

सिलबन्दी दरभाउपत्र आह्वानको सूचना

प्रथम पटक प्रकाशित मिति: २०८३/०४/१२

कपुरकोट गाउँपालिका/जलवायु परिवर्तन स्थानीय अनुकूलन परियोजना द्वारा सञ्चालित पाखापानी खानेपानी तथा सरसफाइ र गोडेखोला सिनवाड लिफ्ट 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 प्रमाणित 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 पाखापानी, गोडेखोला सिनवाड मा ढुवानी तथा जडानभै प्राविधिक चेकजाँच भएपछि मात्र हुनेछ । यसैले बोलपत्र सम्बन्धि धरौटी तथा बैंक जमानतको आवश्यकता पर्ने छैन।

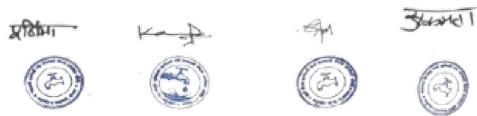


- उपरोक्त अनुसार प्राप्त भएका दरभाउपत्रहरू संकलन गरी यो सूचना प्रकाशित भएको मितिले ११ औं (२०८३।०४।२२) दिन कपुरकोट गाउँपालिका कपुरकोट, सल्यानमा दिउसो १२:०० बजे उपभोक्ता समितिका खरिद समितिका प्रतिनिधिहरू, गाउँपालिका कार्यालयका प्रतिनिधिहरू, जलवायु परिवर्तन स्थानीय अनुकूलन परियोजना प्रतिनिधिहरू र दरभाउपत्रदाताहरू 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) पाखापानी खानेपानी तथा सरसफाई योजना उपभोक्ता समिति, कपुरकोट — ३, सल्यान
- २) गोडेखोला सिनवाड लिफ्ट खानेपानी तथा सरसफाई योजना उपभोक्ता समिति, कपुरकोट — ६, सल्यान



Joint Procurement Committees
Pakhapani Lift DWS, Kapurkot Rural Municipality-3
And
Godekhola Sinbang Lift DWS, Kapurkot Rural Municipality-6
Salyan District

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

Issued by:
Joint Procurement Committee
Pakhapani Lift DWS, Kapurkot Rural Municipality-3
And
Godekhola Sinbang Lift DWS, Kapurkot Rural Municipality-6
Salyan
Contract No.: 2/2083/084

28 July, 2026







Section I. Request for Quotation (RFQ)

Joint Procurement Committee

Pakhapani Lift DWS, Kapurkot Rural Municipality-3

And

Godekhola Sinbang Lift DWS, Kapurkot Rural Municipality-6,

Salyan

Design, Supply, Delivery, Installation, Testing and Commissioning of Solar PV Water Pumping System

Date of Notice Publication: July 28, 2026

- 1. Joint Procurement Committee of Pakhapani Lift DWS and Godekhola Sinbang Lift DWS** invites sealed quotation from registered suppliers for Design, Supply, Delivery, Installation, Testing, Commissioning and After Sales Service of Solar PV Water Pumping System in at Pakhapani Lift DWS, Kapurkot Rural Municipality-3 and Godekhola Sinbang Lift DWS, Kapurkot Rural Municipality-6 Salyan District.
2. The VAT registered suppliers can obtain the signed quotation form from Kapurkot Rural Municipality, Salyan or LACC Project 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) .
3. Sealed quotation must be submitted to Kapurkot Rural Municipality Office or Local Adaptation 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.
4. Quotations must be valid for a period of 90 days from the day of deadline of submission.
5. If the last date of submission 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 BoQ submitted, including documents mentioned in the quotation, along with Technical Specifications, and any other relevant documents of the quotation.
7. The User committee reserves the right to accept or reject, wholly or partially, any or all the quotations without assigning any reason, whatsoever.

















