**SWET GANGA HYDROPOWER & CONSTRUCTION LIMITED**
Sankha Park, Dhumbarahi, G.P.O.Box 19737, Kathmandu Nepal
Site Office: Sirise, Ramechhap

# TALLO LIKHU JALAVIDHYUT AAYOJANA
# (28.1 MW)

## MONTHLY PROGRESS REPORT # 46

**FEBRUARY, 2022**

**(18 Magh, 2078 to 16 Falgun, 2078)**

**Prepared By:**

**SANIMA HYDRO AND ENGINEERING PVT. LTD.**
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| | Signature | Date |
|---|---|---|
| Prepared By: | | |
| | Aashish Dhakal/ Binamra Shrestha | |
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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 $m^3/s$ resulting to an installed capacity of 28.1 MW. 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 Electricity Development (DoED), Ministry of Energy (MoE), Government of Nepal (GoN) | 2 Baisakh 2073 (14 April 2016) |
| | The license period of the project is from |
| | 28 Chaitra 2072 to 27 Chaitra 2107 B. S. |
| Power Purchase Agreement (PPA) with Nepal Electricity Authority (NEA) | 14 Poush 2073 (29 December 2016) |
| Financial Closure | 10 Falgun 2074 (22 February 2018) |
| Contract of Main Civil Works | 5 Chaitra 2074 (19 March 2018) |
| Contract of Hydro-mechanical Works | 9 Poush 2075 (24 December 2018) |
| Contract of Electro-mechanical Works | 18 Bhadra 2076 (4 September 2019) |
| Contract of Transmission Line Works | 8 Shrawan 2077 (23July 2020) |
| RCOD | 15 Mangsir 2078 (1 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<br>(Lead Bank: Laxmi Bank Ltd, Member Banks: Kumari Bank Ltd., Hydroelectricity Investment and Development Company Ltd. Century 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 | 6 |
| Electrical Overseer/Sub-overseer | 5 |
| Surveyor | 2 |
| Social Mobilizer | 3 |
| Admin Assistant | 2 |
| Driver | 4 |
| Cook | 3 |
| Office Helper | 5 |
| Construction Helper | 7 |
| Store keeper | 1 |
| **Total:** | **56** |

## 5.2 MANPOWER FROM CIVIL CONTRACTOR'S SIDE:

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

| Description | Number |
|---|---|
| Technical Manpower | 20 |
| Financial and Administrative manpower | 28 |
| 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)** | **151** |
| **Other Workers (Sub-Contractors)** | |
| DL/Bhimeshwor Construction (Headworks, Seti and Powerhouse) | 60 |
| Shaili Construction (Headworks) | 15 |
| Karan-Arjun Construction (Main Inlet) | 48 |
| Dreamland construction (Seti Outlet) | 40 |
| Hem Construction (Surge shaft and main outlet) | 15 |
| Gaiya Devi Construction (Switchyard) | 15 |
| **Total (B)** | **193** |
| **Grand Total (A+B)** | **344** |

*Note: Data as per weekly report 191 provided by the Main Civil Contractor on 28th February 2022.*

### 5.3 MANPOWER FROM HYDRO-MECHANICAL CONTRACTOR'S SIDE:

Table 4: Human Resource at site from the Hydro-Mechanical Contractor's side

| 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 | 4 |
| Welder | 6 |
| Helper | 10 |
| Cook | 3 |
| **Total** | **34** |

### 5.4 EQUIPMENT MOBILIZED BY CIVIL CONTRACTOR

Table 5: Equipment mobilized by the 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: Equipment mobilized by the Hydro-Mechanical Contractor

| 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 |
| 9 | Grinding Machine (7”) | 14 |
| 10 | Grinding Machine (4”) | 8 |
| 11 | Master Oven | 1 |
| 12 | Portable Oven | 14 |

## 5.6 CONSTRUCTION MATERIALS STORED BY CIVIL CONTRACTOR AT SITE:

Table 7: Construction material stored by the Main Civil Contractor

| Materials | Unit | Balance Quantity |
|---|---|---|
| Diesel | Litres | 6,975 |
| Rebar (25mm dia.) | Ton | 5.00 |
| Rebar (20mm dia.) | Ton | 1.00 |
| Rebar (16mm dia.) | Ton | 3.00 |
| Rebar (12mm dia.) | Ton | 5.00 |
| Cement | Bags | 6,402 |
| Plasticizer | Kg | 1,680.00 |
| Steel Fibre | Kg | 125.00 |
| Micro Silica | Kg | 400.00 |
| Accelerator | Kg | 275.00 |

