

Salient Features of Super Ankhu Khola Hydropower Project 25.4 M.W

S. N.	Description	:	As per Feasibility Study Report	
1.	Project Name	:	Super Ankhu Khola Hydropower Project (SAKHP)	
2.	Location of the Project			
	Administrative location	:	Lapa and Sertung VDCs (Dhading District)	
	Geographical co-ordinates	:	85°02'56"E to 85°04'45"E longitudes and 28°10'00"N to 28°11'44"N latitudes	
3.	Type of project	:	Run-of-the-river (RoR)	
4.	Hydrology			
	Source river(s)	:	Tatopani (Ilep) Khola and Menchet (Bhabil) Khola (named as Ankhu Khola after their confluence)	
	Catchment area at intake	:	274.4 km ²	
	Catchment area at tailrace	:	288.0 km ²	
	Mean annual flow	:	22.71 m ³ /s	
5.	Headworks			
	1. Tatopani (Permanent Type)			
	Type of weir	:	Conventional core wall ,boulder filled (gravity type)	
	Length of weir	:	16.0 m	
	Weir crest elevation	:	1'388.10 masl	
	Weir foundation level	:	1'382.25 masl	
	2. Menchet Diversion (Temporary Type-for dry season only)	:	Temporary diversion with permanent intake and diversion canal to Tatopani Khola	
	Intake type	:	Side intake, orifice type	
	Intake opening	:	3 Nos. x 4.2 m	
	Intake gate opening size	:	4.2 m x 1.5 m (B x H)	
	Intake invert level	:	1'286.40 masl	
6.	Desilting basin			
	Type	:	Dufour, continuous flushing	
	Number of chambers	:	2	

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	Particle size to be removed	:	≥ 0.2 mm	
	Basin size	:	98 m x 10.3 m x 6.9 m (L x B x H)	
	Flushing channel size	:	0.6 m x 0.6 m (L x B)	
	U/S transition	:	7.5 m	
	D/S transition	:	16.5 m	
7.	Headpond			
	Section	:	oval	
	Size	:	21 m x 15 m x 9 m (L x B x H)	
	Tunnel inlet invert level	:	1'378.68 masl	
	Operating water level	:	1'387.58 masl	
	Size	:	15 m x 9 m (B x H)	
8.	Headrace tunnel			
	Type	:	Inverted D-shaped, pressure flow	
	Size	:	3.6 m x 3.9 m (B x H)	
	Length	:	3'455 m	
	Slope	:	1 in 600	
	Lining	:	Fibre shotcrete and steel rib	
	Number of adits	:	1 Nos.	
9.	Penstock pipe			
	Material	:	steel,E490(Fe350)	
	<i>Before bifurcation</i>			
	Diameter	:	2.6 m	
	Length	:	237 m x 1 Nos.	
	<i>After bifurcation</i>			
	Diameter	:	1.85 m	
	Length	:	22m x 2 Nos.	
10.	Surge shaft			
	Section	:	Circular	
	Diameter	:	8 m	

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11.	Powerhouse and turbines			
	Type	:	Surface	
	Size	:	34.5 m x 15.0 m x 27.5 m (L x B x H)	
	Type of turbine	:	Vertical francis	
	Installed capacity	:	12,700 KW x 2 Nos.	
	Turbine axis elevation	:	1'187.25 masl	
	Tailrace Canal	:	58 m	
12.	Turbine			
	Type	:	Pelton	
	Rated capacity	:	2 x 12'500 kW	
	Design discharge	:	7.40 m ³ /s (each unit)	
13.	Power and energy			
	Gross head	:	202.86 m	
	Net head at full flow	:	197.75 m	
	Installed capacity	:	25.4 MW	
	Efficiency	:	92%, 97% and 99% (turbine, generator and transformer)	
	Minimum power output	:	6700 kW (in March)	
	Net dry season energy	:	21.56 GWh/ yr	
	Net wet season energy	:	124.31 GWh/ yr	
	Net marketable energy	:	145.88 GWh/ yr	
	Type of Generator	:	Synchronous 3 Phase	
	Capacity of Generator	:	14.7 MVA, 11KV, 0.85 pf, 50 Hz	
14.	Transmission line			
	Connection (length)	:	Powerhouse to Trishuli 3B sub-station (28 km)	
	Voltage	:	132 kV, single circuit	
15.	Access road			
	Existing	:	Earthen, fair-weather road from Dhaging Besi to Singang (40 km)	
	Proposed	:	From Singang to headworks (15 km)	

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16.	Financial indicators			
	Reference year (exchange rate)	:	June 2015 (1 US\$ ≈ NRs. 100)	
	Total cost (excluding IDC)	:	NRs. 3'531.51 million (approx.)	
	Specific cost	:	1'413 US\$ per kW	
	Total financial cost (including IDC)	:	NRs. 3'968.95 million (approx.)	
	Specific cost (financial)	:	1'588 US\$ per kW	
	Interest rate	:	11%	
	FIRR	:	16.62%	
	B/C ratio	:	1.57	
	NPV	:	NRs. 1'510.38 million	
	Payback period	:	5.79 years	
17.	Construction period	:	3 years	