FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

ETHIOPIAN ROADS ADMINISTRATION

Terms of Reference (TOR)

For

Technical Assistance Services for Capacity Building of ERA's Quality Management System in Technical/Quality and Road Safety Audits and Quality Manual Revision

September 2025

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ABBREVIATIONS

ACP – Agile Certified Practitioner
CMS – Construction Management System
DG – Director General
DDG – Deputy Director General
ERA – Ethiopian Roads Administration
ICB – International Competitive Bidding
PQSM – Performance, Quality and System Management Directorate
PPP – Public Private Partnership
PMI – Project Management Institute
RSDP – Road Sector Development Program
TL – Team Leader

DEFINITIONS OF TERMS

Initial Audit – Projects with progress >5% or <30%
Intermediate Audit – Projects with progress >30% to <80%
Final Audit – Projects with progress >80% or <95%

1. INTRODUCTION AND BACK GROUND

The transport sector is one of the Ethiopian government's priority areas for investment under the country's second Growth and Transformation Plan (GTPII), together with energy, agro-industry and light manufacturing. Expenditure on prioritized infrastructure under GTPII is estimated at USD 9.9 billion in foreign currency. In total this represents 17% of GTPII expenditure over the 5-year period of the plan. The Fifth Road Sector Development Programme (RSDPV) sets a budget of USD 16.1 billion to deliver the targets established in GTPII for the sector. Government has decided to start using PPP to fund infrastructure projects through private sector investment especially for expressway road projects. ERA has been given the mandate for the restoration, expansion and maintenance of Ethiopia's Federal Road network. Its goal is to improve transport operating efficiency and reduce road transport costs, provide access to rural, neglected and food-deficit areas, and develop institutional capacity of the sector.

Accordingly, to enhance the road sector capacity and to achieve the given mandate, Development and use of a well-structured and Best Practice Quality Management System, which will be deemed to integrate and improve the current Performance, Quality & System Management (PQSM) Directorate, with all the necessary Technical skill/capacity, resources, systems, tools and techniques, that enables the continued and unhindered Monitoring, Control and Audit of Quality in the Design, Engineering Procurement, Construction/Design-build/ and Maintenance of road projects, and associated deliverables, is found necessary; complemented with is a Continued and Exhaustive Professional Capacity Building & Skill Enhancement Systems/Mechanisms.

For the assignment, The Government of the Federal Democratic Republic of Ethiopia (FDRE), duly represented by the Ethiopian Roads Administration (ERA), has obtained a fund from the World Bank and allocated the budget to finance payment for the Consultancy Service for capacity building of ERA's Quality Management System in Technical/Quality and Road Safety Audits and Quality Manual Revisions.

This Consultancy Service is intended to be outsourced/ procured and implemented by employing the services of eligible consultant, which shall be a registered firm with relevant experience, under Open International Competitive Bidding (ICB) procedures, for which this Terms of Reference is written.

This Terms of Reference (TOR) therefore provides the necessary information of the project and requirements set by the Employer in order to enable invited/shortlisted consulting firms to provide responsive technical and financial proposals.

2. OBJECTIVES

The objective of the service is to review, upgrade and capacity building of ERA's Quality Management System in Technical/Quality and Road Safety Audits systems and review and upgrade of Quality Manual for Ethiopian Roads Administration.

2.1. Revised Quality Manual for ERA

The objective of the revised quality manual is to help ERA give a high-quality service to the road users and the public in general, by continually improving ERA‟s efficiency and performance. The revised quality manual must be user friendly and suitable for use by ERA.

2.2. Technical/Quality and Road Safety Audits

The objectives of this Technical Assistance/ consultancy service are to:

- ✓ Enable ERA adopt & implement Best Organizational & Professional practices in "Project Quality Management" by Employer, through "Planning, Monitoring, Controlling, Auditing" of Product Quality, Process Quality & Road Safety aspects throughout Project Management Cycles, in order to Proactively diagnose quality non-conformances; and to take remedial measures so that the employer gets the value for what it pays/paid for.
- ✓ Ensure that ERA in General & PQSM in particular are well re-structured & equipped with the necessary system, facility, resources & teams/staffing [with job specialization/differentiation], and the Directorate's, Teams and Staff's Job-description (JD) is revised; so that a full-fledged Employer's Quality Assurance, Quality Monitoring, Control and/or Audit Tasks are undertaken and reach to all road projects. [JD will be reviewed/ improved].
- ✓ To ensure that the PQSMD's capacity is enhanced through necessary documented tools, systems & techniques: Manuals, Guidelines, Reporting Standards, Forms & Checklists; and Real-time & Integrated Project Information System ***(i.e., Project Monitoring and Tracking System – PMTS)*** is put in place, which will automate direct information access among ERA's Regional Construction Project Management Directorates, the PQSM Directorate, and Project Management Offices of the Contractors & Consultants.
- ✓ To ensure that PQSM & other staffs' technical, professional & specialist knowledge & skills are enhanced through Continued & standalone short-, medium- & long-term capacity building initiatives.
- ✓ To ensure that Practical Knowledge & skill are gained by PQSM Staffs through Practical and Joint Technical Audits & Road Safety Inspection/Audits carried out on selected road's Design, Procurement, Construction/Design-build/, Heavy maintenance projects; jointly by TA Consultant & Assigned PQSM Staffs.

3. APPROACH OF THE SERVICE

Local ownership of the new document is imperative and the methodology adopted in its preparation is a key element of this process. The process will involve the full participation of local experts in the preparation of the various chapters or thematic areas. This participation will be guided and supplemented through suitable inputs by local, regional and international experts.

The new revised manual will receive high level quality assurance and will be endorsed by appropriate authorities at both regional and federal government level. The development of the manual will be overseen by the Research Steering Group, which is chaired by ERA. The participation of women must be promoted at all stages of the assignment.

The new revised Manual should promote the use of local resources and the cost-effective and sustainable provision of all roads in Ethiopia. It should take into account national and regional development policies, local variations in implementation and management strategy, topography, geology and soils, all aspects of the natural environment, the needs of local communities, the availability of construction materials, and construction options.

4. SCOPE OF THE SERVICES

4.1. Revised Quality Manual for ERA

The drafting of the manual will be carried out by a team of consultants under the contracted consulting firm. The team is required to:

- ✓ The manual shall be developed to take ERA towards the requirements of ISO 9001 Quality Management Systems and ISO 14001 Environmental Management Systems.
- ✓ Review all relevant federal and regional legislation and policies regarding land ownership, road reserves, environmental protection, etc., that may have an impact on the road.
- ✓ Discuss Quality issues and the production of the new manual with key stakeholders including
    - Ethiopian Roads Administration (ERA);
    - Regional Road Administration;
    - Ministry of Urban Development and Infrastructure (MoUDI);
    - Ethiopian Mapping Agency(Space Since Agency);
    - Ethiopian Meteorological Agency;
    - Statistics agency;
    - Standard Agency;
    - Public Procurement And Property Authority;
    - Utility agencies those need to be integrated with the road project (telecom, electric suppliers, water and sewerage authorities…);
    - Ethiopian Environmental Protection Agency;
    - Ministry of Agriculture, Ministry of Mines etc…; and
    - Road Consultants those are well experienced in Ethiopia.

- ✓ Prepare draft recommendations for presentation at a workshop/seminar including the proposed Table of Contents, design approaches, drawings, figures and photographs for inclusion in the manual.
- ✓ Undertake a desk top review of existing and benchmark study on existing quality manual and guidelines used in the region and internationally, with particular attention to countries with highest quality index.
- ✓ Review the existing ERA Quality Manual and any other existing ERA guidelines for specificized manual topic, and provide recommendations for how these may be incorporated into the newly revised/new manual.
- ✓ Review all relevant federal and regional legislation and policies regarding land ownership, road reserves, environmental protection, etc., that may have an impact on the quality manual topic.
- ✓ Familiarize themselves with existing practice in Ethiopia and international best practice for quality manual topic.
- ✓ Prepare standard checklists to be used by quality inspectors.
- ✓ Prepare a draft Table of Contents for the new manual for approval by ERA.
- ✓ During the preparation of the updated manual a series of thematic peer review panels should be established that comprise local experts from the public and private sector who can provide guidance and support in the review process. The consultant shall arrange and facilitate a minimum of two Peer Review Group meetings and one final review meeting as agreed with ERA on each manual. The members of the thematic peer review panels should firsthand be approved by ERA.
- ✓ Contribute to workshop and steering committee reports.
- ✓ Assist with editing and final drafting of the manual.
- ✓ Prepare a draft of the newly Revised/New Manuals responding to the above shortcomings.
- ✓ Editing, Quality review, checking and proof-reading of final copies for printing.
- ✓ Support and follow-up the approval of the manuals by the standard agency of Ethiopia.
- ✓ Prepare and deliver a presentation at a launch seminar.
- ✓ Produce 250 copies of each Manual with high quality of printing and binding.
- ✓ The Consultant shall design, in consultation with ERA management a training and workshops program which identifies targeted staff, subjects, duration and measurable performance indicators/targets to introduce the manual to the practitioners. The Consultant is expected to deliver two rounds of training for each manual and this includes sharing of the manuals in un-editable electronic format on Flash Drives to all participants. The training is expected to be delivered by the lead authors of each manual.
- ✓ Conduct a dissemination workshop for the entire manual with a bigger event that includes sharing of the manuals in un-editable electronic format on Flash Drives to all

participants of the workshop as well as technical and academic institutions and training colleges.

- ✓ Provide a final version of the document to the Technical Director for final editing, layout and printing.
- ✓ In addition to the Quality Manual, ERA has a full set of systems aimed at ensuring quality, including:
    1. Design Manuals
    2. Technical Specification and Method of Measurement
    3. Standard Detailed Drawings
    4. Low Volume Roads Manual, Specifications and Bidding Documents
    5. Pavement Management System (PMS)
    6. Bridge Management System (BMS)
    7. Estimate Validation System (EVS)
    8. Tender Analysis System (TAS)
    9. Works Monitoring System (WMS)
    10. Performance Appraisal System (PAS)

The consultant is expected to review the listed system.

A. Reviewing and Updating ERAMS – Rate Build-up

ERAMS is a tool mounted on a computer server in ERA Data Centre and accessed through either the Intranet or Internet over a secure website. It is available to assist in management of Projects and Contracts at all levels from Project Engineers performing their duties on individual contracts, through executive chain reporting to the Director General.

Its function is to provide centrally accessible reliable information, which includes providing management information from a single source enabling better management responsibility and accountability giving better assurance in budget.

The consultant is expected to review the system and forward its recommendation.

B. Staff Training and Knowledge Transfer

The Consultant shall primarily carry out a need assessment within Ethiopian Roads Administration and other selected major stakeholders. The Consultant shall design, in consultation with ERA management a training and workshops program which identifies targeted staff, subjects, duration and measurable performance indicators/targets which shall include, inter alia, but not limited to, training on work procedures and safety practices based on the updated construction and maintenance procedures, enhanced Quality Assistance system, safe and effective works methods and techniques, (including class room training and external trainings).

The Consultant shall provide classroom/s as necessary and arrange different workshops by inviting renowned professionals in the sector, especially in the transport business, to share their experiences in the country or outside with the ERA management and Board members. The cost for preparing the workshop including the fees and per-diem for the invitees and participants shall be detailed in the consultant's **Financial Proposal** as **Reimbursable cost**.

The Consultant shall provide classroom trainings (at least four times) to staff from Ethiopian Roads Administration and selected participants from other stakeholders to be nominated by ERA: The aim of the training is to introduce major parts of the manual to the participants.

The Consultant will develop the course content and the training materials for each course including handouts to participants. For the execution of this task, it is expected that the Consultant shall include, in its team of personnel, experts who have experience in providing training/s concerned.

4.2. Technical/Quality and Road Safety Audits

While the Technical Assistance Service aims at bringing about changes on aspects related to Structural/Institutional, Practical & Documented Quality Management System (including Technical Audit & Road Safety Audit Systems); PQSM Directorate Capacity Building, and Staff/Professional Capacity Building, as specifically indicated in item Number 2 above (Objectives), the Consulting firm shall undertake all services necessary to achieve the stated objectives, including the following specific tasks, but not limited to:

4.2.1. Inception, Situation Analysis & Best Practice Assessment

1. Conduct Presentation on the program of the Implementation of the Consulting Service; and Inception/pre-commencement meetings and discussion session in the presence of *the Top Management (DG & DDGs); Performance, Quality & System Management Directorate Director & Team Leaders; Regional Construction Project Management Directorate Directors; Design Management Directorate Director; Engineering Procurement Directorate Director, Training Management Directorate Director & other concerned Directorates stationed at the head-office;* so as to introduce them the consulting service assignment's scopes, methods & deliverables. The consultant shall make sure to capture the expectation of the participant on the consulting service assignment intended to be delivered, and to use such expectations & other feedbacks as inputs & integrate in the scope of the assignment.
2. Conduct review, inception & situation analysis of ERA's Organizational Structure, Project Cycles Management System & Delivery Strategies, Design/Construction Projects Management System, Working Practices, Available QMS & related Documentation System, Tools, Techniques in General & PQSM's. In particular; including the available Technical Audit & Road Safety Audit Systems and practices.
3. Review & Familiarize with ERA's Technical Manuals, Standards, Standard Bidding & Contract Documents, relevant Guidelines, and other available Technical Documents related to Design/ Construction Quality delivered by other/previously completed TA consultants; & Deliverables of Currently on-going/completed Modernization/Change

Initiatives. Identify any Gaps in Standardization and technical manuals that have direct and/or indirect impact on the Design/Construction Quality Management System.

4. Assess the staffing arrangement of ERA's technical departments in general & PQSM in particular (composition, specialization/differentiation); including their professional/technical capacity; as a basis for later Benchmarking & Gap assessment. Conduct the sufficiency of the staffing arrangements from the point of ensuring Technical Quality of Road Projects (in all constraints of Quality, Cost, Time, risks) in the Pre-construction, Construction and Post-construction stages.

5. Assess Best Practices & Modern/Innovative Project Management Methodologies and quality management systems of similar organizations in Developed & Developing Countries; with emphasis on Design/ Construction QMS (including but not limited to, PMI, ISO, Prince2, Agile, etc., or hybrid systems; and Specific Organizational best practices).

   The consultant shall make sure that assessment of Best Practice Project Management (or QMS) shall be carried out from both perspectives of "Best Practice Project and quality management Methodologies/ systems" and "Best Practice Similar Purpose organizations/Institutions & their Methodologies" that are well known and reputable in successfully delivering projects; which shall be assessed/selected based on Key Performance Indicators (KPIs) of success, such as similarity & complexity of the projects as related to ERA's projects, completion of projects as per planned time, cost and quality/cost; risk management; simplicity of implementation, human resource (professional capacity), and other criteria to be proposed by the Consultant and agreed with the Employer.

   The consultant shall identify how such best practices/methodologies would align with ERA's current practices of project delivery systems, cycles and implementation; and assess the impacts on the organizational structure, statutory/legal requirements, available systems/infrastructure, staffing arrangements, decision matrix and challenges/impacts to the local construction industry practices.

6. Assess Best Practice Institution's Organizational Design/Arrangement/ (Structure, Team Set-up, Job-description, Staffing arrangement & Job-differentiation/Specialization) and Continued Capacity Building & Professional Development related to Design/Construction QMS, Technical Audits & Road Safety Audits; with due consideration of ERA's establishment, visions, missions, strategic objectives, project delivery methods, Project types, Number & Size of Projects.

7. The consultant shall prepare and submit to the Employer, **Inception and Situation Analysis Report**, covering all the start-up activities, consultant mobilization status, activities carried out in the aforementioned tasks & other matters, as required in this Terms of Reference.

4.2.2. Capacity Building through Best Practice Benchmarking, Gap Assessment, Improvement Proposals & Preparation of Standard Working Documents

1. The consultant shall conduct Benchmarking of Best Industry Practices of PM Methodologies & QMS; and "Best Practice Similar Purpose Organizations/Institutions & their respective Methodologies" including their Organizational Design Set-up [Structure, Team Set-up, Staffing arrangement, Job-Description, Job-differentiation & Specialization]; and Prepare/submit a separate **Best Practice Benchmarking Report**.
2. Conduct Gap Analysis of ERA's organizational set-up & Available Systems [for CPM, CQMS, Project Information/Communication Management System (PIMS or PCMS), Technical Audits, Road Safety Audit] as compared to the Benchmarked Best Practices; and Prepare & Submit **Gap Analysis & Improvement Recommendation Report,** showing not more than three (3) alternative improvement solutions.
3. Prepare and provide a comprehensive/detailed proposal of Improvement on the alternative Chosen /agreed by ERA. The System (s) shall, as much as possible, align & Integrate with ERA's other Organizational Set-up, IT & Network Infrastructure, and other Directorate Activities, unless the improvement proposal needs/requires minor changes on other Directorate's set-up & activities. The consultant shall also prepare and provide **schedule of pre-requisite activities & resources** expected from ERA for the downstream activities of the opted improvement option (other than those specified in the TOR for ERA & Consultant Responsibilities).
4. The consultant shall concurrently Conduct Preparation of preliminary/draft "Best Practice" Working Documents *[Manuals, Guidelines, Reporting Standards, Forms, Checklists, tools, etc.]* related to QMS, Technical Auditing & Road Safety Auditing of Road Design/Construction/Maintenance/Supervision/ Procurement; as specifically required in this Terms of Reference.

4.2.3. Professional Development & Capacity Building through Short-term, Medium term, Long-term, and Continued Trainings and Certifications

1. The consultant, by itself, through assignment of sub-consultant(s) &/or in cooperation with appropriate institute(s), shall prepare, organize, facilitate & conduct the Following Package of Professional & Technical Capacity Building Trainings/Certification Courses Arrangement/Working Visits to PQSM & other Directorates staffs:
   - Short Term Refresher Courses on Fundamental Civil/Highway Engineer Courses on selected relevant topics [Theoretical & Practical Insights]
   - Short term-Standalone Local Trainings
   - Short-Term Foreign Trainings
   - Short-Term Working Visits to Best Practice International organizations/ Institutes

- "Medium Term" Local and Foreign Certification/Preparation Trainings, plus Arrangement for Certification/Accreditation in Best Practice/International PMS, CPMS, QMS, CQMS and related areas.
- Long-term Overseas Training [PhD, MSc] for five (5) PQSM Staffs at senior & above levels, on Specialist Fields of Study, directly related to the duties & functions of the PQSMD; for those who would quality for the requirements, interested and commit themselves to serve the organization after completion of the study.
- Arrange & Provide Best practice PM, Civil/Highway Engineer, QMS & other Specialist Software Trainings for all PQSM Staffs & other relevant directorates in Collaboration with accredited Certifying Body; and enable the staffs get Certified.
- Short-Term Introductory & Demonstrative Trainings by the Consultant to familiarize PQSM Staffs and concerned staffs from other Directorates on the Final Systems Developed & Documents Generated under the TA Service.

