TERMS OF REFERENCE

CONSULTANCY SERVICES FOR THE SUPERVISION OF REHABILITATION WORKS OF TIGA DAM PHASE II (IMPROVEMENT OF EMBANKMENT) IN HADEJIA-JAMA'ARE RIVER BASIN, KANO STATE

Procurement Reference Number: FMWRS/SPIN/QCBS/CS/2025/021

October, 2025

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ABBREVIATIONS & ACRONYMS

BCM	Billion Cubic Meters
BEME	Bill of Engineering Measurements & Estimates
BOT	Build-Operate-Transfer
BPE	Bureau of Public Enterprises
BOQ	Bill of Quantities
CAC	Corporate Affairs Commission
CADP	Commercial Agriculture Development Project
CDD	Community-Driven Development
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DARES	Distributed Access through Renewable Energy Scale-up Project
DDRO	Department of Dams and Reservoir Operations
DISCOs	Distribution Companies
DISREP	Distribution Sector Recovery Project
E&S	Environmental & Safeguards
EAP	Emergency Action Plan
EPSRA	Electric Power Sector Reform Act
ETP	Energy Transition Plan
FCV	Fragility, Conflict & Violence
FEC	Federal Executive Council
FGN	Federal Government of Nigeria
FMP	Federal Ministry of Power
FMWRS	Federal Ministry of Water Resources and Sanitation
FLID	Farmer Led Irrigation Development
FPMU	Federal Project Management Unit
FX	Foreign Exchange
GDP	Gross Domestic Project
GENCOs	Generation companies
GHG	Green House Gas
HA	Hydrological Areas
ha	Hectare
HPPs	Hydropower Plants
ICOLD	International Commission on Large Dams
ICRC	Infrastructure Concession Regulatory Commission
IFC	International Finance Corporation
IMT	Irrigation Management Transfer
LiDar	Light Detection and Ranging
MO	Market Operator
NIDP	National Irrigation Development Program
NIWRMC	Nigeria Integrated Water Resources Management Commission
NPMU	National Project Management Unit
NREEEP	National Renewable Energy and Energy Efficiency Policy
NWR	National Water Resources
NWRI	National Water Resources Institute
NWRMP	National Water Resources Master Plan
O&M	Operations and Maintenance
PAD	Project Appraisal Document
PBC	Performance-Based Condition
PDO	Project Development Objective
PMU	Project Management Unit
PforR	Program for Result
PPP	Public-Private-Partnership
PSRP	Power Sector Recovery Program
PEWASH	Partnership for Expanded Water Supply, Sanitation and Hygiene
PIM	Participatory Irrigation Management
PPMS	Project Performance Management System
R&D	Research and Development
RBDA	River Basin Development Authorities
SDGs	Sustainable Development Goals
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
SPIN	Sustainable Power and Irrigation in Nigeria
SSP	Statement of Sector Policy
SURWASH	Nigeria Sustainable Urban and Rural Water Supply, Sanitation and Hygiene Program
TCN	Transmission Company of Nigeria
TRIMING	Transforming Irrigation Management in Nigeria
WBG	World Bank Group
WUAs	Water User Associations
WUG	Water User Groups

MW	Mega-watts
NBET	Nigerian Bulk Electricity Trading Company
NDC	Nationally Determined Contribution
NDU	Nigeria Development Update
NESREA	National Environmental Standards and Regulations Enforcement Agency
NERC	Nigerian Electricity Regulatory Commission

Terms of Reference
CONSULTANCY SERVICES FOR THE SUPERVISION OF REHABILITATION WORKS OF TIGA DAM PHASE II (IMPROVEMENT OF EMBANKMENT) IN HADEJIA-JAMA'ARE RIVER BASIN

INTRODUCTION

The Federal Government of Nigeria has received a Credit from the International Development Association (IDA) for the implementation of the "SUSTAINABLE POWER AND IRRIGATION FOR NIGERIA" (SPIN) project in an effort to diversify the economy and create significant welfare improvements for Nigerian citizens; and now desires to achieve nation-wide sustainable growth in agricultural production.

The Project Development Objective (PDO) is to strengthen dam safety and improve management of water resources for hydropower and irrigation in selected areas of Nigeria. The number of people protected from floods and droughts through enhanced dam safety and operations is a PDO-level indicator which the SPIN Project aims to drive vigorously.

The project has four components as mentioned below. The consultancy service described in this TOR forms part of Sub-component 1.1.1

Table 1: SPIN Project Component and Activity Description

Project component	Main Activities
Component 1: Institutional Strengthening and Capacity Building for Water Resources Management	
Subcomponent 1.1:	Institutional Strengthening and National Knowledge Exchange on Water Resources Management at State Level
Subcomponent 1.2:	Institutional Strengthening and National Knowledge Exchange on
Subcomponent 1.3:	Water Resources Management at State Level Improving WRM at River Basin Level
Component 2: Irrigation Modernization	
Subcomponent 2.1:	Mobilization and Development of Water User Associations (WUAs)
Subcomponent 2.2:	Irrigation and Drainage Infrastructure Investments
Subcomponent 2.3:	Irrigation Management Modernization
Component 3: Improvements in dam operations and enhancing dam safety	
Component 4: Project Management	

Component 1: **Institutional Strengthening and Capacity Building for Water Resources Management** aims to support policy, institutions, and regulation at the federal, state, and river basin levels and collaboration among irrigation, dam safety, and hydropower stakeholders to promote Integrated Water Resource Management (IWRM) and help achieve the food-water-energy nexus in Nigeria. The component will institutionalize and scale up the implementation structure, processes, and design standards successfully piloted by the TRIMING Project while integrating lessons learned. This activity falls under Activity 1.1.1 and aims to strengthen the capacity and improve the management framework for dam owners,

operators, and agencies overseeing dam safety to help address dam safety risks by (a) setting up a digital dam asset management system; (b) strengthening the dam safety institutional structure and developing improved national dam safety technical guidelines and manuals to complement NESREA's checklist; and (c) institutionalizing capacity assessment and delivering capacity building for the personnel involved in dam safety, including policy makers, owners, operators, and dam safety organizations at the Federal, RBDA, and at dam site levels. It will help the FMWRS deploy multidisciplinary specialists and purchase necessary equipment to perform dam safety mandates both at the federal and RBDA level, consistent with the legislation for dam safety requirements.

