. contractor shall install culvert in accordance with jd culvert detail. 12. contractor shall install culvert in accordance with penndot specifications and the requirements of these plans. 13. when installation is complete, the contractor shall restore soil surfaces to have 75% vegetative cover. all areas shall receive seed and mulch. any slope 3:1 or greater shall receive straw erosion control blanket. 14. contractor shall remove bmps upon completion only after approval is given by the pike county conservation district. 15. contractor shall clean roadway of any sediment both during and after installation of the culvert.