2. The consultant, by itself, or in collaboration with the involved Institute (as appropriate), shall provide Certificates of Attendance/Completion for all Short-term & Medium-term Certificates to participants.
3. The consultant by itself or in collaboration with the involved Institute (as appropriate), shall Develop Training Curricula & Training Modules for Future Continued Professional & Technical Capacity Building of the PQSM Staff; which will be integrated and assist ERA in its Regular Training programs under the existing facilities *(Training Centers, Road Research Center, and/or the Future "ERA Road Academy"*. The curricula should be prepared considering the following two options:
   - For New Entrants (Induction & "Ice-breaker" Training Curricula & Modules)
   - Intermediate & Senior Employees (Advanced Training Curricula & Modules).

The Training Topics to be included in the Curricula & Training Modules shall be similar to the Short-term & Medium-term Training Topics indicated above; and the consultant and/or its collaborating institute, shall, to the best of their knowledge & experience, prepare comprehensive documents in Integrated Volumes and/or separate Sections/Volumes, as appropriate.

- **THE DETAILED REQUIREMENTS OF CAPACITY BUILDING TRAININGS REQUIRED**

The types, contents and focus areas of the different Capacity building trainings are indicated below; together with the target groups (Directorates & Staffs) of the trainings concerned.

For the trainings to be provided in an online platform/setting, the Employer will make the necessary arrangements of IT and Connection/Network facilities for the trainees.

The local short-term trainings and on-job trainings shall be carried out by the Consultant's Key Personnel or other Qualified Trainer or a combination of both, provided that a prior consent is reached by the Employer on the Consultant's Training Plan and Detailed Contents for the respective trainings. The venue for the training shall be selected by the consultant. The

Consultant shall consider or distribute its related costs for preparation, venue, accommodation & provision of the Training in its **Financial Proposal as a Reimbursable cost**.

1. **On the job training:**

With the intention of capacity building and knowledge transfer from the consulting services, enabling ERA PQSM staffs in gaining the required knowledge, skill and practical experience in Quality Management in general and quality assurance and technical auditing of the design, construction/civil works/, Project procurement and Contract management activities in roads/bridges projects implemented by ERA in particular; the consultant shall provide on-the-job training to assigned PQSM staffs on the actual Technical Auditing tasks to be carried out by the consultant.

Note more than **two (2)** PQSM staffs will be assigned to train on the job of one project's technical audit. The on-job-training will be conducted by the consultant until all relevant PQSM staffs are trained. The training should cover all the steps and procedures of technical auditing at desk-top level and field assessment/recommendations, including the data collection, assessment/evaluation, analysis, reporting. The trainees, shall, however, not intervene in the consultant's decision making resulting from the technical audits. The consultant's Technical Audit schedules including the office works and field works should be communicated to the employer in advance so that the right trainee could be selected and assigned for the on-job training. The consultant's technical proposal shall clearly show the approaches, methods and procedures by which the trainings will be provided.

The office accommodation of the consultant shall also consider the necessary space and facilities required for the trainees; and cost of same shall be included in the consultant's financial proposal.

For the on-site/field assessment works of on-job training, cost of subsistence, housing accommodation, displacement allowance, transportation services and other incidental costs of ERA trainees shall be detailed in the consultant's Financial Proposal as **Reimbursable cost**.

2. **Short-term local training:**

The stand-alone local training which is listed below is short-term in-country courses for the number of trainees and durations indicated against each subject title. It should be conducted by professionals in each subject area.

The short-term trainings are aimed at and should be designed so as to enable the trainees get basic/fundamental and theoretical knowledge on the subject areas in alignment with the Practical Considerations; also becoming as refresher courses in filling knowledge and skill gaps of the concerned ERA staffs.

Table 4-1: Short-term local training

Item No.	Training Description	Estimated duration (weeks/ Days)	Number of Sessions & Trainees per session	Number of Trainee	Target Group
1.	Road/Bridge Engineering and Construction: ▪ Fundamental Concepts, Practices and Technological Advances	15 days	3***20**	60	PQSM Staffs, & selected staffs from other Directorates
2.	Project Management Bodies of Knowledge Areas: ▪ Construction Extensions to the Road/Bridge Projects	15 days	3***20**	60	
3.	Performance and Quality Management System in Road/bridge Construction and Maintenance Projects: ▪ A detailed Approach to the Quality Planning, Executing, Monitoring, Control and Evaluation Activities ▪ Quality Assurance, Quality Appraisal Inspection, Technical Audits and reporting in Road/Bridges Project Contracts (Design Service, Civil Works of Construction/Design-Build, Supervision services).	15 days	2***25**	50	

Item No.	Training Description	Estimated duration (weeks/ Days)	Number of Sessions & Trainees per session	Number of Trainee	Target Group
4.	Risk Management in Roads/Bridge Projects at Design and Construction stages: ▪ Fundamental Concepts and Practical Applications; Focus on how to reflect in the design documents and Construction Contract Documents; Introduction to Risk Management Software	7 days	2***25**	50	PQSM Staffs, & selected staffs from other Directorates
5.	Practical Road Safety Inspection, Management and Auditing: ▪ Theoretical and Procedural Approach	7 days	2***25**	50	PQSM Staffs, & selected senior staffs from other Directorates
6.	Introductory Trainings on the Practical Use & Implementation of Guidelines, Manuals and Other Standards (User Guide Documents) prepared by the Consultant, for: ▪ Quality Assurance and Technical Audit of Road Design, Civil Works and Construction Supervision in Road Projects: ▪ Road Safety Inspection, Auditing and Reporting:	10 days	2***25**	50	All PQSM staffs

Item No.	Training Description	Estimated duration (weeks/ Days)	Number of Sessions & Trainees per session	Number of Trainee	Target Group
7.	Refresher Courses on: ▪ Geotechnical Site & Material Investigation: Application in Road Design & Construction Projects ▪ Hydrology, Hydraulic Study & Applications in Roads Design & Construction Projects (Appropriate Software Included)	15 Days	2***25**	50	PQSM staffs & Selected staffs from Design Management Directorate
8.	Management & Administration of Design Projects: Best Practices for Road/Highways & Bridge Projects	7 days	2***25**	50	
9.	Drafting Technical Specifications, Preparing Cost Estimates and the Validation Process: for Road & Bridge Projects (with Lessons Learnt from International Best Practices and Introduction to Applicable Software)	10 days	2***25**	50	
10.	Management of the Planning, Procurement, Design, and Implementation of Public-Private-Partnership (PPP): With Practical Cases in Transportation and Highway Infrastructure	15 days	2***25**	50	Selected Staffs (Lead Engineer & Above) from the PQSM, Design Management, CPM, Engineer Procurement,

Item No.	Training Description	Estimated duration (weeks/ Days)	Number of Sessions & Trainees per session	Number of Trainee	Target Group
11.	Project Organization, Leadership, Decision Making, Construction site Coordination and Management	5 days	2***25**	50	Road Asset Management Directorates
12.	FIDIC Contracts Modules: Emphasis to Latest FIDIC Conditions of Contract with Practical Cases: - ▪ Module 1: Practical Use of the FIDIC Contracts ▪ Module 2: Management of Claims and the Resolution of Disputes ▪ Module 3: Understanding DABs ▪ Module 4: Management and Administration of FIDIC Contracts ▪ Module 5: Understanding the FIDIC EPC/Turnkey Contract ▪ Module 6: FIDIC DBO Contract	15 days *(not less than 16 hours for each Module)*	3***25**	75	Senior & Above PQSM Staffs; & Selected Senior & above staffs from other Directorates
13.	Prince2 Project management: Foundation Course and Practitioner Course	7 days	2***25**	50	PQSM/ Design Management Lead & Above Staffs, & Selected Senior staffs from other Directorates

Note:

- ✓ *The Number of Sessions and Trainees indicated in the above table are set considering the Classroom/Conference Room and direct-contact training setting. If the virtual/online training setting is adopted in agreement with the Employer; the number of sessions and trainees may vary.*
- ✓ *Depending on the need assessment and design of topic outlines, the title, number of trainees and duration may vary.*
- ✓ *Number of trainees per class room should not be greater than* ***twenty-five (25)****.*
- ✓ *A 1st round of the provision of training in Item* ***Number 3*** *should be arranged* ***4 months*** *from commencement of the service, targeting the ERA staffs in Performance, Quality and System Management (PQSM) Directorate.*

The Consultant would arrange and run the courses for ERA staff, to identified and recommended trainees, in consultation with ERA management, and agree with ERA on the qualification and experience of each trainee. The consultant shall include costs of training material, venue, meal and transportation in the **Financial Proposal** as a **Reimbursable cost**.

The consultant should also propose a methodology for measuring, monitoring and reporting on the improvement in ERA capacity resulting from the training provided.

3. Short-term Overseas training

The Consultant shall arrange a comprehensive short-term training for maximum of **one (1) month** abroad for not more than **ten (10)** professionals aiming for experience sharing and to be acquainted with the Crosscutting Technological Advances of road/bridges engineering and construction management; and Best Practices in Construction Quality Management System and Technical Auditing. And run or arrange to be run at accredited International Training Institute/Centers, the courses for ERA staff, to identified and recommended trainees, in consultation with ERA management, and agree with ERA on the qualification and experience of each trainee.

Among the trainees, at least **five (5)** will be assigned from Performance, Quality and System Management Directorate; aimed to capacity building of the directorate in Best Practices in Project Monitoring and Control; Project/Construction Quality Management System; Technical Auditing of Design and Construction of Road/Bridges projects; and New Emerging Technologies, or Recent Advances in Project Management & Implementation.

The titles/topics of the overseas short-term trainings may be selected among or related to one or more or any of the following; in discussion and agreement with the Employer:

- ✓ Project Management Using Prince 2: Foundation & Practitioner Training (Fundamental Concepts and Practical Application for Construction Projects)
- ✓ Management of the Planning, Procurement, Design, and Implementation of Public-Private-Partnership (PPP): With Practical Cases in Transportation and Highway Infrastructure

- ✓ Best International Practices and New Emerging & Effective/efficient Technologies in Construction Engineering, Design and Management: Emphasis on Highways/Roads & other Transport Infrastructure, including:
  - Road Design, Construction & Asset Management practices with Re-cycled Bitumen & Re-cycled Asphalt mix *(e.g., In-Place Cold Recycling)*
  - Foamed bitumen Technology in Asphalt Road design & construction
  - Lime & Cement Stabilization Practices in Road Design & Construction
  - Advances and Road Design & Construction Practices with Modified Bitumen
  - Innovative tools for Road Construction Quality Control (QC) & Asset Management (MSD, TSD, FWD & LWD)
  - Intelligent Compaction Measurement Values (ICMV)
  - Usage of Plastic Waste in Bituminous Pavements
  - Self-healing asphalt technology
- ✓ Best Practices in Construction Quality Management
- ✓ Best Practices in Road Traffic and Safety Management
- ✓ Advances in Design & Construction /implementation, with:
  - Precast pre-stressed concrete pavement
  - Perpetual Pavement to Improve Sustainability of Roads
- ✓ Super pave system in Design & Construction of Asphalt Roads/Highways/Highway Operations & Management:
  - Smart roads
  - Intelligent Traffic/Transport Management System (ITMS)
  - Project Monitoring & Tracking System (PMTS)- State of the art, real-time Monitoring & Tracking System

Note: For the Short Term Overseas Training, the Client will cover all the expenditures related to training fee, per-diem, trips and accommodation for his staff.

4. Technical Support (Mentorship Training) to PQSM staffs on Selected Projects "Technical Audit & RSA", during the Joint Audit Tasks

During the implementation period of the consulting service, the consultant, through its different technical/key personnel, shall provide intermittent and "as requested" hands-off advisory support or guidance to PQSM staff in the technical auditing processes for project audits carried out by the staff of PQSM as part of the regular job of the directorate. Such technical support of the consultant shall be provided at desk-top (office level) only, and does not involve field visits/inspections; rather, the consultant will guide the staffs on what to do and how to do it.

The consultant's technical support role may include:

- ✓ Providing initial briefing before the staff (group of staff) of the PQSM commences scheduled regular quality audit tasks;
- ✓ Advise on what data to collect;
- ✓ Provision of Forms, checklists and other tools required for the technical auditing tasks
- ✓ How to review and familiarize themselves on the project technical documents from design to construction stages;
- ✓ How to Identify Key Performance and quality indicators and parameters; and other focus areas, on the basis of the technical documents and project management vital dimensions/constraints (i.e., Scope, cost, quality, time, risk, etc.).
- ✓ Identification of conformance and non-conformance to project requirements; irrespective of the contracting non-conforming party, being the employer, contractor or design/supervision consultant.
- ✓ Analysis of Conformance and Non-conformance findings; and
- ✓ Use of statistical testing methods for analysis, as appropriate, in the technical audit tasks
- ✓ Alignment and synthesis of technical audit findings of a given phase/cycle of project to associated risks and impacts at subsequent phase/cycle of the project; such as Design, Civil Works Procurement and Civil Works Implementation.
- ✓ Preparation of Technical/Quality Audit reports and presentation of same;
- ✓ Monitoring of Implementation of corrective and/or preventive actions taken as a result of technical audit findings reported earlier.
- ✓ Any other relevant technical advises requested by the PQSM staff, in relation to technical audit of particular area/element of road design or construction.

Note:

- ✓ *The consultant's technical mentorship support should be planned to provide the follow-up support regularly, for at* ***least four (4) hours per week, per each key personnel*** *of the consultant. The Date and time of such follow-up/technical support will be agreed by the employer and the consultant; without affecting the consultant's other duties and tasks under the contract. In addition, further arrangement of technical support may be made upon ERA's request.*
- ✓ *This technical support will be provided at the employer's PQSM offices at employee's working areas or conference rooms, as appropriate.*
- ✓ *The technical support of the consultant shall commence* ***after six (6) months*** *or after the consultant delivers its first Quarterly Project Technical Audit Reports, whichever comes earlier.*
- ✓ *There shall be no separate payment or cost of employer for this component of capacity building technical support service.*

5. Arrangement of Medium-Term Certification Trainings & Certifications

ERA desires that it's Technical & Leadership/Management Staffs/Project Management Teams & Staffs/ have:

- ✓ A recognized Competence of individuals working in ERA to perform in the role of a Project manager & recognized specific experience in leading & directing road projects;
- ✓ A demonstrated understanding of the fundamental knowledge, processes and terminologies;
- ✓ A recognized/demonstrated experience, skill & performance in the oversight of multiple projects aligned with organizational objectives;
- ✓ Recognized advanced skills needed for the coordinated management of one or more portfolios of projects, programs, or operations to achieve organizational objectives;
- ✓ Recognized knowledge of Agile Project Management principles, practices, tools & techniques across Agile Methodologies, and prospects of applying Agile Methodologies in Road Design and Construction Projects.
- ✓ Recognized demonstrated knowledge and competency in the specialized area of assessing and identifying project risks along with plans to mitigate threats and capitalize on opportunities.

The consultant shall arrange “Medium-Term” Local and/or Foreign Certification/Preparation Sequential Trainings on Best Practice/International Project Management (PM), QMS and related topics to be agreed with the Employer; followed by assessment of the trainees at completion of each training modules. The consultant shall also make the necessary arrangement so that the trainees would sit on Certification Examination for Certification/Accreditation by the respective best practice institute **(Project Management Institute/PMI/or other equivalent),** to be given overseas.

The series of the preparatory courses/pre-requisite training and assessments **(as per the International Institute's Minimum requirements of Contact Hours & Course contents)** shall be arranged on an online platform and short local briefing/tutor by the consultant's assigned staff, unless agreed otherwise.

The indicative/provisional list of the Best Practice Certifiable Courses is listed as follows:

Table 4-2: Medium-term training

I. No.	Certification Title	Target Group	Estimated Number of Participants
1	PMI - Project Management Professional (PMP)®	PQSM (Senior Engineer & Above); other Directorates (Lead Engineer & Above, limited Quota)	5
2	PMI - Certified Associate in Project Management (CAPM)®	PQSM (Senior Engineer & Above); other Directorates (Lead Engineer & Above, limited Quota)	5
3	PMI - Agile Certified Practitioner (PMI-ACP) ® Certification	ERA Senior Staffs, TLs or above fulfilling Pre-requisites for ACP, incl. Training and experience requirement in Agile Practices	5
4	PMI - Program Management Professional (PgMP)®	ERA Senior Staffs, TLs or above fulfilling Pre-requisites for PM & PgM experience requirement	5
5	PMI - Portfolio Management Professional (PfMP)®	ERA TLs, Directors or above fulfilling Pre-requisites for PfM experience requirements	5
6	PMI - Risk Management Professional (RMP)®	PQSM & Other ERA Senior Staffs, TLs or above fulfilling Pre-requisites for RMP, incl. Training and RM experience req.	5
7	PMI - Scheduling Professional (PMI-SP) ®	ERA Senior Staffs, TLs or above fulfilling Pre-requisites for Training and Scheduling experience requirements	5
8	Prince 2 Project Management: Foundations	ERA Senior Staffs, TLs or above fulfilling Pre-requisites for ACP incl. Training and experience requirement in Agile Practices	5
9	Prince 2 Project Management: Practitioner	ERA Senior Staffs, TLs or above fulfilling Pre-requisites for ACP incl. Training and experience requirement in Agile Practices	5

The Employer reserves the right to increase or to reduce or to cancel any of the above certification pre-requisite trainings & Certification Examination programs, or one may be replaced by the other, depending on circumstances.

Selection of the target groups/individuals from the domain, for the PMI Mandatory Trainings and Certification Exams shall be made based on the need assessment and consultation of ERA Management and the PQSM Directorate, who would administer the contract.

The certification examinations & associated overseas trips shall be arranged for the staffs who would qualify for the PMI requirements of Academic Qualification, Experience and successful completion of pre-requisite training (to the minimum required contact hours). Hence, only ERA Staffs, Team Leaders, Directors, other Concerned Management Staff who would formally attend and complete the course formally attend, successfully complete and take/pass the Post-training Preliminary assessment exam.

Note: For the Medium-Term Certification Trainings & Certifications, the Client will cover all the expenditures related to training and certification fee, per-diem, trips and accommodation for his staff.