Background Information:

The Kano River Irrigation Scheme (KRIS) within which the Tiga Dam falls, is located in the Rano, Bunkure, Kura, and Garun Malam Local Government Areas of Kano State. The entire scheme lies within Latitudes 11036'10.89" and 11050'30.10" North; and Longitudes 8023'33.33" and 8037'08.68" East. The area is of hilly/rocky and undulating topography. As such the irrigated areas are essentially made of selected landforms on which gravity irrigation is practicable, scattered within the mass location. The original design capacity of Tiga Reservoir is 1.97 billion m3 which serves the downstream irrigation area of 22,000 hectares known as KRIS, out of which 14,444Ha was rehabilitated under TRIMING Project intervention. The Dam also contributes to the channel flow that impounds Hadejia Barrage which is a source of Irrigation water for Hadejia Valley Irrigation Scheme.

The Tiga Dam is located in the southwest of Kano State, Nigeria, along the banks of the Kano River, a tributary of the Hadejia River, within the local government area of Bebeji. It is approximately 89.7km away from Kano City (see Fig. 1.1-1).

Figure 1: 1-1 Geographical Location Diagram of Tiga Dam

The dam is a broad central impermeable core zoned earthfill dam, with a maximum dam height of 33m (excluding cutoff trench). The dam crest width varies 5 to 12m, and the dam crest length is 6km. The original design capacity of Tiga Reservoir is 1.97 billion m^3, which is a major irrigation project in Kano State, with a downstream irrigation area of 20,000

hectares. After the feasibility study design of the dam was completed by the United States Bureau of Reclamation (USBR) and partial "design level site investigation" was carried out by NEDECO (Netherlands), the detailed design and construction of the dam was undertaken by the Water Resources Division of the Kano State Ministry of Works and Surveys in Nigeria from 1971 to 1974. The dam is presently owned by the Federal Ministry of Water Resources and Sanitation and operated by the Hadejia Jama'are River Basin Development Authority (HJRBDA).

Brief Description of Tiga Dam:

The Tiga Dam is a zoned earthfill dam with a broad impervious core. The upstream and downstream dam shells are made of permeable or semi-permeable soil, with an upstream slope ratio of 1:3 and a downstream slope ratio of 1:2.5. There is a cut-off trench at the bottom of the clay core wall, with a maximum depth of 9 meters, and a row of curtain grouting extends 13 meters into the bedrock below the cutoff trench. The downstream side of the impervious core has a chimney drain connected with a horizontal blanket drainage layer at the foundation. The upstream slope is protected with riprap, while the downstream slope is grassed. The dam crest elevation is 531.20 meters (initially 530.96 meters), the normal water storage level is 523.87meters (initially 527.20 meters), the maximum dam height is 33 meters (excluding cutoff trench), the crest width ranges from 5 to 12 meters, and the crest length is 6 kilometers.

Based on the data provided by the owner, the design section is shown in Figure 1.1-2. The calculation model for this analysis is drawn by referencing the design section on the basis of the measured dam profile.

Figure 2: 1-2 Design Section of Tiga Dam

Key Conclusions of Previous Safety Appraisal

Since its completion in 1974, several international engineering companies have conducted safety appraisal on the Tiga Dam. The main conclusions of those safety appraisals are as follows:

In 1978, the dam safety assessment report made by Haskoning (Netherlands) concluded that the design was incomplete in providing sufficient detail for the size of the dam, and the design of the outlet was inadequate; The foundation treatment was not adequate and quality control on embankment placing and compaction was inadequate. The recommendations proposed included improvements to the outlets and dam drainage, lowering the full supply

water level, strengthening monitoring and management.
In 1987, the USBR conducted a safety assessment on the dam and provided recommendations: taking temporary measures to reduce the risk of dam piping (such as excavating a seepage berm); lowering the full supply water level by excavating a new bywash spillway.
In 2002, Mr. L J S Attewill of Jacobs GIBB Ltd was commissioned to conduct a safety appraisal of the Tiga dam. The appraisal report pointed out that the main threats on the Tiga dam are internal erosion due to arching of fill material over cut-off trench, internal erosion caused by a fracture of one of the two secondary outlet pipes, and slope failure under seismic load.
From 2014 to 2016, Royal Haskoning DHV (Netherlands) conducted an assessment on the safety status of the Tiga dam and proposed a maintenance and upgrading plan for embankment, mainly including: heightening the dam crest elevation to 531.20m (the maximum settlement between 1978 and 1990: 1.2m), adding a layer of large-particle riprap to the upstream slope, repairing the upstream sliding surface tension cracks, dredging piezometer, and adding new dam crest settlement observation piers.
Consultant may research on other previous safety appraisal documents on Tiga dam such as hydropower component e.t.c.

Previous Dam Reinforcements Efforts

The construction of the Tiga Dam started in 1971 and completed in 1974, with first impoundment in May 1974. In September 1977, the first spilling was recorded; indicating serious concerns about the safety of the dam due to inadequate design and construction. With visible deterioration of embankment, some improvements and upgrades recommended by several international engineering companies were implemented on the embankment during the operation of the dam, as follows:
In 1988, for safety reasons, a 200m length of embankment to the left of uncontrolled concrete spillway was excavated to rock, in order to reduce the full supply water level from 527.3m to 523.87m.
1989 – 1995: An extension of blanket filter and installation of a toe drain in the area to the right of main outlet was implemented, which effectively improved the dam drainage system and reduced the risk of dam piping failure.
September - October 2020: Freeboard improvement by raising crest to 531.05m (plus 15cm asphalt pavement to 531.20m).
2021: After completion of crest raising, FMWR commissioned a local contractor to construct a layer of asphalt pavement (10cm gravel + 5cm asphalt) on the dam crest.
December 2024 – June 2025: Restoration of the Drainage Channels and Stairs; Construction of 45 Nos. relief wells with appurtenances (including measuring weir) to the left of main outlet; Curtain Grouting for sealing of the cracks by drilling and curtain grouting along the dam axis, using silt clay slurry and cement clay slurry, to a depth of no less than 15m from the relative dam crest elevation of 531.20 masl; and Excavation of the downstream toe area for finger drains, connection of finger drains to V-notches for conveyance to toe channel.

Crack Development History

After the completion of the Tiga Dam in 1974 and based on analysis, summary of safety appraisal reports of multiple international engineering companies and existing data, the timelines for crack development is recorded as follows:
1978: cracks were not mentioned in Haskoning's safety evaluation on the Tiga Dam.
1987: cracks on the dam crest were mentioned in USBR's Safety Assessment Report on the Tiga Dam, with a depth of up to 2m, but it concluded that it is unlikely that they are sign of embankment failure. Filling cracks by silt-clay-sand slurry was recommended.

