

SALIENT FEATURES

1 Location

i State	Jammu & Kashmir
ii District	Anantnag
iii Town/Tehsil	Mattigarwan/Kokernag
iv Access Road	Jammu-Srinagar (NH-1A) Anantnag-Kokernag-Margam top Road.
v Village	Hajibal

2 Geographical Coordinates

i Weir-Longitudes	75° 26'35.01"E
Latitudes	33°44'0.87"N
ii Basin-Longitudes	75° 26'35.04"E
Latitudes	33°43'58.76"N
iii Forebay-Longitudes	75° 26'35.04"E
Latitudes	33°43'58.76"N
vi Powerhouse-Longitudes	75° 26'34.97"E
Latitudes	33°43'36.74"N

3 River Catchment

i Catchment up to Headwork's	7 Sq-km
ii Nallah/Stream	Hajibal
iii Tributary	Bringi Nallah/Jhelum river

4 Hydrology

Catchment area of Nallah up to	
i Diversion Weir site	7 Sq-km
ii Climate Data	
a) Precipitation (Avg. Rainfall)	1100 mm
b) Precipitation Max.	1400 mm

iii. Atmospheric Temp.

a) Max.

30⁰C

b) Min.

(-) 13⁰C**5 Medium Head Scheme**

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure

RCC Trench Weir

ii. Discharge at Intake

1.88 Cumec

iii. Length

12 m

iv. Width

1.5 m

v. Average bed level of Nallah

2879 m

vi. Longitudinal bed Grade in Trench, 1 in

12 m

vii. Pond Level with 50% clogging

2878.20 m

viii. Highest Flood Level

2881.74 m

ix. Maximum Shingle Flushing Discharge

0.25 Cumec

x. Shingle Flushing Pipe Diametre

mm

xi Sill Elevation of Flushing Pipe

2876.40 m

xii Sill Elevation of Intake service Gate

2877.00 m

xiii Sill Elevation of bulk head Gate

2877.20 m

xiv Trash rack mesh openings

30.00 mm

xv Length of Intake well

3.50 m

xvi Width of Intake well

3.00 m

xvii Number of Gates in well

3 no

xviii Height of Intake well

5.54 m

6 Water Conductor System Supply Channel

i. Supply Channel- Length

45.21 m

ii. Type of Structure	RCC Box Channel		
iii. Design Discharge	1.63	Cumec	
iv. Bed width	1.4	m	
v. Full Supply Flow depth	1	m	
vi. Free board	0.4		
vii. Bed Grade	1 in	700	
viii. Velocity of Flow	1.16	m/sec	
7 Desilting Tank			
i. Type of Structure	RCC common structure with Forebay		
ii. Design Discharge	1.63	Cumec	
iii. Length (main tank)	15	m	
iv. Width	5	m	
Depth of water in main part of Tank			
v. (FSD)	1.65	m	
vi. Flushing discharge	0.25	cumec	
vii. Length (upstream transition)	10.8	m	
viii. Length (downstream transition)	0.00	m	
ix. Total Length including transitions	25.80	m	
x. Particle size removal	0.2 mm and above		
xi. Silt Flushing Pipe Length	20	m	
xii. Type of Flushing	Through M.S pipe 400mm diameter		
xiii. Flushing Control arrangement	400 mm Dia. Sluice Valve		

9 Forebay Type

i.	RCC Rectangular Tank combined with Desilting Basin		
ii. Full supply Water Level	2877.63	m	
iii. Minimum Draw Down Level (MDDL)	2875.98	m	
iv. Size			



	a) Length	21.80 m
	b) Width	5.0 m
	c) Overall Depth	5.23 m
v.	Design Discharge	1.50 Cumec
vi.	Maximum Water Level	2878.13 m
vii.	Spillway Crest Level	2877.63 m
viii.	Storage Capacity Time	2 min
ix.	Live Storage	180 m ³
10	Penstocks	
i.	Number	1 number
ii.	Diameter	750 mm
iii.	Maximum Thickness	10 mm
iv.	Each branch Diameter with Bifurcation at lower end	530 mm
v.	Length of main Penstock	760 m
vi.	Length of each branch penstock	15 m
vii.	Design discharge in main Pipe	1.50 Cumec
viii.	Design Discharge in branch pipe	0.75 Cumec
ix.	Velocity of Flow	3.40 m/sec
x	Maximum Pressure rise	36%
11	Power House	
i.	Type	Surface- RCC framed structure
ii.	Head	
	a) Gross	113.63 m
	b) Net	104.95 m
iii.	Size of power house:	
	a) Length	23 m
	b) Width	15 m
	c) Height (m)	13 m

d)	Machine Hall floor level	2762.75	m
iv.	Installed capacity	1.10	MW
v.	Turbines		
a)	Type	Horizontal Francis	
b)	Number	2	number
c)	Capacity each	0.55	MW
vi.	Type of Generator:	Synchronous	
vii.	Power house crane / lifting tackle capacity	15	ton
viii.	Axis of turbine level	2764	m
12	Tailrace		
i.	Type	RCC Rectangular Section	
ii.	Bed width	2.55	m
iii.	Max. Flow depth	0.7	m
iv.	Design Discharge	1.50	Cumec
v.	Bed Grade	1 in	550
vi.	Free board	0.6	m
vii.	Minimum Tail water Level	2764	m
viii.	Maximum Tail water level	2764.45	m
13	Power		
i.	Installed Capacity	1.10	MW
ii.	Primary Energy	1.08	mu
iii.	Total Annual gross Energy Average Year @ 75% dependability	6.20	mu
14	Switchyard		
i.	Voltage level/basic undulation level	3.3/11/33KV	
ii.	No. of Bays	One	
iii.	Size :-		

	(a) Length	13 m
	(b) Width	10 m
15	Transmission Line	
	i. Voltage Level	11/33. KV
	ii. Length	16 km
	iii. Sub-station	Dandipora
16	Hard Cost of Project	11.78

MDDL	-Minimum Draw down Level
HFL	- Highest Flood Level
EL	- Elevation (Above Mean Sea Level)
OC	-Degree Celsius
RCC	- Reinforced Cement Concrete
RD	- Reduced Distance
FSL	- Full Supply Level
DPR	- Detailed Project Report
U/S	- Upstream
D/S	- Downstream
GTS	- Great Trigonometrically Survey
G-D	- Gauge –Discharge
T&P	- Tools & Plants
IDC	- Interest during Construction
Rs	- Indian Rupees
O&M	-Operation and Maintenance
%	-Percent
WDV	- Written Down Value
SLM	- Straight Line Method
LS	- Lump Sum
IRR	- Internal Rate of Return
PBDT	-Profit before Depreciation & Taxes
DSCR	- Debt Service Coverage Ratio

SALIENT FEATURES

1 Location

i State

Jammu & Kashmir

ii	District	Anantnag
iii	Town/Tehsil	Mattigarwan/Kokernag
iv	Access Road	Jammu-Srinagar (NH-1A) Anantnag-Kokernag-Margam top Road.
v	Village	Mattigarwan

2 Geographical Coordinates

i	Weir-Longitudes	75° 27'52.39"E
	Latitudes	33°43'17.4"N
ii	Basin-Longitudes	75° 27'48.15"E
	Latitudes	33°43'16.7"N
iii	Forebay-Longitudes	75° 27'48.15"E
	Latitudes	33°43'16.7"N
vi	Powerhouse-Longitudes	75° 27'19.26"E..
	Latitudes	33°43'13.69"N

3 River Catchment

i	Catchment up to Headwork's	11.36 Sq-km
ii	Nallah/Stream	Navkin Mattigarwan/Bringi
iii	Tributary	Nallah

4 Hydrology

Catchment area of Nallah up to		
i	Diversion Weir site	11.36 Sq-km
ii	Climate Data	
	a) Precipitation (Avg. Rainfall)	1100 mm
	b) Precipitation Max.	1400 mm
iii.	Atmospheric Temp.	
	a) Max.	30°C
	b) Min.	(-) 13°C

5 Medium Head Scheme**5.1 Diversion Structure (Head works)****5.1.1 Weir**

	<i>RCC Trench</i>	
i. Type of Structure	<i>Weir</i>	
ii. Discharge at Intake	2.55	Cumec
iii. Length	12	m
iv. Width	1.5	m
v. Average bed level of Nallah	2914	m
vi. Longitudinal bed Grade in Trench, 1 in	12	m
vii. Pond Level with 50% clogging	2913.40	m
viii. Highest Flood Level	2916.79	m
ix. Maximum Shingle Flushing Discharge	0.34	Cumec
x. Shingle Flushing Pipe Diametre		mm
xi. Sill Elevation of Flushing Pipe	2911.40	m
xii. Sill Elevation of Intake service Gate	2912.00	m
xiii. Sill Elevation of bulk head Gate	2912.20	m
xiv. Trash rack mesh openings	30.00	mm
xv. Length of Intake well	3.50	m
xvi. Width of Intake well	3.00	m
xvii. Number of Gates in well	3	no
xviii. Height of Intake well	5.59	m

6 Water Conductor System Supply Channel

i. Supply Channel- Length	107.41	m
ii. Type of Structure	<i>RCC Box</i>	<i>Channel</i>
iii. Design Discharge	2.21	Cumec
iv. Bed width	1.5	m

v.	Full Supply Flow depth	1.2	m
vi.	Free board	0.4	
vii.	Bed Grade	1 in	700
viii.	Velocity of Flow	1.25	m/sec

7 Desilting Tank

i.	Type of Structure	RCC common structure with Forebay	
ii.	Design Discharge	2.21	Cumec
iii.	Length (main tank)	20	m
iv.	Width	5	m
	Depth of water in main part of Tank (FSD)	2.25	m
vi.	Flushing discharge	0.34	Cumec
vii.	Length (upstream transition)	10.5	m
viii.	Length (downstream transition)	0.00	m
ix.	Total Length including transitions	30.50	m
x.	Particle size removal	0.2 mm and above	
xi.	Silt Flushing Pipe Length	20	m
xii.	Type of Flushing	Through M.S pipe 400mm diameter 400 mm Dia. Sluice Valve	
xiii.	Flushing Control arrangement		

9 Forebay

	Type	RCC Rectangular Tank combined with Desilting Basin	
i.			
ii.	Full supply Water Level	2912.82	m
iii.	Minimum Draw Down Level (MDDL)	2910.58	m
iv.	Size		
	a) Length	21.80	m
	b) Width	5.0	m

	c) Overall Depth	6.30 m
v.	Design Discharge	2.04 Cumec
vi.	Maximum Water Level	2913.32 m
vii.	Spillway Crest Level	2912.82 m
viii.	Storage Capacity Time	2 min
ix.	Live Storage	245 m ³