6. **Specialist Professional *Software Trainings:***

The consultant in Collaboration with accredited Certifying Body; shall **arrange best practice & latest PM, Civil/Highway Engineer, QMS & other related Specialist Software Trainings for all PQSM Staffs and staffs selected from other Technical ERA Directorates, and enable the staffs get Certified.**

The indicative/provisional list of the Specialist Professional Software is listed as follows:

- ✓ ***Project Management with Primavera P6 or latest version; and/or***
- ✓ ***Other related Professional Software to be agreed later.***

Note: For the ***Specialist Professional Software Trainings****, the Client will cover all the expenditures related to software training and certification fee, purchase of the licensed original software, per-diem, trips and accommodation for his staff.*

7. **Working visit to road sector institutions outside of Ethiopia**

The Consultant shall assess, Identify, consult with ERA and arrange a working visit to *Best Practice International organizations and Institutes, reputed in Project Management & Implementation, particularly Construction Quality Management. The working visit may also be arranged related to the training/course topics indicated above for Short-term Overseas Trainings.*

The working visit shall be arranged for about **20 Numbers** Top and Middle Management of ERA, including the Leadership of PQSM Directorate; **for not more than 2(two) weeks duration.**

Note: For the Working Visit to road sector institutions outside of Ethiopia, the Client will cover all the expenditures related to training fee, per-diem, trips and accommodation for his staff.

8. Long-Term Trainings [Post Graduate Courses]

The consultant shall arrange Long-term Overseas Training in Post-Graduate courses [i.e. PhD, MPhil or MSc] for **five (5)** PQSM Staffs, and/or for Post-Graduate Diploma and/or medium-term Certifiable Practitioner Courses, at senior & above levels, on Specialist Fields of Study, directly related to the duties & functions of the PQSMD; for those who would quality for the Institute's Admission requirements, interested and commit or declare themselves to serve the organization after completion of the study. The consultant shall assist/advise ERA in the selection of the Training Program, in the Survey of International Institutes from among the top 150 Universities in developed countries, Cost Implications and other requirements, and registration processes.

The specialization areas or program of study, the country and the Institute will be decided by ERA, particularly the PQSM Directorate, based on the assessments and options identified by the consultant.

Indicative (optional) lists of fields of post-graduate study/Specialization are indicated below:

- ✓ Construction Cost Management
- ✓ Road Safety Audits
- ✓ Quality Management – in Construction Projects
- ✓ Strategic Quality Management
- ✓ Risk Management and Quality
- ✓ Quality Management – Lean System
- ✓ Quality Management – Six Sigma
- ✓ Quality and Operations Management
- ✓ International Quality Management
- ✓ Construction Management and Engineering

Note: For the Long-term Post-graduate Courses' the Client will cover all the expenditures related to costs such as Tuition fees, Living costs, Overseas transportation costs, and other fixed/variation costs required for the study.

9. Holding Management Briefing Sessions:

The consultant will hold briefing sessions under the consultancy assignment, at different stages of the service, in the presence of Top management, Middle management, Team leaders and Senior/Executive Advisors:

- ✓ **Initial (Inception) Briefing:** During/after commencement of the service; focusing on ERA's QMS, Structure & Establishment required to ensure exhaustive QMS & TA, Technical Auditing procedures; Considerations; best Practices of Technical Auditing; Way forward to QMS and Technical Audit of ERA Road projects; ERA management's expectations; possible challenges, and necessary assistances and other thematic areas; Selection of projects to be audited; and other considerations of Management. The management's ideas/feedback on further considerations to be taken on the various capacity building and knowledge transfer scopes of the service, and the preparation of the working guidelines, manuals and user guides should be collected.

- ✓ **Interim Technical Audit Briefings:** the consultant is required to make Interim Briefings at **six monthly intervals**, on the technical audit findings, recommendations and further corrective and/or proactive actions to be taken, and lessons learnt, in relation to particular projects audited during the period. It also highlights its summative follow-up and assessment report of how the corrective measures reported in previous technical audits are being implemented; put the matter into management's attention. At each semi-annual audit briefing the consultant is expected to present audit of four (4) road projects, 2 projects audited per a quarter.
- ✓ **Final Technical Audit briefing**: This audit briefing focuses on the cumulative audit findings of all projects audited, and the particular details of the audited findings of projects audited in the last six months. It also shows the overall lessons learnt from audit of the overall projects, actions taken and required to be taken, considerations made in the preparation of Guidelines, Manuals and User Guide Documents.
- ✓ **Guideline/Manual/User Guide Briefing:** This will be a short-session intended to introduce the management regarding the Guidelines, Manuals and User-guide documents prepared as part of the consultancy contract. This briefing will be held after the documents are exhaustively peer-reviewed.
- ✓ **Special Audit Service Briefing**: This could be a special briefing as per ERA Management request or by the consultant's own intention, in relation to special issues encountered in the subject service, its deliverables or processes.

10. Training of Trainers (TOT)

This will be one round short-term training, for not more than **twenty (20)** trainees**; lasting not more than 2 weeks,** which needs to be designed so as to enable selected ERA staffs (particularly Team leaders and Lead Engineers) get the necessary knowledge and skill to develop junior and new entrant engineers, in the specific tasks of:

- ✓ Quality Assurance and Technical/Quality Inspection and Auditing of Road/Bridge Projects.
- ✓ Practical Road Safety Inspection, Auditing and reporting

The training shall be conducted after completion of the Standalone Local Trainings; and completion of preparation of the Guidelines, Manuals and User-guide documents; to enable synthesis of the use of the documents into the training.

The consultant shall include costs of training material, venue, meal and transportation in the **Financial Proposal** as a **Reimbursable cost**.

11. Workshops & Seminars

The Consultant shall arrange workshop/experience sharing/training forum at least annually in the presence of professionals representing the Employer (ERA), Consulting firms and contractors working with ERA, and professional associations. It is aiming to fill the gaps in the performance and quality of design, procurement and construction/Maintenance & supervision, as well as quality assurance in road/bridge projects; based on challenges and lessons learnt from Technical Quality auditing & Road Safety Audit tasks of the consultant, Best Practices Benchmarked and associated deliverables. It should be conducted by professionals in each subject area.

The consultant shall include costs of training material, venue, meal and transportation in the **Financial Proposal** as a **Reimbursable cost**.

4.2.4. Capacity Building & Professional Development through Practical Technical Auditing

A. General requirements

1. The consultant shall make sure that ERA's and/or PQSM Directorate's Capacity in Quality Management of Road projects through Technical Auditing is sufficiently improved and strengthened through Practical and hand-on involvement of the PQSM staffs, while the consultant undertakes the audits on selected and agreed projects. In this regard, the technical audit capacity building shall be ensured progressively/ sequentially as follows: -
   - First through Provision of Short-term "Introductory Theoretical and Conceptual Training on Quality Assurance and Technical Auditing for Design, Construction and Maintenance of Road Projects";
   - Followed by Familiarization of "Preliminary Working Documents (Guidelines, Manuals, Checklists, Templates, Reporting Formats & other relevant tools necessary for the work)";
   - Then, on-job training of the staffs "while the consultant undertakes actual/practical Technical Auditing on some of the projects selected for technical auditing"; and,
   - Lastly through Joint Practical technical Auditing to be undertaken jointly by the Consultant team and PQSM Staffs.
2. The Technical/Quality Audit [including Performance Audits] shall be undertaken on selected on-going & completed Design, Procurement, Construction and Maintenance projects, to be proposed by the Consultant and as agreed with the PQSM Directorate.
   Note: - 75% shall be proposed by the Consultant and the remaining 25% shall be proposed by the PQSM Directorate.
   Technical Audit of up to 50% of selected/proposed Projects shall be conducted solely by the Consultant and also will provide on-job training to PQSM staffs. Whereas, technical audit for the remaining [50%] of selected projects shall be done jointly by the Consultant & PQSM Staff; under the leadership, guidance & Mentorship of the Consultant Staff, to enable knowledge transfer, experience/skill sharing & Practical Demonstration of Systems developed.
3. In the course of the Technical and performance Audit of the ongoing and substantially completed road projects, the teams shall also undertake "Constructability Review".

4. The consultant shall make sure that the PQSM staffs acquire the necessary theoretical & practical knowledge, skill and hands-on experience in all required processes of technical auditing to be considered for each project, including but not limited to: *Project Selection, Data Collection, Preliminary Desk review, Preliminary Site Visit, Project Audit Planning & Preparation of specific forms & Checklists, Audit Notification, Pre-audit Meeting, Detailed Documentation (Desk-top) review, Field Surveys & Investigations, Laboratory Tests, Data Analysis & Interpretations of results, Exit/Final Meetings, Preparation of Draft/Final Reports.*
5. The Technical & Performance Audits & Constructability reviews, *within the limits of the data to be collected & reviewed, Surveys, Investigations & Laboratory tests to be carried out, and analysis & recommendations to be made*, are mainly for purposes of Capacity building of ERA in Quality Management in general, and Technical/Performance Auditing in particular; and the outputs of the audits and the associated reports shall be used only for internal purposes. Confidentiality of all data collected, analysis made and reports generated shall be maintained at all times, and shall not be made accessible to parties other than ERA; unless, ERA's consent is obtained otherwise. Disclaimers/Commitments and Confidentiality Clauses shall be included in the technical audit findings and reports to be submitted/ provided by the TA consultant.

   Notwithstanding the above, the findings of the audit shall be presented and technical audit reports will be provided to the top management of ERA (or the Quality Monitoring Committee), the concerned directorates and the project management representatives of the other Contracting parties (Design/Supervision Consultants and Civil Works Contractors); to enable ERA and the other contracting parties of respective projects take the necessary actions to provide pro-active and/or reactive/corrective actions, related to the audit findings (as appropriate).

   Following presentations, discussions & consents reached with the representatives of contracting parties on the technical audit findings, the joint team of the consultant & PQSM staffs shall prepare an agreed action plan based on findings of the audit and discussions for further implementation. The joint team, within the contract period of this service contract, shall routinely monitor and follow-up how the agreed action plans are being implemented by the contracting parties.
6. Projects for the technical audit shall be selected in discussion with PQSM Directorate, considering: Mode of delivery (DB or DBB or OPRC), Financer of the project, Location, Size & Complexity, Performance, Quality Problems & other Challenges, or otherwise.

   The anticipated numbers of projects to be selected for the Technical Audit, by category, are shown below:
   a) Five (5) Road Projects (out of the five projects at least One Heavy Maintenance) for Full Cycle Audit (Completed Projects):
      Design, Procurement, Construction, Supervision, and/or Maintenance.
   b) Projects for Limited Cycle Audit for Pro-active Solutions:
      - ✓ Five (5) Road Design Projects (Completed).
      - ✓ Five (5) One-Time Audits on Active Road Project's Construction/Design-Build/+Supervision Projects with 30% up to 70% Completion].

- ✓ Five (5) Continuous Audits on Active Construction/Design-Build/+Supervision Projects. Continuous Technical Audits in this context involve Initial, Intermediate and Final Audits on the selected on-going road projects. *(Note. If the selected project does not meet the requirement for Initial/Intermediate/Final Audits within the contract period, it can be replaced another project who fulfill the requirement.)*
  - ✓ Initial Audits
  - ✓ Intermediate Audit
  - ✓ Final Audits

7. The limits of the data to be collected & reviewed, Surveys, Investigations & Laboratory tests to be carried out, and analysis & recommendations to be made, will depend on the type/nature, size, complexity, location and status of the project to be audited. The roles of Consultant Personnel & PQSM Staff during the joint Technical Audits, and the team arrangement per project audited shall be discussed and agreed

The consultant shall include the required expenses of PQSM staffs in the financial proposal as a **Reimbursable cost**, during the on-job trainings and Joint Technical Audits to be carried out with the consultant staffs; especially the Fieldworks of Technical Audit.

B. Detailed Technical & Performance Audit Tasks

The consulting firm, to the best of his knowledge, expertise & experience, and best international industry practices, is required to come up in its tender proposal with its detailed approach, methodology and procedures, with activity sequence and schedule for undertaking the capacity building and/or technical audit activities. However, the following lists of activities are stipulated as a minimum requirement.

The Auditing Consultant shall fulfill all the duties and responsibilities so as to result in delivering reports, findings, and recommendations on whether or not the road projects under design, construction/Design-build/ and maintenance are being executed to the specified standard, requirements and conditions of contract.

The Technical audit will focus on the quality of designs completed, Civil works on-going and/or completed, corresponding supervision consultancy services for the civil works, and the Engineering procurement processes for the Civil works and consulting services; to verify if the works and services provided comply with the technical specifications and standards described in the respective Contract documents as well as verifications for key elements / activities that the quantity of works executed and services provided match well with the payments made. The examination will be based on, among others, review of necessary/pertinent project documents, contract documents, design reports & drawings, progress & technical reports, as-built data, Payment data for the civil works & services, historic test/investigations records, correspondence letters between or among contracting parties, site instructions/ inspections/ approvals, visual inspections, verification ground surveys, necessary site investigations and condition surveys, laboratory analysis of construction materials, in-situ tests for ongoing or completed road works/layers; and laboratory analysis road core samples on the completed road sections, to verify, among other elements, layer thicknesses, grading, bitumen content, compaction, voids-in-the-mix, computation of quantities and the general quality of materials used against the specifications.

For the bridges & other drainage structures, the consultant shall propose in its technical proposal the planned methodology for checking the quality of these structures. However, non-destructive tests are recommended. Destructive tests will be agreed with the Client, if found necessary to be applied.

Quality and extent of supervision services will also be assessed for the purpose of providing an overview of its contribution to achieving the 'value for money' for the project.

The consultant shall also assess the mechanisms & procedures followed in contractual changes, variations, extensions of time, handling claims and dispute review by Dispute Review Expert (DRE) or Dispute Board (DB), as appropriate. The nature of the disputes and the decisions provided by the DRE or DB shall be reviewed/ assessed and provide an independent opinion on the management of the disputes from the time of submission to decision, and more importantly the fairness of the decision given for each dispute, so that necessary lessons learnt, pro-active or corrective actions can be taken for forthcoming issues of same audited project(s) or other projects of the contracting administration.

1. Carry out a **pre-audit meeting** with the working unit of the client (i.e., PQSM, Contract management directorates, Design, Engineering procurement directorate and top management of ERA) to share ideas and lay down a common understanding about the purpose and objectives of the service. The pre-audit meeting is expected to set the context for the technical auditing requirements by bringing together the Consultant Team, PQSM and the Contract Management Directorates of ERA to discuss on the scope, purpose and objectives of the audit and review all information available.
2. **Data Collection:** Before commencement and/or in the course of the technical quality audit of projects, the consultant (with the necessary assistance & liaising from PQSM Directorate and/or the management) shall collect all the necessary & appropriate project documents, data and records to be reviewed, but not limited to the copies of the following:
   - ERA Design Manuals, and Standard Technical Specifications (2002 or 2013 versions as appropriate), the Applicable Conditions of Contract and recommended international standards.
   - ERA Quality Manuals and Standards.
   - Legal and Statutory Documents related to public Procurement
   - Design Service Contract Documents
   - Design Contract Data, Outputs, Design Reports & Records
   - Procurement Data for Design service, Civil works &Supervision Service Contracts (as appropriate)
   - Civil Works Contract Documents
   - Consulting Services Contract Documents
   - Consultant's Quality Assurance Manual
   - Contractor's Quality Control Plan
   - Design Review Reports

- Construction materials Review Report
- Monthly Progress Meeting Minutes
- Monthly/Quarterly Progress Reports
- Original and Revised Work Programs for the Civil Works
- Traffic Management Plan
- Environment, Health & Safety Management Manual/Plan
- Communication Records/Letters Made between & among the contracting parties [ERA, Consultant & Contractor] and other stakeholders;
- Interim Payment Certificate (IPC) Documents with appropriate Attachments & Back-up Sheets
- Request for Inspection (RFIs) and Approval Records, together with As-built, level data & Test Results (field & Laboratory), for all Works and Material Production Categories
- Schedule of Drainage Structures & as-built drawings
- Records /Documents related to Key Contractual Issues such as Variations, Determination of EOT & Claims Assessment
- Records of Guarantees and Insurances required under the Contract
- Surveying Data and As-built Drawings
- Dispute /Arbitration Related Documents, Notices, Referrals & Decisions/ Recommendations.

The Consultant shall collect from relevant bodies all the required documents related to the project's supervision and works contracts, contract documents, design documents (topographic surveying data, design standards geometric design and optimization, Extent of earthworks, geotechnical investigation, quantity calculation and engineering cost estimate), Contract Drawings, correspondences, contemporary records, supplementary agreements, variation orders, claim handling procedures, etc. that are required to discharge the auditing services.

The above mentioned & other documents may be requested by the consultant, in consultation with the Employer, for acquisition of the data in the Hardcopy, Raw Softcopy (.doc, .xls, .pdf) and/or scanned electronic copy formats, as appropriate and depending on the data availability in such record formats.

3. Do a **desk-top review** of collected project data and other international quality control and quality assurance best practices, to enable benchmarking of audit requirements, preparation of specific forms/Checklists for the auditing, and integration of the audit tasks in the recommendations. Also do a review of Design Report and Drawings to gain insight into the project for preparation of field visits, and to identify preliminary areas of quality and quantity concern.

   The desk top review shall also entail identification of best practice of countries or organizations on quality control and quality assurance on road design, construction, maintenance, engineering procurement process, environmental and social safeguards, and to lay down the foundations for gap assessment and development of required quality control and quality assurance procedures, guidelines and manuals for ERA; and subsequently to arrange overseas working visits for the selected ERA's staff.

