HDC

TRINIDAD AND TOBAGO
HOUSING DEVELOPMENT CORPORATION
AN AGENCY OF THE MINISTRY OF HOUSING AND URBAN DEVELOPMENT

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WORKING WITH THE HDC

Foreword

The performance of the Trinidad and Tobago Housing Development Corporation (HDC) is closely linked to the provision of works by its contractors. As the largest landlord and supplier of homes in the nation, the HDC has mandated that every job meet the highest standards for its tenants and homeowners.

The Corporation is pleased to offer contractors this concise guide designed to ensure that contractors adhere to the HDC's rules, regulations and policies so that they are fully aware of their obligations when work is undertaken for the Trinidad and Tobago Housing Development Corporation.

It is our sincere hope that this guide will develop smooth business relations between contractors and the HDC.

TABLE OF CONTENTS

HDC
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HDC
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PART ONE – PRE-CONTRACT

1. HDC Housing Programme

The HDC recognises the critical role of housing in the enhancement of quality of life for all citizens and the pivotal role that housing construction plays in generating economic activity for the society. It is a widely held belief that the local housing sector generates more jobs in absolute and relative terms than any other industry.

The Corporation is currently the only agency providing mass housing in Trinidad and Tobago. Pursuant to Government's Accelerated Housing Programme, the Corporation's target is 6,500 new housing units per year. This figure is based on the capacity of the local construction industry and other resource constraints.

In order to fulfil its mandate, the HDC engages the services of suitably experienced and qualified contractors registered in Trinidad and Tobago for construction of its housing units and related infrastructure in accordance with its procurement rules and tenets of good corporate governance.

This process begins with HDC's pre-qualification process.

2. Pre-Qualifcation Process

The process commences when the HDC, by way of public notice in daily newspapers invites suitable qualified and experienced small, medium and large contractors to pre-qualify for the housing programme for the advertised period.

All contractors who are interested in tendering for the design and/or construction of small, medium or large housing projects must be pre-qualified by the HDC.

The pre-qualification process is as follows:

- Collection of the pre-qualification application from the HDC.
- Applications for the pre-qualification must include the following documents:
  - Completed Pre-qualification Application duly signed by an authorised signatory.
  - Certificate of Incorporation or Certificate of Continuance of the Applicant.
  - Certificate of Registration as an External Company (where applicable).
  - A copy of the latest Annual Return filed with the Registrar of Companies (or equivalent for foreign companies) not older than 31 December 2011.
  - A valid Value Added Tax (VAT) Clearance Certificate.
  - A valid Board of Inland Revenue (BIR) Income Tax Clearance Certificate.
  - A valid National Insurance Scheme (NIS) Compliance Certificate (for local companies or joint ventures).
  - An organisational chart indicating the management structure of the company and the names of key personnel.
  - Résumés of key personnel signed and dated not older than 31 December 2011 by each employee.
  - Details of housing projects undertaken within the last five (5) years, including values thereof.
  - Details of other construction projects undertaken within the last five (5) years, including values thereof.
  - Copies of the company's certified or audited financial statements[1] for the last three (3) years. Financial statements must be signed by a qualified accountant and at least two officials, one of which must be a Director.
  - Letter from a Registered Surety confirming willingness to provide a Performance Bond (10 per cent of contract value).
  - Letter from Bankers confirming willingness to provide interim financing.
  - Health, Safety and Environmental Management Policy.
  - Evidence of agreements for joint venture and other partnership arrangements, where applicable.
  - Joint venture partners are required to submit financial statements and Certificates of Incorporation for each associated applicant.
  - Client references in stipulated format.

[1] Financial Statements must be signed by a qualified accountant and at least two officials, one of which must be a Director.

- The pre-qualification notice deadline date for submissions MUST be followed. LATE APPLICATIONS WILL NOT BE ACCEPTED.
- All pre-qualification applications are to be delivered to the tender box located at the HDC head office.
- Incomplete applications will be penalised or rejected.

Small, Medium and Large Contractors

In the pre-qualification application, contractors are required to indicate which category of contract they wish to pre-qualify for.

The HDC categorises its contracts for its Housing Programme according to a prescribed maximum value per contract package.

The ceiling value for the different categories of contractors can be seen in the table below:

Contract Package Categories (excl. infrastructure)	Minimum Value (excl. infrastructure)	Maximum Value
Small $25M	$75M	
Medium	$75M	$200M
Large OVER $200M	OVER $200M	

Site Visits

Subject to approval of the Board of Directors of the HDC, an interim shortlist of qualified contractors in the respective categories will be established following site visits to the offices and/or projects of these contractors. These site visits will be used to verify information provided by applicants on the pre-qualification application, such as physical, financial and human resource capacity. The HDC reserves the right to adjust scores based on its findings during the site visits.

A list of successful applicants will be compiled and those selected will be notified of their pre-qualification in the respective categories.

When the HDC requires works to be performed, it will use the pre-qualification list to invite applicants to tender for the various projects.

3. Tendering Process

The tendering process for award of contract in any of the contract categories is as follows:

Step 1: Issue of Invitation to Tender
Step 2: Evaluation of Tenders
Step 3: Award to Contractor
Step 4: Execution of Contract

Required Documents

A list of documents for submission will be contained in the Invitation to Tender and includes:

- Copies of original documents of company registration.
- Information regarding any current legal or arbitration proceedings or disputes in which contractors are involved.
- Client references.
- A valid income tax clearance certificate.
- A valid VAT certificate of registration.
- A valid VAT clearance certificate.
- A valid NIS compliance certificate.
- Résumés of staff.
- Equipment list.
- Financial statements.
- Capability statements – Statement of equipment and staff the contractor has available to perform work.
- Health and Safety Policy and other applicable procedures.
- Methodology where applicable – Statement outlining the approach the contractor will adopt in carrying out works.

Submission of Tenders

Tenders must be submitted on or before the deadline time and date, be complete and be responsive. The term 'responsive' relates to completeness of compliance to the requirements outlined in the tender document.

4. Employer's Requirements - Technical Specifications

In order to ensure contractors use materials meeting all industry standards in HDC projects and to ensure the delivery of a quality product to every beneficiary, the HDC has developed technical specifications for their usage and application.

This document includes technical specifications and guideline standards for site infrastructure development and building construction, inclusive of all building codes, statutory approvals and materials, and will form part of the HDC's contract documents to successful tenderers for HDC projects. These specifications are based on a combination of local and international codes and standards in the design and construction of houses and other building types, together with best practices in the construction industry.

(See Appendix for complete list of technical specifications).

Forms of Contracts Used by HDC in the Procurement of Services

If you are a successful tenderer, you will be required to enter into a formal contract for the execution of works. The standard forms of contract that are most commonly used by the HDC are from the FIDIC suite of contracts.

The FIDIC Suite of Contracts

- The FIDIC suite of contracts is well known in the consulting engineering industry and defines conditions of contract for the construction industry globally. The Government of the Republic Trinidad and Tobago has mandated that the FIDIC contracts be used by ministries and state bodies.

- The best known of the FIDIC contracts are the Red Book (building and engineering works designed by the employer) and the Yellow Book (M&E, building and engineering works designed by the contractor).

* The HDC subscribes to the following types of FIDIC contracts, which are easily identifiable by the colour of the book they are printed in (Red Book, Yellow Book, Green Book and White Book).

FIDIC Red Book (Conditions of Contract for Building and Engineering Works Designed by the Employer, 1999 Ed.)

- This contract is used for medium to mega-sized projects where the design is external to the contractor/developer.

