Nyadi Hydropower Limited

Nyadi Hydropower Project (30 MW)

Progress Report

(December 2019)

Kathmandu, Nepal

Nyadi Hydropower Limited (NHL)

Buddha Nagar, Kathmandu, Nepal

Nyadi Hydropower Project (30MW)

Monthly Progress Report

December 2019

		Position	Date
Prepared by	Bikram Dhoj Shahi	Project Engineer	January 2020
Checked by	Bibek Karanjit	Senior Project Engineer	January 2020
Approved by	Uttam Amatya	Chief Executive Officer	January 2020

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1. Introduction

1.1. Background

Nyadi Hydropower Project (NHP) was first identified in 1993 during the preparation of the Small Hydropower Master Plan. The feasibility study of the project (20 MW) was completed by Lamjung Electricity Development Company (LEDCO) in the year 2000.

In October 2006, Butwal Power Company Limited (BPC) and Lamjung Electricity Development Company (LEDCO) had an understanding to develop the NHP together. As per agreement made between BPC and LEDCO, Nyadi Hydropower Limited (NHL) was established on 2063/11/17 (01/03/2007) to undertake the NHP independently. The project is being developed through a Special Purpose Vehicle (SPV), by Nyadi Hydropower Limited with BPC as a major stakeholder. Feasibility study of NHP (30 MW) was completed by NHL in October 2010.

1.2. Overall Project Description

The Nyadi Hydropower Project (NHP) is a run-of-river type project, located in Lamjung District of Western Development Region of Nepal. The entire component from intake to powerhouse area located within the Ward no. 6 of Marsyangdi Rural Municipality, Lamjung District.

The project has an installed capacity of 30 MW and will generate 168.55GWh of energy annually. The generated power will be connected to a proposed NEA's Hub that will be constructed at Marsyangdi corridor, about 6 km south of the powerhouse. Moreover, about 250 m long adit tunnels which include Naiche adit, Surge adit and ventilation adit are also proposed to make 4 headings for excavation and construction of the headrace tunnel. Surge shaft is designed near the end of the headrace tunnel having diameter of 5.0 m and 35 m height.

An about 14 m diversion dam has been designed to construct across the Nyadi River. The water from intake is feed to underground settling basin and conveys it through about 3840 m long headrace tunnel and 745 m long penstock pipe. A surface powerhouse has been proposed on the right bank of Nyadi River at the Thulibesi. The gross head of the project is 334.40 m while design discharge of the project is 11.08 m³/s.

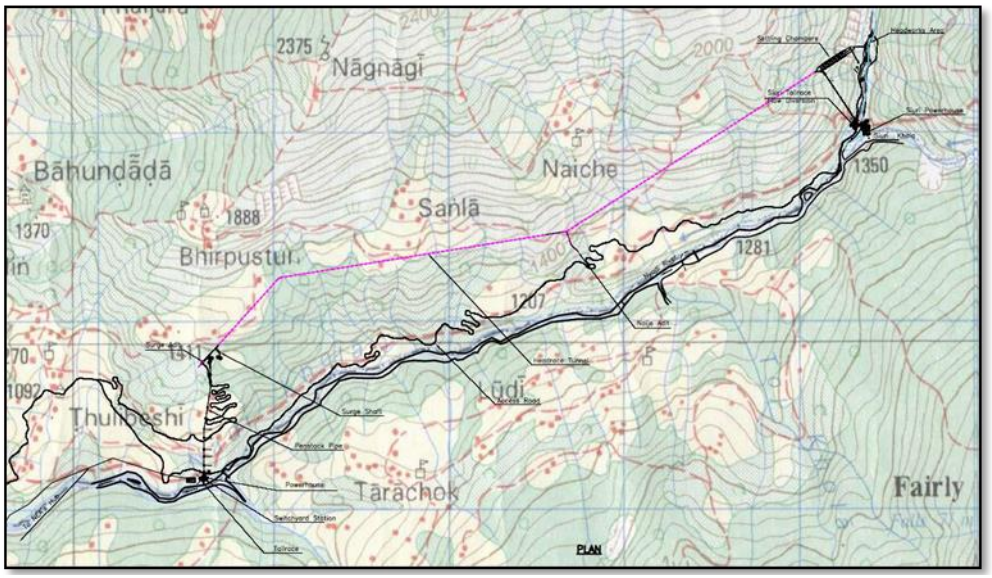


Figure 1: General Project Layout of Nyadi Hydropower Project

1.3. Completed Milestones

S.N.	Milestones	Date
1.	Electricity Generation License	Feb 27, 2013
2.	Power Purchase Agreement (PPA)	May 26, 2015
3.	Financial Closure or facility agreement	Feb 03, 2016
4.	Contract for the Government land lease and Tree Cutting approval signed with Ministry of Forestry & Soil Conservation	March16, 2016
5.	Financial Consultant appointed: A tripartite agreement between NHL, EBL and T.N Acharya & Co., Chartered	December 2, 2016
6.	Required Commercial Operation Date (RCOD) extended up to April 18, 2020	December 26, 2016
7.	EPC Contract Agreement with ZHCIC for Lot 1: Civil works and Hydro-mechanical works Including Electro-mechanical	January 16, 2017
8.	EIA of Transmission Line Approved	March 29, 2017
9.	Client Consulting Services – Employer's Representatives for Lot-1 and Lot-2	April 07, 2017
10.	Technical Consultant appointed: A tripartite agreement between NHL, EBL and Jade Consult P. Ltd.	June 27, 2017
11.	132 kV Transmission line License	June 29, 2017
12.	EPC Contract Agreement with Urja International P. Ltd for 132 kV Transmission Line Works (Lot II)	July 12, 2018
13.	Agreement with CARE Rating Nepal Ltd. for rating of Initial Public Offer (IPO) of NHL.	May 17, 2019
14.	Agreement with Global IME Capital for managing the public issue of shares of NHL as an Issue Manager for IPO	May 21, 2019
15.	IPO Grading "CARE-NP IPO GRADE 4" received from CARE Rating for IPO of NHL	June 26, 2019

2. Institutional Arrangement

Following entities constitute the whole institutional arrangement of Nyadi Hydropower Project having Installed Capacity 30 MW

The Employer/Owner : Nyadi Hydropower Limited (NHL)

The Engineer/Consultant : Hydro-Consult Engineering Limited (HCEL)

Financing Institution : Everest Bank Limited as Lead Bank; Nabil Bank Limited and Global IME Bank Limited as Co-Lead Banks; Himalayan Bank Limited, Sunrise Bank Limited and Hydroelectricity Investment and Development Company Limited (HIDCL)

3. Tender Lot - I (EPC Contract for Civil Works, Electro-mechanical Works & Hydro-mechanical Works)

A contract for the major works of the project was signed on January 16, 2017 -- EPC Contract for Civil Works and Hydro-mechanical Works (Lot 1) including Electromechanical Works for Nyadi Hydropower Project (30MW) (Contract Identification No. NHL/NHP-2015/016-CH-1). The details are listed below.

