नेपाल विद्युत प्राधिकरण

इन्जिनियरिङ सेवा निर्देशनालय

आयोजना विकास विभाग

दरबारमार्ग, काठमाडौँ, फोन नं. ०१-४१५३०३९

प्रथमपटक प्रकाशित मितिः २०७६।११।१९

दक्ष/विज्ञको सूची (रोष्टर)मा नाम समावेश गर्नेसम्बन्धी सूचना

आयोजना विकास विभागबाट विभिन्न जलविद्युत आयोजनाहरूको सम्भाव्यता अध्ययन तथा डिटेल डिजाइन कार्य गर्नको लागि तपसिलमा उल्लेख गरिएका दक्ष/विज्ञहरूको आवश्यकता पर्ने भएकोले यस कार्यालयलाई आवश्यक परेको अवस्थामा सेवा लिने प्रयोजनको लागि सम्बन्धित विषयका विशेषज्ञहरूको सूची राख्ने कार्य भइरहेको छ। उक्त सूचीमा नाम समावेश गर्न इच्छुक विज्ञ महानुभावहरूले ने.वि.प्रा.को वेबसाइट www.nea.org.np मा रहेको निवेदन फाराम तथा आवश्यक फारमहरू भरी यो सूचना प्रथमपटक प्रकाशित मितिबाट १५ (पन्ध्र) दिनभित्र यस कार्यालयको विद्युतीय पत्राचार ठेगाना - (Email: Address): pdd@nea.org.np वा यस कार्यालयमा आइपुग्ने गरी पठाउनहुन अनुरोध छ।

विशेषज्ञहरूको क्षेत्र:

सिनियर ड्याम इन्जिनियर, सिनियर जियोटेक इन्जिनियर, सिनियर टनेल इन्जिनियर, सिनियर स्ट्रक्चरल इन्जिनियर, सिनियर वाटरपावर इन्जिनियर, सिनियर रोड इन्जिनियर, सिनियर हाइड्रोलोजिष्ट, सिनियर कन्स्ट्रक्सन प्लानर, सिनियर कन्ट्रयाक्ट इन्जिनियर, सिनियर फाइनेन्सियल एक्सपर्ट, सिनियर जियोलोजिष्ट, सिनियर वाटर सप्लाई इन्जिनियर, सिनियर हाइड्रोमेकानिकल इन्जिनियर, सिनियर इलेक्ट्रीकल इन्जिनियर, सिनियर एच.वि.ए.सि इन्जिनियर, सिनियर पावर सिष्टम इन्जिनियर, सिनियर ट्रान्समिसन लाइन इन्जिनियर, सिनियर आर्किटेक्ट।

NEPAL ELECTRICITY AUTHORITY

ENGINEERING SERVICES DIRECTORATE

PROJECT DEVELOPMENT DEPARTMENT

TERMS OF REFERENCE

ROSTER OF EXPERT ENGINEERS

1. Background

With over 95% of the Country's total electricity generated by the hydro power plants, Nepal is solely dependent upon the hydropower resources to meet it's energy demand. Hydropower plays vital role in the economic development of the nation. Hydropower potential in Nepal is supposed to be some 83,500 MW as per the studies carried out decades ago and out of these some 43000MW are found to be economically viable. Till the date we have been able to harness only 1167 MW of hydro-power and 957.1 MW are under construction around the country.

If such potential is utilized, it will provide a great contribution in achieving the economic growth of nation by providing regular power supply to growing industries which shall export goods in foreign countries and earn foreign currencies.Besides, to achieve goal of the Nepal Government, producing10000MW in ten years, the feasibility studies and detailed designs of the hydropower projects scattered around the country have to be accomplished and tender processes for the construction have to be set off.

Hence, The Project Development Department (PDD) is preparing the feasibility studies and Detailed Designs of the various projects in Nepal.
This call for application is intended to establish a Roster of Experts/ Senior Engineers, who may be called upon as required for assignments as mentioned below, subject to the Specialists availability and mutually agreed terms and conditions.