10 Penstocks

i.	Number	1 number
ii.	Diameter	900 mm
iii.	Maximum Thickness	10 mm
iv.	Each branch Diameter with Bifurcation at lower end	637 mm
v.	Length of main Penstock	875 m
vi.	Length of each branch penstock	15 m
vii.	Design discharge in main Pipe	2.04 Cumec
viii.	Design Discharge in branch pipe	1.02 Cumec
ix.	Velocity of Flow	3.21 m/sec
x	Maximum Pressure rise	36%

11 Power House

i.	Type	Surface- RCC framed structure
ii.	Head	
	a) Gross	109.82 m
	b) Net	102.38 m
iii.	Size of power house:	
	a) Length	23 m
	b) Width	15 m
	c) Height (m)	13 m
	d) Machine Hall floor level	2801.75 m
iv.	Installed capacity	1.50 MW

v.	<i>Turbines</i>	
	<i>a) Type</i>	<i>Horizontal Francis</i>
	<i>b) Number</i>	<i>2 number</i>
	<i>c) Capacity each</i>	<i>0.75 MW</i>
vi.	<i>Type of Generator:</i>	<i>Synchronous</i>
	<i>Power house crane / lifting tackle</i>	
vii.	<i>capacity</i>	<i>15 ton</i>
viii.	<i>Axis of turbine level</i>	<i>2803 m</i>
12	<i>Tailrace</i>	
i.	<i>Type</i>	<i>RCC Rectangular Section</i>
ii.	<i>Bed width</i>	<i>2.4 m</i>
iii.	<i>Max. Flow depth</i>	<i>0.7 m</i>
iv.	<i>Design Discharge</i>	<i>2.04 Cumec</i>
v.	<i>Bed Grade</i>	<i>1 in 550</i>
vi.	<i>Free board</i>	<i>0.6 m</i>
vii.	<i>Minimum Tail water Level</i>	<i>2803 m</i>
viii.	<i>Maximum Tail water level</i>	<i>2803.45 m</i>
13	<i>Power</i>	
i.	<i>Installed Capacity</i>	<i>1.50 MW</i>
ii.	<i>Primary Energy</i>	<i>1.55 mu</i>
iii.	<i>Total Annual gross Energy Average Year @ 75% dependability</i>	<i>8.68 mu</i>
14	<i>Switchyard</i>	
i.	<i>Voltage level/basic undulation level</i>	<i>3.3/11/33KV</i>
ii.	<i>No. of Bays</i>	<i>One</i>
iii.	<i>Size :-</i>	
	<i>(a) Length</i>	<i>13 m</i>
	<i>(b) Width</i>	<i>10 m</i>
15	<i>Transmission Line</i>	

- | | | |
|-----------|-----------------------------|------------------|
| i. | Voltage Level | 11/33. KV |
| ii. | Length | 16 km |
| iii. | Sub-station | Dandipora |
| 16 | Hard Cost of Project | 14.24 Cr. |

SALIENT FEATURES

1. Location

i	State	Jammu & Kashmir
ii	District	Bandipora
iii	Town	Bandipora
iv	Access Road	Srinagar-Sumbal-Bandipora- Athwato Road.
v	Village	Athwato

2. Geographical Coordinates

i	Longitudes	H/W	74° 42'43.86"E
ii	Latitudes		34°29'32.05"N
		D/B	74° 42'36.41"E
			34°29'33.99"N
		F/B	74° 42'3.02"E
			34°29'36.69"N
		P/H	74° 42'1.99"E
			34°29'33.03"N

3. River Catchment

i	Catchment up to Headwork's	185.92 Sq-Km
ii	Nallah/Stream	Madhumati
iii	Tributary	Wullar

4. Hydrology

i	Catchment area of Nallah up to Diversion Weir site	185.92 Sq-Km
ii	Climate Data :-	
	a) Precipitation (Avg. Rainfall)	1100 mm
	b) Precipitation Max.	1400 mm
iii.	Atmospheric Temp.	

- | | |
|---------|---------|
| a) Max. | 34 °C |
| b) Min. | (-) 7°C |

5. Medium Head Scheme

Diversion Structure (Head works)

Weir

- | | |
|---|--------------------|
| i. Type of Structure | Trench Type (RCC) |
| ii. Length | 25.00 m |
| iii. Width | 2 m |
| iv. Pond Level (with 50% Clogging) | 1942.85 m |
| v. Bed Grade in Trench | 1 in 18.5 |
| vi. Discharge at Intake | 7.54 Cumecs |
| vii. Average Bed Level of Nallah | 1944.00 m |
| viii. Shingle Flushing Discharge | 15% of Power draft |
| ix. Shingle Flushing Pipe Diameter | 0.6 m |
| x. Sill Elevation of Flushing Pipe | 1940.40 m |
| xi. Sill Elevation of Intake service Gate | 1941.20 m |

6. Water Conductor System Supply Channel

- | | |
|---------------------------|-----------------|
| i. Supply Channel- RD | 0 m to 171.31 m |
| ii. Type of Structure | RCC Box Channel |
| iii. Design Discharge | 6.24 Cumecs |
| iv. Bed Width | 2.15 m |
| v. Full Supply Flow depth | 1.65 m |
| vi. Free board | 0.4 m |
| vii. Bed Grade | 1 in 550 |
| viii. Velocity of Flow | 1.78 m/sec |

7. De-silting Tank

- | | |
|----------------------|-----------------------------------|
| | RD 171.31m to RD 240.31m |
| i. Type of Structure | RCC Single bay with flushing duct |

ii.	Design Discharge	6.24 Cumecs
iii.	Length (main tank)	53.0 m
iv.	Width	9.1 m
v.	Depth of water in main part of Tank	3.50 m
vi.	Flushing discharge	1.04 Cumecs
vii.	Length (upstream transition)	11 m
viii.	Length (downstream transition)	5 m
ix.	Total Length including transitions	69.0 m
x.	Particle size removal	0.2mm and above
xi.	Silt Flushing Pipe Length	32.30m
xii.	Type of Flushing	Through M.S pipe 500mm dia
xiii.	Flushing Control arrangement	500 mm Dia. Sluice Valve
8.	Power Channel	RD 240.31 m to RD 1191.98 m
i.	Type of Structure	RCC Box Channel
ii.	Design Discharge	5.20 Cumecs
iii.	Bed Width	2.15 m
iv.	Full Supply Flow Depth	1.65 m
v.	Free board	0.4 m
vi.	Bed Grade	1 in 800
vii.	Velocity of Flow	1.48 m/sec
9.	Forebay	
i.	Type	RCC Rectangular Tank
ii.	Full supply Water Level	1940.90 m
iii.	Minimum Draw Down Level (MDDL)	1939.25 m
iv.	Size	
	a) Length	60.00 m
	b) Width	6.93 m

c) Overall Depth	6.59 m
v. Design Discharge	5.72 Cumecs
vi. Maximum Water Level	1941.50 m
vii. Spillway Crest Level	1940.90 m
viii. Storage Capacity Time	2 Min.
ix. Live Storage	686 m ³

10. Penstocks

i. Number	1 No
ii. Diameter	1.2 m
iii. Thickness	8 mm
iv. Each branch Diameter with Bifurcation at lower end	0.85 m
v. Length of main Penstock	121.40 m
vi. Length of each branch penstock	12 m
vii. Design discharge in main Pipe	5.72 Cumecs
viii. Design Discharge in branch pipe	2.86 Cumecs
ix. Velocity of Flow	5.06 m/sec

11. Power House

i. Type	Surface RCC framed structure
ii. Head (m):-	
a) Gross	50.70 m
b) Net	46.90 m
iii. Size of power house:	
a) Length (m)	21.25 m
b) Width (m)	12.89 m
c) Height (m)	12.0 m
d) Machine Hall floor level	1887.75 m
iv. Installed capacity	2.0 MW

v.	Turbines :-	
a)	Type	Horizontal Francis
b)	Number	2 no.
c)	Capacity each	1 MW
vi.	Type of Generator:	Synchronous
vii.	Power house crane / lifting tackle capacity	18 T
viii.	Axis of turbine level	1889 m
12. Tailrace		
i.	Type	RCC Rectangular Section
ii.	Bed width	6 m
iii.	Max. Flow depth	0.7 m
iv.	Design Discharge	5.72 Cumecs
v.	Bed Grade	1 in 700
vi.	Free board	0.6 m
vii.	Minimum Tail water Level	1889.30 m
viii.	Maximum Tail water level	1890.20 m
13. Power		
i.	Installed Capacity	2.0 MW
ii.	Primary Energy	1.19 MU
iii.	Total Annual Energy Average Year @ 75% dependability	9.23 MU
14. Switchyard		
i.	Voltage level/basic undulation level	3.3/11KV
ii.	No. of Bays	One (1)
iii.	Size :-	
(a)	Length	13.0 m
(b)	Width	9.0m

15. Transmission Line

- | | | |
|------|---------------|------|
| i. | Voltage Level | 11kV |
| ii. | Length | 9 Km |
| iii. | Sub-station | Ajar |

16. Hard Cost of Project 18.19 Cr

SALIENT FEATURES**1. Location**

i	State	Jammu & Kashmir
ii	District	Baramulla
iii	Town	Uri
iv	Access Road	Jammu-Srinagar NHIA-Uri via Baramulla
v	Village	Pawdia

2. Geographical Coordinates

i	Longitudes	H/W	74° 4'29.20"E
ii	Latitudes		34° 3'12.96"N
		D/B	74° 4'26.29"E
			34° 3'15.17"N
		F/B	74° 3'58.48"E
			34° 4'4.51"N
		P/H	74° 4'0.44"E
			34° 4'7.57"N

3. River Catchment

i	Catchment up to Headwork's	102 Sq-Km
ii	Nallah/Stream	Hajipeer
iii	Tributary	Jhelum

4. Hydrology

i	Catchment area of Nallah up to Diversion Weir site	102 Sq-Km
ii	Climate Data :-	
	a) Precipitation (Avg. Rainfall)	1200 mm
	b) Precipitation Max.	1600 mm

iii. Atmospheric Temp.

a) Max. 32 °C

b) Min. (-) 05°C

5. Medium Head Scheme

Diversion Structure (Head works)