*Note: Data as per weekly report 191 provided by the Main Civil Contractor on 26th February 2022.*

# 6 CIVIL CONSTRUCTION WORK PROGRESS

## 6.1 HEADWORKS

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

- Gabion works have been ongoing in the Bhangale Kholsi crossing. 52$m^3$ quantity has been completed this month.
- The construction of the settling basin inspection platform has been completed.
- The civil construction works of the fine trash-rack parking have been completed except the top slab concrete work.
- Construction of the settling basin spillway guide wall at the right side has been completed. The rebar work is ongoing in the left side guide wall. Stone soling work of base is ongoing for the panels 1 and 5.
- Excavation has been completed for additional 45 m length of headrace pipe. Six additional saddle supports have been constructed.
- The construction of the inlet kholsi crossing culvert has been started.

Table 8: Progress at Headworks in February, 2022

| S. N. | Description | Unit | Quantity | Remarks |
|---|---|---|---|---|
| 1 | C25 concrete | $m^3$ | 130.00 | |
| 2 | C35 concrete | $m^3$ | - | |
| 3 | 1:6 Stone masonry | $m^3$ | - | |
| 4 | Rebar | Ton | 9.50 | |

Figure 1: Gabion works at Bhangale Kholsi crossing

Figure 2: Completion of the settling basin inspection platform

Figure 3: Stone soling works at settling basin spillway panel 1 and 5

Figure 4: Fine trash-rack parking adjacent to conveyance tank

Figure 5: Inlet kholsi crossing culvert and HRP saddle supports

## 6.2 HEADRACE TUNNEL, SYPHON CROSSING AND SURGE SHAFT

### HRT FROM MAIN INLET PORTAL TO SETI OUTLET PORTAL

The full concrete lining work has been carried out for 237 m stretch in February 2022. (Total completed = 357 m out of 865 m)

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

| Lining Type | Face | Design length (m) | Completed length (m) | Remaining (m) |
|---|---|---|---|---|
| **Shotcrete** | Face 1 | 528.32 | 528.32 | - |
| | Face 2 | 292.80 | 292.80 | - |
| | **Total** | **821.12** | **821.12** | **-** |
| | | | | |
| **Wall concrete** | Face 1 | 528.32 | 528.32 | - |
| | Face 2 | 292.80 | 292.80 | - |
| | **Total** | **821.12** | **821.12** | **-** |
| | | | | |
| **Full concrete** | Face 1 | 263.00 | 87.00 | 176.00 |
| | Face 2 | 602.00 | 270.00 | 332.00 |
| | **Total** | **865.00** | **357.00** | **508.00** |
| | | | | |
| **Pipe Section** | Face 1 | 37.00 | - | 37.00 |
| | Face 2 | 25.00 | - | 25.00 |
| | **Total** | **62.00** | **-** | **62.00** |

Figure 6: Rebar installation in the Seti outlet tunnel and closing of niche

### 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 rock excavation work for PPV house foundation outside of the main outlet portal has also been completed. The construction of plug block inside the Poku inlet tunnel has been completed along with the pipe section.

### SETI CROSSING

No civil work has been carried out in February month.

### POKU CROSSING

The construction of the anchor block PK CB03 outside the Poku inlet tunnel has been resumed after completion of pipe installation works.

Figure 7: Construction of Anchor Block PK CB03

### SURGE SHAFT, ROCK TRAP AND CONNECTING TUNNEL

The roofing work of the surge shaft has almost been completed including the block masonry wall, truss works and chain link wire fencing. Only a few CGI sheet panels are remaining to install.

Figure 8: Surge shaft roofing works

### 6.3 PENSTOCK, POWERHOUSE AND TAILRACE

**PENSTOCK ALIGNMENT**:
The geo-grid structure of road retaining wall at the right side of anchor block VB02 has been completed. Plum concrete foundation has been prepared for the geo-grid structure at the left side of VB02

**POWERHOUSE**:
All concreting works of the Powerhouse have been completed and Electro-Mechanical installation works is ongoing.

**CONTROL ROOM AND OFFICE BUILDING**:
All RCC works of the control room building and the office building have been completed. Block masonry construction work is ongoing in the office building.