4. Assess the conformity and quality of the contractual documents (works and supervision contracts), while not focusing on standard elements as General Conditions. Checks shall include the following:
    - internal consistency of the contractual documents;
    - Presence/ absence of contractual document elements requiring correction or further action (expiry dates, changes to/renewals of guarantees, etc.);
    - Quality/ adequacy of all the contractual provisions to manage the contracts properly.
5. Assess the relevance and the quality of the design documents.
6. The Auditor/Consultant shall carryout visits to the project sites in order to acquaint him with the ground conditions, adequacy of facilities, observation of site activities and site communications between the Contractor and the Engineer/the employer's representative. This may help the auditor not only to propose realistic amendments and solutions for defects and shortcomings that may be noticed from the review of contracts at first glance, but also help to propose what auditing criteria to adapt and submit a realistic work plan of the audit service. The site visit shall cover the following key activities but not limited to:
    - Physical inspection to ensure the construction is done in accordance with the design specification and there is no need for design change
    - Assess existing road condition to identify if there is any failure resulted in poor design
    - Assess major and minor drainage structures
    - Assess environmental impact and safety considerations
    - To complete the site visit and investigation, the consultant shall take sampling and testing on selected items
7. The Auditor/the Consultant shall carefully and comprehensively, review all the Contractor's submittals and supervision consultant's Recommendations and comments and the Auditor shall clearly understand the scope and complexities of the project by reviewing all these and other necessary data and contract documentations including drawings, specifications, material reports and conditions of contracts.
8. The Auditor/the Consultant, as an outcome of his review of the contract and design documents and site visit findings, will propose to the Client any possible immediate solutions *(other than those to be proposed for future considerations by the client at final audit report)* for those defects which are identified and requires amendments for the project to progress smoothly thereafter. The client after reviewing the proposals may consent and communicate the concerned parties for the implementation of the proposals, if found relevant and acceptable.
9. The Auditor/the Consultant shall also obtain and review day to day documentations of both the contractors and the supervision consultants, especially the quality control and assurance systems that each party has established for the control of project quality, and advise the client with this regard accordingly.
10. Assess the sufficiency of the initial design documentation (Bridges, Roads etc.) submitted by the service contractor for construction purposes and recommend any deemed changes thereto.

11. Conduct Visual assessment of the ongoing works and any finished road sections.
12. Conduct Verification of the ground surveys, Cross-sections, benchmarks, Ground control stations, coordinates; setting-out surveys; for the designed road sections, and levels, thickness, tolerance and accuracy of the constructed work components. Minimum verification survey requirements are as follows:

    - For verification of the completed road designs, **a minimum of 20%** out of the total road section; at continuous of interconnected intervals/lots to be agreed with the Employer (depending on the Size/Complexity of the project); but attention shall be given for locations of difficult terrain sections, curves, major crossing structures. ***[Except those to be covered under Employer's Specified Provisional Sum (PS), the Consultant shall provide necessary survey equipment, tools, and man-power for this aspect of the design survey verification; and cost of same shall be considered in the consultant's financial proposal]***
    - For Verification of As-built Data in on-going Design-build or Construction Contracts [Level, thickness, tolerance, & measurement/ quantities] on on-going construction work components *[Earthwork, Subgrade/Capping Layer, Embankment, Sub-base, Base-course, Wearing Surface]* as appropriate, a **minimum of 30%** of the section/lot from each constructed/on-going work item, as per the intervals/frequencies specified in the respective civil works contracts. Attention shall be given for locations of difficult terrain sections, curves, major crossing structures, suspected/perceived non-conforming work sections following visual assessment or review of project records. ***[The resources (surveying equipment & tools) provided under the Civil works contract will be used; and the verification surveys shall be conducted jointly in the presence of the representatives of the Contractor, Supervision consultant, and the audit team]***.
13. Check and verify the geometric integrity of the designed highway/road and/or the constructed road, in line with the contractual requirements & standards of the design and/or construction contract (as appropriate).
14. Assess whether the design is being implemented; assess the adopted procedure for design changes (pavement design, geometric design, drainage and bridge structures, etc.); the construction workmanship (pavement surface regularity, pavement soundness); and quality control compliance testing (site control testing procedures and practices) including determination of their reliability and where applicable possible impacts on the project.
15. Assess qualitative and quantitative sufficiency of site organization of both the service and works Contractors, including human resources (management team, skilled and un-skilled labour) and material resources (plant, equipment, quality control laboratories, etc.); deployed in conformity with contractual obligations, design requirements, work programmes and method statements.
16. Examine the contractual clauses in the works contract related to sub-contracting and assess in how far these clauses are being complied with.

17. Ensure, by traditional audit methods and through use of appropriate tools, techniques & applicable engineering software, the regularity of requests for payments (advance payments and interim invoices) issued by the Contractor, approved[1] by the Supervising Consultant, the Engineer/Supervisor and the Contracting Administration. Checks shall notably include the following:
    - Audit operations actually performed by the Supervising Consultant;
    - Identification from the bills of quantities, the major activities (which have been executed, certified and paid for through interim payment certificates (IPCs)), and verification of the accuracy of computed quantities; *[The Consultant shall therefore take physical dimensions at site of selected activities, compute quantities and compare with the values certified by the Engineer through IPCs.]*
    - Consistency between the quantities reported in Interim Payment Certificates. Provisional Acceptance Certificate, as-built drawings and the quantities actually measured and recorded on site, with particular attention in respect of earthworks, the thicknesses and dimensions of the different road pavement layers and the contractor's materials on site;
    - accuracy of Interim Payment Certificates and the Provisional Acceptance Certificate;
    - consistency between the technical qualities stipulated in the contract, those stated in the various supervision's reports and those actually noted on site;
    - application of penalties;
    - adequacy of the works contract documents in respect of price revision and/or adjustment;
    - correct application of the price revision and/or adjustment method;
    - Price Adjustment Procedures & correctness
    - Correct fixing of the new unit prices established in the course of the works, on the basis of a detailed price breakdown.
18. Ensure, by traditional audit methods and through use of appropriate tools, techniques & applicable engineering software, the regularity of requests for payments (advance payments and interim invoices) issued by the Supervising Consultant by virtue of its own contract and approved[2] by the Supervisor and the Contracting Administration. Checks shall notably include the following:
    - Inspection of the services actually performed;
    - Consistency between the time inputs (man-months) shown in the invoices and the time inputs (man-months) actually noted on site and the number of monthly fixed-price services (vehicles, office running, etc.);
    - The regularity of unit prices and price revisions and adjustments applied;
    - Application of penalties and price reductions;
    - Consultant's provisional acceptance report, as-built drawings and provisional accounts.

[1] This task also includes documents which, at the time of the audit, have been issued by the company and are in the process of being approved/ endorsed.
[2] This task also includes documents which, at the time of the audit, have been issued by the office responsible for control of the works and are in the process of being approved/ endorsed.

19. Analyze and assess:
    - Contractor's Site organization and Management;
    - Resources deployed by the Contractor and the Supervising Consultant (human resources, equipment, means of control, etc.);
    - Consultant's quality assurance procedures, in particular the laboratory equipment, test methods and general procedures;
    - Adequacy of the Consultant's site information system;
    - Progress of the works compared with the work programme, the history of programme changes due to delays and reasons/responsibilities for the delays.
    - Quality of the setting out of works and its adherence to the drawings; the consistency between the as-built drawings;
    - Compliance with the contractual clauses as regards to implementation of the following plans:
        - Environmental protection plan,
        - Safety of workers, Safety of works, security plan
        - Traffic management plan.
    - Contractor's internal quality control system (including the checking of internal audit plans, where they exist);
    - **Project management documents:** work register, works execution plans, minutes of site meetings, progress reports of the supervising consultant, contractual documents and administrative orders, and correspondence between the Contractor, the Supervising Consultant, the Supervisor, and the Contracting Administration;
    - **Site management aspects:** quality and efficacy of the topographical and geotechnical team deliveries and the adequacy and availability of equipment for laboratory testing;
    - Estimate of the works remaining to be executed and financial forecast of the project;
    - Pre-dispute situations likely to result in a claim from the Contractor *(the audit team is not, however, a substitute for the claim expert of the Supervising Consultant).*
    - Relevant site instructions and approval documents, pavement layer construction records, laboratory test results and survey level records, compliance with specifications, etc.
    - The sufficiency and implementation of the Environmental Management Plan.
    - Overall quality control measures and management, including site and personnel safety precautions, compliance with local labour standards, etc.
    - The organization and implementation of social awareness components, HIV/AIDs awareness campaigns, etc.
    - Payment certificates vs. method of measurement indicated in the contract and/or the technical specifications.
    - The approaches, methodologies, procedures, systems, tools & techniques for the Contractual and technical Quality Assurance activities followed for the project; Communications; recording systems, etc.

20. Ensure that all environmental & social safeguards' protection measures are performed in compliance with the contract requirement, local regulations & policies, and financing agency's (Sponsoring organization's Requirements, as appropriate).
21. Suggest possible corrective measures of anomalies detected that could affect the quality of the works and avoid their repetition.
22. **Quality of Materials Forming part of Permanent Works:** The Consultant or the Technical Audit team shall make visual inspection of the materials ***[Natural Construction Materials, Procured, and Processed on site]*** forming part of the permanent works and select few components for which testing and detailed analysis shall be made to verify their compliance with specifications.
23. Propose additional testing if deemed necessary.
24. Identify key external factors that are affecting the project.
25. Conduct Condition survey of the finished road pavement works, surfacing, and drainage structures; identify the types, possible causes of the distresses & failures; categorize and propose possible remedial measures that need the action of the contracting parties, or external measures.
26. Evaluate the performance of the finished road sections and, if necessary, carry out further tests on materials and selected sections of the finished road;
27. Carryout analysis of Road Pavement Strength and Riding Quality, through the use of Falling Weight Deflectometer (FWD), Bump integrator or other equipment deemed necessary and proposed by the consultant.
28. **Coring/Excavation and analysis of samples:** The testing and analysis of cores samples taken from completed road sections shall be carried out as per the following requirements:
    - An average of one sample per **300-meter** intervals of constructed road section, for a minimum of the **30%** of the total constructed road sections to be taken at random locations and/or at locations where problems may be suspected. The interval of coring may be reduced up to **100 meter in discussion with the ERA/ PQSM for locations where problems are noted or highly suspected, pursuant to visual assessment.**
    - The consultant and/or the joint Audit Team of the Consultant and PQSM Staff will be directly responsible for identifying the precise locations where samples are to be drilled and for the actual drilling and taking of the samples. They will be assisted by the supervision consultant and the Contractor to reinstate the drilled/cored holes (filling and compacting) with appropriate asphaltic materials.
    - The laboratory testing of the core samples will have to include as a minimum: the thickness of the various layers, grading of aggregates, bitumen content and quality, compaction, voids-in-the-mix, and other acceptance requirements defined in the respective contract for the general quality of materials used.
    - In case of technical audit of completed road project(s), where the Contractor's resources have been demobilized or under Defect Liability Period Stage, the actual drilling of the samples, filling in of the holes after coring and the laboratory testing of the samples may be outsourced to an appropriate external qualified and independent supplier **[through Provisional Sum amount to be**

specified] and/or upon discussion with ERA Management and concerned directorate, the reinstatement task may be handled by the ERA's District Road Asset Management/Maintenance Directorate. The Audit team will however be directly responsible for supervising any subcontractor to ensure the quality and accuracy of all subcontracted work, and especially to ensure the accuracy of the laboratory tests. The representative from the supervision consultant and the Civil Works Contractor shall be allowed to attend to observe while conducting such drilling, sampling, testing and filling/reinstatement activities.

29. The Consultant or the audit team shall carry out both visual inspection and accompanying tests for bridges as necessary; checks and tests for finishing, soundness, strength and other parameters to confirm the integrity of the components. Necessary testing equipment and tools, including but not limited to Concrete Rebound (Hammer) Testing tools [Schmidt Hammer, shall be supplied by the consultant itself, and costs of such tools /equipment shall be considered in the consultant's financial proposal.
30. Suggest possible corrective measures of anomalies detected that could affect the quality of the works.
31. **Assessment shall also be carried out on the Quality of Supervision of works** through:
    - Assessment of the managerial capability of the Supervision Consultant in handling technical and contractual issues for the aim of minimizing the overall construction costs;
    - Assessment of the resource inputs by the Supervision Consultant compared with the extent of the supervision works including organization structure
32. As to the **Management and Decisions on Disputes** (for projects encountered Dispute Processes), the Consultant shall review/assess:
    - Genuineness of each dispute,
    - Pre-requisites and Procedure used in handling the disputes against the contractually laid down guidelines:
    - The content of the disputes against the decisions made by the Dispute Review Expert (or Dispute Board); and provide independent opinion for each.
33. The Consultant/Auditor shall carry out the following tasks, but not limited to:
    - **Laboratory tests**: - The Auditor should inspect the laboratory equipment for calibration and check test procedures methodology for compliance with the project specification; routine laboratory test results should also be inspected in order to ensure that the correct materials are utilized;
    - **Construction records**: - Inspect the Daily, weekly, and monthly construction progress records to identify problems resulting in slow progress as well as periods with greater than expected/planned progress; Material quantities, aggregates application rates, bituminous spray rates and quantities usage should all be assessed in terms of the completed works; assess whether record, keeping of different construction materials, labors used and expenditure incurred etc. are properly maintained;
    - **Quality assurance data**: - Routine density/compaction, thickness and quality control/assurance measurements should be inspected to ensure that the correct

quality was achieved. Calibration and control records of compaction density testing equipment should be inspected. The Auditor may take samples or carry out testing to check construction quality if so, dictated by his assessment and/or on request of the client;

- **Project and Contract management issues**:- Number of areas can be assessed under this sub-activity that includes checking of the quality of the work program, details of the work program with the progress rates, consistency between planned activities and those actually undertaken as well as resources and time spent, conformance with the requirements of the provisions of contract as to submissions and responses dates, certificates of insurances, etc have to be reviewed and compliance verified; Verify if both the Contractor and the Engineer have suitably qualified site personnel in order to ensure that the project is properly managed;
- **Auditing of social and environmental safeguards**: - Undertake checking of the provisions of **ESHS** through field visits in consultation with concerned. Special attention be given, whether work sites, contractor camps complied with contract provision, local laws, regulations and guidelines; check whether the works undertaken complied with the social and environmental safeguards framework/agreed plan of work;
- **Performance Audit**: Assess best practices in Performance assessment/monitoring of Contractor's & Consultants and Rating Criteria; Review ERA's Performance Measurement /Evaluation & Monitoring System; and identify gaps/drawbacks or limitations, and propose recommendations for Improvement, if any.

  Also Undertake auditing of the performance of the Contractors and Supervision consultants of the projects under considerations for their efficiency and effectiveness; and demonstrate or propose to the client the performance rating system with rating criteria for future use (i.e., performance rating for the contractor & consultant);
- **Reviewing of Design & Tender documents**: - After reviewing the documents, prepare a special report for Gross deficiencies in design, Bill of Quantities and tender documents identified by the auditor;
  a. To assess the variation orders instructed against the original design, the effect of cost and whether they were implemented correctly or not by reviewing how variations in design and scope of work were handled, including Cost and extension of time claims managed;
  b. To review as built records, relevant correspondence and minutes of meetings, which includes reviewing of the quality and completeness of reports as well as filing systems and documentation procedures;
  c. To review, whether the Resident Engineer was effective in controlling the scope and quality of the work as well as quantity of work measurements, have been done according to the contract requirements and checking whether inspection procedures in place are adequate;
  d. Assess the quality assurance procedures, in particular the laboratory equipment, test methods and general procedures; Assess the construction methods and the care and diligence employed by the contractor;

e. Check the current estimate against the tendered price using both the engineers and the contractor's management systems;
f. Check materials on site by sampling and testing and inspection of materials and records;
g. Check measurement and payment certificates in comparison with the bill of quantities for confirmation of work completed;
h. Identify faults, omissions, inconsistencies, ambiguities in field surveys and investigations, engineering analysis and designs, cost estimates, bill of quantities, drawings, and specifications then suggest remedial measures;
i. check that the employer has not over-paid at any time during the project;
j. Diagnose areas vulnerable to ethical misconduct possibly have taken place in any stage of the implementation of the road works, such as quality test of any works, quantity estimation during works execution and supervision;
k. Determine whether the Employer (ERA) and the supervising consultants have adequately fulfilled their management and contractual obligations;
l. Examine and look for any deficiency in the design of the selected projects with respect to the following issues, (with an intention to formulate a new technical and Managerial approach that ensures highest quality of design) but not limited to:

    - Terms of Reference
    - Consultants contract document
    - Topographic surveying
    - Route selection
    - Feasibility study
    - Design standards
    - Geometric design and optimization
    - Extent of earthworks
    - Rural and town sections design
    - Major and minor drainage structure design
    - Geotechnical investigation
    - Construction material identification and investigation
    - Appropriate pavement structure design
    - Quantity calculation
    - Engineering cost estimate
    - Traffic control and road safety
    - Technical specification and conditions of contract
    - Contract drawings
    - Appropriate tender document

m. Analysis and preparation of Audit Report. The Quality Audit will succinctly report the findings through identification and prioritization of the audit issues. Recommendations should then be made for reducing/eliminating the risk. The recommendations should clearly indicate level of risk associated with the various quality issues identified (e.g., low, medium or high).

n. Determine whether ERA's representatives and the design consultants have adequately fulfilled their management and contractual obligations;
o. Identify and recommend an appropriate technical practice on how to check, control and manage design projects and mitigation measure;
p. Integrate the lessons learned from the technical audit into the recommended design contract management system as well as construction contract management.

34. Based on the findings of the audit and observations made in the field, the Auditor/consultant should recommend ways on how to improve the performance in the areas of problems noted on each of the partners involved in the implementation of the projects. Reporting and presentations to the client at the various stages is also essential. The report should include pictures, videos and diagrams as may be considered useful to further illustrate points made, provide a map(s) indicating location of identified risk(s). The Quality Auditor will present the Audit Findings to key stakeholders through a power point presentation. The feedback from the presentation would be incorporated into the final report. Furthermore, the consultant shall expect to prepare guidelines, manuals, checklists and action plan to avoid the faulty procedures and practices in the future from the organization.
35. **On the basis of the above,** the Consultant shall provide relevant reports including to presentation of a sufficiently qualified independent opinion on all technical audit aspects, including but not limited to the following: -
    - An assessment of the Contractor's general performance; the programme of works and method statements in conformity with design requirements; Contractor's capacity to execute the works foreseen in the contract; sufficiency of site organisation; human resource allocation (management team, skilled and un-skilled labour); material resources (plant, equipment, quality control, laboratories etc.); and the procedures established/applied for quality assurance of works construction (detailed survey and setting out of works, workmanship, pavement surface regularity, pavement soundness).
    - An assessment of the Supervising Consultants' system for quality control compliance testing (site compliance testing procedures and practices) and the existence of systematic and complete records of all tests performed kept in such manner that all test data are accessible for statistical analysis and as-built records. Analysis of relevant site instructions and approval documents, work register, pavement layer construction records, laboratory test results and survey level records, compliance with tolerances etc.
    - Evaluation of the adequacy of survey and measurement recording for the purpose of establishing accurate basis for payment and conformity with the design drawings and specifications. Particular attention shall be paid to geometric control (length, layer thickness and width measurement) for achievement of the tolerance limits given in the technical specification for all road layers
    - Assessment of the environmental impact, employment, gender and other relevant cross-cutting issues

- Recommendations on measures by the Supervisor and/or Contractor that would improve the efficiency and effectiveness of contracts management. Advice on any existing or foreseen problems arising of engineering nature during the execution of the works, together with proposal for addressing these problems.
- Relevant reports shall include annexed relevant back-up documentation including photographic records, results of all measurements, destructive and non-destructive testing carried out on site and in the laboratory, record of individuals and documents consulted.
- An identification of key external factors affecting the project.