Weir

i. Type of Structure Trench Type (RCC)

ii. Length 20.00 m

iii. Width 2 m

iv. Pond Level (with 50% Clogging) 1456.00 m

v. Bed Grade in Trench 1 in 14.8

vi. Discharge at Intake 5.95 Cumecs

vii. Average Bed Level of Nallah 1457.00 m

viii. Shingle Flushing Discharge 15% of Power draft

ix. Shingle Flushing Pipe Diameter 0.6 m

x. Sill Elevation of Flushing Pipe 1453.60m

xi. Sill Elevation of Intake service Gate 1454.40m

6. Water Conductor System Supply Channel

i. Supply Channel- RD 0 m to 73.96 m

ii. Type of Structure RCC Rectangular Channel

iii. Design Discharge 4.92 Cumecs

iv. Bed Width 2 .00 m

v. Full Supply Flow depth 1.6 m

vi. Free board 0.4 m

vii. Bed Grade 1 in 650

viii. Velocity of Flow 1.58 m/sec

7. Desilting Tank	<i>RD 73.96 m to 141.0m</i>
i. Type of Structure	<i>RCC Single bay with flushing duct</i>
ii. Design Discharge	<i>4.92 Cumecs</i>
iii. Length (main tank)	<i>53.0 m</i>
iv. Width	<i>7.1 m</i>
v. Depth of water in main part of Tank	<i>3.50 m</i>
vi. Flushing discharge	<i>0.82 Cumecs</i>
vii. Length (upstream transition)	<i>9 m</i>
viii. Length (downstream transition)	<i>5 m</i>
ix. Total Length including transitions	<i>67.0 m</i>
x. Particle size removal	<i>0.2mm and above</i>
xi. Silt Flushing Pipe Length	<i>45.0m</i>
xii. Type of Flushing	<i>Through M.S pipe 500mm dia</i>
xiii. Flushing Control arrangement	<i>500 mm Dia. Sluice valve</i>
8. Power Channel	<i>RD 140.96m to RD 1924.16</i>
i. Type of Structure	<i>RCC Rectangular Channel</i>
ii. Design Discharge	<i>4.10 Cumecs</i>
iii. Bed Width	<i>2 m</i>
iv. Full Supply Flow Depth	<i>1.6 m</i>
v. Free board	<i>0.4 m</i>
vi. Bed Grade	<i>1 in 950</i>
vii. Velocity of Flow	<i>1.30 m/sec</i>
9. Forebay	
i. Type	<i>RCC Rectangular Tank</i>
ii. Full supply Water Level	<i>1453.60 m</i>
iii. Minimum Draw Down Level (MDDL)	<i>1452.00m</i>

iv.	Size	
	a) Length	45.00 m
	b) Width	7.5 m
	c) Overall Depth	6.20 m
v.	Design Discharge	4.51 Cumecs
vi.	Maximum Water Level	1454.20 m
vii.	Spillway Crest Level	1453.60 m
viii.	Storage Capacity Time	2 Min.
ix.	Live Storage	541 m ³

10. Penstocks

i.	Number	1 No
ii.	Diameter	1.1m
iii.	Thickness	8mm
iv.	Each branch Diameter with Bifurcation at lower end	0.78 mm
v.	Length of main Penstock	98 m
vi.	Length of each branch penstock	12 m
vii.	Design discharge in main Pipe	4.51 Cumecs
viii.	Design Discharge in branch pipe	2.26 Cumecs
ix.	Velocity of Flow	4.75 m/sec

11. Power House

i.	Type	Surface RCC framed structure
ii.	Head (m):-	
	a) Gross	65.85m
	b) Net	62.80m
iii.	Size of power house:	
	a) Length (m)	21.08m

Promoter: Jammu & Kashmir Energy Development Agency

b)	Width (m)	13.07m
c)	Height (m)	13.0m
d)	Machine Hall floor level	1385.76m
iv.	Installed capacity	2.0MW
v.	Turbines :-	
a)	Type	Horizontal Francis
b)	Number	2 no.
c)	Capacity each	0.75MW
vi.	Type of Generator:	Synchronous
vii.	Power house crane / lifting tackle capacity	15 T
viii.	Axis of turbine level	1387m

12. Tailrace

i.	Type	RCC Rectangular Section
ii.	Bed width	4.6 m
iii.	Max. Flow depth	0.7 m
iv.	Design Discharge	4.51Cumecs
v.	Bed Grade	1 in 650
vi.	Free board	0.6 m
vii.	Minimum Tail water Level	1387.30 m
viii.	Maximum Tail water level	1387.75 m

13. Power

i.	Installed Capacity	1.50MW
ii.	Primary Energy	1.70MU
iii.	Total Annual Energy Average Year @ 75% dependability	7.2MU

14. Switchyard

Promoter: Jammu & Kashmir Energy Development Agency

- i. Voltage level/basic undulation level 3.3/11KV
- ii. No. of Bays One (1)
- iii. Size :-
 - (a) Length 17.0m
 - (b) Width 13.0m

15. Transmission Line

- i. Voltage Level 11kV
- ii. Length 6 Km
- iii. Sub-station Salamabad

16. Hard Cost of Project 19.25 Cr

SALIENT FEATURES**1 Location**

- | | |
|----------------|---|
| i State | Jammu & Kashmir |
| ii District | Budgam |
| iii Town | Chadoora |
| iv Access Road | Jammu-Srinagar (NH-1A)-Chadoora-Brenwar Road. |
| v Village | Surasyar |

2 Geographical Coordinates

- | | |
|--------------------------|----------------|
| i Weir-Longitudes | 74° 39'32.47"E |
| Latitudes | 33°39'32.47"N |
| ii Basin-Longitudes | 74° 39'37.42"E |
| Latitudes | 33°52'15.55"N |
| iii Forebay-Longitudes | 74° 40'19.90"E |
| Latitudes | 33°52'52.16"N |
| vi Powerhouse-Longitudes | 74° 40'19.78"E |
| Latitudes | 33°52'57.98"N |

3 River Catchment

- | | |
|------------------------------|-------------------------------|
| i Catchment up to Headwork's | 65 Sq-km |
| ii Nallah/Stream | Surasyar/Doodhganga |
| iii Tributary | Doodhganga-Jhelum river Basin |

4 Hydrology

Catchment area of Nallah up to

- | | |
|----------------------------------|----------|
| i Diversion Weir site | 65 Sq-km |
| ii Climate Data | |
| a) Precipitation (Avg. Rainfall) | 1191 mm |
| b) Precipitation Max. | 1647 mm |

iii. Atmospheric Temp.

a) Max. 32⁰C

b) Min. (-) 10⁰C

5 Medium Head Scheme

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure	RCC Trench Weir	
ii. Discharge at Intake	5.08	Cumec
iii. Length	20	m
iv. Width	2	m
v. Average bed level of Nallah	2116	m
vi. Longitudinal bed Grade in Trench, 1 in	11.76	m
vii. Pond Level with 50% clogging	2114.60	m
viii. Highest Flood Level	2120.03	m
ix. Maximum Shingle Flushing Discharge	0.77	Cumec
x. Shingle Flushing Pipe Diametre	500	mm
xi. Sill Elevation of Flushing Pipe	2112.40	m
xii. Sill Elevation of Intake service Gate	2113.00	m
xiii. Sill Elevation of bulk head Gate	2113.20	m
xiv. Trash rack mesh openings	30	mm
xv. Length of Intake well	3.50	m
xvi. Width of Intake well	3.00	m
xvii. Number of Gates in well	3	
xviii. Height of Intake well	7.83	m

6 Water Conductor System Feeder Channel

i. Supply Channel- Length 144.96 m

ii. Type of Structure	MS Pipe
iii. Design Discharge	4.55 Cumec
iv. Pipe diameter	1.9 m
v. Full Supply Flow depth	1.40 m
vi. Free board	20% of circular Pipe section
vii. Bed Grade 1 in	800
viii. Velocity of Flow	2.03 m/sec

7 Desilting Tank

i. Type of Structure	RCC Rectangular Single bay
ii. Design Discharge	4.55 Cumec
iii. Length (main tank)	28 m
iv. Width	7.0 m
Depth of water in main part of Tank	
v. (FSD)	3.30 m
vi. Flushing discharge	0.7 Cumec
vii. Length (upstream transition)	15.3 m
viii. Length (downstream transition)	10.80 m
ix. Total Length including transitions	54.10 m
x. Particle size removal	0.2 mm and above
xi. Silt Flushing Pipe Length	51 m
xii. Type of Flushing	Through M.S pipe 500mm diameter
xiii. Flushing Control arrangement	500 mm Dia. Sluice Valve

8 Water Conductor System Headrace Channel

i. Headrace Channel- Length	1542 m
ii. Type of Structure	MS Pipe
iii. Design Discharge	3.85 Cumec

iv. Pipe diameter	1.6 m
v. Full Supply Flow depth	1.24 m
vi. Free board	20% of circular Pipe section
vii. Bed Grade 1 in	500
viii. Velocity of Flow	2.30 m/sec

9 Forebay

i. Type	RCC Rectangular Tank
ii. Full supply Water Level	2110.67 m
iii. Minimum Draw Down Level (MDDL)	2108.83 m
iv. Size	
a) Length	43.00 m
b) Width	6.4 m
c) Overall Depth	6.52 m
v. Design Discharge	4.2 Cumec
vi. Maximum Water Level	2111.27 m
vii. Spillway Crest Level	2110.67 m
viii. Storage Capacity Time	2 min
ix. Live Storage	504 m ³

10 Penstocks

i. Number	1
ii. Diameter	1100 mm
iii. Maximum Plate Thickness	8 mm
Each branch Diameter with Bifurcation	
iv. at lower end	778 mm
v. Length of Penstock	190 m
vi. Length of each branch penstock	15 m
vii. Design discharge in main Pipe	4.2 Cumec

viii.	Design Discharge in branch pipe	2.1	Cumec
ix.	Velocity of Flow	4.42	m/sec
x	Maximum allowable Pressure rise	30%	
11	Power House		
i.	Type	Surface- RCC framed structure	
ii.	Head		
	a) Gross	75.93	m
	b) Net	71.43	m
iii.	Size of power house:		
	a) Length	24	m
	b) Width	14	m
	c) Height (m)	13	m
	d) Machine Hall floor level	2031.8	m
iv.	Installed capacity	2.00	MW
v.	Turbines		
	a) Type	Horizontal Francis	
	b) Number	2	
	c) Capacity each	1	MW
vi.	Type of Generator:	Synchronous, 3.3 KV	
	Power house crane / lifting tackle		
vii.	capacity	18	ton
viii.	Axis of turbine level	2033.0	m
12	Tailrace		
i.	Type	RCC Rectangular Section	
ii.	Bed width	4.5	m
iii.	Max. Flow depth	0.7	m
iv.	Design Discharge	4.2	Cumec

	v. Bed Grade	1 in	700	
	vi. Free board		0.6	m
	vii. Minimum Tail water Level		2034.29	m
	viii. Maximum Tail water level		2034.74	m
13	Power			
	i. Installed Capacity		2.00	MW
	ii. Primary Energy		1.15	mu
	Total Annual gross Energy Year @ 75%			
iii.	dependability		10.28	mu
14	Switchyard			
	i. Voltage level/basic undulation level	11/33KV		
	ii. No. of Bays	One		
	iii. Size :-			
	(a) Length		13	m
	(b) Width		10	m
15	Transmission Line			
	i. Voltage Level	11/33 KV.		
	ii. Length		2	km
	iii. Sub-station	Brenwar		
16	Hard Cost of Project		19.26	Cr.

