THANA PLAUN H.E. PROJECT (191 MW)
DISTRICT MANDI, HIMACHAL PRADESH
SALIENT FEATURES

LOCATION	
State	Himachal Pradesh
District	Mandi
River	Beas River
Location of Dam	Latitude: 31º49'28.22" (N)
	Longitude: 76º50'20.53" (E)
Nearest Rail head	Narrow Gauge Rail Link at Jogindernagar and Broad Gauge Rail Link is at Pathankot
Nearest Airport	Gaggal in district Kangra
HYDROLOGY	
River Basin	Beas
Catchment area at Dam Site	7378 sq.km
Average Discharge at dam site	107.60 cumec
Annual Runoff	5416 MCM
Standard Project Flood	10,530 cumecs
Probable Maximum Flood	16,150 cumecs
Average Annual Rainfall	1642 mm
RESERVOIR	
Maximum water level (MWL)	718.75 m
Full reservoir level (FRL)	716.00 m
Minimum draw down level (MDDL)	697.00 m
Gross storage at FRL	78.56 MCM
Live storage	44.93 MCM
Dead Storage + Sediment Storage + Inactive Storage	33.63 MCM

Area under Submergence at FRL	316.77 Ha.
DIVERSION TUNNEL	
Shape	1 No. D-shape on Left Bank
Diameter	11.0 m
Length	453.503 m
Lining Thickness	300mm (upto Springing Level)
Invert Elevation	635.50m **Inlet**, 631.0m **Outlet**
Diversion discharge (1 in 25 Years)	951 cumecs
COFFER DAM	
Type	Colcrete (U/S) Rockfill (D/S)
Max. Height (Upstream)	16.00 m high
Crest Elevation (Upstream)	651.00 m
Length (Upstream)	65 m
Max. Height (Downstream)	8.0m high
Crest Elevation (Downstream)	639.00 m
Length (Downstream)	42 m
DIVERSION DAM	
Type	Roller Compacted Concrete Dam (RCC)
Dam Top	719.00 m
Max. Height of dam above Foundation Level	106.70 m
River Bed Level	634.00 m
Deepest Foundation Level	612.23 m
Total length of dam at top	225.93 m
MAIN SPILLWAY (SLUICES)	
Design flood	15,640 cumecs (Routed Flood)

Type	Breast Wall Sluice Spillway
Length of spillway	85.00 m
Number of bays	5 Nos. Undersluices
Crest level of spillway	670.0 m
Spillway gates	11 m (W) x 15.2 m (H)
Bucket Invert Level and Radius	650.0 m with 35 m Radius
Energy dissipation type	Ski Jump Bucket
AUXILLIARY SPILLWAY	
No. of bays	1
Width of bay	4 m
Size of gate	4.00m (W) x 4.70m (H)
Design flood	37.20 cumecs
Crest level of spillway	713.00 m
Energy dissipation type	Stilling Basin
Features	Cistern Level 653.50m and 44m Length
INTAKE	
Type	Reservoir Intake
Shape	Bell mouth
Maximum Design Discharge	**Intake-1** – 143.78cumec **Intake-2** - 160.503 cumec (Each considering 5% overload discharge)
Invert level	684.00 m
Number of Reservoir Intakes	2
Intake gate size	**Intake 1**- 6.30 m(W) x 6.30 m (H) **Intake 2** - 7.30 m(W) x 7.30 m (H)
Trash rack in each intake	**Intake -1** - 5.0m (W) x 11.52m (H); 3 openings **Intake -2** - 5.0m (W) x 13.17m (H); 3 openings.
Intake Structure Height	35.0 m

