

RUDI-A SMALL HYDRO POWER PROJECT (8.8 MW)



MONTHLY PROGRESS REPORT

June, 2019

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Salient Features of Rudi Khola- A SHP (8.8MW)

1 Project Details

Project Name	Rudi Khola-A Small Hydropower Project
Development Region	Western Development Region
District	Lamjung and Kaski
Location of Project Site	PasGaun&MijureDanda VDCs
Water Source at Intake	Rudi Khola-B Tailrace Tapping, ChhedwaKhola Collection and Rudi Khola Collection
Type of Scheme	Cascade &RoR
Access Road	Existing Road 28 km (Pokhara to Thumsikot), Earthen Track 8 km (Thumsikot – Mungribesi), New Track 8km(Mugribesi to Powerhouse)+ Project Road 10 km up to headpond
Installed Capacity	8.8MW
Gross head	298.5 m
Rated Design head	276.89m
Design Discharge	3.72 cumecs

2 Hydrology

Water Source	Rudi Khola-B Tailrace, ChhedwaKhola, Rudi
Catchment Area	Total Catchment area 53.43 Km ² (Rudi-B Intake 35.3km ² + Chhdewa 9.7km ² + Remaining Rudi Collection 8.43km ²)
Average Precipitation	4225 mm/year
100 year Design flood @ Chhdewa Intake	83 m ³ /sec
Environmental Release	0.134 m ³ /sec
Design Discharge to Plant Q40%	3.72 cumec (Rudi-B Tailrace 2.55m ³ /s+ Chhedewa 0.68m ³ /s+ Remaining Rudi Collection 0.49 m ³ /s)

3 Headworks

3.1 Chheduwa

Headworks

Diversion structure	Free flow weir with Side Intake
Length of weir	10.0 m
Weir crest elevation	EL 968.8 msl
Height of weir	1.0 m
Under sluice	1 Vertical Sluice gate
Crest of Sluice	EL 962.26 msl
Size of Sluice gates(B × H)	1.5m × 1.32 m
Size of Intake opening	1.5× 1.25, 2 no.
Crest elevation of Intake	EL 968.05msl

3.2 Rudi Collection

Diversion structure	Free flow weir with Side Intake
Length of weir	13.0 m
Weir crest elevation	EL 939.00msl
Height of weir	3.0 m
Under sluice	1 Vertical Sluice gate
Crest of Sluice	EL 936.65msl
Size of Sluice gates(b × h)	2.5 m × 2.0 m
Size of Intake opening	2.5 × 1.35 x 3nos
Crest elevation of Intake	EL 938.00msl

4. Gravel Trap

4.1 Chhedwa Collection

Canal Type	Rectangular RCC Channel
Dimension (width × height)	4.2m × 4.3- 6.45m
Bed Slope	1:10
Length of Gravel Trap	17.25 m

Particle to settle > 5 mm

4.2 Rudi Diversion

Canal Type Rectangular RCC Channel

Dimension (width × height) 4.6m × 2.45 – 4.05 m

Bed Slope 1:10

Length of Gravel Trap 18.95 m

Particle to settle > 5 mm

5 ChhedwaHydrocyclon)

Type Hydrocyclon (6 cone)

Dimension (width × height) 7.00 m × 5.00 × 7.5m

No. of feeding Cone 6 nos

Feeding duct 7m * 1.0m * 1.5m

Bypass pipe 0.75 dia circular pipe

Trap Efficiency 98%

6 Collection Pipe

6.1 Chhedwa

Collection

Conveyance Length 457.0 m

Type Mild Steel Welded Pipe

Diameter 0.75 m Internal dia.

Thickness of Pipe 8 mm

Supports S/M Support with Concrete cap

6.2 Rudi Diversion

Conveyance Length 138.45 m

Type RCC Rectangular Box Culvert

Size (B*H) 1.9 m * 1.2m

Thickness of culvert 0.2 m

7. Headrace Pipe

Conveyance Length 4935.00 m

Type Mild Steel Welded Pipe

Diameter 1.5 m Internal dia.

Thickness of Pipe 8 mm

Supports	S/M Support with Concrete cap
Number of Anchor Blocks	75 nos.
Number of Saddle Supports	99 nos.
Number of Simple Supports	354nos.
Number of River Crossing	4 No

Surge Tank and Surge

8 Pipe

Type	Circular Mild steel tank
Size (DiaX Height)	6 m x 8.05m - 1 nos
Surge pipe Anchor Block	4 nos
Surge Pipe (2.5 m dia)	95 m
Surge Pipe (1.5m dia)	25.5 m
Operating level of ST	924.6 msl
Static Level of ST	938.5msl
Upsurge Level of ST	944.4msl

9 Penstock Pipe

Type	Welded Surface Penstock
Length	978 m
Pipe Material	Mild steel confirming to IS 2062-B
Size of Pipe	1.35 m, 8 - 10 mm and 1.25 m, 12 - 20 mm
Supports	S/M Support with Concrete cap
Number of Anchor Blocks	15 nos. (including Y, B, T and those on Surge tanks)
Number of Saddle Supports	47 nos.
Number of Simple Supports	34 nos.

10. Power house

Type	Surface with outdoor substation
------	---------------------------------

PH dimension (b × l)	20.5 X 30.5 m
Height of PH building	14.9 m (uptorooftop Level)
PH Floor level	EL. 639.31msl
Turbine Center Level	640.5 m

11. Tailrace

Type	Rectangular RCC
Size (width x height)	2 m X 1.95 m
Length	84.75 m
Tailrace canal bed level	EL 636.39 -935.85msl
Bed Slope	1 in 250

12. Turbine

Number of Units	2
Type of Turbine	Pelton
Shaft Arrangement	Horizontal
Rated discharge for each turbine	1.86 m ³ /s
Rated Head	276.89 m
Rated Output for each unit	4840 kW
RPM	500
Rated Efficiency	91%
Speed Governor	Electro-Hydraulic
CL of Turbine	EL 640.50 msl

13. Generators

No of units	2
Generator Type	3 ph AC Synchronous
Excitation	Brushless excitation
Rated Voltage	6.3 kV
Power Factor	0.85
Layout	Horizontal
Rated Output	5176.5 kVA
Rated Frequency	50 Hz
Rated Efficiency	96%

14. Power Transformer

Type	Step Up
Capacity	12000 kVA
Quantity	1
Number of Phases	3 ph, 50 Hz
Type of Cooling	ONAN
Voltage Ratio	
Primary (LV Side)	6.3 kV
Secondary (HV Side)	33 kV
Rated Efficiency	99%
Connection /Vector	
Group	YNd11

Station Supply

15. Transformer

Type	Indoor Type
Capacity (Indoor)	200 kVA
Voltage Ratio Indoor	6.3/0. kV
Number of Phases	3 ph, 50 Hz
Type of Cooling	ONAN
Voltage Ratio outdoor	33/0.4 kV
Connection /Vector	
Group	Dyn11

16. Transmission Line

Transmission line	33kV Single circuit line from Rudi-A PH to MugriSub station.
Transmission Length	3.8 km 33kV line up to Mugri S/S
Interconnection	
Substation	33 kV substation @ Mugri Substation.
Line Conductor	ACSR, 100 mm ²

17. Power and Energy

Installed Capacity	8.8 MW
Deemed Generation	50.28 GWhr (at PH after 5% Outage and loss)
Total Contract Energy	46.89 GWhr

for PPA

Dry Season Salable

Energy

(four months) 8.82 GWh

Wet Season Salable

Energy (eight months) 38.07 GWh

18. Construction Period 3 years (April 2016 to March 2019)

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Bindhyabasini Hydropower Development Co. Ltd.

