

PEOPLES ENERGY LIMITED
KHIMTI-2 HYDROELECTRIC PROJECT
(48.8 MW)



PROGRESS REPORT

March 2025

PEOPLES ENERGY LTD.

Shree Krishna Sadan – 6th Floor, New Baneshwor-10,
Kathmandu, Nepal.

Tel.: +977-1-4781891, 4786030

Email: pplsenergyLtd@gmail.com, info.pel@rmgroup.com.np

Website: www.peoplesenergy.com.np

Khimti-2 Hydroelectric Project (48.8 MW)

Progress Report

March 2025

Contact Details:

Head Office:

Shree Krishna Sadan, New Baneshwor-10,
Kathmandu Metropolitan City,
Kathmandu, Bagmati Province, Nepal.
Tel.: 01-4781891, 4786030

Site Office:

Bhimsenthan,
Gokulganga Rural Municipality,
Ramechhap, Bagmati Province, Nepal.
Tel.: 9849150807, 9840231804

Table of Contents

PEOPLES ENERGY LIMITED	i
LIST OF ABBREVIATIONS.....	iii
CHAPTER – 1 PREAMBLE.....	4
1.1 Introduction	4
1.2 Objective of this report.....	4
1.3 Key Dates and Milestones	5
1.4 Bank Consortium.....	6
1.5 The Employer.....	7
1.6 Local Contractors for Site Infrastructures	7
1.7 Access to the Site.....	8
CHAPTER – 2 TECHNICAL FEATURES OF THE PROJECT.....	9
2.1 Salient Features of the Project.....	9
Progress CHAPTER – 3 PROGRESS DETAILS.....	16
3.1 Summary on Construction of Site Infrastructures	16
3.2 Administrative Works.....	18
3.3 Design and Physical Model Study	19
3.4 Progress Work in Detail.....	19
3.4.1 Civil Construction work	19
3.4.2 Headworks Site:.....	19
3.4.3 Tunnel Site:.....	24
3.4.4 Powerhouse Site:.....	27
3.4.5 Hydro Mechanical work	31
3.4.6 Electro-mechanical works.....	36
3.4.7 Design Consultant's Progress	39
3.4.8 132 kV Transmission Line works	39
3.4.9 Loop in Loop Out (LILO) Receiving End Substation	42
3.5 Force Majeure/Difficulties & issues faced	44

LIST OF ABBREVIATIONS

PEL	Peoples Energy Ltd.
PHCL	Peoples Hydro Co-operative Ltd.
PPA	Power Purchase Agreement
NEA	Nepal Electricity Authority
K2HEP	Khimti-2 Hydroelectric Project
HEP	Hydroelectric Project
MW	Mega Watts
RCOD	Required Commercial Operation Date
HCE	Hydro-Consult Engineering Limited
CWTW	Chongqing Water Turbine Works Co. Ltd.
IEE	Initial Environmental Examination
EPC-F	Engineering Procurement Construction-Financing
TOR	Term of Reference
LC	Letter of Credit
FC	Financial Closure
DFO	District Forest Office
KV	Kilo Volt
PH	Power House
MoU	Memorandum of Understanding
BDR	Basic Design Report

CHAPTER – 1 PREAMBLE

1.1 Introduction

Peoples Energy Limited is developing Khimti-2 Hydroelectric Project (48.8 MW) located in the border of Ramechhap and Dolakha districts of Bagmati Province. Khimti River is a tributary of Tamakoshi a major branch of Saptakoshi river system of Nepal. The Khimti River originates at EL. 4500m and converges with the Tamakoshi River at EL. 600m. The total drainage area of the Khimti River is 492.4km², and the drainage area in front of the intake and powerhouse is 295.34km² and 351.4km² respectively. The river section from the dam site to powerhouse is about 7km long. The ridges on both banks are at EL. 2,300~3,000m; the riverbed at the dam is at EL. 1,627m; the riverbed at the powerhouse tailrace is at EL. 1,278m. The run-of-river development scheme is selected.

The headworks site is located at Rasnalu/Gokulganga Rural Municipality of Ramechhap and Jiri Municipality of Dolakha district whereas the powerhouse site is located at Simlep and Hawa/Tamakoshi Rural Municipality of Dolakha District. The headwork is located about 150m downstream the confluence of Jiri Khola and Khimti Khola with headrace alignment passing along the right bank of Khimti Khola and powerhouse site also located on the right bank.

Geographical Coordinates of Khimti-2 Hydroelectric Project

Coordinates	From	To
Latitude	27°33'07"N	27°35'13"N
Longitude	86°09'26"E	86°14'18"E

1.2 Objective of this report

Objective of this report is;

- To update the status of various development activities completed and being undertaken in implementation of 48.8 MW Khimti-2 Hydroelectric Project.
- To update the status of schedules and planning
- To bring forward the difficulties & issues being faced / envisaged at site to the notice of concern authorities and stakeholders

1.3 Key Dates and Milestones

S/N	Activity	Date	Remarks
1.	Survey License Issuance (27.2 MW)	2069 Kartik 15	Closed
2.	Feasibility Study Completed (48.8 MW)	2070 Falgun	Closed
3.	Updated Survey License Issuance (48.8 MW)	2070 Chaitra 7	Closed
4.	IEE ToR Approval	2071 Bhadra 28	Closed
5.	Grid Connection Agreement	2071 Kartik 13	Closed
6.	IEE Report Approval	2072 Kartik 22	Closed
7.	Power Purchase Agreement (PPA) with NEA	2072 Ashwin 14	Closed
8.	Application for Generation License	2072 Kartik 11	Closed
9.	Public Notice of Generation License	2073 Kartik 9-10	Closed
10.	Generation License Issuance	2073 Paush 25	Closed
11.	Generation License Transfer from PHCL to PEL	2073 Falgun 5	Closed
12.	Land Transfer from PHCL to PEL	2074 Jestha 11	Closed
13.	IEE Report Approval transfer from PHCL to PEL	2074 Ashoj 2	Closed
14.	PPA Transfer from Peoples Hydro to Peoples Energy Limited	2074 Ashad 22	Closed
15.	Financial Closure	2074 Ashoj 8	Closed
16.	Updated IEE Report	2076 Poush	Closed
17.	Civil work contract signing with High Himalaya Hydro Construction Pvt. Ltd.	2077 Mangsir 15	Closed
18.	Design Consultant Contract signing with Hydro Tunneling and Research Pvt. Ltd.	2077 Mangsir 25	Closed
19.	Civil Contractor mobilization to site	2077 Poush 14	Closed