<i>MDDL</i>	<i>-Minimum Draw down Level</i>
<i>HFL</i>	<i>- Highest Flood Level</i>
<i>EL</i>	<i>- Elevation (Above Mean Sea Level)</i>
<i>OC</i>	<i>-Degree Celsius</i>
<i>RCC</i>	<i>- Reinforced Cement Concrete</i>
<i>RD</i>	<i>- Reduced Distance</i>
<i>FSL</i>	<i>- Full Supply Level</i>
<i>DPR</i>	<i>- Detailed Project Report</i>
<i>U/S</i>	<i>- Upstream</i>
<i>D/S</i>	<i>- Downstream</i>
<i>GTS</i>	<i>- Great Trigonometrically Survey</i>
<i>G-D</i>	<i>- Gauge –Discharge</i>
<i>T&P</i>	<i>- Tools &Plants</i>
<i>IDC</i>	<i>- Interest during Construction</i>
<i>Rs</i>	<i>- Indian Rupees</i>
<i>O&M</i>	<i>-Operation and Maintenance</i>
<i>%</i>	<i>-Percent</i>
<i>WDV</i>	<i>- Written Down Value</i>
<i>SLM</i>	<i>- Straight Line Method</i>
<i>LS</i>	<i>- Lump Sum</i>
<i>IRR</i>	<i>- Internal Rate of Return</i>
<i>PBDT</i>	<i>-Profit before Depreciation &Taxes</i>
<i>DSCR</i>	<i>- Debt Service Coverage Ratio</i>

SALIENT FEATURES

1 Location

- | | |
|---------------|-----------------|
| i State | Jammu & Kashmir |
| ii District | Ganderbal |

iii	Town/Tehsil	Kangan
	Access Road	
iv		Jammu-Srinagar (NH-1A) Srinagar-Sonamarg Road.
v	Village	Kokran

2 Geographical Coordinates

i	Weir-Longitudes	75°20'29.56"E
	Latitudes	34°17'7.28"N
ii	Basin-Longitudes	75°20'28.54"E
	Latitudes	34°17'6.69"N
iii	Forebay-Longitudes	75°20'28.54"E
	Latitudes	34°17'6.69"N
vi	Powerhouse-Longitudes	75°20'6.74"E
	Latitudes	34°16'55.36"N

3 River Catchment

i	Catchment up to Headwork's	14 Sq-km
ii	Nallah/Stream	Kokran
iii	Tributary	River Sindh

4 Hydrology

	Catchment area of Nallah up to	
i	Diversion Weir site	14 Sq-km
ii	Climate Data	
	a) Precipitation (Avg. Rainfall)	1100 mm
	b) Precipitation Max.	1500 mm
iii.	Atmospheric Temp.	
	a) Max.	28°C
	b) Min.	(-) 18°C

5 Medium Head Scheme

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure	RCC Trench Weir	
ii. Discharge at Intake	3.15	Cumec
iii. Length	12	m
iv. Width	1.5	m
v. Average bed level of Nallah	2870	m
vi. Longitudinal bed Grade in Trench, 1 in	10	m
vii. Pond Level with 50% clogging	2869.20	m
viii. Highest Flood Level	2872.63	m
ix. Maximum Shingle Flushing Discharge	0.42	Cumec
x. Shingle Flushing Pipe Diameter	500	mm
xi. Sill Elevation of Flushing Pipe	2867.20	m
xii. Sill Elevation of Intake service Gate	2867.80	M
xiii. Sill Elevation of bulk head Gate	2868.00	M
xiv. Trash rack mesh openings	30.00	Mm
xv. Length of Intake well	3.50	M
xvi. Width of Intake well	3.00	M
xvii. Number of Gates in well	3	No
xviii. Height of Intake well	5.63	M

6 Water Conductor System Supply Channel

i. Supply Channel- Length	7	M
ii. Type of Structure	RCC Box Channel	
iii. Design Discharge	2.73	Cumec
iv. Bed width	1.5	M
v. Full Supply Flow depth	1.2	M
vi. Free board	0.4	
vii. Bed Grade	1 in	450

viii. Velocity of Flow	1.56 m/sec
------------------------	------------

7 Desilting Tank

i. Type of Structure	RCC common structure with Forebay
ii. Design Discharge	2.73 Cumec
iii. Length (main tank)	20 M
iv. Width	6 M
Depth of water in main part of Tank	
v. (FSD)	2.31 M
vi. Flushing discharge	0.42 Cumec
vii. Length (upstream transition)	13.5 M
viii. Length (downstream transition)	0.00 M
ix. Total Length including transitions	33.50 M
x. Particle size removal	0.2 mm and above
xi. Silt Flushing Pipe Length	20 M
xii. Type of Flushing	Through M.S pipe 500mm diameter
xiii. Flushing Control arrangement	500 mm Dia. Sluice Valve

9 Forebay

i. Type	RCC Rectangular Tank combined with Desilting Basin
ii. Full supply Water Level	2868.42 m
iii. Minimum Draw Down Level (MDDL)	2866.11 m
iv. Size	
a) Length	21.80 m
b) Width	6.0 m
c) Overall Depth	6.68 m
v. Design Discharge	2.52 Cumec
vi. Maximum Water Level	2868.92 m
vii. Spillway Crest Level	2868.42 m

viii.	Storage Capacity Time	2 min
ix.	Live Storage	302 m ³
10	Penstocks	
i.	Number	1 number
ii.	Diameter	1000 mm
iii.	Maximum Thickness	12 mm
	Each branch Diameter with Bifurcation	
iv.	at lower end	707 mm
v.	Length of main Penstock	944.02 m
vi.	Length of each branch penstock	15 m
vii.	Design discharge in main Pipe	2.52 Cumec
viii.	Design Discharge in branch pipe	1.26 Cumec
ix.	Velocity of Flow	3.21 m/sec
x	Maximum Pressure rise	51%
11	Power House	
i.	Type	Surface- RCC framed structure
ii.	Head	
	a) Gross	110.42 m
	b) Net	103.17 m
iii.	Size of power house:	
	a) Length	24 m
	b) Width	15 m
	c) Height (m)	13 m
	d) Machine Hall floor level	2756.75 m
iv.	Installed capacity	1.5MW
v.	Turbines	
	a) Type	Horizontal Francis
	b) Number	2 number
	c) Capacity each	0.75MW

vi.	Type of Generator:	Synchronous	
vii.	Power house crane / lifting tackle capacity	15	ton
viii.	Axis of turbine level	2758	m
12	Tailrace		
i.	Type	RCC Rectangular Section	
ii.	Bed width	2.8	m
iii.	Max. Flow depth	0.7	m
iv.	Design Discharge	2.52	Cumec
v.	Bed Grade	1 in 650	
vi.	Free board	0.6	m
vii.	Minimum Tail water Level	2758	m
viii.	Maximum Tail water level	2758.45	m
13	Power		
i.	Installed Capacity	1.5MW	
ii.	Primary Energy	1.75MU	
iii.	Total Annual gross Energy Average Year @ 75% dependability	7.1MU	
14	Switchyard		
i.	Voltage level/basic undulation level	3.3/11/33KV	
ii.	No. of Bays	One	
iii.	Size :-		
	(a) Length	13	m
	(b) Width	10	m
15	Transmission Line		
i.	Voltage Level	11/33.	KV
ii.	Length	14	km
iii.	Sub-station	Gagangeer	

SALIENT FEATURES(MHP Dadepath

1 *Location*

- | | |
|----------------------------|---|
| <i>i State</i> | <i>Jammu & Kashmir</i> |
| <i>ii District</i> | <i>Kishtawar</i> |
| <i>iii Town/Tehsil</i> | <i>Mughal Maidan</i> |
|
 | |
| <i>iv Access Road</i> | <i>Jammu-Srinagar (NH-1A) -Batote-Doda-Kishtawar-Dadepath Road.</i> |
| <i>v Village</i> | <i>Gagdan Mad</i> |

2 *Geographical Coordinates*

- | | |
|-----------------------------------|----------------------|
| <i>i Weir-Longitudes</i> | <i>75°40'23.16"E</i> |
| <i> Latitudes</i> | <i>33°23'58.16"N</i> |
| <i>ii Basin-Longitudes</i> | <i>75°40'26.17"E</i> |
| <i> Latitudes</i> | <i>33°23'56.68"N</i> |
| <i>iii Forebay-Longitudes</i> | <i>75°41'31.66"E</i> |
| <i> Latitudes</i> | <i>33°23'25.99"N</i> |
| <i>vi Powerhouse-Longitudes</i> | <i>75°41'36.28"E</i> |
| <i> Latitudes</i> | <i>33°23'27.46"N</i> |

3 *River Catchment*

- | | |
|--|---------------------|
| <i>i Catchment up to Headwork's</i> | <i>617 Sq-km</i> |
| <i>ii Nallah/Stream</i> | <i>Chatroo</i> |
| <i>iii Tributary</i> | <i>River Chenab</i> |

4 *Hydrology*

- | | |
|---|--------------------|
| <i>Catchment area of Nallah up to</i> | |
| <i>i Diversion Weir site</i> | <i>617 Sq-km</i> |
|
 | |
| <i>ii Climate Data</i> | |
| <i> a) Precipitation (Avg. Rainfall)</i> | <i>1100 mm</i> |
| <i> b) Precipitation Max.</i> | <i>1900 mm</i> |

iii. Atmospheric Temp.

a) Max. 34⁰C

b) Min. (-) 5⁰C

5 Medium Head Scheme

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure	RCC Trench Weir	
ii. Discharge at Intake	8.25	Cumec
iii. Length	20	m
iv. Width	2	m
v. Average bed level of Nallah	1202	m
vi. Longitudinal bed Grade in Trench, 1 in	10.00	m
vii. Pond Level with 50% clogging	1200.60	m
viii. Highest Flood Level	1213.10	m
ix. Maximum Shingle Flushing Discharge	1.1	Cumec
x. Shingle Flushing Pipe Diametre	600	mm
xi. Sill Elevation of Flushing Pipe	1197.90	m
xii. Sill Elevation of Intake service Gate	1198.50	m
xiii. Sill Elevation of bulk head Gate	1198.70	m
xiv. Trash rack mesh openings	30.00	mm
xv. Length of Intake well	3.50	m
xvi. Width of Intake well	3.00	m
xvii. Number of Gates in well	3	no
xviii. Height of Intake well	15.40	m

6 Water Conductor System Supply Channel

i. Supply Channel- Length	64.5	m
---------------------------	------	---

ii.	Type of Structure	RCC Box Channel	
iii.	Design Discharge	7.15	Cumec
iv.	Bed width	2.3	m
v.	Full Supply Flow depth	1.9	m
vi.	Free board	0.4	
vii.	Bed Grade	1 in	750
viii.	Velocity of Flow	1.62	m/sec

