THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF WATER

RURAL WATER SUPPLY AND SANITATION AGENCY
RUWASA

COUNSTRUCTION SUPERVISION & INSPECTION QUALITY ASSURANCE/CONTROL MANUAL

VERSION 01

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TABLE OF CONTENTS

TABLE OF CONTENTS 2
ABBREVIATIONS AND DEFINITION OF TERMS 5
1.0 INTRODUCTION 7
2.0 OBJECTIVE 7
2.1 Main Objective 7
2.2 Specific Objectives 7
3.0 FUNCTIONS AND ORGANIZATIONAL STRUCTURE OF RUWASA 9
4.0 DUTIES AND RESPONSIBILITIES OF TEAM MEMBERS AND PARTIES 11
4.1 Duties and Responsibilities of Supervision Team 11
4.2 Duties and Responsibilities of Quality Assurance Team 12
4.3 Duties and Responsibilities of Work Quality Inspector 13
4.4 Duties and Responsibilities of Parties 14
4.4.1 The Contractor 14
4.4.2 The Client 15
4.4.3 The Consultant 16
5.0 ADMINISTRATION AND FINANCIAL MANAGEMENT PROCEDURES 18
5.1 Site Office Administration 18
5.2 Working Hours 18
5.3 Vehicles Management 18
5.3.1 Authority for Vehicles Use. 18
5.3.2 Vehicles Operation and Maintenance 18
5.4 Expenses and Accounting 18
5.4.1 Expenses 18
5.4.2 Accounting 18
5.4.3 Process Flow Chart: Approval of Payments Based on Certificate of Completion 19
6.0 QUALITY CONTROL 20
6.1 Approval of Works 20
6.2 Survey and Setting Out Approval 20
6.3 Design Review and Changes 20
6.3.1 Design Queries 20
6.3.2 Design Changes 20
6.4 Measurement of Works 20
6.4.1 Certification of Works 20
6.5 Variation Orders 21
6.5.1 Issuing of Variation Orders 21
6.5.2 Valuation of Variation Orders 21
6.6 Claims 21
6.6.1 Handling of Claims 21

6.6.2 Evaluation of Claims 21
6.7 Site Work Management and Progress Meetings 21
6.7.1 Site Meetings 21
6.7.2 Progress Meetings 21
6.7.3 Progress Reporting 22
6.7.4 Commissioning and Testing 22
6.7.5 As built drawings 22
6.7.6 Handing Over and Taking Over Certificates 22
6.7.7 Defects and Maintenance 22
6.7.8 Overall Conduct 22
6.8 Work Inspection 22
6.8.1 Types of Work Inspections 23
6.8.2 Work Inspection Tasks 23
6.8.3 Material Testing 23
6.8.4 Materials Tested on Site: 23
6.8.5 Materials and Equipment certified by Manufacturer 24
6.8.6 Materials and Equipment Tested under Factory Acceptance Test (FAT) 24
6.8.7 Materials and Equipment Tested by Third Party 24
6.8.8 On-site storage and handling of material and equipment 24
7.0 QUALITY ASSURANCE 25
7.1 Instructions to Contractors 25
7.2 Correspondences with Client 25
7.3 Communication between Head/Site Offices 25
7.4 Program of Works 25
7.5 Quality Inspection Procedures 25
7.5.1 Procedure for Initial Inspection and Testing (QP-1.0) 25
7.5.2 Procedure for Work In-Progress Inspection and Testing *(QP 2.0)* 28
7.5.3 Procedure for Final Inspection and Testing *(QP.3.0)* 29
7.5.4 Procedure for Control of Nonconforming Work *(QP 4.0)* 32
7.5.5 Procedure for Control of Documents (QP 5.0) 34
7.5.6 Control of Project Related Documents (QP 6.0) 35
APPENDIX A: SUPERVISION CHECKLIST - 01 37
Appendix: 1 File Checklist in Supervision Projects 38
Appendix 2: RUWASA Supervision Tasks 39
Appendix 3: Format of Agenda 42
Appendix 5: Format of Monthly Progress Reports 43
Appendix 8: Daily Record Form 44
Appendix 10: Site Instructions 46
Appendix 11: Interim Payment Certificate 48

Appendix: 12 Request for Action 50
Appendix: 13 Record of Approval Forms Submitted 52
Appendix: 14 Corrective Action Request Form 53
Appendix: 15 Letter Received Form: 55
Appendix: 16 Record of Material Inspection Report Submitted: 56
Appendix: 17 Project Summary Sheet: 57
Appendix 18: Format of Minutes of Site Meeting 59
Appendix: 19 Project Supervision Non-Conformance Report: 61
Appendix: 20 Occupational Health & safety Checklist: 62
Appendix: 21 Certificates of Completion of Works 64
Appendix: 22 Certificates of Substantial Completion of Works 65
Appendix: 23 Certificate of Conformance to Quality 66
APPENDIX B: INSPECTION CHECKLIST FORMS 67
APPENDIX C: INSPECTION TASKS 81
APPENDIX D: MATERIAL TESTING CATEGORIES 88
APPENDIX F: STANDARDS 96
APPENDIX G: RAW MATERIAL RECEIVING PROCEDURE 97

ABBREVIATIONS AND DEFINITION OF TERMS

Definitions of Terms

Terms	Meaning
CONTRACTOR	The contractor is a firm that have entered into a contract with RUWASA to execute the project. **Note:** (1) when the project is executed under Force Account DM act as a contractor of the project. (2) When a contract (firm) is involved, RM and DM both act as an overall supervisor of all works at site.
CONSULTANT	The consultant is the firm or Person that work under a contract with RUWASA with the responsibilities of planning, designing and supervision of RUWASA project on behalf of RUWASA. **Note:** When a project is executed under force account RM becomes the consultant of the project.
CLIENT	In all RUWASA Water Supply and Sanitation Projects RUWASA acts a CLIENT of the project
Work Quality Inspector	Work Quality Inspector is an Engineer appointed by the Director General to ensure projects quality management at Regional Level
Major nonconformance	A significant lack of evidence to demonstrate that a requirement of a clause of a particular standard has been achieved i.e., lack of test reports on water quality, soil and construction material or manufacturers certificate as per specifications.
Minor nonconformance	A partial lack of evidence to demonstrate that a requirement of a clause of a particular standard has not been fully achieved i.e Defective works that can be rectified.
Independent Testing Laboratories	RUWASA approved accredited Laboratories.

Abbreviations

Abbreviation	Translation
DG	Director General
DTS	Director of Technical Services
RM	Regional Manager
DM	District Manager
RUWASA	Rural Water Supply and sanitation Agency
FAT	Factory Acceptance Test
QA	Quality Assurance
QC	Quality Control
PM	Project Manager
CM	Contract Manager
PE	Project Engineer
IOW	Inspection of Work
ITP	Inspection Test Plan
BOQ	Bill of Quantity
TBS	Tanzania Bureau of Standards
GSW	Galvanized Stoneware Pipe
HDPE	High Density Polyethylene
UPVC	Un-plasticized Polyvinyl Chloride
GRP	Glass Reinforcement Plastic Pipes
DI	Ductile Iron
HV	High Voltage
MV	Mid Voltage
LV	Low Voltage
ISO	International Organization for Standardizations
PE	Polyethylene
PP	Polypropylene

1.0 INTRODUCTION

In an effort to provide Quality Assurance in all projects implemented, RUWASA has developed a Construction Supervision and Inspection Quality Assurance / Control Manual as a guidance in supervision of water and sanitation projects at various stages of construction to enhance quality of works. The Manual will promote a harmonized efficiency, effectiveness, consistence and improve the overall supervision management of construction projects. Its Continuously use will embrace best practices that meets the requirements and expectations of the public.

This manual is intended for internally and externally use to guide RUWASA technical teams and to introduce RUWASA's Construction Supervision Quality Management System to contractors, consultants and other external organizations or individuals. The Manual has provided controls that are to be implemented to achieve public satisfaction and continuous quality improvement.

This Manual consists of three main parts which are: Duties and Responsibilities of Parties, Administration and Financial Management Procedures for all Site related supervision works, and Supervision Management System (Quality Control and Quality Assurance processes). It contains checklists for Quality Control and Procedures for Quality Assurance of works intended to be used as a day-to-day reference of the Engineers in the field, the Contractors and Consultant engaged in the construction works of water infrastructure under RUWASA.

This Manual is not the intended to supersede any Government Regulations or other RUWASA manuals, policies or standard documents. The manual is a living document and will be reviewed regularly when need arise to ensure compliance with RUWASA requirements, processes and organizational structure.

2.0 OBJECTIVE

This manual has been prepared to describe the requirements for undertaking project implementation processes and activities for the Construction Supervision. The manual defines the procedures to be followed by the project staff to ensure effective and efficient implementation of activities. The Implementation Team must respect and adhere to the procedures described in the Manual.

2.1 Main Objective

The main objective of the manual is to guide RUWASA supervision team and other Project parties' step by step in carrying out activities as controlling measure to provide quality assurance to the public and partners of implemented projects

2.2 Specific Objectives

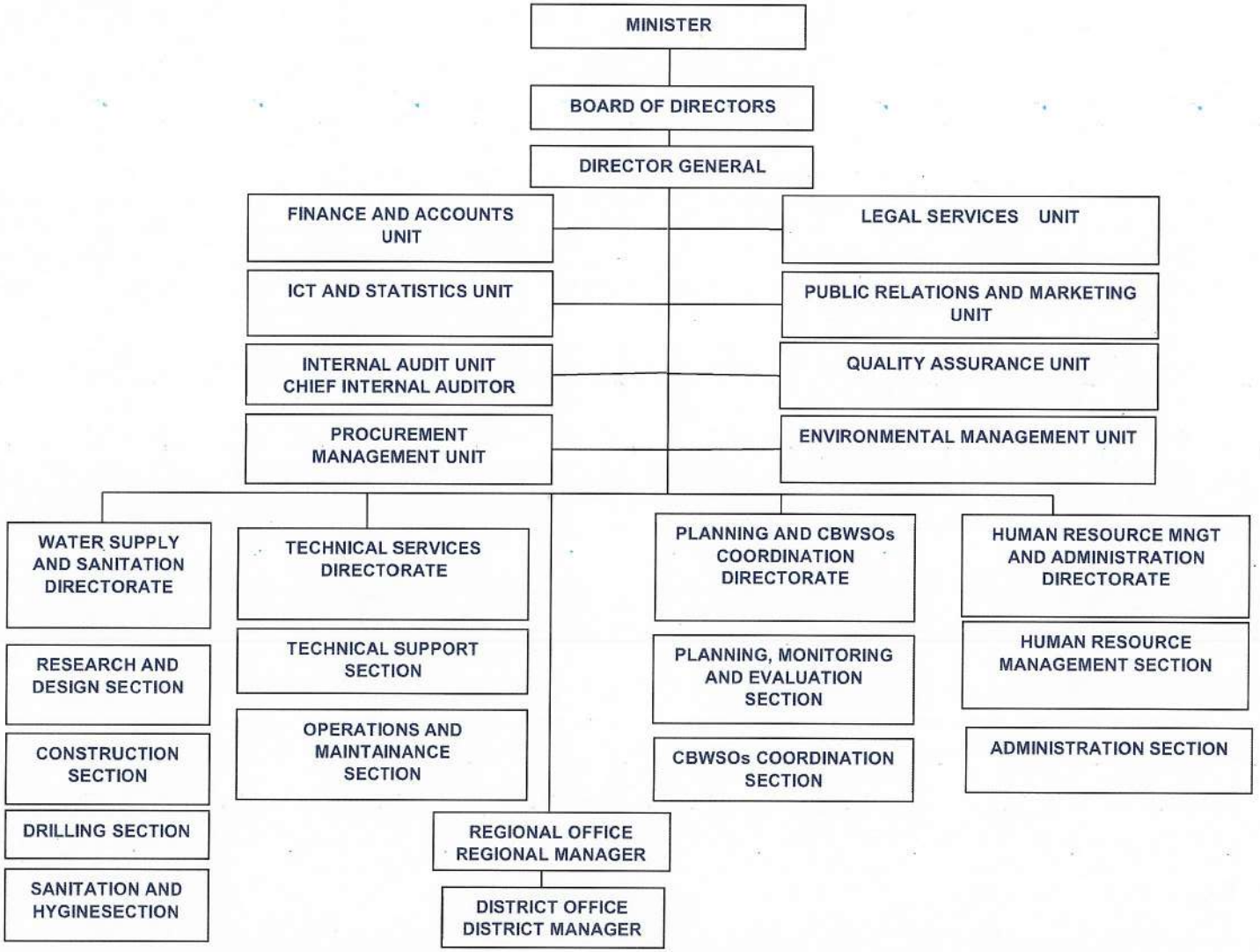
The specific objectives of the Manual are to;

(a) Ensure that all RUWASA supervision teams are aware of their roles and responsibilities.
(b) Set out clear communication processes.
(c) Ensure that RUWASA actions are co-ordinated, efficient and timely delivered.
(d) Inculcate high standards of supervision and professionalism.
(e) Maintain accurate and complete records of all activities.
(f) Ensure that contractor and consultant fulfil their obligations to the highest quality.
(g) Ensure the RUWASA achieve high quality works within allocated budget.

