Nepal Electricity Authority

TERMS OF REFERENCE (TOR)

for

C-1: Project Implementation Consultants

under

SASEC-Electricity Transmission and Distribution Strengthening Project (ETDSP)

March, 2025

Terms of Reference (TOR)

A. Background

Nepal's electricity transmission system is turning to build a 220 Kilovolt (kV) and 400 kV East–West backbone through which electricity can be transported from hydropower collection hubs to customers across the country, and through which electricity can be imported from and exported to India. This network typology will facilitate flexibility in grid operation, increase reliability and quality of the Integrated Nepalese Power System (INPS) and transmission of bulk power and catering of local demand of Western part of Nepal. Selection of 400 kV as the transmission voltage reflects the government's strategy to adopt a longer planning horizon for transmission, and to align with the voltage level adopted for cross-border power transmission to India.

The Government of Nepal has sought assistance from ADB to support its ongoing investment program in the country's electricity transmission and distribution infrastructure. The proposed financing will support a key section of the planned 400 kV transmission backbone, as detailed in the transmission master plan. It will also reinforce supply to NEA's distribution networks and continue the process of modernizing NEA's information technology infrastructure. The overall project scope is aligned with the government's 2018 white paper in which government's vision for the energy sector has been articulated. It is also aligned with the ADB's country partnership strategy for Nepal, 2020–2024 and supports the government's development objective of accelerated and inclusive economic growth.

Similarly, in order to develop high-capacity transmission system in the southern belt of western part of Nepal, 400kV transmission line is much needed as existing 132kV line is not sufficient to transfer bulk power. The construction of the 400kV line from New Butwal to Mahendranagar. It will enhance the transmission capacity and ease the flow of power in the Western part of the country. This will also help to evacuate the power from potential hydropower projects in the western part of the country and will also provide the connection points to Lamahi – Lucknow/Gonda and Dododhara - Bareily cross border transmission lines.

Details of the procurement packages and their status details under SASEC-Electricity Transmission and Distribution Strengthening Project (ETDSP) Project are as follows:

S.no	Package Number	General Description of the Packages	Current Status
1.	P-1	Construction of 400 kV Transmission Line: Lot 1: New Butwal to Motipur on turnkey basis, Lot 2: Motipur to Lamahi on turnkey basis	Bid and Project Preparation Stage
2.	P-2	Construction of 400/220/132kV Gas Insulated Substation at Lamahi on turnkey basis.	Bid and Project Preparation Stage
3.	P-3	Construction of 400 kV Transmission Line from Nijgadh to Ramauli on turnkey basis.	Bid and Project Preparation Stage
4.	P-4	Construction of 400/220/132kV Gas Insulated Substation at Ramauli (near	Bid and Project Preparation Stage

		Parwanipur)	
5.	P-5	New Butwal and Kushma Substations Expansion on turnkey basis.	Bid and Project Preparation Stage
6.	P-7	Construction of 220/132kV GIS substation and associated infrastructure on turnkey basis at Teenpiple and associated Okharpauwa-Teenpiple 220kV LILO Transmission Line.	Bid and Project Preparation Stage
7.	P-8	Construction of 132kV transmission line, sub stations and associated infrastructure on turnkey basis for Dailekh-Jumla 132 kV transmission line and Jumla 132KV GIS substation.	Bid and Project Preparation Stage
8.	P-9	LILO (6km) of 132 kV from Nepalgunj-Nanpara inter- connection transmission line & Construction of 132kV GIS Substation at Nepalgunj inner city on turnkey basis.	Bid and Project Preparation Stage
9.	P-13	Expansion and Augmentation of Distribution System in Karnali Province.	Bid and Project Preparation Stage
10.	P-6	Disaster Recovery Centre construction	Bid and Project Preparation Stage
11.	P-10	Smart meters rollout in Kathmandu Valley Phase-2	Bid and Project Preparation Stage
12.	P-11	Desing, Supply, and Installation of Meter Data Management System	Bid and Project Preparation Stage
13.	P-12	Digital network and SCADA expansion	Bid and Project Preparation Stage
14.	P-14	Distributed Solar PV Subprojects	Bid and Project Preparation Stage
15.	W-1	NEA Training Centre Refurbishment	Bid and Project Preparation Stage

NEA intends to apply a portion of the proceeds of this fund for payments under the consulting services for Project Management and Construction Supervision for the implementation of following packages only under SASEC-Electricity Transmission and Distribution Strengthening Project (ETDSP):

S.no	Package Number	General Description of the Packages	Current Status
1.	P-1	Construction of 400 kV Transmission Line: Lot 1: New Butwal to Motipur on turnkey basis, Lot 2: Motipur to Lamahi on turnkey basis	Bid and Project Preparation Stage
2.	P-2	Construction of 400/220/132kV Gas Insulated Substation at Lamahi on turnkey basis	Bid and Project Preparation Stage
3.	P-3	Construction of 400 kV Transmission Line from Nijgadh to Ramauli on turnkey basis	Bid Document Submitted to ADB for Concurrence.
4.	P-4	Construction of 400/220/132kV Gas Insulated Substation at Ramauli (near Parwanipur)	Bid and Project Preparation Stage
5.	P-5	New Butwal and Kushma Substations Expansion on turnkey basis.	Bid and Project Preparation Stage
6.	P-7	Construction of 220/132kV GIS substation and associated infrastructure on turnkey basis at Teenpiple and associated Okharpauwa-Teenpiple 220kV LILO Transmission Line	Bid and Project Preparation Stage
7.	P-8	Construction of 132kV transmission line, sub stations and associated infrastructure on turnkey basis for Dailekh-Jumla 132 kV transmission line and Jumla 132KV GIS substation	Bid and Project Preparation Stage
8.	P-9	LILO (6km) of 132 kV from Nepalgunj-Nanpara inter- connection transmission line & Construction of 132kV GIS Substation at Nepalgunj inner city on turnkey basis	Bid and Project Preparation Stage
9.	P-13	Expansion and Augmentation of Distribution System in Karnali Province	Bid and Project Preparation Stage

Please note that there will be 2 (two) Consultants as detailed below who will be responsible for Project management, environmental and social safeguards, and construction supervision for all the packages under SASEC-Electricity Transmission and Distribution Strengthening Project (ETDSP). However, Project Implementation Consultant (C-1) will be responsible for overall reporting as per Clause-G of this ToR, including environmental and social safeguards reporting, to NEA, ADB and all other authorities as applicable by collecting data from the other consultant (C-2: Digitalization Support to NEA).

Package Number	General Description	Packages of SASEC-ETDSP
C-1	Project Implementation Consultants	P-1, P-2, P-3, P-4, P-5, P-7, P-8, P-9 & P-13
C-2	Digitalization Support to NEA	P-6, P-10, P-11, P-12, P-14 & W-1

Projects Description

The Proposed projects would comprise the following components tentatively:

P-1) Construction of 400kV Transmission Line from New Butwal Substation to Lamahi

Lot 1: New Butwal to Motipur on turnkey basis,
Lot 2: Motipur to Lamahi on turnkey basis

This 400 kV Double/Multi circuit quad moose transmission line will be constructed in Lumbini Province of Nepal and passes through 5 districts namely Nawalparasi (Bardaghat Susta Paschim), Rupandehi, Kapilvastu, Arghakhanchi and Dang. The entire line length will be 161 km (approximately) and associated facilities.

P-2) Construction of 400/220/132kV Gas Insulated Substation at Lamahi.

The package consists of construction of 400/220/132/33/11 kV Gas Insulated substation (GIS) at Lamahi - 09, Dang district of Lumbini Province along with associated facilities.

Power Transformer details are as follows:
2X500MVA; 400/220kV Auto Transformers
2X315MVA; 220/132kV Auto Transformers
2X63MVA; 132/33 kV Power Transformers
2X24MVA; 33/11 kV Power Transformers
2X630kVA; 33/0.4 kV Substation Transformers

P-3) Construction of 400 kV Transmission Line from Nijgadh to Ramauli.

- The package consists of construction of Multi/Double Circuit 400 kV Quad Moose Transmission Line:
- Nijgadh – Ramauli Multi/Double Circuit 400kV Transmission Line: 40.0 km

P-4) Construction of 400/220/132kV Gas Insulated Substation at Ramauli (near Parwanipur)

- Construction of 400/220/132/33/11 kV Substation at Ramauli, Bara of Madhesh Province.

At Ramauli Substation:

- Installation of 400/132/33 kV Auto Transformer: (3 X315 MVA)

- Installation of 132/33 kV Power Transformer: 2 X63 MVA
- Installation of 132/11 kV Power Transformer: 2 X30 MVA

P-5) New Butwal and Kushma Substations Expansion.

The package consists of the following components and associated facilities –

At New Butwal Substation:

- Replacement of existing 100 MVA 220/132 kV Power Transformer by 2X315 MVA 220/132 kV Power Transformer and its protection system
- Installation of 2X 63 MVA 132/33 kV Power Transformer and construction of 8 Nos of 33 kV Distribution feeder bays
- Installation of 2X 20/24 MVA 33/11 kV Power Transformer and construction of 6 Nos of 33 kV Distribution feeder bays

At Kushma Substation:

- Installation of 1X 24/30 MVA 132/33 kV Power Transformer and construction of 4 Nos of 33 kV Distribution feeder bays

P-7) Construction of 220/132kV GIS substation and associated infrastructure on turnkey basis at Teenpiple and associated Okharpauwa-Teenpiple 220 kV LILO Transmission Line.

The package consists of the following components and associated facilities –

Transmission Line:

- Quad Circuit 220 kV Transmission Line twin bison conductor (LILO from Trishuli-Matatirtha 220 kV DC Transmission Line) of 4 km (approx.) line length.

Substation:

- Construction of 220 kV Line Bays: 4 nos.
- Construction of 66 kV Line Bays: 8 nos.
- Installation of 220/132 kV Power Transformer: (6+1 spare) X105 MVA)
- Installation of 132/66 kV Power Transformer: (6+1 spare) X33.3 MVA
- Installation of 132/11 kV Power Transformer: 2X45 MVA

P-8) Construction of 132kV transmission line, sub stations and associated infrastructure on turnkey basis for Dailekh-Jumla 132 kV transmission line and Jumla 132KV GIS substation.

The Project consists of the following components and associated facilities –

1) 132kV Double circuit Dailekh-Kalikot-Jumla Transmission Line (approximately 82.14 KM)
2) 132/33/11kV new GIS Substation at Jumla
3) 132/33/11kV new GIS Substation at Kalikot
4) Bay extension at 132kV Dailekh AIS Substation

P-9) LILO (6km) of 132 kV from Nepalgunj-Nanpara inter- connection transmission line & Construction of 132kV GIS Substation at Nepalgunj inner city.

The scope of the package includes construction of 6.1 km 4-circuit transmission line, 7 Nos. of 132 kV line bays (including bus-coupler and transformer bays) and installation of 2 nos. of power transformers (132/33 kV, 2X30 MVA) at existing 33/11 kV Nepalgunj Old Substation. The 6.1 KM transmission line extends from Nepal-India Border (Dush Gaja Piller No.: 652/18(32/18)) to the existing 33/11 kV Nepalgunj Old Substation.

Technical Details on the Proposed Substation

Installation of 132/33 kV, 2X30 MVA Power Transformer;

Construction of 7 nos. of 132 kV Bays (including bus-coupler and transformer bays);

Construction of 2 nos. of Dead-End Towers

P-13) Expansion and Augmentation of Distribution System in Karnali Province

The scope of the package includes

- Expansion of distribution lines and construction of 33/11 kV substations in West Rukum, Surkhet, Dailekh, Salyan, Kalikot, Jumla, Jajarkot, Mugu, Humla and Dolpa districts of Karnali Province and Mustang district of Gandaki Province.

B. Objectives of the Project Management Consulting Assignment

The Services aim at providing high quality professional services to assist NEA in supervising and implementing the Project and to ensure that the Project will be completed according to the schedule and that the completed Project will deliver the quality, capacity, performance, reliability and economic life as required by the Employer's requirement defined in the turn key contracts with the contractors as described in these terms of Reference (TOR), and as per the relevant agreements.

C. SCOPE OF SERVICES

Task-1. Design Review/Check, Construction Supervision and Quality Assurance & Inspection and Contract Management.

1.1 Design Review/Design Check

(i) Review and recommend for approval of all designs and drawings and other technical documents available to NEA and submitted by the contractor including manufacturers' drawings for transmission lines and sub-stations.

(ii) Review and recommend for revised bill of quantity submitted by the contractor for Transmission Lines and/or Substations;

(iii) Consultant shall prepare and update document tracking index with details of documents received from contractor and its comments/observations/ recommendations/approvals send back to contractor. The well organized and accurate records index file shall be submitted to the client fortnightly.

(iv) The above-said review and recommendation shall be carried out entirely in close association with NEA engineers so that transfer of technical expertise will take place effectively. During this period, the Consultant will also prepare a spreadsheet required for design, and prepare manual for checking design and drawings as per requirements.

(v) The above said review and recommendation shall be undertaken with reference to the project's detailed design and pre-construction environmental

and social safeguard requirements which are primarily set out in the Environmental Management Plans (included in the Environmental Impact Assessment and Initial Environmental Examination reports available from, https://www.adb.org/projects/54053-001/main) but the Resettlement and Indigenous Peoples Plans to also be referred – the consultant shall ensure the required safeguards inputs to the design review/check process under Task 2.

(vi) The Consultant shall submit comments and observations on design reports to NEA in a single submission, rather than on multiple submissions over a longer period of time.

(vii) The minimum list of design drawings (available to NEA and will be submitted by the Contractor) that needs to be reviewed and recommended for approval are attached in the ANNEXURE-I. However, the Consultant shall have to prepare detail Master Design Drawing List (MDDL) for each packages for review, comments, observations and recommendation for approval on the design drawings available to NEA and submitted by the Contractor.

Payment Terms: Person-months required to complete Task 1.1 for all the packages covered under this Consulting services is fixed for home and field Person-months including any extension of time for the Consulting Services and the Consultant shall have to quote the rates accordingly. However, the Client has estimated person-months required to complete this Task and is detailed under remuneration BOQ.

International design/design review experts shall perform their duty mostly from the field in close association with Client's Engineers.

However, international design/design review experts who will stay at the field shall be reimbursed for economy class domestic and international aeroplane fare, bus, taxi fare which shall be made for minimum of quoted price in price schedule and actual payment made.

The interim payment shall be made based on the payment breakdown. The individual packages weightages are detailed in ANNEXURE-II and the individual design drawings weightages (based on Master Design Drawing List that will be submitted by the consultant) shall be determined by negotiation based on mutual understanding during consulting service execution. The consultant shall depute the suitable experts as per the requirement to complete this activity.

The review and approval of the design and drawings submitted by consultant shall be done promptly as per requirements of the works; however, the following schedule shall be applicable during the approval process under the contract.

SN	Descriptions	Timeline for Review and approval
1	Approval/comments by consultant on submission of design, drawings, test reports and other applicable documents by Contractor	Within 10 days of initial submission or any further extension granted by NEA in writing/mail.
2	Approval or comments resubmitted by Contractor (whenever required)	Within 1 week of re-submission.

1.2 Construction Supervision and Quality Assurance & Inspection

(i) The Consultant shall establish the main office in Kathmandu and Team leader shall be deputed there for co-ordination between NEA project offices and Sites. Team leader shall visit sites upon the request of NEA wherever necessary.

(ii) Consultant shall depute the Deputy Team Leaders for all Consulting Services (Project Management, Construction Supervision etc.) related to the respective regions as below:

Sr.	Region	Proposed Packages (Tentative)	Tentative Regional Office Location	Responsibility
1	North	P-8 and P-13	Jumla	Deputy Team Leader
2	Kathmandu	P-3, P-4 and P-7	Kathmandu (Main Office)	Team Leader
3	West	P-1, P-2, P-5 and P-9	Butwal	Deputy Team Leader

(iii) Provide site supervision to assist NEA during the period of construction works. Key experts will be required for short durations. Mainly services of national experts shall be utilized to carry out construction supervision with back up from the key experts;

(iv) Measurement and Verification of Work quantities on daily basis.

(v) Prepare a detailed Project Control Program using the Critical Path Method (CPM) to provide bar charts, curves and detailed reports of critical activities, percentage completion, interface points, resources entry etc. for design, procurement, and installation and commissioning using the PRIMEVERA software. Prepare suitable formats required by site representatives for site supervision;

(vi) Hold regular planning and progress review meetings in Kathmandu office or at Regional offices upon the directions of NEA to monitor production of design information and approval of drawings, contractors' progress, delays and issue minutes of meeting and record notes of discussion to NEA and submit detailed progress reports to NEA on monthly basis as per prescribed formats;

(vii) Certify contractors' interim and final invoices for payments as per the provisions in the contract between NEA and Contractor. The contractors' invoices shall be certified by deputy team leaders for payments within a week after receipt of invoices from Contractor;

(viii) Assist NEA for overall Quality Assurance including requirements in this regard in the fields, such as but not limited to preparation and implementation of Field Quality Plans and Manufacturer's Quality Plans.

(ix) Inspect and witness stage inspections, type tests and factory acceptance tests (FAT)) of materials and equipment to be supplied and certify its adequacy and quality before items are packed and shipped to the site of works in consultation with NEA. The consultant shall inspect and witness all the equipment supplied at Site for transmission line and substation or as instructed by the NEA.

(x) For each component of transmission lines and substations subject to test, the Consultant will review the contractor's test procedures for compliance with manufacturers' requirements and design criteria. The Consultant shall witness the tests and review the test results. If test results are not satisfactory, the consultant shall ensure that any lack of compliance is addressed and that the equipment and overall systems shall be re-tested until compliant results are achieved. If compliance is not achieved then the material shall be rejected.

(xi) Witness and assist NEA in commissioning of transmission lines and substations. During the commissioning phase, the Consultant shall provide training on the testing and commissioning of all aspects of the project. The Consultant shall assist NEA in this phase of the project and coordinate with the Contractor in addressing any issues with the project components that are unsatisfactory. At the end of this period, and when all acceptance tests have been completed to the Consultant's satisfaction, the Consultant will advise NEA that the construction is complete and all the project components are ready to be declared fully operational.

(xii) Review and compile as built drawings and review the operation and maintenance manual provided by the contractors for accuracy and adequacy and assist NEA in taking over the completed facilities.

(xiii) Review and recommend operation and routine maintenance manual of the Facilities submitted by the contractor.

(xiv) The Consultant shall also prepare and recommend for completion certificate, provisional/final taking over certificates for the facilities completed. Whenever due for the works or part of the works, alert NEA for work deficiencies and outstanding items, if any. The Consultant shall also confirm the remedial measures taken by the contractor and recommend a final taking over certificate after expiry of the warranty period.

(xv) The above said supervision and quality assurance shall be undertaken with reference to the project's environmental and social safeguard requirements primarily set out in the Environmental Management Plans (included in the Environmental Impact Assessment and Initial Environmental Examination reports available from, https://www.adb.org/projects/54053-001/main) but the Resettlement and Indigenous Peoples Plans to also be referred – the consultant shall ensure safeguards inputs to the construction supervision under Task 2.

Payment Terms: The payment for the Task-1.2 shall be paid through renumeration for the certified Person-months.

International experts shall be called for field visit during design, implementation and commissioning stage on need basis by the Employer and the payment for the same will be through renumeration for the certified Person-months. Moreover, hotel stay charge payment shall be made for minimum of quoted price in price schedule and actual payment made. However, maximum limit for hotel stay charge shall be as per Annexure-III. In addition to that, Economy class domestic and international aeroplane fare, bus, train, taxi fare will be paid on minimum of quoted price in price schedule and actual payment made.