2. Objective of the Experts.

The PDD intends to obtain the services of National Experts who are experienced in the design and development of hydropower projects to provide independent advice, involve as an expert, to provide guidance to the sub ordinates in related field and coordinate with the team of the projects. The Roster of Experts shall also form a Resource Pool for design works that PDD will engage on later.

The objective of the Expert is to design, review and guide the engineers of PDD for the technology transfer complying national and international standards of excellence and safety, as reflected in the practice, under the legislation, regulations and guidelines of Nepal. The expert will be hired on hourly or daily or weekly or monthly or delivery basis based on the input requirement and the availability of experts.

The experts may be called upon for any other project study or investigation and detailed design as PDD requires and may be engaged upon in the future.

3.Composition of the Specialists for the Roster

Roster is expected to contain specialists for the PDD as well as other assignments. It is envisaged that the Roster will comprise following experts:

1. Senior Dam Engineer
2. Senior Geotechnical Engineer
3. Senior Tunnel Engineer/ Expert
4. Senior Hydro-Mechanical Engineer/ Expert
5. Senior Structural Engineer
6. Senior Hydropower Engineers/Experts
7. Senior Hydrologist / Hydrology Experts
8. Senior Construction Planner Experts
9. Senior Electro-mechanical Engineer/ Expert
10. Senior Road Engineer/ Expert
11. Senior Contract Engineer. Expert
12. Senior Financial/Economic Analyst
13. Senior Transmission Line Engineer/Experts
14. Senior Architecture
15. Senior Water Supply / Sanitation Engineer.
16. Senior HVAC Expert.
17. Senior Geologist Expert.
18. Senior Communication Expert.

4. Qualifications and Experiences of Experts

The qualifications and experiences of Expert shall be as followed;

SN	*Description*	*Education &Experience*
1	Senior *Dam Engineer*	• *Minimum Bachelor's Degree and Higher Degree in Civil Engineering or Equivalent*
		• *Understanding of international dam regulations.*
		• *Minimum of 10 years of experience working on engineering projects with minimum 5 years as Dam Design/ Engineer / Expert in at least one Hydropower / similar project during feasibility / Detail design stage.*
2	Senior *Geotechnical Engineer*	• *Minimum of a M.Sc. in Geotechnical/Geological Engineering with preference to advanced degrees and training.*
		· *Minimum of 15 years of experience working on engineering projects with minimum 10 years' experience as Geo-tech engineer in at least one hydropower / similar project in Feasibility / Detail Design Stage.*
3	Senior *Tunnel Engineer*	• *Minimum of a M.Sc. in Geotechnical/ Tunnel Engineering.*
		• *Minimum of 10 years of experience in large scale projects or with minimum 5 years worked as Tunnel Engineer in at least one hydropower project in feasibility / Detail design stage. Experience and knowledge of using Phase II design software for tunnel and support works.*
4	Senior *Hydro-Mechanical Engineer*	• *Minimum Bachelor or Higher Degree in Mechanical engineering or equivalent.*
		• *Minimum of 10 years of experience for Master's degree and 15 years of experience for Bachelor's degree in Large Scale projects with minimum 5 years as Hydro-Mechanical Engineer in at least one Hydropower / similar projects during feasibility / Detail design stage.*

