

Brief Description of Budhi Gandaki Hydropower Project

Introduction:

Budhi Gandaki Hydropower Project is a storage type project located in Central/ Western Development region on the Budhi Gandaki River of Nepal. This project was identified during the Gandaki Basin Study in late 70's. In 1984, a prefeasibility study of the project was prepared. The prefeasibility study of the Project has recommended 600 MW capacity plant with FSL 520 masl.

Location and Access:

The project lies in Gorkha and Dhading districts in Western/ Central Development region of Nepal. The project site is accessible through Benighat (At about a distance of 85 km from Kathmandu) on Prithvi Highway (Kathmandu - Pokhara). From Benighat, a pedestrian suspension bridge (Motorable Bridge is under construction) can be used to cross the Trishuli River and access the Dam and Powerhouse site both of which are at a distance of about 2 km from the road head.

Salient Features:

The salient features of the project based on the prefeasibility study of 1984 are as follows:

Installed Capacity: 600 MW

Average Annual Energy: 2495 GWh

1. Reservoir

| | |
|-------------------------------|------------------------------|
| Full Supply Level | El.520 m |
| Minimum Operating Water Level | El. 445 m |
| Gross Capacity (at FSL) | 3 320 Million m ³ |
| Effective Storage Capacity | 2 755 Million m ³ |
| Surface Area | 50 km ² |

2. Hydrology

| | |
|------------------------|--------------------------|
| Catchment Area | 5 370 km ² |
| Long Term Average Flow | 195 m ³ /s |
| Construction Flood | 3 176 m ³ /s |
| Design Flood Discharge | 12 827 m ³ /s |
| Probable Maximum Flood | 15 126 m ³ /s |

3. Diversion System

| | |
|----------------------------------|-------------------------|
| Design Flood (Routed) | 1 170 m ³ /s |
| Type | Circular |
| Diameter | 10 m |
| Crest Elevation of U/S Cofferdam | El.365 m |
| Crest Elevation of D/S Cofferdam | El.320 m |

4. Dam

| | |
|--------------------------------|------------------------------------|
| Type | Zoned rockfill with inclined core. |
| Crest Level | El.525 m |
| Maximum Height | 225 m |
| Crest Length | 510 m |
| Upstream and Downstream Slopes | 1:2.3; 1:1.8 |

5. Spillway

| | |
|-----------------------|------------------------------|
| Type | Ogee type with open chuteway |
| Channel width | 50 m |
| Crest Level | El. 502 m |
| Design Flood (Routed) | 10 053 m ³ /s |
| Gate Type | Radial |
| Gate size | 18m x 12.5 m, Four gates |

6. Waterway and Powerhouse

| | |
|------------------------|---------------------------|
| Intake | Shaft Type |
| Invert Level of Intake | El. 428 m |
| Gate Size | 4.25 m x 10m, Three gates |
| Headrace Tunnel | Circular lined |
| Diameter | 12.0 m |
| Length | 276 m |
| Penstock | |

| | |
|--------------------------------|------------------------------|
| Length | 240 m |
| Diameter | 4.0 m |
| Powerhouse | |
| Type | Underground |
| Width, Length and Height | 24 m x 120m x 43.5 m |
| 7. Generating Equipment | |
| Turbine | |
| Type | Francis Type, vertical axis, |
| Net Head at Rated Water Level | 185 m |
| Rated Discharge | 430 m ³ /s |
| Installed Capacity | 4 x 150 MW |
| Turbine Rated Speed | 214.3 rpm |
| Normal Taiwater level | 312.0 m |
| Generator | |
| Type | Vertical shaft revolving |
| Capacity | 4 x 166 MVA |
| 8. Surge Tank | |
| Location | Tailrace tunnel |
| Type | Simple |
| Dimension | 13mx80mx34.5m |
| 9. Tailrace Tunnel | |
| Shape | D Shape |
| Dimension | 13m x 13m |
| Length | 1.1 km |
| 10. Access Tunnel | |
| Shape | D Shape |
| Dimension | 8m x 10m |
| Length | 976.0 m |