1	Contractor:	Zhejiang Hydropower Construction & Installation Co. Ltd
2	Works:	EPC Contract for Civil Works and Hydro-mechanical Works (Lot 1) including Electromechanical Works for Nyadi Hydropower Project (30MW) (Contract No. NHL/NHP-2015/016-CH-1)
3	Contract Price Contract signed on :	US$ 39,500,000 or NPR 4,207,540,000 at the Exchange rate of USD1=NPR106.52, Jan 16,2017
4	Date of Commencement of work:	2017/02/10,delayed by contractor and Commenced on 2017/03/22
5	Intended Work Completion Date:	April 05,2020 (1150days)
6	RCOD Date:	April 18, 2020 (Extended)

4. Tender Lot- II (EPC Contract for 132 kV Transmission Line Works)

1	Contractor:	Urja International Pvt. Ltd
2	Works:	EPC Contract for 132 kV Transmission Line Works (Contract No. NHL/NHP-2017/019-TR-1)
3	Contract Price Contract signed on :	NPR 70,421,300 (Excluding VAT) July 12,2018 (*USD Exchange Risk to be borned by NHL*)
4	Date of Commencement of work:	July 26,2018
5	Intended Work Completion Date:	December 14, 2019 (520days) Extended
6	RCOD Date:	April 18,2020 (Extended)

5. Contractor's Status of Site Mobilization

The Contractor ZHCIC's mobilization commenced on March 22, 2017 at site with the arrival of Temporary Building materials and Excavators. 151 workers including technical personnel are presently at the site. Contractor has completed mobilization. All equipment and staff have been mobilized in the site. The main camp is near to the powerhouse. All labor camps and other yards like storage yard, Hydro-mechanical, etc. are completed. The status of equipment, materials and personnel are as in the follows tables.

Table 1.1: Equipment List at Project site

S.N.	Name	Nos.	S.N.	Name	Nos.
1	Excavator	4	25	Mucking tractor	12
2	Generator	7	26	Concrete mixture	5
3	Pick-up	4	27	Electric pump	20
4	Vibrator	2	28	Electric pump (Submersible)	20
5	Air Compressor	7	29	Sewage pump	17

S.N.	Name	Nos.	S.N.	Name	Nos.
6	Drill Machine Pusher Leg	20	30	Electric winch machine	3
7	Breaker	1	31	Scrapper bucket type rock debris transporting machine	4
8	Crawler down hole drill	1	32	Bar bender	3
9	Auto Transformer Starter	5	33	Steel plate rolling machine	1 set
10	Dump truck	3	34	Steel flange correcting machine	1
11	Total station (TS02 plus)	1 set	35	Pneumatic Pick	5
12	Air drilling (Jackhammer)	20	36	Wheel barrow	25
13	Air storage tank	5	37	Electronic truck scale	1
14	Shotcrete machine	1	38	Electric wire rope hoist	1
15	Cutting machine (Abrasive cutter)	18	39	Threading machine	2
16	Vibrating screen	2	40	Grouting Machine	1
17	Bar straightening cutter	1	41	Vibrator	2
18	Wheel Loader	2	42	Wheel loader(Small)	3
19	Welding machine	32	43	Concrete pump	3
20	Blower fan	7	44	Submerged water pump	15
21	Air receivers	5	45	Sump pump	20
22	Fuel tank	2	46	Self-priming pump	5
23	Transformers	4	47	Mortar mixture	2
24	Low voltage Distributor	4			

Table 1.2: Lab Equipment List at Project site

S.N.	Name	Nos.	S.N.	Name	Nos.
1	Grinding machine	2	15	Concrete Anti seepage Instrument	1
2	Steel model for mortar	6	16	Thermoelectric Thermostat Air-blowing Drying Chamber	1
3	Grinding compressive fixture	1	17	Concrete Mixer Controller	1
4	Plain bumper motor	2	18	Standard Square Hole Sieve	1
5	Universal testing machine controller	1	19	Cement Anti-compression and Anti-bending tester	1
6	Sieve shaker	1	20	ISO Cement Mortar Plain Bumper	1
7	Punching machine	1	21	Rebound Hammer	2
8	Thermostatted water curing chamber	1	22	Electronic Scale	1
9	Cement concrete standard curing chamber	1	23	Digital Caliper	1
10	Electronic Balance	2	24	Flaky Normalized Device	1
11	Cement Density Condensation Tester	1	25	Universal Material Testing Machine	1
12	Slump cone	2	26	Los Angeles abrasion test machine	1

13	Electric folding machine	1	27	Core cutter machine	1
14	Concrete Anti seepage Instrument Controller	1	28	Bolt puller (Pull out test machine)	1

Table 1.3: Materials stock at Project site

S.N.	Materials	Qty.	S.N.	Materials	Qty.
1	Drill Rod	400 pcs	16	Engine oil	9 drums
2	Stellidium alloy bit (42*22mm)	2600 pcs	17	Safety belt	42 pcs
3	Ventilation pipe (45 mm)	6 pcs	18	Mortar spraying pipe	70 rolls
4	Hose pipe (25 mm dia.)	120 pcs	19	Metal sheet plate 8 mm (8"*4")	25 pc
5	Scaffold couples	3000 pcs	20	Jag shakti TMT rebar (16mm)	80 tons
6	Steel rope	3 roll	21	Jag Shakti TMT rebar (20mm)	60 tons
7	M.S. Sheet (2mm)	1700 kg	22	Jagdamba TMT rebar (25mm)	22 tons
8	M.S. Angle ISA (40x40x5mm)	400 kg	23	Formwork board	1200 pcs
9	M.S. Black pipe (20x20x2mm)	2000 kg	24	Lubricating oil	40 drum
10	M.S. Black pipe (38x38x2.2mm)	45 ton	25	Wood planning machine and its spare parts	5 boxes
11	M.S. Black pipe (2.7mm)	37060 kg	26	Steel plates for Penstock	500 ton
12	M.S. beam ISMB (150*75 mm)	7000 kg	27	Cement	70 ton
13	Channel (125*65 mm)	2375 kg	28	Sand	1200 m^3
14	Channel (150*75 mm)	1580 kg	29	Aggregates	1100 m^3
15	Hume pipe (75cm dia.)	6 pc	30	Diesel	9000 ltr

Table 1.4: Mobilized Contractors personnel

S.N.	Position	Nos.	S.N.	Position	Nos.
1	Project Manager	1	4	Admin	3
2	Deputy Project Manager	-	5	Skilled Workers	65
3	Engineer	3	6	Worker (Nepali)	79
Total Personnel = 151					