5	Senior *Structural Engineer*	• *Minimum Master's Degree or Higher Degree inStructural Engineering or equivalent.*
		• *Minimum of 10 years of experience for Master's degree with minimum 5 years strictly been worked as Structural Design Engineer in at least one Hydropower / similar project during Detail design stage.*
		• *Good knowledge of Design software like ETABS, SAP 2000, Staadpro, Prokon, Risa etc.*
		• *Involvement in large projects inside the country with international consulting firms during design stage shall be given preference.*
6	Senior *Hydrologist*	• *Minimum Bachelor's degree in civil engineering or Master's degree in Water Resource Engineering or equivalent.*
		• *Minimum of 10 years of experience for Master's degree or 15 years of experience for Bachelor's degree with minimum 5 years as Hydrologist in at least one Hydropower / similar project during feasibility / Detail design stage.*
7	Senior *Hydropower Engineer*	• *Minimum Bachelor's Degree with elective subject water power engineering or Master's degree in Water Resources Engineering/ Hydropower Engineering or equivalent.*
		• *Minimum of 10 years of experience for Master's degree or 15 years of experience for Bachelor's degree and with minimum 5 years worked as Hydropower Engineer in at least one Hydropower / similar project during feasibility / Detail design stage.*

8	Senior *Electro-mechanical Engineer*	• *Minimum Bachelor's Degree in Electrical Engineering or Higher Degree in Electrical Engineering or equivalent.*
		• *Minimum of 10 years of experience for the Master's Degree and or 15 years of experience for the Bachelor's degree with at minimum 5 yea worked in at least one Hydropower Project during feasibility Study / Detail Design stage.*
		• *Experience in Electro- mechanical design of hydropower projects.*
		• *Involvement in large projects inside the country with international firms shall be given preference.*
9	Senior *Financial Analyst*	• *Master's Degree in Finance, or Engineering Economics or chartered accountant or other relevant majors.*
		• *Having worked as a Financial Analyst for 15 years with minimum 5 years producing financial / economics indices from various " data collection and analysis" for at least one Hydropower project during feasibility study or detailed design.*
		• *Experience in Financial/Economic Analysis of hydropower projects with international consultant or company inside the country or abroad will be highly preferred*
10	Senior *Construction Planner*	• *Bachelor's degree in civil Engineering or higher degree or equivalent with minimum 10 years of experience in construction industry. Out of which, 5 of those years should strictly worked as construction planner for at least one Hydropower project during the detailed design or construction stage.*
		• *Must have knowledge of software like Primavera P6 or equivalent.*

11	Senior *Contract Expert*	• *Bachelor's Degree or Higher Degree in any engineering discipline with experience in Hydropower Projects preferably worked with international team in English speaking environment.*
		• *At least 20 years of overall experience and* Experienced in Arbitration of claims or complaints is a good choice
		• *Well exposed with insurance policy and general context of contract system in Nepal.*
		• *Candidate should have experience in FIDIC Contract system*
12	Senior *Transmission Line Engineer*	• *Bachelor's Degree or Higher Degree in Civil /Electrical Engineering or equivalent.*
		• *Minimum 15 years of experience in relevant professional works.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree, out of which minimum 5 years should have worked in design of Transmission Line and Towers in Hydropower Projects during the feasibility Study / Detail Design stage.*
		• *Extensive experience in design of Transmission Towers and foundations.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree, out of which minimum 5 years should have worked as power system analyst in Hydropower Projects of capacity greater than 20 MW in the feasibility Study / Detail Design stage.*
13	*Senior Architecture*	• *Bachelor's Degree or Higher Degree in Architecture.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree, out of which minimum 5 years should have worked as Architecture for Buildings / Housing Complex Design.*
		• *Experience in Hydropower Projects shall be given preference.*

14	*Senior Road Engineer*	• *Bachelor's Degree in civil engineering or Master's Degree in Roads Or equivalent.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree in the design and Construction supervision of Roads.*
		• *Experience in Hydropower Projects shall be given preference.*
15	*Senior Water Supply Engineer*	• *Bachelor's Degree in civil engineering or Master's Degree in Sanitation Engineering or equivalent.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree in the design and Construction supervision of water supply projects and sanitation Works.*
		• *Experience in Hydropower Projects shall be given preference.*
16	*Senior HVAC Engineer*	• *Bachelor's Degree or Master's Degree in Mechanical Engineering or equivalent.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree out of those 5 year Worked in HVAC related works.*
		• *Experience in Hydropower Projects shall be given preference.*
17	*Senior Geologist*	• *Bachelor's in Engineering Geology or Master's in Geology*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree with minimum 5 Year Worked in feasibility study and detailed design of Hydropower Projects.*
18	Senior *Power Communication Engineer*	• *Bachelor's degree or Master's degree in Electrical Engineering or equivalent.*
		• *Minimum of 10 years of experience for the Master's Degree and 15 years of experience for the Bachelor's degree with minimum 5 Year Worked in Power System of Hydropower Projects.*