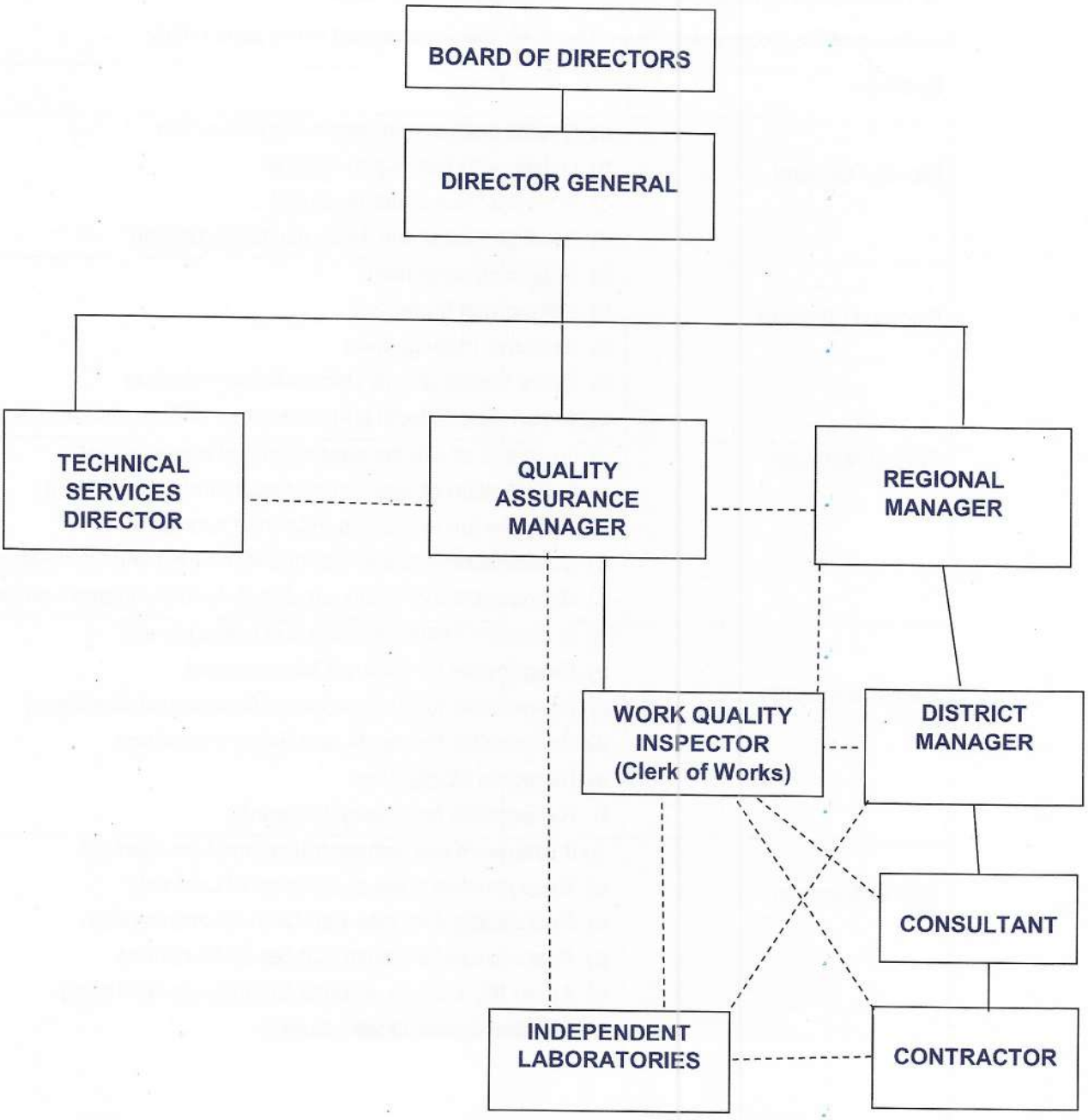
These objectives must be strictly adhered in all supervision activities in order to achieve RUWASA Mission and Vision of controlling the works in terms of Quality, Cost and Time. The Project Manager/Team Leader

shall be responsible for overall management of the project ensuring that the procedures described here are adhered.

3.0 FUNCTIONS AND ORGANIZATIONAL STRUCTURE OF RURAL WATER SUPPLY AND SANITATION AGENCY (RUWASA)



RUWASA QUALITY MANAGEMENT ORGANISATION STRUCTURE



4.0 DUTIES AND RESPONSIBILITIES OF TEAM MEMBERS AND PARTIES

4.1 Duties and Responsibilities of Supervision Team

The tasks of the Supervision Team Members are summarised in the table below;

Position	Tasks
Director General	a) Overall project management and direction b) Liaison with Donor and experts c) Project accounts management d) Local Logistical and Technical Co-ordination
Contract Manager	a) Project management b) Liaison with Experts c) Accounts management d) Office Logistical and Technical Co-ordination e) Ensure that all legal and contractual obligations are observed,
Project Manager	a) In charge of site administration and management. b) Coordination of Site administration and Management. c) Coordination of site supervision of contracts. d) Coordination of Environmental Monitoring and Compliance. e) Responsible for Health and Safety Monitoring and Compliance.
Regional Manager	a) In charge of administration and management. b) Responsible for Contract Management c) Responsible for Environmental Compliance Monitoring d) Responsible for Health and Safety Monitoring e) Resource Mobilization f) Responsible for Quality Assurance
District Manager	a) In charge of site Administration and Management. b) Responsible for site supervision of contracts c) Responsible for Liase with District Administration d) Responsible for Health and Safety Monitoring e) Assist RE in Environmental Compliance Monitoring f) Responsible for Quality Control

Electromechanical Engineer	a) Advising all Reginal Manager and District Managers in all aspects relating to Electrical and Mechanical works for projects. b) Assistance with training of pump attendants c) Check specifications and Installation sequence of the equipment d) Check adherence to the suppliers' installation instructions e) Supervision of installation and testing of the equipment f) Check storage and protection of the equipment once installed g) Check protective measures against over-voltage, under-voltage, dry-run, etc.
Hydro- geologist	a) Groundwater exploration b) Recommendation of technological options (shallow wells, boreholes, etc) for groundwater abstraction c) Recommendation of drilling methods and depths d) Ensure Contractors Deploys Appropriate Drilling Equipment e) Ensure Soil Samples are collected at the required depth intervals f) Ensure Pump Tests are carried out Correctly
Hydrologist	a) Conduct detailed water resources assessment of surface water and ground water sources b) Assist in the supervision and construction of dams for storage of water.
Hydro Geologist Technicians	a) Ensure that the contractor deploys appropriate drilling equipment b) Supervise the drilling of deep boreholes c) Ensure that soil samples are collected at the required depth intervals d) Ensure that the pump tests are carried out correctly
Inspector of Works/Site Agent (IOW)	a) Inspection of all distribution network and construction works b) Undertake all quality control tests c) Recording daily reports
Survey Inspector (IOW)	a) Inspection of all distribution network construction works b) Undertake all surveyors and compaction control tests c) Recording daily reports
Administrative Assistant	a) Office administration and maintenance b) Records logging and filing c) Accounts records
Drivers	a) Vehicle driving and maintenance b) Vehicles usage logging and service scheduling

4.2 Duties and Responsibilities of Quality Assurance Team

Position	Tasks
Project Manager	(a) Interpret laboratory results (b) Order disposition of non-conforming works (c) Inspect works and prepare inspection reports/checklists (d) Certifies quality of work (e) Review quality plan/Inspection and Testing Plan (f) Supervise preparation of samples for laboratory testing
Site Engineer	(a) Prepare samples and submit to laboratories for testing (b) Prepare and implement quality plan/Inspection and Testing Plan (c) Prepare works and attend inspections (d) Submit material testing reports from laboratories
District Manager (DM)	(a) Review quality plan/Inspection and Testing Plan (b) Attend at site during work and material inspections and document non conformances (c) Monitor Implementation of Quality Plan/Inspection Test Plan (d) Acceptance or refusal of material or equipment delivered at site (e) Ensure disposition of non-conforming work or material
Regional Manager (RM)	(a) Approves material testing laboratories (b) Acceptance of Final Works (c) Attend scheduled Inspections (d) Approve quality plan/Inspection and Testing Plan (e) Monitor disposition of non-conforming work or material (f) Issue completion certificate
Quality Assurance Manager (QAM)	(a) Conduct due diligence on approved independent laboratories (b) Prepare and update and implement Quality Guidelines (c) Monitor and Evaluate implementation of Quality Plans (d) Ensure compliance to standards (e) Training and awareness creation on Quality Guidelines
Directorate of Technical Services (DTS)	(a) Prepare and implement specifications (b) Conduct review and approve designs and drawings
Director General (DG)	(a) Ensure compliance of Guidelines and Regulations
Board of Directors	(a) Approve Quality Guidelines (b) Ensure Compliance to guidelines
Independent Laboratories	(a) Testing of Materials and submit results on time (b) Compliance to standards

4.3 Duties and Responsibilities of Work Quality Inspector

The Work Quality Inspectors' Duties and Responsibilities includes:

a) Be completely familiar with all contract documents before commencement of the work.

b) Notify the design professional of any discrepancies observed and request clarification for all items not fully understood.

c) Obtain or have access to all codes and standards governing the work.

d) Comply with requirements of agency's' with jurisdiction over inspection, and submit reports required.

e) Conduct on-site inspections of work in progress to determine compliance with contract documents.

f) Report deficiencies observed to all related parties.

g) Get further details or information from the consultant if required for proper execution of the work.

h) Observe that the testing laboratory performs all tests and inspections required. Keep a record of type and location. Review test results and notify the consultant of observed deficiencies.

i) Consider suggestions or recommendations made by the contractor and refer them to the Consultant.

j) Accompany the Consultant when observing or inspecting the work.

k) Notify the Consultant of material deliveries that do not comply to specifications.

l) Gather information that help to establish the history of the building

m) Request all documents that will assist in acquiring necessary information on the nature and condition of the work such as approved and updated drawings, specifications and other document depending on the inspection case.

n) Issue a Certificate of Conformance to Quality for inspected work that conforms to quality specifications, the certificate shall form part of quality verification to be attached to each Interim Payment Certificate.

o) Maintain a detailed descriptions and provide reasons of work components that were not inspected

p) Propose corrective measures to detected defects and faults detailing reasons for their occurrence

q) Submit a detailed report to Quality Assurance Manager and a copy to Regional Manager of all defects/faults related to all components of work. Detected faults to be categories into major defects, safety risks and minor defects

r) Advise the client on suspension of work implementation in the event of occurrence of major nonconformance of material or work.

s) Not authorized to revoke, alter, or relax any requirements of the Contract; or to issue a Stop Work Order to the Contractor.

4.4 Duties and Responsibilities of Parties

Most construction work will involve three main parties which are the Contractor, Consultant (where necessary) and Client. Each of these parties will have major responsibilities to ensure that the quality of work is achieved. Below are the details of responsibilities of parties:

4.4.1 The Contractor

The Contractors' responsibilities include:

a) Critically study of contract documents, report on errors, inconsistency or omission that may impair the quality of works.

b) Early notification of the testing laboratory on impending/coming samples to avoid delay of work

c) Become fully acquainted with all tests and inspections required of the testing laboratory and special inspections required by agencies.

d) Work requiring continuous inspection should be scheduled to minimize costs.

e) Advice the persons scheduled to inspect of any delay in the work schedule so that unproductive inspection time will be avoided.

f) Prepare a progress schedule for the work, including a schedule of Inspection and Testing (ITP), showing the various phases, and update it periodically.

g) Maintain on the site a complete set of approved construction documents including drawings, specifications, product data, change orders and all correspondence concerning the work.

h) Comply with the requirements of agencies relating to permits and agency-required inspections during the various phases of the work.

i) Perform changes to the work only through processes allowed in the construction documents.

4.4.2 The Client

The Clients' Duties and Responsibilities includes:

j) Obtain valid site survey and geotechnical investigations necessary for the project design

k) Delegate or assign a client representative for the construction of the work. Give the client's representative enough authority to make timely decisions. Thoroughly review the contract documents to grasp the full concept and scope of the project.

l) Establish a sufficient allowance in the project budget to compensate Work Quality Inspector and/or the quality inspection staff adequately.

m) Consult with the consultant as to how much inspection is required.

n) Ensure engagement of the Work Quality Inspector before construction is begun so that full familiarization of the work is allowed and administrative procedures can be established. Engagement before putting the project out for bid is recommended.

o) Maintain Communication only through the consultant, the client's representative and periodically visit the project to review progress.

p) Prevent unauthorized persons to interfere with the work by communicating with consultant, contractor or Work Quality Inspector. All-important communications should be in written form.

q) Organize the financing of the project to allow orderly cash flow. Process certificates of payment promptly to avoid undue delay of monies due the contractor.

r) Allow an adequate budget for changes required by unforeseen factors occurring during construction.

s) Process and approve change orders in a timely manner to avoid contract time extensions or cause conflict with contractors.

t) Accept the work without undue delay. Accompanied by the consultant, the contractor and the Work Quality Inspector, arrange for the inspection and acceptance of the work in an organized manner. It is normally the duty of the consultant to rule on acceptability of the work or portions of it and recommend acceptance to the owner.

u) With the advice of legal counsel do not delay taking recommended actions concerning occupancy and acceptance and executing required documents.

v) Make the final payment promptly upon expiration of lien periods and the issuance of completion certificate.

4.4.3 The Consultant

The Consultants' Duties and Responsibilities includes:

a) Thoroughly review the contract documents with the client to define the scope of the work involved and recommend the necessary procedures to be performed by the client.

b) Establish the nature and extent of services by the testing laboratory and soils engineer and advise the client of a probable budget. Assist the client in the selection of a testing laboratory.

c) Make timely observations of the work with the Work Quality Inspector and promptly notify the contractor of deficiencies observed. Make periodic reports to the client concerning the progress of the work.

d) Establish standards of acceptability.

e) Receive contractor's applications for payment and generally evaluate the progress and quality of the work claimed, after thorough verification promptly issue a certificate for payment to the client.

f) Make timely decisions concerning interpretation of documents and details of design. Do not get involved in the craft jurisdiction. Do not communicate directly with the subcontractors, vendors or suppliers unless authorized by the contractor. All such communication shall be recorded in writing and distributed.

g) Inspect the work when the contractor notifies that the date of substantial completion has been attained and attaches the inspection checklist.

h) Distribute the inspection list to all parties.

i) Recommend to the client to accept the work as substantially completed after evaluation and that the remaining items involve a minor defect that may be rectified within contract time.

j) Accompanied by the Client, Contractor and Work Quality Inspector, make a final inspection of the work after the contractor notifies the client that the work is totally completed. Promptly process all outstanding change orders and other contract document requirements and execute a final certificate for payment.

5.0 ADMINISTRATION AND FINANCIAL MANAGEMENT PROCEDURES

5.1 Site Office Administration

The Resident Engineer shall be overall responsible for the site office administration. In case of his absence, he shall designate one of the Officer for office administration. The Office Administrator/Secretary on routine basis shall assist the RE.

5.2 Working Hours

The working hours shall be 7.30 am to 12.30 noon and 2.00 p.m. to 5.00 p.m. during weekdays. On Saturday, the working hours shall be 7.30 am to 12.30 noon. "*Religious and public holidays must be respected*". The staff must be ready to work extra hours to suit contractor's activities or the need of work.

5.3 Vehicles Management

5.3.1 Authority for Vehicles Use.

The Reginal Manager (RM) and District Manager (DM) shall be overall in-charge of all vehicles on site and their day-to-day coordination. The vehicles shall only be driven by the drivers unless with express permission of the RM/DM.

5.3.2 Vehicles Operation and Maintenance

All vehicle logbooks shall be maintained to clearly log vehicle usage, fuelling, service, and repairs. The drivers designated for each vehicle shall be responsible for making sure the log-book is completed at all times for maintenance record and security. At the end of each month, a vehicle usage analysis shall be undertaken to evaluate the total distance travelled, fuel consumption per km, monthly expenses, mileage service and total costs per km travelled. Any occurrence or incidence on the vehicle must be notified to Project Manager who will inform the RM/DM. The driver or person with the vehicle at the time must make a report of the incident or accident to the RM/DM. Major accidents must be reported to the Contractor, Police and Insurance. All vehicles shall be comprehensively insured at all times and provided with anti-theft devices. The dealers or reputable garages shall service the vehicles. The vehicles shall be parked at the RM/DM Offices during the night. No vehicle shall be used at night except with RM/DM permission. Any journey outside the project area must be approved by the R/DM and shall be organised such that they are completed during daytime.

5.4 Expenses and Accounting

5.4.1 Expenses

All project expenses for the Supervision works must be authorised by the RM/DM in Consultation with the Project Manager. Proper receipts and records for all expenses must be kept at all times. No expenses, which are not reimbursed under the Contract, shall be incurred without express approval of the Project Manager. All cash in hand must be kept in the VERY SAFE.