**TAILRACE**:
The construction of the all civil works of the tailrace culvert has been completed.

**SWITCHYARD**:
All civil works of the switchyard have been completed.

Table 10: Progress at penstock, powerhouse and tailrace in February, 2022

| S.N. | Description | Unit | Quantity (Powerhouse and control building) | Quantity (Penstock) |
|---|---|---|---|---|
| 1 | C25 concrete | $m^3$ | 2.00 | 24.80 |
| 2 | Re-bar | ton | 0.20 | 3.20 |
| 3 | C25 Plum concrete | $m^3$ | - | |


Figure 9: Penstock alignment, anchor block VB02 and geo-grid structure at right of VB02


Figure 10: Geo-grid structure at right side of anchor block VB02

Figure 11: Inside view of Powerhouse machine hall

# 7 HYDRO-MECHANICAL WORKS

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

- The radial gate seal installation has been completed for the undersluice right bay.
- 20 m additional pipe has been erected in the headrace pipe section in February 2020. With this, 210 m length pipe has been fitted out of 344 m.
- The installation of pipe at the Poku crossing has been completed with welding and UT test.
- Bellmouth has been installed at the main outlet tunnel and handed over to the civil contractor for concreting.

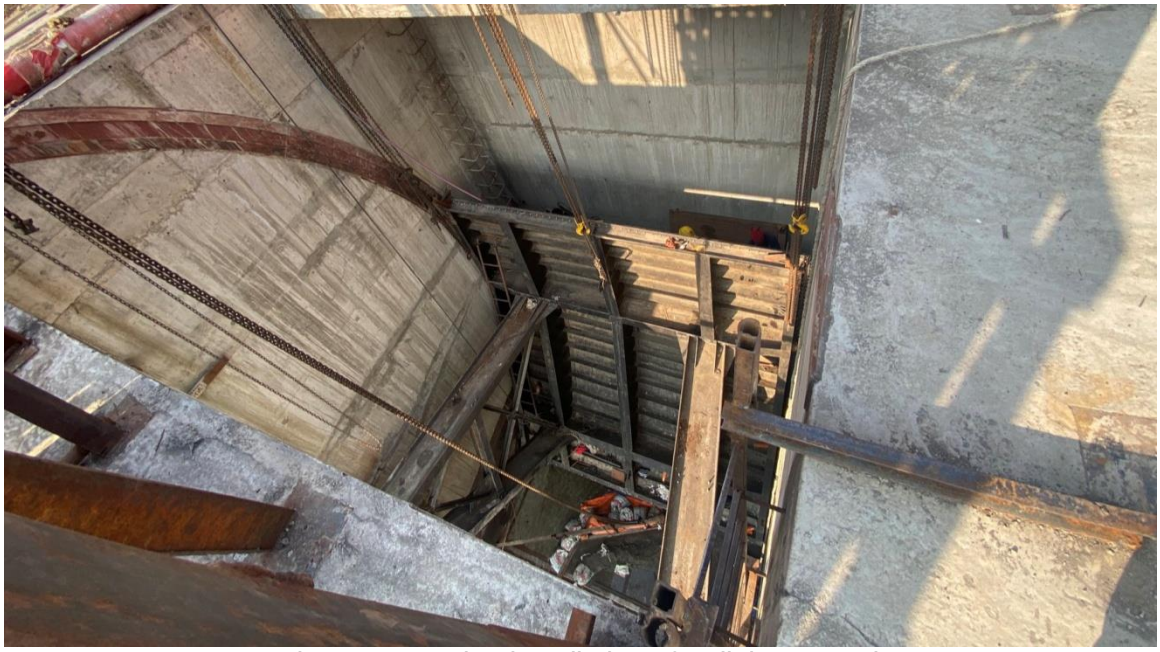

Figure 12: During installation of radial gate seal


Figure 13: Fitting of Headrace pipe at inlet kholsi crossing area

## 8 ELECTRO-MECHANICAL WORK PROGRESS

The work progress of the electro-mechanical installation works in February 2022 is below:

- Pre-assembly of turbine is ongoing at the powerhouse unit 2.
- Installation of cooling water pipeline and motors is ongoing at the powerhouse unit 2.
- Cleaning and non-shrink grout works is ongoing at both machine units.
- Installation of the switchyard terminal box is ongoing.