6. Project Progress

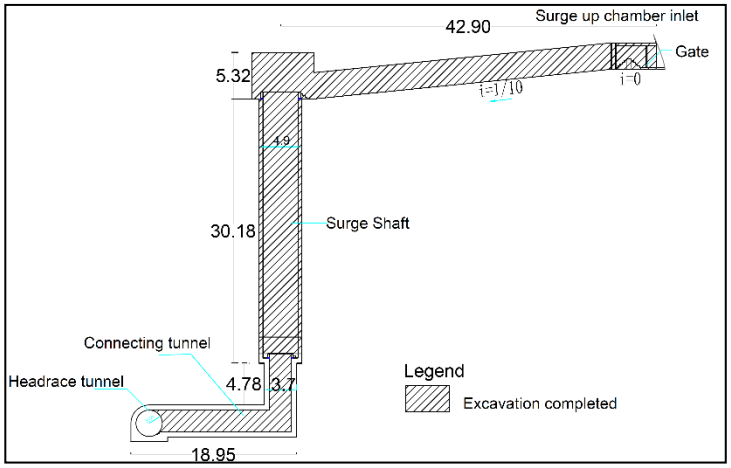
Table 1.5: Project major progress up to December 2019

S.N.	Description	Total	Construction completed up to		% completed
			November 2019	December 2019	
1.	**Mobilization**	**100%**	**100%**	**100%**	**100%**
2.	**Access Road Construction**				

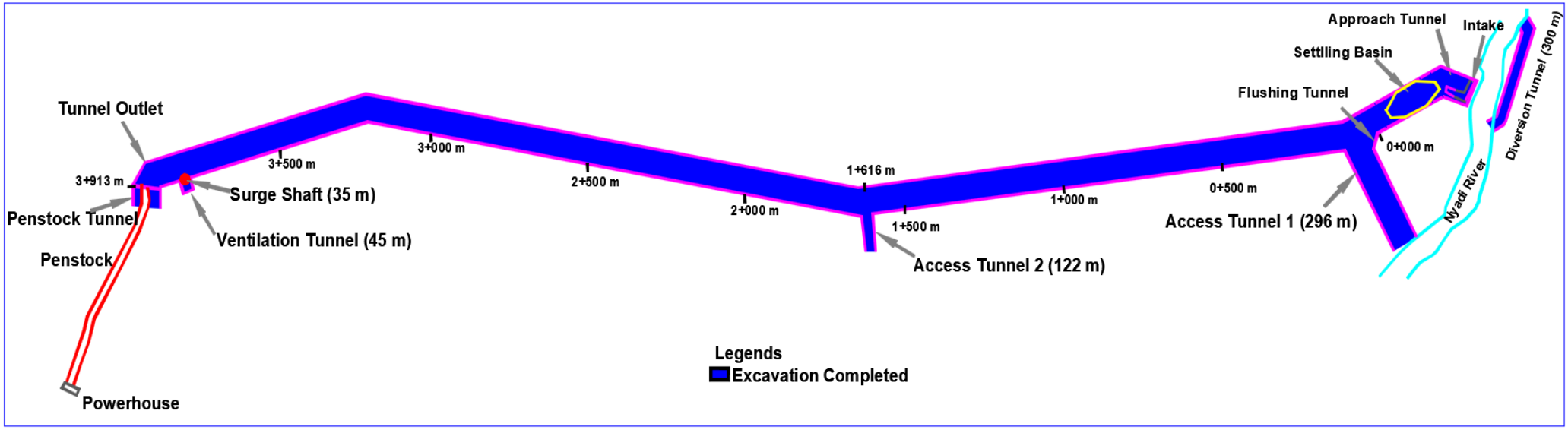
S.N.	Description	Total	Construction completed up to		% completed
			November 2019	December 2019	
a.	Naiche to Headworks (New Track opening)	3000 m	~3000 m (1650 m as per design drawing and 1350 m along river bank)	~3000 m	~100%
b.	Headworks to Diversion Tunnel			~100%	~100%
3.	**Access Road Upgrading of Existing Track**				
a.	Marshyangdi Bridge to Thulibesi Village	100%	~55%	~65%	~65%
b.	Thulibesi Village to Surge Shaft	100%	~65%	~65%	~65%
c.	Thulibesi Village to Naiche	100%	~65%	~65%	~65%
4.	**Temporary camp construction**	**100%**	**~90%**	**~90%**	**~90%**
5.	**Tunnel portal surface excavation**				
a.	At Outlet	100%	~75%	~75%	~75%
b.	At Naiche Access Tunnel 2	100%	~75%	~75%	~75%
c.	At Access Tunnel 1	100%	~75%	~75%	~75%
d.	At Intake	100%			~75%
6.	**Access Tunnel Excavation**				
a.	Access Tunnel 1 at Headworks	296 m		296 m	~100%
b.	Access Tunnel 2 at Naiche	122 m		122 m	~100%
c.	Flushing Tunnel	63 m		63 m	~100%
7.	**Headrace Tunnel Excavation**	**3840 m**		**3840 m**	**~100%**
a.	From Outlet		~1738 m	~1738 m	
b.	Access tunnel 1 towards Headworks		~50 m	~50 m	
c.	Access tunnel 1 towards Access tunnel 2		~519 m	~519 m	
d.	From Naiche Access tunnel-2 towards Headworks		~1053 m	~1053 m	
e.	From Naiche Access tunnel-2 towards Outlet		~480 m	~480 m	
f.	From Intake	230 m	~230 m	~230 m	100%
g.	Penstock tunnel	68 m	68 m	68 m	100%
8.	**Surge Shaft**				
a.	Ventilation Tunnel Excavation	40 m	40 m	40 m	100%
b.	Surge Shaft Excavation	35 m	35 m	35 m	100%
c.	Surge Shaft Concreting	35 m	35 m	35 m	100%
9.	**Penstock**				
a.	Surface Excavation	100%	~45%	~60%	~60%
b.	Anchor Blocks	11 Nos.	~36%	~45%	Anchor blocks 6, 7,9,10 and 11

S.N.	Description	Total	Construction completed up to		% completed
			November 2019	December 2019	
					completed
c.	Pipe Laying	770 m	372.2 m	523.2 m	~67%
10.	**Headwork's**				
a.	Cofferdam	100%		~100%	Diversion by Distributary Structure
b.	Diversion Tunnel Excavation	300 m		~300 m	~100%
i.	Concreting of Inlet portion	112 m^3		112 m^3	~100%
ii.	Concreting of Outlet portion	53 m^3		53 m^3	~100%
c.	Dam side slope excavation	100%	~90%	~90%	~90%
d.	Undersulice	100%		15%	~15%
e.	Intake excavation			100%	Excavation completed
f.	Approach Tunnel	230 m		~230 m	Excavation completed
g.	Settling Basin	62 m		62 m	Excavation and Widening completed
11.	**Powerhouse**				
a.	Excavation	100 %	100%	100%	100%
b.	Concreting	100 %	95%	95%	95%
12.	**Tailrace**				
a.	Excavation	100%		100%	100%
b.	PCC (C20)	100%		100%	100%
13.	**Powerhouse River Protection Works**	1988 m^3	1988 m^3	1988 m^3	100%
14.	**Substation works**				
a.	Excavation and Back filling	100%	45%	45%	45%
b.	Foundation Concrete work	100%	35%	35%	35%
15.	**132kV Transmission Line**	6 Km			
a.	Excavation of Foundation	100%	26%	30%	(Tower 7,8,9,10,11, 12 & 13 Completed)
b.	Concreting	100%	23%	27%	(Tower 7,8,9,10,11, 12 & 13 Completed)

Project Status of underground Surge Shaft and Ventilation Tunnel



Project Status: Tunnel Excavation



6.1. Distributary Structure

River diversion from the Distributary structure to the Diversion tunnel has been completed on 1st January 2019. Masonry wall at Distributary structure for the diversion of high flood level has been completed.