20.	Shifting of Grid Connection Point for Power Evacuation to (loop-in, loop-out Substation at Bhimsensthan, Ramechhap with S/C 132 kV line near PH site)	2078 Magh	Closed
21.	Forest and Government Land Approval/Cabinet approval	2078 Jestha	Closed
22.	Explosive License	2078 Ashad	Closed
23.	132 KV Transmission Line IEE Approval	2080 Ashoj 12.	Closed
24.	132 KV Transmission Line Survey License	2079 Asar 23.	Closed
25.	132 KV Transmission Line Survey License (1 st Amendment)	2079 Magh 4.	Closed
26.	132 KV Transmission Line Generation License	2081 Ashad 10.	Closed
27.	132 KV Transmission Line Land Acquisition		Closed
28.	Contract award to Global Hydro GmbH for Electromechanical Works	2078 Falgun 10.	Closed
29.	Contract awarded to CBMEW Pvt. Ltd for HM works (Gates and hoists)	2078 Falgun 25.	Closed
30.	Contract awarded to Cream-KHS JV for HM works (Penstock, bifurcation and expansion joint)	2079 Baisakh 20.	Closed
31.	Contract awarded to Royal Construction Pvt. Ltd for Transmission Line Construction Works	2080 Bhadra 20.	Closed
32.	Generation License Amendment	2080 Karthik 1	Closed
33.	Required Commercial Operation Date (RCOD)	2081 Shrawan 17	Closed

1.4 Bank Consortium

Financial closure (FC) for the development of Khimti-2 HEP was concluded with the bank consortium of erstwhile ten Class 'A' Commercial Banks of Nepal with Sanima Bank as the lead bank, on September 24th, 2017.

1.5 The Employer

Peoples Energy Ltd. (PEL), previously Peoples Hydro Co-operative Ltd. (PHCL), is the developer of Khimti-2 Hydroelectric Project, situated at Dolakha and Ramechhap districts. PEL obtained the survey license for the project on 2012/10/31. After, feasibility level investigation was concluded and the Power Purchase Agreement (PPA) was signed with Nepal Electricity Authority (NEA) on 2015/10/01. Generation license was obtained for the project on 2017/01/06 by PHCL, and later transferred to PEL on 2017//02/16.

1.6 Local Contractors for Site Infrastructures

PEL has engaged several local contractors for the construction of site infrastructures as pre-construction activities such as access track opening and slope protection works for Access Road, drainage and stone soling for improvement of Access Road, Project Camp, Boundary wall construction and construction of three motorable bailey bridges etc. To execute the mentioned works PEL has engaged some of the local contractors employed at site are:

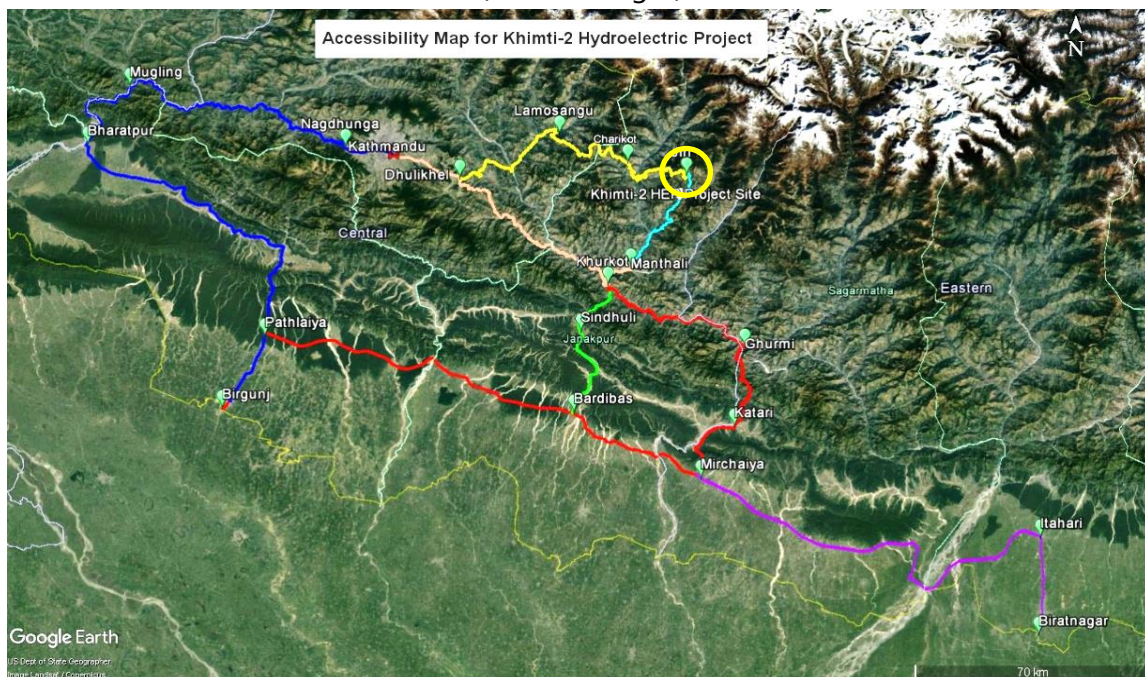
- **For Bridge Construction (Three bridges over Khimti Khola)**
 - S.K. Construction (for Dharapani Bridge at Dam Site)- Bridge I
 - Likhu Nirman Sewa (for Hodampa Bridge for HRT adit site)- Bridge II
 - Him Sagarmatha Construction (for Palate Bridge/PH site)-Bridge III
- **For Road Access and Gabion Works**
 - Bhimeshwor Nirman Sewa
 - Chandrama Nirman Sewa
 - Dangdunge Nirman Sewa
 - Dharmasthali Suppliers
 - Dipshree Construction
 - Greenland Construction
 - Khani Nirman Sewa
 - Kritim Nirman Sewa
 - Likhu Nirman Sewa
 - Moti Construction Pvt. Ltd.
 - New Jagriti Nirman Sewa
 - Peoples Nirman Sewa
 - Prakriti Nirman Sewa
 - Rambole Construction Pvt. Ltd.
 - Serakali Builders Pvt. Ltd.
 - Seti Bhumi Nirman Sewa
 - Sunuwar Nirman Sewa
 - Jiri Nirman Sewa
 - Mama Bhanja Construction
 - Jatteshwor Nirman Sewa

- Evergreen Construction
- **For Camp Construction**
 - Edgemark Consultancy Pvt. Ltd.
 - Jyoti Shree Interior Pvt. Ltd.
- **Transmission Line-Construction Power**
 - New Satakri Khimti Construction Pvt. Ltd.