Figure 14: Fixing of the power transformer radiator

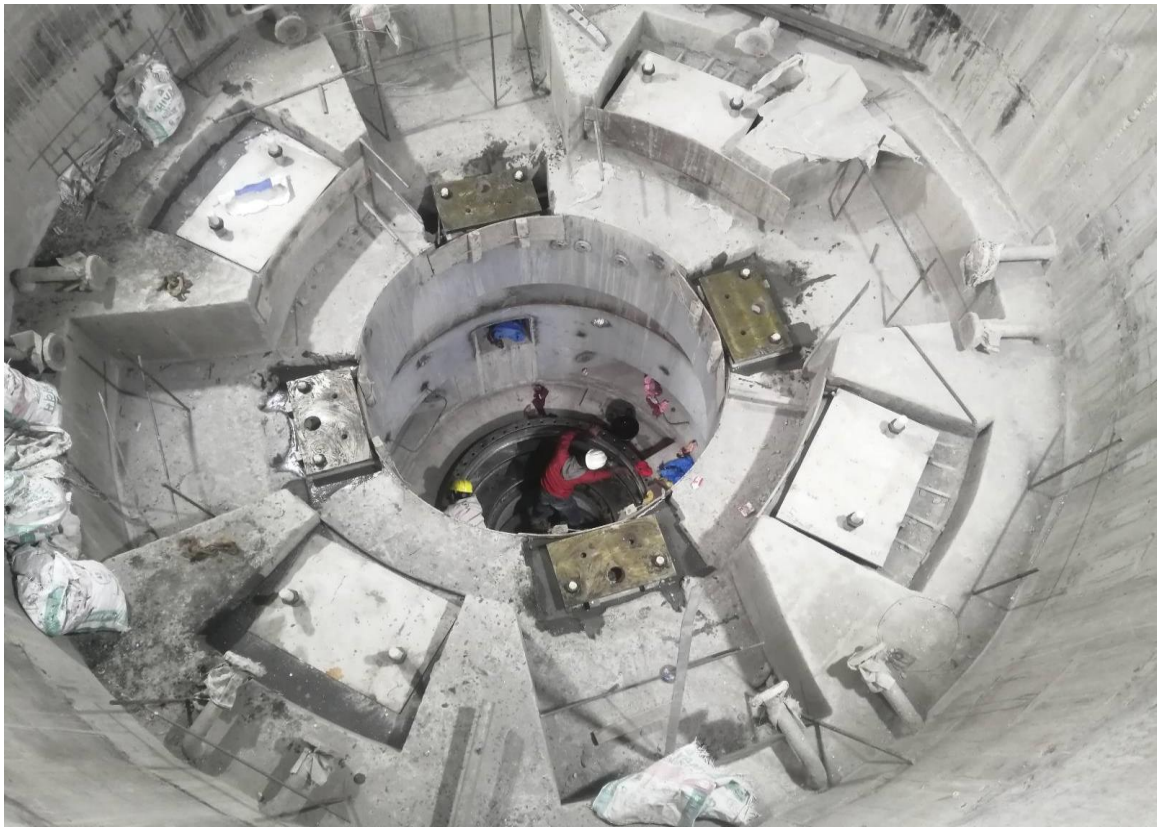

Figure 15: Cleaning of the base of stay ring and bottom ring at unit 1

Figure 16: Installation of cooling water pipeline for 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 is ongoing.

## 10 TRANSMISSION LINE WORKS (132 KV)

In the February 2022, erection of four towers has been completed. Including this, the erection works have been completed for 57 tower foundations. The concreting works have been completed for 59 tower foundations. Conductor stinging works have been completed for 12 km stretch and OPGW cable installation has been started.

In the LLHP bay at New Khimti Substation, the equipment installation is ongoing along with the control building. The installation of lattice structure has been completed.

Figure 17: LLHP bay at New Khimti Substation

Figure 18: Stringing of conductor between AP42 and AP43

Table 11: Transmission line progress

| 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 | 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 | 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 | Ongoing |
| 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 | Completed |
| 53 | AP56 | SM+0 | Completed | 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 28th February 2022.*

## 11 SOCIAL AND PUBLIC

The major social activities undertaken in February 2022 are:

- Distribution of compensation to the affected people of Transmission Line ROW.
- Office vehicle has been provided to the locals during emergency situations for transportation to hospital.
- Logistic support to Kaduri Foundation for Ratmata drinking water project.

Figure 19: Distribution of compensation to affected people

# 12 OCCUPATIONAL SAFETY AND HEALTH (OSH)

Along with the construction activities, Occupational Safety & Health (OSH) is also considered as one of the major components of the project. The OSH team at the site promotes a safe and healthy environment at the working fronts by implementing safety and health standards and safe working procedures through awareness and monitoring. The OSH team ensures preparedness in accidents and emergencies.

Regular meetings 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 safety non-compliance.

The company has also hired an external consultant team (SMS Environment and Engineering Pvt. Ltd) for monitoring the safe working environment. The external consultant periodically performs safety audits at the site to ensure compliance with and provide necessary corrective measures.