1.3 Contract Management

(i) Check/recommend program schedules (construction schedule & supply schedule) prepared and submitted by the Contractor;

(ii) Assessing Extension of Time (EOT) for Completion of the Project as claimed by the Contractor(s) and prepare reply letters on behalf of NEA for each Extension of Time raised by contractors within the stipulated time period in the contract between NEA and Contractor;

(iii) Advise NEA in resolving disputes/claims and prepare reply letters on behalf of NEA for each claim raised by contractors within the stipulated time period in the contract between NEA and Contractor;

(iv) Take part in final inspection of works and recommend NEA on the issuance of Completion, Operational and Taking Over Certificates to the Contractor within the stipulated time period in the contract between NEA and Contractor;

(v) Check the completeness of the final as-built drawings and documentations;

(vi) Prepare Project Completion Report to the satisfaction of NEA and Asian Development Bank (ADB);

(vii) Submit monthly, quarterly and annual progress report to NEA and ADB;

(viii) Submit intermittent site visit reports;

(ix) Review progress of the Project and advise NEA for timely completion of the project;

(x) Prepare reports for NEA and ADB as and when requested;

(xi) Prepare and submit minutes of meeting attended by the Consultant;

(xii) Rate analysis and recommendation of rates to be applied for extra/additional work to be carried out by the contractor as per the provision in the contract between NEA and Contractor.

(xiii) Detailing and explaining any variation/price adjustment in project cost and implementation time from the originals.

(xiv) The above said contract management shall be undertaken with reference to the project's environmental and social safeguard requirements primarily set out in the Environmental Management Plans (included in the Environmental Impact Assessment and Initial Environmental Examination reports available from, https://www.adb.org/projects/54053-001/main) but the Resettlement and Indigenous Peoples Plans to also be referred. In particular, the enforcement of non-compliances observed by safeguard staff and consultants – the consultant shall ensure safeguards input to contract management under Task 2.

Payment Terms: The payment for the Task-1.3 shall be on Remuneration basis. The consultant shall depute the suitable experts as per the requirement to complete this activity.

Task-2. Environment/Social Safeguards and Health/Safety Management

(i) Assist NEA to implement, monitor and manage Environment/Social Safeguards, Health/Safety and Labor policies, procedures and requirements on all subproject components of the Project as per requirements of the Government of Nepal and ADB – the former are set out in the country safeguards system, the latter are set out in ADB's SPS 2009, the IFC EHS Guidelines, the ILO Safety and Health in Construction Guidelines, the ILO Worker Accommodation Guidelines, and all the EMPs included in the EIA and IEE reports of the project;

(ii) Supervise and monitor observance of Environment/Social Safeguards, Health/Safety and Labor policies, procedures and requirements compliance by the implementing agency and their contractors through desk top and field activities identifying where gaps in compliance exist and recommending corrective actions;

(iii) Advise and assist NEA, and other relevant bodies through NEA, on the observance of safeguards, health/safety and labor policies, procedures and requirements including providing capacity development activities such as training sessions etc.

(iv) Guide NEA on the implementation of the EMP during the construction, operation and maintenance performing the functions of the EMP assigned to PIC as set out in each EIA/IEE.

(v) In implementing, monitoring and managing Environment/Social Safeguards particular emphasis to be placed on biodiversity and physical cultural resources management, as well as taking a health/safety risk management approach.

(vi) Assist NEA with Resettlement and Indigenous Peoples Plans implementation.

(vii) Guide NEA on the implementation of the EMPs during the pre-construction and during construction as it pertains to their responsibilities including updating of the EIA and IEE reports for ADB clearance (if required) during the pre-construction – prior to contract award and then following detailed design and during construction phase. This is including (a) understanding the requirements for each mitigation and monitoring measure, and (b) the implementation schedule for each measure considering that no activity will be approved to commence unless the related mitigation and monitoring is set.

(viii) Support NEA in undertaking receptor inventories and meaningful consultations and arranging and incorporating the results of expert studies/surveys that are required for updating of the EIA and IEE reports during the pre-construction, prior to the contract award and during construction as necessary.

(ix) Provide guidance and necessary technical and safeguard inputs to finalizing the EIA, IEEs, and RIPP to ensure robust assessments with meaningful consultations are completed.

(x) Review (quality assure) the final version and any further updates to the EIA, IEE and RIPP prior to submission by NEA for review and clearance by ADB.

(xi) Support NEA in preparing and reviewing the bidding documents (if required) for compliance with the EMP to ensure these documents incorporate and are in accordance with Government and ADB requirements including qualifications, experience, staffing requirements, applicable environmental and social requirements, and reflecting those with cost implication in the BOQ.

(xii) Supporting NEA in bid evaluation (if required) with respect to ensuring the contractors are compliant with the safeguard related qualifications, experience, staffing requirements, applicable environmental and social requirements, BOQ costings etc.

(xiii) Supporting NEA in further updating the EIA/IEE and EMP as required in consultation with ADB prior to NEA approval of the detailed designs to reflect any changes from the subproject design/route alignments assessed by the EIA/IEE.

(xiv) Support NEA in preparing a detailed training plan for the project (subprojects) with reference to the outline training plans included in the safeguard documents.

Support delivery of safeguard training and capacity building activities and provide on-the job guidance to NEA safeguards staff (employed by PMD or in SSEMD) and the EPC Contractors on ensuring compliance with the EMP requirements.

(xv) Provide guidance to the contractors on how the Project EMPs are to be implemented including (a) understanding the requirements for each mitigation and monitoring measure, and (b) the implementation schedule for each measure considering that no activity will be approved to commence unless the related mitigation and monitoring is set.

(xvi) Support NEA in reviewing the EPC Contractor's outline and detailed designs and method statements for compliance with the EMP to ensure these documents incorporate and are in accordance with (a) the environmental and social requirements of the construction contracts and as reflected in the Project EMPs, and (b) the conditions of environmental approvals of the Government, where required.

(xvii) Support NEA in reviewing the EPC Contractors' CSEMP and all topic specific (such as waste, health and safety) and site-specific plans; recommend modifications to these documents to be compliant with: (a) the environmental and social requirements of the construction contracts and as reflected in the Project EMPs, and (b) the conditions of environmental approvals of the Government, where required. Recommend modifications needed, if any, to ensure compliance of the CSEMP with the project's environmental and social requirements.

(xviii) Support NEA to ensure that their contractors secure all necessary permissions from government before the commencement of related works, and maintain records with copies of all clearances, permits, licenses, and insurances obtained.

(xix) Support NEA in ensuring the contractor provides adequate EHS training to their subcontractors and all workers including communication of emergency plans, daily EHS toolbox talks and emergency mock response drills; topics for trainings to be provided based on-site observations where gaps are seen to exist.

(xx) Guide NEA safeguard team on the environmental and social aspects of the project with an emphasis on supervision, monitoring and reporting requirements.

(xxi) Develop formal systems and templates for NEA staff and EPC Contractor safeguard staff to supervise, monitor and report on day-to-day implementation all aspects of EMP implementation, including the immediate reporting of non-compliances, unanticipated impacts, accidents, chance finds, grievances etc.

(xxii) Develop the compliance monitoring system to be used during the construction period for monitoring the contractors' performance relative to environmental requirements, including the preparation of: (a) monitoring and corrective action forms and checklists, (b) inspection procedures, and (c) documentation procedures.

(xxiii) Conduct orientation sessions with the EPC Contractor on the compliance monitoring system to be used, notification of non-compliance, and the process of requiring contractors to implement corrective measures when necessary.

(xxiv) Support NEA in preparing a community liaison plan.

(xxv) Support NEA with establishing and operating the grievance redress mechanism, including creating a grievance tracker chart which is to be updated on a weekly basis by NEA. Assist NEA in resolving grievances received.

(xxvi) Support NEA to undertake ongoing meaningful consultation with affected communities to keep them informed of progress and with local disclosure of the findings of the EIA/IEE reports and EMRs etc.

(xxvii) Following the formal systems and templates developed for supervision and monitoring support assigned NEA safeguards staff and/or consultant's own field staff to undertake day-to-day supervision to ensure that contractors adhere to all the provisions in the EMP as well as their CSEMPs and sub-plans as approved by NEA.

(xxviii) Keep daily records and photo logs of site observations to inform preparation of the semi-annual EMRs.

(xxix) Support monthly EHS meetings including site walkover inspection to determine the status of EMP implementation by the contractor during construction as well as random "spot check" site visits to audit their EMP implementation.

(xxx) Report any unanticipated impacts, grievances, unsafe acts, or EMP violations to NEA, identifying areas for improvement, and assisting them in implementing solutions and remedial measures.

(xxxi) Support NEA with updating of the IEE/EMP as necessary if any unanticipated impacts (including project scope or design changes) occur during implementation

(xxxii) Ensure all health and safety incidents (major or fatal) reported to ADB by NEA within 48 hours with the contractor's incident report but also an incident report with root cause analysis and the proposed corrective action of the PIC shared (minor incidents to be similarly dealt with for reporting in EMRs)

(xxxiii) Ensure all chance finds in relation to physical cultural resources reported by NEA to Department of Archaeology and ADB in accordance with the agreed procedures;

(xxxiv) Develop standard operating procedures reflecting good international industry practice for pollution control and health and safety management at substations for NEA to follow during O&M.

(xxxv) Support NEA in reporting on EMP implementation to ADB within the quarterly progress reports and preparing the semi-annual EMRs for submission to ADB – this includes collating all required information from the other project implementation consultant for packages outside the scope of this TOR.

(xxxvi) Prepare Environment/Social Safeguards input to project completion report on completion of each subproject documenting compliance with the EMP from pre-construction through to construction and readiness for operational compliance by NEA.

(xxxvii) Since the project duration and PIC contract overall will extend beyond the completion of subprojects continue to support NEA with O&M supervision and monitoring of the operational components for reporting purposes.

(xxxviii) Prepare socio-economic impact analysis on individual subprojects after completion.

Payment Terms: The payment for the Task-2 shall be in Remuneration basis. The consultant shall depute the suitable experts as per the requirement to complete this activity.

D. TIME SCHEDULE

The estimated duration of this contract is about ***54 Months*** from the effective date of contract.

The consulting firm shall submit its work program and time schedule for its personnel for the items of works specified in Clause-C above. It should be compatible with the project implementation schedule for the Project.

E. PERSON-MONTHS REQUIREMENT AND CONSULTANCY TEAM

a. Team Composition

It is estimated that in total **1807 person-months** of services are required with **405 person months from International Key Experts** and **1402 person months National Key/Non-Key experts**. Details on International Key Expert and National Key/ Non-Key Expert person month requirements are in Table-1. The international expertise and national technical experts should be provided by a consulting firm specializing in designing the transmission and substation and with environment/social safeguards experience in partnership with national firm(s) and/or individual national consultants in Nepal.

Table-1: International Key Expert and National Key/ Non-Key Expert Person Month Inputs

Summery Total Person- Months (International and Key/Non-Key National Expert)								
S.No	**Expertise**	**No. of PM**	**Total MM for Task 1.1 (Design/ Design Check)**		**Total MM for Task 1.2, 1.3&2**		**Total REM**	
			Field	**Home**	**Field**	**Home**	**Field**	**Home**
A.	**International Key Experts**							
1	Team Leader	54	-	-	-	-	50	4
2	Deputy Team Leader (North)	42	-	-	-	-	36	6
3	Deputy Team Leader (West)	42	-	-	-	-	36	6
4	Transmission Line Design Expert (Civil & Structure)	27	14	13	0	0	14	13
5	Transmission Line Supervision/Field Expert (Civil)	9	0	0	9	0	9	0
6	Transmission Line Design Expert (Electrical)	7	4	3	0	0	4	3
7	Transmission Line Supervision/Field Expert (Electrical)	3	0	0	3	0	3	0

8	Substation Design Expert – Electrical	16	9	7	0	0	9	7
9	Substation Supervision/Field Expert – Electrical	8	0	0	8	0	8	0
10	Protection System Expert – Electrical	10	3	3	3	1	6	4
11	Substation Design and Commissioning Expert – Electrical (SAS & Communication)	10	4	2	3	1	7	3
12	Substation Design Expert – (Civil & Structure)	14	8	6	0	0	8	6
13	Substation Supervision/Field Expert – (Civil)	9	0	0	9	0	9	0
14	Distribution System Design Expert	3	2	1	0	0	2	1
15	Distribution System Supervision/Field Expert	3	0	0	3	0	3	0
16	Geotechnical Expert (For Transmission & Substation)	7	3	1	2	1	5	2
17	Contract Expert	10	0	0	6	4	6	4
18	FAT Inspector and Type Testing Expert	56	0	0	0	56	0	56
19	Environmental Safeguard Expert (TL and SS)	36	0	0	30	6	30	6
20	Health and Safety Expert (TL and SS)	12	0	0	8	4	8	4
21	Labour Expert (TL and SS)	12	0	0	8	4	8	4
22	Physical and Cultural Resources Expert.	6	0	0	4	2	4	2
23	Ecologist (TL and SS) (General)	6	0	0	4	2	4	2
24	Polution Control Specialist (SS)	3	0	0	3	0	3	0
	Sub Total - A	**405**	**47**	**36**	**103**	**81**	**272**	**133**

B.	**KEY/NON-KEY EXPERTS [National Experts]**							
1	Transmission Line Site Engineer (Electrical)	13	0	0	13	0	13	0
2	Transmission Line Engineer Site (Civil)	92	0	0	92	0	92	0
3	Substation Site Engineer (Electrical)	44	0	0	44	0	44	0
4	Substation Site Engineer (Civil)	71	0	0	71	0	71	0
5	Distribution Design & Site Engineer (Electrical)	54	0	0	54	0	54	0
6	Geomantic Engineer (Civil)	11	0	0	11	0	11	0
7	Social Safeguard Specialist (TL and SS)	36	0	0	36	0	36	0
8	Environmental Safeguard Specialist (TL, DL and SS) (x 3 posts)	60	0	0	60	0	60	
9	Health and Safety Specialist (TL, DL and SS) (x 3 posts)	54	0	0	54	0	54	
10	Labour Specialist (TL, DL and SS) (x 3 posts)	54	0	0	54	0	54	
11	Physical and Cultural Resources Expert (TL, DL and SS)	6	0	0	6	0	6	
12	Pollution Control Specialist (SS)	5	0	0	5	0	5	
13	Geologist/Geotechnical (EMP)	6	0	0	6	0	6	
14	Ecologist (General) (TL, DL and SS)	6	0	0	6	0	6	
15	Ecologist (Fauna) (TL, DL and SS)	4	0	0	4	0	4	0
16	Ecologist (Forester) (TL and SS)	12	0	0	12	0	12	0
17	Ecologist (Botanist) (TL and SS)	4	0	0	4	0	4	0
18	Ecologist (Ornithologist) (TL)	4	0	0	4	0	4	0

19	Ecologist (Herpetologist) (TL)	4	0	0	4	0	4	0
20	Field Ecologist (DL) (2 posts)	27	0	0	27	0	27	0
21	EHS Field Consultants x 7 Posts (including 6 posted to DL districts)	108	0	0	108	0	108	0
22	Geotechnical Expert - (For Transmission & Substation)	6	0	0	6	0	6	0
23	Transmission Line Site Supervisor (Civil)	348	0	0	348	0	348	0
24	Substation Site Supervisor (Civil)	120	0	0	120	0	120	0
25	Transmission Line Site Supervisor (Electrical)	30	0	0	30	0	30	0
26	Substation Site Supervisor (Electrical)	39	0	0	39	0	39	0
27	Distribution Line Site Supervisor (Electrical)	144	0	0	144	0	144	0
28	Contract Expert	40	0	0	40	0	40	0
I.	**Sub Total - B**	**1402**	**0**	**0**	**1402**	**0**	**1402**	**0**
II.	**Total (A+B)**	**1807**	**47**	**36**	**1505**	**81**	**1674**	**133**

***Those responsible for Task 1.1 (Design Review/Design Check) to consult safeguards team in undertaking design/design check to ensure EMP requirements adequately reflected.**

The consultant shall depute sufficient manpower for Task 1.1 as the person-months for this task is fixed including any extension of time for the Consulting Services and the Consultant shall have to quote the rates accordingly.

The person months can be interchanged/adjusted among key experts/national experts without exceeding the total contract amount during the contract execution providing the expected quality of work is upheld. For safeguard staff deployment of staff to individual subproject sites must be commensurate with site/EMP requirements and work progress to ensure continued supervision, an alternate must be provided by PIC during periods of sick leave or annual leave more than 1-2 days if requested. The non-key experts for safeguards may be supplemented to provide the necessary safeguards capacity building for NEA. Shortlisted firms may propose additional non-key experts to ensure all aspects of the safeguard work can be adequately undertaken as specified in the EMP and RIPP but the expertise is topic specific and outside the more general expertise of the key experts proposed e.g., asbestos, SF6 management etc.

F. OTHER MISCELLENEOUS ACTIVITIES

1.1 NEA Project Team

The NEA dedicated project team shall be assigned for SASEC-Electricity Transmission and Distribution Strengthening Project (ETDSP) from the very beginning for the consultancy contract implementation and shall work in close collaboration with the Consultant's team and be fully involved in all aspects of the consulting services to enhance the technical capabilities of NEA engineers and safeguards staff. They are responsible for Consultancy contract Management on behalf of NEA. The communication between consultant and NEA project execution team shall be done keeping SASEC-Electricity Transmission and Distribution Strengthening Project (ETDSP) in the loop mandatorily.

NEA has already assigned an individual project team, who will be responsible for respective projects execution. Both NEA and Consultant's teams shall work together as a team in all matters related to the Project.

1.2 Construction Supervision

Engineers, safeguard consultants, and technicians under the responsibility of the Consultant will carry out the day-to-day construction supervision at different site locations of the Projects and the Consultant shall report to the respective Project Managers who is deputed on behalf of the NEA with the safeguard staff additionally reporting to the assigned NEA safeguard staff.

1.3 Software development for Project Management System (PMS)

The Consultant shall develop a Project Management System (PMS) software to manage the design and contractor related safeguard documents and upload the approved documents, manage document tracking index with details of documents received from contractor and it’s comments/observations/ recommendations/approvals send back to contractor. It is also used to manage the safeguard information e.g., tracking of EMP implementation by the contractor, retaining all supervision and monitoring records, tracking of corrective actions, and grievances, vehicle management system, APBG/PBG management system, Minute of meeting Log, Consultant’s and Contractor’s invoice management, field Staff Management system, Pour card and Cube test management system and Master list Management system. The cost for PMS is reimbursable and hence Consultant shall propose in its financial proposal. PMS software shall be in operation within 3 month of contract effectiveness and handover to NEA. Consultant and NEA will operate this software with their individual authorization. The Software shall be handed over to NEA after the completion of project duration. The software should be user-friendly with capability to update the features as per the requirements with existing NEA server.

1.4 Office, Furniture and Office Equipment

The Consultant will make arrangements for office space in Kathmandu, regional offices and site offices along with necessary furniture and office equipment. The Consultant shall manage itself other equipment, which it thinks are necessary. Also, the consultant shall depute the office assistant and cooks as per requirement. The Consultant shall be responsible for telephone bills, maintenance of office(s) & resident equipment and consumables necessary for their own use.