6a Water Conductor System Power Channel

i.	Power Channel- Length	2151.50	m
ii.	Type of Structure	RCC Box Channel	
iii.	Design Discharge	5.50	Cumec
iv.	Bed width	2.3	m
v.	Full Supply Flow depth	1.9	m
vi.	Free board	0.4	
vii.	Bed Grade	1 in	1200
viii.	Velocity of Flow	1.28	m/sec

7 Desilting Tank

i.	Type of Structure	RCC Rectangular bowl type tank	
ii.	Design Discharge	7.15	Cumec
iii.	Length (main tank)	35	m
iv.	Width	8.5	m
v.	Depth of water in main part of Tank (FSD)	4.27	m
vi.	Flushing discharge	1.1	cumec
vii.	Length (upstream transition)	18.6	m
viii.	Length (downstream transition)	12.40	m
ix.	Total Length including transitions	66.00	m
x.	Particle size removal	0.2 mm and above	

xi. Silt Flushing Pipe Length	20 m
xii. Type of Flushing	Through M.S pipe 600mm diameter
xiii. Flushing Control arrangement	600 mm Dia. Sluice Valve

9 Forebay
Type

i.	RCC Rectangular Tank
ii. Full supply Water Level	1197.91 m
iii. Minimum Draw Down Level (MDDL)	1195.91 m
iv. Size	
a) Length	50.00 m
b) Width	7.3 m
c) Overall Depth	8.11 m
v. Design Discharge	6.05 Cumec
vi. Maximum Water Level	1198.51 m
vii. Spillway Crest Level	1197.91 m
viii. Storage Capacity Time	2 min
ix. Live Storage	726 m ³

10 Penstocks

i. Number	1 number
ii. Diameter	1550 mm
iii. Maximum Thickness	8 mm
Each branch Diameter with Bifurcation	
iv. at lower end	1096 mm
v. Length of main Penstock	129.8 m
vi. Length of each branch penstock	15 m
vii. Design discharge in main Pipe	6.05 Cumec
viii. Design Discharge in branch pipe	3.025 Cumec
ix. Velocity of Flow	3.21 m/sec

	x	Maximum Pressure rise	22%
11		Power House	
	i.	Type	Surface- RCC framed structure
	ii.	Head	
		a) Gross	37.91 m
		b) Net	36.15 m
	iii.	Size of power house:	
		a) Length	25 m
		b) Width	15 m
		c) Height (m)	13 m
		d) Machine Hall floor level	1156.75 m
	iv.	Installed capacity	1.5MW
	v.	Turbines	
		a) Type	Horizontal Francis
		b) Number	2 number
		c) Capacity each	0.75MW
	vi.	Type of Generator:	Synchronous
		Power house crane / lifting tackle capacity	
	vii.		18 ton
	viii.	Axis of turbine level	1158 m
12		Tailrace	
	i.	Type	RCC Rectangular Section
	ii.	Bed width	6 m
	iii.	Max. Flow depth	0.7 m
	iv.	Design Discharge	6.05 Cumec
	v.	Bed Grade	1 in 700
	vi.	Free board	0.6 m
	vii.	Minimum Tail water Level	1160 m
	viii.	Maximum Tail water level	1160.45 m

13	Power	
i.	Installed Capacity	1.5MW
ii.	Primary Energy	2.1MU
iii.	Total Annual gross Energy Average Year @ 75% dependability	9.0MU
14	Switchyard	
i.	Voltage level/basic undulation level	3.3/11/33KV
ii.	No. of Bays	One
iii.	Size :-	
	(a) Length	15 m
	(b) Width	10 m
15	Transmission Line	
i.	Voltage Level	11/33. KV
ii.	Length	0.5 km
iii.	Sub-station	Dadepath
16	Hard Cost of Project 18.2cr.	

<i>HFL</i>	- <i>Highest Flood Level</i>
<i>EL</i>	- <i>Elevation (Above Mean Sea Level)</i>
<i>OC</i>	- <i>Degree Celsius</i>
<i>RCC</i>	- <i>Reinforced Cement Concrete</i>
<i>RD</i>	- <i>Reduced Distance</i>
<i>FSL</i>	- <i>Full Supply Level</i>
<i>DPR</i>	- <i>Detailed Project Report</i>
<i>U/S</i>	- <i>Upstream</i>
<i>D/S</i>	- <i>Downstream</i>
<i>GTS</i>	- <i>Great Trigonometrically Survey</i>
<i>G-D</i>	- <i>Gauge –Discharge</i>
<i>T&P</i>	- <i>Tools &Plants</i>
<i>IDC</i>	- <i>Interest during Construction</i>
<i>Rs</i>	- <i>Indian Rupees</i>
<i>O&M</i>	- <i>Operation and Maintenance</i>
<i>%</i>	- <i>Percent</i>
<i>WDV</i>	- <i>Written Down Value</i>
<i>SLM</i>	- <i>Straight Line Method</i>
<i>LS</i>	- <i>Lump Sum</i>
<i>IRR</i>	- <i>Internal Rate of Return</i>
<i>PBDT</i>	- <i>Profit before Depreciation & Taxes</i>
<i>DSCR</i>	- <i>Debt Service Coverage Ratio</i>

SALIENT FEATURES(MHP Keshwan 2x1mw)

1 Location

<i>i State</i>	<i>Jammu & Kashmir</i>
<i>ii District</i>	<i>Kishtwar</i>
<i>iii Town/Tehsil</i>	<i>Mughal Maidan</i>

	Access Road	Jammu-Srinagar (NH-1A) Batote-Doda-Kishtwar-Keshwan-Thakri Road.
iv		
v	Village	Thakri
2	Geographical Coordinates	
i	Weir-Longitudes	75° 24'20.09"E
	Latitudes	33°46'46.31"N
ii	Basin-Longitudes	75° 24'16.51"E
	Latitudes	33°46'45.35"N
iii	Forebay-Longitudes	75° 24'16.51"E
	Latitudes	33°46'45.35"N
vi	Powerhouse-Longitudes	75° 23'29.49"E
	Latitudes	33°47'3.46"N
3	River Catchment	
i	Catchment up to Headwork's	49 Sq-km
ii	Nallah/Stream	Keshwan
iii	Tributary	Silwadi/River Chenab
4	Hydrology	
	Catchment area of Nallah up to	
i	Diversion Weir site	49 Sq-km
ii	Climate Data	
	a) Precipitation (Avg. Rainfall)	1100 mm
	b) Precipitation Max.	1900 mm
iii.	Atmospheric Temp.	
	a) Max.	32 ⁰ C
	b) Min.	(-) 5 ⁰ C
5	Medium Head Scheme	
5.1	Diversion Structure (Head works)	
5.1.1	Weir	

i. Type of Structure	RCC Trench Weir	
ii. Discharge at Intake	4.20	Cumec
iii. Length	15	m
iv. Width	2	m
v. Average bed level of Nallah	1664	m
vi. Longitudinal bed Grade in Trench, 1 in	10	m
vii. Pond Level with 50% clogging	1663.10	m
viii. Highest Flood Level	1668.24	m
ix. Maximum Shingle Flushing Discharge	0.56	Cumec
x. Shingle Flushing Pipe Diameter	500	mm
xi Sill Elevation of Flushing Pipe	1660.90	m
xii Sill Elevation of Intake service Gate	1661.50	m
xiii Sill Elevation of bulk head Gate	1661.70	m
xiv Trash rack mesh openings	30.00	mm
xv Length of Intake well	3.50	m
xvi Width of Intake well	3.00	m
xvii Number of Gates in well	3	no
xviii Height of Intake well	7.54	m

6 Water Conductor System Supply Channel

i. Supply Channel- Length	43.74	m
ii. Type of Structure	RCC Box Channel	
iii. Design Discharge	3.64	Cumec
iv. Bed width	1.8	m
v. Full Supply Flow depth	1.4	m
vi. Free board	0.4	
vii. Bed Grade	1 in	600
viii. Velocity of Flow	1.52	m/sec

7 Desilting Tank

i. Type of Structure	RCC common structure with Forebay	
ii. Design Discharge	3.64	Cumec
iii. Length (main tank)	25	m
iv. Width	6	m
Depth of water in main part of Tank		
v. (FSD)	3.08	m
vi. Flushing discharge	0.56	cumec
vii. Length (upstream transition)	12.6	m
viii. Length (downstream transition)	0.00	m
ix. Total Length including transitions	37.60	m
x. Particle size removal	0.2 mm and above	
xi. Silt Flushing Pipe Length	20	m
xii. Type of Flushing	Through M.S pipe 400mm diameter	
xiii. Flushing Control arrangement	400 mm Dia. Sluice Valve	

9 Forebay

Type		
i.	RCC Rectangular Tank combined with Desilting Basin	
ii. Full supply Water Level	1662.29	m
iii. Minimum Draw Down Level (MDDL)	1659.20	m
iv. Size		
a) Length	21.80	m
b) Width	6.0	m
c) Overall Depth	7.93	m
v. Design Discharge	3.36	Cumec
vi. Maximum Water Level	1662.79	m
vii. Spillway Crest Level	1662.29	m
viii. Storage Capacity Time	2	min

ix.	Live Storage	403	m ³
10	Penstocks		
i.	Number	1	number
ii.	Diameter	1150	mm
iii.	Maximum Thickness	12	mm
	Each branch Diameter with Bifurcation		
iv.	at lower end	813	mm
v.	Length of main Penstock	1085.105	m
vi.	Length of each branch penstock	15	m
vii.	Design discharge in main Pipe	3.36	Cumec
viii.	Design Discharge in branch pipe	1.68	Cumec
ix.	Velocity of Flow	3.23	m/sec
x	Maximum Pressure rise	90%	
11	Power House		
i.	Type	Surface- RCC framed structure	
ii.	Head		
	a) Gross	94.29	m
	b) Net	86.95	m
iii.	Size of power house:		
	a) Length	25	m
	b) Width	15	m
	c) Height (m)	13	m
	d) Machine Hall floor level	1566.75	m
iv.	Installed capacity	2.00	MW
v.	Turbines		
	a) Type	Horizontal Francis	
	b) Number	2	number
	c) Capacity each	1	MW
vi.	Type of Generator:	Synchronous	

	Power house crane / lifting tackle capacity	18 ton
	Axis of turbine level	1568 m
12	Tailrace	
i.	Type	RCC Rectangular Section
ii.	Bed width	4 m
iii.	Max. Flow depth	0.7 m
iv.	Design Discharge	3.36 Cumec
v.	Bed Grade	1 in 900
vi.	Free board	0.6 m
vii.	Minimum Tail water Level	1568 m
viii.	Maximum Tail water level	1568.45 m
13	Power	
i.	Installed Capacity	2.00 MW
ii.	Primary Energy	1.79 mu
iii.	Total Annual gross Energy Average Year @ 75% dependability	9.63 mu
14	Switchyard	
i.	Voltage level/basic undulation level	3.3/11/33KV
ii.	No. of Bays	One
iii.	Size :-	
	(a) Length	13 m
	(b) Width	10 m
15	Transmission Line	
i.	Voltage Level	11/33. KV
ii.	Length	11 km
iii.	Sub-station	Dadepath
16	Hard Cost of Project	