2016: Royal Haskoning DHV's Safety Evaluation and Design of Upgrades Report, mentioned that only one crack was found in the crest near main outlet, and later determined to be caused by blasting for the hydroelectric power station.

September 6th, 2020: Messrs Sinohydro Corporation Ltd – a contractor, reported to the FMWR that longitudinal cracks were found on the embankment crest. one of which was 30m long, 10cm wide, and 60cm deep visually, and located 200m away from the left outlet of Tiga dam. By end of **October 2020**, the same contractor increased the height and filled the embankment crest according to the Ministry's instructions. Shortly afterwards, a local company was commissioned to construct asphalt pavement (10cm gravel + 5cm asphalt) on the embankment crest.

November and December 2022: Following an unprecedented devastating flood which occurred from September – October 2022 in Hadejia-Jama'are River Basin, new reports emerged of the longitudinal cracks in the asphalt road on the crest of the Dam.

January 2023: Two (2) major cracks were identified and investigated by probe pit as follows:

Chainage	Additional Earth Fill to Crest Level (m)	Max. Crack Width (cm)	Crack Depth (m)	Longitudinal Length (m)
0 + 850 – 0+900	1.19 – 1.09	6.12	1.05	50
1+500 – 1+550	1.05 – 1.24	19.6	1.60	50

February 2023 – Second-half of 2023: A geophysical survey using vertical electrical sounding method and a geotechnical investigation including borehole drilling, site testing and sampling, laboratory tests and data processing were carried out to determine the sub-surface condition of the embankment soil along the Tiga Dam.

Based on geophysical and geo-technical investigation conducted on the Tiga Dam Embankment, extensive remedial works were carried out to restore the internal structural distortions and displacements revealed by the Investigations through a) improvement on the entire drainage systems on the Dam body, b) monitoring seepage on the dam through the installed instrumentation equipment including repair of faulty units, c) Cracks treatment and downstream improvement, d) Spillways improvement and other related activities and e) proper operations and maintenance activities by the dam operator (HJRBDA). Also, the report of the investigation recommended the adoption of a phased approach towards tackling the lingering issues by i) Monitoring the drainage system in the short term whilst carrying out detailed studies and design and ii) carrying out improvements based on the studies and design aimed at treating the observed cracks and other related activities. The proposed remedial works were to be conducted in two (2) phases:

Phase 1 works:

Topographic/Terrain Surveys, Studies, Engineering Designs and production of Detailed Drawings;

Restoration of the Drainage Channels

Laying of Asphalt Pavement on the dam embankment crest, 5 cm thick

Construction of 45 Nos. relief wells with appurtenances (including measuring weir);

Curtain Grouting for sealing of the cracks by drilling and curtain grouting along the dam axis, using silt clay slurry or cement clay slurry, to a depth of no less than 15m from the relative dam crest elevation of 531.20 masl; and

Excavation of the downstream toe area for finger drains, connection of finger drains to V-notches for conveyance to toe channel.

The above works were completed in June 2025 and currently under defects liability period, with the exception of the asphalt laying that was postponed to phase II of the project.

Phase 2 works shall consist of the following:

Restoration of downstream slope embankment to 1:2.5 by stepped fill and compaction of the degraded downstream curvilinear section to **Return the Dam Back to its original design**

vertical and horizontal geometries as required. The compaction degree shall not be less than 98% at Chainage 0+000 to 3+ 400.
Laying of Asphalt Pavement on the entire dam embankment crest.

OBJECTIVES OF THE SUPERVISION ASSIGNMENT

The FMWR&S through the Federal Project Management Unit (FPMU) now wishes to engage a qualified consulting firm to provide supervision services on the Dam Safety rehabilitation of Tiga Dam phase 2. The detailed design for this assignment has been reviewed and accepted by the FMWR&S and shall form the basis for the proposed works which the consulting firm will supervise based on approved drawings, Work Requirements / Technical Specifications, etc necessary to enhance the safety standard of Tiga Dam; its associated appurtenant structures and the resilience of downstream population at Tiga Dam.

Overall Objective

The overall objective is to provide international-standard Engineering Supervision of the Phase 2 remedial works on Tiga Dam aimed at enhancing its safety standards including the appurtenant structures as per the detailed designs, bidding documents, construction methodologies, implementation schedules, etc. as approved by the SPIN project (FPMU).

Specific Objective

The specific objective of this aspect of the consulting services is to assist the FMWRS/FPMU to implement the project as follows:

To provide contract administration services as "the Engineer's Representative" in accordance with FIDIC guidelines;

To ensure high standards of quality assurance in the execution of works by the contractors and to actively facilitate completion of the works within the stipulated time and cost.

To provide comprehensive supervision of project implementation activities carried out by the contractors and ensure complete compliance with the design drawings, technical specifications and various stipulations contained in the contract documents; and

To undertake comprehensive and independent measurements of work items, computation of quantities and detailed record-keeping for the estimation of interim payments and computation of final and measured quantity as the need arises for final payment.

SCOPE OF CONSTRUCTION SUPERVISION

The scope of works and Specifications for the rehabilitation activities are contained in the Contract documents. The consultant scope of services of the assignment shall include, but not limited to, the following Tasks:

Task (i): Supervise Main Works; including verification and approval of the Contractor's Health and Safety provisions (of works and visitors to site), general supervision of Construction, review and monitoring of contractor's work program (Construction, Equipment Supply, Installation, Commissioning, Materials and Related activities), conduct quality Control of Civil Works, conduct independent measurement and estimation and review the Contractor's Claims (Payments and Variations), environmental monitoring activities. review and monitor contractor's rehabilitation works, manning schedule, equipment supply, installation and commissioning programs and activities.

The consultants task will include the review of the following: Rehabilitation programs; Equipment supply programs; Integrated Rehabilitation Program, and schedule; Progress monitoring of rehabilitation activities; review and approve partial and final taking over certificates, As-Built drawings, Operations and Maintenance plan/manual, Acceptance of the Works, Defects liability Period; Review contractor's submission for completion & handover of works and related activities as appropriate; conduct weekly or monthly tripartite meetings (Owner, Engineer, Contractor) as and when necessary on work progress, emergency alterations and variation items and other important matters.

Task (ii): Supervise Equipment Supply, Testing and Commissioning, Review contractor's submission and supervise installation, ensure Quality Assurance and manage the commissioning and performance testing of equipment; Quality Assurance and Management: General Factory Witness Inspection and Acceptance Tests; Preparation, Commissioning, Start-up, Post-commissioning and O&M.

