Bairaka Lift DWS

Tatopani Rural Municipality-1

Jumla, District

REQUEST FOR QUOTATION (RFQ)

For

Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting Water Pumping System

Issued by:

User Committee of Bairaka Lift Drinking Water Supply (DWS) Scheme

Tatopani Rural Municipality-1, Jumla

Contract No.: 1/2082/083

June, 2026

Section I.

Request for Quotation (RFQ)

User Committee Bairaka Lift DWSS

Tatopani Rural Municipality-1

Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting Water Pumping System

Date of Notice Publication: June 25, 2026

1. **User Committee of Bairaka Lift DWS Scheme** invites sealed quotations from registered suppliers for Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting Water Pumping System in at Bairaka Lift DWS Scheme, Tatopani Rural Municipality-1, Jumla, District.
2. The VAT registered suppliers can obtain the signed quotation form from Tatopani Rural Municipality (RM), Jumla or Local Adaptation to Climate Change (LACC) Project, Project Support Unit (PSU), Birendranagar, Surkhet or can be downloaded from official sites of Tatopani RM (https://tatopanimun.gov.np/) and LACC Project (www.laccp.org.np) within 15 (i.e. 9th July, 2026) days from the first publication date.
3. Sealed quotation must be submitted to the Office of Tatopani RM or LACC Project, PSU, Birendranagar, Surkhet or Liaison Office of LACC Project- DMI Nepal Pvt Ltd. Sanokharibot, Shantinagar, Kathmandu-31 before 12:00 hours on 16th day (i.e. 10th July, 2026) of first publication date. Documents received after this deadline shall not be accepted.
4. Quotations must be valid for a period of 90 days from the day of deadline of submission.
5. If the last date of purchasing and opening falls on a government holiday, then the next working day shall be considered the last day.
6. The contractor must sign and stamp all the copies of submission including all the documents mentioned along with Technical Specification and any other document in the Quotation.
7. User committee reserves the right to accept or reject, wholly or partly any or all the quotations without assigning any reason, whatsoever.

Section II.

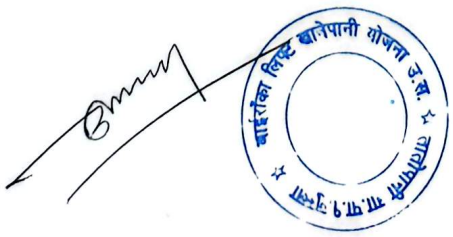
RFQ Data

1	Name of the Purchaser: **Bairaka Lift DWS Scheme of Tatopani Rural Municipality-1, Jumla District**
2	Name of Contract: **Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting Water Pumping System**
3	**Contractor's Eligibility Requirements are:** a) **Cover Letter** for submission of quotation b) **Company Profile and experience** in design, supply, and installation of electrical pumping schemes. Lift with Dug well is highly relevant to proposed assignment c) **Tax Registration/Payment** Certificate issued by the **Internal Revenue Department** evidencing that the contractor is updated with its tax payment obligations, or **Certificate of Tax exemption**, if any such privilege is enjoyed by the Bidder d) **Certificate of Registration of the business,** including Articles of Incorporation, or equivalent document if contractor is not a corporation e) **Quality Certificate** (e.g., ISO, etc.) and/or other similar certificates, accreditations, awards and citations received by the contractor, if any f) **Valid ISO 9001 and ISO 14000 and IEC/IS/NEPQA** Quality Assurance Certification of the proposed product especially solar pump & panel.
4	Purchaser's Address: Bairaka Lift DWS Scheme, Ward no. 1 of Tatopani RM, Jumla District **Technical Contact Person** Mobile no: 9858366555 Kali Bahadur Khadka, Sub Engineer, Tatopani RM, LACC Project Contact Person: Birendra Bahadur Shahi Position: Chairperson, Bairaka Lift DWS Scheme, Tatopani RM-1, Jumla Contact no: 9860537210
5	Language of the Bid: **English**
6	Quote validity period : 90 days counted from the date of bid submission deadline.
7	Deadline for RFQ submission : Date : 16th day of notice publication

	Time : 12:00 hours Place : Tatopani Rural Municipality office, Tatopani Jumla **or** Local Adaption to Climate Change Project, Project Support Unit (PSU), Simtalichowk, Birendranagar, Surkhet **or** Lasion office of LACC Project (DMI Nepal Pvt Ltd. Sanokharibot, Shantinagar, Kathmandu-31)
8	Completion of Task as mentioned in the Scope of Work Within 6 Months from the date of Agreement.
9	Estimated Amount of the Assignment: **NRS 2,577,529.13/-** In Word **Twenty Five Lakh Seventy Seven Thousand Five Hundred Twenty Nine Rupees Thirteen Paisa Only.**
10	Documentary **evidence of technical and production capabilities**: (i) **Minimum Three (3) Years** experience in electrical lifting water supply schemes (ii) **At least three electrical water supply lifting schemes** (lifting head more than 150 m) design, supply delivery, installation, testing commissioning projects within last five years. Experience letter should be submitted with the sealed quotation.
11	Performance Security Amount: Not needed as payment will be done after material received, verified and technical approval at Road Head.
12	Warranty: Minimum 5 years warranty against manufacturing defects of eletrical item. 3 Years Replacement Warranty of the pump and standard applicable for other components.
13	Defect liability period : Repair or replace any defects found during the Defect Liability Period of One Year.
14	**Payment** i. Upon Signing of Agreement and submission of Field verification report: Twenty (20) percent of the Contract Price ii. Upon receiving the materials at road head: Fifty (50) percent of contract price iii. Upon Submission of Installation Completion, Testing & Comssioning report along with handover as per contract: Maximum thirty (30) percent of the Contract Price iv. After Sales Service: The company shall provide regular support and have a field visit atleast once (1) a year up to three years. Thereafter the company shall visit the site atleast once a year on paid basis.