Section II. RFQ Data

1	Name of the Purchaser: User committee of Pakhapani Lift DWS, Ward no 3 and Godekhola Sinbang Lift DWS, ward no 6 of Kapurkot Rural Municipality, Salyan District
2	Name of Contract: Design, Supply, Delivery, Installation, Testing and Commissioning of Solar PV Water Pumping System
3	Contractor's Eligibility Requirements are: a) Cover Letter for submission of the quotation b) Tax Registration/Tax 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 c) Certificate of Registration of the business, including Articles of Incorporation, or equivalent document if contractor is not a corporation d) Quality Certificate (e.g., ISO, etc.) and/or other similar certificates, accreditations, awards and citations received by the contractor, if any e) Valid ISO 9001 and ISO 14001 and IEC/IS/NEPQA Quality Assurance Certification of the proposed product especially solar pump & panel. f) Company Profile and relevant experience in design, supply, and installation of solar pumping schemes.
4	Purchaser's Address: Pakhapani Lift DWS, Ward no. 3 and Godekhola Sinbang Lift WSS, Ward no. 6 of Kapurkot Rural Municipality, Salyan District Technical Contact Person Mobile no: 9841129389 Chhabi Devkota (Sub-Engineer) Contact Person: Bhim Bahadur Budha Position: Chairperson of Pakhapani Lift DWS Contact no: 9842370927 Contact Person: Lok Bahadur Mahatara Position: Chairperson of Godekhola Sinbang Lift DWS Contact no: 9706524049
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 Adaptation to Climate Change Project, Project Support Unit (PSU), Khajura, Birendranagar, Surkhet or Liaison office of LACC Project (DMI Nepal Pvt Ltd. Sanokharibot, Shantinagar, Kathmandu-31)
8	Completion of Task as mentioned in the Scope of Work Within 4 Months from the date of the Agreement.
9	Estimated Amount of the Pakhapani DWS including VAT and Transportation: NRS 17,33,335.94 In Word Seventeen lakhs Thirty Three thousand three hundred thirty five rupees Ninety four paisa only. Estimated Amount of the Godekhola Sinbang Lift DWS including VAT and Transportation: NRs. 14,84,964.31 In Word Fourteen lakhs Eighty four thousand Nine hundred Sixty four rupees thirty one paisa only. <u>Estimated Amount of the Assignment (Both schemes) including VAT and Transportation : NRS 32,18,300.25</u> <u>In Word Thirty Two Lakh Eighteen Thousand Three Hundred Rupees Twenty Five Paisa.</u>
10	Documentary evidence of technical and production capabilities: (i) Minimum Three (3) Years experience in solar lifting water supply scheme (ii) At least three solar 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 required, as payment will be done after material have been received, verified, and technically approved at the Road Head.
12	Warranty: Minimum 5 years warranty against manufacturing defects of Solar PV Module. 3 Years Replacement Warranty of solar pump and standard applicable for other components.










13	Defect liability period : Repair or replace any defects found during the Defect Liability Period of Two 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 the road head: Fifty (50) percent of contract price iii. Upon Submission of Installation Completion, Testing & Commissioning report along with handover as per contract: A 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 solar PV pumping system based on the minimum criteria mentioned in Technical Specification: (I. Minimum Design Criteria- mentioned on the below page).
2. Field verification must be completed to ensure 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 solar PV pumping system based on the component recommended at Bills of Quantities (BoQ).
4. Works required for sequential installation of Solar PV 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. After installation of the system, Testing and commissioning must be done in the presence of LG Engineer or Project Technical Officer, prepare & submit the technical report for further payment process.
6. The contractor will make all necessary arrangements for satisfactory operation, maintenance and performance of the Pumping System for 2 year's Warrantee/ Guarantee period.
7. Warrantee/Guarantee will include rectification/replacement of all the defective and consumable components/items. During Warrantee/Guarantee period, all the arrangements for keeping the Solar PV Pumping System functional shall be the sole responsibility of the contractor.



8. The contractor shall conduct on-site training of the user committee personnel regarding the assembly, start-up, operation, maintenance and repairs of the Solar PV Pumping System.
9. All necessary Spare parts/Tools should be provided by the contractor.
10. Transportation of all the contract related materials to the road head site as per mention in BOQ.
11. Provide Sales Service for an additional 3 years (after 2 years' 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 for sales for the pumping system and must be made linked with the user's committee.



Section IV. Technical Specification

4.1 Minimum Design Criteria

SN	Scheme's name and location	Design Data
1.	Pakhapani Lift Water Supply & Sanitation Scheme, Kapurkot-3, Kapurkot, Salyan Location: Distribution tank GPS: 28.230823, 82.337452	System that must be able to lift a minimum of 17,225 liters of water per day at 450 m dynamic head. Single lift system with Pipe length 961.20 m (with 10% markup) Solar location distance 30 m
2	Godekhola Sinbang Lift WSS Kapurkot-6, Sinbang, Salyan Location: Distribution tank GPS 28.298011976 N, 82.332148065 E	System that must be able to lift a minimum of 50,005 liters of water per day at 183 m dynamic head. Single lift system with Pipe length 607.40 m Solar location distance 160 m

Contractor/Firm could also submit the alternative efficient & economic design in single stage lift with same water lifting at mentioned head. The technical evaluation committee will consider if the proposed system justifies required design and installation as per field requirement.