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1. PROJECT OVERVIEW AND INSTITUTIONAL ARRANGEMENT

Rudi Khola-A Small Hydropower Project (8.8MW) is located in Mijure Danda VDC of Kaski district, Western Development Region of Nepal. Rudi Khola-A Small Hydropower Project was identified as potentially viable project by BHDC during Desk Study Report prepared in 2008. After identifying the project, BHDC applied for survey license in Department of Electricity Development, Ministry of Water Resources, and Government of Nepal. BHDC obtained the survey license for developing the project.

The project comprises of Intake, Approach RCC Culvert (138m), Head pond, Headrace Pipe including Kholsi crossings (4932 m), Surge tank, Penstock including Surge Tank connecting (1070m) and Powerhouse contains two unit followed by Tailrace canal (72m). The generated power is evacuated through 33 kV transmission line of about 3.5 km length to Mungri Substation.

I. CONSTRUCTION MANAGEMENT

- The Employer/ Client: Bindhyabasini Hydropower Development Company Ltd. (BHDC)
- The Consultant: Clean Energy Consultant (CEC) Pvt. Ltd.
- The Contractor (Civil): High Himalaya Hydro Construction Pvt. Ltd.(3HC)
- The Contractor (Hydro Mechanical): North Hydro & Engineering Pvt. Ltd.(NH)
- The Contractor (Electro Mechanical): TPSC India Pvt. Ltd.
- Bank Consultant: Sanima Hydro and Engineering Pvt. Ltd.

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2. KEY DATES


TABLE 1 KEY DATES

SN	Development and Progress Details	Key Dates	Remarks
1	Bindhyabasini Hydropower Company was established	2057/09/03	
2	License awarded to Bindhyabasini Hydropower Dev. Company.	2065/03/20	
3	PPA Signed with NEA	2069/10/28	
4	Civil Contract agreement date	24/03/2016	
5	HM contract agreement date	25/04/2016	
6	EM Contract agreement date	29/06/2016	
7	Commercial Operation Date	19/03/2019	


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 **नेपाल विद्युत प्राधिकरण**
(नेपाल सरकारको स्वामित्व)
योजना, अनुगमन तथा सूचना प्रविधि निर्देशनालय
विद्युत व्यापार विभाग

केन्द्रीय कार्यालय
परिवारमार्ग, काठमाडौं
फोन नं. ४१४२११०
फ्याक्स : ४१४२११९
Web: www.nea.org.np

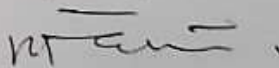

मिति : २०७६/०२/२०

पत्र संख्या : ने.वि.प्रा. ०७५।७६ वि.व्या.वि. च.नं. २१२०

श्री उपकार्यकारी निर्देशकज्यू
अर्थ निर्देशनालय, ने.वि.प्रा. ।

**विषय :- रुदी खोला ए जलविद्युत आयोजना (८.८ मे.वा.)
व्यापारिक उत्पादन शुरु भएको मिति बारे ।**

श्री विन्ध्यावासिनी हाईड्रोपावर कं.लिमिटेड द्वारा प्रवर्द्धित ८.८ मे.वा. क्षमताको रुदी खोला ए जलविद्युत आयोजना अन्तर्गत रहेको Powerhouse र Interconnection Facilities को मिति २०७५/११/१८ मा Testing and Commissioning कार्य सम्पन्न भई आयोजनाबाट उत्पादित विद्युत ने.वि.प्रा.को प्रणालीमा प्रवाह भइसकेको हुँदा विद्युत खरीद-विक्री सम्झौताको प्रावधान बमोजिम गठित समन्वय समितिको मिति २०७५/१२/२१ गते बसेको समन्वय समितिको बैठकमा कम्पनीले पेश गरेको Logsheet, Joint Meter Reading र अन्य कागजातहरूको अध्ययन पछि आयोजनाबाट सन्तोषजनक रूपमा विद्युत उत्पादन भई ने.वि.प्रा.को प्रणालीमा विद्युत प्रवाह भइरहेको तथ्यलाई मध्यनजर गरी मिति २०७५ चैत्र ०५ गते मध्यान्ह १२:०० बजे देखि उक्त आयोजनाको व्यापारिक उत्पादन शुरु भएको मिति (Commercial Operation Date) निर्धारण गर्ने निर्णय भएको व्यहोरा जानकारीको लागि अनुरोध गर्दछु ।


(प्रबल अधिकारी)
प्रमुख

संलग्न :
१) सम्बन्धित मितिबन्धी बैठकको साहचर्यहरूको प्रतिविलिपी

Fig: Letter for Commercial Operation declaration from Nepal Electricity Authorities.

3. MANPOWER MANAGEMENT AT SITE

I. Employer

TABLE 2 EMPLOYER'S MANPOWER AT SITE

Description	Number
Deputy Project Manager	1
Operation In charge	1
Powerhouse operator (electrical)	6
Powerhouse operator (Mechanical)	4
Site Supervisor	6
Driver	1
Security Guard	2
Cook	2
Total	23

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4. CIVIL PROGRESS DETAILS

I. Head Pond

HEADPONDS

Item No.	Description	Unit	Revised BOQ(quantity)	Final Quantity(civil)	Variation Quantity(%)	Remarks
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	2,798.54	6,664.972	138%	exceed BOQ
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	310.95	3,568.147	1047%	exceed BOQ
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	310.95		-100%	
2.1	Dry Stone Soling	m3	106.81	33.727	-68%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	53.41	56.217	5%	exceed BOQ
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	184.62	43.384	-77%	
3.3	Providing and Placing M20/40 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	252.32		-100%	
3.8	Providing, fixing and removing formworks for concreting works	m2	1,682.75	2,849.215	69%	exceed BOQ
3.10	Reinforcement works for RCC Concrete	MT	34.95	82.313	136%	exceed BOQ
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	165.00	155.797	-6%	

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4.5	Gabion works	m3	8.00	12.000	50%	exceed BOQ
9.1	300 mm PVC Water Stopper	Rm	75.00	76.950	3%	exceed BOQ
9.2	25 mm thick Expansion Joint Board (Saltax Board)	m2	22.50	33.208	48%	exceed BOQ
9.3	Joint Sealant	m	22.50	126.550	462%	exceed BOQ
NE W	Providing and Placing M25/20 Cement Concrete machine mixed for Super Structure, including upto 30m lead.	m3		917.287	100%	exceed BOQ
NE W	Boulder Riprap (upto 1.0m Dia. Boulder)	m3		74.790	100%	exceed BOQ
NE W	3mm thick neat cement punning	m2		47.823	100%	exceed BOQ
NE W	12mm thick cement plaster in 1:4 cement and sand mortar	m2		47.823	100%	exceed BOQ

TABLE 3: HEAD POND PROGRESS

Key works:

1. Headpond civil works has completed.
2. Head pond wet testing has completed.



Fig 1: Headpond completed view.



