

SALIENT FEATURES

DETAILED PROJECT REPORT

CLIENT - SEW MAGO CHU POWER CORPORATION LTD



SALIENT FEATURES

LOCATION

State	:	Arunachal Pradesh
District	:	Tawang
River	:	Mago Chu
Nearest Airport	:	Guwahati
Nearest rail head	:	Nagaon

BARRAGE

Latitude	:	27° 37' 42.3" N
Longitude	:	92° 02' 32.7" E

POWER HOUSE

Latitude	:	27° 37' 27.6" N
Longitude	:	92° 00' 53.8" E

HYDROLOGY

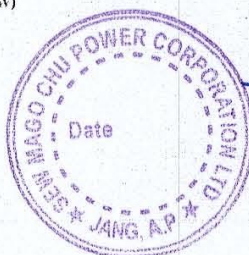
Catchment area at Barrage site	:	830 sq km
Design Flood	:	2452 m ³ /sec (SPF)
GLOF	:	1252 m ³ /sec
Diversion Flood (1: 25 yr monsoon flood)	:	360 m ³ /sec

RESERVOIR

Full Reservoir Level (FRL)	:	EL 2472.0 m
Minimum Drawdown Level (MDDL)	:	EL 2460.0 m
Gross storage at FRL	:	0.332 M cum
Live storage	:	0.257 M cum
Area under Submergence at FRL	:	2.42 ha

DIVERSION STRUCTURE

Type	:	Barrage
Length	:	47.8 m
Top of Barrage	:	EL 2474.0 m



[Signature]
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 Business Associate

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**SPILLWAY**

No. of Barrage bays & opening size	:	4 Nos. (9.2 m (w) x 6.8 m (h) each)
Crest Level	:	El 2453 m
Design Flood (SPF)	:	2452 cumec
Size of stoplog gate (1 set)	:	9.2m (w) x 11.054 m (h)
Size of radial gate (4 nos.)	:	9.2 m (w) x 6.8 m (h)

DESILTING BASIN

Number	:	Two
Size / Shape	:	14.0 m(W) x 19.0 m(H), Dufor type
Length	:	70m
Trashrack at inlet (4 sets for each basin)	:	2.50 m (w) x 17.00 m (h)
Inlet discharge	:	32.43 cumec each
Size of Stoplog gate opening (4 nos.)	:	6.0m (w) x 17.0m (h) – 2 nos. at each inlet

SILT FLUSHING DUCT

Number	:	Two combined into one
Size of Duct upto silt flushing gate	:	Varies from 0.5m (w) x 1.0m (h) to 0.9m (w) x 1.4m (h), L= 55.0m
Size of Duct after Junction upto outlet	:	1.50m (w) x 1.75m (h), L= 20.0m
Silt flushing discharge	:	4.23 cumec through each duct

INTAKE

Number	:	Two
Invert level	:	El 2453.25 m
Design discharge	:	28.2 cumec each
Intake Gate (two nos.)	:	3.5m (w) x 4.5m (h)

CUT AND COVER DUCT

Number	:	Two
Length	:	43.0 m / 66.7m.
Invert level	:	El 2453.25 m

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Design discharge : 28.2 cumec each

FEEDER TUNNELS

Number : Two
Size : 3.5 m
Shape : D- shape
Length : 38m
Design discharge : 28.2 cumec each
Velocity : 2.58 m/s

HEAD RACE TUNNEL

Number : One
Size : 4.8 m
Shape : Modified Horse-Shoe shape
Length : 2773 m
Design discharge : 56.4 cumec
Velocity : 3.08 m/s

SURGE SHAFT

Number : One
Type : Restricted Orifice Type
Size : 7.0 m diameter
Orifice dia : 2.1m
Height : 85 m
Top EL : EL 2510.0 m
Tunnel invert : EL 2420.3 m
Size of gate opening (1 no.) : 3.7m (w) x 3.7m (h)
Maximum surge level : EL 2505.14 m
Minimum surge level : EL 2428.02 m

PRESSURE SHAFT/TUNNEL**Main Pressure shaft/tunnel**

Numbers : One
Size & Length : 3.7 m diameter, 250.4m long

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Pressure tunnel after 1st bifurcation

Numbers	:	Two
Size & Length	:	3.0 m diameter, 22.5 m long 2.2 m diameter, 43.5 m long

Pressure tunnel after 2nd bifurcation

Numbers	:	Two
Size & Length	:	2.2 m diameter, 30 m long 2.2 m diameter, 20 m long

POWER HOUSE

Type	:	Underground
Installed capacity	:	96 MW
Number of units	:	3 x 32 MW
Power house cavern size (LxWxH)	:	87 m x 19mx 38.5 m
Type of turbine	:	Vertical axis Francis turbine
C.L. of turbine	:	El 2265.5 m
Rated Head	:	186.75 m
Transformer cavern size (LxWxH)	:	60 m x 14.0mx 19.0 m
No. & Type of Transformers	:	3 Nos., 3 Phase, 40 MVA

DRAFT TUBE GATE CHAMBER

Type	:	Underground
Size (L x W x H)	:	37.0 m x 6.0mx 8.0 m
Size of gate opening (3 nos.)	:	4.6m (w) x 2.5m (h)

TAIL RACE TUNNEL

Type	:	Modified Horse Shoe Shape
Size	:	5.5m dia
Length	:	62.0 m
Design Discharge	:	56.4 cumec
River Bed Level	:	El 2265.0 m
Minimum TWL	:	El 2270.01 m

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Normal TWL	:	El 2272.32 m
Maximum TWL	:	El 2278.5 m
Number & Size of TRT gate opening (1 no.)	:	5.5m (w) x 5.5m (h)

POWER GENERATION

Installed capacity	:	96 MW (3x32 MW)
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Annual energy generation

i) 90% dependable year	:	405.83 GWh
with 100% machine availability		
ii) 90% dependable year	:	404.42 GWh
with 95% machine availability		

Plant Load Factor

i) 90% dependable year	:	48.26%
with 100% machine availability		
ii) 90% dependable year	:	48%
with 95% machine availability		

COST ESTIMATES & FINANCIAL ASPECT (Rs. Crores)

Civil & HM Works	:	453.65
Electro Mechanical Works	:	158.38
Sub Total	:	612.03
Interest during construction	:	129.47
Escalation	:	131.47
Financing cost	:	6.15
Total (Generation)	:	879.12

TARIFF (With 13% free power)

Tariff for first year	:	Rs. 5.73/kWh
Levellised Tariff	:	Rs. 4.98/kWh

PRE-CONSTRUCTION PERIOD

: 18 months

CONSTRUCTION PERIOD

: 3.5 years



Jayaprakash N.,
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