Notes:

- *The above scopes of activities are only generic & minimum descriptions of the activities required to be considered by the Consultant for the technical audit and Road Safety Audit, as part of the Capacity Building initiative. However, to the best of its knowledge, expertise & professional experience, the consultant shall come up with its detailed approach, methodology, procedures, level/extent of review/audit & parameters for undertaking the assignment, tailored to the following categories of projects or audit cycles:*

  Part-1: Technical Audit of Design Service Contracts [Completed Designs]

  Part-2: Technical Audit of Construction /Design-Build/ & Supervision Service Contracts [Ongoing/Active Projects]

  - *Single (One-time) Audit*
  - *Continues Audit*
    - *Initial Audit*
    - *Intermediate Audits*
    - *Final Audits*

  Part-3: Full-Cycle Audit for Projects whose Construction & Design Build has been completed [Value-for-Money Audit], which includes Design service Procurement & Design; Procurement of Civil works & Supervision Service; and Construction/Design-Build &Supervision stage Activities]

- Checks and analyses shall be mainly carried out in accordance with technically simple operations: site surveys, measurements, photos and calculations to verify quantities on the basis of statements and documents produced by the Contractor and the Supervising Consultant. However, the auditor may recommend more in-depth measures if necessary: in particular, as a member of a firm mandated by the Contracting Administration, he shall have free access to the Supervising Consultant's laboratory where he may, if necessary, ask the Supervising Consultant to carry out additional materials tests. The Contractor shall be informed and associated to the process.
- The consultant shall communicate the findings & outputs of the technical Audits to the Contracting Administration (Employer), Consultant(s) and the Contractor in the form of the Regular **Reports** specifically required under these terms of Reference (TOR) and **Specific Opinions**, as appropriate. Specific opinions may be requested by the parties in the contracts of the projects on the origin of a reported anomaly, following a particular audit visit, on a claim submitted by the Contractor, etc.); provided that such opinions are not requested outside an audit mission.

4.2.5. Capacity Building & Professional Development through Practical Road Safety Auditing

A. General requirements

1. The consultant shall make sure that ERA's and/or PQSM Directorate's Capacity in Practical Road Safety Auditing, at all stages of Project Implementation (Feasibility Study, Detailed Design/Pre-construction Stage/, Construction Stage and Post-Construction), is sufficiently improved and strengthened through Practical and hand-on involvement of the PQSM staffs, while the consultant undertakes the audits on selected and agreed projects. In this regard, the Road Safety Audit capacity building shall be ensured progressively first by Providing Short-term "Introductory Theoretical and Conceptual Training on Road Safety Inspection/Review & Road Safety Auditing for Design, Construction and Maintenance of Road Projects"; followed by Familiarization of "Preliminary Working Documents (Guidelines, Manuals, Checklists, Templates, Reporting Formats & other relevant tools necessary for the work)"; on-job training of the staffs "while the consultant undertakes actual/practical Road Safety Auditing on some of the projects selected for RSA"; and, lastly through **Joint Practical Road Safety Auditing** to be undertaken jointly by the Consultant team and PQSM Staffs.
2. The RSA shall be undertaken on selected on-going & completed Design, Construction/Heavy Maintenance projects, to be proposed by PQSM Directorate and as agreed with the Employer's Top Management &/or Quality Monitoring Committee**.** Unless agreed otherwise, **RSA** of nearly 50% of Projects shall be conducted solely by the Consultant, provided that on-job training is arranged and provided to PQSM staffs on such audits. Whereas, RSA of remaining [50%] selected projects shall be undertaken jointly by Consultant & PQSM Staff; under the leadership, guidance & Mentorship of the Consultant Staff, to enable knowledge transfer, experience/skill sharing & Practical Demonstration of Systems developed.
3. The consultant shall make sure that the PQSM staffs acquire the necessary theoretical & practical knowledge, skill and hands-on experience in all required processes of RSA to be considered for each project, including but not limited to: *Data Collection, Preliminary Desk review, Preliminary Site Visit, Project RSA Audit Planning & Preparation of specific forms & Checklists, RSA Notification, Pre-audit Meeting, Detailed Documentation (Desk-top) review, Field Surveys & Investigations, Laboratory Tests (if any), Data Analysis & Interpretations of results, Exit/Final Meetings, Preparation of Draft/Final Reports.*
4. The RSA are mainly for purposes of Capacity building of ERA; and the outputs of the audits and the associated reports shall be used only for internal purposes. Confidentiality of all data collected, analysis made and reports generated shall be maintained at all times, and shall not be made accessible to parties other than ERA; unless, ERA's consent is obtained otherwise. Disclaimers/Commitments

and Confidentiality Clauses shall be included in the technical audit findings and reports to be submitted/ provided by the TA consultant.

Notwithstanding the above, the findings of the audit shall be presented and RSA reports will be provided to the top management of ERA (or the Quality Monitoring Committee), the concerned directorates and the project management representatives of the other Contracting parties (Design/Supervision Consultants and Civil Works Contractors, as appropriate); to enable ERA and the other contracting parties of respective projects take the necessary actions to provide pro-active and/or reactive/corrective actions, related to the audit findings (as appropriate).

Following presentations, discussions & consents reached with the representatives of contracting parties on the technical audit findings, the joint team of the consultant & PQSM staffs shall prepare an agreed action plan based on findings of the audit and discussions for further implementation. The joint team, within the contract period of this service contract, shall routinely monitor and follow-up how the agreed action plans are being implemented by the contracting parties.

5. Projects for the technical audit shall be selected in discussion with PQSM Directorate, considering: Mode of Delivery (DB or DBB or OPRC), Financer of the project, Location, Size & Complexity, Performance, Reported Safety Problems & other Challenges, or otherwise.

   The anticipated numbers of projects to be selected for the RSA, by category, are shown below:

   - ✓ **Five (5)** Road Design Projects Safety **(Completed); but not Constructed [Pre-construction RSA]**
   - ✓ **Five (5)** Road Projects Design **(Completed); Construction on-going [Pre-construction and Construction RSA]**
   - ✓ **Five (5)** Road Projects /Design-Build or Design-Bid-Build/ **[Post-construction RSA]**
   - ✓ **Two (2)** Existing Road Corridors

Notes: -

- ❖ *The projects to be selected for the Road Safety Audit shall be similar to the projects selected for Technical & Performance Audit (Chapter 4, Section 4.1) and additionally 2 exiting road corridors.*
- ❖ *The reports (Technical Audit and Road Safety Audit) shall be submitted separately.*

6. The limits of the data to be collected & reviewed, Surveys, Investigations & Laboratory tests (if any) to be carried out, and analysis & recommendations to be made, will depend on the type/nature, size, complexity, location and status of the project to be audited.
7. The roles of Consultant Personnel & PQSM Staff during the joint RSA, and the team arrangement per project audited shall be discussed and agreed.

The consultant shall include for the required expenses of PQSM staffs in the financial proposal as a **Reimbursable cost**, during the on-job trainings and Joint Road Safety Audits to be carried out with the Consultant staffs; especially the Fieldworks of RSA.

B. Detailed Road Safety Audit (RSA) Tasks

The Consulting firm, to the best of his knowledge, expertise & experience, and best international industry practices, is required to come up in its tender proposal with its detailed approach, methodology and procedures, with activity sequence and schedule for undertaking the capacity building and/or RSA activities. However, the following lists of activities are stipulated as a minimum requirement.

➢ **General Activities/Requirements:**

- Review Best Practice Systems, Manuals & Guidelines related to Road Safety Management and Road Safety Audit at all Stages of Roads/Highways Development; Benchmark the best international practices; assess the gaps in implementation of Road Safety at national or institutional level;
- Familiarization with available documents and request for additional information:
  The Consultant shall familiarize himself with:
  - ✓ The design standards, guidelines and specifications to be applied to the project;
  - ✓ Review of crash data and reports for the sections/selected projects/ intended to be audited.
  - ✓ Conduct a road safety inspection of the existing road conditions
  - ✓ the available feasibility studies and designs
  - ✓ Applicable domestic legislation, rules and regulations relating to the infrastructure element of road safety;
  - ✓ The historical safety record and any available analysis of the existing road network, for projects intended to be audited.
  - ✓ The available Designs for the road projects intended to be audited for road safety.
  - ✓ Previous studies related to road safety at national or institutional level, if any.

  N.B: Pilot/candidate Project's to be selected for the Road Safety Audit will be agreed, in discussion with the Employer.
- Prepare a plan and activity schedule for the road safety assessments and inspections
- Conduct detailed Review of Project Design Plans and Construction Drawings from the point of view of Safety.
- Prepare checklists, forms & Reporting formats for road safety assessment, inspections and recording of deficiencies identified
- Integrate the lessons learnt from Best Practice Benchmarking and audit findings, in the relevant manuals, guidelines and standards required to be prepared under the Contract of this consulting service assignment; and as much as possible, in the Road Safety Related trainings to be prepared/arranged for ERA staff.
- Prepare, arrange and Conduct Workshops on the Road Safety Audit findings and way forward for ERA and other relevant actors in the Road Sector, in consultation with the Employer.

- **Pre-construction phase [Design Stage] Road Safety Audit Activities:**
  - Assess the project from the completed design plans and Review /Evaluate the Geometric design of the road for Road Safety Aspects;
  - Assess previously recorded road safety deficiencies;
  - Assess the Road Safety Measures incorporated and proposed in the design of the road. This shall be carried out upon review and further investigation of the latest road safety statistics, with particular attention at the national and regional level (as appropriate), and by showing in category fatalities and serious injuries due to road traffic incidents.
  - Identify and review the locations of all areas such as schools along the length of the designed road, and sections of higher pedestrian concentration along the road, both for crossing points, and where pedestrians walk along the road. Review the safety measures incorporated for such points and other accident black spot areas.
  - Also assess the Safety of the Construction Processes, being followed by the Construction Project team.
  - Record road safety deficiencies and recommend remedial measures; Prepare Road "Safety audit findings Report" for the designed the road with necessary improvement recommendations of the safety measures, for consideration in further optimization, changes in geometric design or otherwise.
- **Construction Phase/Stage Evaluation of Road Safety:**
  - **Both During the Road Works & At completion of Construction (Pre-opening for Traffic):**

- Assess the on-going construction project from the construction Plans (latest design plans) and as-built data, for potential road safety risks; i.e., the assessment must go beyond assessing the conformance to standards.
- Assess the project by inspecting the site, both during day and night conditions
- Assess/inspect the site during peak and off-peak operating conditions;
- Conduct safety inspections under adverse weather conditions such as fog, rain, snow, etc. (as appropriate), if the opportunity arises.
- The assessment must be conducted along all approaches from the perspective of all the relevant different road users.
- Record all road safety deficiencies that are identified, completing the agreed checklist.
- Make review/analysis of crash/accident history based on available information.
- Prepare Construction Stage road safety audit report, with the necessary improvement recommendations of the safety measures, for consideration in further optimization, changes in geometric design or otherwise interventions deemed necessary by the contracting parties of the Civil Works Contract.

- **Carryout Evaluation of Road Safety for the Post- Construction Phase:**

- Gather and review all information/material for the road safety audit

- Assess the **road and related infrastructure facilities, furniture, junctions, structures, etc.**, for potential road safety risks; i.e., the assessment must go beyond assessing the conformance to standards.
- Assess the project by inspecting the site, both during daylight and night lighting conditions
- Inspect the site during peak and off-peak operating conditions;
- Conduct safety inspections under adverse weather conditions such as fog, rain, snow, etc. (as appropriate), if the opportunity arises
- The assessment must be conducted along all approaches from the perspective of all the relevant different road users
- Record all road safety deficiencies that are identified, completing the agreed checklist.
- Make review/analysis of crash/accident history based on available information.
- Prepare a special road safety audit report; with the necessary improvement recommendations of the safety measures, for consideration in further optimization, changes in geometric design or otherwise interventions deemed necessary by the Employer.

4.2.6. Capacity Building of ERA PQSM Directorate

1) The consultant shall prepare Technical Manuals, Guidelines and User Guides, Reporting Standard, Inspection/Audit Checklists, Templates, and related Working/Procedure Documents for Quality Control/Monitoring/Assurance & Audit of Road Design Contracts, Road Construction Contracts, Design-Build Contracts and Maintenance Contracts; and Road Safety Inspection & Audit; separately, taking into account Best Practices, other Directives, working Manuals/Specifications & contractual requirements/practices; Deliverables of other previous TA assignments outsourced under ERA Modernization initiatives, and gaps identified and findings of the selected projects' technical audits; i.e.

   To the best of his knowledge, experience and international best practices, the consultant shall prepare the following list of deliverables and Contents:

   i. **Guideline for Quality Assurance and Technical Audit of Road Design, Construction Works and Construction Supervision [Design-bid-Build] delivery cycle of projects:**

      This document shall be prepared, as a single document Separated in the following parts, with appropriate outlines and contents, unless otherwise proposed by the consultant and agreed by ERA, to be used for projects delivered under **Design-bid-Build delivery cycle.**

      Part I: General Principles & Concepts of Quality Assurance and Technical Audits in Road Design, Construction and Construction Supervision

      Part II: Guidelines for Quality Assurance and Technical Audits of Road Design projects/design service contracts,

      Part III: Guidelines for Quality Assurance and Technical Audits of Road Construction projects/civil works contract, *Part IV: Guidelines for Quality Assurance and Technical Audits of Road Construction Supervision projects/consulting service contracts,*

ii. **Guideline for Quality Assurance and Technical Audit of Roads' Design, Construction and Supervision Projects/contracts [Design-Build]**

This document shall be prepared, as a single document Separated in the following parts, with appropriate outlines and contents, unless otherwise proposed by the consultant and agreed by ERA, to be used for projects delivered under **Design-Build delivery cycle.**

Part I: General Principles & Concepts of Quality Assurance and Technical Audits in Road Design-build and Supervision of Design-Build

Part II: Guidelines for Quality Assurance and Technical Audits of Road Design-Build projects/Civil Works contracts,

Part III: Guidelines for Quality Assurance and Technical Audits of Supervision of Road Design-build projects/Consulting Service contracts,

iii. **Manual for Quality Assurance and Technical Audit of Road Design, Construction Works, Construction Supervision and Engineering Procurement.**

This document shall provide details of the approaches, processes, procedures, elements, tools, techniques, requirements and parameters involved in quality assurance and technical audit of road design, civil works construction, and construction supervision contracts outsourced under the Design-Bid-Build delivery/procurement cycle.

The structure and partitioning of the manual should be consistent with the structure/partitioning of the associated Quality Assurance/Technical Audit Guideline indicated above.

iv. **Manual for Quality Assurance and Technical Audit of Road Design-build, Supervision of Design-Build contracts and Engineering Procurement.**

This document shall provide details of the approaches, processes, procedures, elements, tools, techniques, requirements and parameters involved in quality assurance and technical audit of road design, civil works construction, and construction supervision contracts outsourced under the Design- Build delivery/procurement cycle.

The structure and partitioning of the manual should be consistent with the structure/partitioning of the associated Quality Assurance/Technical Audit Guideline indicated above.

v. **User Guide for Quality Assurance and Technical Audit of Road Design, Construction Works and Construction Supervision**

This document should consist of Reporting Standards and Outlines with guidance notes and demonstrative statements, necessary Forms, checklists, etc. The consultant shall make sure that the user guide considers and is harmonious with the Quality Assurance and Technical Audit approaches, procedures, elements, requirements, tools and techniques indicated in the associated guidelines and manuals.

vi. **User Guide for Quality Assurance and Technical Audit of Road Design-Build and Supervision of Design-Build**

This document should consist of Reporting Standards and Outlines with guidance notes and demonstrative statements, necessary Forms, checklists, etc. The consultant shall make sure that the user guide considers and is harmonious with the Quality Assurance and Technical Audit approaches, procedures, elements, requirements, tools and techniques indicated in the associated guidelines and manuals.

vii. **User Guide for Quality Assurance and Technical Audit of Employer's Engineering Procurement for Consulting Services for Design; Consulting Services for Supervision of Construction/Design-Build; and Consulting Services for Civil Works of Construction/Design-Build**

This document should be partitioned in appropriate parts of the procurement item/type; and should consist of Reporting Standards and Outlines with guidance notes and demonstrative statements, necessary Forms, checklists, etc.

The consultant shall make sure that the user guide considers and is harmonious with the Quality Assurance and Technical Audit approaches, procedures, elements, requirements, tools and techniques indicated in the associated guidelines and manuals.

viii. **Road Safety Inspection, Management, Audit and Reporting Manual**

This manual should be a single volume consisting of four parts, with the necessary checklists and tools:

Part I: General Concepts, Principles and Practices of Road Safety, Road Safety Inspection and Road Safety Audit; Road Safety Elements' Design and Construction Considerations

Part II: Manual for Safety Audit of Roads/Highways at Design Stage

Part III: Manual for Safety Inspection and Audit of Roads/Highways at Construction or Post-construction Stage,

Part-IV: Manual for Monitoring, Evaluation and Control of Construction Site Safety on road/highway Construction Projects

The manuals should be prepared considering internationally accepted best practices, National Road Safety Policy and Guidelines, ERA's projects' requirements/organizational contexts, including but not limited to the Design Manuals, Technical Specifications and other pertinent related documents.

ix. **User Guide for Road Safety Inspection, Auditing and Reporting**

This document should consist of Reporting Standards and Outlines with guidance notes and demonstrative statements, necessary Forms, checklists, etc. The consultant shall make sure that the user guide considers and is harmonious with the concepts, approaches, procedures, elements, requirements, tools and techniques indicated in the associated guidelines and manuals of Road Safety and Road Safety Audit.

Note: Preparation of the aforementioned guidelines, manuals and user guides should be made in due consideration of the duties, tasks, responsibilities and obligations of all *contractual parties involved in a project; enabling technical auditors, Road Safety Auditors, and professionals make impartial and sound judgments.*

2) ERA has an already established **Training Centers**, and it is also planning and working on establishing a **Highway Academy** that is intended to enhance the knowledge, technical skills, and ensuring the excellence of staffs employed by ERA, professionals working with Consultants and Contractors in the road construction industry, and Professional staffs of other local/regional road agencies/authorities.