FIDIC Yellow Book (Conditions of Contract for Plant and Design-Build, 1999 Ed.)

- This contract is used where the design construction is undertaken by the contractor based on a performance specification by the employer. This form of contract is generally referred to as 'Design-Build'.

FIDIC Green Book (Short Form of Contract)

- The Green Book is the short form of contract normally used for works that are relatively small in value or where the works are of a repetitive nature.

FIDIC White Book

- The White Book is the Client/Consultant Model Services Agreement.

What the HDC Wants from its contractors

- Adherence to the terms and conditions of the contract.
- Best value for money.
- High quality of products, i.e. houses.
- Commitment of improvement from contractors.
- Technical competence.
- Sound work ethic and integrity.
- Delivery as per work schedule.
- Comprehensive reporting.
- Flexibility and responsiveness to change.
- Adherence to health and safety best practices.

Contact with Client

- All communication must be in writing.
- Contractors requesting clarification of information or those submitting questions to the HDC relative to the tenders issued will receive a response in writing via post, email or fax. All contractors will then be informed of the concern or question raised and the answer will be provided.

5. Contractors' Human Resources

Throughout its pre-qualification process and during the tender stage, the HDC will closely evaluate potential contractors' capacity through their human resources. This will also comprise assessment of organisational structure, résumés of key personnel and relevant certified qualifications, as well as unannounced site visits to offices to confirm stated resources. Human resource personnel need to be qualified and experienced.

6. Insurance, Performance Bonds, Advance Payment Guarantee

Why Insurance is Needed

- Occasionally, man-made or natural events can occur where damage is due to works, workers, third parties, and/or property. Sometimes the cost for remedying the situation may prove prohibitive and prevent the completion of work and may even result in contract solvency.
- Insurance is a mechanism to financially protect the contractors and the HDC if these events occur. A contractor who has successfully tendered is required to take out a joint insurance policy in the name of the HDC and the contractor before work begins.

Types of Insurance Required

- Contractors All Risk (CAR) Insurance: this indemnifies the contractor against any liability for loss of life or limb occasioned by one incident or series of incidents, inclusive of damage to the works.
- Public Liability Insurance: this indemnifies the contractor or the employer from any liability for loss of life or limb to the public at large.
- Workmen's Compensation: this indemnifies the contractor for loss of life or limb of workmen and other authorised personnel (contractors should note that Workmen's Compensation insurance is a statutory requirement).
- Professional Indemnity Insurance: this indemnifies the consultants for claims due to negligence.

Performance Bonds

- A Performance Bond is an instrument (registered by the Board of Inland Revenue) that is requested by the Employer and that guarantees some level of compensation (in the sum of 10 per cent of the contract sum) for non-performance by the contractor. This can be obtained from a bank or insurance company approved by the HDC through payment of a premium or a fee (approximately 1.75 per cent of the contract sum).

Advance Payment Guarantee

- An Advance Payment Guarantee is an instrument (registered by the Board of Inland Revenue) that is requested by the employer and that guarantees repayment by the contractor of the Advance Payment under the contract (10 per cent of the contract sum). This can be obtained from a bank or insurance company approved by the HDC through payment of a premium or a fee.

7. Contract Orientation

If the contractor has been pre-qualified to provide services to the HDC, they will be required to attend a contract orientation, which will follow a similar format of this booklet. The orientation, however, will provide additional details to guide the contractor through the procurement process and the relevant conditions governing the administration of the contract.

8. Advance Payment (Mobilisation)

The HDC makes an advance payment in accordance with the terms of the contract. This advance payment is defined an interest-free loan for mobilisation upon submission of an advance payment guarantee. Details of this advance payment and terms of repayment will be stated in the Appendix to Tender. If the advance payment is not stated in the Appendix to Tender, no advance payment will be payable. It is important to note that for the Design-Build contracts, the advance payment comprises mobilisation and design as one payment of 10 per cent of the approved contract sum.

Time for Payment and Invoices

- Under the Short Form Contract the time for payment is measured as from the time of the contractor's application for payment which is 28 days maximum. For the other forms of FIDIC contracts 56 days, if not stated in the Particular Application. To assist the HDC in meeting these payment deadlines, contractors will be expected to agree on a payment schedule not necessarily on a calendar month basis.

Valuation of Work and Payment

- Following the submission of the application for payment by the contractor, an HDC quantity surveyor or a consultant quantity surveyor will conduct a valuation of the work with the contractor on the HDC's behalf. Based on the valuation, a payment certificate will then be issued in accordance with the relevant contract by the respective project manager. The contractor will be required to submit an invoice in the sum certified. This will ensure that the VAT invoice matches the cheque amount and will facilitate the contractor's VAT payment to the BIR within the statutory required period.
- The payment certificate and the invoice are forwarded to the HDC's finance division for processing and payment.

PART TWO – CONTRACT PHASE

9. Health, Safety and the Environment (HSE)

General HSE Requirements

- Contractors must adhere to applicable national legislation, codes of practices and guidance to which the HDC subscribes.

Occupational Safety and Health Act (OSH) (Amendment) 2006

Contractors are required to:

- Meet the minimum requirements of the HDC's Health Safety Environmental Management System and inclusive HSE policies and procedures.
- Be subject to inspections and audits by the HSE department. Contractors should treat the outcome of such assessment as urgent and work collectively with the HDC to have the necessary actions remedied, etc.
- Comply with Safe Systems of Work used within the HDC, such as risk assessments, job safety analysis, etc.
- Employ adequate preventative measures to reduce the risk of unwanted incidents/accidents.
- Have adequate and sufficient record-keeping of licences, contractor/staff data records and permits, etc.
- Have adequate HSE signage on work site.
- Prohibit the use or sale of alcohol and illegal drugs on the Corporation's worksites in accordance with the HDC's Substance Abuse Policy and prohibit the possession of unlicensed firearms and illegal weapons.
- Promote a safe and positive HSE culture by employing 'Assume nothing and check everything' measures at all times.

Accident Investigation and Reporting

Contractors are required to:

- Provide the HDC with Loss Time Incident (LTI) statistics of the last three (3) jobs performed.
- State if any critical injuries and/or fatalities have occurred within their firm over the last five (5) years.
- Record and make readily available for review all data on LTIs that have occurred on HDC worksites.
- Immediately report all emergencies, accidents and incidents to the HSE department.

Safety Inspection

- Contractors are subject to random inspections by HSE officials.
- Contractors are required to conduct independent inspections to maintain a safe working environment.

Hazard Communication

- Contractors are required to erect adequate and appropriate signage.
- Contractors are required to conduct 'toolbox talks' communicating the hazards and mitigation methods to employees and visitors.
- All contractors will be subject to the HDC's HSE Orientation Programme.
- All contractors must be familiar with HDC Emergency Response Procedures.

10. Site Office and Facilities

Contractors are expected to erect and maintain site office and related facilities for on-site staff in a clean and sanitary manner and in accordance with OSH regulations and best HSE practice.

11. Housekeeping

Adhering to the HDC's Housekeeping Policy and Engaging in Best Industry Practice

- Keep work areas clean and free of dust and hazards.
- Arrange adequate daily waste disposal.
- The HDC will conduct periodic and random checks to ensure contractors adhere to its HSE policies.

*It has been proven that a well-kept site is indicative of proper planning, which results in fewer incidents and injuries, fewer health and safety risks, low wastage and high productivity.

Maintaining the Work Environment

Minimising Dust

Contractors are advised to:

- Erect dust barriers to minimise effects on adjoining properties.
- Mist areas with water before sanding, scraping, drilling and cutting.
- Score paint before separating components.
- Prise and pull apart components instead of pounding and hammering.

