

CHAPTER – 2

SALIENT FEATURES

2.1 LOCATION

STATE	: UTTARANCHAL
District	: Pauri and Tehri Garhwal
River	: Alaknanda
Location of Dam & Power House	: Near Pali village
Nearest Rail head	: Rishikesh
Nearest Airport	: Jolly Grant (Near Dehradun)

2.2 HYDROLOGY

ALAKNANDA RIVER

Catchment area at diversion site	: 11453 sq. km.
Snow catchment	: 2041 sq. km.

2.3 DIVERSION CUM SPILLWAY TUNNEL

Location of Diversion Tunnel	: Right Bank
Invert EL of DT at Inlet	: EL 463.0 m
Invert EL of DT at Outlet	: EL 462.0 m
Diversion Discharge	: 997 cumec
Diameter of Diversion Tunnel	: 9.25 m
Shape of Diversion Tunnel	: Horse Shoe Shaped
Length of Diversion Cum Spillway Tunnel	: 445 m

2.4 DIVERSION CUM SPILLWAY TUNNEL GATES

AT INLET

Nos. (2 nos. Emergency & 2 nos. Service gates)	: 4
Size	: 3.85 m x 9.25 m
Sill elevation	: EL 463.0 m

AT OUTLET

No.	: 1
Size	: 7.70 m x 9.25 m gate
Sill elevation	: EL 462.0 m

2.5 COFFER DAMS

Location of u/s coffer dam	: 135 m u/s of dam axis
Location of d/s coffer dam	: 170 m d/s of dam axis
Top of u/s coffer dam	: EL 490.00 m
Top of d/s coffer dam	: EL 475.00 m

2.6 DAM

Type	: Concrete Gravity
Dam Top	: EL 528.00 m
Minimum river bed level at dam site	: EL 461.20 m
Dam Height above minimum River Bed	: 66.8m
Deepest Foundation Level	: EL 445.00 m
Dam Height above Deepest Foundation Level	: 83 m
Length of Dam at Top	: 186 m

2.7 SPILLWAY

Type	: Orifice type
Design Flood	: 24300 cumec
Width of spillway	: 144 m
Nos. of Bays	: 6 (including one standby)
Crest of Spillway	: EL 501.00 m
Width of each bay	: 16.0 m
Regulation gates	: Hydraulically operated radial gates of size 16 m x 23 m

2.8 UNDER SLUICE

Nos. of Openings	: 6
Size of Openings	: 3.5 m (Width) x 3.7 m (Height)
Type of Gate	: Hydraulically operated vertical lift gates
Crest of Under Sluice	: EL 470.00 m

2.9 RESERVOIR

MWL	: EL 528.00 m
FRL	: EL 526.00 m
MDDL	: EL 521.00 m
River Bed Slope	: 1: 350
Gross storage at FRL	: 90.16 Mm ³
Gross storage at MDDL	: 69.02 Mm ³
Live storage	: 21.14 Mm ³
Reservoir area at FRL	: 4.80 km ²
Length of reservoir	: 25.5 km

2.10 INTAKE

No.	: 2
Invert Level at Inlet	: EL 503.00 m
Size of opening	: 7.75 m x 9.35 m
Trash Rack	: Inclined

2.11 HEADRACE TUNNEL

No. & Size	: 2 Nos., 9.35 m ϕ , Horse-shoe shaped
Design Discharge	: 307.08 cumec through each tunnel
Length	
HRT 1	: 155 m
HRT 2	: 125 m

2.12 PRESSURE SHAFT

BEFORE BIFURCATION

No. & Size	: 2 Nos., 7.75 m ϕ , Circular
Design Discharge	: 307.08 cumec each
Total Length of Pressure Shaft (2 Nos.)	: 15 m each

AFTER BIFURCATION

No. & Size	: 4 Nos., 5.5 m ϕ , Circular
Design Discharge	: 153.54 cumec through each pressure shaft
Total Length of Pressure Shaft / Penstock after Bifurcation (4 Nos.)	: 40 m, 55 m, 40 m, 55 m each

2.13 POWER HOUSE COMPLEX

Location	: Left Bank
Type	: Underground
Installed Capacity	: 280 MW
Size of Power House Cavern	: 165 m x 24.3 m x 43.5 m
Size of Transformer Cavern	: 110 m x 14.5 m x 10.5 m
Nos. and size of draft tube gates	: 4 nos., 5.75 m x 6.60 m
Type of Turbine	: Francis
Generating units	: 4 nos. of 70 MW each
Net Head	: 51.53 m
Type of switchgear	: GIS (Outdoor)
Size of pothead yard	: 125 m x 65 m

MAIN ACCESS TUNNEL

Length : 480 m

CABLE CUM VENTILATION TUNNEL

Size of Tunnel : 6 m diameter, D-shaped
 No. : 1
 Length : 540 m (340 m horizontal + 200 m vertical)

2.14 DOWNSTREAM SURGE SHAFT

No., type & size : 2 Nos., Restricted Orifice Type, Circular 30 m ϕ

2.15 TAIL RACE TUNNEL

BRANCH TUNNELS

No. & Size : 4 Nos., 6.6 m diameter, Horse-shoe shaped
 Length : 190 m, 185 m, 115 m, 110 m each

MAIN TUNNELS

No. & Size : 2 Nos., 9.35 m diameter, Horse-shoe Shaped
 Sill level at Outlet : EL 462.00 m
 Minimum tail water level : EL 462.50 m
 Length
 TRT 1 : 485 m
 TRT 2 : 435 m

2.16 POWER GENERATION

Installed capacity : 280 MW
 Annual energy generation in 90% dependable year at 95% machine availability : 1102.87 MU