6.2. Diversion Tunnel and Cofferdam

The 300 m long diversion tunnel excavation has been finished. Concreting at Inlet and outlet part has been completed. Construction of coffer dam for river diversion has been accomplished.

6.3. Dam and Intake

Excavation and concreting of first cut-off wall up to level 1372.00 m at dam site have been completed. Concreting of second cut-off wall and downstream cut-off wall up to level 1372.00 m have been completed. Likewise, a submerged sand trap at upstream of first cut-off wall up to level 1374.00 m and intermediate submerged sand trap wall up to 1375.50 m has been completed. Retaining wall of stilling basin at right bank of river up to level 1381.00 m has been completed. Curtain grouting work at first cut-off wall has also been completed. Grouting at both side of dam axis between first and second cut off wall has been completed. About 90% excavation quantity of headworks has been completed. Excavation of Approach tunnel (230 m) has been completed. Lining of intake tunnel for type C rock class at Chainage 0+194 m to 0+208 m and Chainage 0+147 m to Chainage 0+158 m has been completed. Lining of inlet transition section from Chainage 0+9.52 m to 0+21.52 m has been completed. Concreting work at intake up to trash rack cleaning machine (TRCM) hoisting slab level 1395.00m has been completed.

Figure 2: Reinforcement and formworks at Stop logs and Radial Gate section above 1372.00masl.

Figure 3: Reinforcement work at pier of stop logs and Radial Gates section above 1375.50masl

Figure 4: Concrete work at central pier section from level 1373.50m to 1375.00masl

Figure 5: Reinforcement and formworks above 1377.3masl at dam

Figure 6: Concreting work at stop logs and radial gate section of Headworks level from 1375.50masl to 1377.30masl

6.4. Siuri Diversion System

Excavation of Siuri pumping outlet pool has been completed. Construction of outlet pool for storage of 1.1 m^3/s discharge has been completed. Installation of three numbers of inlet pipe (40 cm diameter) and 70 cm diameter outlet pipe at overhead tank in ongoing.

Figure7: Inlet Pipe (Three nos. 40 cm diameter) Installation at Siuri Diversion Overhead Tank

Figure 8: Outlet Pipe Installation of Siuri Diversion Overhead Tank

6.5. Underground Settling Basin

Excavation of Underground Settling Basin has been completed and breakthrough from the Flushing tunnel to the Settling Basin was completed on 23rd January, 2019. The length of settling basin is 62 m and its dimension is 8m x 8m x 62 m. Excavation has been completed as size of approach tunnel and widening to its full size is completed and shotcrete lining has been completed. Flushing pipe installation (60 cm dia) and its arrangement is ongoing.

6.6. Headrace Tunnel

Excavation of Headrace tunnel (3840 m) has been concluded. HRT from outlet has been excavated up to 1738 m. Tunnel excavation was carried out in two stages first central part then the peripheral part. Some over break has occurred at weak shear zone. Temporary supports have been provided to those over break portion. 11 Nos. of steel ribs, 7 Nos. of steel ribs and 6 Nos. of steel ribs have been provided to HRT from outlet at Ch.3+182 m to 3+192.6 m, 3+202 m to 3+210 m and 3+979.82 m to 3+984.82 m respectively. 6 nos. of steel ribs provided to Ch.0+1066-1071.10 m due to over break. HRT from access tunnel 2 towards Outlet has been excavated up to 480 m. At Ch.0+2330 large over break about 25-30 m occurred with debris flow, cleaning of the debris has been completed. 519 m HRT tunnel excavation was completed from Access tunnel1 towards Access tunnel 2, over break from Ch. 0+886 m to Ch. 0+898 m has been provided with the support. C25 grade 75 mm thick invert lining up to Ch. 4+100 m has been completed. RCC lining from Ch 0+331 m to 0+354m at downstream of Settling Basin and 0+615 m to 0+624 m has been completed. Shotcrete at downstream of Adit 2 is ongoing at various section of Rock class I section. Installation of rock bolt and wire mesh is ongoing at downstream of Adit 1. Rock bolt at various sections of tunnel according to the requirement of rock class is ongoing.

S. N	Tunnel	Excavation Size (m)	Total length (m)	Progress up to last month (m)	Progress this month (m)	Total Progress (m)
1.	Headrace tunnel (HRT)	3-3.6m (w) x 3-3.6m (h)	**3840**			**3840**
1.1	HRT from outlet	3-3.6m (w) x 3-3.6m (h)				1738
1.2	HRT from access tunnel 2 towards Headwork's	3-3.6m (w) x 3-3.6m (h)				1053
1.3	HRT from access tunnel 2 towards Outlet	3-3.6m (w) x 3-3.6m (h)				480
1.4	HRT from access tunnel 1 towards Headworks	3-3.6m (w) x 3-3.6m (h)				50
1.5	HRT from access tunnel 1 towards Outlet	3-3.6m (w) x 3-3.6m (h)				519
2	Ventilation tunnel	2.6m (w) x 3m (h)	40			40
3	Surge Shaft	4.9m Diameter	35			35
4	Access tunnel 1	4m (w) x 3.5 (h)	296			296
5	Access tunnel 2	2.6m (w) x 2.8m (h)	122			122
6	Penstock Tunnel	3-3.6m(w)x3-3.6m(h)	68			68
7	Diversion Tunnel	3(w)-3.2(h)	300			300
8	Intake Tunnel	4(w)x4(w)	230			230
	Total		**4931**			**4931**

Figure 9: Rock bolting in HRT

Figure 10: Gravel Trap in the HRT from Ch. 4 + 103 m. to Ch. 4+115 m

6.7. Ventilation Tunnel, Surge Shaft and Connecting Tunnel

Concreting of Ventilation tunnel and Surge shaft has been completed. Concreting in the Connecting tunnel has been concluded in the month of January. Length of Ventilation tunnel is 40 m and Surge shaft is 35 m.

6.8. Outlet Portal

Excavation of portal has been accomplished but slope stabilization has yet to be done. The length of penstock tunnel from outlet is 68 m.

6.9. Valve House

Excavation of valve house area has been completed.

Figure 11: Excavation of valve house and anchor block 3 to 4 in penstock alignment

6.10. Penstock

The length of penstock alignment is 780 m. 13 nos. of saddle support (100%), 11 nos. of anchor blocks (45%) and concrete staircase has been constructed at back slope of powerhouse. About 60 % of excavation of penstock alignment has been finished. About 235 m Concrete Casing of Penstock Pipe has been completed. About 100 m normal back filling as original ground slope has been completed. Anchor blocks nos. 6, 7, 9, 10 and 11 has been completed.