SALIENT FEATURES(MHP Pahalgawra I 2x1mw)

1 Location

<i>i</i>	State	Jammu & Kashmir
<i>l</i>	District	Kishtawar
<i>li</i>	Town/Tehsil	Chatroo
	Access Road	
<i>iv</i>		Jammu-Srinagar (NH-1A) Batote-Kishtawar- Pahalgawra Road.
<i>v</i>	Village	Pahalgawra

2 Geographical Coordinates

<i>i</i>	Weir-Longitudes	75°35'20.51"E
	Latitudes	33°31'53.01"N
<i>l</i>	Basin-Longitudes	75°35'19.63"E
	Latitudes	33°31'48.57"N
<i>li</i>	Forebay-Longitudes	75°35'20.45"E
	Latitudes	33°31'20.93"N
<i>vi</i>	Powerhouse-Longitudes	75°35'16.15"E
	Latitudes	33°31'21.25"N

3 River Catchment

<i>i</i>	Catchment up to Headwork's	43 Sq-km
<i>l</i>	Nallah/Stream	Khawria
<i>li</i>	Tributary	Chatroo/River Chenab

4 Hydrology

	Catchment area of Nallah up to	
<i>i</i>	Diversion Weir site	43 Sq-km
<i>l</i>	Climate Data	
	<i>a)</i> Precipitation (Avg. Rainfall)	1200 mm
	<i>b)</i> Precipitation Max.	1900 mm

li. Atmospheric Temp.

a) Max. 30⁰C

b) Min. (-) 13⁰C

5 Medium Head Scheme

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure

RCC Trench Weir

l. Discharge at Intake

5.48 Cumec

li. Length

20 m

iv. Width

2 m

v. Average bed level of Nallah

2178 m

vi. Longitudinal bed Grade in Trench, 1 in

10 m

vi. Pond Level with 50% clogging

2176.70 m

vli. Highest Flood Level

2181.28 m

ix. Maximum Shingle Flushing Discharge

0.73 Cumec

x. Shingle Flushing Pipe Diameter

600 mm

xi Sill Elevation of Flushing Pipe

2174.40 m

xl Sill Elevation of Intake service Gate

2175.00 m

xli Sill Elevation of bulk head Gate

2175.20 m

xiv Trash rack mesh openings

30.00 mm

xv Length of Intake well

3.50 m

xvi Width of Intake well

3.00 m

xvi Number of Gates in well

3 no

xvli Height of Intake well

7.08 m

6 Water Conductor System Supply Channel

i. Supply Channel- Length

181.26 m

I. Type of Structure	RCC Box Channel		
II. Design Discharge	4.75	Cumec	
iv. Bed width	2	m	
v. Full Supply Flow depth	1.5	m	
vi. Free board	0.4		
vI. Bed Grade	1 in	600	
vli. Velocity of Flow	1.61	m/sec	

6 Water Conductor System power Channel

i. Power Channel- Length	815.88	m	
I. Type of Structure	RCC Box Channel		
II. Design Discharge	4.10	Cumec	
iv. Bed width	2.1	m	
v. Full Supply Flow depth	1.5	m	
vi. Free board	0.4		
vI. Bed Grade	1 in	1000	
vli. Velocity of Flow	1.27	m/sec	

7 Desilting Tank

i. Type of Structure	RCC Rectangular Bowl structure		
I. Design Discharge	4.75	Cumec	
II. Length (main tank)	32	m	
iv. Width	6	m	
Depth of water in main part of Tank			
v. (FSD)	4.02	m	
vi. Flushing discharge	0.73	cumec	
vI. Length (upstream transition)	12	m	
vli. Length (downstream transition)	7.80	m	
ix. Total Length including transitions	51.80	m	
x. Particle size removal	0.2 mm and above		

xi. Silt Flushing Pipe Length	20 m
xl. Type of Flushing	Through M.S pipe 500mm diameter
xli. Flushing Control arrangement	500 mm Dia. Sluice Valve

**9 Forebay
Type**

i.	RCC Rectangular Tank
I. Full supply Water Level	2174.79 m
II. Minimum Draw Down Level (MDDL)	2172.79 m
iv. Size	
a) Length	50.00 m
b) Width	5.2 m
c) Overall Depth	6.69 m
v. Design Discharge	4.38 Cumec
vi. Maximum Water Level	2175.29 m
vI. Spillway Crest Level	2174.79 m
vli. Storage Capacity Time	2 min
ix. Live Storage	526 m ³

10 Penstocks

i. Number	1 number
I. Diameter	1100 mm
II. Maximum Thickness	8 mm
iv. Each branch Diameter with Bifurcation at lower end	778 mm
v. Length of main Penstock	116.6 m
vi. Length of each branch penstock	15 m
vI. Design discharge in main Pipe	4.38 Cumec
vli. Design Discharge in branch pipe	2.19 Cumec
ix. Velocity of Flow	4.61 m/sec

	x	Maximum Pressure rise	19%
11		Power House	
	i.	Type	Surface- RCC framed structure
	l.	Head	
		a) Gross	70.79 M
		b) Net	66.76 M
	li.	Size of power house:	
		a) Length	25 M
		b) Width	15 M
		c) Height (m)	13 M
		d) Machine Hall floor level	2102.75 M
	iv.	Installed capacity	2.00 MW
	v.	Turbines	
		a) Type	Horizontal Francis
		b) Number	2 Number
		c) Capacity each	1 MW
	vi.	Type of Generator:	Synchronous
		Power house crane / lifting tackle	
	vi.	capacity	18 Ton
	vli.	Axis of turbine level	2104 M
12		Tailrace	
	i.	Type	RCC Rectangular Section
	l.	Bed width	4.25 M
	li.	Max. Flow depth	0.7 M
	iv.	Design Discharge	4.38 Cumec
	v.	Bed Grade	1 in 600
	vi.	Free board	0.6 M
	vli.	Minimum Tail water Level	2104 M

	vli. Maximum Tail water level	2104.45 M
13	Power	
	i. Installed Capacity	2.00 MW
	l. Primary Energy	1.62 Mu
	Total Annual gross Energy Average	
	li. Year @ 75% dependability	9.30 Mu
14	Switchyard	
	i. Voltage level/basic undulation level	3.3/11/33KV
	l. No. of Bays	One
	li. Size :-	
	(a) Length	13 M
	(b) Width	10 M
15	Transmission Line	
	i. Voltage Level	11/33. KV
	l. Length	13 Km
	li. Sub-station	
16	Hard Cost of Project	16.72Cr.

SALIENT FEATURES

1. Location

i	State	Jammu & Kashmir
ii	District	Kupwara
iii	Town / Tehsil	Handwara
iv	Access Road	Srinagar -Kupwara -Tangdar Road
v	Village	Tumina

2. Geographical Coordinates

i	Longitudes	H/W	74 ⁰ 2'48.89"E
ii	Latitudes		34 ⁰ 28'8.86"N
		D/B	74 ⁰ 3'3.04"E
			34 ⁰ 28'12.28"N
		F/B	74 ⁰ 4'1.33"E
			34 ⁰ 28'24.39"N
		P/H	74 ⁰ 4'0.43"E
			34 ⁰ 28'29.64"N

3. River Catchment

i	Catchment up to Headwork's	221Sq-Km
ii	Nallah / Stream	Kahmil Nallah
iii	Tributary of	Jhelum

4. Hydrology

i	Catchment area of Nallah up to Diversion Weir site	221Sq-Km
ii	Climate Data :-	
	a) Precipitation (Avg. Rainfall)	1200 mm
	b) Precipitation Max.	1600 mm
iii.	Atmospheric Temp.	

- | | |
|---------|----------|
| a) Max. | 34 °C |
| b) Min. | (-) 10°C |

5. Medium Head Scheme

Diversion Structure (Head works)

Weir

- | | |
|---|------------------------|
| i. Type of Structure | Trench Type (RCC Weir) |
| ii. Length | 25.00 m |
| iii. Width | 2 m |
| iv. Pond Level (with 50% Clogging) | 1932.80 m |
| v. Bed Grade | 1 in 16.7 |
| vi. Discharge at Intake | 7.98Cumecs |
| vii. Average Bed Level of Nallah | 1934.00 m |
| viii. Shingle Flushing Discharge | 15% of Power draft |
| ix. Shingle Flushing Pipe diameter | 0.6 m |
| x. Sill Elevation of Flushing Pipe | 1930.20 m |
| xi. Sill Elevation of Intake service Gate | 1931.00 m |

6. Water Conductor System Supply Channel

- | | |
|---------------------------|-------------------------|
| i. Supply Channel- RD | 0 m to 340.00 m |
| ii. Type of Structure | RCC Rectangular Channel |
| iii. Design Discharge | 6.60 Cumecs |
| iv. Bed Width | 2.5 m |
| v. Full Supply Flow depth | 1.8 m |
| vi. Free board | 0.4 m |
| vii. Bed Grade | 1 in 950 |
| viii. Velocity of Flow | 1.47 m/sec |

7. Desilting Tank

- | | |
|----------------------|-----------------------------------|
| | RD 340.00 m to 403.00 m |
| i. Type of Structure | RCC Single bay with flushing duct |

ii.	Design Discharge	6.60Cumecs
iii.	Length (main tank)	50 m
iv.	Width	8.39 m
v.	Depth of water in main part of Tank	4m
vi.	Flushing discharge	1.1 Cumecs
vii.	Length (upstream transition)	8 m
viii.	Length (downstream transition)	5 m
ix.	Total Length including transitions	63 m
x.	Particle size removal and above	0.2mm
xi.	Silt Flushing Pipe Length	42 m
xii.	Type of Flushing	Through M.S pipe 500 mm dia
xiii.	Flushing Control arrangement	500 mm Dia. Sluice Valve
8.	Power Channel	RD 403.00 m to 1990.0m
i.	Type of Structure	RCC Rectangular Channel
ii.	Design Discharge	5.50 Cumecs
iii.	Bed Width	2.5 m
iv.	Full Supply Flow Depth	1.8 m
v.	Free board	0.4 m
vi.	Bed Grade	1 in 1500
vii.	Velocity of Flow	1.17m/sec
9.	Forebay	
i.	Type	RCC Rectangular Tank
ii.	Full supply Water Level	1931.02 m
iii.	Minimum Draw Down Level (MDDL)	1929.22 m
iv.	Size	
	a) Length	25.00 m
	b) Width	16.13m

c) Overall Depth	7.32 m
v. Design Discharge	6.05 Cumecs
vi. Maximum Water Level	1931.72 m
vii. Spillway Crest Level	1931.02 m
viii. Storage Capacity Time	2 Min.
ix. Live Storage	726 m ³