4.2 Solar Submersible Pump Unit

The contractor must design the solar 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 required 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. 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 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, and 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		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks* (Fully Complaint/Nor Complaint)
		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 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 as 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 Solar PV Array

Note: The minimum estimated solar array is 325 Watt (0.325 KWp). The contractor must calculate the solar array size based on the pump designed. In both cases, the capacity proposed by the contractor must not be below the minimum estimated capacity of Solar PV capacity. It is the responsibility of the contractor to guarantee the minimum water as mentioned in **Minimum Design Criteria**.

SN	Description	Specification	Contractor Proposal	Contractor's Remarks*(Fully Complaint/Nor Complaint)
1	Name of the manufacturer			
2	Brand/Model	Seraphim, Jinko, Trina or Equivalent		
3	Minimum Capacity	325 Wp (can be redesigned based on the Note above.)- (For Pakhapani Lift DSS) 250 Wp (can be redesigned based on the Note above.)- For Godekhola Sinbang Lift WSS		
4	PV Module Type	RETS Certified, Mono or Poly Crystalline, should be equal or more/less than 325Wp. The warranty period for the PV module must be at least first year- $\geq 97\%$ of stc power, 10 years- $\geq 90\%$ of STC power and 25 years- $\geq 80\%$ of STC power. All PV modules offered for the scheme must be of the same type, same model, same power rating and same manufacturer. Minimum 5 years warranty against manufacturing defects. The test certificates must be provided.		
		The PV Module should have the International Certification, IEC 61215:2005 2nd Edition or IEC		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks*(Fully Complaint/Nor Complaint)
		61215-1:2016 and IEC 61215-2:2016 for Terrestrial photovoltaic (PV) modules - Design qualification and type approval – Part 1: Test requirements and Part 2: Test Procedures. IEC 61730 for PV module safety qualification, IEC 62804 for detection of potential induced degradation (PID).		
5	Certifications	ISO 9001 / ISO 14000/NEPQA 2015 OHSAS 18001 certified production facilities.		
6	Power degradation	A letter provided by principal PV module manufacturer in their letter head stating the warranty period for their PV module. The warranty period for the PV Module must be at least 10 years against a maximum 10% reduction and 20 years against a maximum 20% reduction of output power at STC.		
7	Minimum Module efficiency	$\geq 16\%$		
8	Peak Power Per Module	100 Watts Peak or greater		
9	Junction Box	IP 65		
10	Module Mounted Structure	noncorrosive support structures to be fixed on the ground		
11	Tilt Angle and direction	As per field		
12	Support structure design, distribution	Wind Speed up to 180 km/hr		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks*(Fully Complaint/Nor Complaint)
	poles and foundation mounting arrangements should withstand			
13	Support Structure	Shall be manufactured with Aluminum or stainless-steel angles and channels; deep galvanized. The support frame structure should be able to resist at least 20 years of outdoor exposure without suffering significant damage or corrosion. It shall support solar PV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly.		
14	Structure Galvanization Requirement	The modules support structure shall be mild steel, hot dipped galvanized (120 micron) iron for holding the PV modules. The size of angle iron should not be less than 50x50x5 mm		
15	Clearance and fixing	Mounting structures shall have necessary clearance at least 60 cm or more between ground level and bottom edge of PV modules as per the requirements. PCC work of 0.3 cm above the ground level for each foundation		
16	HDPE Dugwell (Casing Pipe) with complete fittings with washout provision at bottom	3 mtr 200 mm dia or As per Attached drawings		

SN	Description	Specification	Contractor Proposal	Contractor's Remarks*(Fully Complaint/Nor Complaint)
17	Grounding System of DC surge protector, AC surge protector, DC MCB, AC MCB, Set of Earthing Electrode 2" Dia and 2m length installed in earthing pit with the set of Backfill chemical connected by 16sqmm copper cable all complete, wire 7/18, junction box etc.	SPD (for voltage limiting) shall have a discharge capacity total of 40 kA (8/20 μ s). The earth-termination system with bare copper conductors (minimum cross section of 16 mm ²) by connection to the earthing electrodes or to the buried bare copper conductor connecting the earthing electrodes. The length of each earthing electrode shall not be less than 1.5 meters and outer diameter less than 48 mm and an inner diameter less than 27mm.		

The following information should be provided by the contractor in regard to solar PV module.

- The bidder must submit the technical datasheet of PV Module.
- A manufacturer's Authorization letter should be provided by the principal manufacturer in their letter head.
- Catalogue and technical specifications of solar PV module with I-V curve.
- Inedible labels must be firmly fixed on the solar PV module containing the following information:
 - Name and brand of the manufacturer.
 - Model and type.
 - Manufacturer serial number.

- Maximum power in watt peak.
- Open circuit voltage in volt.
- Short circuit current in ampere.
- Maximum rated voltage in volt.
- Maximum rated current in ampere

4.0 Protection

4.1 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

4.1.1 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 of 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.