Figure 12: Concrete work at Anchor block no 9 of Penstock pipe

Figure 13: Anchor block no 9 of Penstock pipe after concreting

Figure 14. Concreting work for casing between anchor block 7 to 8of Penstock pipe

6.11. Powerhouse, Tailrace and River training works

Final level of powerhouse excavation is completed and the structural concreting has been completed. About 97% of Civil work has been completed till the month of December. Concreting work at slab of Assembly bay level 1047.00 m has been completed. Structural concreting of beam and column up to roof level at Assembly bay 1066.715 m and at Control room up to level 1058.345 m has been completed. Roofing of powerhouse about 90% work has been completed. Brick work for housing construction has been completed. Plaster work at outside and inner side of powerhouse has been completed. Painting work is ongoing. Steel Doors and windows frames installation has been completed. Glass installation on windows is ongoing. Structural concrete of tailrace has been completed. River protection works has been completed in the powerhouse area. Retaining wall about 153 m has been completed. Remaining work of river training work is ongoing. Storage yard has been established about 300 m away from the powerhouse towards Naiche.

Figure 15: Plaster work at control room section of powerhouse

Figure 16: Painting works at control room section of powerhouse

Figure 17: Painting Work and Windows, Doors Installation at Powerhouse

6.12. Switchyard

The foundation of the power transformer, auxiliary transformer, station transformer, lightning arrestor, isolator and circuit breaker as well as bus bar has been completed. Sump pit has also been completed. Steel pillar for switchyard fabrication has been continuing for this month also. Total 6 nos. of steel pillar are being fitted with ladder as per design, and painting is continuing at the welded parts as per steel structure drawing of EPC. Individual Lighting Rods of "E" section having 940*5000mm*4 Nos. have been completed. Similarly, "D" Section having 740*5000mm* 4 Nos. has been completely manufactured on this month.

6.13. Access Road

The length of access road at different components of project site is as follows:

Road Stretch	Length
Marsyangdi Bridge to Thulibesi Village	~3.7 km
Thulibesi Village to Surge Shaft	~2.52 km
Thulibesi Village to Naiche	~4.25 km
Naiche to Headwork's	~3 km

6.14. Camp Facilities

Permanent housing building works have been finished in the month of January. There are total 9 blocks of permanent housing camp. Flooring, painting, house wiring and sanitary works have been completed. Fencing and leveling was done in this month but installation of Gate and outdoor area preparation is still

remaining. Employer's team and the Employer's Representatives team shifted to the permanent housing on 30th, January 2019.

6.15. Quality Control Works

Concrete cube test (7 days and 28 days), tensile strength test and shotcrete test is continued to the period closing.

6.16. Hydro-mechanical Works

6.16.1 Gates

The following table shows the progress work of gates for the month of December

SN	Description of Gates	Quantity	Embedded Parts		Frame				Leaf						
					Fabrication		Installation		Fabrication				Installation		
			Fabrication	Installation	Plate Cutting	Welding	Second Stage concreting	Frame Ins.	Plate Cutting	Welding	Drilling	Typical Parts	Fabrication of	Super Structure	Leaf Installation
A					**HEADWORKS**										
1	Under sluice Radial	2	0	0	0	0	0	0	0	0	0	0	-	-	0
2	Under sluice Stoplog	2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Sewage sluice gate	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Intake gate	1	0	0	0	0	0	0	0	0	0	0	0	0	0
B	**SUB TOTAL**	**6**				**OTHER GATES**									0
1	Bulkhead gate NAICHE	1	0	0	0	0	0	0	0	0	0	0	-	-	0
2	Bulkhead gate adit 1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
C	**SUB TOTAL**	**3**													0
	TOTAL	**9**													

6.16.2 Penstock Pipes

Fabrication of High pressure penstock Pipe of Various thickness is ongoing at Hydro Mechanical Yard of ZHCIC. The following table shows the detail progress of the month of December.

a) Overall Progress in Fabrication of Pipe till December 2019

The following table shows the overall fabrication of penstock pipe for the month December 2019

SN	Thickness (mm)	Total length (m)	Fabrication (length m)						Remarks
			plate cutting	Rolling	welding	NDT test	Sand blasting	Painting	
1	10	61.52	61.52	42	42	42	42	42	Dia 2000
2	10	208	208	208	208	208	208	208	Dia 1750
3	12	114	114	114	114	114	114	114	

S N	Thickness (mm)	Total length (m)	Fabrication (length m)						Remarks
			plate cutting	Rolling	welding	NDT test	Sand blasting	Painting	
4	14	70.41	70.41	70.41	70.41	70.41	70.41	70.41	
5	16	150.61	150.61	150.61	150.61	150.61	150.61	150.61	
6	20	79.61	79.61	79.61	79.61	79.61	79.61	79.61	
7	22	41.68	41.68	41.68	41.68	41.68	41.68	41.68	
8	25	50.5	50.5	50.5	50.5	50.5	50.5	50.5	
TOTAL LENGTH		**776.33**	**776.33**	**756.81**	**756.81**	**756.81**	**756.81**	**756.81**	
	TOTAL PROGRESS %		**100**	**97.49**	**97.49**	**97.49**	**97.49**	**97.49**	

97.49% pipe has been welded by length
97.49% has gone through NDT test
97.49% has gone through sandblasting
97.49% pipe has gone through painting

b) Fabrication Details by Weight

The following table shows the Progress of Penstock Pipe by weight for the month December 2019

S N	Thickness (mm)	Total length (m)	Total weight (kg)	This month progress (m)	This month progress (kg)	Net Fabricated (kg)	Net remaining (kg)
1	10	61.52	30328.1	0	0	25881.43	12211.1
2	10	208	89722.4	0	0	89722.4	0
3	12	114.23	59128.8	0	0	59128.8	0
4	14	70.41	42520.6	0	0	42520.6	0
5	16	150.61	103946.8	0	0	103946.8	0
6	20	79.61	68680.7	0	0	68680.7	0
7	22	41.68	39553.8	0	0	39553.8	0
8	25	50.5	54458.9	0	0	54458.9	0
Total length		**776.56**	**488340.1**	**0**	**0**	**483893.43**	**12211.1**

c) Progress made in Installation of Penstock Pipe

The following table shows the Progress of installation of Bends of Penstock Pipe for the month of December

SN	Description	Diameter(m)	Length(m)	Till last month	This month progress (m)
1	Inside tunnel	2000	61.52	0	0
2	TB 1 - TB 2	1750	27.8	0	0
3	TB 2 - TB 3	1750	13.02	0	0

4	TB 3 - TB 4	1750	80.44	0	72
5	TB 4 - TB 5	1750	101.2	0	0
6	TB 5 - TB 6	1750	114.2	113.5	0
7	TB 6 - TB 7	1750	62.5	62.5	0
8	TB 7- TB 8	1750	109.9	30	79
9	TB 8 - TB 9	1750	42.5	8	0
10	TB 9 - TB 10	1750	84.6	84.6	0
11	TB 10 - TB 11	1750	73.1	73.1	0
		TOTAL	**770.78**	**360.1**	**151**