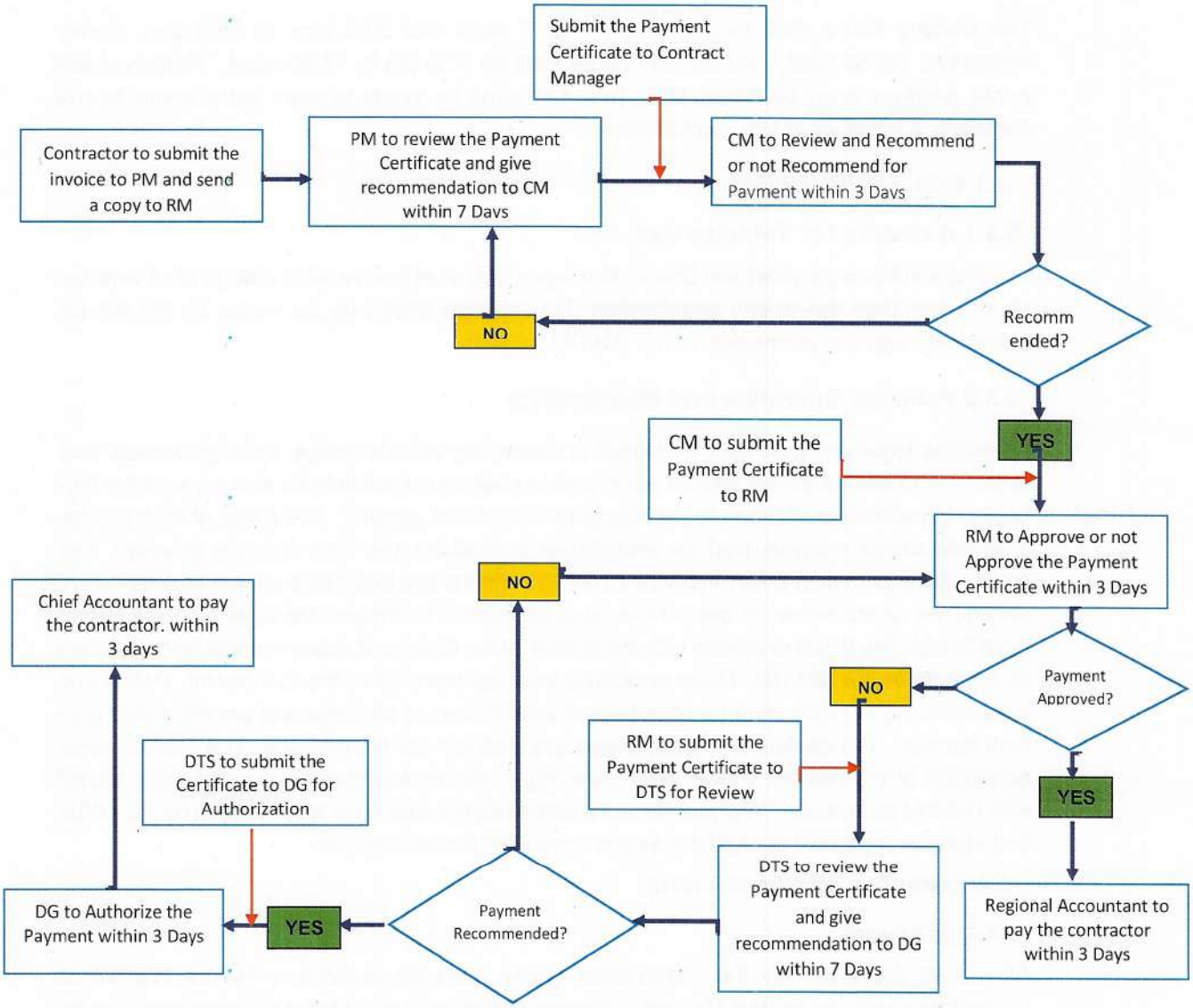
5.4.2 Accounting

The contractor shall submit to the PM each month detailed accounts of all expenses incurred grouped in accordance with corresponding Bill Items and accompanied with summary schedule.

The PM shall review the accounts and forward the same to the DM each month for him to claim for reimbursement in the Monthly Certificate.

The DM shall submit a summary of all project expenses to the RM on monthly basis. The summary shall include the expenses incurred for each provisional sum.

5.4.3 Process Flow Chart: Approval of Payments Based on Certificate of Completion



6.0 QUALITY CONTROL

These are activities that will be carried out by the contractor under supervision to ensure that work is carried out with accordance to specification, standards and to the fulfillment of RUWASA.

6.1 Approval of Works

The Contractor must apply for approval of works at all stages. Form no. *RUWASA-SUP.FORM-7* shall be used by the Contractor to apply for checking and approval of works at the various stages. Approval of works must be in appropriate forms and the forms must be well kept in order to trace the approval details. A detailed procedure for Inspection is given in chapter 7.

6.2 Survey and Setting Out Approval

All contractors' surveys and setting out must be checked and approved. The Contractor is required to set out the works and pipelines for checking by the site supervision team.

6.3 Design Review and Changes

6.3.1 Design Queries

All design queries shall be referred to the PM for clarification. For cases where the PM is not capable of issuing clarification, the design queries shall be forwarded to the RM. The RM may consult the Director of Technical Services (DTS) before forward the recommendations to the PM for necessary action. Form no. *RUWASA-SUP.FORM-7* shall be used for request for clarification.

6.3.2 Design Changes

Design changes may be initiated from site to suit site conditions and circumstances. All design changes must be referred to the RM for his approval. The RM after consultation with the Director of Technical Services (DTS), shall approve the changes in design. All design changes must be noted and recorded in the PM record of drawings. Form no. *RUWASA-SUP.FORM-7* shall be used for request for changes in design.

6.4 Measurement of Works

Measurements sheets shall be prepared at various stages after work has been completed, inspected and approved. The sheet shall be signed by the Contractor, the PM and the representative of DM or RM.

6.4.1 Certification of Works

6.4.1.1 Checking of Contractor's Certificate

The contractor's monthly certificate shall be checked and corrected at the site level and forwarded to the RM for approval. The checking must be based on agreed measurements of work done and supported by records available on site. *"No certification for works not done shall be entertained".*

The Contractor's Payment Application must be acted upon within one week at the site level and forwarded to the RM. The RM shall ensure that the work is certified and approved for payment within the time as detailed in approval of payment process flow given in section 5.4.3.

6.5 Variation Orders

6.5.1 Issuing of Variation Orders

Variation orders shall be issued whenever necessary to vary the works or include works not covered by the Bills of Quantities. The PM shall initiate Variation orders at site and provide details of the works and its valuation to the RM. The RM. shall seek approval of DG before issuing the order to execute the varied works. Once agreed, the RM shall issue a formal variation order to the Contractor through PM. Variation orders shall be numbered consecutively and included in monthly certificates.

6.5.2 Valuation of Variation Orders

Variation orders shall be valued based on contractor's rates as far as possible. In cases where no such rates exist, the PM shall reasonably fix the rates in consultation with the Contractor and the RM. The Project Manager shall submit any new rates for major items to the RM for concurrence.

6.6 Claims

6.6.1 Handling of Claims

Any circumstances or correspondence suggesting possible source of claim must be immediately being notified to the PM in writing who shall forward the same to DM. The DM shall cause the keeping of all data and records, which may be required to evaluate claims. The DM shall promptly notify the RM of any circumstances that may result in claims from the Contractor.

6.6.2 Evaluation of Claims

Claims received from Contractor must be evaluated in accordance with the Contract Agreement. The evaluation of claim will be undertaken by the PM who will submit his determination to RM for their agreement. The RM shall be responsible for approval of claims and make his determination to the DG for payment.

6.7 Site Work Management and Progress Meetings

6.7.1 Site Meetings

The PM may hold technical meetings with the Contractor's personnel at the request of the DM or the Contractor's Site Agent. The records of the proceedings shall be confirmed in writing not later than three days after the meeting.

Monthly site meetings shall be held and attended by Representatives from Consultant, Contractor, DM and RM Staff. The PM shall prepare minutes of the meeting using form no. *RUWASA-SUP.FORM-13* and submit them to the DM with a copy to RM. The minutes of the meeting must be issued to the relevant parties within 10 days from the date of meeting.

6.7.2 Progress Meetings

Progress meetings shall be held to evaluate the overall progress of the project or when there are major issues to be discussed. The Progress Meetings shall be held in site/or other reasonable area, minutes will prepared by the PM who shall also be responsible to record the proceedings. Minutes of the progress meeting must be issued within 7 days from the date of

the meeting and circulated to the relevant parties. Senior staff from the RUWASA head quarter, RM, DM, Consultant, and Contractor shall attend the Progress Meetings, which shall be held on need basis.

6.7.3 Progress Reporting

In accordance with the Consultancy Agreement, the Consultant is bound to issue Quarterly Progress Reports using form no *RUWASA-SUP.FORM-3*. The DM will ensure that Monthly/ Quarterly Progress Reports are prepared outlining progress at each site. These reports will be sent to the RM for incorporation to the Quarterly Progress Report. The Report must be issued within two weeks of the reporting period.

6.7.4 Commissioning and Testing

All completed facilities must be tested and commissioned in accordance with the specifications and manufacturer's requirements. Records of the testing and commissioning report shall be prepared for each component.

6.7.5 As built drawings

The Contractor shall within 90 days from the completion date, provide as built drawings in order to enable the Client to have full and sufficient information that will facilitate future maintenance activities. The drawings shall fully represent the finished work and final conditions of the project and will be submitted in two sets of reproducible sheets.

6.7.6 Handing Over and Taking Over Certificates

Handing over of completed works must be witnessed by the PM and recorded. The PM shall cause the preparation of taking over certificate, which must be certified by him or his representative. The RM or his representative must countersign the taking over certificate. The taking over shall also be witnessed by the Environmental Engineer/Client Representative who shall certify that the disturbed working areas have been reinstated in accordance with the Environmental Management Plan. Procedures for handing over is given in chapter 7.

6.7.7 Defects and Maintenance

During the taking over all defects to be rectified by the Contractor must be recorded and signed by the Contractor. The PM shall make sure that the defects are rectified within maintenance period.

6.7.8 Overall Conduct

The supervision team must conduct themselves with the highest degree of professionalism. It is expected that the team shall conduct their activities in a clean, transparent and polite manner. Confidentiality and exclusivity must be exercised.

6.8 Work Inspection

Work Inspection is the visual and technical examination of a constructed works and the production of a report that outlines the physical state of various components based on the material, technical tests of finished works, prefabricated material specifications and techniques used on the date the inspection is conducted.

6.8.1 Types of Work Inspections

There will be three major types of Work inspection: Initial/Pre-construction Inspection, Work In progress Inspection and Final Inspection, procedures for conducting these inspections are given in chapter 7.

a) Initial/Pre-construction Inspection

This is inspection will be conducted before commencing of construction, mainly conducted to verify compliance to requirements of drawings, manpower and material received on the site. Materials include aggregates, sand, cement, timber, steel and other construction material, equipment and machinery to be installed in works are also inspected upon receipt at the site to ensure that defective machinery is not installed.

b) Work In progress Inspection

At various stages of construction, works will be checked to a certain they conform to standards or specifications before continuing with next construction stage, this measure will help to prevent defective works from being covered. The stages for inspection will be agreed upon by both parties before start of construction and will be described in the Inspection and Test Plan (ITP).

c) Final Inspection

This is Inspection that will be performed on the whole projects, is will be done after completion of all planned works and will involves checks to all constructed facilities to verify that they perform according to their requirements. This inspection is most important as it establishes the fact that work is substantially compliant and is major step towards transfer of liability from the contractor to the client.

6.8.2 Work Inspection Tasks

These are tasks that will be carried out by the quality control team to check compliance with drawings, specifications, standards and quality of workmanship. They include Site Clearance inspection, Setting Out Inspection, Excavation Inspection, Soil Compaction Inspection, Reinforcement placement Inspection, Pre- concreting Inspection, Concrete Casting Inspection, Post concreting Inspection, Block laying Inspection, Formwork Fabrication Inspection, Pipe laying Inspection, Plastering Work Inspection, Paint Work Inspection, Plumbing Work Inspection, Fencing Inspection, Landscaping Inspection, Trenching Inspection, Safety Protective Measures, Fire, Protective Measures and General Construction Site Inspection. Details of main areas to be inspected in each task is given in **Appendix C.**

6.8.3 Material Testing

Quality of construction Material will be verified and validated through main three ways, these include Site testing, Manufacturer certification and third part testing. Test categories for each type will be as explained below.

6.8.4 Materials Tested on Site:

During the receiving of the materials on site, verifications of the documents of each material should be conducted and the physical inspections should be categorized into three aspects.

a) Physical Quality Appearance

b) Physical Quality Dimensions - as per attached Manufacturer's certificates

c) Physical Material Quantity - as per attached delivery notes

For aggregates, sand and soil, the contractor shall obtain the approval from RUWASA of the borrow source or quarry before extracting material. The list of materials to be tested on site is given in the **Appendix D.** Test procedures shall be accordance with Standards as prescribed by the Water Sector Design Manual. The Test reports are to be maintained in a bound register, where in 3 copies of report will be prepared, two copies are to be submitted with monthly report and third copy to be retained by contractor. **Appendix G** details the process flow for material receiving.

6.8.5 Materials and Equipment certified by Manufacturer

Apart from tests conducted on field, acceptance of certain manufactured materials and equipment components, as stipulated in the contract, shall be based on test certificate(s) from the manufacturer conforming to TZS, BIS, ISO or any other applicable standard/specification as stipulated in the contract and on visual inspection. These items shall bear the Tanzania Bureau of Standards (TBS) mark or approved by TBS. The Client should review the manufacturers' certificates for conformance to contract requirements before these items are delivered to the site, installed or otherwise incorporation in the works. Materials and equipment subject to manufacturer's certification are as given in the **Appendix D.** All required standards are given in the **Appendix F.** (For regulatory and non-regulatory products – there should be a conformance certificate from the manufacturer or the imported product should be certified by TBS)

6.8.6 Materials and Equipment Tested under Factory Acceptance Test (FAT)

Materials and equipment cannot be accepted, send to the site and use based on the factory acceptance test (FAT) alone.

6.8.7 Materials and Equipment Tested by Third Party

Materials and equipment are to be inspected by a third party as stipulated in the contract documents. Third party inspection will take place at the site upon delivery and before releases for use. For site inspection quality procedure QP-1.0 will be used. Third-Party Inspection (TPI) certificates shall be reviewed for conformance to requirements. Inspection criteria should be stipulated in the contract document. A list of materials and equipment suggested for inspection by third party is as given in the **Appendix D.**

6.8.8 On-site storage and handling of material and equipment

The Site supervisor shall ensure the onsite storage and handling of the material as per the instruction/ manual provided by the supplier, if any.

7.0 QUALITY ASSURANCE

Quality assurance will be attained through compliance to procedures for inspection of works and testing of materials, it is the responsibility of the PM to ensure that all procedures are followed in the construction circle. This part constitutes ***Work Communication, Program of Work, Inspection Procedures*** *and* ***Control of Documents.***

7.1 Instructions to Contractors

All instructions to the Contractor shall be in writings, for Site Instruction form no *RUWASA-SUP.FORM-5* shall be used. In case of verbal instructions, these must be confirmed in writing at the earliest opportunity. Other forms of instructions may be through Letters, Faxes, or E-mails. Only the PM, is authorised to issue instructions to the contractor except for site instructions that have no financial implications which may be issued by the Site Engineer.