4.1.2 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 68 mm.
- 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 300 mm ? above the ground level for the foundation or as per site.

4.1.3 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 50 mm² 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.

4.2 Surge Protector

- The DC surge protection device (SPD for voltage limiting or class C) 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 phase to neutral and neutral to ground protection module.
- The neutral and phase plugs should have clear marking so that it fits the respective bases only.
- The Class C arrester should not be less than 40 kA protection level at waveforms of 8/20 μ s.
- The unit shall be compatible in mounting on DIN Rail Channel.
- The degree of protection should be IP20 and the inflammability class should be V0.

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

The earthing system shall be designed, supplied, installed, tested, and commissioned using copper-bonded earthing rods suitable for lightning protection, electrical earthing, and safety earthing applications. Each earthing electrode shall consist of a minimum 25 mm diameter and 2.5 m long copper-bonded earthing rod, complete with all necessary accessories. The earthing electrode shall be connected to the Main Earth Bar (MEB) using a minimum 25 mm $\times$ 3 mm copper strip, including suitable copper/brass clamps, connectors, nuts, bolts, and all required jointing accessories to ensure a reliable and corrosion-resistant connection.

Certified Bentonite-based Ground Enhancement Material shall be provided and installed around each earthing electrode, with a minimum quantity of 25 kg per electrode, or as recommended by the manufacturer, to improve soil conductivity and achieve the specified earth resistance. The complete earthing system shall be installed in accordance with applicable standards and good engineering practices. The final installed earthing system shall achieve the specified earth resistance value under normal operating conditions.

4.5 Others

The components of the Solar PV 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. Solar PV array installation and fixing

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



Section V. Bill of Quantity (BoQ)

S.N.	Component Description	Unit	Quantity			Rate		Amount	Re- marks
			Godekhola Sinbang Lift WSS	Pakhapani Lift DWS	Total	In Figures(Rs)	In Words(Rs)		
	Electromechanical Cost								
A	Non Vat Applicable Components								
1	Solar Array, Minimum Panel size 250Wp (Tier 1, Mono PERC) warranty Minimum 25 years-Note: There are 53 number of solar panel with 250Wp and brand of panel is VNUS so these new panel should be minimum of 250Wp . These will be verified during filed visit before agreement.	Pcs	15		15				
2	Solar Array, Minimum Panel size 325Wp (Tier 1, Mono PERC) warranty Minimum 25 years -Note: There are 75 number of solar panel with 325Wp and brand of panel is vikramsolar so these new panel should be minimum of 325Wp. These will be verified during filed visit before agreement.	Pcs		10	10				
Sub Total (A)									
B	Vat Applicable Components including its installation								
1	Panel Mounting Structure, Hot dipped Galvanized structure With RCC Footing of min 300X300X750mm and use of SS nutbolts for panels mounting	Set	1	1	2				
2	Pump Control Drive Minimum 11KW With IP 65 Rated Enclosure(Three phase variable frequency inverter with built in MPPT controller having IP 65 rating NS or ISO certified)warranty Minimum 2 years	Number	1		1				
3	Fully Stainless steel Indian Submersible Pump standard ISO 9001-2008 three phase or equivalent , minimum 15HP (233 L/M at 183 meter head) warranty Minimum 2 years	Number	1		1				
	Pump Control Drive Minimum 30KW With IP 65 Rated Enclosure(Three phase variable frequency inverter with built in MPPT controller having IP 65 rating NS or ISO certified)warranty Minimum 2 years	Number		1	1				

S.N.	Component Description	Unit	Quantity			Rate		Amount	Re- marks
			Godekhola Sinbang Lift WSS	Pakhapani Lift DWS	Total	In Figures(Rs)	In Words(Rs)		
	Fully Stainless steel Indian Submersible Pump standard ISO 9001-2008 three phase or equivalent , minimum 20HP (75 L/M at 450 meter head) warranty Minimum 2 years	Number		1	1				
4	DC String Fuse, 16 A (For each string)	LS	2	2	4				
5	DC MCB, DP 800VDC/63A	Number	1	1	2				
6	DC Cable, 6 Sq. mm MSF	Coil	1	1	2				
7	DC Cable 2 core 10mm2 MSF Copper armoured	Meter	160		160				
	DC Cable 2 core 16mm2 MSF Copper armoured	Meter		30	30				
8	MC4 connector (For series and parallel connection)	LS	1	1	2				
9	DC Surge Protector Device, 40kA/1000VDC (Type II)	Number	1	1	2				
10	AC Surge Protection Device, 40kA (Type II)	Number	1	1	2				
11	AC MCB, TPN, 63A	Number	1	1	2				
12	Dry run Sensor Unit Including sensor connection wire	Set	1	1	2				
13	Copper - Lightning Arrestor with insulated mounting rod, Conventional Type	Set	2	2	4				
14	Earthing Wire for LA, 16mm2 YG cable	Meter	10	20	30				
15	Copper-Bonded Earthing Rod Electrode Ø25 mm × 2.5 m, including 25 × 3 mm copper strip connection to Main Earth Bar (MEB), copper/brass clamps, nuts, bolts, accessories, and Bentonite-based Ground Enhancement Material for achieving specified earth resistance.	Set	3	3	6				