14	Local representative of the company, if any: Name of the representative: Address: Contact no:

1. Design electrical lift pumping system based on the minimum criteria as mentioned in Technical Specification: (I. Minimum Design Criteria- mentioned on the below page).
2. Field verification must be completed to assure the design & **submit the <u>detailed design report</u>** by the contractor's responsible Engineer after the award of the contract & **before the first installment.**
3. After the verification of design, install electrical lift pumping system based on the component recommended at Bills of Quantities (BoQ).
4. Works required for sequential installation of electrical lift Pumping System including necessary civil works (fixing casing pipe, solar frame) for mounting structures of solar module, shall be done by the contractor. All the work related to the proper installation and functioning of the system shall have to be carried out by the contractor with the prices offered in the quotation.
5. The contractor will make all necessary arrangements for satisfactory operation, maintenance and performance of the Pumping System for the Warrantee/ Guarantee period.
6. Warrantee/Guarantee will include rectification/replacement of all the defective and consumable components/items. During Warrantee/Guarantee period, all the arrangements for keeping the Electrical Pumping System functional shall be the sole responsibility of the contractor.
7. Coordinate with the NEA for necessary TOD meter and other electrical component design, supply, installation, testing and commissioning.
8. The contractor shall conduct on-site training of the user committee personnel regarding the assembly, start-up, operation, maintenance and repairs of the electrical lift Pumping System.
9. All necessary Spare parts/Tools should be provided by the contractor.
10. Transport the components to the site till the road head site as per mentioned in the BOQ.
11. Provide Sales Service for an additional 3 years (after 2 year's warrantee period) with a minimum of 1 site visit annually. This visit will be paid by the UC.
12. Contractors should have made representative agents at a provincial level with availability of solar pumping components sales for the pumping system and must be made linked with user committee.



Section IV. Technical Specification

4.1 Minimum Design Criteria

SN	Scheme's name and location	Design Data
2.	Bairaka Lift DWS Scheme, Tatopani-1, Bairaka, Jumla Location: Distribution tank GPS: Intake: 600235.733-X, 3233996.054-Y, 2204.736-Elev.	System that must be able to lift a minimum of = 51335 lpd lpd liters of water per day at = 207.42 m dynamic head with = 470.00 meter pipe length from well to top DC Single lift system proposed.

Contractor/Firm also need to submit alternative design with more efficient & economic design in single stage lift in different head level than mentioned. The technical evaluation committee will consider if the proposed system justifies required design & installation as per field requirement.

4.2 Submersible Pump Unit

The contractor must design the electric water pump unit and submit the detailed technical specification and the calculation showing the discharge of the pump to meet the **Minimum Design Criteria.** Contractor/Firm should submit the separate design with justification in change of pumping size meeting minimum require specification of technical part.

SN	Description	Specification	Contractor Proposal	Contractor's Remarks* (Fully Complaint/Nor Complaint)
1	Name of the manufacturer	Grundfos or Pedrollo or Lorentz or equivalent		
2	Brand/Model	Grundfos or Pedrollo or Lorentz or equivalent		
3	Pump Type	Submersible borehole pump or equivalent Water filled (Oil must not be used for lubrication), Submersible centrifugal or positive displacement Solar Pump, fully stainless Steel, with necessary casing and protection.		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks* (Fully Complaint/Nor Complaint)
		Pump Performance Curve I.e. Flow Vs Input Pump Power shall be provided at the Head of Project design. Warranty on the motor and pump: 2 years		
4	Minimum Efficiency	Pump motor efficiency must be at least 60 %		
5	Minimum Standard	Submersible borehole pump, suitable for pumping clean water. It can be installed vertically or horizontally. Pump carrying drinking water approval. **The pump and controller must be manufactured by the same company.** Pumps suitable for applications in groundwater lowering, pressure boosting, fountain applications. The suction interconnector is fitted with a strainer to prevent large particles from entering the pump. The suction interconnector is designed to comply with NEMA standards for motor mounting/dimensions.		
6	Material	All steel components made in stainless steel, EN 1.4301 (AISI 304), ensure high corrosive & wear resistance. Rotors and impellers must be made of stainless steel with a minimum grade of AISI 304 or higher.		
7	Control	The pump controller must have an MPPT control circuit. The pump or pump set must be capable of stopping operation in the event of dry running or insufficient energy		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks* (Fully Complaint/Nor Complaint)
		supply. Must be equal to or greater than the capacity of the pump. Warranty on the pump controller: 2 years Must be of the same brand of the Pump. The Bidder must submit the technical datasheet. A Manufacturer's Authorization letter provided by principal manufacturer in their letter head.		
8	Warranty	At least 2 years		
9	Protection Features	**Dry run protection,** **Over and under voltage protection,** **Overload protection,** Temperature Protection		

4.3 Motor Control Panel

Motor Control Panel wall mounted minimum 750 mmx 450 mmx 25 mm size sheet metal enclosure for above motors fabricated and assembled as per instruction with auto/manual start, IP 65 standard each consisting of:

1. 1 no. 32 A 50kA 4 Pole MCCB for motor back-up protection.
2. 1 set fully automatic air-break type Star-Delta Starter for 15 kW motor (min.20 A magnetic contactors) with electronic Timer.
3. Protection of motor against current (8-22A), dry running including float switch with required signal cable, single and opposite phasing
4. High and low water level guard with at least 1500m signal cable
5. Digital Voltmeter with S/S for 3 phases
6. C/T digital Ammeter with S/S for each motor.
7. Indicator Lamps for power supply and faults RYB Neon light indicators to indicate
8. Push button switch for "START" and "STOP"
9. 100 A input and output cable shoes connector.

