TALLO LIKHU JALAVIDHYUT AAYOJANA (28.1MW)



MONTHLY PROGRESS REPORT #45

JANUARY, 2022 (17th Poush, 2078 to 17th Magh, 2078)

Prepared By:



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1 PROJECT OVERVIEW AND INSTITUTIONAL ARRANGEMENT

Tallo Likhu Jalavidhyut Aayojana is a run-of-river (RoR) hydropower project which utilizes Gross Head 118 m and Design Discharge of 29.75 m³/s. resulting to an installed capacity of 28.1MW. The entire project area (headworks to powerhouse) is located in Likhu-Tamakoshi Rural Municipality (Saipu, ward no. 2 and Bijulikot ward no. 4) of Ramechhap, Bagmati Province of Nepal. Geographically, the project lies between Longitudes 86°15'38" E to 86°13'17" E and Latitudes 27°25'56" N to 27°22'47"N. Geologically, the project area belongs to the Lesser Himalayas.

The project's headworks area is accessible via two different road routes. One from Kathmandu-Dhulikhel-Charikot-Nayapul-Dhobi-Sirise (227 km) and another from Kathmandu-Dhulikhel-Khurkot-Manthali-Dhobi-Sirise (170 km).

CONSTRUCTION MANAGEMENT

The Employer/Owner	Swet Ganga Hydropower & Construction Ltd. (SGHCL)	
The Engineer/ Consultant	Sanima Hydro and Engineering Pvt. Ltd. (SHEPL)	
The Contractor (Civil Construction Works)	High Himalaya Hydro-Bavari Construction J.V.	
The Contractor (Hydro-mechanical Works)	Machhapuchhre Metal & Machinery Works (P.) Ltd. (3MW)	
The Contractor (Electro-mechanical Works)	Asia Pacific Power-Tech Co. Ltd., China	
The Contractor (Transmission-line Works)	Aster Teleservices Nepal Pvt. Ltd.	
Pre-construction works, camp facilities, social environment	Direct by the Employer	

2 KEY DATES

Table 1: Key dates of major events of the project

Description	Date
Generation License issued by Department	2 nd Baisakh 2073 (14 th April 2016)
Electricity Development (DoED), Ministry of	The license period of the project is from
Energy (MoE), Government of Nepal (GoN)	28th Chaitra 2072 to 27th Chaitra 2107 B. S.
Power Purchase Agreement (PPA) with Nepal Electricity Authority (NEA)	14 th Poush 2073 (29 th December 2016)
Financial Closure	10 th Falgun 2074 (22 nd February 2018)
Contract of Main Civil Works	5 th Chaitra 2074 (19 th March 2018)
Contract of Hydro-mechanical Works	9 th Poush 2075 (24 th December 2018)
Contract of Electro-mechanical Works	18th Bhadra 2076 (4thSeptember 2019)
Contract of Transmission Line Works	8 th Shrawan 2077 (23 rd July 2020)
RCOD	15 th Mangsir 2078 (1 st December 2021)

3 CONTRACT PACKAGES AND IMPLEMENTATION

Main civil construction works	Contract Package 1
Hydro-mechanical works	Contract Package 2
Electro-mechanical works	Contract Package 3
Transmission Line works	Contract Package 4
Pre-construction works, camp facilities, social environment	Direct by the Employer

4 FINANCING

Equity	Promoters	25% of the total Project Cost
Debt	Consortium of Banks	75% of the total Project Cost (Lead Bank: Laxmi Bank Ltd, Member Banks: Kumari Bank Ltd., Hydroelectricity Investment and Development Company Ltd. Cen- tury Commercial Bank Ltd., and Prabhu Bank Ltd.)

5 RESOURCES AT SITE

5.1 MANPOWER FROM EMPLOYER AND ENGINEER'S SIDE:

Table 2: Human Resource at site from the Employer and Engineer's side

Description	Number
General Manager	1
Resident Engineer	1
Environment and Social Officer	2
Finance/Admin Officer	1
Civil Engineer	4
Electrical Engineer	2
Mechanical Engineer	1
Engineering Geologist	1
Safety Coordinator	1
Civil Overseer/Sub-overseer	4
Mechanical Overseer/ Sub	6
overseer	0
Electrical Overseer/Sub-	4
overseer	
Surveyor	2
Social Mobilizer	3
Admin Assistant	2
Driver	4
Cook	3
Office Helper	5
Construction Helper	8
Store keeper	1
Total:	56