Leaving the Work Area Clean

On a daily basis, contractors are advised to:

- Use heavy-duty plastic bags to dispose of refuse and debris.
- Wrap bulky items, such as windows and doors, in heavy plastic sheeting and tape them shut.
- Leave everything free of dust and debris, including tools and equipment before leaving the work area.
- Vacuum the work area as necessary.
- Prevent all unauthorised personnel from entering the work area.

These simple practices ensure that work is performed better, cleaner and safer.

PART THREE – MANAGING THE CONSTRUCTION PROCESS

12. Role of the HDC Departments

Project Management and Oversight

The Project Management and Oversight (PMO) department focuses on the overall management and oversight of the project life cycle from the inception through to completion and handover.

The Department's core activities generally fall into the following key stages of the project cycle:

- Inception Stage
- Project Feasibility Stage
- Implementation Strategy Stage
- Pre-Construction Activity Stage
- Construction Stage
- Completion & Handover

During construction, the PMO department performs a critical oversight and quality management role in the project life cycle. This includes ensuring all necessary control and monitoring systems have been implemented by the contractor during the construction, including the:

- Quality Management Plan
- Schedule Management System
- Quality Control System
- Document Management System

The PMO department also provides oversight during the construction phase to ensure that contractors deliver as per contract requirements at the Completion and Handover stage. This includes ensuring that final inspections were completed, a snag list prepared and an appropriate Certificate of Practical Completion issued. The PMO oversight role would also include ensuring reconciliation of final accounts, rectification of reported defects by the contractor during the Defects Liability Period and ensuring that final project documents of an acceptable quality and standards are handed over.

Tenders/Contracts Department

The Tenders/Contracts Department is managed by the Chief Legal Officer and issues and monitors the procurement life cycle, which includes the:

1. Issue of tenders
2. Closing of tenders
3. Evaluation and award of contracts
4. Execution of contracts
5. Submission of contract documents by contractors, including bonds and insurances

Following the award of the contract, contractors are expected to abide by their contractual obligations, which include using materials of the quality specified in the employer's requirements, adhering to the schedule of works, adhering to health and safety regulations (OSH Act), good housekeeping, securing the works on site, submitting payment applications on time with the requisite supporting documents and submission of monthly progress reports.

Notifications of Breaches

Notifications of breaches by contractors are forwarded by the project manager to attorneys in the Contracts department, who then issue the appropriate warning letter to the contractors.

In instances where there are defects in the executed works by a contractor during the Defects Liability Period (one (1) year after the site is taken over by the HDC) the contractor is called upon to make good those defects within a reasonable period. The contractor is also advised that if it fails to make good these defects, the HDC will proceed to rectify the said defects and recover the monies spent by the Corporation from the Retention held by the HDC under the contract.

In instances where defects in the execution of works only become apparent after the expiry of the Defects Liability Period, the HDC promptly notifies the contractor as to the defects and provides an opportunity to correct the defect, failing which the HDC indicates that it will institute legal action for breach of contract for damages arising out of the breach.

Construction Management and Operations

The Construction Management and Operations (CMO) department is managed by the Chief Construction Engineer who has oversight through the assistance of various project managers and Clerk of Works. The CMO department focuses on the daily operations of managing the process from design to implementation, ensuring the contract is adhered to with the highest quality of work.

Chief Construction Engineer

- Reviews project plans to formulate work schedules, construction methodology statements, staffing requirements and allocates resources to the various work packages.
- Manages the construction site and directs project personnel, contractors and consultants to ensure all requirements of quality, time schedules, cost control and health and safety are fulfilled.
- Processes and controls the tracking of contractor certificates, verifies works completed, measures finished works, monitors payment processes and quality control.
- Any other related duties as may be required.

Project Manager

- Assists in the development of a scope of work for pre-tender documentation for the award of consultancy and construction, and develops contracts and agreements.
- Plans construction methods and procedures.
- Supervises construction sites and directs site managers and subcontractors to make sure standards of building performance, quality, cost schedules and safety are maintained.
- Ensures that building regulations, standards and by-laws are enforced in building operations.
- Consults with architects, engineers and other technical workers to make sure that design intentions are met.
- Evaluates works performed by subcontractors and makes recommendations for payments.
- Analyses monthly progress reports produced by contractors and recommends corrective action where necessary.
- Produces monthly progress reports on each project assigned.
- Ensures that relationships with stakeholders are effectively maintained.
- Performs related duties as may be required.

Clerk of Works

- Develops and implements quality assurance guidelines for construction projects.
- Monitors contractor performance with respect to quality standards.
- Ensures compliance with legal and organisational quality assurance requirements.
- Conducts inspections of building sites.
- Performs related duties as may be required.

13. HDC's Expectations - Rules, Standards, Compliance

I. Project Execution

The execution of HDC works shall be conducted with great vigilance and partnership with all legislative bodies, emergency response authorities, (e.g. TTFS, ODPM) and the HDC.

Contractors are required to:

- Comply with safe systems of work used within the HDC, such as risk assessments, Job Safety Analysis (JSA), etc.
- Communicate the hazards and mitigation methods to all stakeholders.
- Continuously improve the safety awareness of employees by conducting HSE briefings, toolbox talks, HSE orientations and provide training and refresher training, etc.
- Adhere to the HDC's HSE Management system and submit to all legislative authorities.
- Employ adequate preventative measures to reduce the risk of unwanted incidents/accidents.
- Immediately report all emergencies, accidents and incidents to the HSE department.
  A written report must also be submitted to the HSE department within 24 hours.
- Employ competent and certified subcontractors and staff.
- Facilitate the HDC department in overseeing the progress of work and in attending site meetings, etc.
- Be subject to site inspection and audits by the HSE department. Contractors should treat the outcome of such assessment as urgent and work collectively with the HDC to have the necessary remedies actioned, etc.
- Have adequate and sufficient record-keeping of licences, contractor/staff data records and permits, etc.

Contractors are expected to carry out their works in a diligent and professional manner by following the terms of the agreement and must provide:

- Insurances, as stipulated in the tender
- Work schedules
- Cash flow schedules
- Requests for supplier information and the information of testing agencies proposed to supply material
- Samples, if needed or requested by the HDC

II. Project Reporting

The following reports shall be prepared and submitted to the Construction Management and Operations Division:

a) Kick-off Meeting and Report

The Project Kick-Off Report is a comprehensive template for construction kick-off, which includes the:

- Project objectives
- Project scope and key contract requirements
- List of stakeholders
- Timeline of key deliverables
- Meeting schedules
- Contingency plans
- Monthly cash flow according to the project schedule and overall project budget

b) Site Meetings and associated Minutes of Meetings

Bi-monthly project progress meetings will be held with the contractor to determine the progress of works as guided within their contract. Main items will be discussed, including site HSE, project schedule, cash flows, quality of works, tasks completed and upcoming tasks to be completed within the next 2 weeks. Any issues or variations which may arise are to be discussed and documented in the site Minutes of Meetings.