4.4 11 kV Electric Power Line: Supply, install including poling, stringing, etc., testing & commissioning of the following items as per NEA standard and Engineer's instruction

4.4.1 Transformer structure and all fittings

Complete set of Transformer Structure as per NEA Standard consisting of followings in each set with 1 unit 25 kVA capacity 11/0.415 KV, 3 phase, 50 HZ. low loss copper winded Distribution Transformer), Make: NS and ISO Certificate holder Nepalese Manufacturer

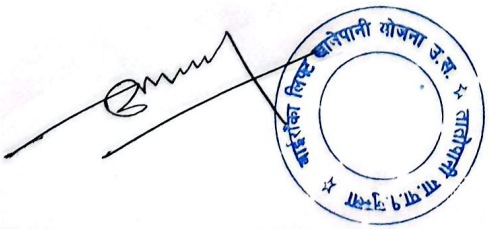
Minimum Accessories required for the transformer supply and installation:

1. 11 kV Pin insulator with pin and nut/washer
2. Steel cross galvanized arm Chanel (50x100x6.4x300) mm
3. Pole Clamp with nut bolt and washers (PC1)
4. Steel cross arm Chanel (500x100x6.4x1200) mm
5. Pole Clamp with stainless steel nut bolt washer (PC2)
6. Flat Cross Arm galvanized
7. 9 kV Surge Arrestor
8. Distribution cutout with fuse holders.
9. Chanel for LA and DO ISLC 100 2348 mm
10. Platform Chanel (TR1) ISMC100 2500 mm
11. Platform Chanel (TR3) ISMC100 2500 mm
12. Platform Chanel (TR2) ISMC100 1200 mm
13. Platform Chanel (TR4) ISMC100 1200 mm
14. Bracing Angle (TR5) 50x50x5 841 mm
15. Bracing Band (TR6 0R TR 6P) with 2 M16 bolt, nut and washer
16. M16 x250 bolt, nut and washer stainless steel
17. Maintenance free Chemical Earthing using Electrode of size 76 mm dia, 03 meter long connected with 50X6 mm Copper internal strip complete with excavation, civil works, cast iron cover with back fill compound. The earth resistance shall be as per IS 3043.
18. As required quantity copper grounding conductor
19. Preform Ties.
20. Full Galvanized Tubular Steel Pole

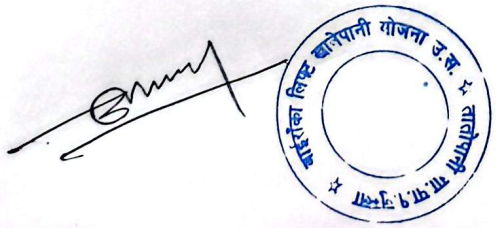
4.4.2 Galvanized Steel Tubular Pole

Full Galvanized Tubular Steel Pole : swaged type , confirming to IS: 2713 (Pat-I and III): 1980 as amended up to date , overall length : 11 m , planting depth : 1.8 m ,height above ground : 9.2 m. Thickness of each Section. : Bottom : 165.1x4.50 mm , middle : 139.7x4.50 mm Top : 114.3x3.65 mm, Approximate weight of Pole : 175 Kg

4.4.3 Other Items for 11 KVA Line



S.N.	Items	Specifications
1	Disconnect Switch	11 kV load disconnect Switch
2	1 ft. Cross Arm	1 feet Galvanized steel cross arm with necessary nut, bolt and washer
3	4 ft. Galvanized steel cross arm	4 feet galvanized steel cross arm with necessary nut, bolt and washer
4	11 kV Disc Insulator	Disc Insulator: IS:731, IS:2544 and IS:5350 or any other authoritative standard. The disc insulators shall be of Ball & Socket type., The cap of disc insulators shall be of Malleable Cast Iron whereas the ball pins shall be of Forged steel and All metal parts shall be of Hot dip galvanized as per IS: 2633., should be supplied in complete set with necessary nut-bolt and washer Nominal system voltage/Working voltage : 11 KV, Highest system voltage : 12 KV
5	11 kV Pin Insulator	Pin Insulator: IS:731, IS:2544 and IS:5350 or any other authoritative standard. Nominal system voltage/Working voltage: 11 KV, Highest system voltage : 12 KV
6	PG Clamp	Medium PG Clamp Suitable for 0.05 sq .in size cable
7	Transmission Wire: ABC Cable	4 core unarmored ABC insulated PVC sheathed 50 Sq mm cable. Standard IEC 60502/NS
8	Cable termination kit	Outdoor/indoor Heat shrink type termination kit suitable for 50 sq.mm size 1.1 kV class 3.5 core XLPE insulated copper conductor
9	Cable Clamp	Cable clamp to clamp 4 core ABC cable in poles
10	Stay set	Galvanized steel heavy stay set with necessary stay wire, stay insulator, binding wire, D-iron. etc all complete
11	Bush Connector	Bush connector for H/T and L/T side of the transformer suitable for 50 mm^2 size cable
12	Brass nut bolt	Brass nut bolt, washer for cable connection to transformer
13	Suspension Clamp	Suspension Clamp: Angled, Straight and or Strap type as per requirement
14	Dead end clamp	Dead end clamp : Aluminum alloy strain clamp (bolted type) or other suitable dead end clamp



4.5 400/230 V Power Line-Supply, Delivery, Installation including fixing, stringing, laying, Testing and Commissioning of Electricity Power Line and Accessories all complete

S.N.	Items	Specifications
1	Armored Copper Power Cable for transformer to main D/B of pump station	4 core 10 sq.mm NS certified 1.1 kV class XLPE insulated armored cable with copper conductor:
2	Outdoor Circuit Breaker	50 - 63 A , 25 kA 3 pole MCCB confirming to IS/IEC 60947-2 in outdoor ss cabinet.
3	KWH meter and Cabinet (Including NEA Processing fee and related works)	TOD KWH meter supplied by NEA and outdoor cabinet with NEA approved design with all necessary accessories and all NEA charge like, shutdown, transformer test, line charge, etc complete.
4	Main Power Distribution Board (MDB)	Main Power Distribution Board , self-supported , suitable size , provision of locking , IP 65 protection, with following components: a) 1 no. 50 -63 A 25 kA three pole MCCB b) 3 no 3P 25 -32 A, 25 kA MCCB c) 1 no.DP MCB 32 A d) Digital Volt meter, C/T Ammeter with S/S, Phase indication lamps e) Copper busbar (25X3)mm busbar
5	Equipment earthing	Maintenance free Chemical Earthing using Electrode of size 76 mm dia, 03 meter long connected with 50X6 mm Copper internal strip complete with excavation, civil works, cast iron cover with back fill compound. The earth resistance shall be as per IS 3043. Copper strip of size 32 mm X 5 mm, length as per required including installation (Cu purity not less than 99.9%) of required length.