5.2 MANPOWER FROM CIVIL CONTRACTOR'S SIDE:

Table 3: Human Resource at site from Civil Contractor's side

Description	Number
Technical Manpower	20
Financial and Administrative manpower	29
Skilled workers(Machine Operators, Electricians, Heavy Drivers)	32
Semi-Skilled workers(Light Drivers, Civil workers)	25
Unskilled workers(Helpers, Kitchen workers, Pump operators)	23

Description	Number
Security guards	23
Total (A)	152
Other Workers (Sub-Contractors)	
DL/Bhimeshwor Construction (Headworks, Seti and Powerhouse)	70
Shaili Construction (Headworks)	14
Karan-Arjun Construction (Main Inlet)	33
Dreamland construction (Seti Outlet)	38
Hem Construction (Surge shaft and main outlet)	14
Gaiya Devi Construction (Switchyard)	25
Total (B)	194
Grand Total (A+B)	346

Note: Data as per weekly report 191 provided by the Main Civil Contractor on 30th January 2022.

5.3 MANPOWER FROM HYDRO-MECHANICAL CONTRACTOR'S SIDE:

Table 4: Manpower list of Hydro-Mechanical Contractor

Description	Number
Site Project Engineer	1
Site Supervisor	3
Safety Officer	1
Store In-charge	1
Quality Controller	1
Electrician	1
Sand Blasting Operator	1
Hydra Operator	1
Tractor driver	1
Fitter	3
Welder	4
Helper	8
Cook	3
Total	29

5.4 EQUIPMENT MOBILIZED BY CIVIL CONTRACTOR

Table 5: Equipment mobilized by Civil Contractor

S.N.	Equipment Name	Number	S.N.	Equipment Name	Number
1	Generator 62.5KVA	2	24	Pusher leg	37
2	Generator 30KVA	1	25	Blaster (Exploder)	6
3	Generator 125KVA	1	26	Siren	6
4	Generator 25 KVA	1	27	Core Cutting machine	2
5	Generator 160 KVA	3	28	Hand drilling machine	3
6	Generator 250 KVA	2	29	Air compressor	7
7	Air Receiver tank	4	30	Vibrators	8
8	Ohm meter	6	31	Water pump 10"	2
9	Excavator	4	32	Water pump 12"	1
10	Dump Truck	11	33	Water Pump 1.5"	6

S.N.	Equipment Name	Number	S.N.	Equipment Name	Number
11	Transportation Truck	1	34	Water pump 6"	4
12	Backhoe Loader (JCB)	3	35	Grinding machine(4")	6
13	Wheeled loader	4	36	Grinding machine(7")	1
14	Tractor	3	37	Welding machine	8
15	Light vehicle	6	38	Ply cutter machine (8"/7")	1
16	Concrete Batching Plant	1	39	Prism with tripod set	5
17	Concrete mixer	10	40	Leveling staff (5m)	4
18	Grouting pump	4	41	Total station (Topcon)	3
19	Concrete pump	3	42	Auto level with tripod set	4
20	Transit mixer	4	43	Shotcrete machine PZ5	3
21	Blower fan set	2	44	Compressive test machine	2
22	Pull out test machine	1	45	Lubricator	43
23	Shotcrete Robot (Jacon)	1	46	Diesel Tank 16000Ltr	3

5.5 EQUIPMENT MOBILIZED BY HYDRO-MECHANICAL CONTRACTOR

Table 6:	Table 6. Equipment mobilized by Hydro-Wechanical Contra					
S.N.	Equipment	Number				
1	Hydraulic Crane	1				
2	Excavator	1				
3	Tractor	1				
4	Diesel Generator (200 KVA)	1				
5	Diesel Generator (40 KVA)	1				
6	Diesel Generator (12.5 KVA)	1				
7	Welding Machine	14				
8	Compressor	1				

Grinding Machine (7")

Grinding Machine (4")

Master Oven

Portable Oven

9

10

11

12

Table 6: Equipment mobilized by Hydro-Mechanical Contractor

5.6 CONSTRUCTION MATERIALS STORED BY CIVIL CONTRACTOR AT SITE:

14

8

1

14

Materials	Unit	Balance Quantity
Diesel	Litres	11,750
Rebar (25mm dia.)	Ton	6.00
Rebar (20mm dia.)	Ton	6.00
Rebar (16mm dia.)	Ton	15.00
Rebar (12mm dia.)	Ton	13.00
Cement	Bags	5,498
Plasticizer	Kg	2,460.00
Steel Fibre	Kg	125.00
Micro Silica	Kg	400.00
Accelerator	Kg	275.00

 Table 7: Construction material stored by Main Civil Contractor

Note: Data as per weekly report 191 provided by the Main Civil Contractor on 30th January 2022.