Minutes of Meetings will be recorded for each project meeting between the HDC and the contractor. It includes the names of the participants, the agenda items covered, decisions made by the participants, the follow-up actions committed to by participants, due dates for the completion of commitments and any other events or discussions worth documenting for future review or history.

c) Clerk of Works Daily Report

The Clerk of Works' function is to inspect in detail and report concisely on the daily progress of works. The Clerk of Works' job diary is an important document for recording the day-to-day happenings on the job. Items which should be noted include:

- Job Instructions: Any directions issued to contractor
- Dayworks
- Weather
- Tests: Records of tests made
- Workmanship
- Delays: Any delays that are evident, and the reasons for them

- Drawings: Any drawing or information that is needed or that has been requested
- Quality control e.g. concrete pouring and striking of important items of formwork
- Labour: Any labour problems including overtime bans, strikes and troubles with labour-only gangs
- Condemned Work

d) Contractor's Monthly Progress Report

At the end of each month, the progress of the design, procurement and construction works must be reported. This report is based on the compilation of the Clerk of Works' Weekly Reports. Each Monthly Progress Report shall include:

- Contract Summary
- Executive Summary
  - Progress of Works to date
  - Significant challenges and delays
  - Reasons for delays and actions taken to mitigate the delays
- Occupational Health, Safety & Environment (HSE)
- Financial Summary
- Procurement
- Programme
  - Forecast completion date
  - Current construction programme
  - As-built Programme
  - Look-ahead schedule displaying key planned activities to be completed
  - Records of contractor's Personnel and Equipment
  - Logs e.g. Request for Information (RFI)
- Summary of the progress of the Works
- Quality assurance documents, test results and certificates of materials
- Progress Photographs

e) Close Out Report

The project close out report finalises all project activities completed across all phases of the project to formally close the project and transfer the completed or cancelled project as appropriate. Its purpose is to assess the project, ensure completion, and derive any lessons learned and best practices to be applied to future projects. A basic format of this report is structured as follows:

- PROJECT TEAM
- SCOPE BASELINE

- CONTRACTOR
  - Contractor's name and address
  - List of subcontractors' names and addresses
  - List of manpower and major equipment (incl. subcontractors')
- DESIGN
  - Quality of Design (assessment)
  - Accuracy of Quantities
  - Special Provisions
- CONSTRUCTION METHODOLOGY
- CONSTRUCTION PROGRESS HISTORY
  - Date of contract award
  - Project start date
  - Date of substantial completion
  - Date work completed and completion certificates
  - As-built construction schedule
  - Key dates, such as start of specific tasks etc.
  - Reasons for any work stoppage
  - Items affecting schedule (weather, R/W purchase, etc.)
  - Defects Liability Period
- REVIEW OF SCHEDULE OF QUANTITIES
  - Tender vs. actual quantities
  - Reasons for major under and over-runs
  - Additional items
  - Final estimate of costs
  - Percentage difference between constructed costs vs. scheduled cost
- FINAL COST SUMMARY
  - Copies of Interim Payment Certificates
  - Approved Variations
  - List of Change Order Documentation
  - Retention
- QUALITY CONTROL AND QUALITY ASSURANCE
  - Materials Testing
  - Copy of Testing Certificates
- CONTRACTORS' MAJOR CLAIMS
  - Brief discussion of issues and resolutions
- STATUTORY APPROVALS
- SAFETY RECORD
- PHOTOGRAPH INDEX
- LESSONS LEARNT

III. Understanding the Payment Cycle

The FIDIC Conditions of Contract provide for a 56-certification-and-payment cycle.

The HDC contractor's payment process:

Step 1

- Work executed by the contractor is verified by either an external consultant acting on behalf of the HDC or the HDC's internal project manager/Clerk of Works.

Step 2

- The contractor submits an application for payment to the office of the Managing Director (MD) at the HDC showing in detail the amounts to which it considers itself to be entitled.

Step 3

- Within three (3) days' receipt of the application by the MD's office, the payment application is forwarded to the office of the Chief Construction Engineer/Divisional Manager of the Construction Management and Operations department.

Step 4

- Within three (3) days' receipt by the Chief Construction Engineer, the payment application is forwarded to the senior project manager and quantity surveyor for review to determine the recommended value of the work for which the contractor is entitled to be paid based on the contract.

Step 5

- Upon review and within fifteen (15) days' receipt by the senior project manager and quantity surveyor, the contractor's application can be either:
  1. Referred to the external consultant or internal project manager for further review and/or verification, where the sums of money claimed for work done cannot be substantiated.
     - Where this is the case, the MD's office will notify the contractor in writing of the issues affecting non-payment.

  Or

  2. Certified for payment.
     - Where this is the case, a certificate of payment is issued for the amount due to the contractor and is sent to the Chief Construction Engineer for vetting, along with all supporting documentation.

Certificate of Payment

HDC
TRINIDAD AND TOBAGO
HOUSING DEVELOPMENT CORPORATION
AN AGENCY OF THE MINISTRY OF HOUSING

Employer/Address
Trinidad and Tobago Housing Development Corporation
Cor/George Street & South Quay,
Port of Spain

This certificate is due for settlement within **56** days of issue ☐ FIDIC

This certificate is due for settlement within **21** days of issue ☐ TTIA ☐ JOINT VENTURE

11/12/13

Site Address:

Description of Works:

Issue Date:

Installment No.:

Valuation No.:

Contract Date:

Valuation Date:

File Reference:

Contract Sum: **(VAT Exclusive)**

Gross Value as per Contract Sum:

Approved Variation Amount:

Gross Amount:

Less Retention:
(see note)

Net Amount:

Add Advance Payment:
Repayment of Advance Payment:

Total:

Less Amount
Previously Certified:

Payment now due
to the Contractor:

Contractor/Address

Note 1
Less Retention

Where retention is not a straightforward percentage of the total amount due, attach a separate statement showing computation.

I/We certify that under the terms of the contract, payment is due from employer to contractor in the sum of :- * Certified amount excludes V.A.T.
Amount in words:
Amount in Figures: $ -

	External	TTHDC Internal
Signature of Quantity Surveyor	☐	☐
Signature of Project Manager	☐	☐

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TRINIDAD AND TOBAGO HOUSING DEVELOPMENT CORPORATION
PAYMENT APPROVAL FORM

☐ JOINT VENTURE ☐ FIDIC ☐ TTIA ☐ OTHER

To : Managing Director

From : Divisional Manager

Subject :

Date: **Valuation No.:**

The claim detail hereunder is recommended for approval
Payee:

Payee V.A.T. Registration:

Contract Works:

Service Account Type DP Ref:

☐ INFRASTRUCTURE DEVELOPMENT PROGRAMME_____

☐ SEWER TREATMENT SYSTEMS_____

☐ URBAN DEVELOPMENT PROGRAMME_____

☐ ESTATE MANAGEMENT PROGRAMME_____

☐ INFILL HOUSING PROGRAMME_____

☐ JOINT VENTURE HOUSING PROGRAMME_____

Job Ref :_____ Letter of Award #_____ Folio #_____

File Ref :

ACCOUNTS DESCRIPTION	SERVICE ACCOUNT $	*V.A.T $	TOTALS $
REVISED CONTRACT AMOUNT:			
ORIGINAL CONTRACT AMOUNT:			
Totals due to date			
Amounts Previously approved - Folio#			
AMOUNT DUE THIS APPROVAL			

***Exclude VAT on Advance Payment**

Project Manager,

☐ External _____ **Quantity Surveyor** _____ **Date**

☐ TTHDC, Internal _____ **Quantity Surveyor** _____ **Date**

The above claim in the sum of $ - is recommended for approval.

Divisional Manager,

☐ External _____ **Project Manager** _____ **Date**

☐ TTHDC, Internal _____ **Project Manager** _____ **Date**

The above claim in the sum of $ - is recommended for approval.

Managing Director,

_____ **Divisional Manager** _____ **Date**

The above Claim in the sum of $ - is approved and forwarded for Settlement

FOR INTERNAL USE ONLY

_____ **Managing Director** _____ **Date**

Step 6

- Within three (3) days' receipt by the Chief Construction Engineer, the payment certificate is sent to the Accounting department.