4.6 Protection

4.6.1 Lightning Arrestor

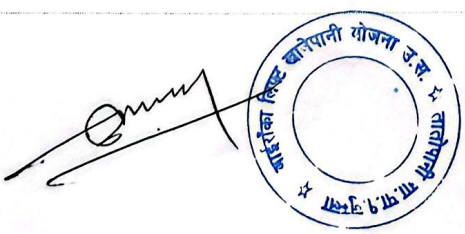
The lightning protection system shall be of the enhanced type which is designed to attract lightning to a preferred point and safely convey the lightning energy to ground with minimal risk of side flashing via a pre-determined route.

The complete lightning protection system will comprise the following key components.

a) Lightning Air Terminal
b) Mounting support
c) Dedicated down conductor
d) Dedicated Earthing system

4.6.2 The Lightning Air Terminal

- The lightning air terminal shall be an Early Streamer Emission terminal which will respond dynamically upon leader activity in the near area.
- The lightning air terminal shall be configured as a spheroid which is comprised of separate electrically isolated panels surrounding an earthed central finial.



- The insulation material used to electrically isolate the panels shall be comprised of a base polymer which provides high ozone and UV resistance with a dielectric strength of 24 – 38 KV/mm.
- The external shape of the advanced lightning rod shall be such that it will limit the development of sharp point corona discharge under static thunderstorm conditions.
- The central finial shall be elevated above the spheroid to a length of 86mm.
- The upper section of the central finals shall be rated to withstand 200KA.
- An air gap shall be provided between the individual electrically isolated panels (4 panels) and the final tip of the central road.
- Arcing shall occur between the panel sections of the spheroid and the finial tip only upon the progression of a lightning leader.
- The lightning air terminal shall have no moving parts and will have no dependence on external power supply or batteries.
- Under a normal atmosphere all components of the advanced lightning terminal shall be non-corroding.

4.6.3 Mounting Support

- The mounting pole used to support the lightning air terminal shall be a circular mast at a minimum height of 2 meters. The pole will have an outside diameter of 68mm.
- The mounting pole and supports shall be securely fixed with brackets and guy wires where required.
- Mounting structure shall be non-corrosive to be fixed on ground.
- PCC box of 0.3 cm above the ground level for the foundation or as per site.

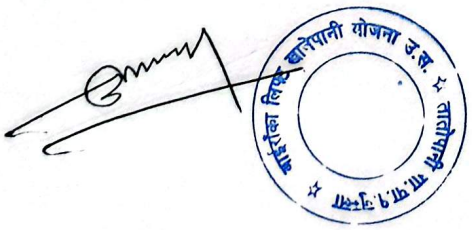
4.6.4 Down Conductor

The down conductor shall pass through the center of the pole for the entire length of the pole.

- Each lightning air terminal should be fixed with one down conductor. The down conductor should have a minimum size of 50mm² and can be a bare or insulated round / flat copper conductor. The down conductor should be fixed securely every one meter.
- The main copper conductor shall allow for direct connection to the lightning rod through the use of a compression lug.

4.7 Surge Protector

- The DC surge protection (SPD for voltage limiting or class C) device shall be installed in TT configuration and in parallel mode compatible with Nepal's electricity supply.
- The Class C arrester used in and neutral side should be single pluggable MOV based and Spark Gap based plug.
- The class C arrester should have visual and remote indication both in phase to neutral and neutral to ground protection module.
- The neutral and phase plugs should have clear marking so that it fits to the respective bases only.
- The Class C arrester should not be less than 40 kA protection level at waveform of 8/20 µs.
- The unit shall be compatible in mounting on DIN Rail Channel.



- The degree of protection should be IP20 and inflammability class should be V0.

4.8 Earthing/Grounding for Lightning Arrestor/ For Electrical and Safety Earthing

- The Earthing electrode shall be constructed in Pipe-in-Pipe technology.
- Chemical shall be filled in between the electrodes.
- Earthing electrode shall not be less than 48 mm outer diameter and 27 mm inner diameter.
- The length of the Earthing electrode shall not be less than 1500 mm.
- The hot dipped galvanization or plating of earth electrode shall be of copper and shall be 70 microns to 100 microns.
- Backfill material shall be chemical bag having not less than 25 kg for each earthing electrode.
- The earthing shall be installed in delta type consists of 3 electrodes for one set.
- Earthing inspection pit shall be made of solid concrete with minimum dimension of 320 mm x 320 mm x 200 mm. Cover shall be marked with word EARTH" or acceptable earthing marking.
- The final impedance reading does not exceed 10 Ohms.
- The use of certified chemical ground resistance improvement material (other than salt and charcoal) shall be applied in order to reduce the resistivity levels of the earthing system.

4.9 Others

The components of the Pumping systems must conform to the latest edition of IEC/ equivalent BoS Standards as specified in table below:

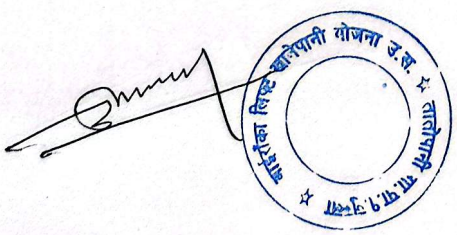
BoS item/component	Applicable Standard	
	Standard Description	**Standard**
Transmission Cables	NS standard for PVC insulated cables and UV resistant for outdoor installation 3 core 16 sqm or as per design	NS Standard
Switches/Circuit Breakers / Connectors	General Requirements Connectors-safety	NS/ IS standard
Junction Boxes/ Enclosures	General Requirements	IP 65 (for outdoor)/ IP 21 (for indoor) or Equivalent
SPV System Design and Installation Practices	PV Stand-alone System design, verification and electrical installation of building requirements for SPV power supply systems	NS/ IS Standard

4.6 Civil Works

The civil works for the solar pumping system will be as under:

1. Well and electromechanical and electrical system installation and fixing

Drawings: The details, drawings and calculations must be provided.