HEAD RACE TUNNEL	
Shape	Horse Shoe
Diameter	**HRT-1** - 6.30 m **HRT-2** - 7.30 m
Length	**HRT-1** - 108.17 m **HRT-2** - 146.89 m
Design discharge	**HRT-1** - 136.93 cumecs **HRT-2** - 152.86 cumecs
PENSTOCK/PRESSURE SHAFT	
Type	Underground
Number	**Pressure Shaft-1:** 5.7 m dia. bifurcating into 2.65 m and 5.00 m dia. which further bifurcates into two branch penstocks of 4.25 m and 2.65 m Dia. **Pressure Shaft-2:** 6.0 m dia. bifurcating into two branch penstocks of 4.25 m Dia. each
Diameter	**Pressure Shaft-1:** 5.7m, 4.25 m and 5.00m and 2.65m **Pressure Shaft-2:** 6.0 m and 4.25 m
Length upto Bifurcation of main pressure shafts	**Pressure Shaft-1 :**92m **Pressure Shaft-2:** 127 m
Grade of Steel	ASTM-537 Class II
Liner Thickness	**Pressure Shaft-1:** Varies from 16mm to 32 mm **Pressure Shaft-2:** Varies from 26mm to 34 mm
POWER HOUSE	
Type	Underground with Drainage Galleries
Installed Capacity	191 MW
Units	5 (3 x 50.33+2 x20.00)
Power house cavern size	145.0m (L) x 21.0 m (W) x 41.50 m (H)
Transformer Hall cavern size	127.0m (L) x 19.0 m (W) x 28.0 m (H)
C.L. of turbine	629.50 m

Type of Turbine	Vertical Francis
Design Discharge a) Main units b) Environmental Units	 229.29 cumecs 60.50 cumecs
Rated Head a) Main units b) Environmental Units	 72.97 m 73.17 m
Normal TWL a) Monsoon b) Lean c) Non-Monsoon i. During Peaking hours ii. During Non-Peaking hours	 634.00 m 632.70 m 633.30 m 631.70 m
Minimum TWL	631.50 m
Annual Design Energy (50% dependable year) a) Main units b) Environmental Units	 547.58 GWh 151.51 GWh
Annual Energy in 50% dependable year on 95% machine availability a) Main units b) Environmental Units	 534.53 GWh 146.35 GWh
Annual Design Energy (90% dependable year) a) Main units b) Environmental Units	 544.07 GWh 148.54 GWh
Annual energy in 90% dependable year on 95% machine availability a) Main units b) Environmental Units	 524.91 GWh 143.16 GWh

Annual Plant Load Factor in 90% Dependable year a) Main Units b) Environmental Units	 41.13% 42.39%
Annual Plant Load Factor in 50% Dependable year a) Main Units b) Environmental Units	 41.40% 43.24%
TAIL RACE ARRANGEMENT	
Type	Pressure Flow Tunnels
Size & Shape	**TRT-7** - 7.80 m dia. D shape **TRT-8** - 8.50 m dia. D shape
Lengths	**TRT-7** - 27.50 m **TRT-8** - 69.50 m
Normal TWL at outlet a) Monsoon b) Lean c) Non-Monsoon i. During Peaking hours ii. During Non-Peaking hours	 634.00 m 632.70 m 633.30 m 631.70 m
COST ESTIMATES & FINANCIAL ASPECT (Rs. Crores)	
Civil Works including Hydro-Mechanical Works	1222.08
Electro Mechanical Works	302.77
Initial Spare Parts	22.87
Total Basic Cost (Hard Cost)	1547.72
Interest during construction (excluding financing cost)	389.32
Escalation	272.06
Financing Charges	14.49

Total Project Cost including Escalation and IDC	2223.59
LEVELLISED TARIFF AT 90% DEP. YRS. (in Rs./KWhr)	
After considering 12% free power & 1% for local area development (levelised)	6.83
LEVELLISED TARIFF AT 50% DEP. YRS. (in Rs./KWhr)	
After considering 12% free power & 1% for local area development (levelised)	6.70
Period of Construction (excluding 18 months preconstruction activities)	**58 months**

General Manager
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