Fig 2: Water flowing through headpond.

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II. Rudi Khola diversion and collection scheme

Rudi Khola Collection and Diversion Scheme

Item No.	Description	Unit	Revised BOQ (quantity)	Quantity up to date(civil)	Variation Quantity (%)	Remarks
	River Diversion Works	LS	1	1.000	0%	
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	2,207.70	6,320.460	186%	Exceeded BOQ
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	245.30	939.080	283%	Exceeded BOQ
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	735.90	1,045.979	42%	Exceeded BOQ
2.1	Dry Stone Soling	m3	97.84	197.864	102%	Exceeded BOQ
2.3	Boulder Riprap (upto 1.0m Dia. Boulder)	m3	433.79	248.065	-43%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	48.92	100.942	106%	Exceeded BOQ
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	182.46	362.811	99%	Exceeded BOQ
3.3	Providing and Placing M20/40 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	839.52		-100%	
3.6	Providing and Placing Plum M15/40 Cement concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	134.49		-100%	
3.8	Providing, fixing and removing formworks for concreting works	m2	1,677.87	3,315.330	98%	Exceeded BOQ

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3.10	Reinforcement works for RCC Concrete	MT	114.05	101.758	-11%	
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	296.40	576.065	94%	Exceeded BOQ
4.5	Gabion works	m3	180.00		-100%	
9.1	300 mm PVC Water Stopper	Rm	60.00	97.450	62%	Exceeded BOQ
9.2	25 mm thick Expansion Joint Board (Saltax Board)	m2	18.00	33.557	86%	Exceeded BOQ
9.3	Joint Sealant	m	18.00	163.700	809%	Exceeded BOQ
NEW	Providing and Placing M25/20 Cement Concrete machine mixed for Super Structure, including upto 30m lead.	m3		1,026.881	100%	Exceeded BOQ
NEW	Filter materials collection and laying	m3		56.14	100%	Exceeded BOQ
NEW	Providing and Laying and fixing of Geo-textile (Filter Fabrics), lead 30m	m2		205.568	100%	Exceeded BOQ
NEW	Red clay blanket Laying	m3		30.835	100%	Exceeded BOQ
NEW	20 mm dowel bar drilling, grouting complete	m		58.9	100%	Exceeded BOQ
NEW	20 cm thick Hard Stone Lining 1:3 cement mortar	m2		100.071	100%	Exceeded BOQ
NEW	30 cm thick Hard Stone Lining	m2		179.652	100%	Exceeded BOQ
NEW	Non-shrinkage chemical	kg		6750	100%	Exceeded BOQ
NEW	12mm thick cement plaster in 1:4 cement and sand mortar	m2		21.6	100%	Exceeded BOQ
NEW	3mm thick neat cement punning	m2		21.6	100%	Exceeded BOQ
NEW	Providing and laying Random Rubble Masonry in 1:6 Cement and Sand Mortar, lead 30m marooned 0-5m	m3		109.865	100%	Exceeded BOQ
NEW	4" dia HDEP pipe for weep hole	m		10.8	100%	Exceeded BOQ

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NEW	63mm HDEP pipe for weep hole masonry wall	m		119.2	100%	Exceeded BOQ
NEW	Earthwork in excavation in shallow water foundation including disposal upto 10m lead and 1.5m lift	m ³		0		

TABLE 4: RUDI KHOLA DIVERSION AND COLLECTION SCHEME PROGRESS

Key works:

1. All civil works has completed except right side protection wall (D/S)
2. Wet testing has done and is successfully completed.



Fig 4: Completed diversion structure with water diverting towards intake.



Fig : water entering through orifice.

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III. CHHEDUWA KHOLA COLLECTION AND DIVERSION SCHEME

TABLE 5: CHHEDUWA KHOLA COLLECTION AND DIVERSION SCHEME PROGRESS

Chheduwa Collection and Diversion Scheme

Item No.	Description	Unit	Revised BOQ(quantit y)	Quantity up to date(civil)	Variatio n Quantit y (%)	Remark s
	River Diversion Works	LS	1.00	1.000	0%	
1.1	Site Clearance	m2	800.00		-100%	
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	622.56	146.644	-76%	
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	77.82	135.360	74%	Exceede d BOQ
1.7	Earthwork in excavation in shallow water foundation including disposal upto 10 m lead and 1.5m lift	m3	77.82	-	-100%	
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	77.82	23.875	-69%	
2.1	Dry Stone Soling	m3	55.76	6.642	-88%	
2.3	Boulder Riprap (upto 1.0m Dia. Boulder)	m3	121.17		-100%	
2.4	River Gravel Packing	m3	45.44		-100%	
2.5	20 cm thick Hard Stone Lining 1:3 Cement mortar	m2	129.14	19.502	-85%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	27.88	4.527	-84%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	192.15	21.498	-89%	

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3.3	Providing and Placing M20/40 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	257.86	7.298	-97%	
3.8	Providing, fixing and removing formworks for concreting works	m2	584.20	667.728	14%	Exceeded BOQ
3.10	Reinforcement works for RCC Concrete	MT	27.00	18.233	-32%	
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	316.16	-	-100%	
4.4	Providing and laying Random Rubble Masonry in 1:6 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	21.56	-	-100%	
NEW	Providing and Placing M25/20 Cement Concrete machine mixed for Super Structure, including upto 30m lead.	m3		158.971	100%	Exceeded BOQ
NEW	300mm PVC water stopper	Rm		13.756	100%	Exceeded BOQ
4.5	Gabion works	m3	74.00	0	-100%	
NEW	Red clay blanket Laying	m3		30.835	100%	Exceeded BOQ
NEW	20 mm dowel bar drilling, grouting complete	m		58.9	100%	Exceeded BOQ
NEW	20 cm thick Hard Stone Lining 1:3 cement mortar	m2		100.071	100%	Exceeded BOQ
NEW	30 cm thick Hard Stone Lining	m2		179.652	100%	Exceeded BOQ
NEW	Non-shrinkage chemical	kg		6750	100%	Exceeded BOQ
NEW	12mm thick cement plaster in 1:4 cement and sand mortar	m2		21.6	100%	Exceeded BOQ
NEW	3mm thick neat cement punning	m2		21.6	100%	Exceeded BOQ
NEW	Providing and laying Random Rubble Masonry in 1:6 Cement and Sand Mortar, lead 30m marooned 0-5m	m3		109.865	100%	Exceeded BOQ
NEW	4" dia HDEP pipe for weep hole	m		10.8	100%	Exceeded BOQ

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NEW	63mm HDEP pipe for weep hole masonry wall	m		119.2	100%	Exceeded BOQ
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Key works:

1. Civil works of Intake, under sluice has completed.
2. Diversion weir works has completed.

IV. GRAVEL TRAP AND SPILLWAY

Item No.	Description	Unit	Revised BOQ(quantity)	Quantity up to date(civil)	Variation Quantity(%)	Remarks
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	432.00	1,734.222	301%	Exceeded BOQ
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	54.00	368.845	583%	Exceeded BOQ
1.7	Earthwork in excavation in shallow water foundation including disposal upto 10m lead and 1.5m lift	m3	54.00	-	-100%	
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	54.00		-100%	
2.1	Dry Stone Soling	m3	24.97	16.555	-34%	
2.5	20 cm thick Hard Stone lining 1:3 Cement mortar	m2	9.50		-100%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	12.49	8.278	-34%	

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3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	30.03		-100%	
3.3	Providing and Placing M20/40 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	34.34		-100%	
3.8	Providing, fixing and removing formworks for concreting works	m2	222.41	624.134	181%	Exceeded BOQ
3.10	Reinforcement works for RCC Concrete	MT	5.15	16.566	222%	Exceeded BOQ
9.1	300 mm PVC Water Stopper	Rm	20.00	35.200	76%	Exceeded BOQ
9.2	25 mm thick Expansion Joint Board (Saltax Board)	m2	6.00	11.198	87%	Exceeded BOQ
NEW	Providing and Placing M25/20 Cement Concrete machine mixed for Super Structure, including upto 30m lead.	m3		159.495	100%	
NEW	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3		11.527	100%	
9.3	Joint Sealant	m	6.00			

TABLE 6 GRAVEL TRAP AND SPILLWAY PROGRESS

D. CHHEDWA KHOLA COLLECTION AND DIVERSION SCHEME								
S.N.	Description of Items	Unit	Quantity				% Progress	Remarks
			As per BOQ	Last month Progress	This month progress	Total up to date		
1	Excavation of Earth soil(excluding hard rock)	m3	622.56	360.00	0.00	360.00	58%	
2	Earthwork in hard rock	m3	77.82	100.00	0.00	100.00	129%	
3	Providing and placing Plum M15/40	m3	146.76	34.00	0.00	34.00	23%	
4	Providing , fixing and removing formworks	m2	315.08	96.00	0.00	96.00	30%	

5	Reinforcement works for RCC Concrete	MT	7.64	0.80	0.00	0.80	10%	
NEW	M25/40 Cement Concrete	m3			51.93	51.93		
							44%	

Key works:

1. Gravel trap civil works has finished except protection works.
2. Hydrocyclon civil structure is ready for erection.

V. COLLECTION PIPE-CHHEDWA

Sub Section D4: COLLECTION PIPE

Item No.	Description	Unit	Revised BOQ(quantity)	Quantity up to date(civil)	Variation Quantity (%)	Remarks
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	6,104.62	4,563.333	-25%	
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	678.29	579.623	-15%	
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	1,356.58	769.725	-43%	
2.1	Dry Stone Soling	m3	43.29	36.045	-17%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	21.64	20.080	-7%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	7.56	147.056	1845%	Exceeded BOQ

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3.6	Providing and Placing Plum M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	146.76	42.140	-71%	
3.8	Providing, fixing and removing formworks for concreting works	m2	315.08	517.744	64%	Exceeded BOQ
3.10	Reinforcement works for RCC Concrete	MT	7.64	13.327	74%	Exceeded BOQ
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	20.63	41.854	103%	Exceeded BOQ
new	Earthwork in excavation in shallow water foundation including disposal upto 10m lead and 1.5m lift	m3		1,667.082		new
new	Providing and Placing M20/40 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3		68.500		new
new	Boulder Riprap (upto 1.0m Dia. Boulder)	m3		49.522		new
new	Earth work in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3		33.243		new

TABLE 7 COLLECTION PIPE-CHEDDWA PROGRESS

E. HEADRACE ALIGNMENT							
E1	Alignment E/W ,Backfilling and structure						
S.N.	Description of Items	Unit	Quantity				% Progress
			As per BOQ	Last month Progress	This month progress	Total up to date	
1	Site Clearance	m2	48720.00	96637.62	0.00	96637.62	198%
2	Common Soil	m3	88901.49	38002.82	0.00	38002.82	43%
3	Hard Rock/ Medium Rock	m3	9877.94	5642.11	0.00	5642.11	57%
5	Masonry	m3	321.55	32.85	0.00	32.85	10%
6	Gabion Works	m3	292.32	1617.00	222.60	1839.60	629%

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								44.30%
New	Excavation in boulder mix soil	m3		695.44			695.44	
New	Dry Stone Soling	m3		22.22			22.22	
E2	Anchor Block							
S.N.	Description of Items	Unit	Quantity				% Progress	
			As per BOQ	Last month Progress	This month progress	Total up to date		
1	Dry Stone Soling	m3	313.93	307.18	18.82	326.00	104%	
2	M10/40 concrete	m3	156.96	172.60	12.40	185.00	118%	
3	M15/40 Concrete	m3	3033.49	4098.00	247.00	4345.00	143%	
4	Formworks	m2	4044.12	4079.90	325.10	4405.00	109%	
5	Reinforcement works for RCC Concrete.	MT	121.34	102.89	7.51	110.40	91%	
							101%	
New	Stone Masonry	m3		11.32	18.24	29.56		
E3	Simple Support							
S.N.	Description of Items	Unit	Quantity				% Progress	
			As per BOQ	Last month Progress	This month progress	Total up to date		
1	Dry Stone Soling	m3	165.00	84.66	0.41	85.07	52%	
2	M10/40 Concrete	m3	82.50	45.93	0.44	46.37	56%	
3	M15/40 Concrete	m3	135.27	103.35	3.65	107.00	79%	
4	Formworks	m2	694.72	515.95	7.05	523.00	75%	
5	Reinforcement works for RCC Concrete.	MT	10.02	6.30	0.22	6.52	65%	
							65%	
New	Stone Masonry	m3		6.16	0.00	6.16		
E4	Saddle Support							
S.N.	Description of Items	Unit	Quantity				% Progress	
			As per BOQ	Last month Progress	This month progress	Total up to date		
1	Dry Stone Soling	m3	88.64	69.96	2.04	72.00	81%	
2	M10/40 Concrete	m3	44.32	52.15	8.75	60.90	137%	
3	M15/40 Concrete	m3	73.58	361.17	3.83	365.00	496%	
4	Formworks	m2	320.24	697.27	5.73	703.00	220%	
5	Reinforcement works for RCC Concrete.	MT	4.42	19.43	0.00	19.43	440%	

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6	Stone Masonry	m3	341.57	379.96	5.04	385.00	113%
							99%
New	Boulder Riprap	m3		6.24		6.24	

Key works:

1. Collection pipe of chheduwa to Rudi connection has been completed.

VI. HEADRACE ALIGNMENT

ALIGNMENT E/W EXCAVATION, BACKFILLING AND STRUCTURE

Item No.	Description	Unit	Revised BOQ(quantity)	Quantity up to date(civil)	Variation Quantity (%)	Remarks
1.1	Site Clearance	m2	48,720.00	96,637.62	98%	Exceeded BOQ
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	88,901.49	61,664.53	-31%	