Figure 18: Pressure test of penstock pipe between anchor block 9 to MIV unit

Figure 19: Penstock pipe installation between anchor block 3 to 4

d) Progress made in Fabrication of Bends

The following table shows the details about fabrication of Bends of Penstock pipe for the month of December

SN	Description	Total wt.(kg)	Fabrication	Installation
1	Underground penstock bend	2270	Completed	Not Completed
2	Bend 1	2072	Completed	Not Completed
3	Bend 2	820	Completed	Not Completed
4	Bend 3	1259	Completed	Not Completed
5	Bend 4	1003	Completed	Not Completed
6	Bend 5	1195	Completed	Not Completed
7	Bend 6	780	Completed	Completed
8	Bend 7	1409	Completed	Completed
9	Bend 8	1914	Completed	On Progress
10	Bend 9	2174	Completed	Completed
11	Bend 10	1525	Completed	Completed
12	Bend 11	5840	Completed	Completed
13	Reducer bend at unit 1	1274	Completed	Completed
14	Reducer bend at unit 2	1274	Completed	Completed

6.17. Electro-mechanical Works

6.17.1 Main Stage Work Progress

The following are the major stage work progress for the month of December 2019.

a. Earthing Stipe

Galvanized MS clad stipe lied down in Corbel beam and roof gutters of machine hall for the purpose of earthing. All the embedded earthing parts were finished on the month of September.

b. EOT 50/10T Bridge Crane

All the accessories of the travelling crane were being installed, the cabin platform, safety railing was completely assembled as per the manufacturer's drawing. Crane track was completely installed; the track was centrally aligned. Foundation bolts M24*300 was embedded according to the drawings. Similarly, pressing plate, backing plate, shim stop washer and pallet was used as per manufacturer's instructions. Meanwhile, installation of resistors was completely connected according to the manufacturer's data and wiring diagram, resistor was placed in the direction of the girder.

Similarly, the protection box and the control box was also installed completely as per the wiring connection diagram. Likewise, the Gantry Conductor was also installed and firmly fixed on the conductor frame. Conductive device of the Trolley Cables was also connected completely, for this purpose the CEFR flexible marine rubber insulated neoprene-sheathed cable was used. The outlet terminal of conduits was lined with the rubber sheet. Tube connectors were used for connecting conduits. The cabin platform was also completely installed and finally come into operation by giving the temporary supply.

c. At 1044.00 masl

1. Main Unit Valve

Main Spherical valve, expansion joints, DN150 brake interface, DN125 Bypass system, weighted mechanism were completely mechanically assembled with the help of Anchor Bolt to the foundation for the Unit#1 on this month. This was properly earthed.

2. Nozzle

Four nos. of Nozzles for both Units were mechanically, temporarily assembled for further alignment checking purpose. Further, it would be permanently adjusted with the help of Pin A20*150, Pin sleeve, Adjust washer Bolt M24*190-8.8, O-ring 670*7 with Washer 42 after centerline aligned.

3. Nozzle Control Mechanism

Control mechanism equipment were delivered on the site on November and kept safely and inspected properly. No further work has been progressed upon control mechanism on this month.

4. Deflectors

Deflectors were delivered on this month and stored at the proper and safe place.

5. Pump House

Technical water supply of 4 nos. of pump sets having 45kW power were mechanically assembled for which upper column pipe was coupled with Bracket to the Transmission shaft to the short transmission shaft, and Lower column pipe connect was also connected to the impeller shaft, which was connected to the strainer. Similarly, 2 nos. of sets of firefighting pumps of 11kW power each were also mechanically assembled. These were properly earthed.

4 sets of Automatic Water treatment also mechanically assembled and properly earthed for this month.

All the equipment were unboxed and kept on their respective positions and set ready for the installation.

6. Pump House

30W of LED angle lighting factory lamps of 5 Nos. were fixed around the MIV and Pump House area each spacing of 1.2m apart. Similarly, 40W LED Broad lighting water/dust proof lamps of 13 Nos. were electrically connected with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25. Similarly, the switch was also fixed at the height of 1.3m.

d. At 1047.6 masl

1. Valve Hydraulic Equipment

Two sets of Valve Hydraulic Equipment were delivered on the site this month, these were permanently fixed by the welding method and also properly earthed. Level was checked while fixing at its central alignment.

2. Governor

Two sets of Mechanical cabinet for both of the units were mechanically bolted and properly assembled and properly earthed on this month.

3. Governor Mechanical Cabinet

Two sets of Mechanical cabinet for both of the units were mechanically bolted and properly assembled and properly earthed on this month.

4. Governor Electrical Cabinet

Two sets of Electrical cabinet for both of the units were mechanically bolted and properly assembled and properly earthed on this month.

5. Rotor Top up Oil Pump

No further work has been progressed upon control mechanism on this month.

6. Rotor Top up Oil Pump

Day lamps of 2*16W of 6 Nos. was fixed on the passage in between of machine hall and control room were installed. Similarly, LED 2*20W of 23 Nos. were fixed along the storage room and control switch room each spacing of 1.2m apart. For this purpose, the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25. Similarly, the switch was also fixed at the height of 1.3m.

7. Machine Hall Lighting Fixtures

Day light lamps of 3*20W of 18 nos, were electrically connected with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25 each spacing of 1.2m apart. Similarly, the switch was also fixed at the height of 1.5m.

e. At 1050.045 masl

1. Excitation Transformer

Two sets of Excitation transformer for each unit of 15kVA was mechanical fixed and electrically earthed.

2. Control Room

Station Auxiliary Transformer of one unit of three phase, 50Hz, 500kVA, 11kV/400V ONAN, enclosed dry type was fixed and earthed properly on the November. 25Nos. of LED 2*20W water/dust proof lights were electrically connected with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25 each spacing of 1.2m, similarly, for day light lamps of LED 3*20W for other rooms of 4 Nos. were electrically connected and also LED 2*16W, 4 Nos. were electrically fixed with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25 each spacing of 1.2m apart. Similarly, the switch was also fixed at the height of 1.5m.

3. Power House Lighting Fixtures

20 Nos. of LED 2*20W water/dust proof lights were electrically connected with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25, each spacing of 1.2m on this month.

f. At 1054.045 masl

1. Generator Lower Cover Plates

Base plate of the cantilever was fixed on the Lower cover plate base support with the help of 16*90 lock washer and M16*50 Bolts on the both Units on the month November.

2. Generator Lower Bracket

Lower Bracket for both the Units were fixed on the generator foundation with the help of Bolts M42*100, M48*140 & Pin A40*90, B30*80 on this month.

3. Machine Hall and Assembly Lighting Fixtures

18 Nos. of LED 300W water/dust proof lights were electrically connected with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25, each spacing of 1.2m on this month.

4. Control Room

32 Nos. of LED 3*20W water/dust proof lights were electrically connected with the single as well as double core 10A wire connected to the junction box via embedded water gas pipe of DN25 each spacing of 1.2m.