1.7 Access to the Site

The project site is accessible from Kathmandu by the following roads:

- i. Kathmandu – Dhulikhel - Dolalghat – Lamosangu - Charikot - Jiri – Headworks site (198 km length)
- ii. Kathmandu – Dhulikhel – Nepalthok – Khurkot – Manthali – Khimti – Betali – Bhimsenthan – Powerhouse site (174 km length)



CHAPTER – 2 TECHNICAL FEATURES OF THE PROJECT

2.1 Salient Features of the Project

Name of Khimti -2 Hydroelectric Project

Project:

Installed Capacity: 48.8 MW

Type of Project: Run of River (ROR)

Location: Jiri Municipality and Tamakoshi Rural Municipality of Dolkha District (Previous Jiri, Thulopatal and Hawa VDC) of Dolkha District)

Gokulganga Rural Municipality of Ramechhap District (Previous Rasnal VDC of Ramechhap District)

Comparative Salient Features of the Project:

Project Features	Features Details	Remarks
General		
Project Boundary	27°33'07"N to 27°35'13"N 86°09'26"E to 86°14'28"E	
Gross Head	351.5m	
Rated Head	341.643m	
FSL	1633.00 masl	
Normal TWL	1275.96 masl	
Minimum TWL	1275.25 masl	
Hydrology		
Turbine Centre Line	1279.3 masl	
Catchment area at Intake site	317.94 km ²	
Catchment area at Powerhouse	351.4 km ²	
Average Flow	27.36 m ³ /sec	
Minimum Monthly flow	4.45m ³ /sec	
Design Discharge(Q ₄₀)	16.11 m ³ /sec	
Design flood at intake site (Q ₁₀₀)	1165 m ³ /sec	
Design flood at intake site (Q ₁₀₀₀)	1439 m ³ /sec	
Diversion Structure		

Type of diversion structure	Ogee weir with U/ S vertical face and under sluice gates	
D/S Slope	1:0.7	
Weir crest level	1633.00masl	
Crest length of Ogee section	7.50 m	
Total Crest Length of Weir	7.50 m	
Width of Weir	7.50 m	
River bed Level	1627.00 masl	
Undersluice		
Length of undersluice base	53m	
Width of undersluice	7.2m	
Dimension of undersluice (L x B)	2 Nos. 5m x 6m	
Undersluice crest level of gate	1628 masl	
Undersluice Gate	Radial gate, 2nos. 3m x 3m	
Stilling Basin		
Stilling Basin for Ogee Weir (L x B)	41.50 m X 38.20 m	
Stilling basin for Undersluice (L x B)	15.7 m*7.20	
Floor level of stilling basin	1623.00 masl	
End level of stilling basin	1623.00 masl	
Intake		
Side Intake orifice	4 nos. 2.3(H) x 3.0(B)	
Invert Level	1630.0 masl	
No. of openings	4	
Intake Discharge	16.11m ³ /s	
Settling Basin		
Location	Surface	
Type	Intermittent conventional flushing	
Number of compartments	2	
Effective length	72.0m	
Total width of basin	19.0 m	
Width of one compartment	8.0 m	

Height in rectangular section	8.0 m	
Side slope of the compartment	1:1	
Flushing system	Intermittent	
Longitudinal slope of flushing channel	1:50	
Invert level at the beginning of flushing channel	1621.10 masl	
Invert level at the end of flushing channel	1620.85 masl	
Width of the flushing channel	1.20 m	
Flushing Culvert (L x H)	2m x 2.5m	
Invert level at the beginning of flushing culvert	1621 masl	
Size	72m (L) x 8.0m (W) x 8.0m (H) 3.4m hopper depth	
Flushing	Gated Box Culvert 1.2m (W) x 1.2m (H) x 60m (L)	
Primary Gravel Trap		
Size (B x H)	8.60m x 8.50m	
Length	20.5m	
Flushing Culvert		
Size (B x H)	1.5m x 1.8m	
Length	21.5m	
Number of culverts	1	
Flushing Gate	Two, 2.1m x 1.8m	
Invert level of Opening	1627.10 masl	
Level at beginning of culvert	1627.10 masl	
Level at Flushing end	1626.67 masl	
Secondary Gravel Trap		
Size (B x H)	8.0m x 8.30m	
Length	18.10m	
Flushing Culvert		
Size (B x H)	1.5m x 1.8m	
Length	28.0m	

Number of culverts	1	
Flushing Gate	Two, 2.1m x 1.8m	
Invert level of Opening	1626.26 masl	
Level at beginning of culvert	1626.26 masl	
Level at Flushing end	1625.14 masl	
Water Conveyance System (Headrace Tunnel)		
Shape of Tunnel	Inverted D type	
Length	6.321 km	
Finish Diameter	3.50m	
Finish Height	3.90m	
Gradient of HRT	1:500	
Tunnel Portal Level	1621.80 masl	
Surge shaft bottom	1599.80 masl	
No. of bends in HRT	7	
Support	Shotcrete and Concrete lining	
Adit Tunnels		
No. of Adit Tunnels	3	
Total Length of Adit Tunnel	522.67 m	
Diameter	4.40m (W) x 4.55m (H)	
Shape	Inverted D type	
Phulping Adit		
Adit -1 Length	284.6m	
Adit -1 HRT junction chainage	3+383.25m	
Adit -1 Portal level	1615.00 masl	
Hawa Adit		
Adit -2 Length	198.07m	
Adit -2 HRT junction chainage	6+784.6m	
Adit -2 Portal level	1580.00 masl	
Adit -3 Powerhouse Area		
Adit -3 Length	40m	
Adit -3 HRT junction chainage	7+473.55m	
Adit -3 Portal level	1278.52 masl	