However, in Kathmandu office consultant shall also arrange the followings:

1. The office shall be established at central location in Kathmandu having minimum of 2200 sq. ft. area including meeting hall with ample parking space. Consultant shall provide the fully furnished 30% space in the same office for NEA project teams.
2. Provide the space for meeting hall having minimum sitting capacity for 20 persons

3. Internet services
4. Networking system/Establishment of Server compatible with NEA server required for project management system (PMS) software. NEA may decide to delete this item if NEA can manage the server from its existing setup.
5. Depute office assistant, cook & security guard during office hour as required
6. One time investment items (the items purchased as below shall be returned to NEA after completion of Project in operating condition):
    a. 3 Nos. of 75-inch 4K, UHD TV in the meeting hall
    b. 3 Nos. of Multifunction Printers with A4 Size (1 for Main Office and 2 for Regional Offices) and 3 Nos. of Color Printers that print up to A3 size (1 for Main Office and 2 for Regional Offices).
    c. Procure and install air conditioning system in Main Office and Regional Site Offices.
    d. Procurement and Installation 3 Nos. of power backup system for Main Office and Regional Site Offices.
    e. 3 No. of drone equipped with 4K UHD camera for photography and videography purposes.
    f. 5 Nos. of Laptops and 2 Nos. of Desktop-PCs for Main Office and 8 Nos. of Laptops and 4 Nos. of Desktop-PCs for Two Regional Offices

The costs for all these items are reimbursable and hence Consultant shall propose in its financial proposal.

1.5 Local Transportation

a. The consultant shall hire themselves, all necessary vehicles for implementation of the service including Insurance, Vehicle Tax, Rental Charge, Fuel, Driver Salary etc. All the vehicles, under this category shall be rented. The type of vehicles the Consultant is required to provide for their use shall be as shown in Table-2 below:

Table 2: Vehicle Inputs for rental basis

Sr. No.	Projects/Team Leader	Full option SUV (Type I)	Full option Pick up vehicle (Type II)	Full option Pick up vehicle (Type III)
1	Consultant's Team Leader	1	-	-
2	Deputy Team Leader-North	-	1	-
3	Deputy Team Leader-West	-	1	-
4	Construction of 400kV Transmission Line from New Butwal Substation to Lamahi	-	-	4
5	Construction of 400/220/132/33/11 kV Substation at Lamahi, Dang District.	-	-	1
6	Extension of Substations at New Butwal and Kushma	-	-	1
7	Nijgadh – Ramauli 400 kV Transmission Line Project	-	-	1
8	Construction of Ramauli 400 kV Substation.	-	-	1
9	Construction of 220/132/66/11 kV Tinpiple Substation and 220 kV LILO Transmission Line	-	-	1
10	Construction of Dailekh – Jumla 132 kV Transmission Line and Jumla 132 kV Substation	-	-	3
11	Construction of Nepalgunj – Nanpara (India) Transmission Line and Nepalgunj 132/33 kV	-	-	1

	Substation			
12	Expansion and Augmentation of Distribution System in Karnali Province			3
Total		**1**	**2**	**16**

b. Full Option SUV **(Type-I) for Team Leader**: New or nearly new, five or six door SUV including but not limited to diesel engine of at least 2.2liter capacity, four-wheel drive, high and low ratio gear box with differential lock, a minimum ground clearance of 200 mm, Air bags, Air Conditioner, cloth seats, seat belts, locking fuel cap, spare wheel, tool kits.

c. Full option Pick up vehicle **(Type-II) for Deputy Team Leaders**: New or nearly new, four doors including but not limited to diesel engine of at least 2400 cc displacement, four-wheel drive, high and low ratio gear box with differential lock, a minimum ground clearance of 220 mm, Air bags, Air Conditioner, cloth seats, seat belts, locking fuel cap, spare wheel, tool kits.

d. Full option Pick up vehicle **(Type-III) for Non-Key National Experts:** New or nearly new, four doors including but not limited to diesel engine of at least 2100 cc displacement, four-wheel drive, high and low ratio gear box with differential lock, a minimum ground clearance of 215 mm, Air bags, Air Conditioner, cloth seats, seat belts, locking fuel cap, spare wheel, tool kits.

e. "Nearly new" means less than 1- year old and with less than 20,000 km travelled and in general good condition and to the satisfaction of the Client.

f. All vehicles should be of current manufacture and shall have a guarantee/warranty for a minimum period of one year.

g. All vehicles shall have full insurance coverage.

h. Payment shall be made only to those vehicles which confirm to the specification.

1.6 Accommodation

The Consultant shall make its own arrangements for accommodation and necessary furniture and equipment for its staff in Kathmandu Office, Regional Offices and Site offices and accordingly the consultant shall propose in its financial proposal. However, the payment shall not be paid to the consultant for those sites where NEA arrange the accommodation to the consultant's site engineers.

All overnight accommodations provided must be in line with the ILO worker accommodation guidelines.

1.7 Administrative support for Consultant Team

If required by local regulations, NEA will provide Consultant with necessary support letters for obtaining visas for consultant staff and other personnel permits. The cost and timing of obtaining the above is entirely consultant responsibility.

G. REPORTS AND DOCUMENTS REQUIRED FROM THE CONSULTANT

The Consultant, in its proposal, shall provide the list of the reports expected in duration of project execution and in line with good engineering practices. These shall not be limited to and comprise, at the minimum, the following:

(1) Reports for the activities which shall be carried to complete various tasks
(2) Review, comment and recommendation on project progress and schedule
(3) All Formats as required for site supervision
(4) Environmental & Social Safeguards reports, review and recommendation of contractor's safeguard documents, site visit, audit and incident reports, non-compliance instructions etc. (Format to be discussed and finalized, the frequency of submissions will be as per the EMP and RIPP requirements)
(5) SOP reflecting good international industry practice for pollution control and health and safety management at substations Quality Assurance & Inspection Procedures including Field Quality Plan
(6) Report on shop inspection and test witnessing and on arrival site acceptance of materials
(7) Review and recommendation on change of scope and additional work claims
(8) Review and recommendation on contractor's invoices
(9) Commissioning plan and reports
(10) Financial Management Reports (Formats to be discussed and finalized)
(11) At NEA's request, all necessary reports concerning special matters related to the Project (installation, work methodology, safety, claims, checklist for equipment testing and commissioning, safeguards etc.)
(12) Monthly reports concerning physical progress/status of works, expenditures, delivery of materials, safeguards compliance etc. in formats acceptable to the NEA/ADB
(13) Quarterly/Semi Annual/Annual progress report describing the progress status, schedules, costs, budgets, safeguard compliance etc. in formats acceptable to the NEA/ADB
(14) Daily update of Contractor's resource mobilization and provide feedback to Employer and Contractor regarding the adequacy
(15) Input to reports to the ADB and Government agencies
(16) Project Completion Report (PCR) including detailed safeguards input for each subproject as per requirement of the NEA and ADB.
(17) Drafting the minutes of project meetings attended by the Consultants
(18) Any other reports as may be required by the project and instructed by NEA from time to time.
(19) The Consultant shall prepare and submit safeguard/monthly/quarterly/semi-annual/annual and other reports as deemed necessary of the Disaster Recovery Centre construction, Smart meters rollout in Kathmandu Valley Phase-2, Design Supply and Installation of Meter Data Management System, Digital network and SCADA expansion, Distributed Solar PV packages of the ETDSP Project with the inputs collected from above mentioned Packages, which shall be carried by Digitalization Support to NEA consultant under ETDSP Project.

All documents and reports would be in electronic format and shall be submitted to ADB and both the electronic format & hard copies to NEA.

H. TRAINING AND TECHNOLOGY TRANSFER

One of the basic objectives of the consulting services is transfer of technology in this field to the NEA's engineers and safeguards capacity development. This will be achieved by the involvement of the Consultants in the field as much as possible and by associating closely the NEA's engineers and safeguard staff in various activities of the project implementation during field works as well as in the home office of the Consultant.

1. Consultant shall arrange four (4) training sessions in its home country for a total of Eight (8) engineers in each session in following disciplines. The duration of each session shall be 2 weeks. Travel, boarding, training & certification fees, accommodation (at least 3 star) and

food and out of pocket expenses of USD 200 per day to each participant in connection with the Engineer's training.

a) Design of HV/EHV transmission lines

-Selection of voltage level and conductor size, insulation coordination, tower earthing, conductor vibration damping, corona, sag and tension, communication, etc.

-Design of EHV tower structure and foundation (checking methodology)
(Load calculation and analysis, tower member and connection design, foundation design, design drawings, testing procedures, etc.)

b) Design of 400/220/132 kV Substations

-Selection of voltage level and switchgear equipment rating, insulation coordination, protection and relaying scheme, substation earthing, communication, etc. for AIS & GIS.

c) Project Management Professional (PMP) Certification from the Project Management Institute (PMI)

d) Project Account Management based on international practices, Taxes, Insurances, Incoterms rules, LC terms and Conditions, international Aids etc.

2. In addition to above, the Consultant shall arrange two (2) training sessions in an appropriate internationally recognized training institute for a total of eight (8) engineers in each session in following disciplines. The duration of each session shall be 2 weeks. Travel, accommodation (at least 3 star) and food, training & certification fees, lodging and out of pocket expenses of USD 200 per day to each participant in connection with the Engineer's training.

   a) Hands on training on the latest version of internationally recognized transmission line design including design of Transmission line tower with internationally accepted software. The training shall be provided on PLS-CADD, PLS Tower and SAPS.

   b) Relay and protection co-ordination training including calculations and programming for different type of relays at internationally recognized training institute.

3. Moreover, the Consultant shall arrange three (3) training sessions in Nepal for a total of eight (8) engineers in each session in following disciplines by the authorized trainer. The duration of each session shall be 10 days. Consultant shall arrange the CDEGS software for each trainee for the training duration.

   a) Hands on training on the latest version of Primavera including Contract Management

   b) FIDIC Condition of Contracts and Economic & Financial Evaluation of Project.

   c) CDEGS software training

4. Finally, the Consultant shall arrange for all safeguard training sessions for the NEA engineering and safeguards staff of each project team, contractors, plus other stakeholders to be delivered in a timely manner as set out in the EIA, IEEs, RIPPs, and the agreed training plans. The safeguards-related training shall be designed to ensure that EMP and RIPP requirements are implemented.

I. SOFTWARE

i. Consultant shall purchase and supply the one set of latest editions (PLS-CADD and PLS-Tower/SAP) software for NEA with regular upgrade up to 7 years.

The licensee of such software and subscription shall be in the name of NEA and shall have the provision of renewal and updates time to time as provisioned. The costs towards supply of the software including supply of Laptop (latest model- minimum 32 GB RAM, 1 TB SSD and 4 GB Graphics Card or better) shall be loaded in the financial proposal of the Consultant.

J. Responsibilities of the International Experts

All international experts and other safeguard consultants indicated in Table-3 are considered as key experts.

Table 3: International Key Experts

S.N.	KEY EXPERTS [International Experts]
1.	Team Leader
2.	Deputy Team Leader (North)
3.	Deputy Team Leader (West)
4.	Transmission Line Design Expert (Civil & Structure)
5.	Transmission Line Supervision/Field Expert /(Civil)
6.	Transmission Line Design Expert (Electrical)
7.	Transmission Line Supervision Expert/Field (Electrical)
8.	Substation Design Expert – Electrical
9.	Substation Supervision Expert/Field – Electrical
10.	Protection System Expert – Electrical
11.	Substation Design and Commissioning Expert – Electrical (SAS & Communication)
12.	Substation Design Expert – (Civil & Structure)
13.	Substation Supervision Expert/ Field –(Civil)
14.	Distribution System Design Expert
15.	Distribution System Supervision Expert
16.	Geotechnical Expert (For Transmission & Substation)
17.	Contract Expert
18.	FAT Inspector
19.	Environmental Safeguard Expert (TL and SS)
20.	Health and Safety Expert (TL and SS)
21.	Labour Expert (TL and SS)
22.	Physical and Cultural Resources Expert.
23.	Ecologist (TL and SS) (General)
24.	Polution Control Specialist (SS)

The main responsibilities of each international experts are highlighted, but not limited to, as follows:

a) Team Leader (Substation Design Expert) (Electrical)

(A) As the Team Leader, the expert is responsible for:

(i) Leading and managing the entire team including both international and national experts and act as the team's point of contact with NEA and ADB.
(ii) Ensuring proactive and regular liaison occurs between the technical teams of NEA and PIC and safeguards teams of NEA and PIC with procedures for checks and balances being put in place at the technical milestones for the satisfactory implementation of the environmental and social safeguard requirements.
(iii) Preparing or leading the team to prepare all the reports as listed in the Reporting Requirements under Section - G.
(iv) Handling contract administration matters related to the Project Implementation Consultant (PIC) contract.
(v) Assisting PMD/NEA in administration of all turn-key contracts for the Project.
(vi) Reviewing the turn-key contractors' health and safety risk assessments and plans.
(vii) Monitoring project progress against plan, report on progress, and propose remedial measures as necessary.
(viii) Reviewing the contractor's claims for extension of time or additional costs; and preparing variation instructions and cost review; certifying invoices/volume of works completed and recommend for payment.
(ix) Providing technical support to NEA in settlement of claims and disputes arising from the turn-key contracts.

(B) As an Expert, he/she is responsible for:

(i) Providing inputs and advice to the project team and to NEA on transmission line and substation technical matters.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line and substation design/construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Developing and maintaining a project quality assurance plan for NEA; and ensuring that works are executed in line with the plan and project requirements.
(iv) Checking the drawings and technical designs submitted by the contractors and recommending them to NEA for approval.
(v) Reviewing, checking and certifying suppliers' equipment design, and approve the technical documents.
(vi) Certifying main equipment shop inspection reports.
(vii) Assisting NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
(viii) Recommending the acceptability of designs and works carried out by the contractors and suggest corrective measures to be undertaken.
(ix) Supervising the installation, testing and commissioning of the transmission line and substations.
(x) Review and certify the contractor's testing and commissioning plans.

(xi) Supervising testing and commissioning in conjunction with NEA and other team members and review of testing and commissioning reports.
(xii) Certifying substantial completion and/or completion of main project components as defined in the contract documents.

(C) The Team Leader will lead the capacity building and be responsible for:

(i) Performing a training needs assessment for NEA staff and preparing a training program with the assistance of the consultant team.
(ii) Contributing to capacity building of NEA counterpart staff.

b) Deputy Team Leader (Civil)

(A) As the Deputy, the expert is responsible for following works in close consultation with the Team Leader:

(i) Preparing or leading the team to prepare all the reports as listed in the Reporting Requirements under Section – G.
(ii) Handling contract administration matters related to the PSC contract.
(iii) Assisting PMD/NEA in administration of all turn-key contracts for the Project.
(iv) In undertaking contract administration ensure necessary environmental and social safeguard requirements are being met (in conjunction with the safeguards team members) including preparing non-compliance instructions and enforcing corrective action.
(v) Reviewing the turn-key contractors' health and safety risk assessments and plans.
(vi) Monitoring project progress against plan, report on progress, and propose remedial measures as necessary.
(vii) Reviewing the contractor's claims for extension of time or additional costs; and preparing variation instructions and cost review; certifying invoices/volume of works completed and recommend for payment.
(viii) Providing technical support to NEA in settlement of claims and disputes arising from the turn-key contracts.

(B) As an Expert, he/she is responsible for:

(i) Providing inputs and advice to the project team and to NEA on transmission line and substation technical matters.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line and substation design/construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Developing and maintaining a project quality assurance plan for NEA; and ensuring that works are executed in line with the plan and project requirements.
(iv) Checking the drawings and technical designs submitted by the contractors and recommending them to NEA for approval.
(v) Reviewing, checking and certifying suppliers' equipment design, and approve the technical documents.
(vi) Certifying main equipment shop inspections and reports.
(vii) Assisting NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.

(viii) Recommending the acceptability of designs and works carried out by the contractors and suggest corrective measures to be undertaken.
(ix) Supervising the installation, testing and commissioning of the transmission line and substations.
(x) Review and certify the contractor's testing and commissioning plans.
(xi) Supervising testing and commissioning in conjunction with NEA and other team members.
(xii) Certifying substantial completion and/or completion of main project components as defined in the contract documents.

(C) The Deputy Team Leader will lead the capacity building and be responsible for:

(i) Performing a training needs assessment for NEA staff and preparing a training program with the assistance of the consultant team.
(ii) Contributing to capacity building of NEA counterpart staff.

c) Transmission Line Design Expert (Civil and Structure)

(i) Review the design parameters to be used for design of transmission towers, tower foundations. Check the tower, tower foundation submitted by the contractors and assist in approval of contractor's designs, drawings and technical information.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Review Manufacturer's quality plan submitted by the Contractors
(iv) Make necessary inputs and advice to the project team and to NEA on transmission line structural matters.
(v) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(vi) Assist the consultant team to perform a training needs assessment for and prepare a training program.
(vii) Contribute to capacity building of NEA staffs.
(viii) Other related works mentioned under Task 1.1.

d) Transmission Line Supervision/Field Expert (Civil)

(i) Review Field Quality Plan (FQP) and Construction Methodologies of tower foundation/tower erection/conductor stringing etc. and assure quality of overall construction during project implementation.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Supervise site construction of tower foundation, tower erection, stringing etc. at site level in close association with national-experts.
(iv) Review and certify the contractor's testing and commissioning plans

(v) Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents
(vi) Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
(vii) Make necessary inputs and advice to the project team and to NEA on transmission line matters.
(viii) Assure overall health and safety during construction of the project.
(ix) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(x) Assist in pre-commissioning training needs assessment and prepare a training programs.
(xi) Contribute to capacity building of NEA staffs.
(xii) Other related works mentioned under Task 1.2.

e) Substation Design Expert (Civil and Structure)

(i) Review and check the design of entire substation layout, civil structures and foundations of the substations (GIS/AIS) submitted by the contractors and assist in approval of contractor's designs, drawings and technical information.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all substation designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Review Manufacturer's Quality Plan (MQP) submitted by the Contractors
(iv) Make necessary inputs and advice to the project team and to NEA on substation structural matters.
(v) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(vi) Assist the consultant team to perform a training needs assessment for and prepare a training program.
(vii) Contribute to capacity building of NEA staffs.
(viii) Other related works mentioned under Task 1.1.

f) Substation Supervision/Field Expert (Civil)

(i) Review Field Quality Plan (FQP) and Construction Methodologies of entire substation civil structures, foundations etc. and assure quality of overall construction during project implementation.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all substation construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Supervise site construction of civil structures, foundations etc. at site level in close association with national-experts.

(iv) Review and certify the contractor's testing and commissioning plans
(v) Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents
(vi) Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
(vii) Make necessary inputs and advice to the project team and to NEA on substations (AIS/GIS) matters.
(viii) Assure overall health and safety during construction of the project.
(ix) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(x) Assist in pre-commissioning training needs assessment and prepare a training program.
(xi) Contribute to capacity building of NEA staffs.
(xii) Other related works mentioned under Task 1.2.

g) Transmission Line Design Expert (Electrical)

(i) Assist NEA in review and approval of contractor's drawings and technical information.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Review, check and certify suppliers' materials design, and approve the technical documents.
(iv) Review Manufacturer's quality plan submitted by the Contractors
(v) Make necessary inputs and advice to the project team and to NEA on transmission line matters.
(vi) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(vii) Assist the consultant team to perform a training needs assessment for and prepare a training program.
(viii) Contribute to capacity building of NEA staffs.
(ix) Other related works mentioned under Task 1.1.

h) Transmission Line Supervision/Field Expert (Electrical)

(i) Review Field Quality Plan (FQP) and Construction Methodologies of tower erection/conductor stringing etc. and assure quality of overall construction during project implementation.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Supervise site construction of tower, tower erection, stringing etc. at site level in close association with national-experts.

(iv) Review and certify the contractor's testing and commissioning plans
(v) Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents
(vi) Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
(vii) Make necessary inputs and advice to the project team and to NEA on transmission line matters.
(viii) Supervise testing and commissioning of substations in conjunction with NEA and other team members and review the testing and commissioning reports.
(ix) Assure overall health and safety during construction of the project.
(x) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(xi) Assist in pre-commissioning training needs assessment and prepare a training programs.
(xii) Contribute to capacity building of NEA staffs.
(xiii) Other related works mentioned under Task 1.2.