6 CIVIL CONSTRUCTION WORK PROGRESS

6.1 HEADWORKS

The work progress achieved at headworks area in January, 2022 is as follows:

- Civil work of the settling basin inlet gate hoisting frame has been completed.
- Concreting has been completed in all the walls of the settling basin panel 6. Formwork and rebar installation is ongoing for the settling basin inspection platform.
- The fine trashrack parking has been constructed up to the intermediate beam level (746.42m amsl). Rebar and formwork installation is ongoing for the upper portions.
- Construction of the settling basin spillway guide wall has been completed. C25 concrete work has been completed for the panels 2, 3 and 4. Excavation work has been completed for the panel 1.

Table 8: Progress at Headworks in January, 2022

S.N.	Description	Unit	Quantity	Remarks
1	C25 concrete	m ³	150.00	
2	C35 concrete	m ³	-	
3	1:6 Stone masonry	m ³	-	
4	Rebar	Ton	11.77	



Figure 1: View of settling basin from upstream side



Figure 2: Conveyance tank fine trash-rack hoisting frame and parking



Figure 3: Settling basin spillway

6.2 HEADRACE TUNNEL, SYPHON CROSSING AND SURGE SHAFT

HRT FROM MAIN INLET PORTAL TO SETI OUTLET PORTAL

The concreting work of the invert and side walls along with shotcrete lining have been completed in this stretch of the tunnel except for the full concrete lining stretch. The full concrete lining work has been carried out for 81 m stretch in January 2022. (Total completed = 117m)

Lining Type	Face	Design length (m)	Completed length (m)	Remaining (m)
	Face 1	528.32	528.32	-
Shotcrete	Face 2	292.80	292.80	-
	Total	821.12	821.12	-
	Face 1	528.32	528.32	-
vvali	Face 2	292.80	292.80	-
Concrete	Total	821.12	821.12	-
F	Face 1	263.00	-	263.00
Full	Face 2	602.00	117.00	485.00
Concrete	Total	865.00	117.00	748.00
Disc	Face 1	37.00	-	37.00
Pipe	Face 2	25.00	-	25.00
	Total	62.00	-	62.00

Table 9: Work progress for the tunnel stretch from main inlet portal to Seti outlet portal



Figure 4: Rebar and formwork installation in the tunnel from main inlet to Seti outlet

HRT FROM SETI INLET PORTAL TO POKU OUTLET PORTAL

Work has been completed at this stretch and the tunnel has been closed.

HRT FROM POKU INLET PORTAL TO MAIN OUTLET PORTAL

The concrete lining works have been completed in this tunnel stretch including the rock trap and the connecting tunnel. The rock excavation work in the main outlet portal area for the PPV house is ongoing.

SETI CROSSING

Backfilling has been completed at the pipe section between vehicle crossing and Anchor block SKCB01.

POKU CROSSING

The construction of the Poku inlet anchor block SK CB03 has been completed below the pipe level and handed over to the HM contractor for pipe installation. No civil work has been carried out in January, 2022.



Figure 5: Backfilling works at the pipe alignment near Seti outlet portal



Figure 6: Progress at Poku inlet slope (PK VB02 to PK CB03)

SURGE SHAFT, ROCK TRAP AND CONNECTING TUNNEL

The roofing work of the surge shaft is ongoing. Concreting has been completed at the Surge shaft roofing columns and ties.



Figure 7: Surge shaft roofing works

6.3 PENSTOCK, POWERHOUSE AND TAILRACE

PENSTOCK ALIGNMENT:

The plum concreting work has been completed in the Anchor block VB02 up to the bottom of the pipe and handed over to the HM contractor for pipe installation. The geo-grid structure of road retaining wall at the right side of anchor block VB02 has been completed up to 676.40 m level (6 m out of 12 m height completed).

POWERHOUSE:

In January 2022, the concrete work has been carried out from the level of 626.93 m to 627.56 m amsl for the generator casing in bay 1. Concreting work has been completed at bay 2.