10. Penstocks

i. Number	1 No
ii. Diameter	1.4 m
iii. Thickness	8 mm
iv. Each branch Diameter with Bifurcation at lower end	990 mm
v. Length of main Penstock	106 m
vi. Length of each branch penstock	12 m
vii. Design discharge in main Pipe	6.05 Cumecs
viii. Design Discharge in branch pipe	3.03 Cumecs
ix. Velocity of Flow	3.93m/sec

11. Power House

i. Type	Surface RCC framed structure
ii. Head (m):-	
a) Gross	37.47 m
b) Net	35.55 m
iii. Size of power house:	
a) Length (m)	24.2 m
b) Width (m)	14.97 m
c) Height (m)	13.5m
d) Machine Hall floor level	
iv. Installed capacity	1.60 MW

v.	Turbines :-	
a)	Type	Horizontal Francis
b)	Number	2 no.
c)	Capacity each	0.8 MW
vi.	Type of Generator:	Synchronous
vii.	Power house crane / lifting tackle capacity	15 T
viii.	Axis of turbine level	1891.6 m
12. Tailrace		
i.	Type	RCC Rectangular open Section
ii.	Bed width	5 m
iii.	Max. Flow depth	0.85 m
iv.	Design Discharge	6.05 Cumecs
v.	Bed Grade	1 in 800
vi.	Free board	0.6 m
vii.	Minimum Tail water Level	1893.0m
viii.	Maximum Tail water level	1893.55m
13. Power		
i.	Installed Capacity	1.60 MW
ii.	Primary Energy	1.50 MU
iii.	Total Annual Energy Average Year @ 75% dependability	8.46 MU
14. Switchyard		
i.	Voltage level/basic undulation level	3.3/11KV
ii.	No. of Bays	One (1)
iii.	Size :-	
(a)	Length	17.1m
(b)	Width	13.0m

15. Transmission Line

- | | | |
|------|---------------|----------|
| i. | Voltage Level | 11kV |
| ii. | Length | 05 Km |
| iii. | Sub-station | Kralpora |

16. Hard Cost of Project 20.18 Cr

SALIENT FEATURES**1. Location**

(i)	State	Jammu & Kashmir
(ii)	District	Poonch
(iii)	Tehsil	Mandi
(iv)	Access Road	Mandi-Sawjia-Galimaidan road
(v)	Village	Sawjia
(vi)	Geographical Coordinates	
	i) Longitudes	H/W 74°19' 13.20"E
	ii) Latitudes	33° 52' 55.48" N

2. River Catchment

(i)	Catchment up to Headwork's	25.24Sq.Kms
(ii)	River	Sawjia Nallah
(iii)	Tributary	Mandi

3. Hydrology

(i)	Catchment area of the Nallah up to Diversion Weir site	25.24 Sq.Kms
ii)	Precipitation (Avg. Rainfall)	1200mm
(ii)	Climate Data	
	Atmospheric Temp.	
	Max.	32°C
	Min.	-04°C

4. MEDIUM HEAD SCHEME**(a) Diversion Structure (Head works)****Weir**

i)	Type of Structure	Conventional RCC / Boulder Weir
ii)	Length	16.50 m

Promoter: Jammu & Kashmir Energy Development Agency

iii)	Maximum Discharging Capacity	99.0Cumecs
iv)	Head over Crest	2.20 m
v)	Weir Crest Elevation	2216.82 m

5. Under sluice

i)	Type of structure	RCC Rectangular
ii)	Discharge Capacity	46.80Cumecs
iii)	No. of Bays	1
iv)	Width of each Bay (1 bay only)	3. 0m
v)	Sill Elevation	2214.00 m
vi)	Bottom Sill depth from intake invert	1.5 m

6. Head Regulator Intake

i)	Type of structure	RCC Rectangular
ii)	Designed Discharge	4.75Cumecs
iii)	No. of Bays	2.0 No
iv)	Width of each Bay	2.60 m
v)	Sill Elevation	2215.50 m
vi)	Bottom Sill depth from intake invert	0.5m
vii)	No. of Gates	2.0 No
viii)	Width of Gate	2.60 m
ix)	Height of Gate	1.30 m

7. Supply channel M S pipe From RD 0 to 89.07mts

(i)	Length	89.07 m
(ii)	Diameter of pipe	1800 mm
(iii)	Bed grade	1 in 750
(iv)	Velocity	2.04 m/sec

Promoter: Jammu & Kashmir Energy Development Agency

(v) F.S.D. 1.41 m

(vi) Design Discharge 4.38 Cumecs

8. Desilting Tank from RD 89.07 m to 152.07m including U/S & D/S transitions

- i) Type of Structure RCC Single bay with flushing duct
- ii) Length (main tank) 50m
- iii) Width 7.40 m
- iv) Depth of water in main part 3 m
- v) Flushing discharge 0.88Cumecs
- vi) Length (upstream transition) 8.0m
- vii) Length (downstream transition) 5.0 m
- viii) Total Length including transitions 63 m
- ix) particle size removal 0.20 mm &above
- x) Design Discharge 4.38 Cumecs
- xi) Type of Flushing Through M.S pipe 500 mm dia
- xii) Flushing Control arrangement 500 mm Dia. Sluice Valve

9. Water Conductor System (Power channel) RD 152.07 to RD 422.75 m

- i) Type M.S pipe
- ii) Design Discharge 3.65 Cumecs
- iii) Velocity of Flow 1.82m/sec
- iv) Full supply Depth 1.35 m
- v) Diameter 1.75m
- vi) Free board 20%
- vii) Bed Grade 1 in 900

10. Forebay type RCC Rectangular Tank

- i) Full supply Water Level 2216.10m

ii)	Minimum Draw Down Level (MDDL)	2214.74 m
iii)	Size	
	a) Length	60.0 m
	b) Width	5.90 m
	c) Depth	6.04 m
iv)	Design Discharge	4.02 Cumecs
vi)	Maximum Water Level	2216.50 m
vii)	Spillway Crest Level	2216.10 m
viii)	Storage Capacity Time	2 Min.
ix)	Live Storage	482m ³

11. Penstock

i)	Number	1
ii)	Diameter	1.0m
	Thickness	8 mm
iii)	Each branch Diameter with Bifurcation at lower end	0.710m
iv)	Length of main Penstock	159.0 m
v)	Length of each branch penstock	15.0 m
vii)	Centerline Level at inlet	2145.0 m
viii)	Design discharge in main Pipe	4.02 Cumecs
ix)	Design Discharge in branch pipe	2.01 Cumecs
x)	Velocity of Flow	5.11 m/sec

12. Power House

(i)	Type	Surface RCC framed structure
(ii)	Head	
	a) Gross	71.69 m

b) Net	67.49 m
(iii) Size of power house:	
(a) Length	21. 0m
(b) Width	13. 0m
(c) Height	13.0m
(d) Machine Hall floor level	2143.46 m
(iv) Installed capacity	2.0M W
(v) Turbine (s):	
Type	Horizontal Francis
a) Number	2 nos.
b) Capacity each	1.0 MW
(vi) Type of Generator:	Synchronous
(vii) EOT Crane, 18 MT capacity	
Power house crane / lifting tackle capacity	
(viii) Axis of turbine level	2145.0 m
13. Tailrace	RCC rectangular channel
(i) Shape	
ii) Tail Water Level	
a) Max	2144.41 m
b) Min	2143.91 m
iii) Size of Tailrace duct	3.0 x 1.30
14. Power	
i) Installed Capacity	2.0 MW
ii) Primary Energy	2.41 MU
iii) Gross Energy	10.41 MU
15. Switchyard	

Promoter: Jammu & Kashmir Energy Development Agency

- | | | |
|------------------------------|--------------------------------------|---|
| i) | Voltage level/basic undulation level | 3.3/11KV |
| ii) | No. of Bays | One (1) |
| iii) | Size | |
| | (a) Length | 17. 0m |
| | (b) Width | 13.0m |
| 16. Transmission Line | | |
| i) | Voltage Level | 11kV |
| ii) | Length | 10Km |
| iii) | Sub-station | Sekloo(10km) receiving station 33/11KVA |
|
 | | |
| 17. | Hard Cost of Project | 13.94 Cr. |
-

SALIENT FEATURES

1 LOCATION

(i)	State	Jammu & Kashmir
(ii)	District	Poonch
(iii)	Town	Surankote
(iv)	Access Road	Mugal Road
(v)	Village	Chandimard
(vi)	Geographical Coordinates	
	i) Longitudes	H/W 75°25' 35.42" E
	ii) Latitudes	33° 37' 35.44" N

2 RIVER CATCHMENT

(i)	Catchment up to Headwork's	39 Sq. Kms.
(ii)	River	Sanai Nallah
(iii)	Tributary	Nil

3 HYDROLOGY

	Catchment area of the Nallah up to	
(i)	Diversion Weir site	39.00 Sq. Km
	Precipitation (Avg. Rainfall)	950 mm
(ii)	Climate Data	
	Atmospheric Temp.	
	Max.	32°C
	Min.	-10°C

4 MEDIUM HEAD SCHEME

(a)	Diversion Structure (Head works)
-----	----------------------------------

Weir

i)	Type of Structure	Conventional RCC / Boulder weir
----	-------------------	---------------------------------------

Promoter: Jammu & Kashmir Energy Development Agency

ii)	Length	28.0 m
iii)	Maximum Discharging Capacity	146 Cumecs
	Head over Crest	2.0 m
	Weir Crest Top Elevation	1948.89 m

5 Under-sluice

i)	Type of structure	RCC Rectangular section
ii)	Discharge Capacity	63.64 Cumecs
iii)	No. of Bays	1 No
iv)	Width of each Bay (1 bay only)	4.0m
v)	Sill Elevation	1946 m
	Bottom Sill depth from intake invert	1.5 m

Intake

6 Head Regulator Intake

i)	Type of structure	RCC Rectangular
ii)	Designed Discharge	5.46 Cumecs
iii)	No. of Bays	2
iv)	Width of each Bay	2.0 m
v)	Sill Elevation	1947.5 m
vi)	Bottom Sill depth from intake invert	1.5 m
vii)	No. of Gates	2
viii)	Width of Gate	2.80 m
ix)	Height of Gate	1.40 m

**7. Supply channel RCC Box
From RD 0 to 343.71 m**

(i)	Length	343.71 m
(ii)	Bed Width	2.4 m

Promoter: Jammu & Kashmir Energy Development Agency

(iii)	Bed grade	1 in 800
(iv)	Velocity	1.48 m/sec
(v)	F.S.D.	1.45 mtr
(vi)	Design Discharge	5.04 Cumecs