7.2 Correspondences with Client

Letters/other documents from site meant for the Client shall be sent by the end of every month by courier to the Project Manager who shall forward to R.M.

7.3 Communication between Head/Site Offices

A system shall be established where all correspondence from site is sent to the Head Office every Month by courier or In. Urgent correspondence may however be faxed between the offices.

7.4 Program of Works

The Contractor's programme of works and any revisions thereof shall be checked by the Project Supervisor who shall recommend its approval to the PM.

7.5 Quality Inspection Procedures

Quality procedures below define how work inspection and material are to be conducted, the responsibility, scope and purpose of the inspection. It also indicates the document to be used to record the process, these documents later become part of verification on the quality status of works. The procedures also define how project documents are to be circulated and kept at the site.

7.5.1 Procedure for Initial Inspection and Testing (QP-1.0)

Purpose

a) To ensure there is adequate preparation at the site prior to commencement of construction, also ensure that material, drawings, manpower, equipment and machinery to be used at the site are being inspected and tested before released for use

b) To specify actions in case of release for urgency need of use of material prior to verification

c) To keep a record of material receipt and issue on site

Scope

Applicable to incoming materials (which include components and appliances) and equipment, including client supplied items but excluding minor items in small quantities

Responsible Personnel

Site Supervisor/RUWASA Site Engineer

Procedure

d) Before commencement of construction, the Site Supervisor or his delegate checks for availability of approved construction drawings, equipment and manpower and if satisfied allows the construction to commence.

e) Upon receipt of material at the site the Site Supervisor checks for its identification and physical characteristics (size, type, shape, cleanliness, damage) and quantity against the delivery note(s) and/or the invoice. He also checks other accompanying documents such as laboratory test reports, records the observation on forms no*: RUWASA-SUP.FORM 11*

f) Upon receipt of plant/machinery to be used in construction, the Site Supervisor or the delegated person inspects the item check, model, quantity, equipment installation manual and its condition, records the observation on forms no: *RUWASA-SUP.FORM 11*.

g) Where so indicated in the inspection and testing plan, he arranges for the item to be sampled by an authorized person and tested by an independent testing laboratory. The item is withheld pending waiting for test results.

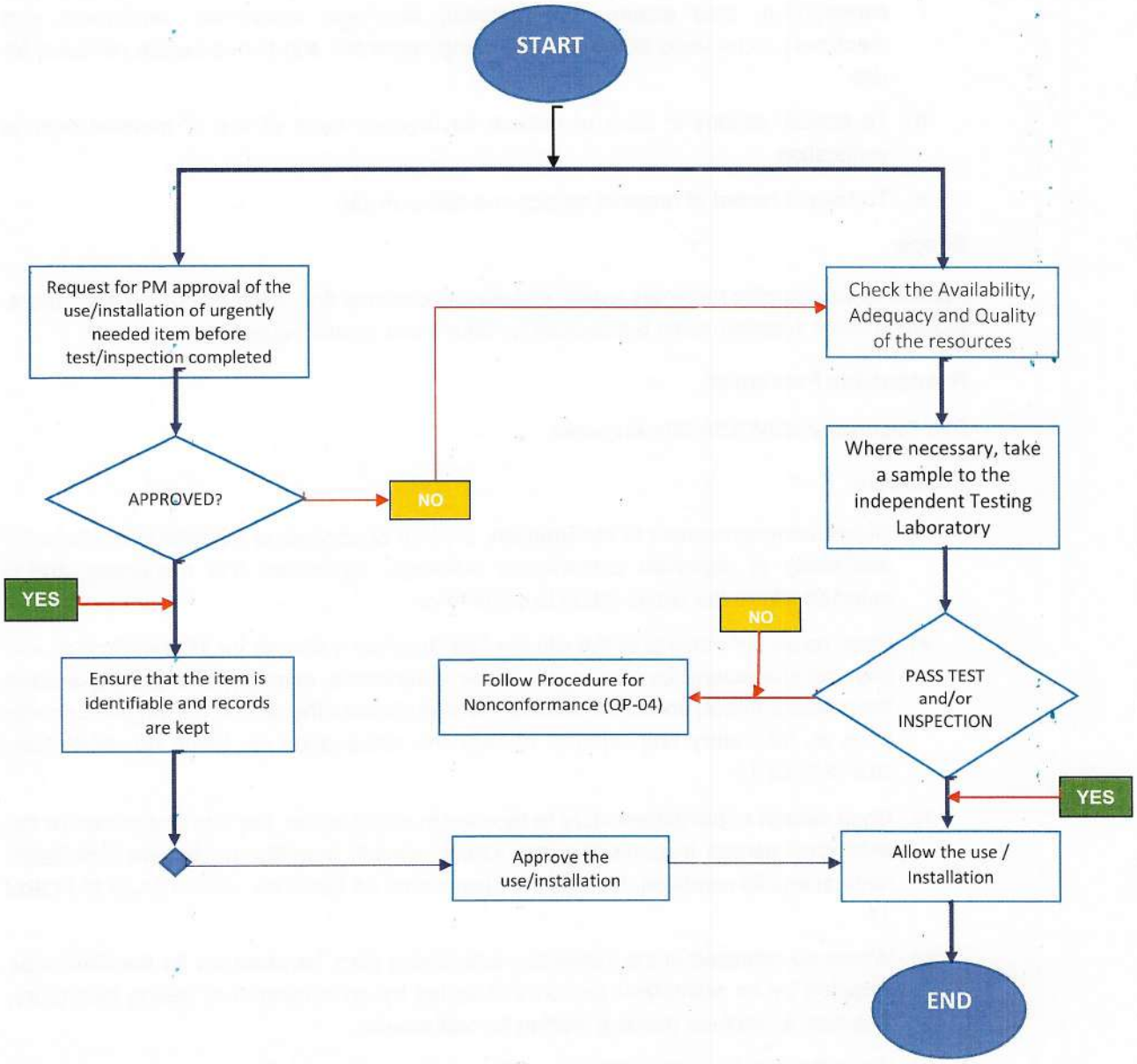
h) When the item has passed the inspection and/or testing, the Site Supervisor authorizes its release for use or installation by signing off,

a) If the item does not pass the inspection and/or testing, it is dealt with as nonconforming supply in accordance with Inspection *Procedure (Q.P 4).*

b) Should the item be urgently needed for use or installation before inspection and/or testing is completed, the Site Supervisor seeks the approval of the Project Manager who will, at his discretion, sign for the release of the item. The exact location where the item is used or installed must be identified and recorded.

c) If traceability of the item is specified in the contract, record is maintained and the unique mark is placed of each individual unit and the exact location where it is used or installed.

Process Flow Chart



Records

RUWASA-SUP.FORM 11.

7.5.2 Procedure for Work In-Progress Inspection and Testing *(QP 2.0)*

Purpose

To prevent unsatisfactory work being built upon or covered up

Scope

Applicable to construction work(s) by direct labor, or contractors, including precast and prefabricated work(s)

Person responsible

Work Quality Inspector or his representative

Procedure

a) The contractor shall prepare a schedule of material testing and Mandatory Inspection (Inspection and Test Plan-ITP) and submit to the Project Manager who upon review shall submit to the client for approval using form no: *RUWASA-SUP.FORM 18.*

b) Based on the approved I.T. P, for Works that require joint inspection and approval the contractor shall submit to the Project Manager a ***Request for Inspection*** within three working days before the day of Inspection using form no *RUWASA-SUP.FORM 7.*

c) The Project Manager shall give prior notice of the arrangement to the Work Quality inspector. The Work Quality inspector may be a member of supervisory staff of the Client or any other person authorized by the client as indicated in the inspection and test plan.

d) The contractor arranges for inspection and/or testing of construction work (either by direct labor or by a subcontractor) at the various inspection/test points indicated in the inspection and test plan.

e) The Work Quality inspector / Inspection team will check the quality of work, score every individual item associated with the relevant work(s) and check if the respective inspection checklist among form no. *RUWASA-INSP.FORM 5, RUWASA-INSP.FORM 6, RUWASA-INSP.FORM 7, RUWASA-INSP.FORM 8, RUWASA-INSP.FORM 9, RUWASA-INSP.FORM 10, RUWASA-INSP.FORM 11 and RUWASA-INSP.FORM 12* have been properly filled.

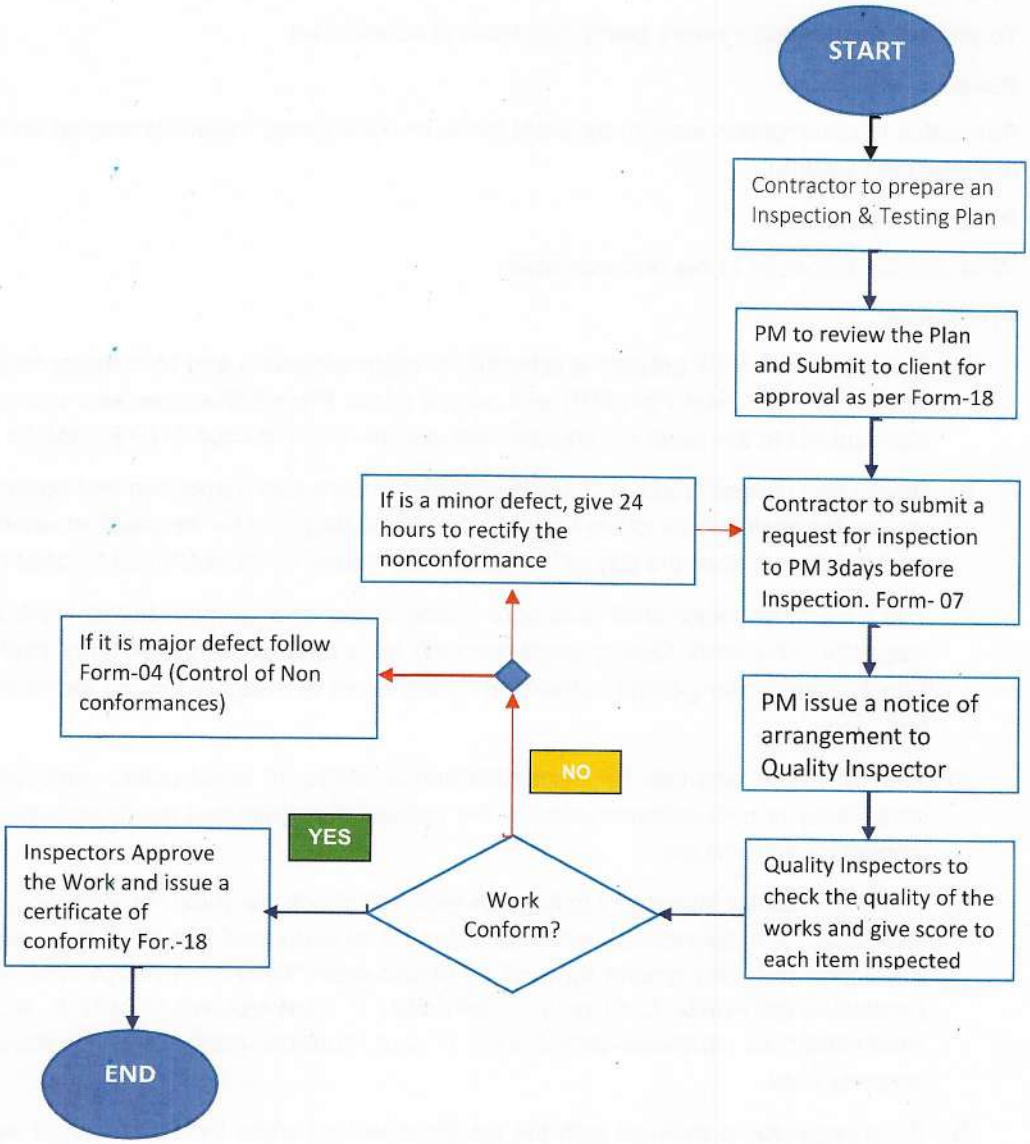
f) If the inspector is satisfied with the quality of work, he/she indicates his/her approval by signing at the corresponding point of the Inspection and Test Plan.

g) If a minor defect is noted, which can be rectified within 24 hours and is not a recurrence, the Project Manager instructs the contractor to carry out the rectification. Any work that is rectified is re-inspected and/or re-tested. If a major defect is noted, the work is dealt with as nonconforming work in accordance with Inspection Procedure *(Q.P 4)*

h) For such work not covered by an inspection and test plan or work that does not require joint inspection, the Project Manager carries out work in-progresses inspection as described in the general conditions of contract/specifications provided and, at his discretion, allows the construction process to proceed or otherwise.

i) For works that conforms to quality requirements, the Work Quality Inspector issues a Certificate of Conformance to Quality using form no *RUWASA-SUP.FORM 18.*

Process Flow Chart



Records

Form(s) No. RUWASA-INSP.FORM 5, RUWASA-INSP.FORM 6, RUWASA-INSP.FORM 7, RUWASA-INSP.FORM 8, RUWASA-INSP.FORM 9, RUWASA-INSP.FORM 10, RUWASA-INSP.FORM 11, RUWASA-INSP.FORM 12 and RUWASA-SUP.FORM 18.

7.5.3 Procedure for Final Inspection and Testing *(QP.3.0)*

Purpose

To complete the evidence of conformance of the finished work to the specified requirements

Scope

Applicable to construction work by direct labour and contractors, including precast and prefabricated work

Person responsible

Project Manager

Procedure

a) The Project Manager or his delegate arranges for final inspection and/or testing of the construction work that has been completed by direct labor or by a contractor. Prior notice of the arrangement is given to the designated inspector and project stake holders. The designated inspector may be the Project Manager or his delegate, Work Quality Inspector or another member of supervisory staff of the Client or an authorized person from the Architect's/Consulting Engineer's office, as indicated in the inspection and test plan.

b) The inspector checks all preceding quality records for presence of authoritative signatures to verify that Work In Progress Inspections and quality tests were carried out at the various inspection/test points as described in the ITP and the results meet specified requirements.

c) The inspector checks the functionality of every facility in the project and give score for each individual facility against the functionality requirements.

d) If the inspector is satisfied with the quality of work, he/she indicates his approval by signing off the final inspection checklist, the work is not considered as duly completed until this is accomplished.