Step 7

- Within ten (10) days' receipt of the payment certificate, the Accounts department, in liaison with the MD's office, confirms and approves the payment certification.

Step 8

- Upon approval of the payment certificate and within two (2) days, the contractor is requested to submit a tax invoice for the certified amount.

Step 9

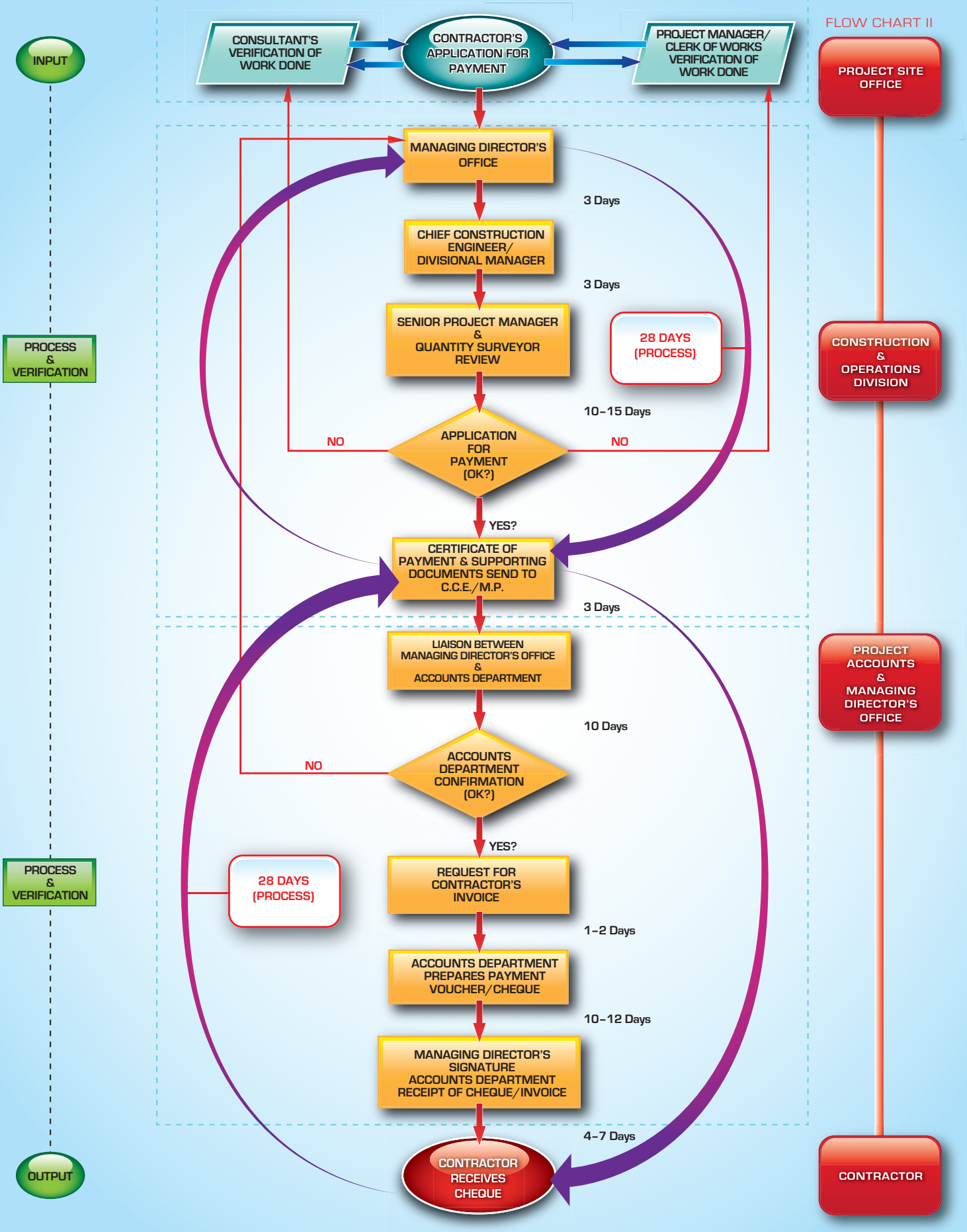
- Within ten to twelve (10-12) days' receipt of the contractor's tax invoice, the Accounts department prepares a payment voucher and issues a cheque payable to the contractor. Cheques the amounts for which exceed the Accountant's limit are referred to the MD for endorsement.

Step 10

- Within four to seven (4-7) days thereafter, the contractor receives a cheque payment.

(Please see Contractor's Payment Process Flow Chart on the next page)

CONTRACTOR'S PAYMENT PROCESS FLOW CHART



HDC
TRINIDAD AND TOBAGO
HOUSING DEVELOPMENT CORPORATION
AN AGENCY OF THE MINISTRY OF HOUSING AND URBAN DEVELOPMENT

14. Procedure for Variations

A variation is any change in the original contracted scope of work. This can take many forms, as follows:

1. Change in size and thickness of various materials, e.g. a door.
2. Change in character: this can occur from a low-priced item (e.g. a flush door) to a more elaborate item (e.g. a panel door) of equal dimension.
3. Change in condition: work done in open spaces, as opposed to confined spaces, can cause variations in the rate of an item.
4. Omissions and additions to original quantities: differences in original quantities can cause variations in the contract price.

The Conditions of Contract provides the process under the contract for the issuance of variations. The HDC's Tender Rules and corporate governance policy guide the HDC's internal process of approval for variations.

The HDC's Procedure for Variations

Whenever it appears to a Project Manager/Consultant that there are works which are necessary to be performed outside of the contracted scope of works contained in a contract, the following procedure will be implemented:-

1. The Project Manager will identify the need for change in the original scope of work.
2. A comprehensive report on the background of the project, the justification of the variation work to be approved, the estimated cost of the variation work and the general impact of the work on the cost and duration of the project are prepared for submission to the Managing Director.
3. The Managing Director shall consider the recommendations in the report and determine whether the variation should be approved or forwarded to the Board of Directors for its consideration and approval as the case may be.
4. A letter from the office of the Managing Director will be issued to the relevant contractor (copied to the Chief Construction Engineer and Project Manager/Consultant) informing it of the Corporation's decision regarding the variation ("Variation Letter").
5. The contractor, upon receipt of the Variation Letter, will then be authorised to proceed with the variation works.

   * No variation works are to be performed without the prior written approval to proceed is issued by the HDC

15. Programme of Works

Within 28 days' receipt of the Notice of Commencement from the HDC, contractors are required to submit a programme showing the order, timing and sequence of the works to be undertaken. The programme must be accompanied by a report stating the methods contractors intend to adopt in the execution of works and in major stages. The report must also include the allocation of human resources for each stage.

If contractors are unable to adhere to the original programme, they will be required to resubmit a revised programme of works showing how the works will be completed within the allotted period.

16. Progress Reports

Contractors will be required to submit monthly progress reports in accordance with the Conditions of Contract. These reports must contain a summary of the project's status.

As such, this portion of the report must provide summary information regarding the overall project. The following project summary details must be provided in the report:

- Will the project be completed on time?
- Will the project be completed within budget?
- Are scope change requests being managed successfully?
- Are project issues being addressed successfully?
- Are project risks being managed successfully?
- Are all HDC concerns being addressed successfully?
- Comment summary. Give more information on any questions above that were answered 'No'.

These monthly progress reports are required under the contract to be submitted along with the application for payment as a supporting document. Failure, therefore, to submit this monthly progress report may result in non-payment to the contractors.