5. Duties of the Experts

The primary tasks of the expert will include, but not necessarily be limited, to the following:

SN	DESCRIPTION	DUTIES
1	Senior Dam Engineer	• Analyze, Design, Review and develop hydro projects with dam/ reservoir options. Selection of type of dam.
		• Preparation of design basis memorandum for dam and optimization of dam height and reservoir regulation.
		• Design of dams, stability analysis for different loading conditions, assessment of instrumentation facilities for the dam operation and maintenance.
		• Economic design of spillway, diversion structures, intake, cofferdams etc.
		• Must have demonstrable skill in the evaluation of technical performance, identifying potential improvements
		• Work together with hydrologist and reservoir simulation expert for floods and routing effects
		• Understanding of international dam regulations
2	Senior Geotechnical Engineer	• Analyze, Design, Calculate and develop, drawings related to geotechnical part of Dam/ Weir, Intake, De-sanding Basin, Tunnels, Surge Tank, Penstock, Power House, Tailrace etc.
		• Design support system of the tunnels and finalise investigations and instrumentations.
		• Carry out necessary calculations and analysis related to tunnel and underground structure design.
		• Inputs for the preparation of design basis memorandum

3	Senior Tunnel Engineer	• Responsible for coordination and productivity of subordinates and provide technical guidance to engineers.
		• Guide and coordinate design development and assists in providing technical expertise in design works,
		• Prepare and responsible for completion of engineering project elements such as reports, designs, specifications and plans.
		• Inputs for design basis memorandum and provide support for design review and quality assurance.
		• Perform calculations and analyses related to tunnel and underground structure design,
4	Senior Hydro- Mechanical Engineer	• Carry out analysis , design and drawings of hydro – mechanical components
		• Review and guide the hydraulic calculations prepared by design team member and work as mentor.
		• Complete Design of Penstock, Gate, Valve, Steel Liner and similar components.
		• Well exposed with the performance of turbine and its accessories
		• Prepare design basis memorandum for hydro- mechanical works
5	Senior Structural Engineer	• Complete responsibility on structural components including specifications, design criteria, and other available data preparatory to the accomplishment of the structural design and the preparation of design analysis.
		• Analyze, Design and coordinate structural design and foundation requirements with all other design disciplines to provide a comprehensive design product.
		• Prepare design basis memorandum for the structural components.

6	Senior Hydrologist	• Investigations for surface water and/or groundwater as well as technical evaluations for their applications to hydrogeology
		• Preform calculations of floods hydrographs and routing effects due to the rainfall pattern and catchment conditions.
		• Preform calculations of for the design discharge in the diversion tunnel, PMF discharge calculation for 100 ,1000 years period and prepare Routing Curve for Headworks and Tailrace.
7	Senior Hydropower Engineers	• Develop a hydropower scheme basis on river system by coordinating other members of the design team.
		• Design and optimize headwork structures and prepare drawings and specifications
		• Develop a design criteria for feasibility studies and detailed design and other reports
		• Develop the feasibility studies from the view point of overall engineering aspects in accordance with international best practices.
		• Prepare the reservoir sedimentation study carried out by the hydrological engineer to identify the least cost solution with minimum environmental impacts. Reflect the optimal design in the cost estimates and tender documents.
		• Prepare any disaster risk management plan including local flood control and early warning systems, with the hydrological engineer.
		• Finalize a generation scheme based on the reservoir sedimentation study with the hydrological engineer.
		• Prepare reports for different levels of the study
		• Work and review the project documents with respect to FIDIC form of contracts.