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1.3	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	9,877.94	9,499.76	-4%	
1.4	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	29,633.83	20,745.58	-30%	
1.5	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	321.55	87.96	-73%	
1.6	Gabion works	m3	292.32	2,921.70	899%	Exceeded BOQ
1.7	Providing and Laying and Fixing of Geo-textile (Filter Fabrics), lead 30m	m2	292.32	482.20	65%	Exceeded BOQ
NE W	Dry stone soling	m3		47.23		Exceeded BOQ
NE W	Earthwork in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3		1,889.38		new
NE W	Boulder Riprap (upto 1.0m Dia. Boulder)	m3		25.00		new
NE W	Earthwork in excavation in sallow water foundation including disposal upto 10m lead and 1.5m lift	m3		-		
NE W	River Gravel Packing	m3		26.22		new
new	Boulder Riprap (upto 1.0m Dia. Boulder)	m3		49.522		new
new	Earth work in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3		33.243		new
<u>ANCHOR BLOCK</u>						
1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	609.62	9,670.724	1486%	Exceeded BOQ
1.4	Earthwork in excavation in boulder mix soil including	m3	487.70	707.088	45%	Exceeded BOQ

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	disposal upto 10m lead and 1.5m lift					
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	121.92	1,843.057	1412%	Exceeded BOQ
2.1	Dry Stone Soling	m3	313.93	404.917	29%	Exceeded BOQ
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	156.96	247.934	58%	Exceeded BOQ
3.6	Providing and Placing Plum M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	3,033.49	5,145.675	70%	Exceeded BOQ
3.8	Providing, fixing and removing formworks for concreting works	m2	4,044.12	5,955.792	47%	Exceeded BOQ
3.1 0	Reinforcement works for RCC Concrete	MT	121.34	139.852	15%	Exceeded BOQ
NE W	Providing and Laying Random Rubble Masonry in 1:4 cement and Sand mortar, lead 30m marooned 0-5m	m3		110.638		new
NE W	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3		297.476		new
NE W	Perforated HDEP drain pipe	m		5.000		new
NE W	20mm dowel bar drilling, grouting complete	m		60.000		new
SADDLE SUPPORT						
1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	252.68	-	-100%	
2.1	Dry Stone Soling	m3	88.64	84.644	-5%	

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3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	44.32	60.106	36%	Exceeded BOQ
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	73.58	377.435	413%	Exceeded BOQ
3.8	Providing, fixing and removing formworks for concreting works	m2	320.24	1,301.596	306%	Exceeded BOQ
3.10	Reinforcement works for RCC Concrete	MT	4.42	33.294	653%	Exceeded BOQ
4.3	Providing and Laying Random Rubble Masonry in 1:4 cement and Sand mortar, lead 30m marooned 0-5m	m3	341.57	483.120	41%	Exceeded BOQ
NEW	Boulder Riprap (upto 1.0m Dia. Boulder)	m3		6.240		NEW

SIMPLE SUPPORT

1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	165.00	0	-100%	
2.1	Dry Stone Soling	m3	165.00	138.316	-16%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	82.50	64.333	-22%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	135.27	130.638	-3%	
3.8	Providing, fixing and removing formworks for concreting works	m2	694.72	698.718	1%	Exceeded BOQ
3.10	Reinforcement works for RCC Concrete	MT	10.02	8.4121	-16%	

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NE W	Providing and Laying Random Rubble Masonry in 1:4 cement and Sand mortar, lead 30m marooned 0-5m	m3		11.088		new
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Table 8 Headrace Alignment progress

Key Works:

All headrace related civil works has finished except protection works in some parts.



Fig 10: Headrace pipe section between AB-38 to AB-39

VII. SURGETANK

TABLE 10 SURGE TANK PROGRESS

G. PENSTOCK ALIGNMENT						
G1	Alignment E/W Excavation					
S.N.	Description of Items	Unit	Quantity			

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			As per BOQ	Last month Progress	This month progress	Total up to date	% Progress
1	Common Soil	m3	12955.50	13850.00	0.00	13850.00	107%
2	Hard Rock/Medium Rock	m3	1439.50	2822.00	0.00	2822.00	196%
3	Backfilling	m3	1439.50	300.00	0.00	300.00	21%
4	Masonry	m3	68.90	42.00	0.00	42.00	61%
5	Gabion Works	m3	62.64	421.00	0.00	421.00	672%
							81%
G2	Anchor Block						
S.N.	Description of Items	Unit	Quantity				% Progress
			As per BOQ	Last month Progress	This month progress	Total up to date	
1	Dry Stone Soling	m3	92.61	64.00	17.00	81.00	87%
2	M10/40 Concrete	m3	46.31	34.00	3.00	37.00	80%
3	M15/40 Concrete	m3	1463.31	804.00	36.00	840.00	57%
4	Formworks	m2	1631.35	841.00	80.00	921.00	56%
5	Reinforcement works for RCC Concrete.	MT	73.17	18.50	0.00	18.50	25%
							61%
New	Stone masonry	m3		8.60	7.35	15.95	
G3	Simple Support						
S.N.	Description of Items	Unit	Quantity				% Progress
			As per BOQ	Last month Progress	This month progress	Total up to date	
1	Dry Stone Soling	m3	12.87	13.00	0.00	13.00	101%
2	Providing and Placing M10/40 Cement Concrete	m3	6.44	6.90	0.00	6.90	107%
3	Providing and Placing M15/40 Cement Concrete	m3	10.13	13.24	0.00	13.24	131%
4	Formworks for Concreting Works.	m2	60.90	67.77	0.00	67.77	111%
5	Reinforcement works for RCC Concrete.	MT	0.90	0.76	0.00	0.76	84%
							107%
G4	Saddle Support						
S.N.	Description of Items	Unit	Quantity				% Progress
			As per BOQ	Last month Progress	This month progress	Total up to date	
2	Dry Stone Soling	m3	34.20	22.00	0.00	22.00	64%
3	Providing and Placing M10/40 Cement Concrete	m3	17.10	18.17	0.00	18.17	106%

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4	Providing and Placing M15/40 Cement Concrete	m3	60.00	28.00	0.00	28.00	47%
5	Formworks for Concreting Works.	m2	267.00	130.00	0.00	130.00	49%
6	Reinforcement works for RCC Concrete.	MT	1.50	2.70	0.00	2.70	180%
7	Stone Masonry	m3	233.25	55.00	0.00	55.00	24%
							78%

SURGE TANK AND SURGE PIPE						
Item No.	Description	Unit	Revised BOQ(quantity)	Quantity up to date(civil)	Variation Quantity(%)	Remarks
1.1	Site Clearance	m2	375.00	-	-100%	
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	2,742.40	-	-100%	
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	304.71	-	-100%	
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	304.71	-	-100%	
2.1	Dry Stone Soling	m3	49.84	45.05	-10%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	24.92	22.52	-10%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	37.71	53.92	43%	Exceeded BOQ
3.4	Providing and Placing M20/20 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	119.63	-	-100%	
3.5	Providing and Placing M25/20 Cement Concrete machine mixed for	m3	152.93	-	-100%	