   As part of endeavors supporting this objective in the continuing capacity development and knowledge/skill enhancement of the staffs working on Quality Assurance, Quality Appraisal Inspection and Technical Auditing on road/bridge design, Construction/design-build, and construction supervision contracts, the consultant is required to develop and submit the following documents:

   i. **Curriculum** for **"Construction Quality Management"** related courses and training, to be integrated into the **Road Academy's or Training centers' programs,** targeted to Capacity Development and Knowledge/ Skill Enhancement of Staffs/ professionals working on Quality Planning/ Control/ Monitoring/ Assurance; Quality Appraisal Inspection; and Technical Auditing on road/bridge design, Construction/design-build, construction supervision contracts; and Technical Appraisal Audits of Engineering Procurement Activities.

      The curriculum shall consider the theoretical, conceptual and practical insights required under the courses/trainings.

   ii. **Training Manuals/Modules for Short-term, Medium Term** and **Long-term Trainings** on

      - Fundamental Concepts, Practices and Technological Advances of Road/Bridge Engineering and Construction
      - Project Management Bodies of Knowledge Areas: Construction Extensions to the Road/Bridge Projects
      - Performance and Quality Management System in Road/bridge Construction and Maintenance Projects: A detailed Approach to the Planning, Executing, Monitoring, Control and Evaluation Activities
      - Quality Assurance, Quality Appraisal Inspection, Technical Audits and reporting in Road/Bridges Project Contracts (Design Service, Civil Works of Construction/Design-Build, Supervision services).
      - Cost Estimation for Road/Bridge Projects and the Validation Process: with Lessons Learnt from International Best Practices
      - Risk Management in Roads/Bridge Projects at Design and Construction stages: Fundamental Concepts and Practical Applications; Focus on how to reflect in the design documents and Construction Contract Documents; Introduction to ***Risk Management Software***
      - Concepts, Procedures, Practices, Management, and Appraisal Audit of Engineering Project Procurements: Emphasis on Consulting services and Civil Works related to Road/Bridge Projects.

- Practical Road Safety Inspection, Management and Auditing: Theoretical and Procedural Approach
- Management & Administration of Design Projects: Best Practices for Road/Highways & Bridge Projects
- Drafting Technical Specifications and Cost Estimation for Road & Bridge Projects

4.2.7. Conducting Workshops, Seminars and Lessons Learnt Sessions

The consultant jointly with the PQSM staffs shall, lot less than semi-annual intervals and not more than annual intervals, shall arrange and conduct Workshops, Seminars & Lessons Learnt Sessions, in relation to Technical Audits, Road Safety Audits, Findings, recommendations, actions, taken, way-forward and other necessary issues, in connection to projects audited within the period. The Participants, to be agreed later, may include ERA Staffs, Contractor & Consulting firms' representatives involved on ERA Projects, and/or relevant key professionals working with ERA in the road sector.

4.2.8. Update, finalize and submit the Standard Working Documents

Update, finalize and submit the standard working documents Prepared earlier by the consultant, after incorporation of the comments/feedbacks of the Employer, filling the gaps identified by the consultant itself and PQSM Staffs during the practical capacity building activities in the implementation of the QMS adopted (Technical Audit & Road Safety auditing included).

5. REPORTING, DELIVERABLES AND SCHEDULE

5.1. Deliverables and Reports

The consultant shall deliver the following list of final reports, deliverables and manuals.

1. **Inception Report**

   Forty-five days after the completion of mobilization, the Consultant shall submit and present the inception report. The report is to outline the Consultants initial findings and confirm the methodology and detailed work program proposed for adoption in the light of the initial findings; while also identifying constraints and proposed solutions, together with any action required by ERA to facilitate the successful implementation of the Auditing.

2. **Bi-Monthly progress reports**

   Every two month progress report of the technical audit shall submit and present to provide a factual report including findings of each project , with regard to the technical Auditing aspects and the results achieved during the implementation of the construction projects and to provide to the Performance, Quality and System Management Directorate, the Quality Monitoring Committee and to ERA Higher Management recommendations to remedy errors that could have occurred or which can lead to improvements in implementation and results of the project.

3. Annual progress Report

The Consultant has responsible to submit progress report to the PQSM directorate and present for ERA top management.

4. Training Accomplishment Report

The Consultant is responsible to submit a training report within 2 week time after carried out of the training.

5. Manuals/Guidelines

The following manuals /guidelines shall be reviewed (updated) in separate volumes:

- Volume 1, Quality Management and Monitoring
- Volume 2, Planning
- Volume 3, Procurement
- Volume 4, Feasibility Studies and Design
- Volume 5, Environmental and Social Management
- Volume 6, Construction Project Management
- Volume 7, Maintenance Project Management

In addition to these the following volumes will be developed and used:

- Volume 6B Construction Management, Quality Control
- Volume 7B Maintenance Management, Quality Control

6. Special Reports

The following Special Reports shall be prepared in separate volumes:

- Review of the TOR and recommendation for the improvement
- Review Engineering procurement process and identify the gaps and indicate recommendations for future implementation.
- Report on the technical auditing of selected design and construction projects as described under Section 6 of the TOR
- Review of the Design documents submitted by the consultants, Identification of major gaps and recommendation for improvements
- Review of the design quality limitations observed on the recently constructed roads and on-going construction projects and recommendation for improvements
- Review of the current the quality of design and design accountability system both for firms and professionals, identify gaps and recommendation on the improvement of the system.

7. Consultancy Completion Report

The Consultant shall submit and present the final Auditing report. The report shall as far as possible be written to stand alone; without reference to other non-standard documents, and shall include but not necessarily be limited to: an executive summary which shall concisely present the key findings and recommendations; key correspondence with ERA, minutes of meetings, etc.; comments received from ERA; and an annex detailing the consulting services including of: the staffing, the resources, facilities and utilities employed, the constraints, final costs and status of payments.

The Consultant should assume that draft reports shall be accepted as final, unless comments are received from ERA within the period stipulated in the table 5-1 below.

5.2. Reporting Requirements/Schedule/

The Consultant shall produce the following draft and final reports/deliverables/documents/ training materials/Manuals in the indicative timing schedule duration shown in Table 5-1 below:

The deliverables to be provided by the Consultant shall be of a high standard, presented in the appropriate format, neatly bound and clearly labeled with the project title, procurement number and date.

In addition to the paper copies of reports, all material shall be submitted in suitable electronic format. The data files from calculations or drawings carried out on a PC with special programs, for example road design, structural design programs, or Computer Aided Design, shall also be submitted.

At the completion of each service, the soft copies of the deliverables shall be submitted by **External Hard Disk.**

Reports and deliverables shall be submitted as indicated below. All reports shall use the standard reporting guidelines of ERA.

Table 5-1: Reporting and Deliverables for Revised Quality Manual

I. No.	Report Title/ Deliverable	No. of paper copies	No. of soft copies	Weeks for ERA Comments	Submission Timing
1.	Inception and situational analysis report (Draft)	3	2	2	4 Weeks after Commencement of the service
2.	Inception Report and situational analysis report (Final)	3	2	1	1 Week after receipt of comments from ERA
3.	Monthly Progress Reports	3	2	-	Monthly after submission of Inception Report
4.	Best Practice and Benchmarking report (Draft)	3	2	3	8 Weeks after Commencement of the service
5.	Best Practice and Benchmarking (Final)	3	2	1	1 Week after receipt of comments from ERA
6.	Draft Quality Manual	5	2	3	10 months after Commencement of the service

I. No.	Report Title/ Deliverable	No. of paper copies	No. of soft copies	Weeks for ERA Comments	Submission Timing
7.	Final Quality Manual	10	2	1	3 Weeks after receipt of comments from ERA
8.	Completion Report	3	3	-	At completion of services

Table 5-2: Reporting and Deliverables for Technical/Quality and Road Safety Audits

I. No.	Report Title/Deliverable	No. paper copies for ERA	No. of soft copies	Weeks for ERA Comments	Submission Timing
1.	Inception Report (Draft)	4	4	2	30 days after commencement
2.	Inception Report (Final)	4	4	2	1 week after receipt of comments on draft report
3.	Bi-month monitoring findings and recommendation of actions for improvement	4	4	2	1 week after End of each two-month progress
4.	Best Practice and Benchmarking report (Draft)	3	2	3	8 Weeks after Commencement of the service
5.	Best Practice and Benchmarking (Final)	3	2	1	1 Week after receipt of comments from ERA
6.	Draft Guide Documents of:				
a)	Draft Road Work Quality Control, Assurance and Inspection Guideline	5	5	2	Within 1 year of commencement. At completion of service
b)	Indicative Road Design Quality Control, Review and Assurance Guideline for Road design Consultant and Road Design Developers Use	5	5	2	Within 12 weeks of commencement. At completion of service
c)	Updating the quality and standard TORs of the Consultant Services.	5	5	2	Within 12 weeks of the commencement
d)	Finalize the draft set of Quality Control, Review, Assurance and Inspection Guidelines	5	5	2	As per the Consultant Findings schedule
e)	Draft work procedures, guideline and checklist which is used to improve and make	5	5	2	Within 1 year of commencement. At completion of

	easy of work to the Engineering Procurement process				service
7.	Final Documents listed under 4 above (a to e)	5	5	2	As per the Consultant Findings schedule
8.	Audit report	5	5		After the Consultant finalize each project audit Findings
9.	Feedback and recommendation/ Consultancy Completion Report	5	5		At completion of services

Notes

- *The Consultant shall also submit the reports by e-mail to ERA.*
- *The Consultant shall send a hard copy of every report to the Financier.*
- *The Consultant shall include executive summary on each deliverable which includes all the data, drawback, problem encountered and solution provided for each activity.*
- *The client has a right to give comments/feedback on the final version of deliverables when deemed necessary, and the Consultant shall resubmit the documents in consideration of the comments/feedback.*
- *The Consultant should assume that draft reports shall be accepted as final, unless comments are received from **ERA** within the period stipulated in the above table. ERA may also give comments on reports that have no draft submissions in the reporting schedule indicated in the table above.*
- *At various stages during the services the Consultant will be required to present elements of the system to ERA staff at all levels and carry out training Particular emphasis will be made on training of trainers and provision of associated documents and exercises to assist in this provision.*
- *The Consultant shall produce the following reports in its duration of the service.*
- *The cost for printing double sided colour and black and white pages for Revised Manuals/Systems including covers and binding shall be included in the Consultant's Financial Proposal.*

All reports that are to be submitted in draft and final version shall be signed by all key staffs that are involved directly or indirectly.

The Consultant shall conduct monthly meeting among all the team so as to discuss the project status, problems and possible solutions during execution of the service and officially submit corresponding minutes of meeting together with progress report.

6. OBLIGATIONS AND FACILITIES

6.1. Obligations of ERA

- ERA will make available to the consultant, upon request and free of charge, any documents relevant to the consulting service, and shall provide required information for the study.
- If necessary, ERA will provide liaison with other Ministries/Departments of the Governments in order to introduce the consultant. The consultants shall be responsible for collection of data and information from these agencies, and making arrangements for meetings and consultation. ERA will be responsible for making any agreements with these agencies.
- ERA, through will be responsible for providing timely comments/feedbacks of draft submissions, reports and deliverables through the assigned counterpart, internal coordinators, working groups, steering committee, or management representative as appropriate and as required in the scopes of the services.
- ERA shall provide a suitable counterpart who will liaise with the consultant for the duration of project.
- ERA will, if required, assist the consultant in obtaining visas, work permits, driving licenses, car registrations and other formalities for all consultant personnel entering or leaving Ethiopia, for the purpose of carrying out the services in line with the Agreement; and if appropriate, their eligible dependents to be provided promptly with all necessary entry and exit visas, residence permits, exchange permits and any other documents required for their stay in the Government's country, for the purpose of carrying out the services in line with the Agreement.
- Facilitate prompt clearance through customs of any property required for the Services and of the consultants' personal effects to the consultants' personnel and their eligible dependents.
- ERA Top management shall consult with the management system consultant on the organization's needs, requirements and objectives under the consulting services, in addition to what has been indicated in the TOR.
- Sampling and testing, necessary geotechnical/Material verification investigations, required during technical audit services.
- Purchase of Professional Books, Standards, References and other International publications for the development & support of ERA's library/Research Centre/Training Centre *(aimed at enhancing ERA personnel's technical/Managerial/ Leadership/ Innovation skill & knowledge excellence)* & PQSM in particular; Training/certification & Purchase licensed professional software; Overseas Long-term Post-Graduate Courses [PhD, Mphil, MSc, PgD]; PMI & related Certification Exam Fees, Transportation Cost & Subsistence Allowance. However, the consultant is responsible for the arrangements.

- Allowances of ERA PQSM Staff payable during field on-job training with the consultant; and for a Responsibility Allowance for the Joint Technical Audit & Road Safety Audit with the consultant at field level.
- Recruitment of Project Director/Coordinator who work on behalf to support project management of the service.

  Note: The consultant is advised to propose its profit, overhead cost and administration associated with each specified PS in its financial proposal.

- Short-term overseas Trainings for ERA staff (*i.e., not more than **10** staff*), and "Working Visits" of selected ERA management and employees (*i.e., not more than **20** staff*) to be conducted at Best Practice Organizations.

  Note: For the Working Visit plus Short Term Overseas Training, the Client will cover all the expenditures related to per-diem, trips and accommodation for his staff.

6.2. Obligations of the Consultant

1. The services are to be executed in Ethiopia. For the duration of the services the consultant shall provide his own office facilities, accommodations, transport and all other facilities, equipment, utilities, consumables, key staff, support staff and any other resources necessary for the complete execution of the services.
2. The Consultant shall be responsible to arrange desktop computer, laptop, printer and other relevant IT equipment for his staff for the use of the service contract.
3. The Consultant shall be responsible to arrange the residential accommodation, medical provision and other related matters for his staff.
4. The Consultant shall be responsible to arrange his own office close to ERA's headquarter, enough to adequately accommodate his key and support staff.
5. The Consultant shall maintain close liaison with ERA throughout the provision of the Services, and provide clarifications on project related matters.
6. The Consultant shall be responsible to identify the Working Visit Organizations plus Short Term Overseas Training topics for ERA staffs.
7. The Consultant may recommend further in-depth measures if deemed necessary. The auditor shall have free access to the supervising consultant's laboratory where, upon approval of the Contracting Administration, he can carry out additional tests in external laboratory if the Auditor wants any.
8. The Consultant shall arrange a presentation session to present his findings and deliverables to the client staff and other experts, where deemed necessary to progress the services efficiently and effectively.
9. Rent of Vehicles and its running cost such as, but not limited to, fuel, maintenance, insurance, registration and drivers, shall be covered by the consultant for the period of the services, and shall be indicated in the financial offer.

10. The Consultant shall attend joint progress meetings called by ERA, and shall take minutes of these and all other project meetings.

    *Note**:** - The costs of provision of each and all the aforesaid shall be detailed in the Consultant's financial proposal. The Consultant should also detail its cost for the, communication and internet costs and any other related items in its financial proposal.*

7. DURATION OF THE SERVICES

The Consultant will be required to complete the services within **3 years (36 months)** from the date of effectiveness of the contract (after an issuance of letter of commencement), with the following Particular Requirements for Each Services:

A. Revised Quality Manual for the ERA

The assignment is expected to be completed within **1 year (12 months)** of the start date, including printing of the final manuals. The anticipated key dates are as follows: Launch seminar and distribution of printed manuals (200 copies) at the end of the month 12.

B. Technical/Quality and Road Safety Audits

The consultant will be required to complete the services within **3 years (36 months)** from the date of the effectiveness of the contract. The Consultant's methodology should reflect that all major assignments such as: -

- Preparation of Audit Guideline, Audit manuals, Procedures and Report standards formats and checklists within 6 months from the commencement of the service contract.
- The project Technical Audit report shall be submitted quarterly for ERA top Management and QMC and prepare at least one workshop in a year on the findings for the Road industry (Client, Contractor and Consultant).

Time extension can be done on mutually agreed terms and under unavoidable circumstances.

8. LIAISON

The Consultant shall maintain close liaison with a Project Counterpart/Chief Coordinator/ to be designated by ERA under overall guidance of **Deputy Director General in charge of the Office of the Director General.** A formal joint meeting shall be arranged by the Consultant to present bi-monthly progress report and to address issues arising out of the consultancy services.

As indicated in the introductory section, as part of ERA's Modernization Program, Institutional Change & Transformation Initiatives have been undertaken; and, a series of technical assistance assignments and other institutional changes are underway. The Consultant will be expected to check same and support ERA in this process, to create alignment of this assignment with other activities as relevant.

9. LANGUAGE OF THE SERVICES

All documents and correspondences shall be in English language.

10. APPLICABILITY OF THE SERVICES (IN TECHNICAL/ROAD SAFETY AUDIT)

The scope of the consultancy service of the Technical/Road Safety Audit is limited for those Designed, Procured, Constructed, Heavy Maintenance Projects whose Contracts are Signed after June 2018.

11. RELATIONSHIP OF THE CONSULTANT WITH THE CLIENT AND CONTRACTOR (IN TECHNICAL/ROAD SAFETY AUDIT)

The consultant is appointed by the Client and is required to report directly to the Client. Hence, under no circumstances will the audit team advice or issue instructions to the Contractor or Supervising Consultant. Communication should be focused on seeking clarification or information regarding the project, and should avoid any interference with smooth implementation of the project. The Consultant, Contractor and Client must make available to the consultant and/or audit team any document, as and when required by him and relevant clauses in the contract documentation and/or letters of appointment will make provision for this.

The relationship between the Auditor and the Client must be documented. The Auditor may need to review actions of the Client during the project and any deficiencies or lack of performance should be noted in his report. This should make the process transparent, improve on internal practices and avoid problematic projects.

12. KEY PERSONNEL AND RESOURCES

12.1. Staffing input/plan

The Consultant shall provide competent personnel for the services, who shall be managed by the **Team Leader/Project Manager/QMS Specialist and Training Coordinator** and who will represent the Consultant in performing the services. At the commencement of project, all team members shall confirm that they have read and understood the ERA Code of Professional Conduct and Ethics, and that they will strictly follow the articles of this Code in the performance of the services for this project

The expert composition has to be diverse and capable enough for the firm to meet the minimum requirements set. To achieve the desired project outcomes, all in all, the consultant will leverage its ability to seamlessly combine all of the above in integrated, collaborative and, highly experienced project team approach to maximize the value of the available expertise. All the Consultant's personnel shall be fluent in the full use (i.e., the writing, reading and speaking) of the contract language, which is English.