A	11 kV Electric Power Line : Supply ,install including poling, stringing...etc, testing & commissioning of the following items as per NEA standard and Engineer's instruction								
S.No.	Item Description		Unit	Unit Weight (kg)	Quantity	Rate (Rs) in Figure	Rate in Words (NRs.)	Total Amount	Remark
1	Transformer structure and all fittings: (Complete set of Transformer Structure as per NEA Standard consisting of followings in each set with 1 unit 25 kVA capacity 11/0.415 KV , 3 phase , 50 HZ. low loss copper winded Distribution Transformer), Make : NS and ISO Certificate holder Nepalese Manufacturer.		Set	210	1.00				
2	Transformer Accessories:	Accessories:							
		a) 11 kV Pin insulator with pin and nut/washer	Nos	275	6.00				
		b) Steel cross galvanized arm Chanel (50x100x6.4x300) mm	Nos	15	2.00				
		c) Pole Clamp with nut bolt and washers (PC1)	Nos	15	2.00				
		d) Steel cross arm Chanel (500x100x6.4x1200) mm	Nos	15	2.00				
		e) Pole Clamp with steelnesssteel nut bolt washer (PC2)	Nos	15	2.00				
		f) Flat Cross Arm galvanized	Nos	15	4.00				
		g) 9 kV Surge Arrestor	Nos	15	3.00				
		h) Distribution cutout with fuse holders.	Nos	15	3.00				
		i) Chanel for LA and DO ISLC 100 2348 mm	Nos	15	1.00				

		j) Platform Chanel (TR1)ISMC100 2500 mm	Nos	15	2.00				
		k) Platform Chanel (TR3)ISMC100 2500 mm	Nos	15	2.00				
		l) Platform Chanel (TR2)ISMC100 1200 mm	Nos	15	2.00				
		m) Platform Chanel (TR4)ISMC100 1200 mm	Nos	15	2.00				
		n) Bracing Angle (TR5) 50x50x5 841 mm	Nos	15	8.00				
		o) Bracing Band (TR6 0R TR 6P) with 2 M16 bolt, nut and washer	Set	15	2.00				
		p) M16 x250 bolt , nut and washer steelness steel	Nos	15	16.00				
		q) Maintenance free Chemical Earthing using Electrode of size 76 mm dia, 03 meter long connected with 50X6 mm Copper internal strip complete with excavation, civil works, cast iron cover with back fill compound. The earth resistance shall be as per IS 3043.	Set	15	3.00				
		r) As required quantity copper grounding conductor	LS	15	1.00				
		s) Preform Ties.	Packet	15	6.00				
		t) Full Galvanized Tubular Steel Pole : swaged type , confirming to IS: 2713 (Pat-I and III): 1980 as amended up to date , overall length :11 m , planting depth : 1.5m ,height above ground : 9.2 m. Thickness of each Section. : Bottom : 165.1x4.50 mm ,	Nos	2	2.00				

		middle : 139.7x4.50 mm Top : 114.3x3.65 mm, Approximate weight of Pole : 175 Kg							
3	Disconnect Switch	11 kV load disconnect Switch	Set	4	1.00				
4	Galvanized Steel Tubular Pole	Full Galvanized Tubular Steel Pole : swaged type , confirming to IS: 2713 (Pat-I and III): 1980 as amended up to date , overall length : 11 m , planting depth : 1.8 m ,height above ground : 9.2 m. Thickness of each Section. : Bottom : 165.1x4.50 mm , middle : 139.7x4.50 mm Top : 114.3x3.65 mm, Approximate weight of Pole : 175 Kg	Nos	175.00	4.00				
5	1 ft. Cross Arm	1 feet Galvanized steel cross arm with necessary nut, bolt and washer	Nos	10.00	4.00				
6	4 ft. Galvanized steel cross arm	4 feet galvanized steel cross arm with necessary nut, bolt and washer	Nos	10.00	4.00				
7	11 kV Disc Insulator	Disc Insulator :IS:731, IS:2544 and IS:5350 or any other authoritative standard. The disc insulators shall be of Ball & Socket type., The cap of disc insulators shall be of Malleable Cast Iron whereas the ball pins shall be of Forged steel and All	Nos	4.00	4.00				

		metal parts shall be of Hot dip galvanized as per IS: 2633., should be supplied in complete set with necessary nut-bolt and washer Nominal system voltage/Working voltage : 11 KV, Highest system voltage : 12 KV							
8	11 kV Pin Insulator	Pin Insulator : IS:731, IS:2544 and IS:5350 or any other authoritative standard. Nominal system voltage/Working voltage : 11 KV, Highest system voltage : 12 KV	Nos	2.00	12.00				
9	PG Clamp	Medium PG Clamp Suitable for 0.05 sq .in size cable	Nos	2.00	4.00				
10	Transmission Wire: ABC Cable	4 core unarmoured ABC insulated PVC sheathed 50 Sq mm cable. Standard IEC 60502/NS	KM	2,950.00	0.20				
11	Cable termination kit	Outdoor/indoor Heat shrink type termination kit suitable for 50 sq.mm size 1.1 kV class 3.5 core XLPE insulated copper conductor	Set	3.00	4.00				
12	Cable Clamp	Cable clamp to clamp 4 core ABC cable in poles	Set	2.00	5.00				
13	Stay set	Galvanized steel heavy stay set with necessary stay wire, stay insulator, binding wire, D-iron .. etc all complete	Set	18.00	3.00				
14	Bush Connector	Bush connector for H/T and L/T side of the transformer suitable to 50 mm^2 size cable	Nos	2.00	7.00				