## 12.1 OSH IMPLEMENTATION BY THE CONTRACTORS

Table 12: OSH implementation by the Civil Contractor

| Particular | Description | Remarks |
|---|---|---|
| **Repair of fencing at Face 2** | The fencing at Seti Outlet tunnel area has been replaced. | Completed |
| **Electric installation inside Face 1-2** | Electric bulbs have been added in the tunnel stretch face seen faces 1 and 2. | Completed |
| **Fencing at VB02** | TMT bars have been used for barricading the VB02 area. | Completed |
| **Dewatering at Face 1** | Dewatering has been carried out at the main inlet tunnel for maintaining safe access. | Continued |
| **Signage** | Safety signage has been replaced by new ones at several work fronts. | |

Table 13: OSH implementation by the Hydro-mechanical contractor

| Particular | Description | Remarks |
|---|---|---|
| **Toolbox talk** | Toolbox talks have been organized regularly before the start of work. | Ongoing |
| **Electric bulbs at working area** | The Electric bulbs have been installed inside long stretch pipes for proper visibility wherever necessary. | Ongoing |
| **Toolbox talk** | Toolbox talks have been organized regularly before the start of work. | Ongoing |

Table 14: OSH implementation by the TL contractor

| Particular | Description | Remarks |
|---|---|---|
| **Toolbox talk** | Toolbox talks have been organized regularly before the start of work. | Ongoing |
| **Use of PPE** | The use of PPE has been regularly monitored. | Ongoing |
| **Safety during conductor stringing** | The TL contractor has taken maximum possible safety measures during stringing of conductor at road crossings and LT line crossings. | 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 | 120 | 100 | 68 | 50 | Normal |
| 2 | Set outlet | 115 | 100 | 65 | 50 | Normal |
| 3 | Seti inlet | Work Completed, tunnel has been closed | | | | |
| 4 | Poku outlet | | | | | |
| 5 | Poku inlet | | | | | |
| 6 | Main outlet | 110 | 100 | 62 | 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 above 19.5 |
| 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

| S.N. | Locations | Measured Noise Level (dBA) | Status |
|---|---|---|---|
| 1 | Main inlet | Breakthrough on 2078-02-13. No loud noise after breakthrough | After Breakthrough, generally noise level does not exceed 85dBA. Workers are provided noise protection PPE |
| 2 | Set outlet | | |
| 3 | Seti inlet | Break through on 2076-08-30. No loud noise after breakthrough | |
| 4 | Poku outlet | | |
| 5 | Poku inlet | Break through on 2077-02-20. No loud noise after breakthrough | |
| 6 | Main outlet | | |
| 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

| Topic | Discussed | Implementation Status |
|---|---|---|
| **COVID** | The discussion was made with the contractor regarding COVID-19 precautions to be taken at the endemic stage. | The measures have been forwarded to the workers and Employees. |

| | | |
|---|---|---|
| **Cleanliness of labour camp area** | Discussion has been made with the contractor regards the cleanliness the of labour camp area. | The workers have been instructed to maintain clean surroundings at the labour camp. |
| **Safety during VB02 construction** | The discussion was made with the contractor regarding working the VB02 area with safety. | The work has been carried out in VB02 with utmost care. |

Table 19: Discussion at Site with Hydro Mechanical Contractor

| Topic | Discussed | Implementation Status |
|---|---|---|
| **Safety during installation works inside the tunnel** | The discussion was made with the HM contractor regarding the safe working procedures during the installation of pipe sections inside the tunnel. | Regular monitoring is ongoing during working at the confined space of the tunnel. |
| **Covid-19** | The discussion was made with the contractor regarding Covid-19 prevention. | The contractor's safety officer provided awareness to the workers about COVID and hygiene. |

## 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 | 11 | 22 | 1 |
| Aster | 5 | 13 | 81 |
| EM supplier staff (APP) | - | 2 | - |

# 13 PROGRESS PHOTOGRAPHS

Figure 20: View of weir, undersluice, intake and fish passage

Figure 21: Settling basin and conveyance tank top view

Figure 22: Fish passage construction

Figure 23: Rebar laying at the settling basin spillway upstream wing wall

Figure 24: Concrete lining at the Seti Outlet tunnel

Figure 25: Cooling water pumps at Powerhouse

Figure 26: Main Inlet Valve (MIV) at bay 2

Figure 27: Construction of Public drinking water tank at Sirise

# 14 PROGRESS CHART