Pressure Shaft/Tunnel		
Diameter	2.3m	
Total Length (with bends)	954.23m	
Length up to Manifold	917m	
Valve house to VIP-1	53.95m	
Vertical section (VS-1)	69.00m	
VIP-2 to Upper pressure tunnel portal (AB1)	391.70m	
Surface Penstock Length	207m	
Vertical section (VS-2)	61.40m	
Pressure shaft up-to Manifold (From VS-2)	110.65m	
Diameter of pressure after manifold	1.3m	
Lining	Shotcrete wire mesh and bolts lining	
Surge Shaft		
Diameter	6 m	
Shape	Circular	
Height	64.67m	
Surge Tunnel –HRT junction chainage	6+719.05m	
Invert level of surge tunnel junction	1599.80 masl	
Invert level of ventilation tunnel portal	1667 masl	
Powerhouse		
Type of Power house	Surface	
Powerhouse cavern dimension (l x B x H)	45m (L) x 16m (W) x 32m (H)	
Turbine Axis Level	EL. 1279.30 masl	
Machine floor level	EL. 1283.42 masl	
Tailrace		
Type	Free Flow Box Culvert	
Length	209.26m	

Shape	Rectangular	
Size	Culvert: 4.00m (B) x 2.5m (H)	
Outlet Level	1275.25 masl	
Turbine		
Type of turbine	Pelton	
Shaft configuration	Vertical Axis	
No. of turbine	3	
Turbine Output	16.451 MW per unit	
No of nozzle	6	
Rated speed	600 rpm	
Rated Efficiency	91.0%	
Generator		
Type	Synchronous 3 Phase	
Rated Power	19.176 MVA	
Rated output capacity per unit	16.267 MW	
Power Factor	0.85	
Voltage	11kV	
Frequency	50 Hz	
No. of Units	3	
Efficiency	97.6%	
Transformer		
No. of Transformer	2 Nos., three-phase	
Capacity	30/31.5 MVA ONAN/ with fan	
Voltage ratio	11/132 kV	
Efficiency	99.3%	
Transmission line		
Length	Approx. 2 km to Loop In Loop Out Switching Station at Bhimsensthan Constructed to evacuated its power on NEA DC 132 KV TL (Going from Garjyang to 220/132KV Substation at New Khimti)	
Connection	Loop In Loop Out Switching Station at Bhimsensthan	

Type	132 kV, Single circuit	
Cable	ASCR, Bear	
Power and Energy Generation		
Wet Energy	219.5 GWh	
Dry Energy	40.8 GWh	
Total Energy	260.3 GWh	
Firm Energy	107 GWh	
Financial		
Total Project cost	NRs. 8.646 billion	
Revenue	NRs. 1.4 billion	
B/C Ratio	1 .41	
IRR	16.01 %	
Access to the site		
Kathmandu- Charikot – Jiri	198 km (188 km blacktopped)	
Jiri to Dam site	11 km Gravel Road	
Dam Site to Powerhouse site	16 km Gravel Road	
Birgunj-Bardibas-Khurkot-Manthali-Kirnetar/Khimti	290 km	
Khimti to Powerhouse site	27 km Gravel Road	

Progress CHAPTER – 3 PROGRESS DETAILS

3.1 Summary on Construction of Site Infrastructures

S/N	Project Activity	Description	Status/Progress
CONTRACTOR/CONSULTANT'S PROGRESS			
1.	Civil Construction work	<ul style="list-style-type: none"> • High Himalaya Hydro Construction (3HC) 	<ul style="list-style-type: none"> • Contract Signing on 30th November 2020 with High Himalaya Hydro Construction (3HC) • Contractor Mobilized to site on 17th March 2021 • Army mobilized to site on 15th June 2021 • Overall cumulative Civil works progress- 82%
2.	Design Consultant	<ul style="list-style-type: none"> • Hydro Tunneling and Research 	<ul style="list-style-type: none"> • Contract Signing on 10th December 2020 with Hydro Tunneling and Research • IFC drawings of various Civil Components are being issued. Total 100 IFC drawings have been issued. • Balance design work along with structural design is ongoing.
3.	Electromechanical works	<ul style="list-style-type: none"> • Global Hydro GmbH 	<ul style="list-style-type: none"> • Contract signing of EM works done at 22nd February 2022. • Overall cumulative EM work progress- 68%
4.	Hydromechanical Works	<ul style="list-style-type: none"> • CMW India • Cream KHS JV 	<ul style="list-style-type: none"> • Contract signing between CBM India and Peoples Energy Limited for the entire gates and hoists as hydromechanical components of headworks on 9th March 2022 • Contract signing between Cream KHS JV and Peoples Energy Limited for the complete works of penstock and accessories on 3rd of May 2022 • Overall cumulative HM works progress- 82%
5.	132 KV Transmission Line works	<ul style="list-style-type: none"> • Royal Construction Pvt. Ltd 	<ul style="list-style-type: none"> • IEE final report has been approved from Ministry of Energy, Water Resources and Irrigation • Land acquisition works- 90% completed

			<ul style="list-style-type: none"> • Rebar, frames for foundation work of dead end tower at Loop in Loop out Substation received at site. • Contract awarded to Royal Construction Pvt. Ltd on 6th September for Design, Manufacture, Shop test, Supply and Delivery of Plant and Equipment for S/C 132 kV Transmission line. • Overall cumulative TL work progress- 42%
ACCESS ROAD			
6.	Dharapani to Dam site (Ramechhap side)	• 1.0 km	• 1.0 km of Track opening works – Completed.
7.	Intake-Dharapani Road (Dolakha Side)	• 0.5 km	<ul style="list-style-type: none"> • 200 m of Track Opening towards intake – completed. • 250 m of access road to Inlet portal completed.
8.	Burke – Hodampa/Phulping (Ramechhap side)	• 2.5 km	• 2.5 km track opening completed Gabion works and Maintenance of Burke-Bhage road- Completed.
9.	Thulopatal – Hodampa/Phulping - Gaighat (Dolakha side)	• 2.0 km	• 2.0 km Track opening, Gravel or Stone paved - Completed.
10.	Hanwa - Palate (Dolakha side)	• 5.5 km	• 5.5 Km Track opening, Gravel or Stone paved – Completed.
11.	Bhimsenthan – Palate/Powerhouse site new track (Ramechhap side)	• 0.5 km	• 0.5 km of Track opening, Gravel or Stone paved – Completed.
12.	Bhimsenthan – Palate/Powerhouse site Old track to be upgraded (Ramechhap side)	• 3.0 km	• Track opening, Gravel or Stone Paved- Completed.
PROJECT CAMP			
13.	Camp Building Construction works	• Total 12 Buildings	<ul style="list-style-type: none"> • Construction work completed. • Furnishing works completed.
14.	Water Supply System	• Drinking water to Project Camp	• Construction of water supply system completed and is in operation.
		• Drinking water to Locals	<ul style="list-style-type: none"> • 9 no of Public Tap stand constructed. • Reservoir tank construction is completed. • Water supply to locals is in operation.