15	Brass nut bolt	Brass nut bolt , washer for cable connection to transformer	Nos	14	7.00				
16	Suspension Clamp	Suspension Clamp : Angled, Straight and or Strap type as per requirement	Nos	15	5.00				
17	Dead end clamp	Dead end clamp : Aluminum alloy strain clamp (bolted type) or other suitable dead end clamp	Nos	15	5.00				
B	**400/230 V Power Line**	**Supply, Delivery, Installation including fixing , stringing, laying, Testing and Commissioning of Electricity Power Line and Accessories all complete**							
1	Armoured Copper Power Cable for transformer to main D/B of pump station	4 core 10 sq.mm NS certified 1.1 kV class XLPE insulated armoured cable with copper conductor:	Meter	2.95	35				
2	Outdoor Circuit Breaker	50 - 63 A , 25 kA 3 pole MCCB confirming to IS/IEC 60947-2 in outdoor ss cabinet.	Set	2	1				
3	KWH meter and Cabinet (Including NEA Processing fee and related works)	TOD KWH meter supplied by NEA and outdoor cabinet with NEA approved design with all necessary accessories and all NEA charge like, shutdown, transformer test, line charge....etc complete.	Work	14	1				

4	Main Power Distribution Board (MDB)	Main Power Distribution Board , self supported , suitable size , provision of locking , IP 65 protection, with following components: a) 1 no. 50 -63 A 25 kA three pole MCCB b) 3 no 3P 25 -32 A, 25 kA MCCB c) 1 no.DP MCB 32 A d) Digital Volt meter, C/T Ammeter with S/S, Phase indication lamps e) Copper busbar (25X3)mm busbar	Set	35	1				
5	Equipment earthing	Maintenance free Chemical Earthing using Electrode of size 76 mm dia, 03 meter long connected with 50X6 mm Copper internal strip complete with excavation, civil works, cast iron cover with back fill compound. The earth resistance shall be as per IS 3043. Copper strip of size 32 mm X 5 mm , length as per required including installation (Cu purity not less than 99.9%) of required length.	Set	105	3				
6	Misc. items	Copper wire of different sizes ,Cable shoes, cable socket, screw, nut, bolt, PVC tape , 11 meter aluminium ladder etc. misc. unidentified items required for the installation of all above items	LS	195	1				

						Total (A+B)			
5	Transportation of Goods	Transportation of all goods including load unload and stocking	kg		5,233.25				
6	Installation Services	Installation, Testing and Commissioning of all works and related	LS		1.00				
						Sub Total			
						VAT, 13%			
						Grand Total			

Tatopani Rural Municipality

Local Adaptation to Climate Change Project

Name of Scheme: Bairaka Lift DWS **Location: Ward No. 1.00** **Tole/Cluster: Bairaka**

BoQ of Electromechanical Item

1	Supply, Delivery, Installation , Testing and Commissioning of Electromechnical Item including pipe welding								
S.No.	Item	Technical Specification	Unit	Unit Weight (kg)	Total Quantity	Rate In Figure (Rs)	Rate in Word (Rs)	Amount	Remark

1	Pump Set	Submersible pump confirming to IS: 8034 (KSB or Pedrollo) or equivalent coupled with a suitable submersible motor to be installed in a 150 mm diameter well. for a duty of : 2.85 lps at 211 m total head. Power: 12 KW/15HP, Pump outlet : DN 50 mm, Nom. Length of pump set : 2042mm, Available power Supply : AC 3 phase 400 ± 10 % Volt, 50 HZ, Pump and Motor combined efficiency: 60%, Pump Body: Fully Stainless Steel	Set	135	2				
2	Motor Control Panel	Motor Control Panel wall mounted minimum 750 mmx 450 mmx 25 mm size sheet metal enclosure for above motors fabricated and assembled as per instruction with auto/manual start, IP 65 standard each consisting of : a) 1 no. 32 A 50kA 4 Pole MCCB for motor back-up protection. b) 1 set fully automatic air-break type Star-Delta Starter for 15 kW motor (min.20 A magnetic contactors) with electronic Timer . c) Protection of motor against : over current (8-22A) , dry running including	Set	35	1				

		flot switch with required signal cable, single and opposite phasing d) High and low water level guard with at least 1500m signal cable e) Digital Voltmeter with S/S for 3 phases f) C/T digital Ammeter with S/S for each motor. g) Indicator Lamps for power supply and faults RYB Neon light indicators to indicate. h) Push button switch for "START" and "STOP" i) 100 A input and output cable shoes connector.							
3	Casing Pipe	GI Casing Pipe / Pump Housing with necessary fittings and fitted with above pump (with the connection of Surface Plate, 65mm dai GI outlet, 63mm Inlet and 63mm dai washout pipe)	Set	8	1				
4	Submerssible Cable	6 mm squared 3-core copper submersible flat cable from control panel to pump	Mtr	1.95	50				
5	Pressure Gauge	Standard bottom entry water pressure gauge, size 100 mm , pressure reading up to 50 kg/cm^2 , connection : M10 x 1 , supplied with steel ball valve and adaptor for 15 mm (½")dia connection	Set	0.5	1				

6	**Cast Steel** Check Valve/Non Return Valve	DN 50 mm Double flanged Class ASA600 cast steel swing check (N-R) valve :Hydrostatic Test pressure : Body 150Kg/cm2 , Seat 110 Kg/cm2, Each valve shall be supplied with MS/GI flange at both ends	Set	2	1				
7	**Cast Steel** Gate Valve	DN 50 Double flanged Class ASA 600 cast steel Gate valve :Hydrostatic Test pressure Body 150 Kg/cm2 , Seat 110 Kg/cm2 : Each valve shall be supplied with MS/GI flange at both ends	Set	2	2				
8	GI Elbow	DN 50 mm GI 90^0 Heavy class Elbow	Nos	3	2				
9	GI Nipple	DN 50 mm GI Heavy Class 6" long nipple	Nos	1.5	6				
10	Unequal Tee	DN 50mm to 1/2" Unequal Tee	Nos	0.5	1				
11	Flange Set	ND-2"(50mm) 20 mm thick MS flange confirming to IS:6392 for 2.5 N/mm2 having 4 nos 18 mm dia bolt holes for M16 bolts.	Nos	3	6				
12	Gasket Sheet	5 mm thick Heavy class Gasket sheet	Nos	0.3	10				
13	Stainless steel nut bolt washer	a) M 16 nom. length : 75 mm	Nos	0.1	50				
		b) M20 nom. length :100 mm	Nos	5	50				
14	Chain Pulley	5 ton capacity chain pulley (ISO/ISI Standard)	Set	25	1				