(i) Substation Design Expert (Electrical)

(i) Assist NEA in review and approval of contractor's drawings and technical information.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all substation designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Review, check and certify suppliers' equipment design, and approve the technical documents.
(iv) Review Manufacturer's quality plan submitted by the Contractors
(v) Assist the consultant team to perform a training needs assessment for NEA staffs and prepare training programs
(vi) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical matters.
(vii) Contribute to capacity building of NEA counterpart staff.
(viii) Review and certify the contractor's testing and commissioning plans.
(ix) Supervise testing and commissioning of substations in conjunction with NEA and other team members.
(xii) Perform other functions as may be assigned or delegated by Team Leader/ Deputy Team Leader from time to time during the time of assignment.
(xiii) Other related works mentioned under Task 1.1

j) Substation Supervision/Field Expert (Electrical)

(i) Review Field Quality Plan (FQP) and Construction Methodologies of substation equipment and assure quality of overall construction during project implementation.

(ii) In undertaking engineering reviews, checks and recommendations ensuring that all substation method statements reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Supervise site installation of substation equipment at site in close association with national-experts.
(iv) Review and certify the contractor's testing and commissioning plans
(v) Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents
(vi) Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
(vii) Make necessary inputs and advice to the project team and to NEA on transmission line matters.
(viii) Supervise testing and commissioning of substations in conjunction with NEA and other team members.
(ix) Assure overall health and safety during construction of the project.
(x) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(xi) Assist in pre-commissioning training needs assessment and prepare a training programs.
(xii) Contribute to capacity building of NEA staffs.
(xiii) Other related works mentioned under Task 1.2.

(k) Substation Design Expert -Electrical (SAS and Communication)

(i) Assess NEA's existing SCADA and communications systems and prepare design concepts for interfacing with the transmission line and substations.
(x) In undertaking engineering reviews, checks and recommendations ensuring that all substation designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(ii) Assist NEA in review and approval of contractor's drawings and technical information with regard to communication/SCADA system.
(iii) Supervise site construction and installation works in conjunction with NEA and other team members.
(iv) Review and certify the contractor's testing and commissioning plans.
(v) Supervise testing and commissioning in conjunction with NEA and other team members and review the testing and commissioning reports.
(vi) Review, check and certify suppliers' equipment design, and assist NEA in approving the technical documents.
(vii) Supervise installation, testing and commissioning of the transmission line and substations SCADA and communication systems. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.

(viii) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(ix) Make necessary inputs and advice to the project team and to NEA on transmission line and substation communication matters.
(x) Other related works mentioned under Task 1.1 and 1.2.

l) Protection Expert (Electrical)

(i) Assess Client's existing protection systems and prepare design concepts for protection of the transmission line and substations.
(ii) In undertaking engineering reviews, checks and recommendations ensuring that all transmission line/substation designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).
(iii) Review, check and certify suppliers' equipment design, and assist Client in approving the technical documents from the protection system viewpoint.
(iv) Review and recommend for protection co-ordination values and related calculation for high/medium/low voltage switchgears, substations (GIS and AIS), transmission line and other electrical equipment submitted by the Contractor.
(v) Review and recommendation of the Grid Impact Study (GIS) documents obtained from the Client.
(vi) Review, check and certify suppliers' equipment design, and assist NEA in approving the technical documents
(vii) Make necessary inputs and advise Client on high/medium/low voltage switchgears, substations (GIS and AIS), transmission line and other electrical equipment's protection systems.
(viii) Review and certify the contractor's testing and commissioning plans
(ix) Supervise site construction and installation works in conjunction with NEA and other team members.
(x) Supervise and witness the testing and commission of high/medium/low voltages switchgears, substations (GIS and AIS), transmission line and other electrical equipment in line with the submitted protection system values and maintain the proper records of the protection system values and recommend to the Client.
(xi) Monitor project progress against plan, report on progress, and propose remedial measures as necessary
(xii) Contribute to capacity building of NEA staffs from the viewpoint of protection systems including uses of different protection system software provided by the Contractor as per Scope of the Works and Technical Specification.
(xiii) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leaders from time to time during the time of assignment.
(xiv) Other relevant works as mentioned under Task 1.1 and Task 1.2.
(xv) With the assistance of the consultant team, perform a training needs assessment for counterpart staff and prepare a training program.

m) Distribution System Design Expert

(i) Assist NEA in review and approval of contractor's drawings and technical information related to distribution networks and distribution substations.

(ii) In undertaking engineering reviews, checks and recommendations ensuring that all distribution system designs reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).

(iii) Review, check and certify suppliers' equipment and material's design, and approve the technical documents.

(iv) Review Manufacturer's quality plan submitted by the Contractors

(v) Assist the consultant team to perform a training needs assessment for NEA staffs and prepare training programs

(vi) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical matters.

(vii) Contribute to capacity building of NEA counterpart staff.

(viii) Perform other functions as may be assigned or delegated by Team Leader/ Deputy Team Leader from time to time during the time of assignment.

(ix) Other related works mentioned under Task 1.1.

n) Distribution System Supervision/Field Expert (Electrical)

(i) Review Field Quality Plan (FQP) and Construction Methodologies of substation equipment and assure quality of overall construction during project implementation.

(ii) In undertaking engineering reviews, checks and recommendations ensuring that all distribution system construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).

(iii) Supervise site installation of substation equipment and distribution lines at site in close association with national-experts.

(iv) Review and certify the contractor's testing and commissioning plans

(v) Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents

(vi) Monitor project progress against plan, report on progress, and propose remedial measures as necessary.

(vii) Make necessary inputs and advice to the project team and to NEA on transmission line matters.

(viii) Supervise testing and commissioning of substations and distribution lines in conjunction with NEA and other team members and review testing and commissioning reports.

(ix) Assure overall health and safety during construction of the project.

(x) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.
(xi) Assist in pre-commissioning training needs assessment and prepare a training program.
(xii) Contribute to capacity building of NEA staffs.
(xiii) Other related works mentioned under Task 1.2.

o) Environmental Safeguard Specialist.

(i) Environment safeguard specialists from PIC will be nominated to support each component with the assignment determined in reference to the PIC inputs expected per the EMPs but depending on NEA scheduling etc. It is anticipated there will be one lead environment safeguard specialist (international) to manage the safeguards team overall and liaise with the PM and DPMs, with one staff assigned to the NBLTL EMP since this subproject is category A and sections of the 161 km TL and SS works may occur in parallel, one staff to DJTL and the DL component due to its remote location, and, one staff to the other TL and SS more accessible from Kathmandu.
(ii) Deliver on the PIC Environment Safeguard Specialist assigned tasks as per the EMPs in the most recent version of the EIA and IEEs disclosed on the ADB website.
(iii) Regularly and proactively liaise with and make necessary inputs and advice with support of other safeguard experts to the assigned NEA safeguards staff and contractors EHS team on environmental safeguard issues to ensure implementation as required by the national laws and regulations, ADB's environmental safeguard policy requirements and the disclosed EMPs.
(iv) Regularly and proactively liaise with and make necessary inputs and advice with the support of other safeguard experts to the PIC technical team, NEA engineers, and contractor's engineers on environmental safeguard issues related to design, construction methods, contracts, and contract supervision to ensure implementation as required by the national laws and regulations, ADB's environmental safeguard policy requirements and the disclosed EMPs. In particular, ensure transmission and distribution lines and substation technical design and construction matters are undertaken in accordance with the EMP requirements.
(v) Guide and assist NEA as necessary in finalizing the EIA and IEEs as necessary. Updates must ensure a robust biological, physical, socioeconomic and physical cultural resources baseline is established, thorough meaningful consultations are conducted, and include detailed qualitative and quantitative analysis of the

anticipated changes to the baseline to determine the direct, indirect, induced and cumulative impacts of the subprojects in the construction and operational phases. These impacts may include, but not limited to, loss of habitat and ecosystems, loss of flora and fauna, impacts on wildlife, food supply chain and migration patterns of wildlife, water quality, emission of greenhouse gases, erosion and sedimentation, loss of physical and cultural resources, impacts associated with construction etc.

(vi) Ensure pre-construction baseline monitoring and reporting is conducted and then monitoring and reporting of contractor's compliance with environmental mitigation and monitoring measures during the design, pre-construction and construction phases.

(vii) Support NEA in developing training plans and community liaison plans and establishing and operationalizing the GRM at project, subproject and site levels.

(viii) Lead in conducting environmental trainings and briefings to provide environmental awareness on ADB and government environmental safeguards policies and requirements and international good industry practices in line with training requirements set out in the EMPs and as included in the training plans

(ix) Contribute to on-the-job capacity building of NEA counterpart staff.

(x) Lead development of a SOP to ensure NEA's compliance with mitigation and monitoring measures at SS during the O&M phase with inputs from other PIC experts.

(xi) Guide and assist on any further updates to the EIA and the IEEs including EMPs for the individual subprojects, as required, following detailed designs and in response to any unanticipated impacts.

(xii) Guide and assist NEA and their contractors in implementation of EMPs for the subprojects.

(xiii) Review documentation and undertake site visits to confirm that all EMP actions for the existing facilities have been adequately implemented.

(xiv) In addition, to project components include associated facilities in the scope.

(xv) Review all documents and reports regarding the integration of environment aspects by the contactor into design and construction including the CSEMP and subplans and recommend revisions as necessary to ensure construction is undertaken in accordance with the EMP requirements.

(xvi) Develop EMP compliance monitoring systems and templates with inputs from other PIC safeguard experts for implementation by those assigned day to day supervision responsibilities including PIC

field staff, NEA safeguards staff, and the contractors EHS team – the lead environment safeguard specialist (international) will ensure the systems are set up project wide, provide guidance to the project overall, and train other experts on the environment safeguards.

(xvii) Conduct routine inspections of construction/installation activities including visual survey of ROW clearance, construction equipment storage areas, waste disposal areas and construction camps etc.

(xviii) Supervise the contractor's compliance to the EMP/CSEMP alongside the PIC field staff and/or NEA safeguards staff where assigned, support monthly EHS meetings and site visits, and prepare monthly compliance and the completion reports for submission to NEA.

(xix) Support NEA to prepare quarterly progress reports and semi-annual environmental monitoring reports for onward submission to ADB.

(xx) Prepare an annual report on reforestation for each subproject component and sub-component requiring a reforestation program.

(xxi) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leaders from time to time.

(xxii) Lead on all other safeguards related works mentioned under Task 2.

p) Social Safeguard Specialist

(i) Update existing resettlement and indigenous peoples plans (RIPP) based selected transmission route alignment in accordance with the national laws, regulations and ADB's SPS 2009.

(ii) Make necessary inputs and advice to the project team and to NEA on social safeguard issues as required by the national laws, regulations and ADB's SPS 2009.

(iii) Prepare and /or update land acquisition and resettlement impact assessment based on selected route alignment and substation details.

(iv) Review/revise the entitlement matrix for each subproject listing all likely effects, such as permanent and or temporary land acquisition, and a study to determine the replacement costs of all categories of losses based on the asset valuation process, with particular attention to vulnerable groups including indigenous peoples, women, children and the poor and socially excluded.

(v) Prepare and/or update detail cost estimate of land acquisition, RoW acquisition and resettlement for each subproject. Update the implementation schedule of RP.

(vi) Update the implementation schedule consistent with all the resettlement plan requirements, making sure that major components are carried out before the civil works.

(vii) Provide guidance to the national environmental safeguard specialist and NEA's concerned staff responsible for social safeguard in data collection and census surveys of affected persons.

(viii) Establish dialogue with affected peoples for incorporating their suggestions.

(ix) Ensure compliance with all government rules and regulations and ensure that the RPs are in compliance with ADB's SPS 2009.

(x) Submit all finalized/updated RPs to ADB for review and clearance for ADB review and clearance.

(xi) Perform other functions as assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.

(xii) Other related works mentioned under Task 2.

q) Health and Safety Experts

(i) Health and safety experts will be nominated to support each component with the assignment determined in reference to the PIC inputs expected per the EMPs but depending on NEA scheduling etc. It is anticipated there will be two staff assigned to the NBLTL EMP since TL and SS works may occur on different sections in parallel, one staff to DJTL and the DL component due to its remoter location, and, one staff to the other TL and SS more accessible from Kathmandu.

(ii) Deliver on the PIC Health and Safety Expert assigned tasks per the EMPs in the most recent EIA and IEE disclosed on the ADB website.

(iii) Support the environmental specialist assigned to the subprojects to deliver on their tasks with reference to health and safety risk and management – the lead health and safety specialist (international) will ensure systems are set up project wide, providing guidance to the project overall, and training other experts on the requirements.

(iv) Contribute to on-the-job capacity building of NEA counterpart staff.

(v) Provide health and safety inputs to trainings and be responsible for ensuring that all aspects of the project comply with the health and safety provisions of the project's civil works contracts, EMP/CSEMP, and with relevant national laws and regulations and GIIP (IFC, EHS and ILO).

(vi) Provide inputs to the standard operating procedures reflecting good international industry practice for health and safety management at substations for NEA.

(vii) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leaders/Environment Lead from time to time.

(viii) Lead on all other health and safety related works mentioned under Task 2.

r) Labor Expert

(i) Labor experts will be nominated to support each component with the assignment determined in reference to the PIC inputs expected per the EMPs but depending on NEA scheduling etc. It is anticipated there will be two staff assigned to the NBLTL EMP since TL and SS works may occur on different sections in parallel, one staff to DJTL and the DL component due to the remoter location, and one staff to another component implementation.

(ii) Deliver on the PIC Labor Expert assigned tasks per the EMPs in the latest EIA and IEEs disclosed on the ADB website.

(iii) Support the environmental specialist assigned to the subprojects to deliver on their tasks with reference to labor management – the lead labor specialist (international) will ensure systems are set up project wide, providing guidance to the project overall, and training other experts on the requirements.

(iv) Provide labor inputs to trainings and be responsible for ensuring that all aspects of the project comply with the labor provisions of the project's civil works contracts, EMP/CSEMP, and with relevant national laws and regulations and GIIP (ILO).

(v) Support in establishing and operationalizing the GRM at project, subproject and site levels with respect to grievances that may be raised by the workers.

(vi) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leaders/Environment Lead from time to time.

(vii) Lead on all other labor related works mentioned under Task 2.

s) Contract Expert

(i) Responsible of overall management of contract for timely completion with stipulated quality and cost of whole project works

(ii) In undertaking bid and contract reviews, checks and recommendations ensuring that all bids, contracts and tender submissions reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).

(iii) Review and guidance on contractual records and documentation such as receipt and control of all contract correspondence

(iv) Responsible for review all the contractual analysis.

(v) Review and comments on progress and performance to ensure goods and services confirming to the Contractual requirements.

(vi) Facilitating and negotiating contract variations and amendments

in line with approved delegations.

(vii) Facilitating to identify and resolve disputes with contractor in a timely manner.

(viii) Review and guidance to work with accuracy of invoices and authorize payments consistent with the contract terms.

(ix) Must be Familiar with ADB, NEA and PPMO's rules and regulations,

(x) Must have experience in the Arbitration of claims or complaints and assist projects in arbitration and complaints resolutions.

(xi) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.

(xii) Other related works mentioned under Task 1.3.

t) Factory Acceptance Test Inspector and Type Testing Expert

(i) Witness Factory Acceptance Tests of the materials used for the projects and certify shop inspection reports. Assist NEA with shop inspections and certifications of manufactured main equipment prior to shipment.

(ii) Witness Type Tests of the major materials and equipment but not limited to tower proto-type testing, type testing of power transformers, type testing of GIS, type testing of high voltage switchgears etc. used for the projects and certify shop inspection reports. Assist NEA with shop inspections and certifications of manufactured main equipment prior to shipment.

(iii) Supervise testing of Transmission Line and substations in conjunction with NEA and other team members.

(iv) Perform other functions as may be assigned or delegated by Team Leader/Deputy Team Leader from time to time during the time of assignment.

(v) Other related works mentioned under Task 1.2

u) Geotechnical Expert (Transmission and substation)

(i) Make necessary inputs and advice to the project team and to NEA on Transmission line and Substation technical matters.

(ii) Review and recommendation of the geotechnical study and geotechnical parameters considered during the design stage

(iii) In undertaking engineering reviews, checks and recommendations ensuring that designs and construction methods reflect necessary environmental and social safeguard requirements (in conjunction with the safeguards team members).

(iv) Contribute to capacity building of NEA counterpart staff.

(v) Assist NEA in review and approval of geotechnical reports submitted by the Contractor and NEA.

(vi) Review and supervision of design of slope stabilization.

(vii) Supervision of the field exploration program; Data compilation and analysis;

(viii) Provide support to the Team Leader/ Deputy Team Leader and other concerned experts about geotechnical works for timely and successful completion of the project with stipulated quality

(ix) Other related works mentioned under Task 1.2

v) Physical Cultural Resources specialist

(i) The consultant will support all components but with particular attention to (a) the NBTL and SS (b) the DJTL and the DL component, and (c) other TL and SS components where PCR risk is flagged in the IEEs. They will deliver on the expert assigned tasks per the EMPs in the latest EIA and IEEs.

(ii) Support the environmental specialist assigned to the subprojects to deliver on their tasks with reference to archaeology and cultural heritage assessment and management – the lead PCR specialist (international) will ensure systems are set up project wide, providing guidance to the project overall, and training other experts on the requirements.

(iii) Make necessary inputs and advice to the project team and to NEA on Archeological and Cultural Heritage matters in (a) finalizing and updating the EIA/IEEs and EMPs/PCRMPs including ensuring baseline data is adequately collected, meaningful consultation with the DoA and PCR users, and preparation of adequate management plans, and (b) reviewing designs, construction methods and CSEMPs including chance find procedures to ensure risks to archaeology and cultural heritage will be managed.

(iv) Review the recommendations of the Archeological and Cultural Heritage studies in the EIA/IEEs, and in light of this guide, review and quality assure additional studies conducted by NEA safeguard staff and contractors during the design and pre-construction stage e.g., Heritage Impact Assessment (HIA) reports and historical monuments/structures studies.

(v) Provide archaeology and cultural heritage inputs to trainings and be responsible for ensuring that all aspects of the project comply with ADB's SPS (2009) requirements, the EMP/CSEMP/chance find procedures, and with relevant national laws and regulations and GIIP:

a) Contribute to on-the-job capacity building of NEA counterpart staff.

b) Assist NEA safeguard staff and PIC field staff during supervision of the ongoing construction works considering the Archaeological, Cultural and Heritage aspects of the proposed sites.

c) Liaise with the social tam and provide support to the Team Leader/Deputy Team Leaders/Environment Lead about Archeological and Cultural Heritage works for timely and successful completion of the project with stipulated quality

d) Lead on all other related works to archaeology and cultural heritage mentioned under Task 2.

l) Ecologist (General)

(i) The consultant will support all components but with particular attention to (a) the NBTL and SS (b) the DJTL and the DL component, and (c) other TL and SS components where ecology

risk is flagged in the IEEs delivering on the expert assigned tasks per the EMPs in the most recently disclosed EIA and IEEs.

(ii) Support the environmental specialist assigned to the subprojects to deliver on their tasks with reference to biodiversity assessment and management– the lead ecology specialist (international) will ensure systems are set up project wide, provide guidance to the project overall, training other experts/national ecology field staff.

(iii) Coordination of the national ecologists in the PIC team and QA of their deliverables before submission to NEA.

(iv) Contribute to capacity building of NEA counterpart staff.

