

सिलबन्दी दरभाउपत्र आह्वानको सूचना

प्रथम पटक प्रकाशित मिति: २०८३/०४/१२

कपुरकोट गाउँपालिका/जलवायु परिवर्तन स्थानीय अनुकूलन परियोजना द्वारा सञ्चालित खहरे लिफ्ट खानेपानी तथा सरसफाइ र जामुने जुकेखोला खानेपानी तथा सरसफाइ योजनाहरूका लागि परियोजनाको खरिद निर्देशिका बमोजिम लिफ्ट योजना निर्माणमा प्रयोग हुने सोलार, विद्युतिय तथा इलेक्ट्रो—मेकानिकल सामग्रीहरू (पम्प, कन्ट्रोलर, तार, फिटिङ्ग्स आदि) खरिद तथा जडान गर्नुपर्ने भएकोले इच्छुक तथा योग्य आपूर्तिकर्ता/फर्महरूबाट प्रस्ताव पेश गर्नका लागि खरिद समितिले खुला आह्वान गर्दछ। तसर्थ, निम्न सर्तहरू अन्तर्गत रहि दरभाउपत्र फाराममा प्रदान गरिएको परिमाण तथा तोकिएको स्पेसिफिकेशन गुणस्तर र तौल अनुसार सामग्री आपूर्ति गर्न इच्छुक भ्याटमा दर्ता भएका तथा सम्बन्धित क्षेत्रमा अनुभव प्राप्त सप्लायर वा फर्महरूबाट सिलबन्दी दरभाउपत्र आह्वान गरिएको छ ।

शर्तहरू:

- इच्छुक विभिन्न आवश्यक सोलार, विद्युतिय तथा इलेक्ट्रो—मेकानिकल सामग्रीहरू (पम्प, कन्ट्रोलर, तार, फिटिङ्ग्स आदि) खरिद तथा जडान कार्य सम्बन्धी दरभाउपत्र फारम सम्बन्धित कपुरकोट गाउँपालिकाको कार्यालय कपुरकोटबाट वा लक परियोजनाको आधिकारिक वेबसाइट www.laccp.org.np वा कपुरकोट गाउँपालिकाको वेबसाइट www.kapurkotmun.gov.np बाट प्राप्त गर्न सकिनेछ ।
- सिलबन्दी दरभाउपत्र पेश गर्दा तोकिएको फारम र विभिन्न आवश्यक आवश्यक सोलार, विद्युतिय तथा इलेक्ट्रो—मेकानिकल सामग्रीहरू (पम्प, कन्ट्रोलर, तार, फिटिङ्ग्स आदि) खरिद तथा जडान कार्य सम्बन्धी दरभाउपत्र फारम प्रति फारामरु. ३००० अक्षरेपी रु. तिन हजार मात्र (पछि फिर्ता नहुने गरी) कपुरकोट गाउँपालिकाको नाममा रहेको नेपाल इन्भेष्टमेन्ट मेगा बैंक लिमिटेडमा रहेको आन्तरिक राजस्व खाता नं.-१२८०१४००००००८६ (ग १.१) मा LLRP वाट जम्मा गरेको सक्कलै भौचर वा राजस्व शाखा सुत्रमा जम्मा भएको सिर्जित सक्कल भौचर सहित फारम वा कम्पनी वा सप्लायरको लिखित निवेदनको साथमा मूल्य अभिवृद्धि कर दर्ताको प्रमाणपत्र, यस आ ब को कर चुक्ताको प्रमाणपत्र तथा कार्य अनुभवको प्रमाणपत्र सहित यो सूचना प्रकाशित भएको मितिले ८औं (आठौं)(२०८३।०४।१९)दिनको दिउसो १२:०० बजे भित्र कार्यालय समय भित्र सम्बन्धित कपुरकोट गाउँपालिकाको कार्यालय वा जलवायु परिवर्तन स्थानीय अनुकूलन परियोजना, परियोजना सहयोग इकाई बिरेन्द्रनगर सुर्खेत वा विकास व्यवस्थापन सस्था (DMI Pvt. Ltd) प्रा.लि. नुससे मार्ग, शान्तिनगर-११, काठमान्डौमा पेश गरि सक्नु पर्नेछ। दरभाउपत्र फाराम सिलबन्दी गरी सम्बन्धित उपभोक्ता समितिको नाम, ठेगाना र सोलार/विद्युतिय र इलेक्ट्रो मेकानिकल सामग्रीहरू (पम्प, कन्ट्रोलर, तार, फिटिङ्ग्स, आदि) सप्लाइ तथा जडान सम्बन्धी दरभाउपत्र भन्ने व्यहोरा उल्लेख गर्नुपर्नेछ।
- सिलबन्दी दरभाउ पत्र पेश गर्दा
 - सप्लायरको आधिकारिक प्रतिनिधि आफै उपस्थित भई वा हुलाक वा कुरियर मार्फत समेत पेश गर्न सक्नेछ ।
 - हुलाक वा कुरियर मार्फत पठाएको सिलबन्दी दरभाउपत्र सूचना प्रकाशित भएको मितिले ८औं (आठौं) दिनको दिउसो १२:०० बजे भित्र प्राप्त भईसक्नु पर्नेछ ।
- सप्लाइ हुने सामग्रीहरूको भुक्तानी उपभोक्ता समितिहरूको गोदाममा खहरे, जामुने मा ढुवानी तथा जडानभै प्राविधिक चेकजाँच भएपछि मात्र हुनेछ । यसैले बोलपत्र सम्बन्धि धरौटी तथा बैंक जमानतको आवश्यकता पर्ने छैन।