15	GI stand for Chain Pulley block	1.5" GI Pipe stand for connect the chain pulley as per engineer's instruction	Set	15	1				
16	Joing of GI Pipe by welding	DN 50 mm Medium class ERW GI pipe confirming to IS:1239 , both end threaded with steel socket in one end ,nom. length 6 m each :	Mtr	6	16				
17	Sensor	High & Low water level Guard / Sensor / Level probes; prevent dry running	Nos	1	1				
						Total			

Summary of Financial Proposal

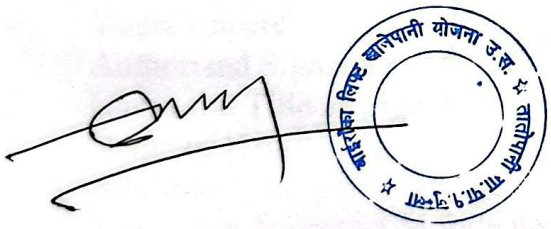
S.N.	Item Name	Cost	Remark
1	Supply, Delivery, Installation , Testing and Commissioning of Electromechnical Item including pipe welding		
2	11 kV Electric Power Line : Supply ,install including poling, stringing...etc, testing & commissioning of the following items as per NEA standard and Engineer's instruction		
3	Supply, Delivery, Installation including fixing , stringing, laying, Testing and Commissioning of Electricity Power Line and Accessories all complete		
4	Transportation of all goods including load unload and stocking		
5	Installation, Testing and Commissioning of all works and related		
	Total		

Important Note: Contractor/Firm/Suppliers can propose separate economical, efficient design & estimated BoQ by authorized Engineering designer with one of the pumping systems of **Grundfos or Pedrollo or Lorentz** or equivalent. Technical evaluation can consider the new design and proposed costing maintaining the minimum standards of technical specifications.

Transportation (Road Head locations): Bairaka, Tatopani Rural Municipality-1, Jumla (Scheme Area)

Please trick the following information option as per your capacity:

Availability Pump in the stock	☐ Yes ☐ No
Time required for the contractor to deliver the materials to the sites after agreement with the UC:	☐ Within One month ☐ 1-2 month ☐ More than 2 months
Availability of spare parts of solar pump, Panel & other accessories in local Market:	☐ Available in Jumla Bazar ☐ Birendranagar, Surkhet ☐ Nepalgunj ☐ Kathmandu
Availability of Local Technical Agent for repair & maintenance of solar pump, Panel & other accessories in region:	Available in ☐ Jumlaa Bazar ☐ Birendranagar, Surkhet ☐ Nepalgunj



Annex: 1 Cover Letter format

[On Firm's Letterhead]

<Insert date>

To: Bairaka Lift DWS Scheme, User Committee

Tatopani-1, Jumla

We, the undersigned, provide the attached proposal in accordance with **RFQ** Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting Water Pumping System **dated** ..... Our attached proposal is for the total price of <Sum in Words Rs ..... Sum in Figures..... for the three systems) >. We honestly understood & accepted the technical specification and requirement of the WSUC for the given task.

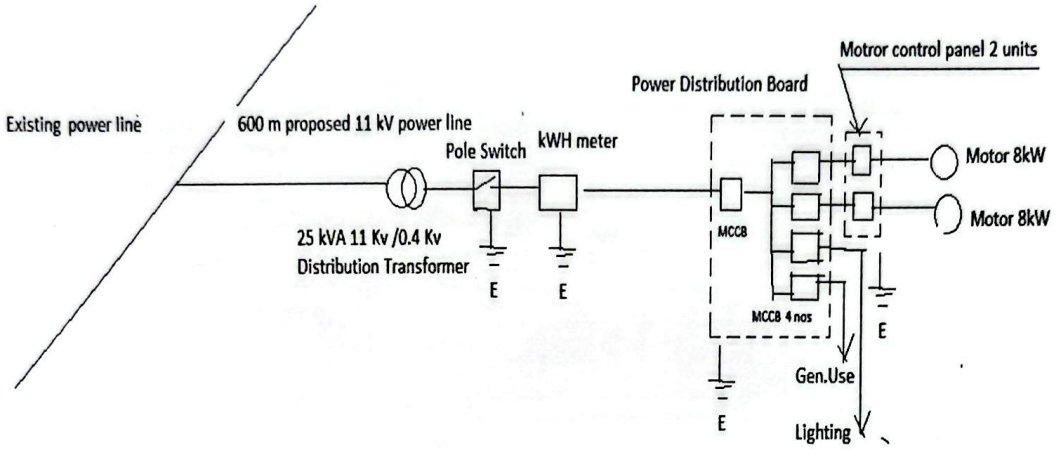
I certify a validity period of ..... days for the prices provided in the attached Bill of Quantities. Our proposal shall be binding upon us subject to the modifications resulting from any discussions.

Offeror shall verify here the items specified in this RFQ document.
We understand that the User Committee is not bound to accept any proposal it receives.