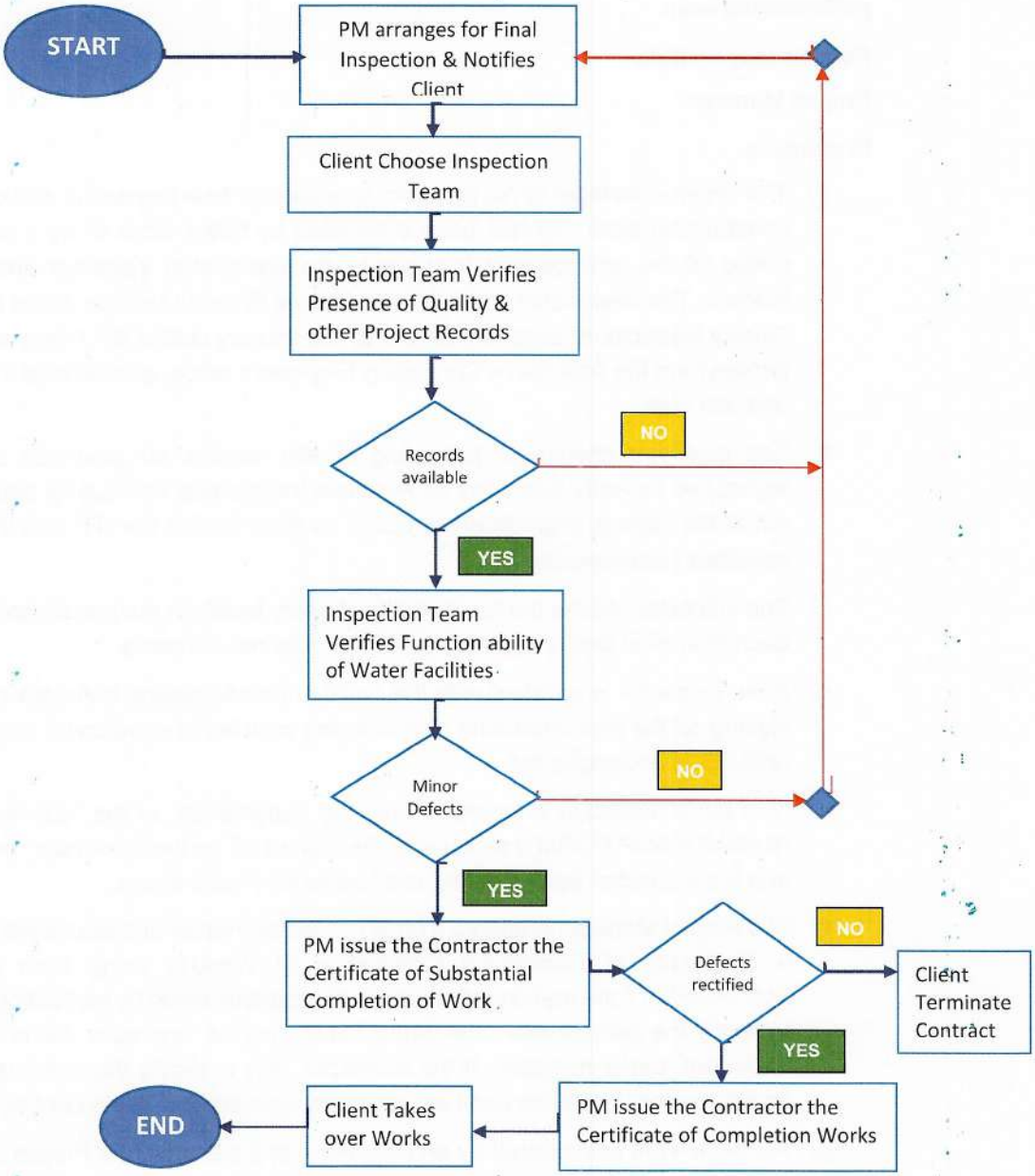
e) If a minor defect(s) is noted, it shall be documented in the form as per form no: RUWASA-SUP.FORM 9 which shall be signed off by the contractor, project manager and the inspector, such a defect shall be termed work snags.

f) The Project Manager prepares a Final Inspection Report and issues the contractor with a Certificate of Substantial Completion of Work(s) using form no RUWASA-SUP.FORM 17 the manager then takes appropriate action by instructing the contractor to rectify the defects within the defect liability period. Any work that is rectified is re-inspected and/or re-tested. If the contractor fails to rectify the defect(s) within defect liability period, it shall be dealt as per clauses prescribed in the contract document.

g) For such work not covered by an inspection and test plan, the Project Manager or his delegate carries out final inspection and/or testing as described in the general conditions of contract/specifications provided and, at his discretion, accepts or rejects the work.

h) If there are no defects observed after the defect liability period has elapsed, the project manager shall issue to the contractor the Certificate of Final Completion of works using form no *RUWASA-SUP.FORM 16.*

Process Flow Chart



Records

RUWASA-SUP.FORM 9
RUWASA-SUP.FORM 16
RUWASA-SUP.FORM 17

7.5.4 Procedure for Control of Nonconforming Work *(QP 4.0)*

Purpose

a) To ensure that finished or semi-finished work which does not conform to specified requirements is prevented from being unintentionally covered or built upon

b) To define responsibility for review and authority for the disposition of nonconforming work

Scope

Applicable to construction work which does not pass the work(s) in progress or final inspection and testing

Person responsible

Project Manager

Procedure

a) The Work Quality inspector identifies the nonconforming work on the working drawing with indelible ink, then he/she marks the defective facility at the site with paint.

b) The Project Manager, assisted by the contractor reviews the extent and severity of the nonconformity.

c) Based on the outcome of the review, the Project Manager works out a proposal for the disposition of the nonconforming work. The disposition may be concessional acceptance, repair or rework.

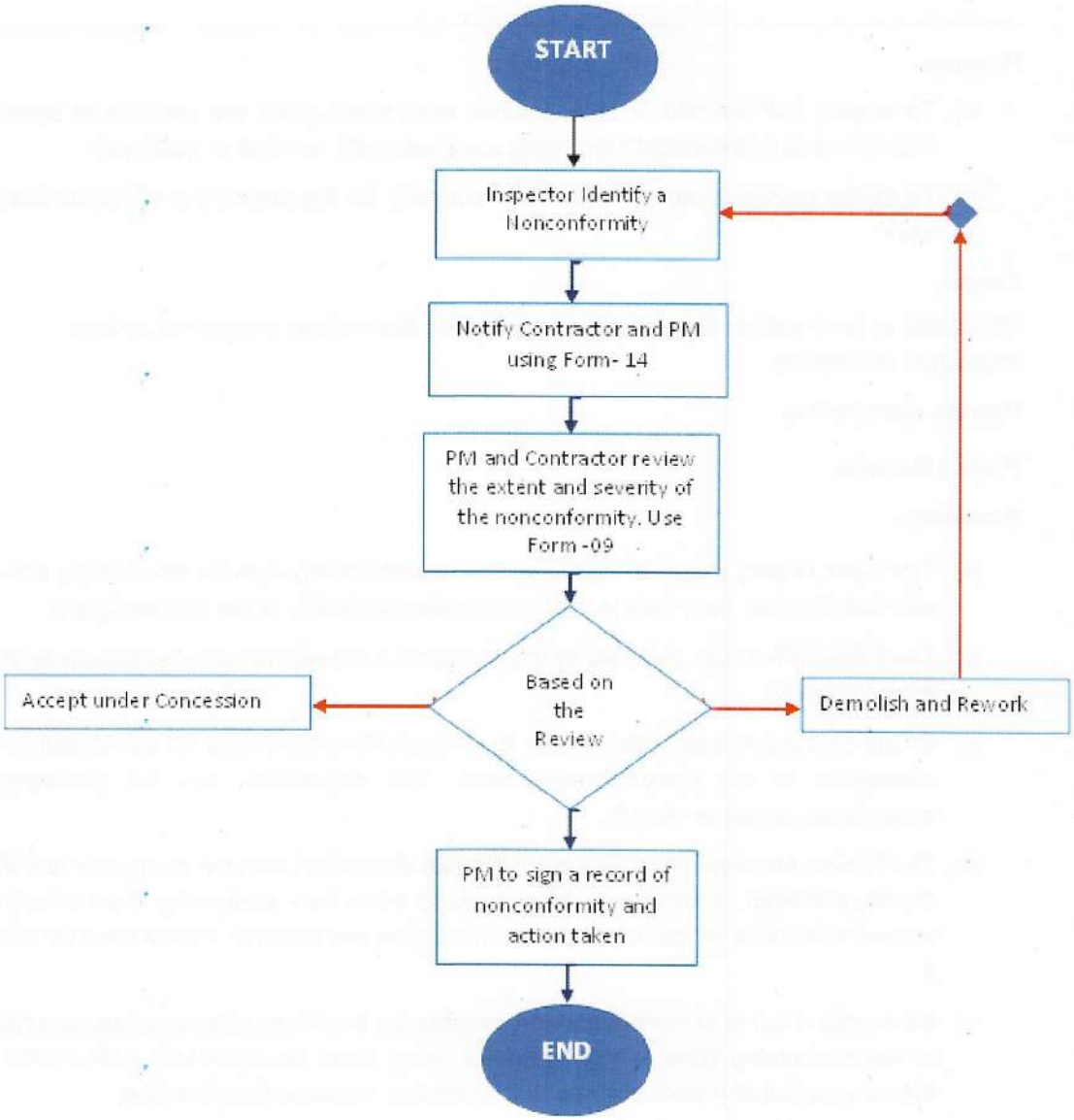
d) The Project Manager discusses the proposed disposition with the contractor and Work Quality inspector, if the work is found to have minor non- conformity, then a technical agreed solution is proposed and implemented as per form no: RUWASA-SUP.FORM 9.

e) If the work is found to have major non- conformity, the Project Manager issues a Notice of Nonconforming Work to the contractor, using Form no: RUWASA-SUP.FORM 14, the non-conforming work shall be demolished or removed from the Site.

f) The Project Manager ensures that any non-conforming work is demolished, re-worked, re-inspected and/ or re-tested in accordance with the inspection and test plan.

g) The Project Manager signed records of the Nonconforming Work and evidence of its disposition shall be submitted to the Work Quality inspector.

Process Flowchart



Records

RUWASA-SUP.FORM 09.

RUWASA-SUP.FORM 14.

7.5.5 Procedure for Control of Documents (QP 5.0)

Quality Assurance and Quality Control Procedures and instructions for individual activities shall be maintained by the Contract Manager and issued to Project Managers as controlled documents.

Purpose

To ensure specific activity QA/QC procedures and instructions are conveyed to the individuals or contractors performing the specific activities.

Scope

This procedure covers the control of all documents, this includes forms, checklists, Work Instructions, reports and other records.

Person responsible

The Project Manager

Procedure

a) Establish a master list or equivalent of quality control document control and identify the current revision of documents in order to preclude the use of non-applicable documents.

b) Issue approved documents, for revised documents they shall be re- issued after a practical number of changes have been made.

c) Revisions to the QA/QC documents shall be by section and approved for adequacy by authorized personnel prior to issue.

d) A revised table of contents indicating the newly issued approved and accepted revision shall accompany the revised sections. In the case of sample forms a revised "Listing of Exhibits" shall indicate the latest exhibit revisions.

The PM shall ensure that:

a) All pertinent issues of appropriate QA/QC documents are available at all locations where operations essential to the effective functioning of the quality system are performed;

b) All obsolete documents are promptly removed from all points of issue or use.

7.5.6 Control of Project Related Documents (QP 6.0)

Purpose

To ensure project related documents are available at site, properly used, kept and instructions are conveyed to the individuals or contractors performing the specific activities.

Scope

This procedure covers the control of all project related documents, this includes forms, checklists, Work Instructions, reports and other records.

Person responsible

The Project Manager

Procedure

a) Upon award of contract, each project shall be assigned a project number and the Project Manager establishes a "Project Job File". This file shall contain a complete set of all project related contract documents, specifications, drawings, etc. All information generated during the life of the project shall be maintained in this job file.

b) A listing shall be made of all drawings, specifications, vendor data, etc. that are to be submitted to the client for review and approval. A copy of all documents returned by the client approved, or approved as noted, shall be maintained in the job file.

c) Any revisions to the contract documents shall be date stamped on the date received and reviewed by the Project Manager for any possible impact to the project. All changes after contract award shall be properly documented and any associated addition or deduction to the contract price shall be immediately identified and submitted to the client for review and approval.

d) A complete set of all documents required for proper execution of the work shall be maintained at the project site.

e) Any revisions received shall be immediately forwarded to the project site for use while executing the project. Any field changes to the work shall be properly noted on the project site set of the drawings. The project site set of the drawings shall show the work exactly as the work was built. (Hereinafter referred to as the "As-Built" set of drawings.)

APPENDICES

APPENDIX A: SUPERVISION CHECKLIST - 01

Appendix: 1 File Checklist in Supervision Projects

Form No: RUWASA- SUP.CHECKLIST/01 Version: 00	
The Project Manager/Team Leader at the beginning of the Project should open the following files:	
• 1.	• Correspondence from the Site to the Contractor
• 2.	• Correspondence from the Main Office to the Contractor
• 3.	• Correspondence from the Site to the Client
• 4.	• Correspondence from the Site to the Main Office
• 5.	• Internal MEMOS
• 6.	• Contractor's Enterim Payment Application
• 7.	• Consultant's Daily & Monthly Reports
• 8.	• Inspection Request Forms/approval forms
• 9.	• Variation Orders
• 10.	• Contractor's Reports
• 11.	• Minutes of Meetings
• 12.	• Personnel Records
• 13.	• Laboratory Tests
• 15.	• Modifications on Design
• 17.	• Submittal
• 18	• Correspondence from the Main Office to the Client
• 19.	• Correspondence from the Contractor to the Site
• 20.	• Contractor's Non Conformities
• 21.	• Contractor's Claims
• 22.	• Calibration of Measurement Devices
• 23.	• Vehicle(s) on Site
• 24.	• Respective Operational Files of forms and checklists

The Contractor Project Manager shall adopt the RWASA filing system and shall not open any other file without the official approval from RUWASA Management. The Project Manager should keep all files open and accessible until the end of the project and should copy the Technical Manager (TM) all project correspondence. Thereafter, the Contractor PM at the end of the project shall deliver all files to the TM inside a Box with a proper labeling that lists all files content.

The following coding system shall be used for correspondence reference.
RUWASA/FILE NAME/serial number.