6.17.2 Test Performed

Without Load and Capacity test was performed for the Electrical Overhead travelling crane main hook 50T of the Power house on the date 20th Oct 2019 in the presences of Employer's and Engineer's representative and the test was found out to be with in the permissible limiting value.

6.17.3 Electro-mechanical Equipment Dispatched at Site

The following Electro-mechanical equipment were dispatched at site on the month of December.

3.1.1 Power transformers having serial # LTD-190-0032, LTD-190-0035 respectively, along with its accessories has been dispatched at the site on the month of October.

3.1.2 Fire-proof package of 20kg/bag of 50 bags has been delivered at site on October.

3.1.3 Inorganic fire proof materials 25kg/bag of 16 bags has been delivered at site on this month.

3.1.4 Organic fire proof materials 20kg/bag of 40 bags has been dispatched at site on October.

3.1.5 Fire proof sealing partition of (2000*500*5) mm of 80 pcs has been dispatched on the site on October.

3.1.6 Cable trays of various sizing (2000*500*150) mm 163 pcs, (2000*200*100) mm 25 pcs, (670*670*150) mm 16 pcs, (870*840*150) mm 8 pcs respectively has been dispatched at site on this month of October.

3.1.7 Electro-mechanical Equipment of 4th LC were dispatched on the site for this month.

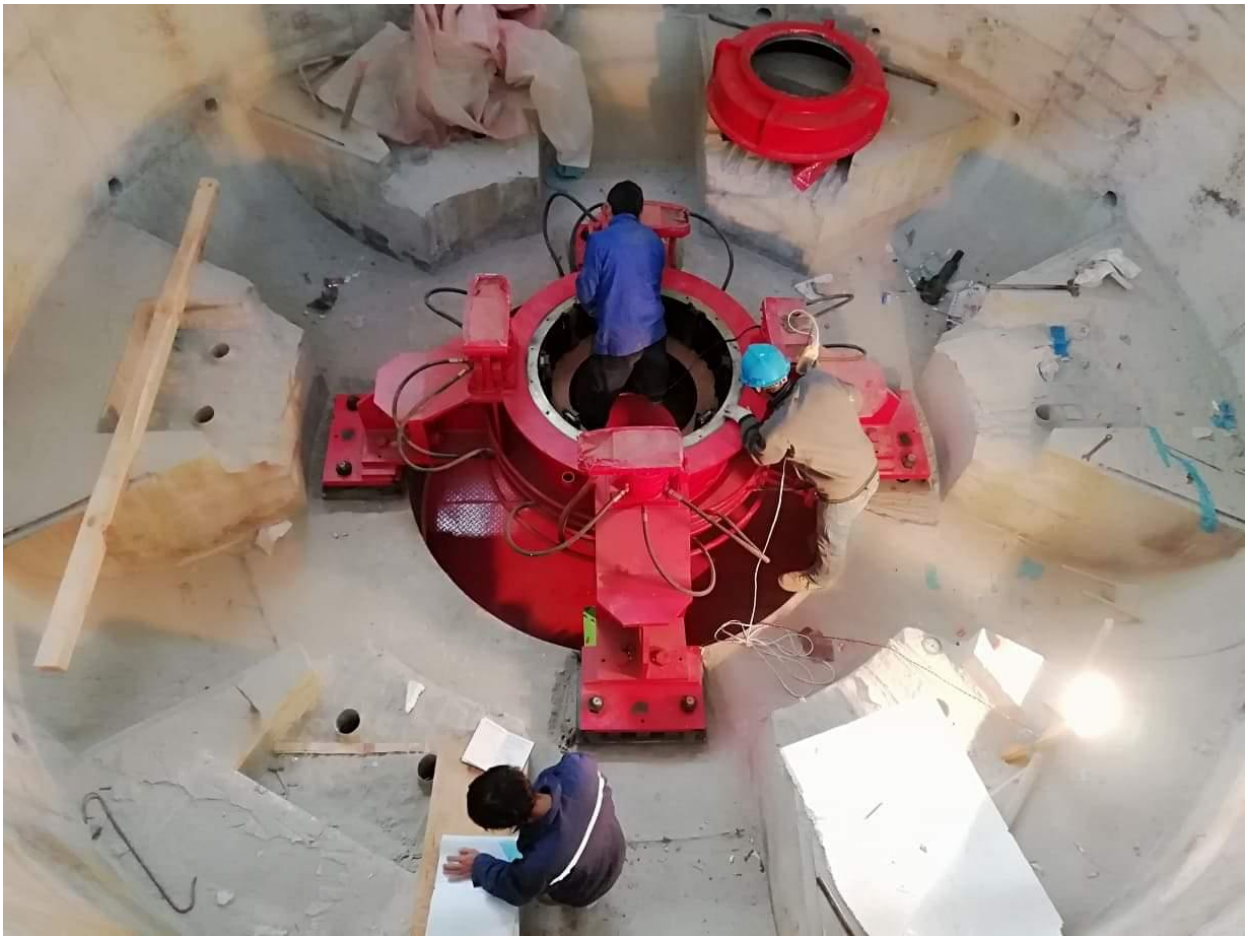


Figure 20: Lower bracket installation at unit 2 of powerhouse

Figure 21: Nozzles and conical shaft seal

Figure 22: Excitation transformer

6.18. 132kV Transmission Line

Public hearing for Supplementary Environmental Impact Assessment (SEIA) program of 132kV transmission line was organized on Ashwin 9, 2076 in Marsyangdi Rural Municipality, Buddhabazar, Lamjung as a part of Contingency plan for power evacuation. The transmission line tower to be installed for an additional 3.5 km has already been identified after related study and land survey at the site. Private & Government Land need to be procured from the private owner and shall be taken on lease from the Government entity simultaneously. The final approval of SEIA is expected by the end of February 2020. The foundation work for tower no. 7, 8, 9, 10, 11, 12 and 13 of 132kV Transmission Line has been completed; the excavation work for tower no. 3 is ongoing.

7. Government Land Leasing and the purchase of the private land

NHL had received letter from Department of Land Management and Archive dated January 17, 2019 on the waiver of land ceiling limit beyond 75 Ropanis as per the Ministry Level decision. Now, NHL can retain 313 Ropanis of land as mentioned in project IEE Report. NHL has signed a tripartite agreement between Department of National Park & Wild Life Conservation and Department of Forest & Soil Conservation for leasing of forest on June 30, 2019. Similarly, in respect of private land acquisition in respect of 132kV transmission line for an additional 3.5 km line, adequate process has already been started and procurement shall be completed by February 2020.

8. Work Related to Corporate Social Responsibility

NHL has been carrying the works on Corporate Social Responsibility in the affected areas of the project with the mutual understanding with locals including Uppallo Nyadi Jaal Bidyut Sahayog Tatha Sarokar Samaj (UNJSSS) as per the directives of Government of Nepal.