(v) Provide ecology inputs to trainings and be responsible for ensuring that all aspects of the project comply with the ecology provisions of the project's civil works contracts, EMP/CSEMP, and with relevant national laws and regulations and GIIP.

e) Make necessary inputs and advice to the project team and to NEA on ecological matters in (a) preparing, finalizing and updating the EIA/IEEs and EMPs/BMPs/BAPs including ensuring baseline data is adequately collected, meaningful consultation with the ecological stakeholders and CFUGs, and preparation of adequate management plans, and (b) reviewing designs, construction methods and CSEMPs to ensure risks to biodiversity will be managed.

(vi) Support consultations with the protected area management and the finalization of the BAP for the NBLTL and development of the biodiversity action plan in relation to the national park buffer zone with reference to ADB SPS 2009 legally protected area requirements being met.

(vii) Review the recommendations of the ecology studies in the EIA/IEEs, and in light of this guide, review and quality assure additional ecology study reports (including forests, flora/botany, fauna, ornithology, herpetology) submitted by the contractors and NEA safeguard staff during the design and pre-construction stage.

(viii) Assist NEA safeguard staff and PIC field staff in supervision of the construction works considering the ecological values of the concerned project areas with particular attention to critical habitat and works in forest areas and other natural habitat.

(ix) Provide support to the Team Leader/Deputy Team Leader/Environment Lead regarding ecology (including forests, flora/botany, fauna, ornithology, herpetology with inputs from national team) for timely and successful completion of the project with stipulated quality.

(x) Lead on other related ecology works mentioned under Task 2.

m) Pollution Control Consultant

(i) The consultant will support all components but with particular attention to the SS components delivering on the expert assigned tasks per the EMPs in the most recently disclosed EIA and IEEs.

(ii) Support the environmental specialist assigned to the subprojects to deliver on their tasks with reference to pollution risk and management–the lead pollution control specialist (international)

will ensure systems are set up project wide, providing guidance to the project overall, and training other experts on the requirements.

(iii) Provide pollution control inputs to trainings and be responsible for ensuring that all aspects of the project comply with the pollution control provisions of the project's civil works contracts, EMP/CSEMP, and with relevant national laws and regulations and GIIP (IFC, EHS).

(iv) Provide input to the standard operating procedures reflecting good international industry practice for pollution control at substations for NEA. In doing so undertake gap analysis of NEA's current practice at provincial and district level versus national requirements and GIIP on pollution risk management and control for the design, operation and maintenance of two new substations, storage yards, and maintenance workshops and develop an easy to understand manual (standard operating procedures) with photos/drawings for NEA in order to facilitate adherence to national requirements and adoption international good practice.

K. Responsibilities of the National Experts

Although national consultants are classified as non-key in the proposal evaluation, they play important role in the PSC team with local knowledge of dealing with environmental, social and technical issues arising from the Project. Each national expert will perform the same or similar duties as his/her counterpart in the international team in his/her respective field.

Table 4: NATIONAL KEY/NON-KEY EXPERTS

S.N.	NATIONAL KEY/NON-KEY EXPERTS
1.	Transmission Line Site Engineer (Electrical)
2.	Transmission Line Engineer Site (Civil)
3.	Substation Site Engineer (Electrical)
4.	Substation Site Engineer (Civil)
5.	Distribution Design & Site Engineer (Electrical)
6.	Geomantic Engineer (Civil)
7.	Social Safeguard Specialist (TL and SS)
8.	Environmental Safeguard Specialist (TL, DL and SS) (x 3 posts)
9.	Health and Safety Specialist (TL, DL and SS) (x 3 posts)
10.	Labour Specialist (TL, DL and SS) (x 3 posts)
11.	Physical and Cultural Resources Expert (TL, DL and SS)

12.	Pollution Control Specialist (SS)
13.	Geologist/Geotechnical (EMP)
14.	Ecologist (General) (TL, DL and SS)
15.	Ecologist (Fauna) (TL, DL and SS)
16.	Ecologist (Forester) (TL and SS)
17.	Ecologist (Botanist) (TL and SS)
18.	Ecologist (Ornithologist) (TL)
19.	Ecologist (Herpetologist) (TL)
20.	Field Ecologist (DL) (2 posts)
21.	EHS Field Consultants x 7 Posts (including 6 posted to DL districts)
22.	Geotechnical Expert - (For Transmission & Substation)
23.	Transmission Line Site Supervisor (Civil)
24.	Substation Site Supervisor (Civil)
25.	Transmission Line Site Supervisor (Electrical)
26.	Substation Site Supervisor (Electrical)
27.	Distribution Line Site Supervisor (Electrical)
28.	Contract Expert

(a) Geologist/Geotechnical Expert (EMP)

The responsibility of this expert will be same as that of the responsibilities assigned in "u" of International expert. In addition to that, the expert shall have to perform the tasks assigned below:

i. The consultant will support all components but with particular attention to (a) the NBTL and SS and (b) the DJTL and the DL component delivering on the expert assigned tasks per the EMPs in the latest EIA and IEEs disclosed on the ADB website.
ii. Support the environmental specialist assigned to the subprojects to deliver on their tasks with reference to geological/geotechnical aspects including ensuring the EMP/CSEMP requirements, relevant national laws and regulations and GIIP in relation to geological risks and impacts, notably seismicity, slope stability and landslide risk are followed.

(b) Ecologist (General, Fauna, Forester, Botanist, Ornithologist, Herpetologist, Field) Specialist

(i) Make necessary inputs and advice to the project team and to NEA on Ecology matters.

(ii) Review and recommendation of the applied conservation planning for migratory waterbirds, including conservation assessment, planning, and gap analysis considered during the design stage.
(iii) Contribute to capacity building of NEA counterpart staff.
(iv) Assist NEA in review and approval of Ornithology reports submitted by the Contractor and NEA.
(v) Assist NEA in supervision of the construction works considering the Ornithology of the concerned project area.
(vi) Shall have in wetland management including habitat restoration and tailoring environmental flows to support biodiversity conservation.
(vii) Shall have to support the environment specialist to deliver their tasks with respect to the biological environment, providing training on biodiversity requirements, ensuring detailed designs, and subplans are reflective of biodiversity requirements,
(viii) Monitor in coordination with the forest department implementation of the compensatory reforestation plan for tree cutting ensuring that no net loss of biodiversity is achieved,
(ix) Shall have to conduct ecology surveys per the EMP, conduct ongoing consultations with the forest department and local persons regarding wildlife sightings, oversee the wildlife rescue protocol, and supervise all vegetation clearance/cutting of trees, demolition works, earthworks, and all works located within forest or scrub habitat even if not forest land.
(x) Shall have to participate in monthly EHS meetings/site walkovers. Undertake at least monthly site visits to all active project sites across all subprojects during the construction period.
(xi) Shall have to provide ecological inputs to development of good practice EHS guidelines for operation and providing NEA staff training on the same.
(xii) Provide ecological inputs to monthly, quarterly, semiannual environmental monitoring reports (on agreed template) based on at least monthly site visits to all active construction sites and completed checklists for submission to the NEA and ADB throughout project implementation in compliance with ADB SPS.
(xiii) Provide support to the Team Leader/ Deputy Team Leader and other concerned experts regarding Ornithology for timely and successful completion of the project with stipulated quality.
(xiv) Other related works mentioned under Task 2.

In addition, the various ecology experts forming part of the PIC will support the key experts in field surveys and other biodiversity specific tasks in relation to the NBLTL and SS (1no. forester, 1no. botanist, 1no. ornithologist and 1no. herpetologist), distribution component (2no. field ecologists) and other components (1no. flora and 1no. fauna) as set out in the EMPs.

(c) EHS Field Consultants

The responsibility of this expert will be same as that of the responsibilities assigned in "o & q" of International expert.

EHS Field Consultant will support the other components which do not have nominated EHS officers from NEA, as set out in the EMPs.
Including 6 posted to DL districts- 6 no. EHS Field Consultants will be assigned, one to each of the district, in the distribution component, and 1 no. for other sub- projects.

L. Qualification/Experience of Experts

i. International Experts

a) **Team Leader (Electrical Engineer)** shall have Master's Degree in Electrical Engineering with more than 10 years' experience or Bachelor's Degree in Electrical Engineering with more than 15 years' experience in transmission line projects with substation and substantial experiences in other than his/her own country. The expert shall have previous team leader experience in detail design and construction supervision of 400 kV and above voltage level transmission line projects with substation. Experience shall cover 400 kV or higher voltage class transmission line and substation, specification, construction, testing and commissioning. It is expected that the amount of time spent by the Team Leader in the field (at the office in Kathmandu or project sites) will not be less than 80 percent of the required total person month inputs from the Team Leader during the execution of the project.

b) **Deputy Team Leader** shall have Master's Degree in Civil Engineering with more than 8 years' experience or Bachelor's Degree in Civil Engineering with more than 12 years' experience in transmission line projects with substation and substantial experiences in other than his/her own country. The expert shall have experience in detail design and construction supervision of 400 kV and above voltage level transmission line projects with substation. Experience shall cover 400 kV or higher voltage class transmission line design with substation, specification, construction, testing and commissioning. It is expected that the amount of time spent by the Deputy Team Leader in the field (at the regional office or at project sites) will not be less than 80 percent of the required total person month inputs from the Deputy Team Leader during the execution of the project.

c) **Transmission Line Design Expert (Civil and Structure)** shall have Master's Degree in Structural Engineering, with more than 8 years of experience or Bachelor's Degree in Civil Engineering, with more than 12 years of experience in design of 400 kV and above voltage level transmission line towers and substation structures.

d) **Transmission Line Supervision/Field Expert (Civil)** shall have Bachelor's Degree in Civil Engineering, with more than 8 years of experience in construction supervision of 132 kV and above voltage level transmission line towers and substation structures.

e) **Transmission Line Design Expert (Electrical)** shall have Master's Degree in Electrical Engineering, with more than 8 years of experience or Bachelor's Degree in Electrical Engineering, with more than 12 years of experience in design of transmission line of 400 kV and above voltage level.

f) **Transmission Line Supervision/Field Expert (Electrical)** shall have Bachelor's Degree in Electrical Engineering, with more than 8 years of experience in construction supervision of transmission line of 132 kV and above voltage level.

g) **Substation Design Expert (Electrical)** shall have Master's Degree in Electrical/High Voltage Engineering, with more than 8 years of experience or Bachelor's Degree in

Electrical Engineering, with more than 12 years of experience in design of GIS substation of 400 kV and above voltage level.

h) **Substation Supervision/Field Expert (Electrical)** shall have Bachelor's Degree in Electrical Engineering, with more than 8 years of experience in construction supervision of GIS substation of 400 kV and above voltage level.

i) **Protection System Expert s**hall have Master's/Bachelor's Degree in Electrical Engineering with specialization in protection system and/or further qualifications and training in protection system engineering with over 10 years of experience in design, calculation, selection and relay settings of interconnected electrical power system. Experience of the expert shall cover design of protection system for 400 kV transmission systems and substations.

j) **Substation Design and Commissioning Expert (SAS and Communications) s**hall have Master's Degree in Electrical/Communications Engineering or other relevant discipline with over 10 years of experience in the design, selection and preparation of specification of SCADA and communication systems for 400 kV and above voltage level transmission lines, substations and control center interfacing. The expert shall have previous experience in designing/planning SCADA/communication system for interconnected/integrated power grid system.

k) **Substation Design Expert (Civil and Structure)** shall have Master's Degree in Civil Engineering with more than 8 years of experience or Bachelor's Degree in Civil Engineering, with more than 12 years of experience in the design of substation structures, foundations etc. for substation structures of 400 kV and above voltage level.

l) **Substation Supervision/Field Expert (Civil)** shall have Bachelor's Degree in Civil Engineering, with more than 8 years of experience in construction works of substation of 400 kV and above voltage level.

m) **Distribution System Design Expert** shall have Master's Degree in Electrical Engineering with more than 8 years of experience or Bachelor's Degree in Electrical Engineering, with more than 12 years of experience in distribution system expansion of 33 kV, 11 kV and 400 V distribution systems.

n) **Distribution System Supervision/Field Expert** shall have Bachelor's Degree in Electrical Engineering, with more than 8 years of experience in construction supervision of distribution system expansion of 33 kV, 11 kV and 400 Voltage distribution systems.

o) Geotechnical Expert (Transmission/Substations) and (EMP) shall have Master's Degree in Geotechnical/ Civil Engineering. For the transmission/substation role 10 years of experience in geotechnical investigations of tower foundations/substations of 132 kV or above voltage level, transmission lines and substation structures. For the EMP role 10 years experience of working in seismically active areas, steep terrain and high landslide risk areas.

p) Contract Expert (Transmission/Substation) shall have Bachelor's degree in Engineering and Master's degree in Engineering/Management/Law or equivalent and more than 10 years' experience in contract management of power projects. The expert shall have experience in detail contractual analysis, contract management, and experience in the dispute settlement, arbitration of claims, complaints etc. of power projects.

q) **Environmental Safeguard Specialists** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. At minimum they shall have Master's

Degree in Environmental Science, Environment Management, Environmental Engineering or closely related discipline with more than 10 years of professional experience in conducting environmental impact assessments and environmental management of infrastructure projects. Specialists shall have a minimum 10 years of experience in the supervision, monitoring and implementation of major infrastructure EMPs following Good International Industry Practice (GIIP) guidelines, and preparing environmental monitoring reports, including for Multilateral Development Bank (MDB) lenders, with experience of working in countries with mature EIA systems. Experience of transmission/distribution projects and providing trainings in environmental protection and management is essential. Experience in conducting environmental impact assessment (EIA) and initial environmental examinations (IEE) of such project types as per GIIP and Multilateral Development Bank (MDB) lenders requirements with regard to environmental protection is required. The specialists/expert should be conversant with national laws relating to environment and ADB's Safeguard Policy Statement 2009.

r) **Health and Safety Experts** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. They will be a professionally qualified specialist with at least 10 years of experience in health and safety with IOSH/NEBOSH certification or equivalent and a minimum of 10 years of GIIP experience of major civil works construction supervision including in countries with mature H&S systems, undertaking works in steep and remote terrains, and for Multilateral Development Bank (MDB) lenders. Experience of transmission/distribution projects (as assigned) and in facilitating health and safety risk assessment workshops, trainings and developing good practice guidance is essential.

s) **Labor Experts** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. They will be a professionally qualified specialist with a master's degree in social science or equivalent and at least 10 years of experience in labor management per GIIP with exposure to the core labor standards, good international industry practice, from ILO and Multilateral Development Bank (MDB) lender projects.

t) **Physical and Cultural Resources Expert** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. They shall have Master's Degree will have an advanced degree (Master of Arts [MA] or equivalent) in the archaeology and at least 10 years of GIIP experience with archaeological assessment, and experience of conducting heritage impact assessment for Multilateral Development Bank (MDB) lenders. The experience shall be in Cultural and Heritage Impact Assessment of projects related to linear construction and the power sector.

u) **Ecologist (General)** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. shall be professionally qualified specialists with a master's degree in ecology, botany, zoology or equivalent. The experts will have at least 10 years of experience with ecological assessment, including in countries with mature EIA regulations, and experience of working in natural and critical habitat per Multilateral Development Bank (MDB) lenders.

v) **Pollution Control Specialist** shall comply with the requirements set out in the EMP of the subproject to which they are assigned. They will be a professionally qualified specialist with a master's degree in environmental science, environmental management or equivalent and at least 10 years of GIIP experience with pollution control measures for oil, fuel and chemicals management including the design of oil bunds and storage areas. Experience in providing trainings and developing good practice guidance is essential.

12.2. National Experts

a) **Electrical Engineer (Transmission)** shall have Bachelor's Degree in Electrical Engineering and 5 years of experience in transmission line design/construction supervision/testing and commissioning of 132 kV or above voltage class.

b) **Electrical Engineer (Substation)** shall have Bachelor's Degree in Electrical Engineering and 5 years of experience in transmission line design/construction supervision/testing and commissioning of 132 kV or above voltage level substations.

c) **Civil Engineer (Transmission/Substation)** shall have Bachelor's Degree in Civil Engineering with 5 years of experience in the design/ construction supervision of transmission line towers and substation structures for 132 kV and above voltage level.

d) **Geotechnical Engineer** shall have Master's Degree in Geotechnical/ Civil Engineering and 5 years of experience in geotechnical investigations of power projects.

e) **Distribution System Engineer** shall have Bachelor's Degree in Electrical Engineering with more than 5 years of experience in design/construction supervision/ testing and commissioning of distribution systems of 33/11/0.4/0.23 kV.

f) **Environmental Safeguard Specialist** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. At minimum they shall have Master's Degree in Environmental Science, Environment Management, Environmental Engineering or closely related discipline with more than 10 years of professional experience in conducting environmental impact assessments and environmental management of infrastructure projects. Specialists shall have a minimum 10 years of experience in the supervision, monitoring and implementation of major infrastructure EMPs following Good International Industry Practice (GIIP) guidelines, and preparing environmental monitoring reports, including for Multilateral Development Bank (MDB) lenders, with experience of working in countries with mature EIA systems. Experience of transmission/distribution projects and providing trainings in environmental protection and management is essential. Experience in conducting environmental impact assessment (EIA) and initial environmental examinations (IEE) of such project types as per GIIP and Multilateral Development Bank (MDB) lenders requirements with regard to environmental protection is required. The specialists/expert should be conversant with national laws relating to environment and ADB's Safeguard Policy Statement 2009.

w) Social Safeguard Specialist shall have Master's Degree in Sociology/Social Science/Anthropological Science with more than 10 years of professional experience. The Specialist shall have experience in preparation of resettlement plan and indigenous peoples plan (IPP) etc., in 400 kV or above voltage class transmission line projects in accordance with the international practices as well as latest donor agencies' guidelines, preferably ADB Guidelines with regard to environmental protection and resettlement. The Specialist should be conversant with national laws relating to land acquisition and resettlement and ADB's Safeguard policy Statement 2009.

g) **Physical and Cultural Resources Expert** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. They shall have Master's Degree will have an advanced degree (Master of Arts [MA] or equivalent) in the archaeology and/or anthropology of Nepal and/or South Asia and at least 10 years of GIIP experience with archaeological assessment, and experience of conducting heritage impact assessment for Multilateral Development Bank (MDB) lenders. The experience shall be in Cultural

and Heritage Impact Assessment of projects related to linear construction and the power sector.

h) **Ecologist- Ornithologist, Herpetologist, Forester, Flora/Botanist, Fauna and General Field Ecologist Roles** 10 years of experience in ecological assessment, and experience of biodiversity surveys with flora/fauna expertise relevant to their assigned area of experience and supervision of similar projects in the critical/natural habitat and forest area/habitat in Nepal.

i) **Health and Safety Specialist (HSS)** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. They will be a professionally qualified specialist with at least 10 years of experience in health and safety with IOSH/NEBOSH certification or equivalent and a minimum of 10 years of GIIP experience of major civil works construction supervision including in countries with mature H&S systems, undertaking works in steep and remote terrains, and for Multilateral Development Bank (MDB) lenders. Experience of transmission/distribution projects (as assigned) and in facilitating health and safety risk assessment workshops, trainings and developing good practice guidance is essential.

j) **Labor Specialist (LS)** shall comply with the requirements set out in the EMP of the subprojects to which they are assigned. They will be a professionally qualified specialist with a master's degree in social science or equivalent and at least 10 years of experience in labor management per GIIP and in South Asia, ideally Nepal, with exposure to the core labor standards, good international industry practice, from ILO and Multilateral Development Bank (MDB) lender projects.

k) **Pollution Control Specialist (SS)** shall comply with the requirements set out in the EMP of the subproject to which they are assigned. They will be a professionally qualified specialist with a master's degree in environmental science, environmental management or equivalent and at least 10 years of GIIP experience with pollution control measures for oil, fuel and chemicals management including the design of oil bunds and storage areas. Experience in providing trainings and developing good practice guidance is essential.

l) **EHS Field Consultants -** will be professionally qualified with at least 10 years of experience in EHS management in Nepal with exposure to GIIP and MDB lender projects.

m) Contract Expert (Transmission/Substation) shall have Bachelor's degree in Engineering and Master's degree in Engineering/Management/Law or equivalent and more than 10 years' experience in contract management of power projects. The expert shall have experience in detail contractual analysis, contract management, and experience in the dispute settlement, arbitration of claims, complaints etc. of power projects.

n) **Civil Supervisor** shall have Diploma in Civil Engineering with preferably more than 5 years of experience or Bachelor's in Civil Engineering with 2 years of experience in construction/supervision in transmission line and/or substation projects.

o) **Electrical Supervisor** shall have Diploma in Electrical Engineering with preferably more than 5 years of experience or Bachelor's in Electrical Engineering with 2 years of experience in construction/supervision in transmission line and/or substation projects.