CONTROL ROOM AND OFFICE BUILDING:

All RCC works of the control building and office building have been completed. Block masonry works have been completed in the high-low voltage cubicle room and ongoing in other rooms of the control building.

TAILRACE:

The construction of the all civil works of the tailrace culvert have been completed.

SWITCHYARD:

All civil works of the switchyard have been completed.

S.N.	Description	Unit	Quantity (Powerhouse and control building)	Quantity (Penstock)	Quantity (Tailrace)
1	C25 concrete	m ³	45.00	-	-
2	Re-bar	ton	2.00	3.00	-
3	C25 Plum concrete	m ³	-	200.00	-



Figure 8: Penstock alignment, anchor block VB02



Figure 9: Powerhouse machine hall, Rebar and concrete in machine unit 1



Figure 10: View of switchyard

7 HYDRO-MECHANICAL WORKS

The progress of hydro-mechanical works achieved in January, 2022 are listed below:

- Installation of rubber seal of undersluice radial gate is ongoing at the right bay.
- The settling basin outlet gate panels have been lowered in position.
- 37 m additional pipe installation work has been completed at the Poku crossing including bend piece. With this, 181 m out of 183 m has been completed till January end.



Figure 11: Pipe installation at Poku



Figure 12: Settling basin outlet gate panels

8 ELECTRO-MECHANICAL WORK PROGRESS

The work progress of the Electro-mechanical installation works in January 2022 are below:

- Fitting of MIVs with final welding have been completed in both bays.
- Surface cleaning is ongoing for stator foundation plate and lower bearing foundation plate.



Figure 13: Progress of EM works in the powerhouse unit 2

9 CONSTRUCTION POWER

The 12 km long construction power line has been erected from headworks area to Sangutar in coordination with NEA and the public. The line has been charged from a 6 MVA transformer at Manthali on 16th of Mangsir, 2076. The NEA's dedicated line has been made available to all working fronts. Regular monitoring and bush-cutting has been ongoing.

10 TRANSMISSION LINE WORKS (132 KV)

In the month of January 2022, erection of four towers and excavation for one tower has been completed. Including this, the erection works have been completed for 53 tower foundations. The concreting works have been completed for 59 tower foundations. Conductor stinging works have been completed for 7 km stretch.



Figure 14: Stringing of conductor at AP 21-22



Figure 15: LLHP bay at New Khimti Substation

S.N	Location	Type of Tower	Excavation	Foundation concrete	Backfill	Erection
1	AP0	SD+0	-	-	-	-
2	AP1	SB+0	Completed	Completed	Completed	Completed
3	AP2	SC+0	Completed	Completed	Completed	Completed
4	AP3	SM+0	Completed	Completed	Completed	Completed
5	AP4	SM+0	Completed	Completed	Completed	Completed
6	AP5	SM+0	Completed	Completed	Completed	Completed
7	AP6	SC+0	Completed	Completed	Completed	Completed
8	AP7	SB+0	Completed	Completed	Completed	Completed
9	AP8	SB+0	Completed	Completed	Completed	Completed
10	AP9	SM+0	Completed	Completed	Completed	Completed
11	AP10	SM+0	Completed	Completed	Completed	Completed
12	AP12	SM*+0	Completed	Completed	-	-
13	AP13	SM+0	Completed	Completed	Completed	Completed
14	AP14	SM+0	Completed	Completed	Completed	Completed
15	AP15	SM*+0	Completed	Completed	Completed	Completed
16	AP16	SM+0	Completed	Completed	Completed	Completed
17	AP17	SM+6M	Completed	Completed	Completed	Completed
18	AP19	SM*+0	Completed	Completed	Completed	Completed
19	AP20	SM*+6	Completed	Completed	Completed	-
20	AP21	SM*+0	Completed	Completed	Completed	Completed
21	AP22	SM*+0	Completed	Completed	Completed	Completed
22	AP23	SM+0	Completed	Completed	Completed	Completed
23	AP24	SM+0	Completed	Completed	Completed	Completed
24	AP25	SC+0	Completed	Completed	Completed	Completed
25	AP26	SB+0	Completed	Completed	Completed	Completed
26	AP27	SC+0	Completed	Completed	Completed	Completed
27	AP28	SC+0	Completed	Completed	Completed	Completed
28	AP29	SM+0	Completed	Completed	Completed	Completed
29	AP30	SB+0	Completed	Completed	Completed	Completed
30	AP31	SC+0	Completed	Completed	Completed	Completed
31	AP32	SM+0	Completed	Completed	Completed`	Completed
32	AP33	SB+0	Completed	Completed	Completed	Completed
33	AP34	SC+0	Completed	Completed	Completed	Completed
34	AP35	SC+0	Completed	Completed	Completed	Completed
35	AP36	SC+0	Completed	Completed	Completed	Completed
36	AP37	SB+0	Completed	Completed	Completed	Completed
37	AP38	SC+6M	Completed	Completed	Completed	-
38	AP39	SM+0	Completed	Completed	Completed	Completed
39	AP40	SM+0	Completed	Completed	Completed	Completed
40	AP41	SM+0	Completed	Completed	Completed	Completed
41	AP42	SM*+0	Completed	Completed	Completed	Completed
42	AP43	S90	Completed	Completed	Completed	Completed
43	AP44	S90	Completed	Completed	Completed	Completed
44	AP45	SB+0	Completed	Completed	Completed	Completed
45	AP46	SM+0	Completed	Completed	Completed	Completed