Appendix 2: RUWASA Supervision Tasks

Form No: RUWASA-SUP.FORM-01	Version: 00

General tasks of the consultant in the supervision works is as summarised in the table below;

S/N	Tasks
1.	Clarify queries about conditions of contract
2.	Decide contractual matter in behalf of the Employer
3.	Communication in writing
4.	Approve of subcontracting
5.	Approve of Key Personnel
6.	Authority to remove a person
7.	Approve of certificates for insurance
8.	Approve of alterations to the certificates of insurance
9.	Clarify queries on the Contract Data
10	Contractor can commence work when work programme approved by PM
11	Receive and approve specs and drawings for temporary works
12	Approval by PM shall not alter Contractor's responsibility
13	Approval of specs and drawings before use
14.	PM to be notified of important discoveries and give instructions
15.	Contractor shall allow PM and representatives right of access to site
16.	Contractor obliged to carry out PM's instructions
17.	Contractor to refer wrong decisions by PM to adjudicator within 14 days
18.	Approve of work program
19.	Receive and approve of an updated work program every 60 days
20.	Approval of program by PM shall not alter Contractor's obligations
21.	Extend the completion date in case of compensating events or variations are issued
22.	Decide within 21 days how long extension
23.	Obtain prised proposals for acceleration of works
24.	Right to instruct delays
25.	Obliged to meet in management meetings
26.	Record minutes of management meetings
27.	Receive early warnings from contractor of future events that may adversely affect

28.	Contractor to co-operate with PM on how to avoid adversely effects
29.	Check works, notify of defects and instruct
30.	Instruct the contractor to carry out tests to check works
31.	Give notice to contractor on defects before end of Defects Liability Period
32.	Contractor shall correct defects as instructed by the PM
33.	Right to assess correction costs and have the contractor to pay
34.	Adjust the rate if quantity differs from BoQ
35.	Not adjust if price exceeds with more than 15 %
36.	Request the contractor to provide cost breakdown
37.	Request quotations for carrying out variation orders
38.	Make an opinion on if the quantity of variation works is within limits
39.	If unreasonable quotation, order the variation and decide on price
40.	If PM decides that the work is very urgent, contractor shall go ahead without quotation
41.	Contractor shall submit cash flow forecast to follow the work program updates
42.	Contractor to submit monthly statements on value of works
43.	Check the Contractors monthly statements
44.	Determine the value of work executed
45.	May exclude previous items in the light of later information's
46.	Certify amounts to be paid by the employer
47.	Compensating events if the PM: (a) orders a delay or does not issue drawings; (b) requires tests that prove to be unnecessary; (c) not approves of subcontract unreasonably; (d) instructs for dealing with an unforeseen condition caused by employer; (e) unreasonably delays certificate of completion,
48.	Decide on price increase and date extension when information given on a compensating event
49.	Assess the above and if necessary, decide himself the adjustment of price
50.	No pay if contractor not co-operate with PM or if employers' interest is adversely affected
51	Adjust the price if taxes etc changes
52	Repayment of retention when PM certifies that defects have been corrected
53	Correct any overpayment of liquidated damages by adjusting next payment
54	(Not applicable since no bonus)
55	Employer to make advance payment against Guaranty
56	Contractor to supply PM with copies of invoices demonstrating advance payment used for mobilisation

57	Employer to be provided, after 21 days, with Performance Security
58	Give written permission to use day works rates for additional work
59	Approve records of work paid for as day work
60	After request from the contractor, issue a certificate of completion
61	Contractor to supply PM with a final and detailed account of amount considered payable
62.a	Breach of contract (BoC) if PM instructs delay and the instruction is not withdrawn
62.b	BoC if a payment certificate by the PM is not paid by the employer
62.c	BoC if PM notice to correct a defect is ignored
63	PM to decide if a noticed BoC other than listed obove, is fundamental or not
64	If contract is terminated because of a fundamental breach, PM shall issue a certificate for the value of work done
65	If contract is terminated for employers' convenience or because of a fundamental brake by employer, PM shall issue a certificate for the value of work done
66	If contract is frustrated by force majeure PM shall certify this

Appendix 3: Format of Agenda

Form No: RUWASA-SUP.FORM-02	Version: 00

AGENDA OF MEETING

Agenda for Meeting No. _____ to be held in the office of _____

at _____ hours on _____, Year _____

The meeting shall be preceded with the site visit.

1. Opening of the meeting and site visit
2. Confirmation of minutes of previous meeting
3. Matters arising from Previous Meeting
4. Review of the site visit
5. Progress Report by the contractor
6. Discussion and matters arising out of the report
7. Report by the Project engineer/Site engineers
8. AOB

Appendix 5: Format of Monthly Progress Reports

Form No: RUWASA-SUP.FORM-03	Version: 00

MONTHLY PROGRESS REPORTS

Table of Contents:

Part I – Supervision of Works Monthly Progress Report

List of Figures

Acronyms and abbreviations

1.0 Introduction
1.1 Location
1.2 Project Background
1.3 Project Objective
1.4 Overall Project Scope
1.5 Scope of Works
2.0 Site Meetings
3.0 Site visits
4.0 Works progress
4.1 Physical progress
5.0 Weather conditions
6.0 Quality of Works
7.0. Site Instructions
8.0. Environmental and Socio-economic aspects
9.0 Conclusions & Recommendations
9.1 Conclusions
9.2 Recommendations

Part II – Contractor's Contracts Monthly Progress Report

1.0 Personnel & Organisation
2.0 Progress: Project Implementation
2.1 Work performed in the period
2.2 Progress
2.3 Problems encountered
3.0 Financial Status during a year
3.1 Invoices
3.2 Fees

Appendix 8: Daily Record Form

Form No: RUWASA-SUP.FORM-04	Version: 00

Project:

Contractor……Consultant……

Project Area……Location……

Date……Week No……
(From…… To……)

Weather	Tick where appropriate				
	Sunny	Cloudy	Rainy	Hot	Cold
Morning					
Afternoon					

2 Activities Carried Out

S/N	Activity	Unit	Quantity
1			
2			
3			
4			
5			

3 Summary of Materials Consumption

S/N	Material	Their use in the construction of the works
1		
2		
3		
4		
5		

4 Contractors Manpower on site

1……2……3……4……5……6……

.

7……..8……9……10……11……..12……

5 Equipment on site

1……2……3……4……5……6……

7……..8……9……10……11……12……

6 General Comments and Remarks

……

……

……

…

7 Accident/Incident

Nature of Accident/Incident……

Location of Accident……

Was there injury to people? Yes/No

Does the accident involve third parties Yes/No

Detailed description of accident/Incident……

……

……

…

8 Signatures

a) Contractor

Signature……..

Signature……

Name……

Name……..

b) Consultant

Appendix 10: Site Instructions

Form No: RUWASA-SUP.FORM-05	Version: 00

Site Instruction(s) No.....

Issued in respect of (Project Name): .....

Project Location: .....

Client: .....

Lead Consultant: .....

From RUWASA: .....

Category: Civil/Structural/Water/Environmental/others.....

To the Contractor: .....

Under the terms and conditions of the contract for the above-mentioned works, the following instructions are hereby issued:

On Behalf of Consultant	On Behalf of Contractor
Instruction Issued by:	Instruction Received by:
Reg. No..... Name.....	Reg. No. ..... Name.....
Date: ..... Signature.....	Date..... Signature.....
Position (RE/Project Eng.)	Position (Site Agent/Eng.) .....

Appendix 11: Interim Payment Certificate

Form No: RUWASA-SUP.FORM- 6		Version: 00		
	Interim Payment Certificate CLIENT: CONTRACT TITLE: CONTRACT NO: INTERIM CERTIFICATE NO:			
	CONTRACT DETAILS		CUMULATIVE AMOUNT(TSH)	
	CONTRACT SUM			
1.1	Preliminaries and General works performed			
1.2	Value of work done up to previous certificate			
1.3	Value of work done for this certificate			
1.4	Additional works			
	Total Works and materials			
2	ADVANCE PAYMENT DETAILS			
2.1	Advance payment 15 % of CS			
2.2	Less Advance Payment Recovery			
2.3	Balance Advance Payment Owed to Client			
3	Retention			
3.1	Less Retention (10%)			
3.2	Add Retention Repayment (10 %)			
4	Total Certified to Date			
4.1	Less Amount Previously Certified			
		Cert. 1		
		Cert. 2		
		Cert. 3		
		Cert. 4		
		Cert. 5		
		Cert. 6		
		Total		
4.2	Net Amount Payable This Certificate			

	TOTAL AMOUNT DUE			
	Contractor		Project Manager	Client
	----------		----------	----------
	Date:		Date:	Date:

Appendix: 12 Request for Action

Form No: RUWASA-SUP.FORM-7	Version: 00

Form No.	Ref. no. _____	
Project Details		
Project:		
Date:	Reference: project number-	
	Firm:	Person:
Contractor:		
Supervisor:		
Request for:		
☐ Approval ☐ Clarification ☐ Inspection		

Area of Request:	
☐ Designs /Design Changes	☐ Materials
☐ Method statement	☐ Formwork
☐ Planning / schedule of work	☐ Pipelaying
☐ Reinforcement	☐ O&M manual / calibration certificates
☐ As built drawings	☐ Other:
Reference to drawings:	
Reference to BoQ numbers:	
Reference to Specification:	
Description:	
Attachments:	

Consultant Comments:		
Status:	☐ approved	☐ approved with comments
	☐ revise and resubmit	☐ not approved
Date:	Name:	Signed:

Appendix: 13 Record of Approval Forms Submitted

Form No: RUWASA-SUP.FORM- 8	Version: 00

AFS	Ref. No. _____	RUWASA

Record of Approval Forms Submitted

Project:	
Location:	

Approval Form Nr.	Submitted to	Subject of approval (design, construction planning, method statement, formwork, materials to be used etc.)	Reference to (Drawing, BoQ Number. Specification)	Date received	Status*[1], [2], [3], [4]	Comments	Submitted by	Date

*[1] approved; [2] approved with comments; [3] revise and resubmit; [4] not approved

Appendix: 14 Corrective Action Request Form

Form No: RUWASA-SUP.FORM-9	Version: 00

CARF	Ref. No._____	RUWASA

Corrective Action Request Form		
Project:		
Date:	Reference:	
	Firm:	Person:
Contractor:		
Supervisor:		
Subject of Corrective action request:		

Corrective Action requested by the Supervisor:	
Corrective Action required for:	
☐ executed work:	☐ Materials
☐ Other:	☐ Formwork
Reference to drawings, specification:	
Location:	
Description of non-conformity:	
Attachments:	

Date:	Name:	Signed:

Answer to Corrective Action requested by the Contractor:		
Cause of non-conformity:		
Proposed corrective action:		
Evidence of execution (after approval of proposed corrective action):		
Attachments:		
Date:	Name:	Signed:

Approval of proposed corrective Action		
Description:		
Status:	☐ approved	☐ approved with comments
	☐ revise and resubmit	☐ not approved
Attachments:		
Date:	Name:	Signed:

Approval of executed corrective Action		
Attachments:		
Date:	Name:	Signed:

Appendix: 15 Letter Received Form:

Form No: RUWASA-SUP.FORM -10	Version: 00

LR	Reference no.....	RUWASA Rural Water Supply and Sanitation Agency
Letters Received		
Project:		
Date:		
Location:		

Letter nr.	From	To	Date received	Subject	Answered with letter nr.	Date answered

Appendix: 16 Record of Material Inspection Report Submitted:

Form No: RUWASA-SUP.FORM 11	Version: 00

MIRS	Reference. No.....	RUWASA
Record of Material Inspection Reports Submitted		
Project:		
Date:		
Location:		

MIR Nr.	Submitted to	Date of submission	Subject of material inspection	Reference to BoQ Number, Drawings, Specification	Date Material received	Status* [1], [2], [3], [4]	Submitted by

*[1] approved; [2] approved with comments; [3] revise and resubmit; [4] rejected

Appendix: 17 Project Summary Sheet:

Form No: RUWASA-SUP.FORM 12	Version: 00

		RUWASA
Project Summary Sheet		
Project:		
Date:		
Location:		

ITEM	DESCRIPTION
(1). Name and Code of Contract:	
(2). Financed by:	
(3). Contract type:	
(4). Contractor:	
(5). Principal Sur-Contractons :	
(6). Letter of Acceptance (date):	
(7). Contract date (date):	
(8). Contract period (months):	
(9). Client Contract Reference:	
(10). Accepted Contract Amount:	
(11). Commencement date :	
(12). Completion date:	
(13). Defects Liability Period:	
(14). Performance Security:	
Issued by:	
On:	
Amount:	
Valid until:	
15. Advance Payment Guarantee Amount:	
Issued by:	
On:	
Amount:	

Valid until:	
16. Advance Payment Amount:	
Date:	
Amount:	
Paid On:	
17. Repayment of Advance (% and time period):	
18. Payments (monthly / quarterly):	
19. Percentage of Retention:	
20. Limit of Retention Money:	
21. Procedural Matters (contact persons):	
Client/Employer:	
Beneficiary:	
Consultant:	
Contractor:	
22. Information updated on:	

Date:	Name:	Signed:

Appendix 18: Format of Minutes of Site Meeting

Form No: RUWASA-SUP.FORM 13	Version: 00

MINUTES OF SITE MEETING

Project : :

Contract No. :

Minutes of site meeting No _____ held on _____

Venue :

Time :

Attendance :

S/No	Name	Title & firm

Absent with/without apology

S/No	Name	Title & firm

Agenda:

1

2

3

4

5

6

7

8

Minute	Discussion	Action
	Discussions from the site visit	
	Confirmation of minutes of previous meeting	
	Matters arising out of previous minutes	
	Progress report by the Contractor	
	Discussion and matters arising out of the report	
	Progress report by the Engineer/Site engineers	
	AOB	

This is a true record of the proceedings.

.....	.....
Chairperson	**Secretary**
.....	.....
Client	**Contractor**

Appendix: 19 Project Supervision Non-Conformance Report:

Form No: RUWASA-SUP.FORM 14	Version: 00

NCR	Ref. No. _____	RUWASA Rural Water Supply and Sanitation Agency
Project Supervision Non-Conformance Report		
Project:		
Date:	Reference project number-	
	Firm:	Person:
Contractor:		
Consultant:		
Subject of Non-conformance report:		

Non-conformance as detected by the Supervisor:	
Non-conformance detected for:	
☐ Executed work	☐ Materials
☐ Operational health and safety measures	☐ Equipment
☐ Other:	
Reference to drawings, specification:	
Location:	
Description of non-conformity:	
Attachments:	

For	Name:	Signature:	Date:
Contractor			
Consultant			
Client			

Appendix: 20 Occupational Health & safety Checklist:

Form No: RUWASA-SUP.FORM 15	Version: 00

Doc No: RUWASA/OHS/19, **Version:** 00	Ref. No._____	RUWASA
Occupational Health and Safety Checklist		
Project:		
Date of inspection:		
	Firm:	Person:
Contractor:		
OHS inspector:		
Reference Project number:		

General Remarks
On a construction site, it is not only the safety of the staff of the contractor that is important. Also the supervision staff, visitors and the public in general must be safe. This also means that after working hours, the public (e.g. children) should not have access to the site.
The main responsibility for Operational Health and Safety lies with the Contractor. This checklist is meant to make sure that the contractor adheres to basic OHS practices.

Housekeeping:		
Check for the items below: waste on site: a hazard? Tools and equipment: are the tools safe to use?		
Subject	**Status**	**Action**
Waste on site: a hazard?		
Pieces of wood with nails:		
Reinforcement steel:		
Cables, hoses, ropes:		
Other materials:		
Tools and Equipment:		
Electrical tools safe for use?		
Hand tools safe to use?		
Hygiene:		
Toilets available/clean?		
Wash basins available/clean?		

Safety program:		
Is safety program in place?		
Is site safety manual in place?		
Are contractor's personnel informed of safety requirements?		
Is the Engineer and Employer indemnified from all claims?		
Is site drainage well maintained?		
Is all kind of pollution controlled?		
Are waste collection containers provided?		
Are warning signs in place?		
Is dust controlled?		
FIRST AID		
Is first AID officer provided?		
Is first AID kit provided?		
FIRE PROTECTION		
Are fire extinguishers in place?		
SAFETY HARD HATS AND SHOES		
Do all personnel on site furnished by safety shoes?		
Do all personnel on site furnished by reflecting safety jackets		
Do all personnel on site furnished by safety hard hats?		
White hats - for Engineer's and Employer's staff.		
Yellow hats - for Contractor's staff		
Green hats – for Visitors		

Appendix: 21 Certificates of Completion of Works

Form No: RUWASA-SUP.FORM 16	Version: 00

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

RURAL WATER SUPPLY AND SANITATION AGENCY

RUWASA

CONTRACT FOR CONSTRUCTION/REHABILITATION OF .....