8	Senior Electro-mechanical Engineer	• Plan and carryout the electric equipment installation works, considering the site conditions.
		• Prepare the technical section for the electrical equipment in the tender documents.
		• Prepare a cost estimate as per the schedule for design, transportation and installation works for the electrical equipment.
		• Prepare documentation on the actual design including all design principle criteria, parameters and standards. Also prepare all major calculations and analysis including all the drawings related to electromechanical equipment's and coordinates with the design team.
		• Estimate construction power study for project construction and finalize construction power study of nearby substation, transmission line required including the preliminary design component of construction power supply system prepared by the design team.
		• Prepare the technical specifications for the electrical equipment and transmission lines in the tender documents and review tender documents..
9	Senior Financial/Economic Analyst	• Determine and finalize all indicators such as Net Present Value (NPV), Benefit Cost Ratio, Internal Rate of Return etc. essential for analysis
		• Prepare and finalize financial analysis of the projects and the project entity such as, commercial merits of the projects under alternative power market conditions (Electricity Market and Demand), financial packages and fiscal regimes.
		• Prepare and identify risks associated with the project and allocated to the party that is assumed to cover the risk in the most cost efficient way in order to minimize financial costs of the venture.
		• Identify and assess various financial sources including public funds from Nepal and other countries that may benefit from the projects, multilateral / bi lateral organizations and commercial financial institutions.
		• Prepare sensitivity Analysis of the project.

10	Senior Construction Planner/ Scheduler	• Develop the project schedule in Primavera P6 or similar equivalent software.
		• Identify the critical path and report any issues impacting the critical path
		• Coordinate with the design team to ensure that schedule activities are accurately updated
		• Provide reports in accordance with the project calendar.
		• Examine and finalize construction methods for civil works in consideration of the site conditions, and work with estimated BOQ and manpower needed for the execution of the project.
		• Prepare and finalize construction schedule for civil, hydro-mechanical and electromechanical works including transmission line works.
11	Senior Contract Expert	• Prepare all the contractual analysis required in the light of FIDIC clauses and technical specification.
		• Prepare all required contractual documents related to EPC level Contract documents with respect to FIDIC clauses and technical specifications.
12	Senior Transmission Line Engineer	• Prepare the transmission line routing with alternatives and select the tower types and locations
		• Carryout the design of the tower including analysis with structural models used for their optimum design.
		• Select the Conductor type, schemes, specifications selection, and accessories and insulators selection and design
		• Finalize the sub-station location and the switchyard design.
		• The Transmission lines will be of 132 kV, 220 kV, 400 kV and similar voltages
		• Inputs for design basis memorandum preparations
13	Senior Water-supply Engineer	• Calculate data required for the water supply system and design necessary structures for the system..
		• Insure the water quality tests in the laboratory and finalize essential treatment plants and process for the safe potable water.
		• Design the sanitation process in the camp, power house, Headwork control building and other locations as needed.
		•Prepare cost and necessary tender documents for the execution.

14	Senior Road Engineer	• Design Road Geometry and review drawings.
		• Design the structures essential in road construction.
		• Review cost and rate analysis and prepare contract document.
15	Senior Architect	• Planning and review the layout of power house area, camp and other office buildings.
		• Design the aesthetic looks of the power house, control building, office and residential buildings.
		• Prepare drawings and specifications.
16	Senior HVAC Expert	• Design and Layout of duct systems including supply, return, exhaust, ventilation and duct collection centers.
		• Knowledge of building materials and internal heat loads.
		• General knowledge of HVAC system control.
17	Senior Communication Engineer	• Design and prepare communication system from control building at head-works to control building of power house.
		. • Prepare networking system in the office building
		. • Design and prepare communication system in all the dam and power house instruments.
		. • Prepare drawings for the networking systems.