S.N.	Component Description	Unit	Quantity			Rate		Amount	Re- marks
			Godekhola Sinbang Lift WSS	Pakhapani Lift DWS	Total	In Figures(Rs)	In Words(Rs)		
16	Submersible Flat Cable(Copper), 3 x 6mm2	Meter	20		20				
	Submersible Flat Cable, 3 x 16mm2	Meter		20	20				
17	GI Pipe medium class 2.5 inch	Meter		18	18				
18	Riser Pipe 2 inch GI medium duty	Meter	2	2	4				
19	GI Nipple 2 inch (medium class)	Number	5	5	10				
20	GI Elbow 2 inch (Medium class)	Number	1	1	2				
21	GI Reducer 3/2 inch (Medium class)	Number	1		1				
	GI Reducer 2.5/2 inch (Medium class)	Number		1	1				
22	4-inch Pressure Gauge, 40kg	Number	1	1	2				
23	GI Equal Tee 2 inch (medium class)	Number	1	1	2				
24	GI Reducer 4/3 inch (Medium class)	Number	1		1				
26	GI-HDP Flange Set (100*110 mm)	Number	1		1				
	GI Socket 2.5 inch (medium class)	Number		1	1				
	GI Union 2.5 inch (medium class)	Number		2	2				
	GI-HDP Flange Set (65*75 mm)	Number		1	1				
27	GI Unequal Tee. 2/0.5 inch	Number	1	1	2				

S.N.	Component Description	Unit	Quantity			Rate		Amount	Re- marks
			Godekhola Sinbang Lift WSS	Pakhapani Lift DWS	Total	In Figures(Rs)	In Words(Rs)		
28	CS Made Non-Return Valve 2 inch (with flange complete gasket and nutbolts)	Number	1	1	2				
29	CS Made Wash Out 2 inch (with flange complete gasket and nutbolts)	Number	1	1	2				
30	Remote Monitoring Unit - GPRS with data logging feature	Nos	1	1	2				
31	Tool Set - Multimeter, Screwdriver, Pliers, Wire Cutter, Tester,Misc.items	Set	1	1	2				
32	Installation,Testing & Commissioning of all work (Existing & New Lift part-Solar System, Pipe Line & all complete works)	Number	1	1	2				
33	Transportation and Installation of all electromechanical equipments -Up to Road Head at site	Number	1	1	2				
Sub Total (B)									
C	13% Vat on Vat Applicable Components								
Grand Total (A+B+C)									

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 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): Pakhapani, Kapurkot-3 and Sinbang, Kapurkot-6










Please tick the following information option as per your capacity:

Availability Pump & Panel in the stock	☐ Yes ☐ No
Time of materials delivery to the sites after agreement with UC:	Within One month 1-2 month not more than 3 months
Availability of spare parts of solar pump, Panel & other accessories in local Market:	☐ Available in Tulsipur, Dang ☐ Birendranagar, Surkhet ☐ Nepalganj ☐ Kathmandu
Availability of Local Technical Agent for repair & maintenance of solar pump, Panel & other accessories in region:	Available in ☐ Tulsipur, Dang ☐ Birendranagar, Surkhet ☐ Nepalganj











Annex: 1 Cover Letter format

[On Firm's Letterhead]