17. Contractors Performance Evaluation

Throughout the duration of a project, all contractors will be evaluated on the performance of their projects to determine suitability and recommendations by HDC for future works.

The evaluation will be based on Compliance with:

- HSE audits (safety breaches, legal breaches).
- Quality requirements (quality of material, quality and experience of tradesmen).
- Communication (project reporting and monitoring), as well as project closeout documentation.
- Adhering to work schedule.
- Successful completion of the project, which includes:
    - Correction of all defects in works on a timely basis
    - Submission of the relevant statutory approvals
    - Submission of as built drawings
    - Submission of operation manuals where applicable
    - Submission of all variations and guarantees

Performance evaluations will be documented on a database and contractors' performances will be tracked and recorded.

17.1 Project Schedule Monitoring

The project team must give considerable attention to monitoring how well the project is performing against the schedule as this is a crucial element of project control. Since all HDC contracts require the completion of work to meet a contractual project completion date, if issues occur during construction, then the project team must be able to predict and forecast the potential impact these issues may have on the overall project completion date.

During construction, the project team is required to review schedules provided by contractors for planning and execution to ensure that these schedules are reasonable and in compliance with contractual requirements.

The contractor's construction schedule is used as a guide to show how the contractor plans to structure the works to complete the project within the contract duration.

Along with the project's cashflow projection and monthly progress updates, the contractor's performance can be determined.

Project Schedule on Time

If the contractor is performing the Works according to the original schedule and cashflow projection, it can be safely assumed that the project will be completed on time and within budget.

if upon review of the schedule, it is observed that the project is currently experiencing a delay, the HDC firstly assesses the cause. If the contractor is found liable for the delay, the HDC will then write to the contractor, informing them that the rate of progress has deteriorated and that a revised schedule is required, along with a supporting report describing revised methods, which the contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

18. Dispute Resolution

Should the HDC and the contractor be unable to amicably resolve any dispute arising out of the contract, the contract provides for the appointment of a Dispute Adjudication Board to decide the matter. The DAB can comprise one (1) adjudicator or three (3) adjudicators to whom the respective parties will present their case. Both parties will share the cost of the DAB.

- If one of the parties wishes to contest the findings of the DAB, then the matter will be subject to arbitration.
- In arbitration, both parties present their cases before an arbitrator. The decision of the arbitrator is final.

19. Statutory Approvals

All of the HDC's projects are to be constructed in accordance with the relevant statutory regulations and include approvals from:

1. Town and Country Planning
2. Drainage Division
3. Fire Services
4. WASA
5. Regional Corporations
6. Environmental Management Authority

Where a contractor is required under its contract to obtain these approvals, the HDC will monitor its progress very closely to ensure compliance. Where a contractor is delinquent in obtaining these approvals, the HDC reserves the right to:

- Intervene and obtain these approvals and deduct the costs for so doing from monies payable to the contractor.
- Withhold part or entire payment owed to the contractor at the end of the project to facilitate the obtaining of these approvals.
- Terminate the contract.

The contractor will be required to include designs and the acquisition of statutory approvals in the Programme of Works.

20. Correspondence

Contractors are required to address all formal correspondence to:

The Managing Director
Trinidad and Tobago Housing Development Corporation
44-46 South Quay
Port of Spain

Correspondence must be copied to the Chief Construction Engineer, as well as the relevant Project Manager.

21. Termination

Contractors are expected to follow the statutory laws of Trinidad and Tobago. The HDC will not tolerate breaches of the law or of building codes. Violations of statutory law will be reported to the relevant authorities and the contract will be terminated immediately.

PART FOUR – PROJECT CLOSEOUT

22. Closeout and Handover

Closeout and Handover refers to the period of the contract when the contractor has completed the works required under the contract and has applied for his Taking Over Certificate.

This triggers a joint inspection by the HDC's CMO Personnel (Chief Construction Engineer, Project Manager, and Clerks of Works), the Settlements & Community Relations Department Personnel and the contractor's representatives, whereby a detailed check on the completeness of the Scope of Works, as well as the quality of the works performed per unit. Any defects in the works identified are required to be remedied by the contractor within a stipulated timeframe.

23. Taking Over, Defects Liability Period

Once it is verified by the HDC that works completed are in accordance with the contractual requirements in respect of scope and quality of works, the HDC will issue a Taking Over Certificate to the contractor and receive possession of the Site.

The date of the Taking Over Certificate marks the start of the Defects Liability Period. The Defects Liability Period, as its name suggests, is the time (usually 365 days for FIDIC Red and Yellow Book Projects) during which the contractor remains liable for any defects in the works which become apparent. The contractor is obliged to remedy these defects at its own expense within a reasonable time.

It should be noted that the HDC's Settlements and Community Relations Department will also conduct a secondary inspection as part of the walkthrough process of housing units with prospective homeowners and the contractor, and will also note defective workmanship or incomplete works, which the contractor will be obliged to remedy.

23.1 DEFECTS LIABILITY PERIOD

Definition:
The Defects Liability Period, as its name suggests, is the time during which the contractor remains liable for any defects in the works which become apparent. The contractor is obligated to remedy these defects at its own expense within a reasonable time.
During the Defects Liability Period, the contractor must:
(a) complete any work which is outstanding on the date stated in the Taking Over Certificate, within a reasonable time, and
(b) execute all work required to remedy defects or damage, as may be notified by the HDC, on or before the expiry date of the Defects Notification Period.

23.2 Documents Required Prior To Defects Liability Period

The following documents are required prior to triggering the Defects Liability Period:

- Clerk of Works snag lists
- Joint walkthrough by Settlements and Project Management and Oversight Departments
- Tests on Completion
- Electrical Certificates
- Termite Treatment Certificates
- Water Pressure Testing Confirmation
- Civil Works Quality Control Tests
- Plant and Equipment Commissioning and Warranties/Guarantees
- Other testing as instructed by the Engineer
- Key Submission Transmittal
- Site plan showing units to be handed over
- CMO Project Close Out Checklist Sheet
- Memo identifying:
  - Development
  - Unit #

- Unit Type
- Electrical Meter #
- # of Keys
- Copy of Taking Over Certificate
- Copy of Paint Schedule

23.3 Beginning of the Defects Liability Period

Once it is verified by the HDC that works completed are in accordance with the contractual requirements in respect of scope and quality of works, the HDC will issue a Taking Over Certificate to the contractor and receive possession of the Site. This period begins from the date certified in the Taking Over Certificate.

23.4 During the Defects Liability Period

During the Defects Liability Period, there will be identification of defects and deterioration by the HDC; defects are related to agreed contractual obligations. It should be noted that the HDC's Settlements and Community Relations Department will also conduct a secondary inspection as part of the walkthrough process of housing units with prospective homeowners and the contractor, and will also note defective workmanship or incomplete works, which the contractor will be obligated to remedy.

The contractor is also responsible for any damage caused by its employees and sub-contractors while completing any activities during the Defects Liability Period. The Clerk of Works is to monitor rectification works by the contractor to ensure works are done in a controlled and orderly manner so as to not cause further damage to other works.

Further, a Schedule of Defects is to be developed from inspections and segmented into the following categories:

- Remedial and reinstatement works as a result of non-compliance to contract specifications and workmanship.
- Fair Wear and Tear.
- Additional works which arise but are outside the contracted scope.
- Latent defects.

If the work of remedying defect or damage affects the performance of the works, the HDC may require the repetition of any test as described in the contract. The contractor is neither responsible for consequences of fair wear and tear nor inadequate maintenance by the employer. Upon rectification of a defect, and acceptance by the Clerk of Works, both parties shall formally record and sign off the remedial works to declare the contractor as satisfactorily correcting the outstanding defects.