Task (iii): Supervision of implementation of the Environmental and Safeguards Management Plan (ESMP). Assist the FPMU to Establish procedures for monitoring ESMP implementation, prepare a detailed program for implementing the ESMP during Construction, review and update of the ESMP (including Gender), review Contractor's environmental reports, coordinate with Client, Local Authorities and contractors as need be, conduct capacity building and training of Safeguards and Gender Officers (including Counterpart Staff) and review of the overall approach.

Task (iv): Conduct Technology Transfer. Work with the FPMU to design the approach and methodology as well as the scope of the technology transfer component. Define the scope of the technology transfer component; Conduct on-the-job training; Conduct and organize operation and maintenance training; Preparation of As- Built drawings of rehabilitated works; Preparation of Standard Operating Procedures (SOP) of Reservoir and Electromechanical Installations; Preparation of Safety Operation Manual(s) of reservoirs and installations; As and where necessary the progress of implementation should be with photo/video recorded.

Task (v): Preparation of all project reports – monthly progress reports, quarterly reports, incident reports, routine technical reports, completion reports, etc. Consultant shall prepare monthly reports fully describing the progress of work and the services rendered during the month under review, indicating also the problem areas and action required to overcome them.

Specifically, the scope of the consulting services for each of the major areas includes but is not limited to the following activities: -

Quality Control

Review of all mix designs proposed by the contractor and approve/suggest modifications in the mix design, laying methods, sampling and testing procedure, and quality control measures, to ensure required standard and consistency in quality and performance at the commencement of works. The approval of mix designs with or without modifications shall be issued as early as possible, but in any case, not later than the time limit prescribed in the relevant specifications. In cases where no time limit is prescribed in the specifications, not later than 14 days from the date of submission of Job Mix Formula (JMF) by the Contractor.

Evolve a system of Quality Assurance of works, including, but not limited to, establishing testing frequencies and acceptance criteria for all construction activities based on best international practices;

Inspect the performance of the work with regard to workmanship, compliance with the specifications and all necessary testing required for acceptance of any item of work;

Inspect and approve all materials sources nominated by the Contractor;

Assess and check the laboratory and field tests carried out by the contractor and carry out independent and comprehensive tests in the consultant's own or independent material testing laboratory.

Issue orders to the contractor to remove or make good any work which is found to be:

1. Not in accordance with the working drawings;

2. Not in accordance with the specifications in terms of either work method or materials specification;
3. Covering work which has not been inspected for acceptance or rejected as unacceptable;

Maintain independent records of all testing work, including cross referencing to items of work to which each test refers and location from which any samples were obtained for testing;

The consultant will process interim and final payments to the contractor in accordance with contract. Interim monthly payments shall be based on interim payment certificates processed by the consultant following claims filed by the contractor.

Supervision of Construction Work

The consultant will be responsible for the supervision of all construction works.

The consultant will make all necessary measurements and control the quality of works. The consultant will make all engineering decisions required for the successful and timely implementation of the construction contract. He will have powers that are defined as those of 'The Engineer' with the exception of the following, for which he will seek prior approval of the "Employer" using FIDIC Guidelines:

a) Issuing the order to commence the works;

b) Issuing/approving variations in quantities not exceeding 3% percent variation for individual item or aggregate variation not exceeding 0.1% of the contract value;

c) Issuing/approving/sanction of additional items, sums or costs;

d) Variation of rates and prices;

e) Approving subletting of any part of the works;

f) Recommending any extension of contractual time limits;

g) stopping and/or termination of the Contractor for Works.

The Consultant will be responsible for the supervision of all construction work. As the 'Engineer's Representative' the Consultant will administer the Construction Contracts for relevant packages and ensure that the Contractual clauses with respect to both quality and quantity of works, are respected and the works are constructed in accordance with the provisions of the Construction Contract. The Team Leader of the consultant's team shall be nominated as Engineer representative as may be necessary for day to day working. However, the Supervision consultant shall be responsible for all action taken by Engineer's representative and his team. For this purpose, the Engineer will undertake regular visits to the project site not less than quarterly, or as he may deem necessary. The Supervision Consultant will make all necessary measurements and control the quality of works. The supervision consultant will make all engineering decisions required for the successful and timely implementation of the Construction works. In addition to or as an expansion of the activities and responsibilities required of the Engineer as detailed in Construction Contracts, the supervision consultant will, inter alia, undertake, but not limited to the following activities:

Administer the Construction Contracts, approve materials, issue variation orders to the contractors and ensure that the quality of the works is in accordance with the contractual specifications;

Approve/suggest modifications in the contractor's work program, method statements, material sources, etc;

Monitor progress of the Works, identify causes, or potential causes, of any delay and advise the Employer of suitable corrective actions in a timely manner;

Monitoring of cracks

Review and approve Contractor's proposed personnel for positions nominated in the Contract;

Provide assistance to the Employer in respect of contract implementation by evaluating and making recommendations on claims and other matters;

Advise and assist the Employer with respect to arbitration and the appeal of arbitration or litigation relating to the works, whenever required;

Provide other specialist services relevant to the Project as may be agreed to, during negotiations or ordered by the Employer; on the basis of personnel rates in line with similar qualifications and experience;

Monitoring and reporting on the implementation of the Resettlement Plan in accordance with the WB 's Policy on Involuntary Resettlement.

Monitoring of status of the contractor's compliance with HIV/AIDS provisions in the Civil Works Contracts.

Will design PPMS and undertake project performance monitoring and evaluation of the Project in accordance with the Bank's Project Performance Management System (PPMS) Handbook. Baseline data will be collected by the supervision Consultants assisting the Employer before Project Commencement, throughout implementation and at Project completion.

Ensure that the construction methods as proposed by the contractor for carrying out the works are satisfactory, with particular reference to the technical requirements of sound environmental standards on the basis of the World Bank's Environmental Guidelines for Selected Infrastructure Development Project, inspection of contractor's construction equipment, safety of the works, property, personnel, and general public.

Initiate advance actions for handing over of site and/or issue of drawings, and/ or advise Employer.

Scrutinize the Construction Methods proposed by the Contractor for carrying out the works to ensure that these are satisfactory with particular reference to the technical requirements, project implementation schedule and environmental aspects as well as safety of works, personnel and the general public.

Submit for approval by the FMWR&S ably represented by the FPMU, the Quality Assurance System to be implemented by the Consultant for their own operations.

(xvi) Obtain, review and make recommendations on the Quality Assurance System of the Contractor and forward to the client for approval.