S.N	Location	Type of Tower	Excavation	Foundation concrete	Backfill	Erection
46	AP47	SC+0	Completed	Completed	Completed	Completed
47	AP48	SM+6	Completed	Completed	Completed	-
48	AP49	SM*+0	Completed	Completed	Completed	Completed
49	AP50	SM+0	Completed	Completed	Completed	Completed
50	AP51	SM+0	Completed	Completed	Completed	Completed
51	AP53	SM+0	Completed	Completed	Completed	Completed
52	AP54	SM+6	Completed	Completed	Completed	-
53	AP56	SM+0	Completed	Completed	Completed	-
54	AP57	SM*+6	Ongoing	-	-	-
55	AP58	SB+0	Ongoing	-	-	-
56	AP59	SC+0	Completed	Completed	Completed	Completed
57	AP60	SC+0	Completed	Completed	Completed	Completed
58	AP61	SC+0	Completed	Completed	Completed	Completed
59	AP62	SC+0	Completed	Completed	Completed	Completed
60	AP63	SC+0	Completed	Completed	Completed	Completed
61	AP64	SM*+3	Completed	Completed	Completed	Completed
62	AP65	SD+0	Completed	Completed	Completed	Completed

Note: Data as per report provided by the TL Contractor on 31st January 2022.

11 SOCIAL AND PUBLIC

The major social activities undertaken in January 2022 are:

- The supply of drinking water to Sirise has been started.
- Office vehicle has been provided to the locals during emergency situations for transportation to hospital.
- Logistic support to Kaduri Foundation for Ratamata drinking water project.



Figure 16: During laying of pipe for Sirise drinking water

12 OCCUPATIONAL SAFETY AND HEALTH (OSH)

The OSH team at site promotes a safe and healthy environment at work places by implementing safety and health standards and safe working procedure through awareness and monitoring. The OSH team ensures preparedness in accidents and emergencies. Regular meeting with the contractors and workers are conducted for the enhancement of safety culture.

The OSH team regularly monitors the working fronts to ensure safe practice and discourage the safety non-compliance. The company has also hired an external OSH consultant (SMS Environment and Engineering Pvt. Ltd) for monitoring the safe working environment. Several physical as well as virtual trainings are provided to the OSH responsible persons and supervisors regarding OSH, leadership, etc.

Motivation is provided to the workers on regular basis for maintaining safety at site.

12.1 OSH IMPLEMENTATION BY THE CONTRACTORS

Table 12: OSH implementation by the Civil Contractor

Particular	Description	Remarks
VB02 excavation safety	Safety net was used in the excavation area be- side VB02 and special monitoring was done dur- ing excavation.	Safe level achieved
Barricading inside Powerhouse vertical openings	The vertical openings in the powerhouse bay 2 and 3 were barricaded using reinforcement bars.	Completed
Dewatering	Dewatering has been carried out at the main in- let tunnel for maintaining safe access.	Continued
Compliance of PPE	Contractor is instructed for compliance of PPE requirements by their workers. Use of PPE is regularly monitored.	
COVID awareness	Awareness has been provided to the workers regarding the Omicron variant of COVID-19.	