Annexure – I

The minimum list of design, drawings and calculations that needs to be reviewed and recommended for approval are attached herewith. However, the Consultant shall have to prepare detail Master Design Drawing List (MDDL) for each packages for review, comments, observations and recommendation for approval on the design drawings available to NEA and submitted by the Contractor.

A. For Substation

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
1.00	**SUBSTATION LAYOUT DRAWINGS**	
1.01	Single Line Diagram of substation	A
1.02	Electrical layout (plan & section) drawing	A
1.03	Overall General Arrangement drawing	A
1.04	Structure loading diagram cum layout drawing	A
1.05	DSLP Layout drawing	A
1.06	Switchyard Foundation layout drawing	A
1.07	Erection Key Diagram (plan & section) & Erection Bill of quantity	A
1.08	Indoor Cable trench layout drawing	A
1.09	Outdoor Cable trench layout drawing	A
1.10	Buried cable trench layout drawing	A
1.11	Lighting Fixture & conduit layout – Control room building	A/R
1.12	Lighting Fixture & conduit layout – FFPH building	A/R
1.13	Lighting Fixture & conduit layout – Transit camp (if applicable)	A/R
1.14	Lighting Fixture & conduit layout – Switchyard/Street	A/R
1.15	Lighting Fixture & conduit layout – Switchyard panel room	A/R
1.15	Earthing layout - Control Room building	A
1.16	Earthmat layout – Outdoor Switchyard area	A
1.17	Layout drawing for gravel and fence	A
1.18	Switchyard Road & drain layout drawing	A
1.19	Layout drawing of Visual Monitoring System	A
1.20	SLD of LT AC/DC systems	A
1.21	LT switchgear room -Panel layout	A
1.22	Fire Fighting Piping layout in the switchyard	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
1.23	Fire protection system (Hydrant system & Extinguishers) for Control room building, GIS Building & FFPH building etc	A
1.24	HVW spray system drawings (plan, elevation, side view, isometric view and pylon support location details)	A
1.25	NIFPS drawings	A
1.26	Fire detection & Alarm system for Control room building, GIS Building & Switchyard panel room	A
1.27	Panel layout in Control room building	A
1.28	Layout drawing for LT station	A
1.29	Switchyard Panel room - Panel layout	A
1.30	Power cable termination schedule	R
1.31	Control cable termination schedule	R
	APPLICABLE FOR GIS	
1.32	Gas System Line Diagram (GAS SLD) indicating compartment details & Weight	A
1.33	GIS Layout drawing including outdoor GIB (Plan & Section)	A
1.34	Layout drawing of UHF sensors for PD Measurement	A
1.35	GIS building - Layout drawing	A
1.36	GIS Building – Lighting Fixture & conduit layout	A
1.37	GIS Building - Layout drawing of Ventilation System	A
1.38	GIS Building (Panel Room) – Air Conditioning system layout drawing	A
1.39	GIS Building – Indoor cable trench Layout drawing	A
2.00	**DESIGN CALCULATION**	
2.01	DSLP Calculation	A
2.02	Sag Tension & Short Circuit Force Calculation (if applicable)	R
2.03	Lighting system design calculation (if applicable)	R
2.04	Earthing system design calculation (if applicable)	R
2.05	Battery/Charger sizing calculation (if applicable)	R
2.06	Hydraulic calculations for Fire protection system	R
2.07	AC & Ventilation calculation for GIS Building (if applicable)	R

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
2.08	EOT crane sizing for GIS building	R
3.00	**GAS INSULATED SWITCHGEAR**	
3.01	Design Review document along with all supporting documents	A
3.02	Guaranteed Technical Particular (GTP)	A
3.03	Components GA drawing for CB, DS, ES, GIB, CT, VT, Spacers, Bushings etc.	A
3.04	Schematics for CB, DS, ES, CT, VT etc. (Except for LCC)	A
3.05	Type Test Reports for GIS Equipment	A
3.06	Detailed drawing of Bus Extension Module	
3.07	Foundation plan for GIS (Including Loading Data)	A
3.08	Platform Arrangement	R
3.09	Name Plates	R
3.10	GA & Schematic drawings of Local Control Cabinets (LCC)	A
3.11	GA & Schematic drawings of overhead crane	A
3.12	Earthing layout inside GIS building	R
3.13	Catalogues for	R
a)	SF6 gas leakage detector	
b)	SF6 gas filling & evacuation plant	
c)	SF6 gas Analyser	
d)	On line partial discharge monitoring system	
3.14	List of Mandatory spares	A
3.15	List of Special Tools & Tackles	A
3.16	Instruction Manual including catalogue of sensors	R
4.00	**AUTOTRANSFORMER**	
4.01	Design Review	A
4.02	Guaranteed Technical Particulars	A
4.03	Outline General Arrangement Drawing with Bill of material (OGA parts list)	A
4.04	Foundation Plan	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
4.05	Over Fluxing withstand duration curve	R
4.06	Hysteresis Characteristics & specific loss vs flux density curve of iron core	R
4.07	General Arrangement & Control Schematic of OLTC along with write-up	A
4.08	General Arrangement & Control Schematic of Marshalling Box, Common Marshalling Box and Cooler control cubicle along with write-up	A
4.09	General Arrangement & Control Schematic of Digital RTCC relay and cubicle	A
4.10	Interconnection diagram of Drive Mechanism Box, Marshalling Box, Common Marshalling Box & Digital RTCC.	A
4.11	SCADA communication interface of online monitoring equipment	A
4.12	Transport Drawing	R
4.13	Technical Particulars of Online DGA, Drying system, FO system	A
4.14	Outline and control schematic of NIFPS	A
4.15	GA & GTP of bushings	A
4.16	Earthing Arrangement Drawing (Internal & External)	A
4.17	Drawing of Aircell, Conservator & Radiator	A
4.18	Conservator & Tank Oil filling procedure plate	R
4.19	Magnetizing Characteristics of bushings CT	R
4.20	Rating and Diagram plate	A
4.21	Oil flow Diagram	R
4.22	Valve Schedule plate drawing	A
4.23	GA of Twin-Bi directional roller	A
4.24	Instruction Manual	R
4.25	Type Test Report	A
5.00	**REACTOR**	
5.01	Design Review	A
5.02	Guaranteed Technical Particulars	A
5.03	Outline General Arrangement Drawing with Bill of material (OGA parts list)	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
5.04	Foundation Plan	A
5.05	General Arrangement & Control Schematic of Marshalling Box, Common Marshalling Box along with write-up	A
5.06	SCADA communication interface of online monitoring equipment	A
5.07	Transport Drawing	R
5.08	Technical Particulars of Online DGA, Drying system, FO system	A
5.09	Outline and control schematic of NIFPS	A
5.10	GA & GTP of bushings	A
5.11	Earthing Arrangement Drawing (Internal & External)	A
5.12	Drawing of Aircell, Conservator & Radiator	R
5.13	Conservator & Tank Oil filling procedure plate	R
5.14	Magnetization characteristics of Reactor Core and bushing CTs	R
5.15	Hysteresis Characteristics & specific loss vs flux density curve of iron core	R
5.16	Rating and diagram plate	A
5.17	Voltage Ampere curve for Reactor	R
5.18	Valve Schedule plate drawing	A
5.19	GA of Twin bi-directional roller	A
5.20	Instruction Manual	R
5.21	Type test Report	A
6.00	**NEUTRAL GROUNDING REACTOR (NGR)**	
a)	**AIR CORE TYPE NGR**	
6.01	Design Review Document	A
6.02	General Technical Particulars	A
6.03	General Arrangement Drawing with BOM	A
6.04	Main Coil Lifting Details	R
6.05	Foundation Detail Drawing	R
6.06	Main Coil & Insulator Assembly Drawing	A
6.07	Terminal Detail Drawing	A
6.08	Rating & Diagram Plate	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
6.09	Transport Drawing	R
6.10	NGR Pedestal Drawing	A
b)	**OIL FILLED TYPE NGR**	
6.11	Design Review Document	A
6.12	General Technical Particulars	A
6.13	General Arrangement Drawing with BOM	A
6.14	Foundation Detail Drawing	R
6.15	Combined Foundation of Reactor, NGR and LA	A
6.16	Rating & Diagram Plate	A
6.17	Transport Drawing	R
6.18	Control Schematic	A
7.00	**CIRCUIT BREAKER**	
7.01	GA drawing of SF6 CB	A
7.02	GTP	A
7.03	OGA drawing of control unit	A
7.04	OGA drawing of support insulator, interrupter insulator, PIR chamber insulator, grading capacitor insulator (as applicable)	R
7.05	Support structure & foundation plan drawing	A
7.06	Schematic drawings/Wiring diagrams	A
7.07	Rating and name plate drawing	A
7.08	SF6 gas connection diagram	R
7.09	Schematic diagram of operating mechanism	R
7.10	GA drawing, GTP & Type Test Reports of Controlled Switching Device	A
7.11	Terminal pad and corona rings	R
7.12	Sectional view of interrupter	R
7.13	Type Test Reports	A
7.14	Instruction Manual	R

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
8.00	**ISOLATOR**	
8.01	GA drawing of Isolator with/without earth switch	A
8.02	GTP	A
8.03	Contact blade assembly (main & earth switch)	R
8.04	Terminal pad & hinge contacts	R
8.05	GA of MOM – main switch	R
8.06	Schematic & wiring drawing for main switch	R
8.07	Name plate - details	A
8.08	GA of terminal pad	A
8.09	GA of post insulator for isolator	R
8.10	Type Test Report	A
8.11	Instruction Manual	R
9.00	**INSTRUMENT TRANSFORMER (CT/CVT/IVT)**	
9.01	General Arrangement	A
9.02	GTP	A
9.03	Sectional view	R
9.04	Sec. terminal box GA	R
9.05	Wiring drawing of JB incl. interpole	R
9.06	Terminal pads	A
9.07	Schematic & rating plate	R
9.08	Porcelain insulator	R
9.09	Corona ring	R
9.10	Type Test Reports	A
9.11	Instruction Manual	R
10.00	**SURGE ARRESTER**	
10.01	GA of Surge Arrester	A
10.02	GTP	A
10.03	Porcelain/ Polymer insulator	R

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
10.04	Cross sectional view	R
10.05	Arrestor and unit name plate	A
10.06	Corona & Grading rings	R
10.07	Insulating base / surge counter detail	R
10.08	Outline drawing of surge counter	R
10.09	Circuit diagram of surge counter	R
10.10	GA drawing of ZnO element	R
10.11	Line terminal bracket with corona rings	R
10.12	Drawing showing pressure relief arrangement.	R
10.13	Type Test Report	A
10.14	Instruction Manual	R
11.00	**BUS POST INSULATOR**	
11.01	GA drawing & GTP	A
11.02	Type Test Reports	A
12.00	**MARSHALLING BOX, JUNCTION BOXES**	
12.01	GA drawings	A
12.02	Schematic drawings	A
12.03	Type Test Reports	A
13.00	**CONDUCTOR, AL. TUBE & GS EARTH WIRE**	
13.01	Type Test Reports (if applicable)	A
14.00	**DISC INSULATOR**	
14.01	GA drawing & GTP	A
14.02	Type Test Reports	A
15.00	**LONG ROD POLYMER INSULATOR**	
15.01	GA drawing & GTP	A
15.02	Type Test Reports	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
16.00	**INSULATOR STRING(S) WITH HARDWARE ASSEMBLY**	
16.01	GA drawing & GTP	A
16.02	Component drawings	R
16.03	Type Test Reports	A
17.00	**CLAMPS & CONNECTORS**	
17.01	GA Drawings	A
17.02	Type Test Reports	A
18.00	**HORN GAP FUSE**	
18.01	GA drawing & GTP	A
18.02	Type Test Reports	A
19.00	**BATTERY AND BATTERY CHARGER**	
19.01	GA drawing & GTP of Battery Bank	A
19.02	GA drawing, GTP & Schematic Drawings of Battery Charger	A
19.03	Type Test Reports of Battery & Charger	A
20.00	**ILLUMINATION**	
20.01	GTP/Catalogue of fittings/fixtures	A
20.02	GA drawing of lighting poles/posts	A
20.03	GA drawing of Junction box	A
20.04	GA drawing of street lighting panel/outdoor/indoor lighting panel	A
20.05	GA drawing of Receptacles	A
20.06	Schematic drawing of panel/LDBs to fixtures	R
21.00	**LT SWITCHGEAR**	
21.01	SLD, GA & Schematic drawings of MSB	A
21.02	SLD, GA & Schematic drawings of ACDB	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
21.03	SLD, GA & Schematic drawings of 220V DCDB	A
21.04	SLD, GA & Schematic drawings of 48V DCDB	A
21.05	SLD, GA & Schematic drawings of MLDB	A
21.06	SLD, GA & Schematic drawings of ELDB	A
21.07	Type Test Reports	A
21.08	Instruction Manual	R
22.00	**HT POWER CABLES**	
22.01	GTP & Catalogue	A
22.02	Type Test Reports	A
23.00	**POWER & CONTROL CABLES**	
23.01	Type Test Reports for control cables	A
23.02	Type Test Reports for power cables	A
24.00	**CONTROL AND RELAY PANELS & SUBSTATION AUTOMATION SYSTEM (SAS), VISUAL MONITORING SYSTEM (VMS)**	
24.01	GTP for all protection relays, Travelling Wave Fault Locator, SAS Equipment	A
24.02	Type Test Reports of all protection relays, Travelling Wave Fault Locator & SAS IEDs	A/R
24.03	GA and schematic drawings for: -	
a)	Relay and protection panels for all type of line(s)	A
b)	Relay and protection panels for all type transformer(s) including tertiary loading	A
c)	Relay and protection panels for bus/line reactor(s) (switchable & non-switchable as applicable)	A
d)	Relay and protection panels for tie bay(s)	A
e)	Relay and protection panels for TBC bay(s)	A
f)	Relay and protection panels for BC bay(s)	A
g)	Relay and protection panels for Bus Sectionaliser bay(s)	A
h)	Busbar protection panel (s)	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
i)	Breaker relay panel(s)	A
j)	Interface panel	A
24.04	SAS Architecture	A
24.05	Relay Settings	A
24.06	GTP/Catalogue of VMS equipment	A/R
24.07	GTP/Catalogue of Camera	A/R
24.08	VMS architecture drawing	A
24.09	Technical Literature and O&M manuals	R
24.10	Relay settings	R
25.00	**PLCC EQUIPMENTS**	
25.01	GTP/Drawings for PLCC Carrier Equipment	A/R
25.02	GTP/Drawings for Wave traps	A
25.03	GTP/Drawings Coupling device	A
25.04	Digital/ Analog Protection coupler	A
25.05	SNR calculation (if applicable)	R
25.06	GTP/Drawing of HF cable	A
25.07	Type Test Reports of PLCC equipment	A
25.08	Testing & maintenance equipment	R
25.09	Frequency Planning	A
25.10	Technical literature and O&M Manuals	R
26.00	**DG SET**	
26.01	GTP	A
26.02	Drawings/manuals	A
27.00	**AIR CONDITIONING & VENTILATION SYSTEM**	
27.01	Drawings/GTP/Catalogues	A
27.02	A/C sizing calculation	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
28.00	**LT TRANSFORMER**	
28.01	GTP	A
28.02	Drawings	A
28.03	Type Test Reports	A
29.00	**FIRE PROTECTION SYSTEM**	
29.01	Fire Fighting Annunciation & control panels	A
29.02	GA and Schematic for LCP for deluge valve operation	A
29.03	Hydraulic calculations for HVW spray network	R
29.04	Drawing for deluge valve housing	A
29.05	GTP & drawings for strainers (Y type & basket strainer)	A
29.06	Drawing of valve pit details	A
29.07	System write-up with various settings	A
29.08	GTP & drawing for gate valve, check valve, solenoid valve, outdoor hydrant valve	A
29.09	GTP & catalogue for deluge valve, spray nozzles & projectors	A
29.10	GTP & catalogue for quatrzoid bulb detector	A
29.11	GTP & drawing for pressure switch, pressure gauge	A
29.12	GTP for G.I. & M.S. pipes & pipe accessories	A
29.13	Any other drawing/document required for completion of work	A/R
30.00	**CONTROL ROOM BUILDING / TRANSIT CAMP / FFPH BUILDING / SWITCHAYRD PANEL ROOM/INDOOR HT SWITCHGEAR ROOM / TOWNSHIP BUILDINGS (AS applicable)**	A
30.01	Architectural drawing	
a)	Plan, section & elevation	
b)	Doors & windows schedule	
30.02	Building design calculation (if applicable)	
30.03	Civil Construction design/drawings	
31.00	**DRAWING FOR GIS BUILDING (If applicable)**	A

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
31.01	Architectural drawing	
a)	Plan, section & elevation	
b)	Doors & windows schedule	
31.02	GIS building superstructure drawings & design calculation	
31.03	Civil Construction design/drawings	
31.04	GIS Equipment foundation inside GIS building	
32.00	**SWITCHYARD CIVIL CONSTRUCTION DRAWINGS (AS APPLICABLE)**	**A**
a)	Tower Foundation	
b)	Equipment Foundation	
c)	Transformer foundation	
d)	Reactor foundation	
e)	Road construction including culverts, rail cum road	
f)	Switchyard fencing & Gate	
g)	Cable trench section	
h)	Drain section	
i)	Rain harvesting	
j)	Boundary wall	
k)	DG set foundation	
l)	LT transformer foundation	
m)	Car Parking Shed/Security Room	
n)	Outdoor GIB foundation	
o)	Outdoor Sf6/Air bushing foundation	
p)	BMK/ Lighting pole foundation	
q)	Fire Wall	
r)	Drawing of contour levels	
s)	Drawing of Formation levels	
t)	Soil Investigation Report	
u)	Any other foundation inside switchyard	

LIST OF DRAWINGS		
SL.NO.	**DRAWINGS/DOCUMENTS TITLE**	**CATEGORY**
33.00	**DESIGN, FABRICATION & PROTO CORRECTED DRAWINGS OF ALL TYPES OF TOWERS & BEAMS**	**A/R**
34.00	**DESIGN, FABRICATION DRAWINGS FOR EQUIPMENT SUPPORT STRUCTURES**	**A/R**
35.00	**MISCELLANEOUS CIVIL DRGS**	**A/R**