(xvii) Review of Construction plan for service roads and drainages based on review of Tender drawings and the survey carried out by the Contractor.

(xviii) Issue of all detailed drawings including canals, drainages and protection works etc.

(xix) Scrutinize and approve the Contractor's working drawings and drawings for temporary works, as required under the contract.

(xx) Review and ensure conformity of Contractor's securities in approved formats.

(xxi) Associate himself with all tests being carried out by staff of the Contractor and undertake additional closely supervised and independent tests as necessary to ensure the quality of works.

(xxii) Review the test results/certificates of all construction materials and/ or sources of materials and undertake additional tests as necessary to assess the quality of works.

(xxiii) Review and check the safety management plan prepared by the Contractor, and undertake daily safety patrol. If construction is not carried out within the framework of safety management plan, then bring it to the attention

of the Contractor and the FPMU.

(xxiv) Prepare updated and additional drawings as required during the contract period and supply to the contractor in time.

(xxv) Measurement of quantities and certification, recording of measurements, and verification of invoices of the contractor.

(xxvi) Examine the requests for advances and monthly statements of Contractors.

(xxvii) Prepare Financial Statements.

(xxix) Maintain a day-to-day diary recording of all events relevant to the works.

(xxx) Review and certify as-built and maintaining all test data and results.

(xxxi) Obtain requisite insurances and ensure confirmation of their validity.

(xxxii) Ensure validity of various securities furnished by contractor.

(xxxiii) Monitor closely and regularly the mobilization and progress of work and advise the Contractor about corrective measures.

(xxxiv) Carry out detailed checking and verification of the setting-out data for the work including lines, levels and layout to ensure conformity with the working drawings.

(xxxv) Carry out supervision of all works as per approved method statement of various items of work and ensure proper supervision as per requirement.

(xxxvi) Examine Contractor's preparation and the completed portion of work as per 'requests for inspection' and promptly advise the Contractor.

(xxxvii) Ensure taking requisite samples during execution and promptly advise the contractor about the results.

(xxxviii) Carry out regular inspection of the contractor's equipment, plant, machinery, installations, housing and medical facilities etc. and ensure they are adequate and are in accordance with the terms and conditions of the Contract.

(xxxix) Direct the Contractor to carry out all such works or to do all such things as may be necessary to avoid or to reduce the risk in case of any emergency affecting the safety of life or of the works or of the adjoining property and advise the Employer thereof as soon thereafter as is reasonably practicable.

(xl) Supervise the Contractor in all matters concerning safety and care of the work including environmental aspects and labor welfare.

(xli) Evolve and implement a system for the quality assurance of the works. The system of control of quality of materials and completed works shall also include sampling methods, criteria and acceptance criteria.

(xlii) Maintain a permanent record of all measurements for the work quantities to be paid for and the results of all tests carried out for monitoring the quality of works.

(xliii) Inspect the Works on-completion before taking over and indicate to the Site Contract Coordinator any outstanding work to be carried out by the Contractor during the Defects Liability (Notification) Period; and certify the Defect Liability certificate.

(xliv) Evolve and implement a work safety audit system

(xlv) Maintenance of co-ordination with every package of implementation of project.

(xlvi) Ensure execution of work as per implementation schedule.

(xlvii) Prepare and issue the following reports in hard and soft copies, in the format and content acceptable to the Employer as shown in **Table 1: Deliverables and Timing.**

(xlviii) Ensure that staff are trained on the Code of Conduct (CoC), and on GBV /SEA/SH prevention.

(xlix) Ensure that all staff read, understand and sign CoC before commencement of assignment.

(l) Conduct an Integrated Water Resources Management (IWRM) and allocation assessment with recommendations for all user groups.

(li) Monitor structural cracks and associated instruments, with analysis provided by the consultants.

(lii) Carry out seepage monitoring and flow measurements throughout the project life, including detailed analysis.

(liii) Perform an observational study on the immediate and long-term effects of the power plant at the dam toe on the safety of the dam complex.

Design/Technical

The Consultant's work will include if required, amending the alignment plans, profile drawings, and other elements of the works, based on updated topographic survey of the project site, including data gathered by the Contractor as work proceeds. The Construction Drawing are to provide full construction details which will include, but not be limited to, the following:

Good construction drawings shall be issued by the Consultant as early as possible, but in any case, no later than 14 days from the date of submission of relevant data by the contractor.

Make necessary modifications to the design and drawings wherever required due to levels or conditions that are found on site as a result of the change in the founding strata or any other reason at the time of execution

Ensure that Good Construction Drawings as issued to the Contractor are complete, consistent and coherent across the entire project;

Measurement and Payment

The consultant will process interim and final payments to the Contractor. Interim monthly payments shall be based on interim payment certificates processed by the consultant following claims filed by the Contractor. The Consultant will be accountable for the quality and the measured quantities of the work. The Consultant will independently take-off all quantities from drawings for items defined in the Bill of Quantities and arrive at independently substantiated measurements, keeping neat and accessible measurement records for each interim certificate and the final certificate, including the maintenance of any measurement books issued to him.

The Consultant will make a comparison of independently calculated quantities and the Contractor's estimated quantities as presented in his interim certificates for payments, and any differences will be resolved in the physical presence of and signed off by the Resident Engineer and contractor's representative

Issue interim certificates for payments;

Certify completion of part or all of the works;

Review and ensure continuity of contractors' sureties in approved formats;

Prepare quarterly cash flow projections. Cash flows should identify budget estimates for all outstanding work;

Update cost estimates each year or at quarterly completion (25 percent, 50 percent, 75 percent, and 100 percent) of the Project, whichever takes place early;

Maintain records of all plant, labour and materials used in the construction of the Works;

Check Contractor materials ordering schedule;

Analyze any contractual claim submitted by the Contractor and prepare a report addressing the actual basis, in terms of both technical and financial issues, for the claim and recommendations for a response to the Contractor;

Prepare financial statements and withdrawal applications.

The consulting firm will provide engineering services that cover the tasks described above including contract administration, rehabilitation supervision and specialist support during the rehabilitation, supply commissioning, and testing and early operation phases of the project. The team will act as the Supervision Engineer forming an integral part of the project

supervision consultant.

CONSULTANT QUALIFICATIONS AND STAFFING REQUIREMENT

To ensure the successful supervision of the Phase II rehabilitation works of Tiga Dam, the consulting firm must meet the following qualifications and staffing requirements:

Consultant Qualification Requirements.