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	Superstructure, including upto 30m lead					
3.8	Providing, fixing and removing formworks for concreting works	m2	134.95	69.18	-49%	
3.9	Providing, fixing and removing formworks for Wall	m2	955.42	-	-100%	
3.10	Reinforcement works for RCC Concrete	MT	28.58	2.33	-92%	
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	327.41	97.510	-70%	
5.1	12mm thick Cement Plaster in 1:4 Cement and sand mortar, lead 30m marooned 0-5m	m2	368.76	-	-100%	
	Providing, fixing and removing Scaffolding	L.S	1.00	-	-100%	
1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	609.62	-	-100%	
1.4	Earthwork in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3	487.70	-	-100%	
	LOWER SURGE TANK (SURGE PIPE)					
1.1	Site Clearance	m2	375.00	5,503.190	1368%	
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	2,611.55	7,769.579	198%	
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	290.17	1,293.575	346%	Exceeded BOQ

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1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	290.17	-	-100%	
2.1	Dry Stone Soling	m3	49.81	30.834	-38%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	24.90	18.083	-27%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	98.86	-	-100%	
3.4	Providing and Placing M20/20 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	120.90	-	-100%	
3.5	Providing and Placing M25/20 Cement Concrete machine mixed for Superstructure, including upto 30m lead	m3	236.82	0	-100%	
3.8	Providing, fixing and removing formworks for concreting works	m2	217.64	606.582	179%	Exceeded BOQ
3.9	Providing, fixing and removing formworks for Wall	m2	1,770.47	0	-100%	
3.10	Reinforcement works for RCC Concrete	MT	39.23	13.976	-64%	
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	187.12	0	-100%	
5.1	12mm thick Cement Plaster in 1:4 Cement and sand mortar, lead 30m marooned 0-5m	m2	368.76	0	-100%	
	Providing, fixing and removing Scaffolding	L.S	1.00	0	-100%	

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NEW	25mm dowel bar drilling, grouting complete	m		68		
NEW	Providing and Placing Plum M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3		858.075		

Key Works:

1. Surge pipe and surge tank works has finished.



Fig : completed view of Surge

VIII. PENSTOCK

TABLE 11 PENSTOCK PROGRESS

H. POWERHOUSE							
S.N.	Description of Items	Unit	Quantity				% Progress
			As per BOQ	Last month Progress	This month progress	Total up to date	
1	Site Clearance	m2	2091.00	2091.00	0.00	2091.00	100%
2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	9803.92	2949.00	0.00	2949.00	30%
3	Earth Work in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	1089.32	278.20	0.00	278.20	26%
4	Backfilling works	m3	1089.32	1000.00	0.00	1000.00	92%
5	Dry Stone Soling	m3	85.87	163.10	0.00	163.10	190%
6	M10/40 Cement Concrete .	m3	47.62	65.10	0.00	65.10	137%
7	M20First stage Cement concrete	m3	313.67	39.44	0.00	39.44	13%
8	M20 Second stage cement concrete	m3	154.17	91.09	0.00	91.09	59%
9	M25/20 Cement Concrete	m3	16.45	800.00	0.00	800.00	4863%
10	Formworks	m2	1746.69	2389.93	0.00	2389.93	137%
11	Reinforcement works for RCC Concrete.	MT	56.86	96.25	0.00	96.25	169%
12	Masonry Works	m3	153.94	373.00	0.00	373.00	242%
							81%
New	Excavation in boulder mix soil	m3		8920		8920	
New	Gabion Works	m3		150		150	
New	Block masonry work	m3	120	120	0.00	120	100%

Penstock alignment						
Ite m No.	Description	Unit	Revised BOQ(quantity)	Quantity up to date(civil)	Variation Quantity (%)	Remarks

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1.1	Site Clearance	m2	8352.00	16,377.94	96%	Exceeded BOQ
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	12,955.50	14,526.65	12%	Exceeded BOQ
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	1,439.50	2,822.29	96%	Exceeded BOQ
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	1,439.50	5,143.78	257%	Exceeded BOQ
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	68.90	-	-100%	
4.5	Gabion works	m3	62.64	421.00	572%	Exceeded BOQ
9.5	Providing and Laying and fixing of Geo-textile (Filter Fabrics), lead 30 m	m2	62.64	374.00	497%	Exceeded BOQ
NE W	Dry Stone Soling	m3		23.21		
NE W	Random Rubble Masonry in 1:6 Cement and sand mortar	m3		37.00		
NE W	Weep Hole (63 mm HDPE Pipe)	m		48.51		
NE W	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead.	m3		2.04		
NE W	Providing, fixing and removing formworks for Concreting Works.	m2		2.44		
NE W	Earthwork in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3		37.571		
NE W	Providing and Laying and fixing of Geo-textile (Filter Fabrics), lead 30m	m2		(748.000)		
NE W	315mm HDEP drain pipe laying	m		135.000		

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Penstock (Anchor Blocks)						
1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	323.51	3,754.454	1061%	Exceeded BOQ
1.4	Earthwork in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3	194.10	2,177.481	1022%	Exceeded BOQ
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	129.40	1,756.186	1257%	Exceeded BOQ
2.1	Dry Stone Soling	m3	92.61	106.207	15%	Exceeded BOQ
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	46.31	55.271	19%	Exceeded BOQ
3.6	Providing and Placing Plum M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	1,463.31	1,261.718	-14%	
3.8	Providing, fixing and removing formworks for concreting works	m2	1,631.35	2,380.949	46%	Exceeded BOQ
3.10	Reinforcement works for RCC Concrete	MT	73.17	44.014	-40%	
NE W	Providing and Laying Random Rubble Masonry in 1:4 Cement and Sand mortar, lead 30m marooned 0-5m	m3		124.062		new items
NE W	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3		521.024		new items
NE W	Providing and Placing M20/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3		419.944		new items

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NE W	Providing and Placing M25/20 Cement Concrete machine mixed for Superstructure, including upto 30m lead	m3		93.068		new items
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SADDLE SUPPORT

1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	203.00	0	-100%	
2.1	Dry Stone Soling	m3	34.20	32.333	-5%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	17.10	15.81	-8%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	60.00	55.976	-7%	
3.8	Providing, fixing and removing formworks for concreting works	m2	267.00	244.238	-9%	
3.1 0	Reinforcement works for RCC Concrete	MT	1.50	3.039	103%	Exceeded BOQ
4.3	Providing and Laying Random Rubble Masonry in 1:4 Cement and Sand mortar, lead 30m marooned 0-5m	m3	233.25	89.094	-62%	

SIMPLE SUPPORT

1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	25.65	-	-100%	
2.1	Dry Stone Soling	m3	12.87	15.046	17%	Exceeded BOQ
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	6.44	7.523	17%	Exceeded BOQ

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3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	10.13	16.350	61%	Exceeded BOQ
3.8	Providing, fixing and removing formworks for concreting works	m2	60.90	83.911	38%	Exceeded BOQ
3.1 0	Reinforcement works for RCC Concrete	MT	0.90	0.946	5%	Exceeded BOQ

Key works:

1. Penstock works has completed.



Fig: View of Penstock completed section from patikhola.