<Insert date>

To: Joint Procurement Committee

Pakhapani Lift DWS, Kapurkot-3 and Godekhola Sinbang Lift DWS
Kapurkot-6 Salyan

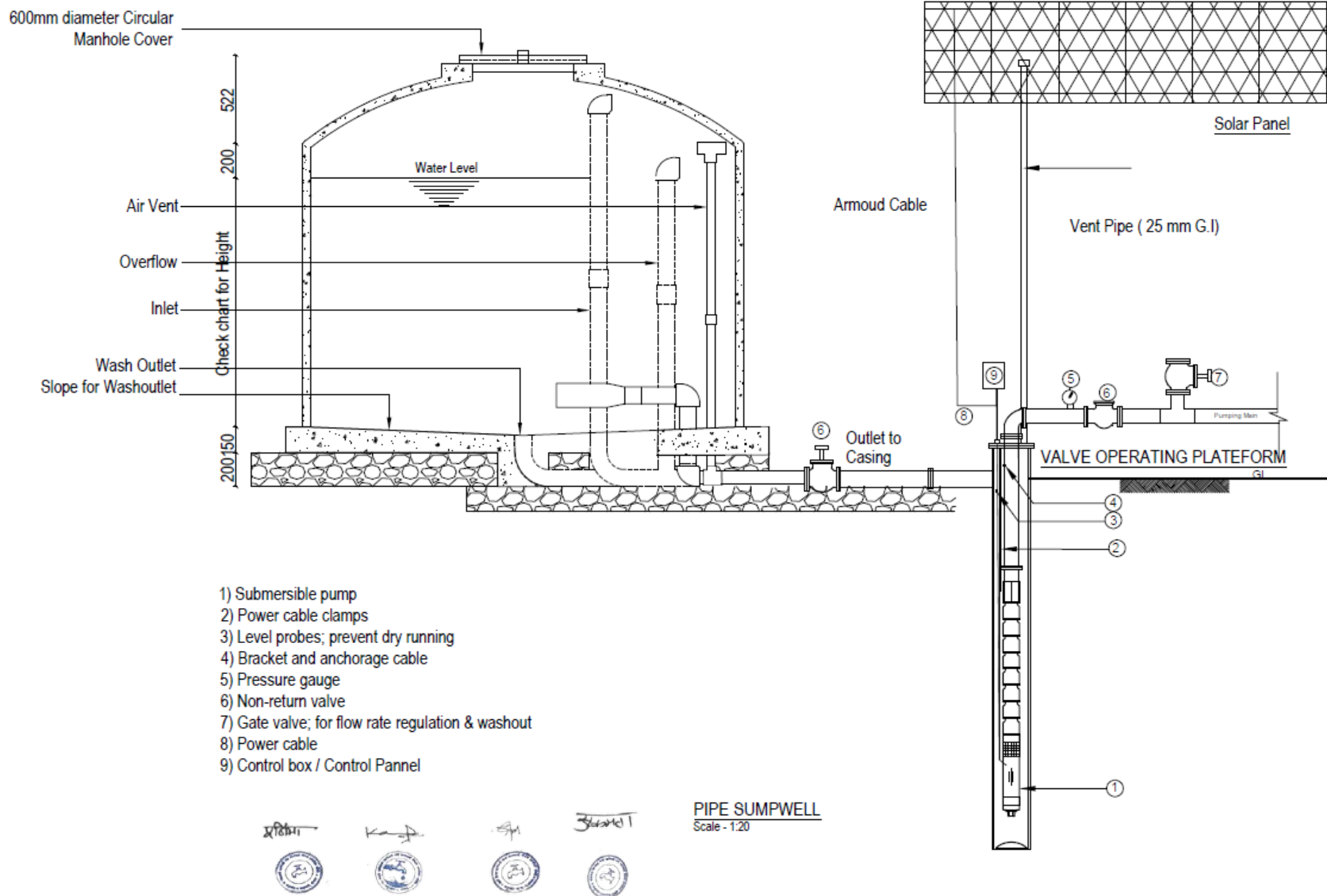
We, the undersigned, provide the attached proposal in accordance with **RFQ** Design, Supply, Delivery, Installation, Testing and Commissioning of Solar PV Water Pumping System **dated** Our attached proposal is for the total price of <Sum in Words Rs Sum in Figures..... for the three systems) >. We 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.