A. Legal Status and Eligibility

- The firm must not be under suspension or debarment by the World Bank or any Nigerian regulatory authority.
- Must demonstrate compliance with World Bank procurement guidelines and environmental/social safeguards.

General Experience

- The firm shall be in the business of providing engineering consultancy services related to infrastructure for at least 15 years.

Specific Experience

The firm must demonstrate successful completion of at least two similar assignments in the last five (5) years, each meeting the following criteria:

- Must have proven experience in Supervision of concrete dam construction, rehabilitation, or remedial works, especially embankment stabilization and hydraulic structures and familiarity with instrumentation and monitoring systems for dam safety.
- The consultants must have supervised projects with a minimum value of USD 2 million.
- Experience in geotechnical investigations, slope stability analysis, and seepage control.
- Experience in environmental and social compliance monitoring under or equivalent frameworks.

Experience in supervising contracts using FIDIC Conditions of Contract (Red, Yellow, Emarald, Silver Books)

D. Technical Capacity

- Access to qualified professionals in dam engineering, geotechnics, hydrology, environmental and social safeguards, and contract management.
- Availability of modern tools and software for project design review, quality assurance, and reporting.
- Demonstrated capacity to mobilize field teams and equipment for on-site supervision.

The firm shall demonstrate its technical and managerial capabilities in supervision of infrastructure projects.

E. Quality Assurance and Risk Management

Documented internal quality control procedures.

Experience implementing dam safety protocols and emergency preparedness plans.

Capacity to identify and mitigate construction risks, environmental hazards, and social impacts.

Demonstrate experience in using Quality Management & Compliance Verifications Systems for large scale Dam construction projects.

F. Local Knowledge and Presence

- Familiarity with Nigerian dam safety regulations and environmental laws.
- Preferably with a local office or partnership with Nigerian firms to ensure responsiveness and contextual understanding.

Staff requirements and qualifications

The Consultant's team for the assignment is to be composed of both international/regional and local professionals. The total implementation period will consist of (i) the preparation of construction supervision of one month before commencement of civil work, (ii) the construction period of 18 months and (iii) a Defect Liability Period of 12 months. The site supervision team would be mobilized on the date of actual commencement of works by the contactor with prior approval and documented by the Employer or any designated Officer. During the defect liability period, the consultant will be required to continue on a part time basis, as and when required for which the matter shall be dealt separately at the appropriate stage towards the completion of the project.

Both key and non-key staff should be included in the bid, but only key staff will be evaluated numerically.

Staffing terms and conditions

The following guidance is suggested to respective bidders in proposing their staff.
The total implementation period will consist of:

One (1) month for the preparation period prior to commencement of rehabilitation works;

Eighteen (18) months implementation period running concurrently across the various sections of the works (Embankment & Crest, Downstream Slopes, Return channel / Emergency Spillway) and

Defect Liability Period as per the arrangement proposed (maximum 12 months).

The site supervision team would be mobilized on the date of actual commencement of works by the contactor as decided and documented by the Employer or its designated officer, except the Team lead whose services are required during the preparation period (one month before commencement of works). During the defect liability period, the consultant will be required to continue on a part time basis, as and when required for which the matter shall be dealt with separately at the appropriate stage towards the completion of the project.
After award of the contract the Employer expects all the proposed key personnel to be available during implementation of the contract as per the agreed staffing schedule. The Client will not consider substitutions during contract implementation except under compelling circumstances acceptable to the client.

Any confirmed *"bait and switch"* practice wherein a high-quality staff is proposed in the technical proposal in order to win the contract and subsequently substituted with other less qualified staff at the time of negotiations, or in the early implementation stage of the assignment is frowned upon. Evidence of such practice would be grounds for contract termination. Proposals should include an account of proposed staff assignments, their durations and schedules, and their levels of input by tasks.

Indicative key expert's requirement for this assignment

Consultants are required to furnish the Bio-data of the following key personnel:

Key Staff: For entire contract works supervision

Chief Resident Engineer- Civil Engineer (CRE-Team Leader) 1no

Resident Geotechnical Engineer (i/c of QA/QC)	1no
Contract Specialist	1no
Senior Quantity Surveyor	1no
Occupational, Health and Safety Officer (OHS)	1no

Non-Key staff

Civil Engineers	2nos
Quantity surveyor (measurement)	2nos
Land Surveyor	1no
Safeguards Officers (ESHS & Gender)	3nos
CAD Draftsman 2 (drawings/doc control)	2nos
Field / Laboratory Technicians	2nos
Field Survey Team	2nos
Administration assistants	2nos

Preferred Qualification Requirements for Key Personnel

The requirements stipulated are "preferred" qualifications meeting of which would be rated "average" in the technical evaluation. However, qualifications specifically mentioned with language such as "minimum" or "at least" are minimum qualification requirements, failing which may be considered as "noncompliant" for those specific requirements.

Team Leader/Chief. Resident Engineer

The Team Leader who will be permanently available for this assignment should be a highly experienced engineer, with a minimum of master's degree in civil engineering or equivalent, having overall experience of at least 25 years in Civil Engineering. He should have worked as Senior or Chief Resident Engineer or as 'Engineer' or 'Engineer's Representative' for at least fifteen (15) years, with at least 8 years on design and supervision of Dam projects costing over USD$15 million (single project) and on supervision of rehabilitation of Dams. The person should have experience in contract administration of large dam projects in his home country or in other developing countries, preferably in Africa. He must have experience of supervising the Dam projects in difficult areas. Must be familiar with FIDIC Conditions of Contract and must be fully writing-proficient and fluent in the English language.

Resident Geo-Technical Engineer

Person shall/must possess a minimum of Master's degree in Geo-technical Engineering or Civil Engineering with at least overall 20 years' experience and a minimum of fifteen (15) years in assessing ground conditions (soil and rock) for the safety and stability of dam foundations and the dam itself, covering investigation, design, construction, and ongoing operation and maintenance. Their responsibilities shall include analysing soil properties, designing stable foundations, preventing issues like seepage and liquefaction, and monitoring the dam's structural integrity over time to prevent failure. Essential requirements also include experience in dam projects design and implementation, proficiency with design and analysing software like AutoCAD and Excel, strong communication and problem-solving skills and, the ability to work effectively in multidisciplinary teams. Practical experience is crucial with specific requirements for design, construction and management of dam systems. Ability to use both standards-based deterministic and risk-based probabilistic evaluations of earthen dams and levees, concrete dams, spillways, outlet works, and other ancillary structures using state of the practice modelling and analytical

methodologies will be an advantage. Experience in facilitating risk-informed-decision making (RIDM) by performing quantitative and semi-quantitative risk assessments (QRA and SQRA), developing and implementing risk reduction measures, consequence and hazard potential evaluations, emergency action planning and exercises will be an advantage.