23.5 Cost of Remedying Defects

The cost of remedying defective works is to be borne by the contractor and includes:

(a) any error omission or defect in design for which the contractor is responsible,
(b) plant, materials or workmanship not being in accordance with the contract
(c) failure by the contractor to comply with any other obligation.

23.6 Time for Remedying of Defects

The date of the Taking Over Certificate marks the start of the Defects Liability Period (DLP). The Defects Liability Period is typically:

- One (1) year for FIDIC Red and Yellow Books
- Six (6) months for FIDIC Green Book

However, it must be noted that the time as stated in the Appendix to Tender takes priority.

The contractor must correct defects and repair damages in a timely manner. In defining what is a reasonable time, the HDC is guided by the practices of a competent contractor. As such, the Engineer or Project Manager should specify the following timelines to the contractor:

#	NATURE OF DEFECT	MAXIMUM TIMEFRAME
1	Replacement of Fixtures and Finishes; Touch Painting, Roof Leaks, Broken Panes, Installation of Handles and Locks, Shrinkage Cracking, General Housekeeping	7 days
2	Correction of Plumbing and Electrical Works, Wet Works, Replacement of Tiling, Making Good of Imperfections	14 days
3	Sewer Line Collapse, Sewer and Water Connections, Minor Structural Cracks, Latent Defects	28 days
4	Major Structural Defects - recommendation first sought from a practising Structural Engineer or registered Civil Engineer	As determined by a competent engineer

23.7 Failure to Remedy Defects

Should a contractor fail to remedy defects as notified during the Defects Liability Period, the HDC (in accordance with the provisions of the contract) will give written notice, stating a time within which the defects are to be remedied. Failure to comply will result in the HDC executing the remedial works and deducting the cost thereof from Retention payable under the contract. The HDC can also, by Notice, extend the Defects Liability Period should it become apparent that the contractor will not complete the remedial works within the original period. However, the limit of the extension of the Defects Liability Period is a maximum of 2 years.

23.8 End of Defects Liability Period

At the end of the Defects Liability Period and prior to the issuance of the Performance Certificate, the contractor must submit all the contract documents, test all the works and remedy all related defects. The Engineer or Project Manager will review the submission for adequacy and accuracy prior to issuing the Performance certificate. Once found acceptable, the Performance Certificate shall be issued within 28 days after the latest of the expiry dates of the Defect Liability Period or as soon thereafter as the contractor has supplied all supporting documents as contractually obligated.

23.9 Latent Defects

Defects attributable to the work of the contractor, which become apparent after the expiration of the Defects Liability Period, are considered latent defects. contractors are required under law to remedy these defects. Should a contractor fail to do so, the HDC will issue a Pre Action Protocol Letter calling on the contractor to fix these defects within a stated time, failing which, the HDC will institute legal proceedings for damages for Breach of Contract.

24. Release of Retention

Under the provisions of the contract, the HDC is entitled to deduct 10% of the value of Interim Payments due to the contractor (up to a limit of 5% of the Contract Price or as indicated in the Appendix to Tender). This represents Retention on the project and this sum is to be used to carry out any remedial works which the contractor has failed to perform.

Upon issue of the Taking Over Certificate, one half of the Retention sum is paid to the contractor. The other half is paid to the contractor upon the expiration of the Defects Liability Period and upon verification that all outstanding defective works have been remedied.

25. Final Accounts Administration

The purpose of this final account is to review all payments previously made for works (including variations), as well as to confirm the Retention due on the project, and determine the validity of any unresolved claims which may exist under the respective contracts, either on the part of the contractor or the employer.

26. The HDC's Housing Training Institute

One of the major initiatives to be introduced by the Corporation is the establishment of the Trinidad and Tobago Housing Development Corporation's Housing Training Institute. The HDC Housing Training Institute will have within its location the HDC Product/Standards display area. This area will display the exact examples and set specifications of all material to be used in design/project build for the Corporation.

The displays and samples of products and services utilised in the construction and repair of the HDC's assets is vital for all contractors conducting business with the Corporation. This will ensure a clear understanding of expectations when a contract is awarded. Additionally, failure to comply with set standards will result in contract termination.

The Housing Training Institute will provide contractors with the knowledge to deliver superior service to the Trinidad and Tobago Housing Development Corporation's beneficiaries.

27. Contact Information

HDC Head Office
44-46 South Quay
Port of Spain

Phone: 623-4663

HDC Maloney Sub-Office
Jacana Avenue
Maloney Gardens

Phone: 646-3086

HDC San Fernando Sub-Office
2 Mc Gillivary Street
San Fernando

Phone: 652-2010

Web: www.hdc.gov.tt

28. Appendix

HDC's Technical Specifications

SECTION	NUMBER
Division 01 – General Requirements	
Project Schedules	01 32 16 15
Shop Drawings, Product Data and Samples	01 33 23
Division 02 – Existing Conditions	
Site Surveys	02 21 00
Demolition	02 41 00
Division 03 – Concrete	
Cast-in-Place Concrete	03 30 00
(Short-Form) Cast-in-Place Concrete	03 30 53
Shotcrete	03 37 13
Pre-Cast Concrete Hollow Core Planks	03 41 13
Division 04 – Masonry	
Masonry Mortaring	04 05 13
Unit Masonry	04 20 00
Division 05 – Metals	
Structural Steel Framing	05 12 00
Steel Joist Framing	05 21 00
Steel Decking	05 31 00
Cold-Formed Metal Framing	05 40 00
Metal Fabrications	05 58 00
Metal Stairs	05 51 00
Division 06 – Wood and Plastics	
Rough Carpentry	06 10 00
Finished Carpentry	06 20 00
Division 07 – Thermal and Moisture Protection	
Bituminous Damp-Proofing	07 11 13
Sheet Waterproofing	07 13 00
Roofing and Siding Panels	07 40 00
Flashing and Sheet Metal	07 60 00

28. Appendix

SECTION	NUMBER
Division 08 – Doors and Windows	
Hollow Metal Doors and Frames	08 11 13
Aluminium Windows	08 51 13
Steel Windows	08 51 23
Door Hardware	08 71 00
Glazing	08 80 00
Louvres and Vents	08 90 00
Side-Hinged Aluminium Windows	08 51 13.11
Division 09 – Finishes	
Non-Structural Metal Framing	09 22 16
Portland Cement Plastering	09 24 00
Gypsum Board	09 29 00
Ceramic/Porcelain Tiling	09 30 13
Acoustical Ceilings	09 51 00
Resilient Sheet Flooring	09 65 16
Portland Cement Terrazzo Flooring	09 66 13
Terrazzo Floor Tile	09 66 13
Painting	09 91 00
Division 10 – Specialties	
Toilet, Bath and Laundry Accessories	10 28 00
Division 11 – Equipment	
Unit Kitchens	11 26 00
Countertops	12 36 00
Division 22 – Plumbing	
General Duty Valves for Plumbing Piping	22 05 23
Domestic Water Pumps	22 11 23
Facility-Elevated Potable Water Storage Tanks	22 12 16
Sanitary Sewerage Pumps	22 13 29
Packaged Submersible Sewerage Pump Units	22 13 33
Facility Storm Drainage	22 14 00
Electric Domestic Water Heaters	22 33 00
Plumbing Fixtures	22 40 00

