Salient Features

The principle features of the Ankhu Khola Hydropower Project (AKHPP) are summarized below.

Name of the project	:	Ankhu Khola Hydropower Project
Type	:	Run-of-River
Location	:	Ri VDC of Dhading District
Longitude	:	28°04'00''N and 28°07'00''N
Latitude	:	84°58'35''E and 85°01'04''E
Hydrology		
Catchment area at headwork site	:	427.55 km^2
Mean Annual Precipitation	:	1847.76 mm
Mean Annual Flow	:	23.65 m^3/s
Design Flood (1 in 100 years)	:	666.44 m^3/s
Power Development		
Type of Power Generation	:	Run-of-river
Design Discharge (Q37%)	:	23.65 m^3/s
Minimum Flow	:	5.04 m^3/s
Full Supply Level	:	EL 894.16 m
Tail Water Level	:	EL 677.77 m
Gross Turbine Head	:	216.40m
Net Turbine Head	:	209.27 m
Installed Capacity	:	42.9 MW
Average Annual Energy	:	230.91 GWh
Annual Wet Energy	:	200.13GWh
Annual Dry Energy	:	30.77 GWh
Weir		
Type	:	Ogee Shaped, Overflow Type
Length	:	35 m
Height	:	4.75 m
Crest Level of Weir	:	EL 894.41m
Under Sluice		
Design Discharge	:	133.29 m^3/s
Invert level near gate	:	889.65 masl
No.	:	2 Nos.
Width	:	2.5 m
Height	:	5 m
Intake		
Intake Type	:	Side Intake
No.	:	4 Nos.
Size (W×D)	:	(3.4 × 2.3) m
Gravel Trap		
Type	:	Surface/Hopper Shaped
Settling Criteria	:	90% of ≥ 2mm
No. of Basin	:	2 Nos.
Size of each Gravel Trap (L × B × D)	:	(17.5 × 7.8 × 4.0) m

Length of Spillway	:	16.95 m
Length of Flushing Canal	:	92.53 m
Flushing opening size (W×D)	:	(0.8 × 0.9) m
Flushing canal (W×D)	:	Surface/Rectangular
Approach Tunnel		
Type	:	Underground/ Inverted D Shaped
No.	:	2 Nos.
Size (W×D)	:	(4.0 × 4.0) m
Length	:	57.50 m
Settling Basin		
Type	:	Underground/Hopper
Settling Criteria	:	90% of ≥ 0.2 mm
No. of Chamber	:	2 Nos.
Size (L × W)	:	(116.7 × 14) m
Total Depth	:	7.74 m
Inlet Transition Length	:	27.75 m
Forebay Size (L×B × H)	:	(16.36 m x 10. M × 10.9 m)
Normal Water Level at Forebay	:	893.87 masl
Spillway Length	:	16.46 m
Flushing Canal after Flushing opening (W × D)	:	(0.9 × 1.0) m
Flushing Canal after conv. (under pressure) (W × D)	:	(1.75 × 1.0) m
Flushing Canal before conv. (under gravity) (W × D)	:	(3.5 × 1.4) m
Accelerating Tunnel		
Shape	:	Inverted D-Shaped
Tunnel Size (W×D)	:	4.0 m × 4.0 m
Length	:	44 m
Type of Lining	:	Shotcrete, Concrete
Headrace Tunnel		
Tunnel Type	:	Inverted D-Shaped
Tunnel Length	:	5262 m
Tunnel Size (W×D)	:	4.0 m × (2.0+2.0) m
Type of Lining	:	Shotcrete, Concrete
Surge Tank		
Type	:	Non Spilling Type
Shape	:	Circular
Diameter	:	10.30 m
Height	:	39 m
Upsurge Elevation	:	908.32 m
Down Surge Elevation	:	878.56 m
Normal Water Level in Surge Tank	:	890.67 m
Static Water Level in Surge Tank	:	893.94 m
Penstock		
Penstock Type	:	Surface and Underground (Steel Penstock)
Length	:	420 m
Inner diameter	:	3.2 m
No. of Branches	:	3 Nos

Thickness	:	12-32 mm
Power House		
Type of Powerhouse	:	Semi Surface
Size (L x B x H)	:	63.0 m × 20.6 m × 13.5 m
Tail Water Level	:	EL 677.77 m
Turbine		
Turbine Type	:	Francis
Rated Discharge	:	7.88 m^3/s
Number of Turbine	:	3 Nos.
Rated Output	:	3 x 14.30 MW
Rated Net Head	:	209.27 m
Efficiency of turbine	:	92%
Generator		
Number of units	:	3 Nos.
Rated output	:	3 × 17.87 MVA
Rated speed	:	750 rpm
Rated frequency	:	50 Hz
Type	:	Synchronous with brushless excitation system, water cooled
Efficiency	:	97 %
Transformer		
Rating	:	3 × 17.87 MVA
Primary Voltage	:	11 kV
Secondary Voltage	:	132 kV
Frequency	:	50 Hz
Efficiency of transformer	:	99 %
Efficiency		
Overall Efficiency Adopted	:	88.3 %
Tailrace Canal		
Size (B x H)	:	3.8 m × 6.15/2.85 m
Length	:	103.78 m
Longitudinal Slope	:	1 in 1000
Tail Water Level	:	677.77 masl
Transmission Line		
Transmission Line	:	About 30 km, 132 kV single circuit to Proposed Trishuli "3B" substation
Construction Period	:	4 Years