Contract Specialist

Person should be a senior level engineer with a minimum of bachelor's degree or its equivalent in civil engineering or its related discipline and overall experience of 20 years in infrastructure projects. He must have professional experience of 12 years in Dam project/Water sector or works of similar nature and has worked for at least 8 years in Contract Administration of large size international FIDIC based Contracts, costing over $10 million (single project). Experience in arbitration and dispute resolution procedures shall be preferable.

Senior Quantity Surveyor

Professionally qualified quantity surveyor, civil engineer or equivalent, preferably with 15 years overall experience where 10 years' experience is expected on projects similar to the assignment, and 5 years' experience on projects located in environments similar to the project. At least part of this experience will be on World Bank or similar international development agency-financed projects that have used the agency's standard FIDIC-based procurement documents. The QS engineer will be responsible for preparing cost estimates for the works, through developing unit rates for each of the work elements, preparing bills of quantities, and contributing as required to the preparation of the project's civil works procurement documentation. Key qualifications include expertise in cost estimation, BOQ production, tendering, contract management, and proficiency with relevant software. Crucially, they must possess strong analytical, communication, and problem-solving skills, along with commercial awareness and a deep understanding of construction and irrigation engineering principle. Must have experience in the preparation of quantity/cost records/planning of works using project management software such as M/S Project, PRIMAVERA or other Critical Path Method (CPM)/Program Evaluation and Review Technique (PERT) software, in the administration and scheduling of Construction activities in the context of the FIDIC Conditions of Contract and of technical specifications and methods of measurement.

Occupational, Health and Safety

The Key Expert shall have the appropriate level of academic (minimum of BSc) and professional qualifications and experience to recognize and to deliver good international industry practice with respect to Environment, Social, Health and Safety (ESHS). Post graduate degree in Environmental Civil Engineering, Environmental Management/ Science, Natural resource management or other relevant fields, having overall experience of at least 12 years, at least 8 years of work experience in the implementation of Environmental and Social Management Plan/ Environmental Audits for Projects financed by international donor agencies. In addition, proven experience and accomplishment in the following specific areas is recommended:

Experience in assessing and reviewing environmental and social safeguards compliance documents related to the infrastructure and Agriculture sectors;

Knowledge of Nigerian Federal and state legislations related to environment, & social issues in infrastructure sector such as Irrigation, Agriculture, Water Resources etc.;

Knowledge of the Federal Ministry of Environment regulations and procedures; and World Bank Safeguards Policies will be an added advantage;

Proven track record in working effectively within multidisciplinary teams;

Evidence of being able to work effectively in high-pressure environment and to tight delivery deadlines;

Literacy in Geographical Information System (GIS) is recommended;

Candidate must be computer literate and should have good verbal and written English language skills.

Resident Civil Engineers (Non-Key) – 2nos

Civil Engineer – Geotechnical
Civil Engineer- Hydraulic structures and Concrete expert
Person should be a senior level engineer with a minimum of a bachelor's degree in civil engineering with specialty in Geotechnical and Hydraulics as the case may be. Should have professional experience of 15 years in the Water Resources sector construction projects or in works of similar nature and has worked for at least 5 years on design and supervision of Dam projects costing over USD$5 million (single project). Should have experience in planning and monitoring Dam rehabilitation works using project management software like MS project software for administration and scheduling of water resources projects. The person should be conversant with the FIDIC Conditions of Contract and technical specifications and methods of measurement currently used in Nigeria or any other developing countries.

Quantity Surveyor (-Measurements, Non-key) – 2nos

Person should have a minimum of bachelor's degree or its equivalent. He should have professional experience of at least 5 years in civil works of similar nature, and has worked for at least 8 years as Quantity Surveyor. Must have experience in the preparation of quantity/cost records/planning of works using project management software such as PRIMAVERA or other Critical Path Method (CPM)/Program Evaluation and Review Technique (PERT) software, in the administration and scheduling of Rehabilitation activities in the context of the FIDIC Conditions of Contract and of technical specifications and methods of measurement.

Notes:

The input of the Team Leader, who should have overall coordination of the experts in all the sites, includes one (1) month of advance mobilization prior to mobilization by the contractor and four (4) months during the defect liability period.
Visits and review by 'Engineer or any other staff of headquarters will be deemed to have been covered within the overheads.
For the purpose of the technical evaluation, the assessment will be limited to key experts Nos.1-5.

In their proposals, ''Consultants are free to comment, modify any or all of these indicative key staff positions, in conjunction with the provision of corresponding sound reasoning and justifications, and provided that such changes are commensurate with the required scope of services during or before the pre-proposal conference''. The total estimated person-months for the key experts is seventy-five (75) man-month for the entire assignment. Each position can be filled by more than one staff if timing and the level of effort so requires, in which case the CV of all proposed staff shall be included in the technical proposal.

Other (non-key) staff shall have at least 5 years of professional experience in related assignments. Demonstrable satisfactory execution of the dam systems requiring a multi-disciplinary study team with high levels of both technical and social skills should be emphasised. Consultants are required to propose teams that will bring an appropriate mix of disciplines, education, skills and levels of experience, sound understanding of development issues, and strong international and/or regional experience on similar projects.

ORGANIZATION AND MANAGEMENT

Executing Agency

The Federal Ministry of Water Resources & Sanitation (FMWRS) / FPMU and concerned State Departments / RBDAs (in this case Hadejia / Jama'are River Basin) are the project executing agencies. The Federal Project Management Unit (FPMU) of the SPIN project is established within the FMWR&S is responsible for overall coordination, monitoring and evaluation of the consultancy activities. The consultant is to report directly to the FPMU, who will facilitate the activities of the Consultant's team and provide coordination and linkages between the consultant, FGN and other national organizations as needed and the World Bank. In the event of problems encountered during execution of the assignment that are affecting or could affect works-supervision performance, progress and results, the consultant is to communicate directly with the FPMU on an urgent and immediate basis, identifying the problems, outlining and recommending measures for their resolution, and requesting PMU assistance, intervention or approvals if and as needed. The project is also advised and supervised intermittently by a highly qualified team of specialists named Dam Safety Panel of Experts (DSPoE)

Offices, Facilities, Support Staff and Services

The Consultant is to have site offices in close proximity to Tiga Dam. The Consultant will be responsible for all costs related to offices, office facilities, transportation, communication, support staff and support service arrangements, as well as for all study data collection, survey, investigations, analysis, design, drawings and reports production arrangements, Consultants should therefore make provision for all such costs, as well as for the Consultant's own assignment costs, as reimbursable expenses in their financial proposals.