- उपरोक्त अनुसार प्राप्त भएका दरभाउपत्रहरू संकलन गरी यो सूचना प्रकाशित भएको मितिले ११ औं (२०८३।०४।२२) दिन कपुरकोट गाउँपालिका कपुरकोट, सल्यानमा दिउसो १२:०० बजे उपभोक्ता समितिका खरिद समितिका प्रतिनिधिहरू, गाउँपालिका कार्यालयका प्रतिनिधिहरू, जलवायु परिवर्तन स्थानीय अनुकूलन परियोजना प्रतिनिधिहरू र दरभाउपत्रदाताहरू वा निजहरूको प्रतिनिधिको रोहवरमा खोलिनेछ । दरभाउपत्रदाताको प्रतिनिधि उपस्थित नभएमा दरभाउपत्र खोलन बाधा पुग्ने छैन ।
- दरभाउपत्र दर्ता गर्ने तथा खोल्ने अन्तिम दिनमा सार्वजनिक विदा पर्न गएमा सो को भोलिपल्ट कार्यालय खुलेको दिन तोकिएको समय भित्र दर्ता गरिने वा खोलिनेछ ।
- दरभाउपत्रमा दररेट लेख्दा अंक र अक्षरमा स्पष्ट लेख्नुपर्नेछ । अंक र अक्षरमा फरक परेमा अक्षरमा लेखेकोलाई मान्यता दिइनेछ । अंक र अक्षरमा केरमेट भएकोमा दस्तखत र छाप लगाएको हुनु पर्नेछ ।
- दरभाउपत्र फारममा तोकिएका लेखे स्थानहरू बाहेक, अन्यत्र कुनै पनि थप नोट, संकेत तथा कुनै जानकारी लेख्नु हुँदैन ।
- म्याद नाघी वा रीत नपुगी आएको दरभाउपत्र उपर कुनै कारबाही हुने छैन ।
- दरभाउपत्र स्वीकृत गर्ने वा नगर्ने वा आंशिक रूपमा स्वीकृत गर्ने सम्पूर्ण अधिकार उपभोक्ता समितिहरूमा सुरक्षित रहनेछ ।
- अन्य शर्तहरू परियोजनाको सामुदायिक खरिद कार्यविधि २०८२ बमोजिम हुनेछ । थप शर्तहरू दरभाउपत्र फारम साथै संलग्न गरिएको छ ।
- यो सूचनामा केहि संशोधन गर्नु परेमा सो को सूचना गाउँपालिका/नगरपालिकाहरूको सूचना पाटीमा जानकारी गरिनेछ ।
- थप आवश्यक जानकारीहरू सम्बन्धित योजनाहरूको कोटेशन फारम तथा स्पेसीफिकेशनमा उल्लेख गरिएको छ ।
- अन्य थप जानकारी चाहिएमा कपुरकोट गाउँपालिका वा जलवायु परिवर्तन स्थानीय अनुकूलन परियोजना क्लस्टर प्राविधिक सहयोग इकाई खलंगा, सल्यानमा मा सम्पर्क गर्न सकिनेछ ।

संयुक्त खरिद समिति

तपसील

- १) खहरे लिफ्ट खानेपानी तथा सरसफाई योजना उपभोक्ता समिति, कपुरकोट — २, सल्यान
- २) जामुने जुकेखोला खानेपानी तथा सरसफाई योजना उपभोक्ता समिति, कपुरकोट — ५, सल्यान



Joint Procurement Committees
Jamune Jukekhola Lift WSS, Kapurkot Rural Municipality-5
And
Khahare Lift WSS, Kapurkot Rural Municipality-2
Salyan, District

REQUEST FOR QUOTATION (RFQ)
For
Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting
Water Pumping System

Issued by:
Joint Procurement Committee of
Jamune Jukekhola Lift WSS, Kapurkot Rural Municipality-5
And
Khahare Lift WSS, Kapurkot Rural Municipality-2
Salyan, District

Contract No.: 2/2083/084

28 July, 2026



Section I. Request for Quotation (RFQ)