NHL has conducted following CSR works in Project Affected Area at Marsyangdi Rural Municipality

S.N	CSR Program	No. of Locals Benefited	Location	Expenses In NPR.	Status
Year 2009					
1	Electrical training	10	Project Affected Areas 390 hrs. Training, held at CTEVT	7,51,000	Completed
	Mechanical training	10			
	Plumbing training	5			
	Mason training	15			
	Scaffolding training	15			
Year 2017					
1	Electrical training 390 hrs. Training, held at CTEVT	20	Project Affected Areas	4,43,395	Completed
Year 2018					

S.N	CSR Program	No. of Locals Benefited	Location	Expenses In NPR.	Status
1	Scaffolding, Welding and Mason training 390 hrs. Training held at CTEVT. NHL has sponsored 10 out of 65 trainees. Organized by Marsyangdi Rural Municipality	10	Project Affected Areas	1,80,000	Completed
2	Naiche Community Building	~300	Naiche Village 6	7,00,000	Completed
3	Village road	~700	Thulibesi 6	5,00,000	Completed
4	Community Kitchen Building	~210	Thulibesi 9	3,50,000	Completed
5	Village road	~635	Tarachowk	3,50,000	Completed
6	Temple		Thankan	2,50,000	Completed
7	Electricity Wiring		Chandradaya School, Bahundanda	1,00,000	Completed
8	Village road	~500	Thulibesi 6	3,00,000	Completed
9	Water Supply	~200	Nana Bhirphustung Village 6	8,32,400	Completed
10	Water Supply	~300	Naiche Village 6	4,40,089	Completed
11	Internal Pedestrian Way	~300	Naiche Village 6	7,00,000	Completed
12	Muda Weaving Training	30	Bahundanda	30,365	Completed
13	Poultry Farming and Livestock training	30	Thulibesi 6	59,350	Completed
14	Women Health Education Training	548	Naiche, Tarachwok, Shera, Usta, Thulibesi, Bahundanda, Thakan,	1,27,180	Completed
15	Free Health Check Up Camp	493	Naiche, Tarachwok, Thulibesi, Bahundanda Bhulbhule, Ngadi,	1,34,869	Completed
16	Shree Jateswor Basic School Fencing		Thulibesi 6	1,00,000	Completed
17	Irrigation Canal		Thulibesi 6	6,95,873.44	Completed
Year 2019					
1	Plumbing Training	10	Thulibesi 9 (Participants are from Shera, Ludi, Tarachwok, Naich, Bahundanda, Thulibesi, Ding Ding,	74,850	Completed

S.N	CSR Program	No. of Locals Benefited	Location	Expenses In NPR.	Status
2	Bee Keeping Training	30	Thulibesi 9 (Participants are from Marsyangdi Rural Municipality, Ward No. 6)	16,145	Completed
3	Public Awareness Program on World Environment Day 2076		Thulibesi 9	41,106	Completed
4	Village Road		Bhirpustun 6	7,00,000	Completed
5	Community Building		Thulibesi 6	6,00,000	Completed
6	Community Building		Lampata 6	3,00,000	Completed
7	Village Road		Ding Ding 6	3,00,000	Completed
8	Community Toilet	400	Usta 7	2,50,000	Completed
9	Stone pavement		Dahare	50,000	Completed
10	Naya Jyoti School Computer		Naiche 6	50,000	Completed
11	Kalika Primary School Computer		Bhirpustun 6	50,000	Completed
12	Clubs		Wards of 6	1,00,000	Completed
13	Dobhan Chour via Neupane Bahundanda Road maintenance 2 times (80,600+1,27,500)			2,08,100	Completed
14	Community Building		Ludi 7	100,000	Completed
15	Community Building	90	Shera 7	100,000	Completed
16	Community Building	160	Cchinkhola 7	150,000	Completed
17	Community Building	375	Tarachwok 7	100,000	Completed
18	Community Building	300	Naiche 6	5,50,000	Completed
19	Stone Pavement	340	Usta 7	4,00,000	Completed
20	Village Road		Phaijara, Bahundanda-	2,00,000	Completed
21	Community Building		Bahundanda-6	3,00,000	Completed
22	Village Road		Thakan -3	4,00,000	Completed
23	Village Road	200	Bhirpustun	6,50,000	Completed
24	Village Road (Gairi Ban Playground)		Bahundanda 6	3,00,000	Completed
25	Maintenance of Playground	245	Naya Gaun 7	1,30,000	Completed
26	Stone Pavement		Taranche 7	1,50,000	Completed
27	Retaining Wall		Bahundanda 6	2,50,000	Completed

9. Initial Public Offer (IPO) of Nyadi Hydropower Limited

The Company as per the prescheduled capital plan has initiated the IPO process to meet up equity and cash flow requirements. Global IME Capital has been appointed as an Issue Manager for the public issue of shares of NHL Similarly, CARE Nepal Ltd. has been appointed as a Rating Agency of initial public offer of shares of NHL. Approval from Electricity Regulation Commission for the proposed Initial Public Offer (IPO) of NHL has been received on 2076.09.25.

Annex 1: Salient Features of Project

S.N.	Items	Descriptions
1	**Project Name**	Nyadi Hydropower Project
2	**Location**	Thulibesi and Naiche Village, Marshyangdi Municipality, Lamjung District
3	**Type of Power Plant**	
	Type	Run-of-River (RoR)
4	**Hydrology**	
	Catchments area at intake site	154.7 km^2
5	**General Hydraulics**	
	Gross head	334.4 m
	Design flow	11.08 m^3/s
	Installed Capacity	30 MW
6	**Diversion Weir**	
	Diversion Type	RCC Gravity Free Flow
	Crest length	14 m
	Height	10 m above natural river bed
7	**Settling Basin**	Single Bay, 60m length parallel Section & 8m width
8	**Headrace tunnel**	
	Length	3840 m
9	**Surge Shaft**	
	Type	Vertical shaft (Underground)
	Internal diameter	5.0 m
	Height of surge shaft	28.74 m
	Connecting conduit size	Circular with 3.2 m dia. and 2.80 m Height
10	**Ventilation Adit**	
	Length	30 m
11	**Penstock**	

	Type	Surface and Buried , steel penstock
	Diameter	1750 mm
	Length of surface penstock	745 m
12	**Powerhouse**	
	Type	Surface
	Size	45.5 m long, 16.0 m wide and 29.2 m high
13	**Tailrace Canal**	
	Length	37.0 m
14	**Turbines**	
	Type	Pelton turbine
	No of units	2 Nos.
15	**Transmission Line**	
	Length	6 km (Nyadi Switchyard to proposed 132 kV NEA Hub at Marsyangdi Corridor)
	Voltage	132 kV
	No. of Circuits	Single
16	**Energy Generation**	
	Mean annual energy per year	168.55GWh
17	**Access Road**	
	From Marshyangdi Bridge at Thakanbeshi to Headwork's site	10.615 km
	From Thulibesi to Surge shaft	2.393 km
	Total length	13.50 km
18	**Construction Period**	1150 Days

Annex 2: Project Schedule