18	Senior Geologist	• To study the general suitability of site for the hydropower structures.
		• To determine the possible difficulties that may occur during construction method.
		• To determine the suitability of construction materials.
		• To ascertain the nature of sub surface and their properties and behavior for the safe design of dams, tunnels and other structures.
		• Seismological study of project to derive seismic design parameters, to ensure earthquake safety of the major structures and its associated seismic hazard and selected design and risk of failure of the competent structure. Review of pertinent and available geological and seismological reports and data.
		• Evaluation of seismic status of faults, thrusts and other weak features in the vicinity of the dam sites and within the region, etc.
		• Based on the available information and assessment of local and regional seismicity the seismic design criteria of structures shall be determined.

Form 1: An Application

Date:
.....

To,
The Director,
Project Development Department
Engineering Services Directorate
Nepal Electricity Authority
Durbar Marg, Kathmandu, Nepal

Sir,

1. Being duly responsible…. ……
…….(hereinafter "the Applicant"), and having reviewed and fully understood all the required information provided in the Roaster of Experts, the undersigned hereby apply to be included in Roaster of Experts in the field of ……(to be filled by applicant) by the Project Development Department (PDD) as Expert for Feasibility Study / Detailed Design of the Hydropower Project / other Study works to be carried out.

2. Attached to application are photocopies of original documents defining:

   a) Applicant's eligibility includes registered number from the Nepal Engineering Council, Pan No
   b) Experiences status in format given in table 3A, 3B, 3C and 3D.

3. Project Development Department (PDD) and its authorized representatives are hereby authorized to verify the statements, documents, and information submitted in connection with this application. This Application will also serve as authorization to any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in this application, or with regard to the experience and competence of the Applicant.

4. I declare that, I have no conflict of interest in the proposed proceedings and I have not been punished for an offense relating to the concerned profession or business and I have not been declared ineligible.

5. I further confirm that, if I would found engaged to prepare the TOR for any ensuing assignment resulting from our work product under this assignment, I myself will be disqualified from the Roaster of Experts and participation in the assignment.

6. I, the undersigned, declare that the statements made and the information provided in the duly completed application are complete, true and correct in every detail.

Signature:……..

Name:…….

Mail Add:…….…….

Mobile No.:……

Form 2: Curriculum Vitae

Form 3A: Experience in Feasibility Study of Hydropower Project.

List of experience in Feasibility Study of Hydropower Projects.

S. No.	Name of the Project	Location	Capacity	Client	Execution Year / Duration	Name of the Responsibilities
1						
2						
3						
4						
5						

Signature of Applicant: *Date:*

Note: the experience of the applicant shall be supported with evidence/proof in the form of experience certificates.

Form 3B: Experience in Detail Design of Hydropower Project.

List of experience in Detailed Design Hydropower Projects.

S. No.	Name of the Project	Location	Capacity	Client	Execution Year / Duration	Name of the Responsibilities.
1						
2						
3						
4						
5						

Signature of Applicant: *Date:*

Note: the experience of the applicant shall be supported with evidence/proof in the form of experience certificates.

Form 3C: Experience in Supervision of HEP structures.

List of experiences in Supervision of Hydroelectric Project.

S. No.	Name of Project	Location	Capacity	Year started	Year Completed	Client	Name of the Responsibilities
1							
2							
3							
4							

Signature of Applicant: *Date:*

Note: the experience of the applicant shall be supported with evidence/proof in the form of experience certificates.

Form 3D: General Experience in Relevant work.

List of experiences in relevant job.

S. No.	Name of Project / Office.	Location	Capacity	Year started	Year Completed	Client	Name of the Responsibilities
1							
2							
3							
4							

Signature of Applicant: *Date:*

Note: the experience of the applicant shall be supported with evidence/proof in the form of experience certificates.