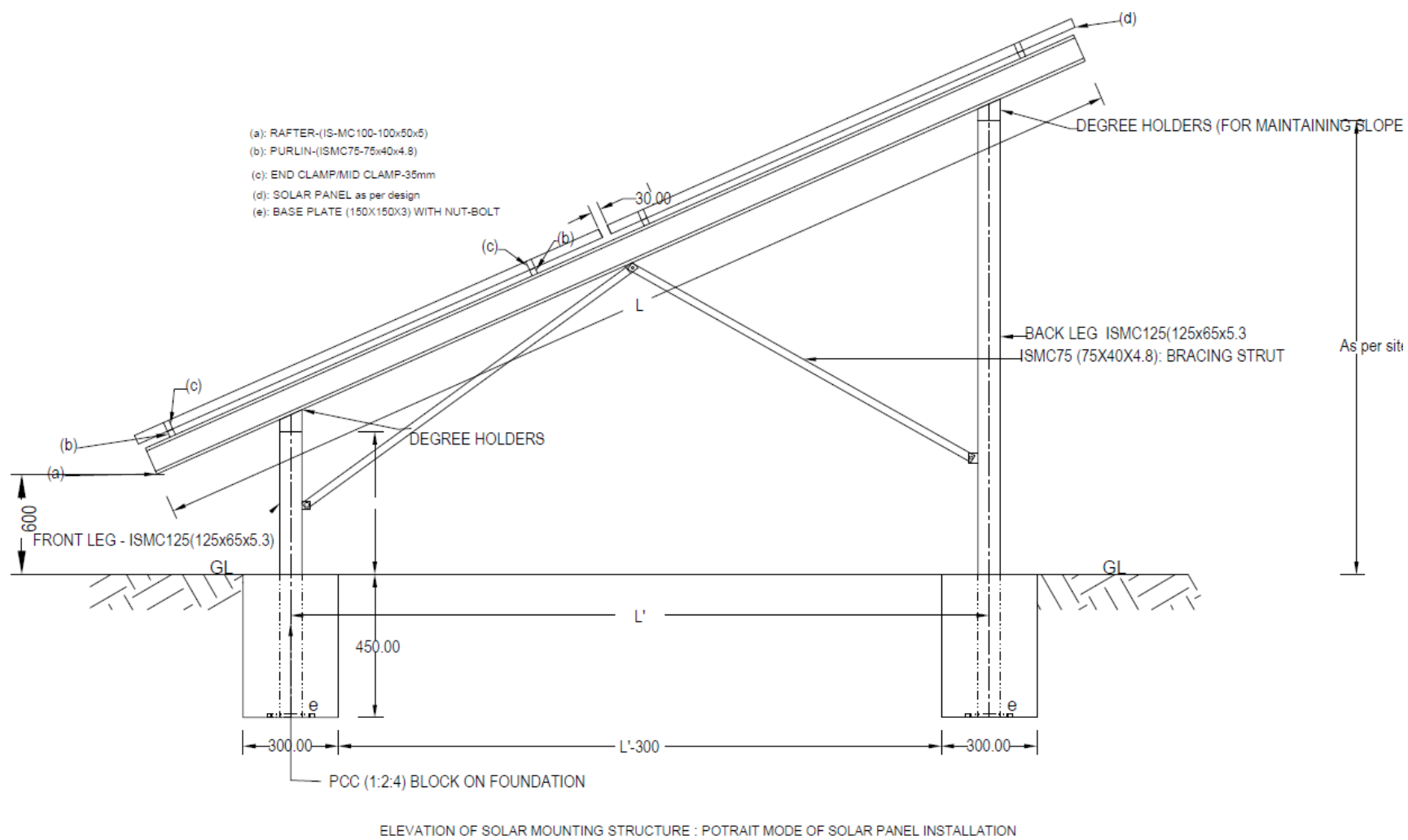
Offeror shall verify here the items specified in this RFQ document.
We understand that the User Committee is not bound to accept any proposal it receives.

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 Casing Pipe



Annex :3 Drawing of Solar mounting frame



Annex 4: Initial Design

A. Godekhola Sinbang Lift DWS, Kapurkot-6. Salyan

	From pump manufacturer's characteristic performance curve, following pump matches		
	Name of pump : KSB		
	Pump Type : UQD 182/20	Motor Type:- UMA I 150-13/22	
	Phase of power supply: Three Phase	Outlet: 50mm	2"
	Power of pump : 11 kW	(15 HP)	
	Discharge : 233LPM at 183m Head	From Pump Performance Curve	
1	Solar Panel Design		
	Minimum PV Array Capacity (KW):	15.0	For 15 HP Pump
	For Solar Panel Proceed with Solar 250 Watt		
	Capacity of One Panel:	250 watt	Existing(53)
		250 watt	New(15)
	No. of Panel Required :	60.00 No.	
	Lets Say:	68.00 No.	
	Total Designed Panel Capacity:	17000 Watt	
		17000 watt	
	From Solar Specification Chart attached:		
	Open Circuit Voltage (Voc):	44.26 V	
	Maximum Power Current-IMPV:	6.66 A	
	In series, Total Voc:	44.26	752.42 V
	In parallel , Total Impv:	6.66	26.64 A
			17
			4
	So, Arrange the 14 no. of 250 Solar Panel in 5 Parallel String		
2	Inverter Design		
	Inverter Requirement (KW) = Minimum (Designed Solar Array Capacity)	17 KW	
	From Inverter Availability list		
	For Inverter Proceed with GD100-011G-4-PV	11 KW	Existing
	From Inverter Specification Chart, for GD100-011G-4-PV,		
	Max. Input DC voltage:	800 V	
	Check Voltage	OK	
	Max. DC input Current :	32 A	
	Check Current	OK	
	So take , One no. Inverter Size:	11 KW	
	Model: GD100-011G-4-PV		
3	DC String Fuse		
	Max. DC input String Current :	6.66 A	
	Required DC Fuse Size	8.658 A	30% upsize
	We chose market available DC Fuse	16 A	Market Available
	No of DC Fuse require	2	6,16,32,63 A
	Hence we require 2 Nos of 16A DC Fuse		
4	DC DP MCB		
	Maximum Array Current	26.64 A	
	Required DC DP MCB	34.632 A	30% upsize
	We chose market available DC DP MCB	63 A	
	Hence we require 1 Nos of 63A DC DP MCB		
5	AC TP MCB		
	Pump:	15 HP	
		11190 Watt	
	Three Phase :	380 V	
	Maximum Current of Pumpset	17.00194482 A	$P = V \times I \times 1.732 \text{ or } (\sqrt{3} \times V \times \cos \phi)$
	Required TP MCB	22.10252826 A	30% upsize
	We chose market available AC TP MCB	63 A	
	Hence we require 1 Nos of 32A AC TP MCB		
5	DC SPD		
	Since its hilly region, we choose 1 nos of 40kA DC SPD		