IX. POWERHOUSE

Powerhouse

Item No.	Description	Unit	Revised BOQ(quantity)	Quantity up to date(civil)	Variation Quantity(%)	Remarks
1.1	Site Clearance	m2	2,091.00	14275.6	583%	BOQ exceeded
1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	9,803.92	2949.641	-70%	
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	1,089.32	270.199	-75%	
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	1,089.32	127.995	-88%	
2.1	Dry Stone Soling	m3	85.87	268.147	212%	BOQ exceeded
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	47.62	134.213	182%	BOQ exceeded
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	100.72	28.132	-72%	
3.3	Providing and Placing M20/40 Cement Concrete machine mixed for the wall etc, including upto 30m lead	m3	313.67	125.908	-60%	

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3.4	Providing and Placing M20/20 Cement Concrete machine mixed for the wall, column, beam etc, including upto 30m lead	m3	154.17			-100%	
3.5	Providing and Placing M25/20 Cement Concrete machine mixed for the II Stage concrete etc, including upto 30m lead	m3	16.45	770.123		4582%	BOQ exceeded
3.7	25mm Cement Concrete Flooring in 1:1.5:3 Cement sand mortar with 20mm gauge stone	m2	173.28			-100%	
3.8	Providing, fixing and removing formworks for concreting works	m2	963.71	1159.894		20%	BOQ exceeded
3.9	Providing, fixing and removing formworks for Beam and Column	m2	782.98	1127.82		44%	BOQ exceeded
3.10	Reinforcement works for RCC Concrete	MT	56.86	86.587		52%	BOQ exceeded
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	153.94	1174.232		663%	BOQ exceeded
4.4	Random Rubble Masonry in 1:6 Cement and Sand mortar	m3	149.88				
4.6	Brick Masonry Work in 1:4 Cement and Sand mortar	m3	135.06				
5.1	12mm thick Cement Plaster in 1:4 Cement and Sand mortar	m2	877.47	303.727		-65%	
6.1	Wood works in Chaukhat of Door/Window	m3	3.32				
6.2	1.5" thick Saalwood Door Shutter	m2	6.72				

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6.3	Glass Shutter for Windows	m2	76.68			
6.4	False Ceiling with 3mm Plywood	m2	95.20			
7.1	Two Coat Water Proof Cement Painting on Plastered surface	m2	877.47	2869.633	227%	
7.2	One Coat Enamel Painting over One Coat Priming	m2	82.35			
8.1	CGI Sheet Roofing works with supply of materials complete	m2	436.02			
9.4	Barbed wire Fencing	m	300.00			
9.7	Flat Iron Grill in windows with red oxide paint	kg	1,720.44			
	Powerhouse Entrance Gate	L.S	1.00			
	Providing, fixing and removing Scaffolding	L.S	1.00			
	Sanitary, Plumbing and Electrical Works, 3% of Total	L.S	1.00			
NEW	Earth Work in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3		8919.855		new
NEW	Providing and laying and fixing of geotextile(filter fabrics), lead 30m	m2		159.065		new
NEW	Aero block masonry work	m3		143.633		new
NEW	Perforated HDEP drain pipe	m		123.04		new
NEW	River gravel packing	m3		25.841		new

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NEW	Heritage colour sheet roofing work	m2		439.102		new
NEW	Gabion Works	m3		150		new
NEW	Door	m2		36.611		new
NEW	Fixed window	m2		69		new
NEW	Sliding window	m2		51.84		new

TAILRACE AND RIVER PROTECTION

1.2	Excavation of Earth soil (Excluding Hard Rock) by equipment	m3	1,850.40	3034.117	64%	BOQ exceeded
1.5	Earthwork in excavation in hard rock without blasting including disposal upto 10m lead and 1.5m lift	m3	205.60			
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	205.60			
2.1	Dry Stone Soling	m3	88.64	70.33	-21%	
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	44.32	35.165	-21%	
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m3	356.23	63.703	-82%	
3.8	Providing, fixing and removing formworks for concreting works	m2	1,494.33	680.955	-54%	
3.10	Reinforcement works for RCC Concrete	MT	21.37	29.342	37%	BOQ exceeded

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4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m3	115.50	147.334	28%	BOQ exceeded
4.5	Gabion Works	m3	8.00			
9.1	300mm PVC Water Stopper	Rm	70.00	29.36	-58%	
9.2	25mm thick Expansion Joint Board (Saltax Board)	m2	21.00	23.03	10%	BOQ exceeded
9.3	Joint Sealant	m	21.00			
9.5	Providing and Laying and Fixing of Geo-textile (Filter Fabrics), lead 30m	m2	75.00			
NEW	Earth Work in excavation in boulder mix soil including disposal upto 10m lead and 1.5m lift	m3		4241.61		
NEW	Providing and Placing M25/20 Cement Concrete machine mixed for the II Stage concrete etc, including upto 30m lead	m3		161.503		

SWITCHYARD AND INTERCONNECTION

1.3	Earthwork Excavation in Common Material including disposal upto 10m lead and 1.5m lift	m3	273.65			
1.8	E/W in backfilling by ordinary Soil in 15cm thick layer and compaction with sprinkling of water, haulage distance 10m	m3	27.36			
2.1	Dry Stone Soling	m3	30.09	68.947	129%	BOQ exceeded

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2.2	Laying 15cm thick Stone Aggregates inclusive haulage upto 10m and lift upto 1.5m	m ²	554.76			
3.1	Providing and Placing M10/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m ³	15.05	34.473	129%	BOQ exceeded
3.2	Providing and Placing M15/40 Cement Concrete machine mixed for the foundation, footing etc, including upto 30m lead	m ³	64.27	92.985	45%	BOQ exceeded
3.8	Providing, fixing and removing formworks for concreting works	m ²	24.30	464.208	1810%	BOQ exceeded
3.10	Reinforcement works for RCC Concrete	MT	18.20	5.764	-68%	
4.3	Providing and laying Random Rubble Masonry in 1:4 Cement and Sand Mortar, lead 30m marooned 0-5m	m ³	74.32	220.23	196%	BOQ exceeded
	50*50 10 SWG Chainlink Fencing on 65*65*6 mm angle posts located 3m apart, 2m height above ground, 0.5m foundation depth, 3 layers of barbed wire at top	m		75.1		
	Civil Cost Sharing with Bijaypur I SHP		1.00			

TABLE 12 POWERHOUSE PROGRESS

Key works:

1. All civil works has completed.



Fig15: Completed view of Rudi A Powerhouse.