The Consultant will cater for his own office equipment such as computers, printers, photocopying machines, related consumables, related services and transportation as may be required. The consultant will ensure that all reports, technical notes and guidelines, training kits, etc are electronically produced. Technical field audits of canals and headworks, gates etc, will be presented using a GPS referencing, GPS referenced photographs, linked worksheets and computer-assisted drawings. The Consultant's will make use of, or ensure generation of Google Earth digital files (file type .kmz) for engineering layouts, audit and site inspection photographs, soils mapping and other spatial data and overlays. The consultant is responsible for the security of its personnel and is expected to routinely liaise with the government security framework for advice in their security management.

DELIVERABLES WITH TIMELINE:

The duration required for the execution as well as for construction supervision (including Defect Liability Period) are described in Section II. The indicative schedule on Table 1 (Deliverables & Timing) and Table 3 (Proposed Schedule) below are intended to guide

prospective consultants in preparing their proposal, which include a work plan and schedule, covering activities and outputs to meet the requirements indicated in this TOR. Consultants are free to propose modifications to the indicative schedule, with corresponding justifications.

However, the consultant shall not extend the total assignment duration beyond that indicated in Table 1. The estimated time period for the construction contract is 18 months and Defect Liability Period is 12 months. Their proposed detailed schedule should include logically organized flow diagram describing key milestones and processes to include the deliverables described below.

Deliverable 1. Inception Report + Construction Supervision Manual: to be submitted 30 days after mobilization.
Deliverable 2: Progress and Financial Management Report (Monthly)
Deliverable 3: Detailed Quarterly Report
Deliverable 4: Routine / Incident Reporting
Deliverable 5: Defects Liability Report
Deliverable 6: Detailed Contract Completion Report

The various reports to be prepared by the Consultants shall be submitted both in hard (bound) and soft (electronic) formats as shown in table 1 below:

Project Monthly Progress Reports

Throughout the period of the services, the Consultant shall submit monthly progress and financial management reports to the Client. The format of the monthly reports shall be agreed with the Client at the project inception. The report should cover at least, the amount disbursed, the physical progress made in relation to projections in the inception Report and conclusions reached under specific assignments and site meetings. These reports should establish whether the contractor is complying with provisions in the contract, whether value is being delivered for money disbursed, and also highlight any specific lingering problematic issues during the month with recommendations on how they can be solved.

Project Close-Out Report

A close-out report shall be prepared and submitted at the time indicated. This report shall summarize all close-out documentation including but not limited to (a) Final integrated commissioning test results, (b) As-Built Drawings (in digital format), (c) approved O&M Manual (Phases I&II) and (d) Maintenance Management System.

Final Completion and Evaluation Report

A completion report will be prepared at the time of final handing over of works in a format to be agreed with the Client. This report shall summarize all the relevant aspects of the project implementation, project inputs, outputs, outcomes and evaluate the extent of the attainment of the project objectives and make suggestions and recommendations for future projects in relation to (a) project log-frame-in Annex II, (b) engineering design, (c) technical specifications, (d) conditions of contract, (e) rehabilitation techniques, (f) staff training, (g) routine maintenance, highlighting specific locations where special care and attention would be required and (h) framework for continuous dialogue with relevant stakeholders to ensure service sustainability. A selection of photographs printed out from the project electronic album, should be included in the report.

Table 2: Deliverables and Timing

	Supervision Phase	Description	Format
1	Inception Report	Inception/commencement report along with a construction supervision manual including; Details of all meetings held with the Client and the Contractor and decisions taken; Resources mobilized by the Consultants as well as the Contractor and the Consultants' perception in the management and supervision of the project; Master Work Program and Resource Mobilization for the Project; Quality Assurance Manual in 7 copies, detailing all QA/QC procedures, to be submitted within 30 days of commencement of services. The primary objective of the Supervision Manual will be to evolve guidelines for administration, supervision and management of the project; (not intended to be a contractual document nor is it to take precedence over the specifications), but will serve as a guide and reference to the various staff in the management and supervision of the project in discharging their duties in a smooth and systematic manner.	One electronic and 5 hard copies, to be submitted within 30 days of commencement
2	Monthly Reporting	Progress reporting	One electronic and 5 hard copies which should be submitted within 7 days of the end of each month.
3	Detailed Quarterly Report	Description of project activities, illustrated by progress/completion photographs, status of any delays and contractual claims, and details of all latest financial projections. The Progress Report (monthly and quarterly) shall contain minutes of meetings, decisions taken therein, mobilization of resources (Consultants' and the Contractors') physical and financial progress and the projected progress for the forthcoming periods. The report shall clearly bring out the delays/non-conformance(s) if any, reasons for such delays, if any, and the recommendation for corrective measures. The report shall also contain the performance data for Contractor's plant and equipment.	One electronic and 5 hard copies, to be submitted within 7 days of the end of each quarter
4	Routine Reports	Interpretation of the Technical Specifications, and other Contract Documents with routine advisory and due consultation with Technical personnel of the FPMU	As it occurs

5	Incident Reports	Details of incidents such as minor and fatal accidents, injuries, near misses, health related issues, property/equipment related damages, security breaches, environmental hazards, GBV issues e.t.c	One electronic and 5 hard copies as it occurs
6	Defects Liability report	Comprehensive list of all observed defects and certified agreed timelines for repair	Submitted at commencement of Defects Notification Period. One electronic and 5 hard copies
7	Detailed Contract Completion Report	A Comprehensive final completion report of the construction contract package after completion of the work; incorporating the following: - Summary of the method of construction, and construction supervision performed, certified as-built construction drawings, problems encountered, and solutions undertaken. - Self-appraisal report within the prescribed time summarizing the following details: Details of Personnel including substitution made during the Assignment. Details of variation orders issued. Details of extension of time granted to the Contractor. Details of Quality Assurance System. Quality of works observed at site by the consultant. Details of claims. Certified Defect Liability Certificate Special preventive measures for maintenance suggested by the consultant. O & M Manual detailing routine and periodic maintenance tasks that will be required to maintain the completed Project.	In 6 copies are to be submitted to the Employer; submitted at end of Defects Liability Period. Draft copies of the O&M manual should be submitted for comments to the Employer within 3months of commencing services;