33KV TRANSMISSION LINE FOR CONSTRUCTION POWER			
15.	Transmission Line for Construction power	<ul style="list-style-type: none"> 9 km 33 kV sub-transmission line 	<ul style="list-style-type: none"> Contract awarded to New Satakri Khimti Construction Transmission line work for construction power completed Electricity connection at all site is in operation.
BAILEY BRIDGE			
16.	Dharapani Bridge (Bridge I)	<ul style="list-style-type: none"> 42.672m 	<ul style="list-style-type: none"> Civil works Completed. Erection work Completed. The Bridge in operation.
17.	Hodampa Bridge (Bridge II)	<ul style="list-style-type: none"> 33.528m 	<ul style="list-style-type: none"> Civil works Completed. Erection work Completed. The Bridge in operation.
18.	Hawa-Palate Bridge (Bridge III)	<ul style="list-style-type: none"> 51.816m 	<ul style="list-style-type: none"> Civil works Completed. Erection work Completed. The Bridge in operation.
OTHER ACTIVITIES			
19.	Hydrology and Sediment Study	<ul style="list-style-type: none"> Hydrology and Sediment Study 	<ul style="list-style-type: none"> Sediment collection & Analysis by HydroLab-Completed. Discharge Measurement & Hydrological Analysis by Recham Consult - Completed.

3.2 Administrative Works

20.	ADMINISTRATIVE WORKS	<ul style="list-style-type: none"> Various administrative issues 	<ul style="list-style-type: none"> Forest Land Approval-Completed Land acquisition: 100% completed Survey License for Transmission Line (Power Evacuation): Completed.
		<ul style="list-style-type: none"> Shifting grid Connection for Power Evacuation 	<ul style="list-style-type: none"> Approval received for loop in loop out connection shifting grid connection completed.
		<ul style="list-style-type: none"> Updated IEE Report 	<ul style="list-style-type: none"> Final approval received: Completed
21.	LOCAL STAKEHOLDERS ENGAGEMENT	<ul style="list-style-type: none"> Local issues 	<ul style="list-style-type: none"> Local Stakeholders Engagement through various discussion addressing the project related environmental and social issues are continued

			<ul style="list-style-type: none"> Implementing various social and local infrastructural development works
--	--	--	---

3.3 Design and Physical Model Study

22.	PHYSICAL HYDRAULIC MODEL STUDY	<ul style="list-style-type: none"> Model of Revised Headworks 	<ul style="list-style-type: none"> Consulting contract award to Hydrolab Provided required documents completed model construction of structures. All the details of the model are finalized and model run successfully completed. waiting for the final report of the hydraulic model design.
-----	---------------------------------------	---	--

3.4 Progress Work in Detail

3.4.1 Civil Construction work

The civil construction contract work was awarded to High Himalaya Hydro Construction on 30th November, 2020. The Employer issued Notice to proceed to the contractor on 1st December 2020.

Major Activities by the civil contractors at different sites are listed below:

3.4.2 Headworks Site:

- **Intake structures:** Divide wall in panel 4 is completed. Rebar work in intake and primary gravel trap is completed up to level 1630.5. Steel lining completed. Back fill completed. Hard stone lining completed.
- **Under sluice structure:**
 - Panel 1: Concrete work completed, concrete work up to 2nd stage at stop log gate completed.
 - Floodwall D/S: Panel 1, Panel 2 and Panel 3 completed.
 - Panel 2: Concrete work completed.
 - Panel 3: Concrete work completed.
 - Panel 4: Concrete work completed.
 - Hard stone lining: panel 1, 2, 3 & 4 completed.
 - Removal of debris, trash.
 - Right side flood wall completed.
- **Approach culvert structures:** Slope excavation, rock bolting and shotcreting work was completed up to the level of 1633m and concrete work of Panel 1,2,3,4,5,6,7, 8, 9, 10,12& 13 is completed. Panel 11 (Concrete work completed up to 1st lift shear wall).
- **Approach culvert (Bifurcation part):** concrete work completed of all panels (p-1 to p-8).
- **Transition part (Bifurcation):** Concrete work fully completed.

- **Secondary gravel trap:** Concrete work completed, placing of trash rack completed. Installation of Flushing chamber gate completed.
- **Intake and primary gravel trap:** Concrete work totally completed. Concrete work on flushing gate chamber of primary gravel trap up to level 1636m completed (reaches up to 1638.50m), hard stone lining continues. Installation of trash rack completed. Flushing chamber concrete work completed up to second last stage. Non shrinkage grouting completed. Epoxy grouting continues.
- Concrete work on Transition part shear wall completed (up to level 1637m) (only 2 panels are available).
- Approach canal D/S side concrete work is completed (panel 1 and panel2).
- **Settling Basin Flood wall:** Concrete work, back fill, compaction and sub-surface drainage in Panel 1 to 11 are completed.
- **Transition part of primary gravel trap-** concrete work totally completed.
- **Settling Basin:** Backfill in flood wall up to 8m in Panel 1 to 8 is completed. Backfill in flood wall up to 5m in panel 9, 10&11 is completed. Concrete work of panel 1, 2, &3 are totally completed (river side, hill side and mid wall). Masonry work of panel 4&5 completed.
- **Settling Basin Transition part-** Concrete work fully completed (up to slab).
- **U/S of under sluice (flood wall):** Panel 1 only- concrete work completed, backfill completed.
- **D/s of under sluice (flood wall):** panel 1, 2, 3, 4-Concrte work completed, backfill completed.
- **River diversion:** River diversion to undersluice completed.
- **Left Bank protection wall** – Left bank cutting continue. Stone riprap just up steam of left bank flood wall continues. panel16, Panel 17, panel 18, panel 19, panel 23, panel – 24 & panel 25 -concrete work totally completed. Panel 19, 23 – Base slab completed. Panel 20 & 21 excavation work completed. Panel 22 –concrete work completed up to 3rd lift. Panel -27,28 & 29 excavation work completed.
- **Weir-** Concrete work of U/S cutoff wall completed. Inclined weir- concrete work completed from level 1622 to 1628. U/S cutoff wall- fully completed. D/S cutoff wall- completed. Ogee weir 6 meter depth completed up to level 1623 meter, reaches up to 1633 meter. (out of 17 meter section only 6 meter section under construction)
- **Middle flood wall:** Panel 4- concrete work completed. Panel 5 & 6- concrete work completed up to 4th lift.