5. HYDRO MECHANICAL PROGRESS DETAILS

Table 19 Hydro mechanical progress

S.N.	HM Work	Total Quantity	Work done upto last month	Work done up to date	Total Progress	Remarks
1	Fabrication (m.)	6500	6500	6500	100%	
2	Erection (m.)	6500	6500	6500	100%	
3	Painting (m.)	6500	6500	6500	100%	
4	Bends(No.)	99	99	99	100%	
5	Gate & Stop Log(No.)	18	18	18	100%	
a.	Fabrication	18	18	18	100%	
b.	Erection	18	18	18	100%	
6	Expansion Joint(No.)	26	26	26	100%	
a.	Fabrication (No.)	26	26	26	100%	
b.	Erection (No.)	26	26	26	100%	
7	Anchor Ring (MT)				100%	
8	Y- & branch pipe (No.)	1 set	1 set	1 set	100%	
a.	Fabricaton	1	1	1	100%	
b.	Erection (branch pipes) (m)	1	1	1	100%	
9	Flushing Bend with Pipe(No.)	4	4	4	100%	
10	Erection of Truss of power house	1	1	1	100%	
		100 %				

Key works:

1. All HM works has completed.

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Electromechanical Work Progress in detail				
Date: January 15, 2019				
S.N.	Sequence of Work	Status	Progress in %	Remarks
A	Installation of EOT Crane & Testing/Commissioning	Completed	100%	
B1	Unit-1 Turbine & Generator Assembly	Completed	100%	
B2	Unit-2 Turbine & Generator Assembly	Completed	100%	
C	Mechanical BOP		100%	
1	Drainage & De Watering System	Completed	100%	
2	Assembly of Pressure Oil System& Piping Unit-1&2	Completed	100%	
3	Other Piping	Completed	100%	
4	Air Conditioning & Ventilation System	Completed	100%	
5	Firefighting system	Completed	100%	
D	Electrical BOP		100%	
1	33KV Outdoor Switchyard equipment and Remote Substation	Completed	100%	
a	Switchyard at Powerhouse	Completed	100%	
b	Remote Substation	Completed	100%	
2	Main Transformer Installation	Completed	100%	
3	Testing of Main Transformer	Completed	100%	
4	Grid Ready and Back Charge of Main Transformer	Completed	100%	
5	Station Auxiliary Transformer	Completed	100%	
6	DC Battery Bank and DC System	Completed	100%	
7	DG System	Completed	100%	
8	Installation of Control Room Panel	Completed	100%	
9	Installation of MV Switch Gear Panel	Completed	100%	
10	Cable & Cable Tray & Termination	Completed	100%	
11	Protection & PLC Panels	Completed	100%	
12	Testing of Common System	Completed	100%	
E	Pre Commissioning& Commissioning		93%	
1	Pre commissioning of Unit-1	Completed	100%	
2	Commissioning of Unit-1	On Going	85%	
3	Pre commissioning Check of Unit-2	Completed	100%	
4	Commissioning of Unit-2	On Going	85%	

Gallery:



FIGURE 1 UNIT 2 AFTER COMPLETE ERECTION



FIGURE 2 SCADA SETUP AND GENERATOR PROTECTION TEST INSIDE CONTROL ROOM



FIGURE 3 LTAC PANEL



FIGURE 4 MV SWITCH GEAR PANEL



FIGURE 5 UNIT 2 AFTER COMPLETE ERECTION AND TESTING



FIGURE 6 BATTERY SYSTEM

Galleries:



Fig: Headworks area of Rudi A and Rudi B powerhouse.



Fig:- Rudi A powerhouse area

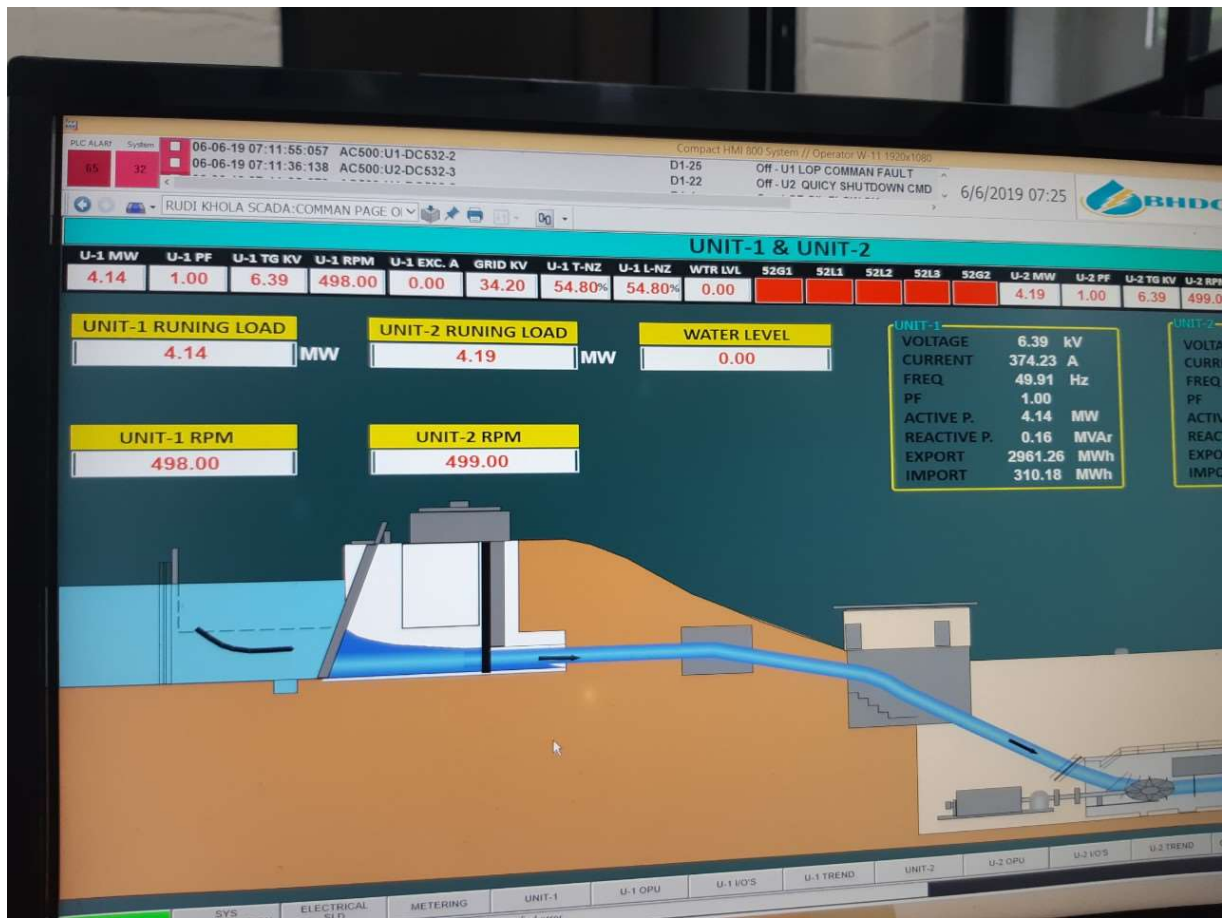


Figure: Rudi A power plant running nearly at full capacity (8400KW)

THANK YOU