28. Appendix

SECTION	NUMBER
Division 26 – Electrical	
Requirements for Electrical Installations	26 05 11
Grounding and Bonding for Electrical Systems	26 05 26
Raceway and Boxes for Electrical Systems	26 05 33
Underground Electrical Construction	26 05 41
Commissioning of Electrical Systems	26 08 00
Lighting Controls	26 08 23
Distribution Switchboards	26 24 13
Panel Boards	26 24 16
Wiring Devices	26 27 26
Division 31 – Earthwork	
Earthwork	31 20 00
Dewatering	31 23 19
Pressure Grouting Soil Stabilisation	31 32 23
Driven Piles	31 62 99
Auger Cast Grout Piles	31 63 16
Drilled Caissons	31 63 26
Flowable Fill	31 23 23.33
Division 32 – Exterior Improvements	
Asphalt Paving	32 12 16
Brick Unit Paving	32 14 16
Pavement Markings	32 17 23
Chain-Link Fences and Gates	32 31 13
Perimeter Security Fences and Gates	32 31 53
Planting Irrigation	32 84 00
Division 33 – Utilities	
Water Utilities	33 10 00
Sanitary Sewerage Utilities	33 30 00
Storm Sewer Utilities	33 40 00
Foundation Drainage	33 46 13

28. Appendix

For larger and more complex building types, such as multi-storey apartment buildings or other commercial structures, HDC will use or require consultants to apply the following listed codes and standards in developing designs and plans:

Architectural Designs

- Uniform Building Code (UBC) 1997
- National Fire Protection Association (NFPA)
- Uniform Fire Code (UFC) 2000 and Uniform DO 58 Structural Fire Code
- Underwriter's Laboratories Inc. (UL)
- National Electrical Manufacturer Association (NEMA)
- Americans with Disabilities Act Accessibility Guidelines (ADAAG) – Barrier
- Free Plumbing Fixtures
- American National Standards Institute (ANSI)

2006 International Building Code (IBC)

1.	User Groups	IBC 302.1
2.	Height and Area Limitations	IBC Table 503
3.	Construction Type	IBC 602.1
4.	Fire Resistance Rating	IBC 702/704
5.	Smoke Control System	IBC 909
6.	Maximum Length of Travel	IBC 1015
7.	Exit Stairways	IBC 1007
8.	Occupant Load	IBC 1004
9.	Minimum Exit Width	IBC 1005
10.	Minimum Number of Exits	IBC 1014
11.	Dead Ends	IBC 1016
12.	Common Path of Travel	IBC 1013
13.	Minimum Width for Corridors	IBC 1016
14.	Stairway Width	IBC 1009
15.	Stairway Headroom	IBC 1009
16.	Vertical Rise	IBC 1009
17.	Treads and Risers	IBC 1009

28. Appendix

Structural Engineering Designs

Local Codes and Standards

- Trinidad and Tobago Standard – Recommendations for the Design of Building – TTS 16 90 400 (1978)
- TTS 599: Guidelines for the Design and Construction of Small Buildings
- BAPE WIND CODE (1981)
- Wind Speed Maps for the Caribbean for Application with the Wind Load Provisions of ASCE 7 must be used to determine reference velocities as defined in ASCE 7
- Caribbean Uniform Building Code (CUBIC)

International Codes

- International Building Code (IBC) (2006)
- American Society of Civil Engineers – ASCE 7-95 Minimum Design Loads for Buildings and other structures – Live Loads and Wind Loads
- BS 8110: Part 2, Structural Use of Concrete
- Uniform Building Code (UBC) (1997)
- 2000 Uniform Structural Fire Code (UFC)
- Structural Engineers Association of California (SEAOC)

North America Codes

- ACI – American Concrete Institute
- ACI – American Concrete Institute publications to be utilised in the design of concrete and masonry structural elements in accordance with the requirements of IBC 2006 and ASCE 7:
  - 318-05: Building Code Requirements for Structural Concrete and Commentary
  - 530-05: Building Code Requirements for Masonry Structures and Commentary
- AISC – American Institute of Steel Construction publications to be utilised in the design of structural steel elements in accordance with the requirements of IBC 2006 and ASCE 7:
  - 303-05: Code of Standard Practice for Steel Buildings and Bridges
  - 325-05: Steel Construction Manual – Thirteenth Edition
  - 327-05: Seismic Design Manual
- AISI – American Iron and Steel Institute
- ANSI – American National Standards Institute
- ASTM – American Society for Testing and Materials
- ASCE – American Society of Civil Engineers

28. Appendix

Roadway, Road Pavement Designs

- AASHTO Codes (American Association of State Highway and Transportation Officials)

Mechanical Engineering Designs

Trinidad and Tobago Bureau of Standards

AMSE B31	Standards of Pressure Piping
ASME B16	Standards of Pipes and Fittings
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ASHRAE 55	Thermal Environmental Conditions for Human Occupancy
ASHRAE 90.1	Energy Standard for Buildings except Low-Rise Residential Buildings
ASHRAE 62.1	Ventilation for Acceptable Indoor Air Quality
ICC IC 2007	2007 Supplement to the International Codes
ICC IFC 2006	2006 International Fire Code
ICC IPC 2006	2006 International Plumbing Code
ICC IMC 2006	2006 International Mechanical Code
ICC IFGC 2006	2006 International Fuel Gas Code
ICC IECC 2006	2006 International Energy Conservation Code
ICC IWUIC 2006	2006 International Wildland-Urban Interface Code
ICC IEBC 2006	2006 International Existing Building Code
ICC IPSDC 2006	2006 International Private Sewerage Disposal Code
NFPA 10	Standards on Portable Fire Extinguishers
NFPA 13	Standard for the Installation of Sprinkler System
NFPA 15	Standard Water Spray Fixed Systems for Fire Protection
NFPA 14	Standard for the Installation of Standpipes and Hose Systems
NFPA 22	Water Storage Tank Systems

28. Appendix

Electrical Engineering Designs

IBC	International Building Code
TTBS	Trinidad and Tobago Bureau of Standards
TTS-171	Trinidad and Tobago Electrical Wiring Code
ANSI C34.2	Substation Transformers and Rectifier Units
ANSI C37.13	Low Voltage AC Breakers
ANSI C37.14	Low Voltage DC Breakers
ANSI C37.16	Low Voltage Breakers and AC Protectors
ANSI C57.12.01	Transformer – General Requirements for Dry Type Distribution
ANSI C63.12	Electromagnetic Compatibility
ANSI C7.14	Stranding of Conductors
ANSI C80.3	Electrical Metallic Tubing, Zinc-Coated
ICEA Class H	Flexible Cables
IEEE 730	Software QA Plans
IEEE 830	Recommended Practice for Software Requirements Specifications
NEC	2008 National Electrical Code
NFPA 70	National Electric Code
NFPA 72	National Fire Alarm Code
NFPA 780	Standard for the Installation of Lightning Protection Systems
UL 96A	Lightning Protection
IEEE Std 1100	Powering and Grounding Electronic Equipment

Designs are to be prepared in accordance with the guidelines, regulations and statutory and legal requirements of all governmental statutory and regulatory agencies, which include:

- Town and Country Planning Division (TCPD)
- Water and Sewerage Authority (WASA)
- Trinidad and Tobago Electricity Commission (T&TEC)
- Port of Spain City Corporation
- Local Health Authorities
- Ministry of Works and Infrastructure, Ministry of Transport (Drainage Division, Highways Division, Traffic Management Branch and other applicable divisions)
- Regional Corporations
- Trinidad and Tobago Fire Services
- Environmental Management Authority (EMA)
- Telecommunications Services of Trinidad and Tobago (TSTT)
- Cable Television Company

Notes