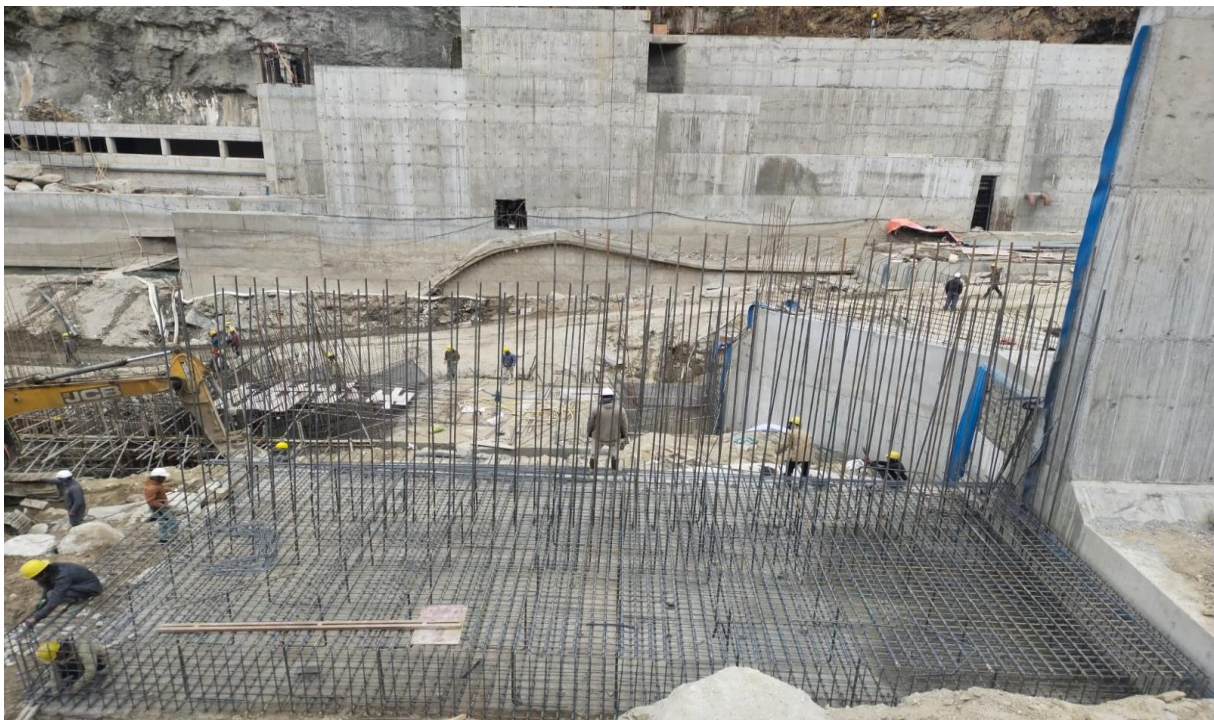
Headworks Undersluice



Headworks area



Ogee weir base PCC



Rebar works at left bank floodwall



Ogee weir rebar and formwork



Settling basin (masonry wall)

3.4.3 Tunnel Site:

- ✓ HRT Inlet site (HRT Face-1): 1671.5 reached and completed.
- ✓ HRT Face-2: 1293.5m reached and completed.
- ✓ Successful breakthrough of Face 1 and Face 2.
- ✓ Tunnel lining started from face 2.



Face 1 and Face 2 successful breakthrough



Lining works from Face 2 (Invert, wall and arcs)



Inlet Lining works

HRT Face-3 Tunnel excavation work at D/S HRT from Adit 1 junction: **1+508.6 m face chainage reached (49.6 m achieved in this month) .**



Face 3

Adit-2 Portal (Surge Tunnel/HRT Outlet) site:

- Adit Tunnel excavation work: **0+196 m face chainage reached** and completed^d.
HRT Face-4
- Excavation work at U/S HRT from Adit 2 junction: **1+1724.95 m face chainage reached** (**41.8 m** length achieved in this month).
- Excavation work at Vertical Shaft (VS1) **0+162.26 m face chainage reached** and completed.
- Vertical Shaft-1 (VS-1) breakthrough on 27th February, 2024.
- Excavation work at D/S HRT from Adit 2 junction: **0+035.4 m face chainage reached** and completed^d.
- Excavation work at bifurcation to vertical shaft from Adit 2: **0+056 m face chainage reached** and completed^d.
- Excavation work at Ventilation Tunnel: **0+113.10 m face chainage reached** and completed^d.
- Excavation work at HRT VS1-VC: **0+080.7 m face chainage reached** and completed^d.
- Concrete work in surge shaft is completed.

*Face 4*



Surge shaft concrete works completed

Khimti-2, Hydroelectric Project 48.8 MW									
Ramechhap/ Dolakha									
Monthly Progress Report - March 2025									
S.N	Description of Work site	Unit	Total Length	Progress upto		This month	Progress in %	Remaining Length	Rem
				1st March	31st March				
1	HRT from inlet to Adit 1 (F1)	M	1671.5	1671.5	1671.5	0	100.00	completed	67.45
2	HRT from Adit 1 Junction to U/S (F2)	M	1293.5	1293.5	1293.5	0	100.00	completed	
3	Adit 1	M	284	284	284	0	100.00	completed	
4	HRT from Adit 1 Junction to D/S (F3)	M	1550	1459	1508.6	49.6	97.33	41.4	
5	HRT from Adit 2 Junction to U/S (F4)	M	1751	1683.15	1724.95	41.8	98.51	26.05	
6	Adit 2	M	200	200	200	0	100.00	completed	
7	HRT from Adit 2 Junction to D/S (F5)	M	30	30	30	0	100.00	completed	
8	HRT from VS1 to Adit 2 Junction U/S (F6)	M	90	90	90	0	100.00	completed	
9	Ventilation Tunnel	M	104	104	104	0	100.00	completed	
10	Surge shaft	M	65	65	65	0	100.00	completed	
11	Surge shaft to HRT connecting	M	43.25	43.25	43.25	0	100.00	completed	
12	Bifurcation from Adit 2 to VS1	M	55	55	55	0	100.00	completed	
13	Upper Vertical Shaft (VS1)	M	157.39	151.2	157.39	0	100.00	completed	
14	HRT from VS1 access junction to VS1	M	23.5	23.5	23.5	0	100.00	completed	
15	Upper Pressure Tunnel (F7)	M	519	519	519	0	100.00	completed	
16	Lower Vertical Shaft (VS2)	M	67	67	67	0	100.00	completed	
17	Pressure tunnel from PH to Lower Vertical Shaft	M	180	180	180	0	100.00	completed	
18	Adit-3	M	40	40	40	0	100.00	completed	
19	Phulping Brook Horizontal tunnel	M	33	33	33	0	100.00	completed	
20	Phulping Brook Vertical Shaft	M	33	23	33	10	100.00	completed	
21	Niche	M	182	182	182	0	100.00	completed	
22	Total volume	M	8372.14	8197.10	8304.69	101.40	99.19	67.45	