B. B Design of Pakhapani DWS, Kapurkot-3, Salyan

Design of Pump			
Pakphani WS Scheme, Kapurkot-3			
Distance of pumping main, L		= 961.20 m	From Site Visit Conducted (with 10% mark up)
Total level difference between Source and proposed reservoir		= 305.25 m	From Site Visit Conducted
The discharge to be pumped, Q		= 4219.75 L/Hr	70.3 LPM
		= 1.172 lps	
By Lea's formula, economical size of pumping main, D is given then:			= 4.22 m³/hr
D = 1.22√Q		= 41.77 mm	
Hence, D			
However available size of GI pipe is:		= 65.00 mm	Existing 65 mm GI pipe
	Hence, use 65 mmØ GI pipe having bore	= 65.00 mm	
Calculation of head loss :			
	Here, Discharge, Q	= 1.172 Lps	
	For 65 mmØ GI pipe		
	Pipe bore, D	= 65.00 mm	
	For length, L	= 961.20 m	
	Pipe material being used	GI	
	Velocity of flow, V = Q/A = 4Q/πD ²	= 0.35 m/s	
	Absolute roughness	= 0.15 mm	From table
	Coefficient of friction, f	= 0.0306	
Using Darcy-Weisbach equation			
	Headloss, H _f = f . L/D . v ² /2g	= 2.88 m	
	Total headloss	= 2.88	
Total head for pumping = Level difference + headloss + Suction head			m
Depth of collection tank (If deep boring keep that depth here)		= 0.00 m	
However take the dynamic level of water for submersible pump as 1.5 m below the collection tank			
		= 1.50 m	
Additional Head Loss (10% of total static head measured)		= 30.53	
	Total dynamic head, H	= 340.10 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 %	(average eff. of pump available in market)	
The HP of pump required	= 10.47	= 7.81 KW	
Based on above pump design and available performance chart, submersible pump with performance of at least 75L/M at 450 meter head has been selected.			
From pump manufacturer's characteristic performance curve, following pump matches			
Name of pump :	KSB		
Pump Type :	UPFN 60/30	Motor Type:- UMAH 150-15/23	
Phase of power supply :	Three Phase	Outlet: 50mm	2"
Power of pump :	15 kW	(20 HP)	
Discharge :	75LPM at 450m Head		From Pump Performance Curve
Which is higher than the requirement			
Power of 3-phase pump/motor = √3×V.I Cosφ			
Where,	V = (400-415) V		
Therefore current I(in Ampere) :- 28.71			
	[Cosφ = 0.75 (for motors)]		
Solar Array Size Requirement	9.76	KWP	Minimum requirement
	20.00	KW	For 20HP pump, 20KW solar array is required
For a 20 HP pumpset opt for a solar array size at least equivalent to 15kWp or atleast 20% higher			
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:			
	$P_h = \sqrt{\frac{V}{w} \left[\frac{1}{K} + \frac{d}{t.E} \left(1 - \frac{1}{2m} \right) \right]}$		
Where,			
	V = velocity of flow in pipe(m/s)		
	g = acceleration due to gravity(m/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 = 0.35 m/s		
	g = 9.81 m/s ²		
	w = 9810.00 N/m ³		
	K = 2060.00 N/mm ²		
	d = 65.00 mm		
	t = 3.65 mm		
	E = 210.00 kN/mm ²		
	1/m = 0.270		
Max. water hammer pressure, Ph = 0.473 N/mm ²			
	= 4.64 kg/cm ²		
Max. pressure that should be withstand by conduit material:			
(static pressure+water hammer pressure)	= 35.91 kg/cm²	359.0508252	m of water