Table 13: OSH implementation by the Hydro-mechanical contractor

Particular	Description	Remarks
Compliance of PPE	Contractor is instructed for compliance of PPE	Ongoing
	requirements by their workers. Use of PPE is	
	regularly monitored.	
Safety of welders in	The contractor has made facilitation for	Ongoing
steep sloped pipe	maintaining good ergonomics of workers working	
	in steep sloped pipe.	

Table 14: OSH implementation by the TL contractor

Particular	Description	Remarks
Compliance of PPE	Contractor is instructed for compliance of PPE requirements by their workers. Use of PPE is regularly monitored.	
Traffic safety	The traffic safety procedures have been implemented during the stringing works at public road area.	Ongoing

12.2 TEST RESULTS

Table 15: Illumination Intensity in the Tunnel

S. N.	Location	Readings at working face (LUX)	Min. Light required, (LUX), Nepal	Readings inside tunnel (LUX)	Min. Light required, (LUX), Nepal	Status
1	Main inlet	115	100	70	50	Normal
2	Set outlet	110	100	65	50	Normal
3	Seti inlet	Work Completed, tunnel has been closed				
4	Poku outlet					
5	Poku inlet					
6	Main outlet	105	100	70	50	Normal
7	Surge shaft	125	100	125	50	Normal

Table 16: Oxygen level in the tunnel

S.N	Locations	Status		
1	Main inlet	Natural air circulation between Face 1 and 2. Oxygen level		
2	Set outlet			
3	Seti inlet	Natural air circulation between Face 3 and 4. Oxygen level above 19.5		
4	Poku outlet			
5	Poku inlet	Natural air circulation between Face 5 and 6. Oxygen level above 19.5		
6	Main outlet			
7	Surge shaft	Natural air circulation between connecting tunnel and surge shaft. Oxygen level above 19.5		

Table 17: Sound intensity in the tunnel

	Lesstians		Chatters	
5.N.	Locations	Measured Noise Level (dBA)	Status	
1	Main inlet	Breakthrough on 2078-02-13. No	After Breakthrough,	
2	Set outlet	loud noise after breakthrough	generally noise level does	
3	Seti inlet		Workers are provided	
4	Poku outlet	loud noise after breakthrough	noise protection PPE	
5	Poku inlet			
6	Main outlet	loud noise after breakthrough		
7	Surge Shaft	Breakthrough on 2077-04-20 No loud noise after breakthrough		

12.3 DISCUSSION WITH THE CONTRACTORS REGARDING OSH

Table 18: Discussion at site with Main Civil Contractor

I opic Discussed Implementation Status
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Working at height	Discussion was made with the contractor regarding safely working on height at the powerhouse with full safety compliance especially the use of safety harness	The workers used safety harness while working at height in Powerhouse.
COVID-19 prevention	Discussion has been made with the contractor regarding COVID-19 prevention and hygienic camp/working area	The contractor has been providing regular awareness regarding COVID and hygiene to the workers
Electrical wiring system	The main civil contractor was instructed to maintain proper electrical wiring system at the working fronts	The contractor has repaired the damaged sockets and replaced the weary wires.

Table 19: Discussion at Site with Hydro Mechanical Contractor

Topic	Discussed	Implementation Status
Safety during pipe fitting	Discussion was made with the HM contractor regarding the safe working procedures during fitting of pipes at Poku	Special monitoring was done during the pipe fitting works at Poku.
Covid-19 prevention	Discussion was made with the contractor regarding Covid-19 prevention	The contractor has been providing regular awareness regarding COVID and hygiene to the workers

12.4 COVID-19 VACCANITATION STATUS

Table 20: Details of COVID-19 vaccination

Company	Only First dosage	Both dosage	Remaining to be vaccinated
SGHCL	-	55	1
HHH-BC JV	15	330	1
MMMW	-	28	1
Aster	12	3	70
EM supplier staff (APP)	-	2	-

13 PROGRESS PHOTOGRAPHS



Figure 17: Upstream view of weir, undersluice and intake



Figure 18: Rock cutting for PPV house



Figure 19: Concreting works at the cable duct of switchyard



Figure 20: Laying of Para-link material in geo-grid soil reinforced structure right side of penstock anchor block VB02



Figure 21: Surge shaft from bottom



Figure 22: EM installation works in machine unit 2



Figure 23: Erection of transmission line tower AP20



Figure 24: Full concrete lining at Face 1-2 stretch



Figure 25: Main outlet tunnel

14 PROGRESS CHART