The proposed team and the estimated duration of inputs are summarized in the table below. The Consultant may propose additional staff for the completion of the project.

Table 12-1: Man-Month Input Requirements of the Consultant

I. No.	Names	No. of Staff	Estimated Man-months for Each Projects		Estimated Total Man-months
			Quality Manual	Technical/Road safety Audit	
	General, Management & Administrative Staffs				
1	Project Manager/Team Leader/QMS Specialist and Training Coordinator	1	36		**36**
2	Business Process Reform & Management Specialist	1		4	**4**
3	Secretary/Office Manager	1	36		**36**
4	Senior Trainers/Specialists for Project Management or Respective Technical Fields or related **(for Local short-term Trainings)**	1		16	**16**
5	Head office support		As required by the Consultant		
	Technical Key Staffs				
6	Highway Design/Transport Engineer	2		2*26=52	**2*26=52**
7	Pavement/material Engineer	2		2*26=52	**2*26=52**
8	Geotechnical Engineer	2		2*26=52	**2*26=52**
9	Structural/Bridge Engineer	2		2*26=52	**2*26=52**
10	Contract Engineer/ Contract Management Specialist	2	2*3=6	2*26=52	**2*29=58**
11	Land Surveyor/Surveying Engineer	2		2*26=52	**2*26=52**
12	Quantity Surveyor/Cost Engineer	1		20	**20**
13	Road Safety Engineer/ Safety Audit Specialist	2	2*1=2	2*26=52	**2*27=54**
14	Procurement Specialist	1	4	26	**30**
15	Environmental Audit Specialist/ Environmentalist	2	2*3=6	2*26=52	**2*29=58**
16	Hydrologist/Hydraulic Engineer	2		2*26=52	**2*26=52**
17	Senior Laboratory Technician	2		2*26=52	**2*26=52**
18	Quality Management and Monitoring Specialist	1	6		**6**
19	Transport Economist	1	6		**6**
20	Construction Management Specialist	1	6		**6**
21	Maintenance Management Specialist	1	6		**6**
22	Lead Author	1	12		**12**
Total		**31**	**54**	**658**	**712**

*The consultant, to the best of its professional knowledge, experience, Scopes of this TOR, its technical approach/Methodology and best international practices, **shall assign specific tasks and responsibilities for the proposed key personnel and other additional technical/support staffs**. Its detailed Manning schedule/inputs shall also be prepared reflecting deployment schedule of the personnel for the specified tasks/responsibilities and activity phasing.*

In addition, at the commencement of project, all team members shall confirm that they have read and understood the ERA Code of Professional Conduct and Ethics, and that they will strictly follow the articles of this Code in the performance of the services for this project. The Code of Professional Conduct and Ethics, and the form by which the team members confirm their reading and understanding of the code are attached as ANNEX-B of the Terms of Reference.

12.2. Qualification Requirements of Key Professional Experts and Support staffs

The Consultant shall provide staff having the capabilities described below. The job descriptions are indicative and the Consultants can propose alternatives distribution of tasks to better match individual skills of the expert proposed.

The consultant, to the best of its professional knowledge, experience, Scopes of this TOR, its technical approach/Methodology and respective Benchmark Management System Standards, shall assign specific tasks and responsibilities for the proposed key personnel and other additional technical/support staffs. Its detailed Manning schedule/inputs shall also be prepared reflecting deployment schedule of the personnel for the specified tasks/responsibilities and activity phasing.

All the Consultant's personnel shall be fluent in the full use (i.e., the writing, reading and speaking) of the contract language, i.e., **English**.

The Employer shall require submission of Curriculum Vitae (CV) & necessary Qualification Documents (Credentials) with tender proposals, and evaluate the Competence of the following **Ten (10)** key expert positions, **for the tendering purposes**.

i. Project Manager/QMS Specialist and Training Coordinator
ii. Senior Pavement/Material
iii. Senior Geotechnical Engineer
iv. Senior Highway Design/Transport Engineer
v. Senior Structural/Bridge Engineer
vi. Senior Contract Engineer/ Contract Management Specialist
vii. Senior Quantity Surveyor/Cost Engineer
viii. Senior Land Surveyor/Surveying Engineer
ix. Road Safety Engineer/ Safety Audit Specialist
x. Lead Author

The minimum qualifications and experience of experts for the services are indicated below:

1. **Project Manager/QMS Specialist and Trainings Coordinator**

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering or related fields.
- A general professional working experience of **20 Years**.
- Being an accredited member of a recognized professional body would be an advantage.

Adequacy for the assignment:

- A specific experience of **15 years** is required in highway design/Construction/construction supervision and/or tender preparation/assessment and contract management of similar works projects,
- **8 years'** experience in project leadership positions **[Team leader for Highway/Road Design, Project Manager for Civil Works of Highway/Road and/or Resident Engineer for Construction Supervision, or equivalent]**
- **5 years'** Experience as Quality Manager/ Specialist on design, construction and/or maintenance of transport infrastructure projects.
- **5 years'** Experience as Team Leader of Technical Assistance Service Assignments related to Similar Capacity Building Initiatives for Contracting Authorities.
- **5 years'** Experience in technical audit of road projects; previous experience with technical audits is highly desirable.
- Experience as Team Leader or equivalent capacity in at least three (3) years technical audits of highway /road and other transportation projects.
- Excellent experience in Management and Provision of Technical Trainings related to Design, Construction, Quality Management/Audits, and/or management of Civil Infrastructure projects.
- Experience and/or involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures.
- **3 Years'** Experience in Sub-Saharan African Countries.

2. **Business Process Reform & Management Specialist**

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering/Construction Technology & Management/, or MA in Management, or MBA in Business Management, or MBA in Project Management Major), or MA/MSc degree in Project Management; with added professional specialization in Business Process Reform, Management and/or Organizational Development.
- General Experience of **12 years** of Professional experience in the road/highway/ or railways development and construction Industry/sector. International experience would be an advantage.

Adequacy for the assignment:

- Experience/Active involvement/ in organization design or reforming/restructuring of road/railway sector organizations/agencies or institutional capacity building of road transport agencies/authorities; in the role/position of a specialist consultant /expert/ or HR Development/Organization Change Management Consultant or Top Management Body or Committee Member for Organization Design/Reform/Restructuring Studies ***[2 organization Experiences or 2 years' experience]***.
- **3 Years'** experience in Leading, Managing or Coordinating **"Management System Consultancy services"** related to road/railways sector, involving organization Change, reform and re-structuring activities.
- **2 Years'** experience/ Involvement in establishment/ development of Manuals/ Specifications/Standards/Guidelines related to Road/Highway design, construction or maintenance; for road/highway agencies or for "Transport/Road Research Agencies".
- **2** Years' Experience in Sub-Saharan African Countries.

3. **Senior Trainers/Specialist for Project Management**

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering/Construction Technology & Management/, or MA in Management, or MBA in Project Management Major), or MA/MSc degree in Project Management.
- General Experience of **15 years'** of Professional experience in the road/highway/ or railways development and construction Industry/sector. International experience would be an advantage.
- Certifications like Project Management Professional (PMP) from the Project Management Institute (PMI) or other relevant project management certifications.
- Specific training in areas like construction law, risk management, or contract administration would be an advantage.
- Being an accredited member of a recognized professional body would be an advantage.

Adequacy for the assignment:

- **5 Years'** experience in providing technical assistance and training mentoring, or coaching others with regard to contractual, technical and managerial issues of road construction project management.
- **5 Years'** experience in institutional capacity building of road transport agencies/authorities.
- **3 Years'** experience in Leading, Managing or Coordinating **"Management System Consultancy services"** related to road/railways sector, involving organization Change, reform and re-structuring activities.
- **2 Years'** experience/ Involvement in establishment/ development of Manuals/ Specifications/Standards/Guidelines related to Road/Highway design, construction or maintenance; for road/highway agencies or for "Transport/Road Research Agencies".
- **5 Years'** Practical experience on construction sites, managing projects of various sizes and complexities
- **2 Years'** Experience in Sub-Saharan African Countries.

4. **Senior Pavement/Material Engineer**

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering or related fields.
- **15 Years'** general (combined) experience in highway design, Construction, Civil works/Construction, construction supervision, and related technical assistance services
- Being an accredited member of a recognized professional body would be an advantage.

Adequacy for the assignment:

- **10 years'** Experience as Pavement/Material Engineer on Road Design and/or Construction Projects; out of which 5 years are on Construction of **Asphalt Concrete (AC)** or equivalent standard road projects
- Experience as Pavement /Material Engineer on design of **5 Road Projects** of length at least 50km.
- Professional Involvement or experience for Similar Technical Assistance /Capacity Building Services and/or Technical Audit of **Two (2)** road projects.
- Professional Involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures, **is an advantage**.
- **2 Years'** Experience in Sub-Saharan African Countries.

5. **Senior Geotechnical Engineer**

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering, Geotechnical Engineering or related fields.
- **15 Years'** general (combined) experience in highway design, Construction, Civil works/Construction, construction supervision, and related technical assistance services
- Being an accredited member of a recognized professional body would be an advantage.

Adequacy for the assignment:

- **10 years'** Experience as Geotechnical Engineer on Road Design and/or Construction Projects; out of which 5 years are on Construction of **Asphalt Concrete (AC)** or equivalent standard road projects
- Experience as Geotechnical engineer on design of **5 Road Projects** of length at least 50km.
- Professional Involvement or experience for Similar Technical Assistance /Capacity Building Services and/or Technical Audit of **Two (2)** road projects.
- Professional Involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures, **is an advantage**.
- **2 Years'** Experience in Sub-Saharan African Countries.

6. **Senior Highway Design/Transport Engineer**

General Qualification:

- **A minimum of BSc. Degree** in Civil /Transportation Engineering,
- **15 Years'** relevant experience in road projects

- Being an accredited member of a recognized professional body would be an advantage.

Adequacy for the assignment:

- **10 years'** experience as a Highway Engineer on design and/or construction of road/highway projects.
- Experience as **Team Leader/Project Manager/** on design of five **(5)** Road Projects
- Experience /Involvement as Highway Engineer for Technical Audit of road projects **(two (2) road Projects)**
- Competence with the use of latest Computer Aided Design applications for Highway/Roadway design is desirable.
- Professional Involvement in the preparation of Technical Manuals, Standards & Standard Specifications related to design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures, **is an advantage.**
- **2 Years'** Experience in Sub-Saharan African Countries.

7. **Senior Structural /Bridge Engineer:**

General Qualification:

- **A minimum of MSc. Degree** in Civil /Structural Engineering,
- **15 Years'** relevant experience in roads/railway projects,
- Being an accredited member of a recognized professional body would be an advantage.

Adequacy for the assignment:

- **10 years'** practical experience as a Structural Engineer in bridge design/Construction supervision on design and/or construction of road/bridge/railway projects.
- Involvement as Structural or Bridge Engineer for Technical Audit of road projects **(two (2) road Projects)**
- Competence with the use of latest Computer Aided Design applications for structural design is desirable.
- Professional Involvement in the preparation of Technical Manuals, Standards & Standard Specifications related to design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures, **is an advantage.**
- **2 Years'** Experience in Sub-Saharan African Countries.

8. **Senior Contract Engineer /Contracts Management Specialist**

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering or Construction Technology & Management, or related fields,
- **15 Years'** relevant experience in Road/ Railway Construction and/or Design projects

Adequacy for the assignment:

- **10 years'** Experience on Contracts and Claims Management of Road Projects, under the FIDIC Conditions of Contract.

- Experience in preparation of tender documents for construction works of Six (6) road Projects; out of which **three (3)** projects using the guidelines and procedures of International Financing Institutions such as World Bank, AfDB, ADB and EU.
- **5 years'** of extensive experience in disputes resolution, projects management and claims administration.
- Involvement as Contract Management Expert/Engineer for Technical Audit of road projects **is an advantage**.
- Experience as Claims Expert in **two (2)** major road/highway construction projects;
- Experience as a Contract Engineer/ Specialist in preparation of Quality Manuals for Road projects **(four (4) road Projects).**
- Excellent experience (Track record) in Management and Provision of Trainings related to contracts, Claims & disputes for Civil Infrastructure projects.
- Experience and/or involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures.
- **2 Years'** Experience in Sub-Saharan African Countries.

9. Senior Procurement Specialist

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering or related fields,
- **15 Years'** relevant experience in road projects

Adequacy for the assignment:

- **10 years'** experience on Public Procurement of Works and Consultancy Services related to Road Projects; out of which **5 years** is on the procurement management/leadership position.
- Experience as a Procurement Specialist on Road Projects, under International Competitive Bidding (ICB), using Guidelines and Procedures of financing institutions such as World Bank, AfDB, ADB and EU. **[5 road Projects]**
- **3 Years'** Experience in contract administration of road design and/or construction Projects
- **2 Years'** Experience in Provision of Trainings related to Engineering Procurement and Contracts Management for Civil Infrastructure projects.
- **4 Years'** Years of Experience on procurement management/ leadership position
- Experience and/or involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures.
- Involvement as Contract Management Expert/Contract Engineer/ for Technical Audit of road projects; **is an advantage**.
- **2 Years'** Experience in Sub-Saharan African Countries.

10. Senior Quantity Surveyor/Cost Engineer:

General Qualification:

- **A minimum of BSc. Degree** in Civil Engineering or related fields;
- **12 Years'** relevant experience in road design and construction projects
- Being an accredited member of an internationally recognized professional body, **is an advantage**

Adequacy for the assignment:

- **8 years'** experience as Cost Engineer or Quantity Surveyor on design and/or construction of road projects.
- Active involvement or experience as Quantity Surveyor for Technical Audit of road projects; **is an advantage**.
- **2 Years'** Experience in Sub-Saharan African Countries.

11. Senior Land Surveyor/Surveying Engineer:

General Qualification:

- **A minimum of BSc. Degree** in Civil Engineering, Surveying, or related fields;
- **12 Years'** relevant experience in road design and construction projects
- Being an accredited member of an internationally recognized professional body, **is an advantage**.

Adequacy for the assignment:

- **6 years'** experience as Senior Surveyor on design and/or construction of road projects.
- Active involvement or experience as Quantity Surveyor for Technical Audit of road projects; **is an advantage**.
- Demonstrable experience in the use of latest technology Land Surveying equipment
- **2 Years'** Experience in Sub-Saharan African Countries.

12. Road Safety Engineer/Safety Audit Specialist:

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering, Road and Transport Engineering, Traffic Engineering, or related fields,
- **15 Years'** experience in road Engineering: design and/or construction projects, Road Safety
- Being an accredited member of an internationally recognized professional body, **is an advantage**.

Adequacy for the assignment:

- **10 Years'** experience in Road Safety Studies; Safety Audit and inspections of Road design and Construction Projects; traffic analysis, crash data analysis or road safety measures;

  Or; Experience in Safety Audit of Road design and/or Construction Projects in the role of Road Safety Specialist/Engineer or Highway Engineer ***[10 projects]***
- **5 years'** Experience as a **lead road safety auditor** of road safety audits and inspection projects of a similar nature;

- **2 years'** Experience as Highway/Transport Engineer in road design projects;
  or Experience as Highway/Transport Engineer in road design projects ***(2 projects);***
- A recognized certification in road safety audit procedure.
- Experience and/or involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures.
- **2 Years'** Experience in Sub-Saharan African Countries.

13. Environmentalist:

General Qualification:

- **A minimum of BSc. Degree** in Civil Engineering, Environmental Science or related fields,
- **12 Years'** Professional experience in Environmental works

Adequacy for the assignment:

- **Eight (8) Years'** experience in Planning, Design, Monitoring and/or Evaluation of transport projects
- Experience in Environmental Impact Assessment (EIA) of road design and/or Construction projects **[six (6) Road projects]**
- Involvement as Environmentalist for environmental audit on Technical Audit of road projects
- **2 Years'** Years of Experience in Provision of Trainings related to Environmental Impact of road projects
- Experience and/or involvement in the preparation of Technical Manuals, Standards & Standard Specifications for design /construction of roads/highways/bridges; and/or QA/QC Manuals, Guidelines and Procedures.
- **2 Years'** Experience in Sub-Saharan African Countries.

14. Hydrologist/Hydraulic Engineer:

General Qualification:

- **A minimum of BSc. Degree** in Civil Engineering, Hydraulic Engineering, Hydrology or related fields,
- **12 Years'** Professional experience in Infrastructure Projects' Design or Construction
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **Ten (10) Years'** experience in as Hydraulic Engineer /Hydrologist in road design or construction projects
- Involvement as **Hydrologist/Hydraulic Engineer** on Technical Audit of road projects
- **2 Years'** Experience in Sub-Saharan African Countries.

15. Senior Laboratory Technician

General Qualification:

- **A minimum of BSc. Degree** in Civil Engineering or related fields.
- **10 Years'** general (combined) experience in a laboratory of road construction projects.
- Certifications in laboratory quality management, soil testing, concrete testing and asphalt testing.
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **10 years'** Experience as Laboratory Technician on Road Design and/or Construction Projects; out of which 5 years are on Construction of **Asphalt Concrete (AC)** or equivalent standard road projects
- Experience in construction materials testing, including soil, asphalt, and concrete, and in field testing and data interpretation of **5 Road Projects** of length at least 50km.
- Professional Involvement or experience for Similar Technical Assistance /Capacity Building Services and/or Technical Audit **[two (2) Road Projects].**
- Strong knowledge of construction standards, such as, AASHTO, ASTM, BS, ACI, and ISO Standards.

16. Lead Author:

General Qualification:

- **A minimum of MSc. Degree** in Civil Engineering or related fields,
- **15 Years'** Professional experience in Road /Railway/ Bridge Construction and/or Design Projects/,
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **10 Years** of Experience as a Structural Engineer and/or Senior Hydraulic Engineer/ Hydrologist on road and/or bridge and/or interchanges construction and/or design projects,
- Experience in involvement of preparation of Quality Manuals for road projects **[two (2) Road Projects].**

17. Quality Management and Monitoring Specialist:

General Qualification:

- **A minimum of BSc. Degree** in Civil Engineering, Hydraulic Engineering, Hydrology or related fields,
- **12 Years'** Professional experience in Infrastructure Projects' Design or Construction
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **8 Years'** of Experience on quality management and monitoring related to Road Projects; out of which **5 years** is on the leadership position,
- Experience on gathering and analyzing data to identify the strengths and weaknesses of current operations, developing new strategies to optimize procedures, creating new quality assurance methods, maintaining records of transactions, and coordinating the workforce **[5 road Projects],**
- **2 Years'** Experience in contract administration of road design and/or construction Projects
- **2 Years'** of experience in contract administration in preparation of Quality Manuals for Road Projects
- **2 Years'** Experience in Provision of Trainings related to Quality Management and Monitoring for Civil Infrastructure projects
- **2 Years'** Experience in Sub-Saharan African Countries.