Joint Procurement Committee

Jamune Jukekhola Lift WSS, Kapurkot Rural Municipality-5

And

Khahare Lift WSS, Kapurkot Rural Municipality-2

Salyan, District

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

Date of Notice Publication: July 28, 2026

- 1. Joint Procurement Committee of Jamune Jukekhola Lift WSS Scheme and Khahare Lift WSS** invites sealed quotation from registered suppliers for Design, Supply, Delivery, Installation, Testing and Commissioning of Electrical Lifting Water Pumping System in at Jamune Jukekhola Lift WSS Scheme, Kapurkot Rural Municipality-5 and Khahare Lift WSS, Kapurkot Rural Municipality-2, Salyan, District Salyan, District.
- The VAT registered suppliers can obtain the signed quotation form from Kapurkot Rural Municipality, Salyan or LACCP PSU, Birendranagar, Surkhet or can be downloaded from official sites of Kapurkot RM (<https://www.kapurkotmun.gov.np>) and LACC Project (www.laccp.org.np) .
- Sealed quotation must be submitted to Kapurkot Rural Municipality office or Local Adaption to Climate Change Project, Project Support Unit (PSU), Birendranagar, Surkhet or Liaison office of LACC Project (DMI Nepal Pvt Ltd. Sanokharibot, Shantinagar, Kathmandu-31) before 12:00 hours on 8th day of first publication date. Documents received after this deadline shall not be accepted.
- Quotations must be valid for a period of 90 days from the day of deadline of submission.
- If the last date of purchasing and opening falls on a government holiday, then the next working day shall be considered the last day.
- 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.
- 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: Jamune Jukekhola Lift WSS and Khahare Lift WSS of Kapurkot Rural Municipality, Salyan 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 Authority 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 the pump.
4	Purchaser's Address: Jamune Jukekhola Lift WSS Scheme, Ward no. 5 of Kapurkot Rural Municipality and Khahare Lift WSS, Kapurkot Rural Municipality-2, Salyan, District Salyan District Technical Contact Person Mobile no: 9841129389 Chhabi Devkota (Sub-Engineer) Email: d.chhabi@gmail.com Contact Person: Kashiram Reule Position: Chairperson of Jamune Jukekhola Lift WSS Scheme Contact no: 9766800799 Contact Person: Lalit Bahadur Oli Position: Chairperson of Khahare Lift WSS Contact no: 9766449360
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 : 8th day of notice publication Time : 12:00 hours Place : Kapurkot Rural Municipality office, Kapurkot Salyan or Local Adaption to Climate Change Project, Project Support Unit (PSU), Simtalichowk, Birendranagar, Surkhet or Liason 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 Jamune Jukekhola DWS including VAT and Transportation: NRS 2,757,370.28 In Word Twenty seven lakhs fifty seven thousand three hundred seventy rupees twenty eight paisa only. Estimated Amount of the Khahare Lift DWS including VAT and Transportation: NRs. 3,596,721.89 In Word Thirty five lakhs ninety six thousand seven hundred twenty one rupees eighty nine paisa only. <u>Estimated Amount of the Assigment (Both Scheme) including VAT and Transportation: NRs. 6,354,092.17</u> <u>In Word Sixty Three Lakh Fifty Four Thousand Ninety Two Rupees Seventeen Paisa.</u>
10	Documentary evidence of technical and production capabilities: (i) Minimum Three (3) Years experience in electrical lifting water supply scheme (ii) At least three electrical water supply lifting schemes (lifting head more than 250 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 & Commissioning 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.
15	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 detailed design report** by the contractor's responsible Engineer after the award of the contract & **before first installments**.
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, frames) for mounting structures, 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 2 year's 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 mention in 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 UC.
12. Contractors should have made representative agents at a provincial level with availability of the electric 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
1.	Jamune Jukekhola Lift WSS Scheme, Kapurkot-5, Sihabire danda, Salyan Location: DC-GPS 28.271028328 N 82.338523088 E	1 st Stage: System that must be able to lift a minimum of = 32,181 lpd liters of water per day at 200 m dynamic head with 462.3meter pipe length from well to intermediate RVT. 2nd Stage: System that must be able to lift a minimum of = 32181 lpd liters of water per day at 200 m dynamic head with 655-meter pipe length from well to top DC. Double lift system proposed.
2	Khahare Lift WSS Scheme, Kapurkot-2, Khahare Tole Salyan Location: Distribution tank GPS 28.239281661, 82.372857435	System that must be able to lift a minimum of = 14,475 lpd liters of water per day at 354 m dynamic head with 602 meter pipe length from well to top RVT Single lift system proposed in

Contractor/Firm also need to submit alternative design with more efficient & economic design in two 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 electrical 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 KSB or Pedrollo or Lorentz or equivalent		
2	Brand/Model	Grundfos or KSB or Pedrollo or Lorentz or equivalent		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks* (Fully Complaint/Nor Complaint)
3	Pump Type	Submersible borehole pump or equivalent Water filled (Oil must not be used for lubrication), Submersible centrifugal or positive displacement Electrical Pump, fully stainless Steel, with necessary casing and protection. Pump Performance Curve I.e. Flow Vs Input Electrical 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 50 %		
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 &		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks* (Fully Complaint/Nor Complaint)
		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 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 over 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.

- Lightning Air Terminal
- Mounting support
- Dedicated down conductor
- 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 finials 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 rod.
- 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.

- The Class C arrester should not be less than 40 kA protection level at waveform of 8/20 μ s.
- 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.
- Chemicals 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.

4.5 Others

The components of the Electrical 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 electrical 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.

Section V. Bill of Quantity (BoQ)

S.No.	Items	Unit	Total Quantity			Rate		Amount	Re- marks
			Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
1	Supply, Delivery, Installation , Testing and Commissioning of Electrical Water Lifting Project								
1.1	Pump Set: Submersible pump confirming to IS: 8034 or equivalent coupled with a suitable submersible motor to be installed in a 100 mm diameter well. for a duty of :6 m³/hr at 200 m total head, nom. Power: 5.5KW/7.5HP, Pump outlet : DN 50 mm, Available power Supply : AC 3 phase 400 ± 10 % Volt, 50 HZ, Pump and Motor combined efficiency: 50%,	Set	2		2				
	Pump Set: Submersible pump confirming to IS: 8034 or equivalent coupled with a suitable submersible motor to be installed in a 100 mm diameter well. for a duty of :2.5 m³/hr at 354 m total head, nom. Power: 5.5KW/7.5HP, Pump outlet : DN 38 mm, Available power Supply : AC 3 phase 400 ± 10 % Volt, 50 HZ, Pump and Motor combined efficiency: 50%,	Set		1	1				
1.2	Pump Housing:DN 200 mm PN6 HDPE pump housing pipe in 4 m length with all required items as per instruction and drawing.	Set	1	1	2				
1.3	Pump Housing Cover:Surface discharge plate fabricated with a OD 200 mm , 22 mm thick circular MS plate having 8 nos. 22 mm dia. Bolt holes for M20 bolts with DN 50 mm (OD matching to class 600 cast steel check Valve Flange) GI flange and a DN 25 mm ventilator pipe fabricated as per instruction and drawing	Set	2	1	3				
1.4	Gate Valve For Feeder pipe:DN 50 mm gate valve with complete flange set(Ns-149)	Set	2	1	3				
1.5	GI Elbow:DN 50mm GI 90 ⁰ Med. class Elbow	Nos	4		4				
1.6	GI Nipple:DN 50 mm GI Med. Class 6" long nipple	Nos	12		12				