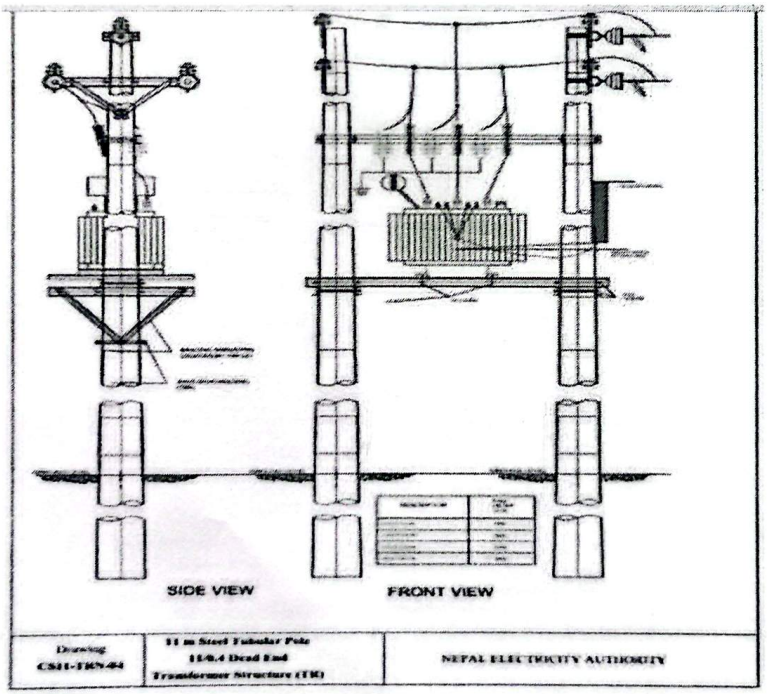
Yours sincerely,
Authorized Signature:
Name and Title of Signatory: .....
Name of Firm: .....
Address: .....
Telephone & contact Mobile no: .....
Email: .....
Company Seal/Stamp:

Annex :2 Drawing of Power Distribution System

POWER DISTRIBUTION DIAGRAM



Annex-3: Drawing of Transformer



Annex:5 Initial Design

Tatopani Rural Municipality

Local Adaptation to Climate Change Project

Design of Pump

Name of Scheme: Bairaka Lift DWS   Location   Ward No   1.00 Tole/Cluster   Bairaka

Distance of pumping main, L	= 470.00 m	470.00	Design length of Transmission pipe main
Total level difference between Source and proposed reservoir	= 130.00 m	130.00	RL of Lifting point - RL of source
Total Water Demand	= 51335 lpd	48890.00	Total water Demand (at the end of Design year)
Working hour of Pump	= 5.0 hour		
The discharge to be pumped, Q	= 10266.90 L/h		
	= 10.27 m^3/h		
	= 2.85 lps		0.102270403

By Lea's formula, economic size of pumping main, D is given then.

$D = 1.22\sqrt{Q}$

Hence, D = 65.15 mm

However available size of GI pipe nearest to this size is: = 50.00 mm

Hence, use 50 mmØ GI pipe having bore = 50.00 mm

Calculation of head loss :

Here, discharge, Q	2.85 Lps
For 50 mmØ GI pipe	
Pipe bore, D	= 50.00 mm
For length, L	= 470.00 m
Pipe material being used	GI
Velocity of flow, $V = Q/A = 4Q/\pi D^2$	= 1.45 m/s
Absolute roughness	= 1.00 mm
Coefficient of friction, f	= 0.0495

Using Darcy-Weisbach equation

Headloss, $H_l = f.L/D.v^2/2g$	= 55.02 m
Total headloss	= 55.02

Total head for pumping = Level difference + headloss + Suction head   m

Depth of sump-well = 18.00 m   Infiltration Galleries

However take the dyanimic level of water for submersible pump as 1.4 m below the sumpwell

the dynamic level of water below the sumpwell for submersible pump as = 1.40 m

∴ **Total dynamic head, H** = 207.42 m   Adopted Head   195.00 For safety

Horse Power of Pump

$$HP = \frac{Q \rho g H}{746\, \eta}$$

Where,

Q = discharge, m^3/s
ρ = density of water, kg/m^3
g = acceleration due to gravity, m/s^2
H = total dynamic head, m
η = efficiency of pump

Assuming efficiency of pump as = 50.00 %

The HP of pump required = 15.53 = 11.58 KW

From pump manufacturer's characteristic performance curve, following pump matches

Name of pump :	**KSB Submersible Pump or its equivalent**
Pump model :	**UPF 60/23, UMA I 150-13/22, 11KW, 15HP, Rated Current-20A, Length-2042mm & 135kg weight**
11m3/hour at 211m dynamic head	
Phase of power supply :	Three
Power of pump :	**11.00 kW**
Discharge :	11m3/hr
Which exactly matches the required condition	
Total length of pump and motor(ksb):- 2042mm, NRV size of pump :- 50mm	
Minimum Well Diameter=100mm	

Name of pump :	**Pedrollo Submersible Pump or its equivalent**
Pump model :	6SR 70G/150-N Stages-14, 11KW, 15HP, 1785mm-long, 77.2kg-Weight
12m3/hour at 220m dynamic head	
Phase of power supply :	Three
Power of pump :	**11.00 kW**
Discharge :	12m3/hr

Efficiency of Pump, η is given by equation

Where,

η = efficiency of pump
Q = discharge, m^3/s
ρ = density of water, kg/m^3
g = acceleration due to gravity, m/s^2
H = total dynamic head, m
P = power of pump in kW

Efficiency of proposed pump, η for Q=2.852 L/s, H=207.42 m and P=11 kW

η = 52.66 %

Power of 3-phase pump/motor = √3×V.I Cosφ

Where, V = 400-415) V

Therefore current I(in Ampere) :- = 21.17

[Cosφ = 0.75 (for motors)]

Water Hammer Pressure

Since the pump is closed suddenly, which results the water hammer pressure at the delivery pipe. The water hammer pressure, Ph is given by:

Where,

V = velocity of flow in pipe(m/s)
g = acceleration due to gravity(m/s^2)
w = specific weight of water (N/m^3)
K = Bulk modulus of water(N/m^2)
d = bore of pipe(m)
t = thickness of pipe(m)
E = Youngs modulus of elasticity of pipe material(N/m^2)
$1/m$ = Poisson ratio

For galvanised iron pipe and for above condition.

V	= 1.45 m/s
g	= 9.81 m/s^2
w	= 9810.00 N/m^3
K	= 2060.00 N/mm^2
d	= 50.00 mm
t	= 4.50 mm
E	= 210.00 kN/mm^2
1/m	= 0.270

Max. water hammer pressure, Ph = 1.993 N/mm^2
= 20.32 kg/cm^2

Max. pressure that should be withstand by conduit material

(static pressure+water hammer pressure = 35.54 kg/cm^2 Provide the Pipe to withstand this pressure immediately out of Pump

This pressure may withstand by GI heavy pipe duty with welded joints.