CERTIFICATE OF COMPLETION

TO: (CONTRACTOR'S NAME): .....

CONTRACT FOR (PROJECT NAME): .....

CONTRACT NO: .....

ORIGINAL CONTRACT PRICE..... REVISED PRICE .....

CONTRACT START DATE: .....FINISH DATE.....

STATEMENT

Whereas the Engineer and the Contractor have jointly carried out measurements and inspection of the said works above at Date/Month/Year after the defect's liability period expired.

NOW WITNESSES AS FOLLOWS:

This Completion certificate, issued and delivered pursuant to RUWASA Conditions of Contract for Civil Works, I the undersigned certify that the Contractor has completed the works to my satisfaction.

The Works are now being received by the Employer in good order and without defects. It is also declared that the contractor is fully released of his obligations which he was bound under this contract.

SIGNED ON BEHALF OF THE EMPLOYER

.....	.....	.....
PROJECT MANAGER'S NAME	**SIGNATURE**	**DATE**

WITNESSED BY:

.....	.....	.....
CONTRACT MANAGER'S NAME	**SIGNATURE**	**DATE**

Appendix: 22 Certificates of Substantial Completion of Works

Form No: RUWASA-SUP.FORM 17	Version: 00

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

RURAL WATER SUPPLY AND SANITATION AGENCY

RUWASA

CONTRACT FOR CONSTRUCTION/REHABILITATION OF .....

CERTIFICATE OF SUBSTANTIAL COMPLETION

TO: (CONTRACTOR'S NAME): .....
CONTRACT FOR (PROJECT NAME): .....
CONTRACT NO: .....
ORIGINAL CONTRACT PRICE..... REVISED PRICE .....
CONTRACT START DATE: .....FINISH DATE.....
STATEMENT Whereas the Engineer and the contractor have jointly carried out measurements and inspection of the said works under the said contract above on …Date….. Month ……Year… after completion of the works. **NOW WITNESSES AS FOLLOWS**: This Substantial Completion certificate, issued and delivered pursuant to RUWASA Conditions of Contract for Civil Works, I the undersigned certify that the Contractor has substantially completed the works to my satisfaction. The Works now shall remain in the hands of the contractor for a period not more than the period specified in the contract documents as defect liability period.
SIGNED ON BEHALF OF THE EMPLOYER .... **PROJECT MANAGER'S NAME SIGNATURE DATE**
WITNESSED BY: .... **CONTRACT MANAGER'S NAME SIGNATURE DATE**

Appendix: 23 Certificate of Conformance to Quality

Form No: RUWASA-SUP.FORM 18	Version: 00

Certificate of Conformance to Quality

Contract No.	
Detail of the Works	
Contract Amount	
Name of Contractor	
I.P.C Bill No./Date	

Period Covered :_____; to: _____

This is to certify that we have inspected the conduct of the works in accordance with the established Quality Control procedures and that the items included in this Interim Payment Certificate satisfythe required quality of works and are acceptable with regard to the specifications and standards as prescribed under the Contract.

Signature/Date:

_____

[Work Quality Inspector]

ACCEPTANCE NOTE

This is to certify we accept the Quality Certificate.

Signature/Date:

_____

[Contractor]

Note: This Quality Certificate and Acceptance Note shall be completed and attached to each Interim Payment Certificate (I.P.C) before payment is made.

APPENDIX B: INSPECTION CHECKLIST FORMS

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 0 **GENERAL INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/ Deficient-Poor*	Remarks
	GENERAL CONDITIONS					
1	Site Supervisor and other Key Personnel Available?					
2	Necessary tools and equipment available?					
3	All related construction documents Material approval and shop drawings in place and approved.					
4	Site clear from waste material?					
5	Construction material available?					
6	Are protective gears provided and used at the site?					
7	Work program prepared and followed?					
8	Quality assurance plan prepared and followed?					
9	Site Meetings Conducted?					
10	Site Logbook available and activities recorded daily?					
11	Materials properly arranged at site?					
12	Is First Aid kit available at site?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 1 **KEY PERSONNEL INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/ Deficient-Poor*	Remarks
	AVAILABITY OF KEY PERSONNEL					
1	Civil Engineer					
2	Water Engineer					
3	Civil Technician					
4	Water Technician					
5	Electrical Technician					
6	Mechanical Technician					
7	Land Surveying Technician					
8	Plumber					
9	Mason					
10	Carpenter					
11	Steel Fixer					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 2 **TOOLS & EQUIPMENT INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/Deficient-Poor*	Remarks
	AVAILABILITY OF TOOLS & EQUIPMENT					
1	Pipe wrenches					
2	Chain Spanner (Chain Tong)					
3	Pipe Threading Kit/Dies					
4	Concrete Mixer					
5	Poker vibrator					
6	Generator					
7	Block Making Machine					
8	Arch Welding Machine					
9	Butt Fusion Machine					
10	Chain Block					
11	Pipe Bender					
12	Dewatering Pump					
13	Angle Grinding Machine					
14	Wheel Barrow					
15	Shovel					
16	Pick Axe					
17	Gauge Box					
18	Vice					
19	Hacksaw					
20	Masonry Hammer					
21	Plumb bob					
22	Spirit Level					
23	Tape Measure					
24	Masonry Square					
25	Masonry Trowel					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 3 **CONSTRUCTION MATERIALS INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/ Deficient-Poor*	Remarks
	AVAILABILITY OF MATERIALS					
1	Galvanized Steel Pipes					
2	Glass Reinforced Pipes					
3	H.D.P.E Pipes					
4	UPvc / Pvc Pipes					
5	Black Pipes (Ungalvanized Pipes)					
6	Aggregates					
7	Sand					
8	Cement					
9	Timber					
10	Reinforcement					
11	Concrete blocks					
12	Pipe Fittings					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 4 **DOCUMENTS INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)1** *Good/ Acceptable/ Deficient-Poor*	Remarks
	AVAILABILITY OF DOCUMENTS					
1	Approved Construction Drawings					
2	Specifications					
3	Site Log Book					
4	Work Program/Work Schedule					
5	Inspection and Testing Plan					
6	Work Progress Report					
7	Site Meeting Minutes					
8	Construction Pictures					
9	Site Instruction Book					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 5 **EXCAVATIONS INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)1** *Good/ Acceptable/ Deficient-Poor*	Remarks
	EXCAVATIONS					
1	Are the excavated areas provided with fence/barricades?					
2	Are excavated pits adequately shored/timbered?					
3	Is Depth and Width of trench as per dimensions in Drawing?					
4	Are the excavated material kept away from the edge of the pit/trench by at least 1m?					
5	Are Warning signs placed near the excavated area?					
6	Means of access and exit from the work area provided?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 6 **REINFORCEMENT INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)1** *Good/Acceptable/ Deficient-Poor*	Remarks
	REINFORCEMENT					
1	Are the reinforcement tensile strength Test certificates available and as per design?					
2	Is reinforcement size as per design?					
3	Is curtailment of reinforcement satisfactory as per bending Schedule?					
4	Are reinforcement hooks as per bending schedule?					
5	Does the placing of reinforcement, diameter, number and spacing match with the Construction Schedule?					
6	All reinforcement tied properly at all points where they cross each other using appropriate binding wires?					
7	Are Reinforcement covers placed as per design and spacer blocks properly placed?					
8	Is the weight of reinforcement (kg) provided as per in BoQ?					
9	Cleanliness of shuttering and bars, OK?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 7 **FORMWORK INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)1** *Good/ Acceptable/ Deficient-Poor*	Remarks
	FORMWORK					
1	Is the formwork structure erected according to drawing and specifications?					
2	Are horizontal, diagonal bracings provided in both longitudinal & transverse directions?					
3	Are the shores properly seated top and bottom to prevent Displacement?					
4	Are formwork structure shores of adequate size and spacing?					
5	Formwork corners and joints adequately tied to prevent leakage or bulging and spreading of concrete?					
6	Adequate lap between forms and previously cast concrete provided?					
7	Is the formwork level and alignment, Ok?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:.....	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 8 **PRE-CONCRETING INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/ Deficient-Poor*	Remarks
	PRE-CONCRETING					
1	All necessary equipment's available?					
2	Is mix design approved?					
3	Sand and aggregate test conducted and are as per design?					
4	Casting and curing method accepted?					
5	Formwork dimensions in accordance to drawing?					
6	Formwork clean, smooth, water tight and free from deleterious material?					
7	Formwork meets level and line requirement?					
8	Steel fixed and located according to drawing?					
9	Reinforcement clean, and free from deleterious material?					
10	Concrete cover placed as per drawing?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 9 **CONCRETTING INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/ Deficient-Poor*	Remarks
	CONCRETTING					
1	Formwork clean, smooth, watertight and free from deleterious material?					
2	Water cement ratio as per design?					
3	Surface preparation before placing?					
4	Slump test perfumed?					
5	Adequate vibration provided?					
6	Does segregation of aggregates occur?					
7	Temporary spacers and ties removed?					
8	Shuttering prop Displacement /settlement occurs?					
9	Concrete cube for testing prepared as per specification?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 10 **POST -CONCRETING INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/ Deficient-Poor*	Remarks
	POST -CONCRETING					
1	Honey combing, cracks and bubbles observed?					
2	Surface f finishing, line and level as per drawing?					
3	Curing method and f frequency done as per specification?					
4	Stripping/removal of formwork, Supports done as per specified method and time?					
5	Repair of surface finish as per specified method?					
6	Structure cleared for next construction stage?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 11 **BLOCKWORK INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/Deficient-Poor*	Remarks
	BLOCKWORK					
1	Certificates of testing of blocks, sand and cement available?					
2	Setting out and Surface Preparation, ok?					
3	Mortar mix ratio as per specification?					
4	Blocks dampened with water before installation?					
5	Number of course as specified and approved?					
6	Block work joints properly filled with mortar and raked to form key for plaster?					
7	Wall ties are fixed at junctions of concrete walls and columns and all required?					
8	Horizontal stack provided as per method statement					
9	All required mechanical, electrical and plumbing embedment / openings are in place?					
10	Horizontal and vertical alignment a checked					
11	Curing method and frequency done as per specification?					

Comments / Observations:

	Contractor	Consultant/ Supervisor
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

RURAL WATER SUPPLY AND SANITATION AGENCY

Form No: RUWASA-INSP.FORM 12 **PIPE LAYING INSPECTION CHECKLIST**

Project Name:

Client:

Contractor/ Implementor's Name:

Village: District: Region:

Coordinates:

Note: Coordinates should be measured using a GPS and taken at the site of inspection

	Item	Yes	No	N/A	**(Condition)**[1] *Good/ Acceptable/Deficient-Poor*	Remarks
	PIPE LAYING					
1	Pipe size, type and schedule is according to drawing?					
2	Bottom of the trench is firm and free from loose material, thoroughly compacted prior to placing bedding material.					
3	Pipe length and ends are free from cracks or imperfections?					
4	The line and grade of the trench according to the cut sheet?					
5	Pipe has proper bearing and is fully placed into the pipe bedding material and is cantered in the trench?					
6	Pipe joints pushed and secured properly to mark?					
7	Correct pipe f fittings (Air valves, washout, etc.) installed in proper direction and location as per drawing?					
8	Are specified backfill material used?					
9	Pipeline flushed upon completion of construction?					
10	Hydrostatic testing conducted?					

Comments / Observations:

	Contractor:	Consultant/ Supervisor:
	Signature: ..... Name: ..... Position: ..... Date:	Signature: ..... Name: ..... Position: ..... Date: .....

APPENDIX C: INSPECTION TASKS

Site Clearance inspection

The inspector shall check if:

(a) Machinery or equipment specified for site clearance are available.

(b) Unwanted surplus materials and rubbish are removed.

(c) Vegetation and surface soil has been removed, levelling for preparing the ground for the planned construction works has been done.

(d) Security measures are provided to avoid accident

Setting Out Inspection

The inspector shall check if

(a) Site clearance is completed before commencement

(b) Only approved drawings are used

(c) Work is carried out by qualified personnel as per contract

(d) Work is cross checked by different personnel

Excavation Inspection

The inspector shall check if:

(a) Excavated areas are provided with fence/barricades

(b) Proper trench supports is used

(c) Depth and width of excavation matches the specifications

(d) The excavated material is kept away from the edge of the pit/trench by at least 1m

(e) Security measures are provided to avoid accident

(f) Means of access and exit from the work area provided

(g) Techniques, material, tools and machinery used comply with construction code of standards

(h) There is bedding, backfill placement and compaction

(i) Major pipe/appurtenance and other utilities are encountered, documented (ownership / size / type/ depth) and method of supporting prior to backfilling.

Soil Compaction Inspection

The inspector shall check If:

(a) If the used techniques, material, tools and machinery comply with construction work specification.

(b) If security measures are provided to avoid any accident

Hard Core Laying Inspection

The inspector shall check If:

(a) Hardcore of a suitable filling material is used to make up the top soil removal and reduced level excavations.

(b) Hardcore has a top surface which can be rolled out to ensure that cement grout is not lost from the concrete.

(c) The top surface is blinded with a layer of sand especially if the damp proof membrane is to be placed

Reinforcement placement Inspection

The inspector shall check If:

(a) The reinforcement tensile strength Test Certificates are available and as per design

(b) Reinforcement size is as per design

(c) Curtailment of reinforcement satisfactory as per bending Schedule

(d) Reinforcement hooks are as per bending schedule

(e) Placing of reinforcement, diameter, number and spacing match with the Construction Schedule

(f) All reinforcements are tied properly at all points where they cross each other using appropriate binding wires

(g) Reinforcement covers are placed as per design and spacer blocks properly placed

(h) Weight of reinforcement (kg) provided as per in bills of quantities.