S.No.	Items	Unit	Total Quantity			Rate		Amount	Re- marks
			Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
1.7	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	2	1	3				
1.8	Cast Steel Check Valve(NRV):DN 50 mm Double flanged Class ASA300 cast steel swing check (N-R) valve :Hydrostatic Test pressure : Body 150Kg/cm ² , Seat 110 Kg/cm ² , Each valve shall be supplied with MS/GI flange at both ends	Set	2		2				
1.9	Cast Steel Gate Valve:DN 50 mm Double flanged Class ASA300 cast steel Gate valve :Hydrostatic Test pressure Body 150 Kg/cm ² , Seat 110 Kg/cm ² : Each valve shall be supplied with MS/GI flange at both ends	Set	2		2				
1.10	Flange Gasket:DN 50 mm Heavy class Rubber flange gasket	Nos	24		24				
1.11	Gasket Sheet:5 mm thick Heavy class Gasket sheet	Nos	20	10	30				
1.12	GI-HDPE Flange Set: GI-HDPE Flange set 50*63 mm, NS/IS	Nos	2		2				
1.13	Chain Pulley: 3 ton capacity chain pulley (ISO/ISI Standard)	Set	1	1	2				
1.14	Water level float switch-dry run sensor: Water level float switch-dry run sensor for both pump and sump well with complete set.	set	2	1	3				
1.15	Tripod Stand :Tripod heavy duty 6m long all complete	Set	1	1	2				
1.16	Toolset: Toolset (Clampmeter, Pipe Wrench, Wire Cutter, Spanner, Plier, Tester, Plus/Minus Screw driver etc) as per engineer's instruction	Set	2	1	3				

S.No.	Items	Unit	Total Quantity			Rate		Amount	Re- marks
			Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
1.17	GI Elbow:DN 40 mm GI 90 ⁰ Med. class Elbow	Nos		2	2				
1.18	GI Nipple:DN 40 mm GI Med. Class 6" long nipple	Nos		6	6				
1.19	Cast Steel Check Valve:DN 40 mm Double flanged Class ASA300 cast steel swing check (N-R) valve :Hydrostatic Test pressure : Body 150Kg/cm ² , Seat 110 Kg/cm ² , Each valve shall be supplied with MS/GI flange at both ends	Set		1	1				
1.2	Cast Steel Gate Valve:DN 40 mm Double flanged Class ASA300 cast steel Gate valve :Hydrostatic Test pressure Body 150 Kg/cm ² , Seat 110 Kg/cm ² : Each valve shall be supplied with MS/GI flange at both ends/HATAUNE	Set		1	1				
1.21	Flange Gasket:DN 40 mm Heavy class Rubber flange gasket	Nos		12	12				
Total of S.No.1									
2	Supply , jointing with electrical arc welding , laying , testing and commissioning all complete of Pumping Main Pipeline								
2.1 (a)	ERW Galvanized steel pipe	i) DN 50 mm 3.65 mm thick medium class ERW galvanized steel pipe confirming to IS 1239 plain ended (bevel cut) suitable for electric welding nom length .	Mtr	30	30				
		i) DN 40 mm 3.25 mm thick medium class ERW galvanized steel pipe confirming to IS 1239 plain ended (bevel cut)	Mtr	630	630				

S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
		suitable for electric welding nom length .								
2.1 (b)	GI SOCKET	ii)GI SOCKET 50mm , NS/IS	nos	5		5				
2.1 (c)	Anchor Block	iii)RCC Anchor block at each 12m distance of GI pipe length along 18m	Nos	3	53	56				
	Jointing with welding	Jointing of above pipes with electric arc welding	Joint		105	105				
							Total of S.N. 2			
3	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									
3.1	Transformer structure (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. (NEEK or Equivalent)		Set		1	1				
	Accessories:	a)Transformer Mounting Set	SET		1	1				
		b)GI Channel 100*50*6.4*2348mm	NOS		4	4				
		c)GI Channel 100*50*6.4*1200mm	NOS		1	1				
		d)GI Channel 100*50*6.4* 600mm	NOS		4	4				

S.No.	Items	Unit	Total Quantity			Rate		Amount	Re- marks
			Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
	e)GI Channel 100*50*6.4*300mm	NOS		1	1				
	f)GI Pole Clamp 5"	NOS		4	4				
	g)GI Pole Clamp 4"	NOS		6	6				
	h)11KV Lighting Arrestor	NOS		3	3				
	i)33KV DO Fuse Set	NOS		3	3				
	j)Earthing Chemical Compound	KG		125	125				
	k)Earthing Copper wire	m		50	50				
	l)Copper earthing rod	NOS		5	5				
	m)Cable shoe different sizes	pse		21	21				
	n) 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 : 1.8m	Nos		2	2				

S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
		,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								
3.2	Disconnect Switch	11 kV load disconnect Switch	Set		3	3				
3.3	Pin Insulator	11 kv pin insulator	nos		6	6				
3.4	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 :	set		6	6				

S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
		11 KV, Highest system voltage : 12 KV								
3.5	11 kv Tension Dead End Clamp	Tension Dead End Clamp : 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		6	6				
3.6	HT LINE: XLPE CABLE:TRANSMISSION LINE	11kV (12/20 kV) XLPE insulated aluminium conductor cable, 1C × 50 mm ² , Unarmoured, conforming to IEC 60502- 2 complete with Unarmouring, outer sheath, suitable for overhead distribution system in NEA	M		150	150				