18. Transport Economist:

General Qualification:

- **A minimum of BSc. Degree** in Economics/Civil Engineering or related fields,
- **12 Years'** Professional experience in Road/Railway construction projects,
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **8 Years'** Experience on quality manual studies related to Road Projects; out of which 5 years is on the leadership position
- Experience on the planning, feasibility studies, appraisal and evaluation of road projects that includes identifying a rationale for a project, specifying objectives, appraisal, monitoring implementation of a project, evaluation, feedback to inform future projects **[4 road Projects],**
- **2 Years'** Experience in planning and feasibility studies of road design and/or construction Projects,
- **2 Years'** Experience in Provision of Trainings related to Planning and Feasibility Studies for Civil Infrastructure projects,
- **2 Years'** Experience in Sub-Saharan African Countries.

19. Construction Management Specialist:

General Qualification:

- **A minimum of BSc. Degree** in Construction Management/ Civil Engineering or related fields
- **10 Years'** Professional experience in Infrastructure Projects' Design or Construction
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **8 Years'** of Experience in road construction, rehabilitation/maintenance management projects, and quality assurance, of which 5 (five) years' experiences in asphalt road construction/maintenance projects,
- **4 Years'** of Experience as project manager/ construction Engineer in road construction/maintenance projects
- **2 Years'** of Experience as highway engineer on road design projects as highway engineer on road construction, rehabilitation/ maintenance projects – and directly involved in quality assurance process,
- **2 Years'** of Experience in contract administration
- **2 Years'** Experience in Sub-Saharan African Countries.

20. Maintenance Management Specialist:

General Qualification:

- **A minimum of BSc. Degree** in Construction Management/ Civil Engineering or related fields,
- **12 Years'** Professional experience in Infrastructure Projects' Design or Construction,
- Being an accredited member of an internationally recognized professional body, is an advantage.

Adequacy for the assignment:

- **8 Years'** of Experience in road construction, rehabilitation/maintenance management projects, and quality assurance, of which 5 (five) years' experiences in asphalt road construction/maintenance projects,
- **4 Years'** of Experience as project manager/ construction Engineer in road construction/maintenance projects
- **2 Years'** of Experience as highway engineer on road design projects as highway engineer on road construction, rehabilitation/ maintenance projects – and directly involved in quality assurance process,
- **2 Years'** of Experience in contract administration
- **2 Years'** Experience in Sub-Saharan African Countries.

21. Secretary:

General Qualification:

- **A minimum of B.Sc. Degree** in respective related fields from University/College
- A minimum of Good Experience in use of Computer in Word Processing and Spread Sheet and
- Good Knowledge of English Language

<u>Note:</u>

a) *Educational Testimonies for Certificate, Diploma, BSc., MSc. or PhD will be merited in accordance with the specific award indicted / mentioned in the Diplomas.*

b) *Educational testimonies with certified translation to English language need to be attached and their equivalence to the educational requirement of the ToR should be clearly explained with reference to the regulation of the country/institution awarding the testimonies.*

c) *The CVs of technical support staff shall be submitted when and as required during the implementation period of the project. Additional professional and support staff in addition to the key staff can be included in the consultants' proposal according to his plan of staffing.*

d) *Developed countries in this context refer to all high-income countries, i.e., countries with Gross National Income (GNI) per capita > USD 12,475.*

Please also refer databank.worldbank.org/data/download/GNIPC.pdf

e) *In the spirit of encouraging successive key staff development and capacity building, the Client have arranged the following alternatives for key position recruitment:*

   i. *In all Adequacy for the Assignment (Specific Experience) requirements of Key Staffs, previous **<u>all experiences obtained as an Assistant/Junior Engineer</u>** related to the respective key staff position will be **partially considered as indicated in the tables above**, for the assignment in the respective proposed position.*

   - *In addition, previous experiences obtained as support / key staffs related to only the respective key staff positions indicated above, for example, Quantity Surveyor, Highway Engineer, Works Inspector and Office Engineer, as appropriate, will be partially considered for Deputy Resident Engineer. Likewise, experiences obtained as a support/ key staffs related to the required Key Staff Position would be partially/fully, as appropriate, would have been obtained working as key personnel in the respective position, for adequacy for the assignment in the respective proposed position, provided that the proposed personal attained the minimum educational qualification for the position.*

   - *In additional, the Client has devised a mechanism in which the experience of professionals who have been working on Client's or Contractor's side to be considered for the required Consultancy Service Position shown in the table above.*

   - *Furthermore, Key Staff Positions or Support/Assistant Positions are to be considered for Key Staff Positions related to Design/Quantifying/Claim Administration, provided that firms can demonstrate that the proposed staff has adequate experience in tasks* *related to the proposed position, details of which is indicated above on the Adequacy requirement for the position.*

- *Junior Staffs who have participated in a single project can be employed as a Junior Staff or Support Staff till, he/she meets the minimum requirement for Key Staff Position.*
- *Finally, for Key staff positions requiring B.Sc. / B.A. as a minimum educational qualification, the Client would consider previous experience as follows: -*
    - ***Experience gained after attaining Diploma would be considered as 60% and***
    - ***Experience gained after attaining Certificate would be considered as 40%.***

f) *Only Key Personnel having the minimum educational qualification set shall be considered for evaluation; key personnel with educational qualification below the minimum required will be rejected and merited zero (0) points. If the firm is found successful upon the overall evaluation, the rejected professional position shall be replaced by fulfilling personnel with minimum total score of **60%**, prior to concluding the contract signing.*

g) *Personnel who scored below **60%**, of the allotted points for their respective criteria, will be replaced by a better-qualified one, prior to concluding the Contract signing. However, during replacement, personnel who scores less than 100% but greater than 90% of what the originally proposed personnel for the proposed position has achieved shall be subjected to deduction of 10% of the respective fees quoted by the firm; and those who score below 90% **of the originally proposed personnel** shall not be accepted for replacement.*

h) *The induction of any **staff** including the intermittent ones shall be subject to the Client prior approval.*

i) *CVs of the support staff **and the remaining keys staff not subject to evaluation during tendering** shall be submitted when and as required during the implementation period of the project.*

j) ***Bidders are strongly advised not to propose professionals that have been suspended from ERA's on-going and upcoming projects. If bidders propose a suspended professional, the CV will be rejected and will be merited zero point out of the allocated points for that professional. Please refer ERA's website (www.era.gov.et/ PerformanceRating/DesignAccountability Staff.aspx) for the list of professionals.***

N.B.

- The educational qualifications requirements stated for the Consultants' key personnel are reference requirements, otherwise those personnel that possess more educational qualification will be merited as excellent.

- The function of team leadership will be dealt with the Team leader. Mobilization and demobilization of the full-time staff and the intermittent key staff shall only be done with prior written approval of ERA, the client.
- During the implementation of the service, the team would need to be supplemented with other support staff and associated specialists and advisors from time to time to provide support in accomplishment of various assignments indicated in this TOR. Provision for same shall be made by the consultant in its proposal (Technical & financial).
- In addition to the minimal required team of Key Personnel mentioned above, additional technical and support staff may be proposed by the consultant to complete the assignment.

13. WORK PLAN

On the basis of the proposed time schedule outlined in this Terms of Reference, the Consultants will prepare a work plan and include this in their offer; the work plan should set out the Consultants' approach to the following activities:

- ✓ Fact finding/data collection/surveys;
- ✓ The Consultant shall clearly show the time schedule for activities for Technical/Quality and Road Safety Audits, updating standard working document, updating Quality Manual, and capacity building training and workshops given;
- ✓ A desk top review of existing documents and benchmark study in the region and internationally;
- ✓ Conducting Technical/Quality and Road Safety Audits different parts of the country and different roads (completed and under construction);
- ✓ Consultation with different relevant offices to collect first-hand data and factual information and discuss issues and the updating of the manual with key stakeholders;
- ✓ Arrangement of a workshop/seminar about findings and recommendation of quality audit and for input data collection for the manual review process;
- ✓ Arrangement of Capacity Building through Short-term, Medium term, Long-term, and Continued Trainings and Certifications;
- ✓ Arrangement of Capacity Building of ERA PQSM Directorate
- ✓ Arrangement of Capacity Building & Professional Development through Practical Technical and Road Safety Auditing
- ✓ Arrangement of Capacity Building through Best Practice Benchmarking, Gap Assessment, Improvement Proposals & Preparation of Standard Working Documents
- ✓ Preparation of draft and final manuals and summary of changes and updates including the proposed Table of Contents, design approaches, drawings, figures and photographs for inclusion in the manual;
- ✓ Preparation of Quality Audit Reports;
- ✓ Other required activities listed in the ToR.

14. CONTRACT CLOSE OUT

The consultant should close the Auditing services at the end of the contract completion. In his close out it must address the following main points:

1. **Project Outcome**
   - ✓ This section should outline the outcome of the project by comparing it to the objectives stated in the charter (or the approved changed objectives documented in the TOR Plan). It should analyze the end result against key success factors that were identified in the project Auditing Services and/or charter. It should analyze its performance against plans and tolerances and baselines (cost, schedule, quality, scope, risk, communication, etc.). Budgeted vs actual costs should be included, as well as how the project measured against the planned timeline/milestones. Relevant statistics could also be included (e.g., Status on change requests received).
   - ✓ This section should also list planned vs actual product and project deliverables. This section should also include any final quality or cost measurements that were identified in the project management plan.
2. **Lessons Learned Summary**
   - ✓ This section should only contain a high-level summary of lessons learned for the project, with a referral to where the complete lessons learned are documented. This high-level summary should highlight the top 3 - successes and issues that should be kept in mind for future projects.
3. **Recommendations**
   - ✓ List recommendations for future projects.
4. **Post Project or Outstanding Tasks and Issues**
   - ✓ List any post project or outstanding tasks/issues that still remain, who is responsible and how they will be managed to ensure completion.
5. **Contract Closure**
   - ✓ Summarize project contract closure activities for procurement during the project.
6. **Project Closure Approval**
   - ✓ Approved by: [insert who has reviewed and approved this project's closure]
     Approval Date: [insert date the closure is approved] this closure report was discussed by [insert where this closure was discussed] and documented at [insert where documentation for closure resides].

15. KEY RESULTS

Summary of Key Deliverables

1. **Summary of Training Requirements**
   - i) On the job training
   - ii) Short-term local training
   - iii) Short-term Overseas training
   - iv) Technical Support (Mentorship Training) to PQSM staffs on Selected Projects "Technical Audit & RSA", during the Joint Audit Tasks
   - v) Arrangement of Medium-Term Certification Trainings & Certifications

vi) Specialist Professional Software Trainings
vii) Working visit to road sector institutions outside of Ethiopia
viii) Long-Term Trainings [Post Graduate Courses]
ix) Holding Management Briefing Sessions
x) Training of Trainers (TOT)
xi) Workshops & Seminars

2. Summary of Reporting Deliverables

i) Inception & Situation Analysis Report (Draft & Final)
ii) Best Practice Assessment Report
iii) Best Practice Benchmarking, Gap Assessment & Improvement Recommendations Report
iv) Quarterly Progress Report
v) Semi-Annual Project Technical Audit Reports ***[Five (5) Reports per 6 months]***
   - ✓ Technical Audit Report of Design service, and/or Construction works/Design-Build and Supervision services; per Project, for two projects
   - ✓ Technical Audit Report of Employer's Engineering procurement of Design service, and/or Construction works/Design-Build and Supervision services; per Project, for two projects.

vi) Semi-Annual Progress Report
vii) Annual Progress Report
viii) Trainings Accomplishment Report
ix) Summative Audit Findings, Lessons Learnt and Improvement Recommendations Report (Annually and Cumulatively for subsequent Years)
x) Consultancy Completion Report

3. Manuals/Guidelines/Handbook/Procedures to be developed

These manuals/Guidelines/Handbooks with single/multiple volumes shall be prepared to guide PQSM staff involved in Quality and Performance Monitoring/Assurance, Technical Quality inspection and auditing, and Road safety Inspection and Auditing of Road/bridge projects in different phases/cycles of the project:

Guidelines:

- Guidelines for Quality Assurance and Technical Audit of Road Design, Construction Works and Construction Supervision **[Design-Bid-Build]**;
- Guidelines for Quality Assurance and Technical Audit of Roads' Design-Build and Design-build Supervision contracts;

Manuals:

- Manual for Quality Assurance and Technical Audit of Road Design, Construction Works, Construction Supervision and Engineering Procurement **[Design-Bid-Build]**;
- Manual for Quality Assurance and Technical Audit of Road Design-build, Supervision of Design-Build contracts and Engineering Procurement.
- Road Safety Inspection, Management, Audit and Reporting Manual

User-Guide Documents:

- User Guide to Quality Assurance and Technical Audit of Road Design, Construction Works and Construction Supervision [Design-Bid-Build]
- User Guide to Quality Assurance and Technical Audit of Road Design-Build and Supervision of Design-Build
- User Guide to Quality Assurance and Technical Audit of Employer's Engineering Procurement for Consulting Services and Civil Works Contracts
- User Guide for Road Safety Inspection, Auditing and Reporting

ANNEX - A: CODE OF PROFESSIONAL CONDUCT AND ETHICS

Code of Professional Conduct and Ethics

The ERA Code of Professional Conduct and Ethics is included in Annex A. All firms submitting bids for these consultancy services shall include a signed statement with their bid stating the following:

Consultant Name:

Consultancy Service for:

Project Name:

Project No:

We confirm that we have read and understood the ERA Code of Professional Conduct and Ethics, and that we will strictly follow the articles of this Code in the performance of the services for this project.

In addition, the selected firm for the project will be required to submit the same statement with each report and major deliverable, signed by all key members of the project team who have been involved in the relevant report or deliverable.

Introduction

The Ethiopian Roads Administration (ERA) seeks to ensure that all professional firms and individuals, who provide services and works on its behalf, abide by a Code of Professional Conduct and Ethics that supports the aim of providing a high quality, safe and efficient road network in the interest of the public. ERA now expects all ERA staff and Professional Firms and Individuals who carry out work on behalf of ERA to uphold the Code with professional integrity by adhering to this set of rules.

In straightforward language the rules can be stated as:

Do the right thing, do it the right way and do it at the right time.
Understand the job to be done, and do a good job.
Be committed, be creative, and be proud of what you do.
Take responsibility and care at all times in doing your job.

Article 1: Responsibility to Public, Society and Profession

i.) Act with integrity and have full regard to the public interest.
ii.) Act within the laws of the country.
iii.) Uphold the dignity, standing and reputation of the professions involved.
iv.) Reject corruption in all forms.
v.) Neither offer nor accept remuneration of any kind which, in perception, or in effect, either seeks to influence the process of selection or compensation or seeks to affect impartial judgments.
vi.) Recognize that the lives and safety of the public and workers may be dependent on professional judgments, actions, or lack of actions during the study, design or implementation of a project, and take the necessary actions.

Article 2: Responsibility to Client/Employer

i.) Apply due skill, care, diligence and accuracy in the services rendered to the client.
ii.) Perform services only in areas of one's competence, and disclose any limitations of competence that may affect the services rendered.
iii.) Provide only those professionals with appropriate qualifications, skills and competence and required to undertake the project.
iv.) Provide services of a high quality that are technically correct, innovative, giving value for money, and support the aims of the client.
v.) Approve only those design documents that have been professionally reviewed and are accepted to be within prescribed engineering and professional standards.
vi.) Inform the client of any potential conflict of interest that might arise in the performance of the project.
vii.) Identify, evaluate and where possible quantify risks.
viii.) Be impartial in the provision of professional advice, judgment or decision, and be truthful in the evaluation of a project.
ix.) Do not disclose confidential information and commercial matters without the specific consent of the client/employer.

x.) Do not accept compensation from third parties in connection with work being undertaken for the client/employer, unless circumstances are disclosed and fully agreed by all interested parties.

xi.) Be honest and transparent at all times in the management, control and expenditure of funds allocated by the client for a project.

xii.) Cooperate fully with any legitimate investigation or audit which makes inquiry into the technical or financial administration of any services or works contract.

Article 3: Responsibility for Environment

i.) Seek solutions that are compatible with the principles of sustainable and safe development.

ii.) Understand the effects of the work on society and the natural environment.

iii.) Be committed to improving the environment and enhancing quality of life wherever possible.

iv.) Promote the use of renewable and recycled materials with the least use of natural resources, wherever possible.

Article 4: Responsibility to Professionals

i.) Promote the concept of selection by ability.

ii.) Ensure credit and validation for work is given to those to whom it is due.

iii.) Afford assistance and time for professional development with continued education and training.

iv.) Neither carelessly nor intentionally do anything to injure the reputation of other firms or individuals.

v.) Neither directly nor indirectly attempt to take the place of another organization or individual who is already appointed for a specific work.

vi.) Behave in accordance with appropriate professional conduct, standards, ethics and courtesy in the event of being asked to review the work of another.

vii.) Maintain knowledge and skills at levels consistent with developments in technology, legislation and management.

Article 5: Adherence and Disclosure

i.) All individuals and organizations that carry out services and works for ERA shall undertake to abide by the ERA Code of Professional Conduct and Ethics.

ii.) All individuals within ERA shall undertake to abide by the ERA Code of Professional Conduct and Ethics.

iii.) Disclose any violations of the ERA Code of Professional Conduct and Ethics by any other individual or organization. Disclosure of any violations may be to any Director within ERA, who shall bring it to the attention of Senior Management.

iv.) In the case of any disclosure or report about any individual or organization not following this Code of Ethics, ERA will appoint an Ethics Board to investigate, and where appropriate recommend action or penalties. The ERA Ethics Board shall comprise of at least three impartial senior persons from the industry, proposed by ERA and ratified by the Chairman of the ERA Board.

Consultant Name:
Consultancy Service for:
Project Name:
Project No:

I/We confirm that I/we have read and understood the ERA Code of Professional Conduct and Ethics, and that I/we will strictly follow the articles of this Code in the performance of the services for this project.

Position on Project	**Name**	**Signature**

Date:
Examples for staff who should sign
Resident Engineer, Assistant Resident Engineer, Highway Engineer, Hydrologist, Environmentalist, Materials Engineer, Geotechnical Engineer, Senior Surveyor, Claim Expert, Sociologist other key staff etc.

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