

SALIENT FEATURES

1. General		
Project Name	:	Likhu Khola Hydroelectric Project (LKHEP)
Name of River	:	Likhu River
Type of Scheme	:	Peaking Run of River (PROR)
Daily Peaking Hours	:	3.0 Hours
Design Discharge (at $Q_{43.3}$)	:	36.0 m ³ /s
Gross Head	:	123.03 m
Net rated Head	:	115.29 m
Installed Capacity	:	36.0 MW
2. Project Location		
Province	:	Koshi and Bagmati Province
District	:	Okhaldhunga and Ramechhap
Location		Likhu Rural Municipality Ward No.2, Ramechhap Municipality Ward No. 3, 4 & 5
Intake Site	:	Ghirling, Likhu Rural Municipality Ward No.2, Ramechhap Municipality Ward No. 3
Powerhouse Site	:	Near Phundri Dovan, Ramechhap Municipality, Ward no. 5
Nearest Town	:	Manthali
Geographical Co-ordinates		
Latitude	:	27° 15' 34" N to 27° 20' 57" N
Longitude	:	86° 12' 14" E to 86° 15' 50" E
Conservation Area (if applicable)		NA
3. Hydrology		
Catchment Area at intake	:	850.68 km ²
Mean Annual Discharge	:	57.42 m ³ /s
Design Discharge (at $Q_{43.3\%}$)	:	36 m ³ /s
Riparian Release	:	1.23 m ³ /s
Average Annual Precipitation	:	1620.0 mm
4. Diversion Structure		

Type	:	Gated Dam
Length	:	40.0 m
Crest Elevation	:	546.51 masl
Spillway type	:	Free flow, Ogee shaped
Undersluice Opening (W X H)	:	3.0 m x 5.0 m
Nos of Undersluices	:	2
Undersluice Level	:	542.0 masl
5. Peaking Reservoir		
Type	:	On river, upstream of gated dam
Total Storage Volume	:	310,096.22 m ³
Live Storage Volume	:	269,051.90 m ³
Full Reservoir Level	:	552.52 m
6. Intake Structure		
Type of Intake	:	Orifice type side intake
Nos of Opening	:	4 nos
Size of Intake (W x H)	:	4.0 m x 2.25 m
Intake Sill Level	:	544.0 masl
NWL inside intake	:	552.36 m
7. Approach Tunnel		
Type	:	Inverted D-shaped
No. of Tunnel	:	1
Length	:	445m
Size (Diameter)	:	4.8*x 4.8m
8. Approach Culvert		
Type	:	Square Shaped
No. of Culvert	:	1 no
Length	:	287.52 m
Size (W x B)	:	4.8 m x 4.8 m
9. Settling Basin		

Type	:	Surface/ Dufour Type
Dimension (L x B x H)	:	2 nos, 120 m x 16 m x 13.9 m
Min particle Size to be settled	:	0.2 mm
Trapping Efficiency	:	90% for 0.2 mm
10. Head Pond		
Type	:	Surface/ Rectangular
Size	:	32.4 m x 15.5 m x 13.8 m (avg)
11. Headrace Tunnel		
Type	:	Pressure Tunnel, Inverted D-shaped
Size (Diameter)	:	4.8m x 4.8 m
Length	:	6860 m or 8250 m
Type of Lining	:	Shotcrete/ Concrete
12. Adit (Optional)		
Type	:	Inverted D-shaped
Size (Diameter)	:	4.80 m x 4.80 m
Length	:	135.0 m
Type of Lining	:	Shotcrete
13. Surge Tank		
Type	:	Simple cylindrical
Total Height up to Crown	:	31.3 m
Diameter	:	16.0 m
Upsurge Level	:	564.06 masl
Down Surge Level	:	542.78 masl
Normal Operation Level	:	547.17 masl
14. Steel Penstock Pipe		
Type	:	Circular
Internal Diameter	:	4.0 m
Length	:	1,183.12 m
Steel Thickness	:	12 mm - 26 mm
15. Powerhouse		

Type	:	Surface
Size (L x W)	:	50 m x 20 m
Height	:	21 m
16. Tailrace		
Type	:	Box culvert
Size (W x H)	:	5.0 m x 2.4 m
Tailrace Length	:	57.9 m
Tailrace Water Level at draft tube	:	429.49 masl
17. Turbine		
Type	:	Francis
Number	:	2 nos
Rated Output Capacity per unit	:	18.73 MW
Net Head	:	115.29 m
Discharge per Unit	:	18.0 m ³ /s
Efficiency	:	92 %
18. Generator		
Type	:	Synchronous, 3 Phase
Rated Output Capacity per Unit	:	21.4 MVA
Power Factor	:	0.85
Generation Voltage	:	11 kV
Frequency	:	50 Hz
No of Units	:	2 nos
Excitation System	:	Brushless Type
Efficiency	:	97.0%
19. Transformer		
Type	:	Three phase, Oil Immersed
Power Factor	:	0.85
Rated Capacity	:	22 MVA

Voltage Ratio	:	11/132 kV
No of Units	:	2 nos
Frequency	:	50 Hz
Efficiency	:	99.0%
20. Switchyard and Transmission Line		
Switchyard type	:	Outdoor, Conventional
Transmission line length	:	Approx. 30 km
From	:	Switchyard of Likhu Khola Hydroelectric Project
To	:	132 kV, New Khimti Substation
21. Power and Energy		
Installed Capacity	:	36.0 MW
Dry Season Peak-Energy	:	18.32 GWh
Dry Season off-peak Energy	:	49.06 GWh
Wet Season Energy	:	151.72 GWh
Total Annual Energy	:	219.10 GWh
22. Project Cost	:	NRs 7,703.05 Million
23. Financial Parameters		
B/C Ratio	:	1.24
Internal Rate of Return	:	12.51%
Return on Equity	:	20.25 %
Net Present Value	:	NRs. 1,692.34 Million
24. Construction Period	:	4 years