Underground Works Summary

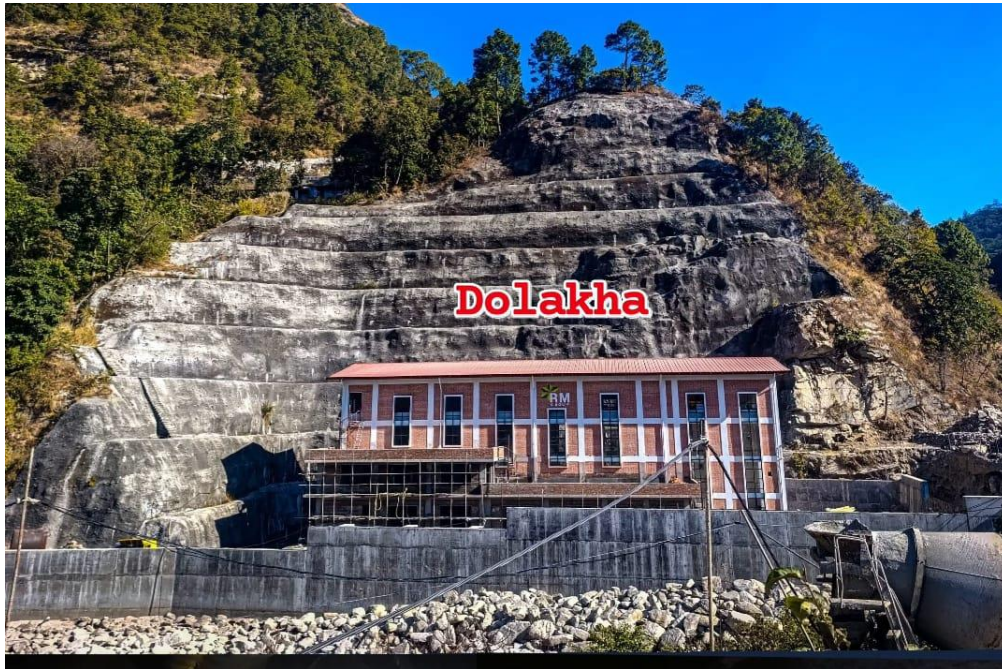
3.4.4 Powerhouse Site:

- Turbine outlet gate: concrete work completed.
- Control building: Concrete work on both slab (A & B) completed. Column of 1st lift above slab A completed. Ceiling plaster works completed. Brick work on ground floor

completed, brick work completed. Plaster work completed. Placing of spiral stair case completed.

- Tailrace gate: Completed.
- Powerhouse Building- Cleaning work for 2nd stage concrete for machine foundation continue.
- Tail pool: Concrete work of top of slab is completed.
- Manifold tunnel 1, 2, 3: Plum concrete completed. Consolidation grouting completed. Anchorage work completed. Rebar work completed. Concrete work completed of block 4 and 5 and 1st lift completed of 6th block.
- Manifold junction: Placing of anchor rod completed.
- Tailrace: Concrete work of all panels (1 to 13) is completed.
- Tailrace drain: construction of surface drain completed.
- Floodwall: Panel 14, 15 16, 17, 18, 19, 20 21, 22, 23, 24, 25, 26 & 27, 28, 29 is totally completed (All completed).
- Control Building: Plumbing work completed. Sukri work continues .plaster work completed.
- Switchyard: Outer boundary masonry wall continue. Back fill work completed.
- Anchor block: Excavation and P.C.C completed (between vs2 and upt). Pipe erection continue, concrete work of base slab completed, concrete work up to 4th lift completed (1356 to 1360.40 m).
- Truss: Placing of truss on top of power house completed. Placing of CGI sheet above truss completed. (Roofing work completed)
- Gutter work completed.
- VS-2: Infill up to Anchor block base is completed.
- Brickwork: Brick work on power house is completed.
- Plaster Work: Inner side of powerhouse completed.
- Cleaning inside the power house completed.
- Surki works in Powerhouse- completed.
- Back fill up to top of transition portion completed.
- Percolated pipe (sub surface drainage system): Completed up to adit3 section.
- Switchyard protection wall (retaining wall) – panel1, panel2 & panel3- all completed. Masonry work continues. Back fill completed.
- Manifold tunnel 1, 2, 3- Drilling for consolidation grouting completed. Placing of anchor completed. Reinforcement placement completed. Concrete work completed up to 1st lift of 1, 2, 3 completed.
- Gabion wall between bridge and retaining wall completed.
- Boulder Riprap (C35): All most completed (up to large boulder section)
- Outside anchor block: concrete work continues. Masonry work continue foe key.
- Aluminum frame work completed.
- Glass work on powerhouse completed.
- Color work on powerhouse continues (up to 1st beam).

- Service bay protection retaining wall: Total 3 number of retaining wall. Panel 1 & 3 completed. Panel 2- concrete work completed up to 2nd lift.
- Back side of service bay protection retaining wall –Gabion work continues.
- Transformer yard – P.C.C. completed, Concrete work completed (Base slab, oil pit e.t.c).



Powerhouse and control building



Powerhouse & Control building



Switchyard Retaining Wall



Transformer yard and transformer

Upper Pressure Tunnel site:

- Excavation work at Upper Pressure Tunnel: **0+519 m face chainage reached** and completed.
- Concrete infill up to 20 meter section completed.
- Excavation work at Vertical Shaft-2: **0+067 m face chainage reached** and (Completed).
- Shotcrete Work: completed, cleaning work completed.
- VS1 Bottom anchor block- Concrete work completed.
- Infill concrete on VS1: 75m from base completed.
- Motor grouting bottom anchor block of U.P.T completed.
- Excavation for UPT anchor block completed.
- Base preparation for saddle support continues.