S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
3.7	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 : 8 m , planting depth : 1.5 m ,height above ground : 6.5 m. Approximate weight of Pole : 98 Kg	Nos	16	18	34				
3.8	LT LINE: ABC Cable	4 core unarmoured ABC insulated PVC sheathed 50 Sq mm cable. Standard IEC 60502/NS	m	800	900	1700				
3.9	Cable Clamp	Cable clamp to clamp 4 core ABC cable in poles	Set	8	10	18				
3.10	Stay set	Galvanized steel heavy stay set with necessary stay wire, stay insulator, binding wire, D-iron .. etc all complete HT/LT as per instructed by an engineer.	Set	8	8	16				
3.11	Suspension Clamp	Suspension Clamp : Angled, Straight and or Strap type as per requirement	Nos	9	15	24				
3.12	Q Bolt	Q Bolt : IS:731, IS:2544 and IS:5350 or any other authoritative standard	Nos	16	18	34				

S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
3.13	GI Nutbolt with washer full and half thread	GI Nutbolt with washer full and half thread IS:2544 and IS:5350 or any other authoritative standard	KG	15	25	40				
3.14	Liknk fuse	Link fuse:IS:731, IS:2544 and IS:5350 or any other authoritative standard	nos	3	3	6				
3.15	Aluminium binding wire	Aluminium binding wire:IS:731, IS:2544 and IS:5350 or any other authoritative standard	kg	15	10	25				
							Total of S.N 3.			
4	Supply, Delivery, Installation including fixing , stringing, laying, Testing and Commissioning of Electricity Power Line and Accessories all complete									
4.1	Aluminium Power Cable for pump station	4*50 sq.mm NS certified 1.1 kV class XLPE insulated cable with aluminium conductor:	Meter	60	50	110				
4.2	Circuit Breaker	25 - 63 A , 25 kA 3 pole MCCB confirming to IS/IEC 60947-2 in outdoor ss cabinet.	Set	2	1	3				










S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
4.3	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.(Three Phase meter)	work	1	1	2				
4.4	Control panel to submersible pump cable	3 core 10 sq. mm flat submersible copper cable	Meter	80	40	120				
4.5	Star Delta configuration Control Panel for motors	Motor Control Panel wall mounted sheet metal enclosure for above motors fabricated and assembled as per instruction with auto/manual start, IP 65 standard each consisting of :a) 1 set fully automatic air- break type Star-Delta Starter for 7.5 hp motor (min.20 A magnetic contactors) with electronic Timer .b) Protection of motor against : over current (8-22A) , dry running including float switch with required signal cable, single and opposite phasing - dry run sensor.c) High and low water level guard with at least 1500m signal cable.d)	Set	2	1	3				

S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
		Digital Voltmeter with S/S for 3 phases.e) C/T digital Ammeter with S/S for each motor.f) Indicator Lamps for power supply and faults RYB Neon light indicators to indicate.g) Push button switch for "START" and "STOP".h) 100 A input and output cable shoes connector.								
4.6	20 kva 3 phase Stabilizer Oil cooled	20 kva 3 phase stabilizer Oil cooled with bipass panel board as per instructed by an engineer.	set	2	1	3				
4.7	Automatic System for Pump operation	Supply, Delivery and Installation for automatic system for 7.5 HP Pump as per instructed by an engineer.	set	2	1	3				

S.No.	Items		Unit	Total Quantity			Rate		Amount	Re- marks
				Jamune Jukekhola Lift WSS	Khahare Lift WSS Scheme	Total	In Figures(Rs)	In Words(Rs)		
4.8	Surge Protection Device With Box	Surge Protection Device With Box: IS:731, IS:2544 and IS:5350 or any other authoritative standard	set	2	1	3				
4.9	Misc. items	Copper wire of different sizes ,Cable shoes, cable socket, screw, nut, bolt, PVC tape , 8 meter aluminium ladder etc. misc. unidentified items required for the installation of all above items	LS	1	1	2				
							Total of S.N 4			
5	Transportation of Goods	Transportation of all goods including load unload and stocking	Job	1	1	2				
6	Installation Services	Installation, Erection,Testing and Commissioning of all works and related	LS	1	1	2				
Sub Total (1+2+3+4+5+6)										
VAT, 13%										
Grand Total (1+2+3+4+5+6) With VAT										

Important Note: Contractor/Firm can propose separate economical, efficient design & estimated BoQ by authorized Engineering designer with one of the pumping systems of **Grundfos or KSB, 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): Scheme Area (Jamune, Kapurkot-5 and Khahare, Kapurkot-2)

Please tick the following information option as per your capacity:

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










Annex: 1 Cover Letter format

[On Firm's Letterhead]

<Insert date>

To: Joint Procurement Committee

Jamune Jukekhola Lift WSS and Khahare Lift WSS User Committee

Kapurkot-5 & 2, Salyan

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:

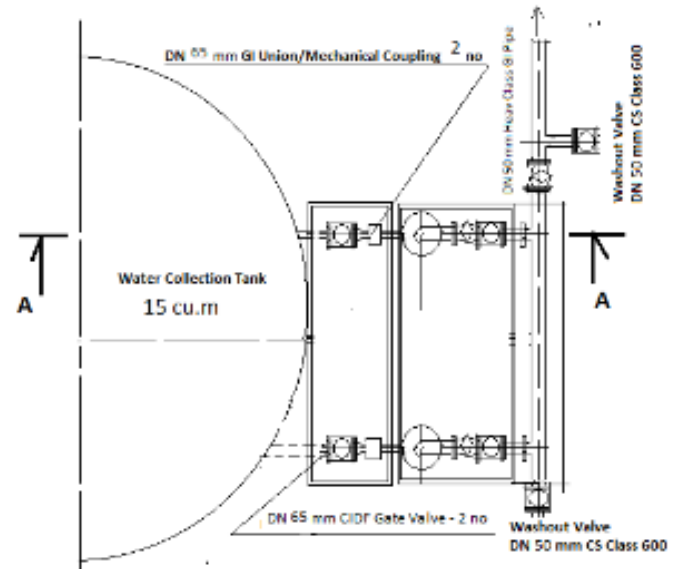
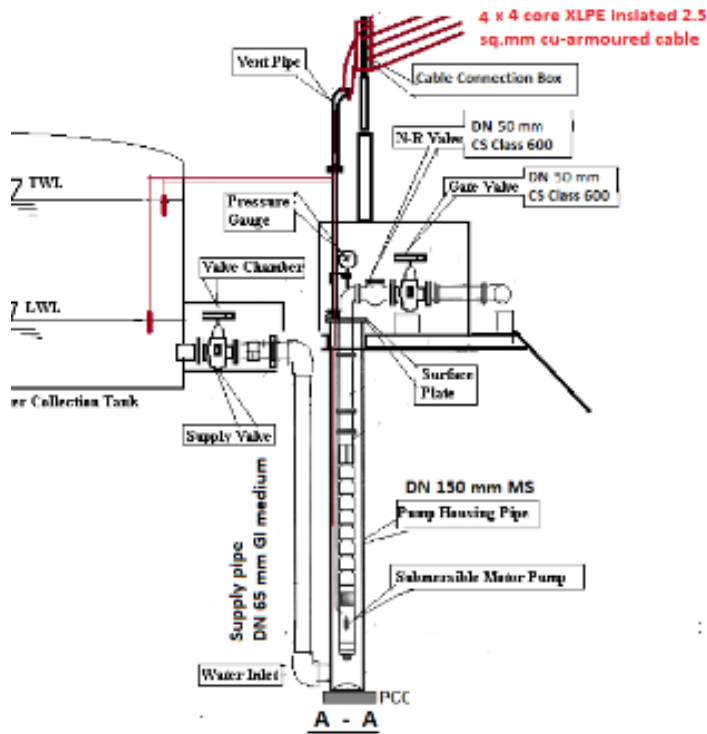
Address:

Telephone & contact Mobile no:

Email:

Company Seal/Stamp:

Annex :2 Drawing of Sump Well for both scheme



PUMP INSTALLATION DIAGRAM

Note: Details Fittings are provided in the BoQ



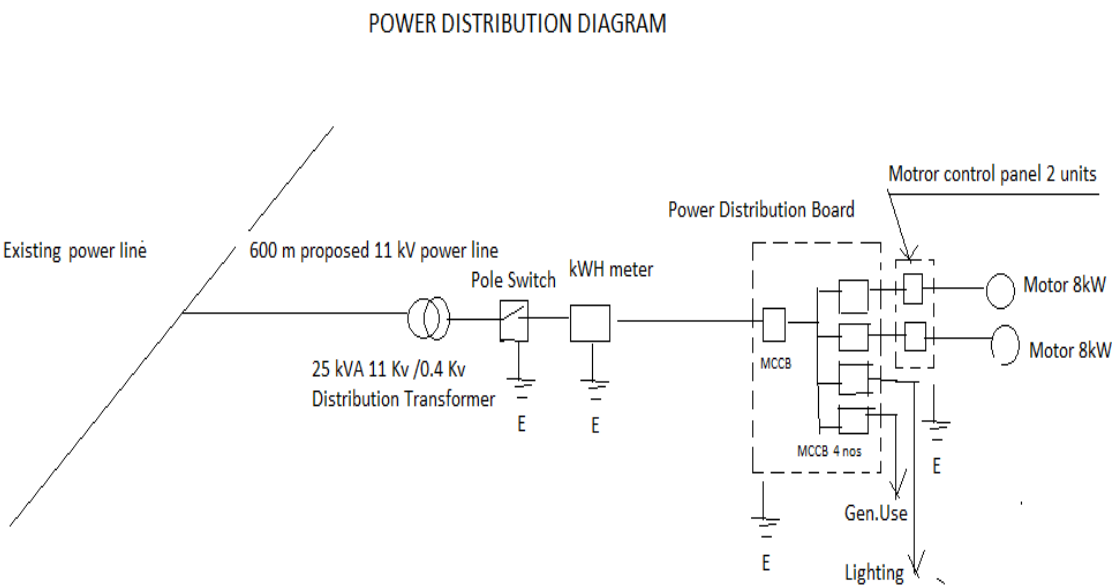




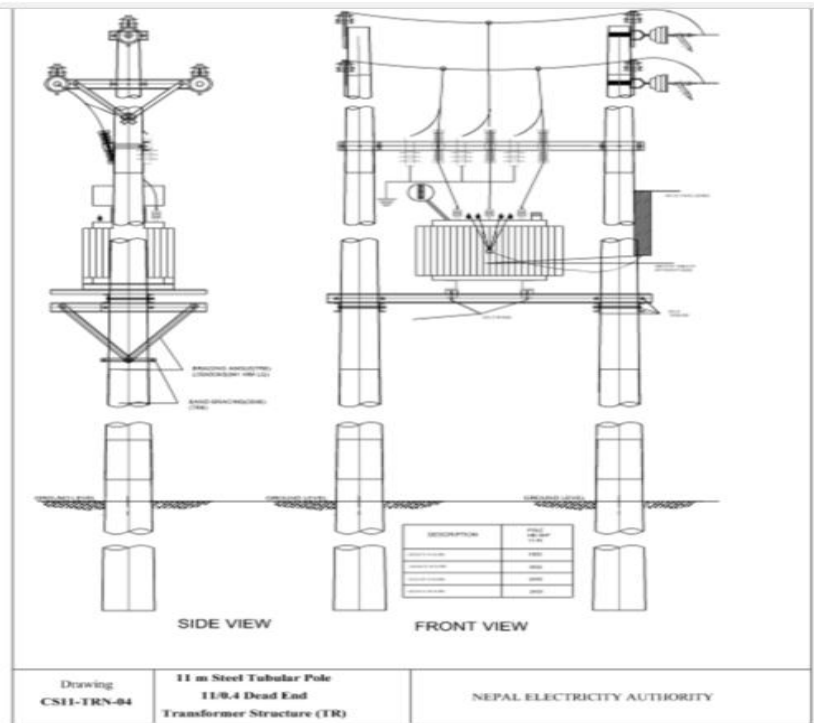




Annex :3 Drawing of Power Distribution System



Annex-4: Drawing of Transformer



Annex:5 Initial Design of Jamune Jukekhola Lift WSS

Stage 1

<u>Design of Pump</u>					
Name of Scheme		LG	Ward	District	
Jamune Jukekhola Lift WSS		Kapurkot	5	Salyan	
Distance of pumping main, L			462.30	m	
Total level difference between Source and proposed reservoir			156.16	m	
Total Demand (Excluding School tap)			32181.00	L	
Pumping Hours			6.00	Hr	
The discharge to be pumped, Q			= 5363.50	L/h	
			= 1.490	lps	89.391667
			= 5.364	m ³ /hr	
By Lea's formula, economic size of pumping main, D is given then:					
	D = 1.22√Q				
Hence,	D		= 47.09	mm	
However available size of GI pipe nearest to this size is:			= 50.00	mm	Existing
		Hence, use 50 mmØ GI pipe having bore	= 50.00	mm	
Calculation of head loss :					
		Here, discharge, Q	= 1.490	Lps	
		For 50 mmØ GI pipe			
		Pipe bore, D	= 50.00	mm	
		For length, L	= 462.30	m	
		Pipe material being	GI		
		Velocity of flow, V = Q/A = 4Q/π D ²	= 0.76	m/s	
		Absolute roughness	= 1.00	mm	
		Coefficient of friction, f	= 0.0502		
Using Darcy-Weisbach equation					
		Headloss, H ₁ = f.L/D.v ² /2g	= 14.99	m	
		Total headloss	= 14.99		
Total head for pumping = Level difference + headloss + Suction head					m
Depth of sump-well			= 2.50	m	
However take the dyanimic level of water for submersible pump as 1.2 m below the sumpwell					
However take the dynamic level of water below the sumpwell for submersible pump as			= 2.00	m	
		∴ Total dynamic head, H	= 175.65	m	
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			= 6.87		= 5.12 KW



			<u>OR</u>	
			From pump manufacturer's characteristic performance curve, following pump matches	
	Name of pump :		KSB or PEDROLLO, Grundfos or equivalent	
	Pump model :		CORA 7D+UMAI 100, CORA7D/35, UMAI 100, 5.5KW/7.5HP	
	Phase of power supply :		Three	
	Power of pump :		5.50 kW	
	Total Dynamic Head (m) :		200	
	Discharge (m ³ /hr) :		= 6.000	
	Which almost matches the required condition.			
	Power of 3-phase pump/motor = $\sqrt{3} \times V \cdot I \cdot \cos\phi$			
	Where,		V = (400-415) V	
	Therefore current I (in Ampere) :- 10.59			
			[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:			
			$P_h = \frac{V}{\sqrt{\frac{g}{w} \left[\frac{1}{K} + \frac{d}{t \cdot E} \left(1 - \frac{1}{2m} \right) \right]}}$	
	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 = 0.76 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 = 3.65 mm	
			E = 210.00 kN/mm ²	
			1/m = 0.270	
	Max. water hammer pressure, Ph = 1.031 N/mm ²			
			= 10.11 kg/cm ²	
	Max. pressure that should withstand by conduit material:			
	(static pressure+water hammer pressure)		= 26.49 kg/cm ²	= 264.89 m of water
	This pressure may withstand by GI heavy pipe duty with welded joints.			

Stage 2

Design of Pump					
Name of Scheme		RM	Ward	District	
Jamune Jukekhola Lift WSS		Kapurkot	5	Salyan	
Distance of pumping main, L			655.00	m	
Total level difference between Source and proposed reservoir			150.33	m	
Total Demand (Excluding School tap)			32181.00	L	
Pumping Hours			6.00	Hr	
The discharge to be pumped, Q			= 5363.50	L/h	
			= 1.490	lps	
			= 5.364	m3/hr	
By Lea's formula, economic size of pumping main, D is given then:					
D = 1.22√Q					
Hence, D			= 47.09	mm	
However available size of GI pipe nearest to this size is:			= 50.00	mm	
			= 50.00	Existing	2 Inch
Calculation of head loss :					
			Here, discharge, Q	= 1.490	Lps
			For 50 mmØ GI pipe		
			Pipe bore, D	= 50.00	mm
			For length, L	= 655.00	m
			Pipe material being	GI	
			Velocity of flow, V = Q/A = 4Q/πD²	= 0.76	m/s
			Absolute roughness	= 1.00	mm
			Coefficient of friction, f	= 0.0502	
Using Darcy-Weisbach equation					
			Headloss, H _f = f.L/D.v²/2g	= 21.23	m
			Total headloss	= 21.23	
Total head for pumping = Level difference + headloss + Suction head					m
Depth of sump-well			= 2.50	m	
However take the dyanimic level of water for submersible pump as 1.2 m below the sumpwell					
However take the dynamic level of water below the sumpwell for submersible pump as			= 2.00	m	
			∴ Total dynamic head, H	= 176.06	m
Horse Power of Pump					
			$HP = \frac{Q \rho g H}{746 \eta}$		
Where,					
Q = discharge, m³/s					
ρ = density of water, kg/m³					
g = acceleration due to gravity, m/s²					
H = total dynamic head, m					
η = efficiency of pump					
Assuming efficiency of pump as = 50.00 %					
The HP of pump required			= 6.89		= 5.14 KW



OR

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

Name of pump : **KSB or PEDROLLO, Grundfos or equivalent**

Pump model : **CORA 7D+UMAI 100, CORA7D/35, UMAI 100, 5.5KW/7.5HP**

Phase of power supply : **Three**

Power of pump : **5.50 kW**

Total Dynamic Head (m) : **200**

Discharge (m³/hr) : **= 6.000**

Which almost matches the required condition.