(i) There is cleanliness of shuttering and bars

(j) Security measures are provided to avoid accident

Pre- concreting Inspection

The inspector shall check If:

(a) All necessary equipment's are available

(b) Mix design approved

(c) Sand and aggregate test conducted and are as per design

(d) Casting and curing method accepted

(e) Formwork dimensions is in accordance to drawing

(f) Formwork is clean, smooth, water tight and free from deleterious materials

(g) Formwork meets level and line requirement

(h) Steel is fixed and located according to drawing

(i) Reinforcements are clean and free from deleterious materials

(j) Concrete cover placed as per drawing

Concrete Casting Inspection

The inspector shall inspect If:

(a) Formwork is clean, smooth, watertight and free from deleterious materials

(b) Water cement ratio is as per design

(c) Surface preparation before placing

(d) Slump test to measure concrete workability is performed

(e) Adequate vibration provided

(f) There is segregation of aggregates

(g) Temporary spacers and ties removed

(h) Shuttering prop

(i) Displacement/settlement occurs

(j) Concrete cubes for testing are prepared as per specification

Post concreting Inspection

The inspector shall check If:

(a) Honey combing, cracks and bubbles observed

(b) Surface finishing, line and level are as per drawing

(c) Curing method and f frequency done as per specification

(d) Stripping/removal of formwork

(e) Supports done as per specified method and time

(f) Repair of surface were finished as per specified method

(g) Structure cleared for next construction stage

Block laying Inspection

The inspector shall check If:

(a) Certificates of testing of blocks are in place

(b) Availability of adequate quantities of Sand and cement,

(c) Setting out and Surface Preparation are correct

(d) Mortar mix ratio is as per specification

(e) Blocks are dampened with water before installation

(f) Number of block courses are as specified in the approved drawing

(g) Block work joints are properly filled with mortar and raked to form key for plaster

(h) Wall ties are fixed at junctions of concrete walls and columns and all required

(i) Horizontal stack provided as per method statement

(j) All required mechanical, electrical and plumbing embedment openings are in place

(k) Horizontal and vertical alignment checked

(l) Curing method and frequency is done as per specification

Formwork Fabrication Inspection

The inspector shall check If:

(a) Formwork structure erected according to drawing and Specifications.

(b) Horizontal, diagonal bracings provided in both longitudinal & transverse directions

(c) Shores properly seated top and bottom to prevent displacement

(d) Formwork structure shores are of adequate size and spacing

(e) Formwork corners and joints adequately tied to prevent leakage or bulging and spreading of concrete

(f) Adequate lap between forms and previously cast concrete provided

(g) Formwork level and alignments are correct

Pipe laying Inspection

The inspector shall inspect If:

(a) Pipe size, type and schedule is according to drawing

(b) Bottom of the trench is firm and free from loose material, thoroughly compacted prior to placing of bedding material.

(c) Pipe length and ends are free from cracks or imperfections

(d) The line and grade of the trench according to the cut sheet

(e) Pipe has proper bearing and is fully placed into the pipe bedding material and is cantered in the trench

(f) Pipe joints pushed and secured properly to mark

(g) Correct pipe fittings (Air valves, washout, etc.) installed in proper direction and location as per drawing

(h) Specified backfilling materials are used

(i) Pipeline flushed upon completion of construction

(j) Hydrostatic testing conducted

Plastering Work Inspection

The inspector shall check if:

(a) Only specified type of sand and cement are used

(b) Mortar mix ratio are as per specification

(c) There is smooth finishing using spirit levels for undulations, cracks evenness or straightness in vertical and horizontal directions.

(d) Plastered surface is cured for the entire recommended period.

(e) Plastering thickness is even at all points during plastering.

(f) The button marking tiles are removed.

Painting Work Inspection

The inspector shall check if:

(a) The color of the new coat of paint matches with the specification.

(b) Edging lines are straight.

(c) Old paint coat is not visible after applying new paint

(d) Whole area is painted

(e) There is no presence of paint dripping.

Plumbing Work Inspection

The inspector shall check if:

(a) Gate valves in the main water supply are functioning and have no defects or damages.

(b) No water meters are continuously reading water if the valve is shut off

(c) The plumbing system is watertight even after filling it with water and closely sealing.

(d) Plumbing can withstand the design water pressure test

(e) The water supply runs smoothly even with the minimum water pressure requirement.

Fencing Inspection

The inspector shall check if:

(a) The executed finishes comply with approved drawings

(b) The material used comply with the specification and the approved bills of quantities

(c) The Method/technology used for onsite fabricated material comply with specifications

(d) The procedures, methods, and techniques used comply with the good workmanship as per specifications

(e) There are no visible or detectable defects

Landscaping Inspection

The inspector shall check if the landscaping installations comply with:

(a) Approved landscape plans – as per drawings

(b) Specifications of approved bills of quantities

(c) The conformity with TBS Codes, Tanzanian Construction Code of Standards and Zoning Regulation

Safety Protective Measures

The inspector shall check if:

(a) General safety measures as per specifications are being applied

(b) The recommended techniques and materials as per the demolition permit are respected

(c) The sealing of services and the protection of public utilities have been done before starting demolition

(d) Safety Glasses for eye protection provided,

(e) Helmets provided at all times within the confines of the construction area where workers are prone to accidents caused by falling materials or tools,

(f) Gloves are provided when handling materials and to protect against burns from hot materials,

(g) Safety Boots for protection against foot injuries are provided

(h) Appropriate working tools to avoid using hands, fingers, or nails are provided.

(i) Sanitation facilities are provided for the use of workers according to public health guidelines

(j) Working areas are free from rubbish and debris,

(k) Site First-Aid Kit is provided with a permanent trained person onsite,

(l) Barricades, guard rails or perimeter cables are provided for cranes, trenches or hole over 1.5m deep and danger areas,

(m) Trenches and holes over 1.5m deep without barricades or guard rails are properly shored or sloped as prescribed in the specifications

(n) The material used for building scaffold comply with specification

(o) There is an elaborated evacuation plan in case of emergency,

(p) Fire extinguishers/equipment are provided and located at accessible and appropriate place,

(q) The site insurance covers the execution period and the total number of workers onsite

Fire Protective Measures

The inspector shall check if:

(a) The location of installed facilities and equipment comply with approved drawings

(b) The fixtures and equipment used comply with the specification in the approved bills of quantities and specification codes

(c) The procedures, methods, and techniques used for fixtures and equipment installation comply with specification codes

(d) All required fire protective equipment's and measures as per specification

(e) There are no visible and detectable defects such as damaged/emptied extinguishers, non-operation fire detectors or fire alarms or clogged pipes

(f) The personnel onsite have skills on firefighting equipment and skills on the usage of First Aid Kit

General Construction Site Inspection

The inspector shall check for:

(a) Material delivery and storage location

(b) Portable facilities location

(c) Contractor's site office location

(d) Excavation and backfill cleanliness

(e) Access to utility stations (hydrants/telephone boxes/etc.)

(f) Access to bus shelters, sidewalks, driveways, businesses etc.

APPENDIX D: MATERIAL TESTING CATEGORIES

Materials and Equipment certified by Manufacturer

(a) Cement
(b) Paint, Primers and Protective Coatings
(c) Water Proofing Compound
(d) Metal Works such as windows, barbed wire, MS ladder, footrest, rolling shutters
(e) Glazed Stoneware Pipes (GSW) for general civil works
(f) Gratings & Plates
(g) Manhole Covers
(h) Sanitary Fittings
(i) Joint Filler Material
(j) Pre-fabricated Water Tanks
(k) Flow Measuring Devices
(l) Electrical Conduits
(m) Electrical Wires/Cables
(n) Switches & Sockets
(o) Distribution Boards
(p) Earthing Material
(q) Insulators
(r) Lightening Arrestor
(s) Batteries
(t) Cable Termination Kit
(u) Fire Fighting Equipment
(v) Any other items as specified in the contract documents
(w) High Density Polyethylene (HDPE) Double Wall Structured pipes and fittings (WEHOLITE).
(x) WEHOLITE Tanks
(y) Fittings
(z) Glass Reinforcement Plastic Pipes (GRP)

Materials and Equipment Tested under Factory Acceptance Test (FAT)

(a) Cement
(b) Paint, Primers and Protective Coatings
(c) Water Proofing Compound
(d) Metal Works such as windows, barbed wire, MS ladder, footrest, rolling shutters
(e) Glazed Stoneware Pipes (GSW) for general civil works
(f) Gratings & Plates
(g) Manhole Covers
(h) Pipe & Sanitary Fittings
(i) Joint Filler Material
(j) Pre-fabricated Water Tanks

(k) Flow Measuring Devices
(l) Electrical Conduits
(m) Electrical Wires/Cables
(n) Switches & Sockets
(o) Distribution Boards
(p) Earthing Material
(q) Insulators
(r) Lightening Arrestor
(s) Batteries
(t) Cable Termination Kit
(u) Fire Fighting Equipment
(v) Any other items as specified in the contract documents
(w) High Density Polyethylene (HDPE) Double Wall Structured pipes and fittings (WEHOLITE).
(x) Glass Reinforcement Plastic Pipes (GRP)

Materials and Equipment Tested by Third Party

(a) DI, CI, BWSC, PSCC, GRP, PVC, HDPE, MDPE and other Pipes
(b) Steel/Reinforcing Steel
(c) Equipment, Specials, Valves & Fittings for Water Supply & Waste Water Systems
(d) All types of Pumps and Motors
(e) Transformers
(f) Electrical Cables
(g) Telephone / Internet Cable and accessories.
(h) Electrical Starters
(i) Switch Boards (HV/MV/LV)
(j) Manhole Frames & Covers
(k) Fire Fighting Equipment
(l) SWM bins and Equipment.
(m) All other items as specified in the contract document
(n) High Density Polyethylene (HDPE) pressure and non-pressure pipes and fittings.
(o) Unplasticized Polyvinyl Chloride (UPVC) pressure and non-pressure pipes and fittings.

APPENDIX E: INSPECTION AND TEST PLAN

Form No: RUWASA-INSP.FORM 18

INSPECTION AND TEST PLAN FOR CONCRETE WORKS

PROJECT NAME:

NO	Activity / Description	Inspection /Test Requirements		Reference Documentation		TESTING / INSPECTION ROLE				
		Test of Inspection	Stage/Frequency	Acceptance Criteria	Verifying Document	Cont	Cons.	Client	Name	Sign & date
1.0	**Material/ Approval/ Preliminaries**									
1.1	Drawings	Approval	Prior to Start of Work	Approved and signed	Approved Drawing	E	A	H		
1.2	Aggregates	Flakiness & Elongation	On delivery to site	37.5 mm/tender specification clause	Laboratory Test Report	E	H	R		
1.3	Sand	Particle Size & Organic Material	On delivery to site	Specification clause	Laboratory Test Report	E	H	R		
1.4	Reinforcement	Tensile Strength, Yield Strength & Elongation	On delivery to site samples will be taken from every type of rebar	Tender Specification clause (High yield=460N/mm^2, Mild steel 250N/mm^2)	Laboratory Test Report	E	H	R		
1.5	Cement	Compressive Strength	On delivery to site	Tender Specification clause/ BS 4027	Cube Test Report/Manufactures certificate	E	H	R		
2.0	**Pre-Placement Inspection**									
2.1	Shuttering Work/form work	Dimensions, level, alignment, stability	Before proceeding to rebar works	Tender document Specification's clause / as per approved drawing	Inspection Repot/Checklist	E	I	W		

2.2	Rebar Work	Size, Spacing, Cover	Before proceeding to concrete placement	Specification's clause/ as per approved drawing	Inspection Repot/Checklist	E	H	W		
3.0	**Concreting, Placement & Post Placement Inspection**									
3.1	Placement Work	Mix proportion	During mixing	Tender document Specification's clause / as per approved mix ratio	Inspection Repot/Checklist	E	I	W		
		Workability	Sample to be taken during placement	Specification clause / should not exceed 80mm	Slump Test Results	E	I	W		
		Compressive Strength	Sample to be taken during placement	As per approved design strength - specs	Cube Test Report	E	H	R		
		Compaction, level dimensions	During placement	As per specs clause	Inspection Repot/Checklist	E	I	W		
		Concrete work Inspection	After Concrete Laying	As per specs	Inspection Repot/Checklist	E	H	A		

W: Witness Point **H: Hold Point** **A: Approve** **I: Inspect** **E: Execution**
R: Review **Cont: Contractor** **Cons: Consultant**

INSPECTION AND TEST PLAN FOR BLOCK WORKS

PROJECT NAME:

NO	Activity / Description	Inspection /Test Requirements		Reference Documentation		TESTING / INSPECTION ROLE				
		Test of Inspection	Stage/Frequency	Acceptance Criteria	Verifying Document	Cont	Cons	Client	Name	Sign & Date
1.0	**Material/ Approval/ Preliminaries**									
1.1	Drawings	Approval	Prior to Start of Work	As per drawing	Approved Drawing	E	A	H		
1.2	Block	Compressive Strength	On delivery to site	Specification Clause	Laboratory Test Report	E	H	R		
1.3	Sand	Particle Size & Organic Material	On delivery to site	Specification Clause	Laboratory Test Report	E	H	R		
1.4	Reinforcement	Tensile Strength, Yield Strength & Elongation	On delivery to site samples will be taken from every type of rebar	Tender Specification clause	Laboratory Test Report	E	H	R		
1.5	Cement	Compressive Strength	On delivery to site	Tender Specification clause/ BS 4027	Cube Test Report/Manufactures certificate	E	H	R		
2.0	**Block Laying Inspection**									
2.1	Block Laying	Sand Cement Mix proportion	During mixing	As per approved drawing	Inspection Repot/Checklist	E	I	W		
		Horizontal and vertical alignment	During block laying	As per approved drawing	Inspection Repot/Checklist	E	I	W		
		Curing frequency	After Block Laying	Tender Specification clause	Inspection Repot/Checklist	E	I	W		
		Block work Inspection	After Block Laying	As per specs	Inspection Repot/Checklist	E	H	A		

R: Review **W: Witness Point** **H: Hold Point** **A: Approve** **I: Inspect** **E: Execution**
Cont: Contractor **Cons: Consultant**

INSPECTION ANDTEST PLAN FOR PIPE LAYING

PROJECT NAME:

NO	Activity / Description	Inspection /Test Requirements		Reference Documentation		TESTING / INSPECTION ROLE				
		Test of Inspection	Stage/Frequency	Acceptance Criteria	Verifying Document	Cont	Cons	Client	Name	Sign & Date
1.0	**Material/ Approval/ Preliminaries**									
1.1	Drawings	Approval	Prior to Start of Work	As per approved drawings	Approved Drawing	E	H	A		
1.2	Pipes	Hydrostatic	On delivery to site	Specification	Laboratory test Report	E	H	A		
2.0	**Trench Excavation Inspection**									
2.1	Trench Excavation	Dimensions & alignment	After excavation	Tender document Specifications clauses	Inspection Repot/Checklist	E	H	A		
3.0	**Pipe Laying Inspection**									
3.1	Pipe Laying	Size, type & Class	During Pipe Laying	Tender document Specification's clause	Inspection Repot/Checklist	E	I	W		
		Pipeline pressure test	After Pipe Laying	As per specifications clauses	Inspection Repot/Checklist	E	I	W		
		Pipe work Inspection	Before Backfilling	As per specs	Inspection Repot/Checklist	E	H	A		

R: Review **W: Witness Point** **H: Hold Point** **A: Approve** **I: Inspect** **E: Execution**
Cont: Contractor **Cons: Consultant**

APPENDIX F: STANDARDS

S. N	Standard Number (Identification Number)	Standard Description
1.	TZS 921 /ISO 4427	Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE)
2.	TZS 605 /ISO 1452	Plastics piping systems for water supply and for buried and above - ground drainage and sewerage under pressure-Unplasticized poly (vinyl chloride) (uPVC).
3.	TZS 2345/ 1S0 21138	Plastics piping systems for non-pressure underground drainage and sewerage Structured-wall piping systems of un plasticized poly (vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 2: Pipes and fittings with smooth external surface, Type A.
4.	C-950	American Water Works Associations.

APPENDIX G: RAW MATERIAL RECEIVING PROCEDURE