B. For Transmission Lines

S.NO.	ORGN DRG NO	DRG TITLE
1	SAG TENSION (+9)	SAG TENSION CALCULATIONS (Up to +9m Extn) for 400 kV M/C (WZ-4, TWIN HTLS) TOWERS
2	TSD (+9)	TOWER SPOTTING DATA (Up to +9m Extn) for 400 kV M/C (WZ-4, TWIN HTLS) TOWERS
3	TWR DESIGN QA+9	TOWER DESIGN DOCUMENT OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9
4	TWR DESIGN QB+9	TOWER DESIGN DOCUMENT OF400 kV M/C WZ-4 (TWIN HTLS) TT-QB+9
5	WR DESIGN QC+9	TOWER DESIGN DOCUMENT OF400 kV M/C WZ-4 (TWIN HTLS) TT-QC+9
6	TWR DESIGN QD+9	TOWER DESIGN DOCUMENT OF400 kV M/C WZ-4 (TWIN HTLS) TT-QD+9
7	GA STUB QA+9	STRUCTRUAL DRAWING FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9
8	GA STUB QB+9	STRUCTRUAL DRAWING FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB+9
9	GA STUB QC+9	STRUCTRUAL DRAWING FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+9
10	GA STUB QD+9	STRUCTRUAL DRAWING FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD+9
11	BOM STUB QA+9	BILL OF MATERIAL FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9
12	BOM STUB QB+9	BILL OF MATERIAL FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB+9
13	BOM STUB QC+9	BILL OF MATERIAL FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+9
14	BOM STUB QD+9	BILL OF MATERIAL FOR STUB OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD+9
15	FDN DES QA+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0
16	FDN DES QC+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+0
17	FDN DES QA+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9

S.NO.	ORGN DRG NO	DRG TITLE
18	FDN DES QC+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+9
19	FDN DWG QA+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0
20	FDN DWG QC+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+0
21	FDN DWG QA+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9
22	FDN DWG QC+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+9
23	FDN DES QB1+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0
24	FDN DES QB2+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0
25	FDN DES QB1+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9
26	FDN DES QB2+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9
27	FDN DES QC1+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0
28	FDN DES QC1+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9
29	FDN DES QD45+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0
30	FDN DES QD60+0	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0
31	FDN DES QD45+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9
32	FDN DES QD60+9	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9
33	FDN DWG QB1+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0
34	FDN DWGQB2+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0
35	FDN DWG QB1+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9
36	FDN DWG QB2+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9
37	FDN DWG QC1+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0
38	FDN DWG QC1+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9
39	FDN DWG QD45+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0
40	FDN DWG QD60+0	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0
41	FDN DWG QD45+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9
42	FDN DWG QD60+9	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9
43	TWR DES QB+18_25	TOWER DESIGN DOCUMENT OF400 kV M/C WZ-4 (TWIN HTLS) TT-QB+18/25
44	WR DES QC+18_25	TOWER DESIGN DOCUMENT OF400 kV M/C WZ-4 (TWIN HTLS) TT-QC+18/25

S.NO.	ORGN DRG NO	DRG TITLE
45	TWR DES QD+18_25	TOWER DESIGN DOCUMENT OF400 kV M/C WZ-4 (TWIN HTLS) TT-QD+18/25
46	SST DWG QA+9	STRUCTURAL DRAWING FOR STUB SETTING TEMPLATE OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9
47	SST DWG QB+9	STRUCTURAL DRAWING FOR STUB SETTING TEMPLATE OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QB+9
48	SST DWG QC+9	STRUCTURAL DRAWING FOR STUB SETTING TEMPLATE OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+9
49	SST DWG QD+9	STRUCTURAL DRAWING FOR STUB SETTING TEMPLATE OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD+9
50	TT Procedure QA	TYPE TEST PROCEDURE FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA
51	TT Procedure QB	TYPE TEST PROCEDURE FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB
52	T Procedure QC	TYPE TEST PROCEDURE FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC
53	TT Procedure QD	TYPE TEST PROCEDURE FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD
54	TWR DWG QA	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-BASIC BODY
55	TWR DWG QA+0M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+0M EXTENSION
56	TWRDWG QA+1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+1.5M EXTENSION (ATTACHED TO BB)
57	TWR DWG QA+3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+3M EXTENSION (ATTACHED TO BB)
58	TWRDWG QA+4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+4.5M EXTENSION (ATTACHED TO NT)
59	TWR DWG QA+6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+6M EXTENSION (ATTACHED TO NT)
60	TWRDWG QA+7.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQA+7.5M EXTENSION (ATTACHED TO NT)
61	TWR DWG QA+9M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+9M EXTENSION (ATTACHED TO NT)
62	TWRDWG QA-1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-1.5M EXTENSION (ATTACHED TO BB)
63	TWR DWG QA-3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-3M EXTENSION (ATTACHED TO BB)
64	TWRDWG QA-4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-4.5M EXTENSION (ATTACHED TO BB)

S.NO.	ORGN DRG NO	DRG TITLE
65	TWR DWG QA-6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-6M EXTENSION (ATTACHED TO BB)
66	TWR DWG QB	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-BASIC BODY
67	TWR DWG QB+0M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+0M EXTENSION
68	TWRDWG QB+1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+1.5M EXTENSION (ATTACHED TO BB)
69	TWR DWG QB+3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+3M EXTENSION (ATTACHED TO BB)
70	TWRDWG QB+4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+4.5M EXTENSION (ATTACHED TO NT)
71	TWR DWG QB+6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+6M EXTENSION (ATTACHED TO NT)
72	TWRDWG QB+7.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQB+7.5M EXTENSION (ATTACHED TO NT)
73	TWR DWG QB+9M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+9M EXTENSION (ATTACHED TO NT)
74	TWR DWG QB+18M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+18M EXTENSION
75	TWR DWG QB+25M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+25M EXTENSION
76	TWRDWG QB-1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-1.5M EXTENSION (ATTACHED TO BB)
77	TWR DWG QB-3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-3M EXTENSION (ATTACHED TO BB)
78	TWRDWG QB-4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-4.5M EXTENSION (ATTACHED TO BB)
79	TWR DWG QB-6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-6M EXTENSION (ATTACHED TO BB)
80	WR DWG QC	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-BASIC BODY
81	WR DWG QC+0M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+0M EXTENSION
82	WRDWG QC+1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+1.5M EXTENSION (ATTACHED TO BB)
83	WR DWG QC+3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+3M EXTENSION (ATTACHED TO BB)
84	WRDWG QC+4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+4.5M EXTENSION (ATTACHED TO NT)

S.NO.	ORGN DRG NO	DRG TITLE
85	WR DWG QC+6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+6M EXTENSION (ATTACHED TO NT)
86	WRDWG QC+7.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQC+7.5M EXTENSION (ATTACHED TO NT)
87	WR DWG QC+9M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+9M EXTENSION (ATTACHED TO NT)
88	WR DWG QC+18M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+18M EXTENSION
89	WR DWG QC+25M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+25M EXTENSION
90	WRDWG QC-1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-1.5M EXTENSION (ATTACHED TO BB)
91	WR DWG QC-3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-3M EXTENSION (ATTACHED TO BB)
92	WRDWG QC-4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-4.5M EXTENSION (ATTACHED TO BB)
93	WR DWG QC-6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-6M EXTENSION (ATTACHED TO BB)
94	TWR DWG QD	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-BASIC BODY
95	TWR DWG QD+0M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+0M EXTENSION
96	TWRDWG QD+1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+1.5M EXTENSION (ATTACHED TO BB)
97	TWR DWG QD+3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+3M EXTENSION (ATTACHED TO BB)
98	TWRDWG QD+4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+4.5M EXTENSION (ATTACHED TO NT)
99	TWR DWG QD+6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+6M EXTENSION (ATTACHED TO NT)
100	TWRDWG QD+7.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQD+7.5M EXTENSION (ATTACHED TO NT)
101	TWR DWG QD+9M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+9M EXTENSION (ATTACHED TO NT)
102	TWR DWG QD+18M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+18M EXTENSION
103	TWR DWG QD+25M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+25M EXTENSION
104	TWRDWG QD-1.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-1.5M EXTENSION (ATTACHED TO BB)

S.NO.	ORGN DRG NO	DRG TITLE
105	TWR DWG QD-3M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-3M EXTENSION (ATTACHED TO BB)
106	TWRDWG QD-4.5M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-4.5M EXTENSION (ATTACHED TO BB)
107	TWR DWG QD-6M EXT	STRUCTURAL DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-6M EXTENSION (ATTACHED TO BB)
108	TWR BOM QA	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-BASIC BODY
109	TWR BOM QA+0M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+0M EXTENSION
110	TWRBOM QA+1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+1.5M EXTENSION (ATTACHED TO BB)
111	TWR BOM QA+3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+3M EXTENSION (ATTACHED TO BB)
112	TWRBOM QA+4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+4.5M EXTENSION (ATTACHED TO NT)
113	TWR BOM QA+6M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+6M EXTENSION (ATTACHED TO NT)
114	TWRBOM QA+7.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQA+7.5M EXTENSION (ATTACHED TO NT)
115	TWR BOM QA+9M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA+9M EXTENSION (ATTACHED TO NT)
116	TWRBOM QA-1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-1.5M EXTENSION (ATTACHED TO BB)
117	TWR BOM QA-3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-3M EXTENSION (ATTACHED TO BB)
118	TWRBOM QA-4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QA-4.5M EXTENSION (ATTACHED TO BB)
119	TWR BOM QB	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-BASIC BODY
120	TWR BOM QB+0M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+0M EXTENSION
121	TWRBOM QB+1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+1.5M EXTENSION (ATTACHED TO BB)
122	TWR BOM QB+3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+3M EXTENSION (ATTACHED TO BB)
123	TWRBOM QB+4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+4.5M EXTENSION (ATTACHED TO NT)

S.NO.	ORGN DRG NO	DRG TITLE
124	TWR BOM QB+6M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+6M EXTENSION (ATTACHED TO NT)
125	TWRBOM QB+7.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQB+7.5M EXTENSION (ATTACHED TO NT)
126	TWR BOM QB+9M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+9M EXTENSION (ATTACHED TO NT)
127	TWR BOM QB+18M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB+18M EXTENSION
128	TWRBOM QB-1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-1.5M EXTENSION (ATTACHED TO BB)
129	TWR BOM QB-3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-3M EXTENSION (ATTACHED TO BB)
130	TWRBOM QB-4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-4.5M EXTENSION (ATTACHED TO BB)
131	TWR BOM QB-6M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QB-6M EXTENSION (ATTACHED TO BB)
132	WR BOM QC	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-BASIC BODY
133	WR BOM QC+0M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+0M EXTENSION
134	WRBOM QC+1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+1.5M EXTENSION (ATTACHED TO BB)
135	WR BOM QC+3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+3M EXTENSION (ATTACHED TO BB)
136	WRBOM QC+4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+4.5M EXTENSION (ATTACHED TO NT)
137	WRBOM QC+7.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQC+7.5M EXTENSION (ATTACHED TO NT)
138	WR BOM QC+9M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+9M EXTENSION (ATTACHED TO NT)
139	WR BOM QC+18M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+18M EXTENSION
140	WR BOM QC+25M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC+25M EXTENSION
141	WRBOM QC-1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-1.5M EXTENSION (ATTACHED TO BB)
142	WR BOM QC-3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-3M EXTENSION (ATTACHED TO BB)
143	WRBOM QC-4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-4.5M EXTENSION (ATTACHED TO BB)

S.NO.	ORGN DRG NO	DRG TITLE
144	WR BOM QC-6M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QC-6M EXTENSION (ATTACHED TO BB)
145	TWR BOM QD	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-BASIC BODY
146	TWR BOM QD+0M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+0M EXTENSION
147	TWRBOM QD+1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+1.5M EXTENSION (ATTACHED TO BB)
148	TWR BOM QD+3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+3M EXTENSION (ATTACHED TO BB)
149	TWRBOM QD+4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+4.5M EXTENSION (ATTACHED TO NT)
150	TWR BOM QD+6M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+6M EXTENSION (ATTACHED TO NT)
151	TWRBOM QD+7.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TTQD+7.5M EXTENSION (ATTACHED TO NT)
152	TWR BOM QD+9M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+9M EXTENSION (ATTACHED TO NT)
153	TWR BOM QD+18M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+18M EXTENSION
154	TWR BOM QD+25M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD+25M EXTENSION
155	TWRBOM QD-1.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-1.5M EXTENSION (ATTACHED TO BB)
156	TWR BOM QD-3M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-3M EXTENSION (ATTACHED TO BB)
157	TWRBOM QD-4.5M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-4.5M EXTENSION (ATTACHED TO BB)
158	TWR BOM QD-6M EXT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QD-6M EXTENSION (ATTACHED TO BB)
159	HTLS Cond-ACSS-GTP	GUARANTEED TECHNICAL PARTICULARS AND CROSS-SECTION DRAWING OF HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
160	GS EW-7/3.66-TTR	TYPE TEST REPORTS OF 7/3.66 mm GS EARTH WIRE FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
161	HW DWG - SIS(WC)	HARDWARE FITTING DRAWING OF SINGLE I SUSPENSION STRING (WITHOUT CLAMP) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
162	HW DWG - SIS(WC)-JMP	HARDWARE FITTING DRAWING OF SINGLE I SUSPENSION PILOT STRING FOR TRANSPOSITION TOWER (WITHOUT CLAMP) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL

S.NO.	ORGN DRG NO	DRG TITLE
163	HW DWG - ST(WC)	HARDWARE FITTING DRAWING OF SINGLE TENSION STRING (WITHOUT CLAMP) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
164	HW DWG - DT(WC)	HARDWARE FITTING DRAWING OF DOUBLE TENSION STRING (WITHOUT CLAMP) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
165	HW TTR -ST(WC)	HARDWARE FITTING TYPE TEST REPORT OF SINGLE TENSION STRING (WITHOUT CLAMP) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
166	HTLS CLAMP DWG -SC	DRAWING OF SUSPENSION CLAMP FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR SUSPENSION STRING FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
167	HTLS CLAMP DWG -SCJ	DRAWING OF SUSPENSION CLAMP FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR SUSPENSION STRING FOR JUMPER FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
168	HTLS CLAMP DWG -DE	DRAWING OF DEAD END CLAMP FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR TENSION STRING FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
169	HTLS ACC DWG -MSCJ	DRAWING OF MID SPAN COMPRESSION JOINT FOR HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
170	HTLS ACC DWG -RS	DRAWING OF REPAIR SLEEVE FOR HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
171	HTLS ACC DWG -TCONN	DRAWING OF T-CONNECTOR FOR HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
172	HTLS ACC DWG -SD	DRAWING OF TWIN SPACER DAMPER FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
173	HTLS ACC DWG -RGD S	DRAWING OF TWIN RIGID SPACER FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
174	HTLS CLAMP TTR -SC	TYPE TEST REPORT OF SUSPENSION CLAMP FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR SUSPENSION STRING FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
175	HTLS CLAMP TTR -SCJ	TYPE TEST REPORT OF SUSPENSION CLAMP FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR SUSPENSION STRING FOR JUMPER FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
176	HTLS CLAMP TTR -DE	TYPE TEST REPORT OF DEAD END CLAMP FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR TENSION STRING FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
177	HTLS ACC TTR - MSCJ	TYPE TEST REPORT OF MID SPAN COMPRESSION JOINT FOR HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
178	HTLS ACC TTR - RS	TYPE TEST REPORT OF REPAIR SLEEVE FOR HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
179	HTLS ACC TTR - TCONN	TYPE TEST REPORT OF T-CONNECTOR FOR HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL

S.NO.	ORGN DRG NO	DRG TITLE
180	HTLS ACC TTR - SD	TYPE TEST REPORT OF TWIN SPACER DAMPER FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
181	HTLS ACC TTR - RGD S	TYPE TEST REPORT OF TWIN RIGID SPACER FOR HTLS CONDUCTOR (ACSS) SUITABLE FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
182	GS EW-ACC-DWG	DRAWING OF ACCESSORIES OF 7/3.66 mm GS EARTH WIRE FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
183	INSULATOR-120KN-DWG	DRAWING OF 400KV, 120KN INSULATOR STRING (23 Nos. Porcelain Disc Insulator OR 3 Nos. Porcelain Long Rod Insulator) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
184	INSULATOR-160KN-DWG	DRAWING OF 400KV, 160KN INSULATOR STRING (23 Nos. Porcelain Disc Insulator OR 3 Nos. Porcelain Long Rod Insulator) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
185	INSULATOR-120KN-TTR	TYPE TEST REPORT OF 400KV, 120KN INSULATOR (Porcelain Disc OR Porcelain Long Rod) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
186	INSULATOR-160KN-TTR	TYPE TEST REPORT OF 400KV, 160KN INSULATOR (Porcelain Disc OR Porcelain Long Rod) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
187	SPAN MARKER-DWG	DRAWING OF SPAN MARKER
188	AVN LGHT-2LI1MI-DWG	DRAWING OF AVIATION WARNING LIGHT - 1MEDIUM INTENSITY + 2 LOW INTENSITY
189	AVN LGHT-4LI1MI-DWG	DRAWING OF AVIATION WARNING LIGHT - 1MEDIUM INTENSITY + 4 LOW INTENSITY
190	EARTHING-SHIELDWIRE	DRAWING OF SHIELDWIRE EARTHING INCLUDING PG CLAMP, DOWNLEAD CLAMP BUT EXCLUDING EARTHWIRE BITS
191	HTLS Cond-ACSS-DD	DRUM DRAWING OF HTLS CONDUCTOR (ACSS) FOR 400 kV M/C (WZ-4, TWIN HTLS) TL
192	FDN DES QA+0-DRY	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0-DRY SOIL
193	FDN DES QA+9-DRY	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9-DRY SOIL
194	FDN DWG QA+0-DRY	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0-DRY SOIL
195	FDN DWG QA+9-DRY	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9-DRY SOIL
196	FDN DES QD45+0-DRY	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0-DRY SOIL
197	FDN DES QD60+0-DRY	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0-DRY SOIL
198	FDN DES QD45+9-DRY	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9-DRY SOIL
199	FDN DES QD60+9-DRY	FOUNDATION DESIGN FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9-DRY SOIL
200	FDN DWG QD45+0-DRY	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0-DRY SOIL
201	FDN DWG QD60+0-DRY	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0-DRY SOIL
202	FDN DWG QD45+9-DRY	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9-DRY SOIL
203	FDN DWG QD60+9-DRY	FOUNDATION DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9-DRY SOIL

S.NO.	ORGN DRG NO	DRG TITLE
204	TWR ACC DWG	TOWER ACCESSORIES DRAWING FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TL
205	FDNDES-QB1-25M-DRY	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DRY
206	FDNDES-QB1-25M-DFR	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DFR
207	FDNDES-QB1-25-SAND	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - SANDY
208	FDNDRG-QB1-25M-DRY	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DRY
209	FDNDRG-QB1-25M-DFR	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DFR
210	FDNDRG-QB1-25-SAND	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - SANDY
211	FDNDES-QB2-25M-DRY	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION - DRY
212	FDNDES-QB2-25M-DFR	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION - DFR
213	FDNDES-QB2-25-SAND	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION - SANDY
214	FDNDRG-QB2-25M-DRY	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION - DRY
215	FDNDRG-QB2-25M-DFR	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION - DFR
216	FDNDRG-QB2-25-SAND	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION - SANDY
217	FDNDES-QD60-25-DRY	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DRY
218	FDNDES-QD60-25-DFR	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DFR
219	FDNDES-QD60-25-SAN	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - SANDY
220	FDNDRG-QD60-25-DRY	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DRY
221	FDNDRG-QD60-25-DFR	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DFR
222	FDNDRG-QD60-25-SAN	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - SANDY
223	STUB DWG-QB2-1825M	DRAWING OF STUB FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION
224	STUB BOM-QB2-1825M	BILL OF MATERIAL OF STUB FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION

S.NO.	ORGN DRG NO	DRG TITLE
225	STUBDWG-QD60-1825M	DRAWING OF STUB FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION
226	STUBBOM-QD60-1825M	BILL OF MATERIAL OF STUB FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION
227	FDNDES-QD60DRY-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DRY (2M RAISED CHIMNEY)
228	FDNDES-QD60DFR-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DFR (2M RAISED CHIMNEY)
229	FDNDES-QD60SAN-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - SANDY (2M RAISED CHIMNEY)
230	FDNDRG-QD60DRY-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DRY (2M RAISED CHIMNEY)
231	FDNDRG-QD60DFR-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DFR (2M RAISED CHIMNEY)
232	FDNDRG-QD60SAN-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - SANDY (2M RAISED CHIMNEY)
233	STUB EXTN DWG-QD60	STRUCTURAL DRAWING OF STUB EXTENDER (FOR 2M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION
234	STUB EXTN BOM-QD60	BILL OF MATERIAL OF STUB EXTENDER (FOR 2M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION
235	STUBEXTN DWG-QB2+9	STRUCTURAL DRAWING OF STUB EXTENDER (FOR 2M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+9M EXTENSION
236	STUBEXTN BOM-QB2+9	BILL OF MATERIAL OF STUB EXTENDER (FOR 2M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+9M EXTENSION
237	STUBEXT DWG-QB2+25	STRUCTURAL DRAWING OF STUB EXTENDER (FOR 2M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION
238	STUBEXT BOM-QB2+25	BILL OF MATERIAL OF STUB EXTENDER (FOR 2M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB2+18/25M EXTENSION
239	WR DESIGN QCT	TOWER DESIGN DOCUMENT OF 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QCT
240	WRDWG QCT	STRUCTURAL DRAWING OF TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QCT
241	WR BOM QCT	BILL OF MATERIAL FOR TOWER OF 400 kV M/C WZ-4 (TWIN HTLS) TT QCT-BASIC BODY
242	FDNDES1-QB1DRY-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+9M EXTENSION - DRY (2M RAISED CHIMNEY)
243	FDNDES1-QB1DFR-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+9M EXTENSION - DFR (2M RAISED CHIMNEY)
244	FDNDES-QB1SAN-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+9M EXTENSION - SANDY (2M RAISED CHIMNEY)

S.NO.	ORGN DRG NO	DRG TITLE
245	FDNDES-QB1DRY-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DRY (2M RAISED CHIMNEY)
246	FDNDES-QB1DFR-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DFR (2M RAISED CHIMNEY)
247	FDNDES-QB1SDY-2RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - SANDY (2M RAISED CHIMNEY)
248	FDNDRG1-QB1DRY-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+9M EXTENSION - DRY (2M RAISED CHIMNEY)
249	FDNDRG1-QB1DFR-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+9M EXTENSION - DFR (2M RAISED CHIMNEY)
250	FDNDRG-QB1SAN-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+9M EXTENSION - SANDY (2M RAISED CHIMNEY)
251	FDNDRG-QB1DRY-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DRY (2M RAISED CHIMNEY)
252	FDNDRG-QB1DFR-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - DFR (2M RAISED CHIMNEY)
253	FDNDRG-QB1SDY-2RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QB1+18/25M EXTENSION - SANDY (2M RAISED CHIMNEY)
254	FDNDES-QD60DRY-3RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DRY (3M RAISED CHIMNEY)
255	FDNDES-QD60DFR-3RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DFR (3M RAISED CHIMNEY)
256	FDNDES-QD60SAN-3RC	FOUNDATION DESIGN FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - SANDY (3M RAISED CHIMNEY)
257	FDNDRG-QD60DRY-3RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DRY (3M RAISED CHIMNEY)
258	FDNDRG-QD60DFR-3RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - DFR (3M RAISED CHIMNEY)
259	FDNDRG-QD60SAN-3RC	FOUNDATION DRAWING FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION - SANDY (3M RAISED CHIMNEY)
260	STUB 3MRC DWG-QD60	STRUCTURAL DRAWING OF STUB EXTENDER (FOR 3M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION
261	STUB 3MRC BOM-QD60	BILL OF MATERIAL OF STUB EXTENDER (FOR 3M RAISED CHIMNEY) FOR 400 kV M/C (WZ-4, TWIN HTLS) TOWER TYPE QD60+18/25M EXTENSION
262	STR-1	STRINGING CHART OF 400 kV M/C (WZ-4, TWIN HTLS) FOR LOC. NO. 43/0 - 51/0
263	GA STUB DDH	STRUCTRUAL DRAWING FOR STUB OF 400 kV D/C WZ-4 (TWIN HTLS) TT-DDH

S.NO.	ORGN DRG NO	DRG TITLE
264	TWR DWG DDH	STRUCTRUAL DRAWING FOR NORMAL TOWER (WITHOUT PEAK) OF 400 kV D/C WZ-4 (TWIN HTLS) TT-DDH
265	BOM STUB DDH	BILL OF MATERIAL FOR STUB OF 400 kV D/C WZ-4 (TWIN HTLS) TT-DDH
266	TWR BOM DDH	BILL OF MATERIAL FOR NORMAL TOWER (WITHOUT PEAK) OF 400 kV D/C WZ-4 (TWIN HTLS) TT-DDH
267	STRINGING CHART-2	STRINGING CHART (Part 2) For 400 kV M/C (WZ-4, TWIN HTLS) BIKANER II - KHETRI TL (PART-1)
268	STRINGING CHART-3	STRINGING CHART (Part 3) For 400 kV M/C (WZ-4, TWIN HTLS) BIKANER II - KHETRI TL (PART-1)
269	STRINGING CHART-4	STRINGING CHART (Part 4) For 400 kV M/C (WZ-4, TWIN HTLS) BIKANER II - KHETRI TL (PART-1)
270	QCT EXTN LINK	ACCESSORIES DRAWING OF EXTENSION LINK 1100MM FOR 400 kV M/C (WZ-4, TWIN HTLS) TT-QCT
271	STRINGING CHART-5	STRINGING CHART (Part 5) For 400 kV M/C (WZ-4, TWIN HTLS) BIKANER II - KHETRI TL (PART-1)
272	HTLS-SD-Plcmt-Chrt	PLACEMENT CHART OF TWIN SPACER DAMPER FOR ACSS TYPE HTLS CONDUCTOR FOR 400 kV D/C (TWIN HTLS) TL
273	EW-VD-Plcemt-Chart	PLACEMENT CHART OF VIBRATION DAMPER FOR 7/3.66MM GS EARTHWIRE
274	FDN DES QA+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
275	FDN DES QA+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0M FOR WFR & SFR SOIL
276	FDN DES QA+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0M FOR HARD ROCK SOIL
277	FDN DES QA+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
278	FDN DES QA+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9M FOR WFR & SFR SOIL
279	FDN DES QA+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9M FOR HARD ROCK SOIL
280	FDN DWG QA+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
281	FDN DWG QA+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0M FOR WFR & SFR SOIL
282	FDN DWG QA+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+0M FOR HARD ROCK SOIL
283	FDN DWG QA+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
284	FDN DWG QA+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9M FOR WFR & SFR SOIL
285	FDN DWG QA+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QA+9M FOR HARD ROCK SOIL
286	FDN DES QB1+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0M FOR WET, PS, FS, WBC & WET PADDY SOIL

S.NO.	ORGN DRG NO	DRG TITLE
287	FDN DES QB1+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0M FOR WFR & SFR SOIL
288	FDN DES QB1+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0M FOR HARD ROCK SOIL
289	FDN DES QB1+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
290	FDN DES QB1+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9M FOR WFR & SFR SOIL
291	FDN DES QB1+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9M FOR HARD ROCK SOIL
292	FDN DWG QB1+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
293	FDN DWG QB1+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0M FOR WFR & SFR SOIL
294	FDN DWG QB1+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+0M FOR HARD ROCK SOIL
295	FDN DWG QB1+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
296	FDN DWG QB1+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9M FOR WFR & SFR SOIL
297	FDN DWG QB1+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+9M FOR HARD ROCK SOIL
298	FDN DES QB2+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
299	FDN DES QB2+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0M FOR WFR & SFR SOIL
300	FDN DES QB2+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0M FOR HARD ROCK SOIL
301	FDN DES QB2+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
302	FDN DES QB2+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9M FOR WFR & SFR SOIL
303	FDN DES QB2+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9M FOR HARD ROCK SOIL
304	FDN DWG QB2+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
305	FDN DWG QB2+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0M FOR WFR & SFR SOIL
306	FDN DWG QB2+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+0M FOR HARD ROCK SOIL
307	FDN DWG QB2+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
308	FDN DWG QB2+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9M FOR WFR & SFR SOIL
309	FDN DWG QB2+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+9M FOR HARD ROCK SOIL

S.NO.	ORGN DRG NO	DRG TITLE
310	FDN DES QC1+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
311	FDN DES QC1+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0M FOR WFR & SFR SOIL
312	FDN DES QC1+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0M FOR HARD ROCK SOIL
313	FDN DES QC1+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
314	FDN DES QC1+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9M FOR WFR & SFR SOIL
315	FDN DES QC1+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9M FOR HARD ROCK SOIL
316	FDN DWG QC1+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
317	FDN DWG QC1+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0M FOR WFR & SFR SOIL
318	FDN DWG QC1+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+0M FOR HARD ROCK SOIL
319	FDN DWG QC1+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
320	FDN DWG QC1+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9M FOR WFR & SFR SOIL
321	FDN DWG QC1+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+9M FOR HARD ROCK SOIL
322	FDN DES QC2+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
323	FDN DES QC2+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+0M FOR WFR & SFR SOIL
324	FDN DES QC2+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+0M FOR HARD ROCK SOIL
325	FDN DES QC2+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
326	FDN DES QC2+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+9M FOR WFR & SFR SOIL
327	FDN DES QC2+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+9M FOR HARD ROCK SOIL
328	FDN DWG QC2+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
329	FDN DWG QC2+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+0M FOR WFR & SFR SOIL
330	FDN DWG QC2+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+0M FOR HARD ROCK SOIL
331	FDN DWG QC2+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
332	FDN DWG QC2+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+9M FOR WFR & SFR SOIL

S.NO.	ORGN DRG NO	DRG TITLE
333	FDN DWG QC2+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+9M FOR HARD ROCK SOIL
334	FDN DES QD45+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
335	FDN DES QD45+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0M FOR WFR & SFR SOIL
336	FDN DES QD45+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0M FOR HARD ROCK SOIL
337	FDN DES QD45+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
338	FDN DES QD45+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9M FOR WFR & SFR SOIL
339	FDN DES QD45+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9M FOR HARD ROCK SOIL
340	FDN DWG QD45+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
341	FDN DWG QD45+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0M FOR WFR & SFR SOIL
342	FDN DWG QD45+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+0M FOR HARD ROCK SOIL
343	FDN DWG QD45+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
344	FDN DWG QD45+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9M FOR WFR & SFR SOIL
345	FDN DWG QD45+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+9M FOR HARD ROCK SOIL
346	FDN DES QD60+0 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
347	FDN DES QD60+0 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0M FOR WFR & SFR SOIL
348	FDN DES QD60+0 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0M FOR HARD ROCK SOIL
349	FDN DES QD60+9 WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9M FOR WET, PS, FS, WBC & WET PADDY SOIL
350	FDN DES QD60+9 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9M FOR WFR & SFR SOIL
351	FDN DES QD60+9 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9M FOR HARD ROCK SOIL
352	FDN DWG QD60+0 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0M FOR WET, PS, FS, WBC & WET PADDY SOIL
353	FDN DWG QD60+0 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0M FOR WFR & SFR SOIL
354	FDN DWG QD60+0 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+0M FOR HARD ROCK SOIL
355	FDN DWG QD60+9 WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9M FOR WET, PS, FS, WBC & WET PADDY SOIL

S.NO.	ORGN DRG NO	DRG TITLE
356	FDN DWG QD60+9 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9M FOR WFR & SFR SOIL
357	FDN DWG QD60+9 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+9M FOR HARD ROCK SOIL
358	FDN DES QB1+25WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
359	FDN DES QB1+25 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+25M FOR WFR & SFR SOIL
360	FDN DES QB1+25 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+25M FOR HARD ROCK SOIL
361	FDN DES QB2+25WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
362	FDN DES QB2+25 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+25M FOR WFR & SFR SOIL
363	FDN DES QB2+25 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+25M FOR HARD ROCK SOIL
364	FDN DES QD45+25DRY	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR DRY, DFR & SANDY SOIL
365	FDN DES QD45+25WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
366	FDN DES QD45+25 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR WFR & SFR SOIL
367	FDN DES QD45+25 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR HARD ROCK SOIL
368	FDN DES QD60+25WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
369	FDN DES QD60+25 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+25M FOR WFR & SFR SOIL
370	FDN DES QD60+25 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+25M FOR HARD ROCK SOIL
371	FDN DWG QB1+25WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
372	FDN DWG QB1+25 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+25M FOR WFR & SFR SOIL
373	FDN DWG QB1+25 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB1+25M FOR HARD ROCK SOIL
374	FDN DWG QB2+25WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
375	FDN DWG QB2+25 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+25M FOR WFR & SFR SOIL
376	FDN DWG QB2+25 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QB2+25M FOR HARD ROCK SOIL
377	FDN DWG QD45+25DRY	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR DRY, DFR & SANDY SOIL
378	FDN DWG QD45+25WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR WET, PS, FS, WBC & WET PADDY SOIL

S.NO.	ORGN DRG NO	DRG TITLE
379	FDN DWG QD45+25 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR WFR & SFR SOIL
380	FDN DWG QD45+25 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD45+25M FOR HARD ROCK SOIL
381	FDN DWG QD60+25WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+25M FOR WET, PS, FS, WBC & WET PADDY SOIL
382	FDN DWG QD60+25 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+25M FOR WFR & SFR SOIL
383	FDN DWG QD60+25 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QD60+25M FOR HARD ROCK SOIL
384	FDN DES QC1+25DRY	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR DRY & SANDY SOIL
385	FDN DES QC1+25WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR WET, PS, FS, WBC & WET PADDY SOIL
386	FDN DES QC1+25 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR DFR, WFR & SFR SOIL
387	FDN DES QC1+25 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR HARD ROCK SOIL
388	FDN DES QC2+25DRY	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR DRY & SANDY SOIL
389	FDN DES QC2+25WET	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR WET, PS, FS, WBC & WET PADDY SOIL
390	FDN DES QC2+25 FR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR DFR, WFR & SFR SOIL
391	FDN DES QC2+25 HR	FOUNDATION DESIGN FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR HARD ROCK SOIL
392	FDN DWG QC1+25DRY	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR DRY & SANDY SOIL
393	FDN DWG QC1+25WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR WET, PS, FS, WBC & WET PADDY SOIL
394	FDN DWG QC1+25 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR DFR, WFR & SFR SOIL
395	FDN DWG QC1+25 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC1+18/25M FOR HARD ROCK SOIL
396	FDN DWG QC2+25DRY	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR DRY & SANDY SOIL
397	FDN DWG QC2+25WET	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR WET, PS, FS, WBC & WET PADDY SOIL
398	FDN DWG QC2+25 FR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR DFR, WFR & SFR SOIL
399	FDN DWG QC2+25 HR	FOUNDATION DRAWING FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC2+18/25M FOR HARD ROCK SOIL
400	DWG QC+18/25 STUB	STRUCTURAL DRAWING OF STUB FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+18/25M
401	BOM QC+18/25 STUB	BILL OF MATERIAL OF STUB FOR 400 kV M/C WZ-4 (TWIN HTLS) TT-QC+18/25M

C. For Distribution Packages

(i) 33/11/0.4/0.23 kV Distribution Lines

Design and Drawings for Distribution Lines					
S.N	**Description of documents**		**33kV Transmission line**	**11kV Distribution line**	**0.4kV Distribution Line**
1	Pre-Construction Survey of 33/11/0.4kV Transmission and Distribution line		☑	☑	☑
2	GTP & Drawings of Poles				
		13 m STTP pole	☑	☐	☐
		11m STP Pole	☐	☑	☐
		9m STP Pole	☐	☐	☑
		11m PSC Pole	☐	☑	☐
		9m PSC Pole	☐	☐	☑
3	Pole frame and accessories drawings for Transmission and Distribution line		☑	☑	☑
4	Conductors GTP & Drawings				
		33kV 300sqmm XLPE underground cable	☑	☐	☐
		11kV 300 Sqmm XLPE underground cable	☐	☑	☐
		GTP of ACSR DOG Conductor	☑	☑	☐
		GTP of 0.12 sq inch Covered Conductor	☐	☑	☐
		GTP of 95 Sqmm AB Cable	☐	☐	☑
		GTP of 70 Sqmm AB Cable	☐	☐	☑
5	GTP & Drawings of Transformers				
		GTP of 300kVA, 200kVA & 100kVA Distribution Transformer	☐	☑	☐
		GTP of 300kVA, 200kVA & 100kVA Distribution	☐	☑	☐

Design and Drawings for Distribution Lines					
S.N	**Description of documents**		**33kV Transmission line**	**11kV Distribution line**	**0.4kV Distribution Line**
		Transformer's Panel Board			
		Transformer load calculation of 300kVA, 200kVA & 100kVA	☐	☑	☐
		Transformer Platform of 300kVA, 200kVA & 100kVA	☐	☑	☐
6	GTP & Drawings of fiitings				
		0.12 Sq.mm Covered conductor fitting	☐	☑	☐
		AB Cable fitting	☐	☐	☑
7	GTP & Drawings of Insulators				
		33kV Pin Insulators	☑	☐	☐
		11kV Pin Insulators	☐	☑	☐
		11kV Disc Insulators	☑	☑	☐
		HT Stay Insulator	☑	☑	☐
		LT Stay Insulator	☐	☐	☑
8	GTP & Drawings of Switchgear accessories				
		Lightning Arrestors	☐	☑	☐
		DO Fuse	☐	☑	☐
		Earthing Sets	☐	☑	☐
9	As-Built Survey of 33/11/0.4kV Transmission and Distribution line		☑	☑	☑

(ii) 33/11 kV Distribution Substation:

Necessary design drawings (as applicable) from 400kV substation list shall form the list of the design/drawings and calculation for 33/11 kV distribution substations that needs to be reviewed and recommended for approval to the Client.

Annexure - II
Individual Packages Weightage
(For Task 1.1 – Design Services-Payment Break Down)

P-No	Packages	Weightage (%)
P-1	Construction of 400kV Transmission Line: Lot 1: New Butwal to Motipur on turnkey basis Lot 2: Motipur to Lamahi on turnkey basis	17 (Lot-1: 8 and Lot 2: 9)
P-2	Construction of 400/220/132kV Gas Insulated Substation at Lamahi.	16
P-3	Construction of 400 kV Transmission Line from Nijgadh to Ramauli.	12
P-4	Construction of 400/220/132kV Gas Insulated Substation at Ramauli (near Parwanipur)	12
P-5	New Butwal and Kushma Substations Expansion.	4
P-7	Construction of 220/132kV substation and associated infrastructure on turnkey basis at Teenpiple and associated Okharpauwa-Teenpiple 220kV LILO Transmission Line.	15 (TL – 7, SS -8)
P-8	Construction of 132kV transmission line, sub stations and associated infrastructure on turnkey basis for Dailekh-Jumla 132 kV transmission line and Jumla 132KV GIS substation.	12 (TL – 5, SS – 7)
P-9	LILO (6km) of 132 kV from Nepalgunj-Nanpara inter- connection transmission line & Construction of 132kV Substation at Nepalgunj inner city.	8 (TL – 4, SS – 4)
P-13	Expansion and Augmentation of Distribution System in Karnali Province	4
	Total %	100