Power of 3-phase pump/motor = $\sqrt{3} \times V \times I \times \text{Cos}\phi$

Where, $V = (400-415) \text{ V}$

Therefore current I (in Ampere) :- 10.59

[Cos ϕ = 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:

$$P_h = \frac{V}{\sqrt{\frac{g}{w} \left[\frac{1}{K} + \frac{d}{t.E} \left(1 - \frac{1}{2m} \right) \right]}}$$

Where,

V = velocity of flow in pipe(m/s)

g = acceleration due to gravity(m/s²)

w = specific weight of water (N/m³)

K = Bulk modulus of water(N/m²)

d = bore of pipe(m)

t = thickness of pipe(m)

E = Youngs modulus of elasticity of pipe material(N/m²)

$1/m$ = Poisson ratio

For galvanised iron pipe and for above condition.

$V = 0.76 \text{ m/s}$

$g = 9.81 \text{ m/s}^2$

$w = 9810.00 \text{ N/m}^3$

$K = 2060.00 \text{ N/mm}^2$

$d = 50.00 \text{ mm}$

$t = 3.65 \text{ mm}$

$E = 210.00 \text{ kN/mm}^2$

$1/m = 0.270$

Max. water hammer pressure, Ph = 1.031 N/mm²

= 10.11 kg/cm²

Max. pressure that should withstand by conduit material:

(static pressure+water hammer pressure) = 25.89 kg/cm²

= **258.95 m of water**

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



Annex:5 Initial Design of Khahare Lift WSS

Design of Pump					
Name of Scheme	LG	Ward	District		
Khahare Lift WSS	Kapurkot	2	Salyan		
Distance of pumping main, L		602.00	m		
Total level difference between Source and proposed reservoir		276.00	m		
Total Demand (Excluding School tap)		14475.00	L		
Pumping Hours		6.00	Hr		
The discharge to be pumped, Q		= 2412.50	L/h		
		= 0.670	lps	40.208333	
		= 2.413	m ³ /hr		
By Lea's formula, economic size of pumping main, D is given then:					
D = 1.22√Q					
Hence, D		= 31.58	mm		
However available size of GI pipe nearest to this size is:		= 40.00	mm		
	Hence, use 40 mmØ GI pipe having bore	= 40.00	mm		
Calculation of head loss :					
	Here, discharge, Q	= 0.670	Lps		
	For 40 mmØ GI pipe				
	Pipe bore, D	= 40.00	mm		
	For length, L	= 602.00	m		
	Pipe material being	GI			
	Velocity of flow, V = Q/A = 4Q/πD ²	= 0.53	m/s		
	Absolute roughness	= 1.00	mm		
	Coefficient of friction, f	= 0.0555			
Using Darcy-Weisbach equation					
	Headloss, H _f = f.L/D.v ² /2g	= 13.32	m		
	Total headloss	= 13.32			
Total head for pumping = Level difference + headloss + Suction head				m	
Depth of sump-well				= 2.50	m
However take the dyanimic level of water for submersible pump as 1.2 m below the sumpwell					
However take the dynamic level of water below the sumpwell for submersible pump as				= 2.00	m
∴ Total dynamic head, H				= 293.82	m
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		= 5.17		= 3.86	KW
OR					
From pump manufacturer's characteristic performance curve, following pump matches					
Name of pump :		KSB or PEDROLLO, Groundfos or equivalent			
Pump model :		CORA 3HH+UMA I 100/ CORA3HH/60, 5.5/22, 5.5KW, 7.5HP			
Phase of power supply :		Three			
Power of pump :		5.50 kW			
Total Dyanamic Head (m) :		354			
Discharge (m ³ /hr) :		= 2.500			
Which almost matches the required condition.					
Power of 3-phase pump/motor = √3×V.I Cosφ					
Where,		V = (400-415) V			
Therefore current I(in Ampere) :- 10.59					
[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:

$$P_h = \frac{V}{\sqrt{\frac{g}{w} \left[\frac{1}{K} + \frac{d}{t.E} \left(1 - \frac{1}{2m} \right) \right]}}$$

Where,

V = velocity of flow in pipe(m/s)

g = acceleration due to gravity(m/s²)

w = specific weight of water (N/m³)

K = Bulk modulus of water(N/m²)

d = bore of pipe(m)

t = thickness of pipe(m)

E = Youngs modulus of elasticity of pipe material(N/m²)

$1/m$ = Poisson ratio

For galvanised iron pipe and for above condition.

V = 0.53 m/s

g = 9.81 m/s²

w = 9810.00 N/m³

K = 2060.00 N/mm²

d = 40.00 mm

t = 3.25 mm

E = 210.00 kN/mm²

$1/m$ = 0.270

Max. water hammer pressure, Ph = 0.728 N/mm²

= 7.14 kg/cm²

Max. pressure that should withstand by conduit material:

(static pressure+water hammer pressure) = 35.74 kg/cm² = **357.38 m of water**

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