3.4.5 Hydro Mechanical work

- Bifurcation II erection completed.
- Bifurcation I erection completed.
- Lowering of Penstock Pipe started in VS-1. Overall 155m pipe lowering work completed.
- Surge bellmouth erection completed.
- Turbine Outlet Gate leaf- 3 set erection completed.
- Settling Basin Inlet Gate- 2 sets erection completed.
- Sand blasting – 29 pic. Sand blasting completed in this month. Total number of sand blasting 315 pic.completed.
- Tailrace Gate Leaf- 1 set erection completed.
- Second stage of settling basin inlet gate- 2 sets.
- 20m pipe erection work completed in UPT.



Bifurcation-I Erection Works



Bifurcation-II



Penstock Pipe Lowering at VS-1



UPT Pipe Erection



Pipe Erection at Surge



Drainage Pipe Installation at UPT



Dry Testing of Turbine Outlet Gate

3.4.6 Electro-mechanical works

- Completed the assembling and Alignment of Turbine casing Parts and three Ring Circuit of Unit 1 and Unit 2.
- Installation of Unit III MIV.
- Installation of the power transformer at the sending-end switchyard.
- All control panels switchgear shifted to control room.
- Generator accessories delivered to site.



Distributary pipes



Installation of Unit 3 MIV



Installation of Power Transformers



Generator accessories delivered to site

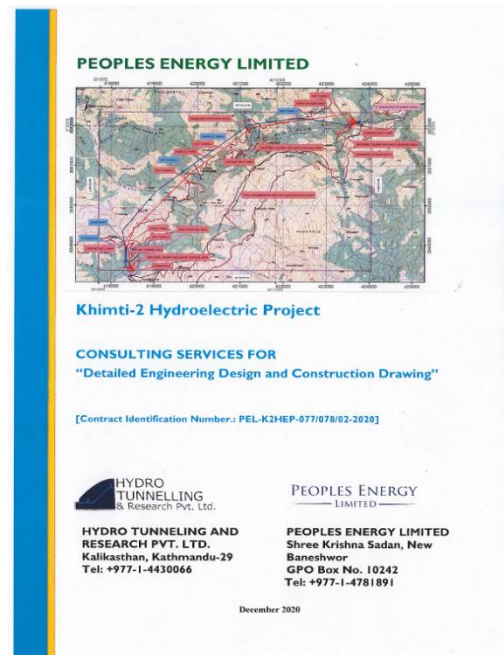


UT test of distributary pipe Unit 3

3.4.7 Design Consultant's Progress

For the consulting services for detailed engineering design and construction drawing Hydro Tunneling and Research Pvt. Ltd. was awarded the contract on 10th December 2020. Major Activities by the Design Consultant are listed below:

- Total of 111 IFC drawings have been issued till now.



3.4.8 132 kV Transmission Line works

- Incoming and outgoing dead end tower foundation works, including stub setting have been completed.
- Foundation works for AP7 and AP5 tower of the 132 KV transmission line between the powerhouse switchyard and receiving end substation completed.
- Stubs of all towers delivered to site.
- Excavation of AP-1 tower foundation.
- Excavation of AP-6 tower foundation.



AP 7 foundation works



AP 6 foundation excavation works



AP 5 foundation works

3.4.9 Loop in Loop Out (LILO) Receiving End Substation

- **Access Road** - Access roads to the substation completed.
- **Concrete panel**- Concrete work of panel 6R, 5R, 2R, 4R, 3R completed. Panel 1R-concrete work completed up to 1st lift. Panel 7R- Concrete work of base slab completed.
- **Masonry Panel**- Masonry work of 5M, 8M (30meter) completed.
- **Back fill** – Back fill up to 4R top slab completed.
- **Tower**: Dead in and dead out & AP07 –civil work completed.
- **Excavation work** – 3rd bench excavation work continue.
- **Earthing works ongoing.**



Earthing works at LLO



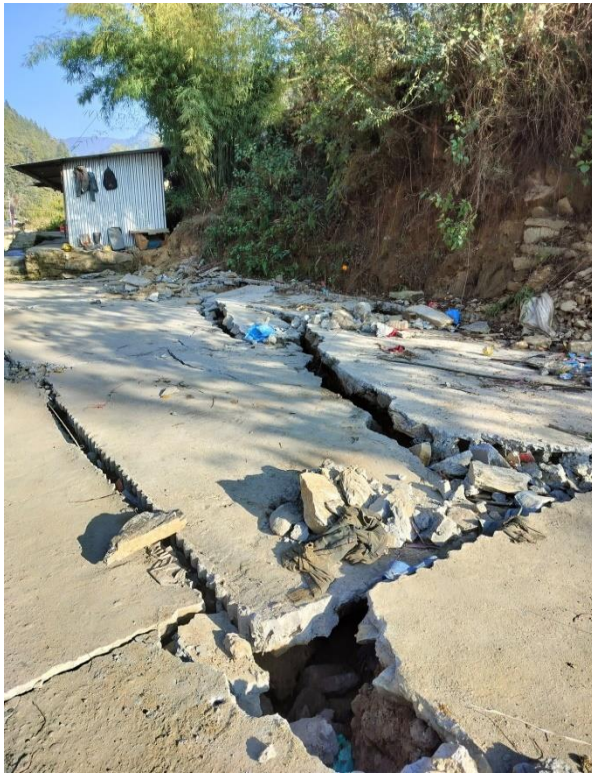
Tower leg



Masonry work, R.C.C work and Back fill

3.5 Force Majeure/Difficulties & issues faced

- Force majeure condition of COVID-19 Pandemic has affected the project and delayed the works by 2 years.
- Delay to open the access to surge shaft due to forest land approval.
- Floods during the monsoon season of 2022 has disrupted the access and slowed down the progress.
- Locals' various demands like infrastructure development, contracts as well as employment has been hindering the smooth pick up of the progress.
- Flood and landslides due to heavy rainfall on 28th of September significantly disturbed the works.
- Headworks left bank collapse, Progress slowed due to slope stabilization works.



Left Bank Cracks at Headworks