8.a De-silting Tank from RD343.71 m to 406.71 including U/S & D/S transitions

i)	Type of Structure	RCC Single bay with flushing duct
ii)	Length (main tank)	50m
iii)	Width	8.50 m
iv)	Depth of water in main part	3.0 m
v)	Flushing discharge	1.01 Cumecs
vi)	Length (upstream transition)	8.0m
vii)	Length (downstream transition)	5.0 m
viii)	Total Length including transitions	63 m
ix)	particle size removal above	0.20 mm
x)	Design Discharge	5.04 Cumecs
xi)	Type of Flushing	Through M.S pipe 500
xii)	Flushing Control arrangement	500 mm Dia. Sluice Valve

8b Water Conductor System (Power channel) RD 406.71 to RD 864.0 m

i)	Type	RCC Box
ii)	Design Discharge	4.2 Cumecs
iii)	Velocity of Flow	1.27mts/sec
iv)	Full supply Depth	1. 45m
v)	Bed width	2.4 m
vi)	Free board	0.4 m

Promoter: Jammu & Kashmir Energy Development Agency

vii)	Bed Grade	1 in 1100
8	Forebay type	RCC Rectangular Tank
i)	Full supply Water Level	1947.63 m
	Minimum Draw Down Level (MDDL)	1946.18 m
iii)	Size	
	Length	22.0 m
	Width	17.40 m
	Depth	5.74 m
iv)	Design Discharge	4.62 Cumecs
v)	Maximum Water Level	1948.23 m
	Spillway Crest Level	1947.63 m
vi)	Storage Capacity Time	2 Min.
vii)	Live Storage	554 M ³
10.	Penstocks	
i)	Number	1 No
ii)	Diameter	1.0 m
iii)	Thickness	8 mm
	Each branch Diameter with Bifurcation at lower end	0.78m
iv)	Length of main Penstock	122 m
v)	Length of each branch penstock	12 m
		1893.75 m
vii)	Centerline Level at inlet	
viii)	Design discharge in main Pipe	4.62 Cumecs
ix)	Design Discharge in branch pipe	2.31 Cumecs
x)	Velocity of Flow	4.86 m/sec

(11) Power House

(i)	Type	Surface RCC framed structure
(ii)	Head (m):	
	Gross	50.00 m
(iii)	Net	46.53 m
(iv)	Size of power house:	
(v)	Length (m)	21 m
(vi)	Width (m)	13.0m
(vii)	Height (m)	13.0m
(viii)	Machine Hall floor level	1893.76
(ix)	Installed capacity	1.70M W

(12) Turbine (s):

i)	Type	Horizontal Francis
ii)	Number	2 nos.
iii)	Capacity each	0.85 MW
(iv)	Type of Generator:	Synchronous
(v)	Power house crane / lifting tackle capacity	EOT Crane, 14 T capacity
(vi)	Axis of turbine level	1895 m

(13) Tailrace RCC rectangular
channel

(i) Shape

ii)	Tail Water Level	
	Maxi.	1897.61(max)
	Mini.	1897.16 (mini)

(iii)	Size of Tailrace duct	4.0 x 1.3 m
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14 POWER

i)	Installed Capacity	1.4MW
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ii) <i>Primary Energy</i>	1.4MU
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<i>Total Annual Energy Average Year @ 75%</i>	6.2MU
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iii) *dependability*

15 SWITCHYARD

i)	Voltage level/basic undulation level	3.3/33KV
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<i>ii)</i>	<i>No. of Bays</i>	<i>One (1)</i>
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iii)	Size	
	(a) Length	17.10m

(b) Width 12.45m

16. TRANSMISSION LINE

i) Voltage Level 11/33kV

ii) *Length* 13Km

iii) Sub-station Draba Receiving station
11/33KVA

SALIENT FEATURES

1. Location

i	State	Jammu & Kashmir
ii	District	Poonch
iii	Tehsil	Mandi
iv	Access Road	Jammu-Rajouri-Poonch and Srinagar-Shopian -Poonch (Mughal road)
v	Village	Gagrian

2. Geographical Coordinates

i	Longitudes	H/W	74°17'9.77"E
ii	Latitudes		33°53'44.65"N
		D/B	74° 17'12.47"E
			33°53'43.31"N
		F/B	74° 17'17.25"E
			33°53'20.96"N
		P/H	74° 17'23.42"E
			33°53'23.37"N

3. River Catchment

i	Catchment up to Headwork's	62.30 Sq-Km
ii	Nallah/Stream	Gagrian
iii	Tributary	Jhelum

4. Hydrology

i	Catchment area of Nallah up to Diversion Weir site	62.30 Sq-Km
ii	Climate Data :-	
	a) Precipitation (Avg. Rainfall)	1200 mm
	b) Precipitation Max.	1600 mm

iii. Atmospheric Temp.

a) Max. 33 °C

b) Min. (-) 6°C

5. Medium Head Scheme

Diversion Structure (Head works)

Weir

i. Type of Structure	Trench Type (RCC)
ii. Length	15.00 m
iii. Width	2 m
iv. Pond Level (with 50% Clogging)	2011.15 m
v. Bed Grade in Trench	1 in 18.8
vi. Discharge at Intake	4.64 Cumecs
vii. Average Bed Level of Nallah	2012.00 m
viii. Shingle Flushing Discharge	15% of Power draft
ix. Shingle Flushing Pipe Diameter	0.6 m
x. Sill Elevation of Flushing Pipe	2009.40 m
xi. Sill Elevation of Intake service Gate	2010.20 m

6. Water Conductor System Supply Channel

i. Supply Channel- RD	0 m to 46.12 m
ii. Type of Structure	RCC Box Channel
iii. Design Discharge	3.84 Cumecs
iv. Bed Width	1.8 m
v. Full Supply Flow depth	1.40 m
vi. Free board	0.4 m
vii. Bed Grade	1 in 600
viii. Velocity of Flow	1.52 m/sec

7. Desilting Tank RD 46.12 m to RD 107.12 m

i.	Type of Structure	RCC Single bay with flushing duct
ii.	Design Discharge	3.84 Cumecs
iii.	Length (main tank)	50.0 m
iv.	Width	6.5 m
v.	Depth of water in main part of Tank	3.00 m
vi.	Flushing discharge	0.64 Cumecs
vii.	Length (upstream transition)	7 m
viii.	Length (downstream transition)	4 m
ix.	Total Length including transitions	61.0 m
x.	Particle size removal	0.2 mm and above
xi.	Silt Flushing Pipe Length	28.80m
xii.	Type of Flushing	Through M.S pipe 400mm dia
xiii.	Flushing Control arrangement	400 mm Dia. Sluice Valve
8.	Power Channel	RD 107.12 m to RD 749.34m
i.	Type of Structure	RCC Box Channel
ii.	Design Discharge	3.20 Cumecs
iii.	Bed Width	1.80m
iv.	Full Supply Flow Depth	1.40 m
v.	Free board	0.4 m
vi.	Bed Grade	1 in 850
vii.	Velocity of Flow	1.28 m/sec
9.	Forebay	
i.	Type	RCC Rectangular Tank
ii.	Full supply Water Level	2010.44 m
iii.	Minimum Draw Down Level (MDDL)	2009.04 m
iv.	Size	
	a) Length	40.00 m

b) Width	7.54 m
c) Overall Depth	5.53 m
v. Design Discharge	3.52 Cumecs
vi. Maximum Water Level	2011.04 m
vii. Spillway Crest Level	2010.44 m
viii. Storage Capacity Time	2 Min.
ix. Live Storage	422 m ³

10. Penstocks

i. Number	1 No
ii. Diameter	0.95 m
iii. Thickness	8.mm
iv. Each branch Diameter with Bifurcation at lower end	0.67 mm
v. Length of main Penstock	166.5 m
vi. Length of each branch penstock	12 m
vii. Design discharge in main Pipe	3.52 Cumecs
viii. Design Discharge in branch pipe	1.76 Cumecs
ix. Velocity of Flow	4.97 m/sec

11. Power House

i. Type	Surface RCC framed structure
ii. Head (m):-	
a) Gross	58.14 m
b) Net	53.43 m
iii. Size of power house:	
a) Length (m)	20 m
b) Width (m)	12.0 m
c) Height (m)	12.0 m
d) Machine Hall floor level	1950.20

iv.	Installed capacity	1.40 MW
v.	Turbines :-	
	a) Type	Horizontal Francis
	b) Number	2 no.
	c) Capacity each	0.7 MW
vi.	Type of Generator:	Synchronous
vii.	Power house crane / lifting tackle capacity	10 T
viii.	Axis of turbine level	1951.5 m
12. Tailrace		
i.	Type	RCC Rectangular Section
ii.	Bed width	3.7 m
iii.	Max. Flow depth	0.7 m
iv.	Design Discharge	3.52 Cumecs
v.	Bed Grade	1 in 650
vi.	Free board	0.4 m
vii.	Minimum Tail water Level	1951.80 m
viii.	Maximum Tail water level	1952.30 m
13. Power		
i.	Installed Capacity	1.40 MW
ii.	Primary Energy	1.95 MU
iii.	Total Annual Energy Average Year @ 75% dependability	8.48 MU
14. Switchyard		
i.	Voltage level/basic undulation level	3.3/11KV
ii.	No. of Bays	One (1)
iii.	Size :-	
	(a) Length	13.0 m

(b) Width	9.0m
15. Transmission Line	
i. Voltage Level	11/33kV
ii. Length	18 Km
iii. Sub-station	Sekloo
16. Hard Cost of Project	14.76 Cr

SALIENT FEATURES(MHP Budhal-II .

1 Location

i	State	Jammu & Kashmir
ii	District	Rajouri
iii	Town/Tehsil	Budhal
	Access Road	
iv		Jammu-Rajouri-Budhal Road.
v	Village	Gulasnard Budhal

2 Geographical Coordinates

i	Weir-Longitudes	74°38'46.92"E
	Latitudes	33°23'33.95"N
ii	Basin-Longitudes	74°39'14.66"E
	Latitudes	33°22'9.57"N
iii	Forebay-Longitudes	74°39'14.66"E
	Latitudes	33°22'9.57"N
vi	Powerhouse-Longitudes	74°38'55.77"E
	Latitudes	33°23'6.99"N

3 River Catchment

i	Catchment up to Headwork's	24.3 Sq-km
ii	Nallah/Stream	Budhal
iii	Tributary	River Chenab

4 Hydrology

	Catchment area of Nallah up to	
i	Diversion Weir site	24.3 Sq-km
ii	Climate Data	
	a) Precipitation (Avg. Rainfall)	1100 mm
	b) Precipitation Max.	1900 mm

iii. Atmospheric Temp.

a) Max. 32⁰C

b) Min. (-) 5⁰C

5 Medium Head Scheme

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure	RCC Trench Weir	
ii. Discharge at Intake	4.13	Cumec
iii. Length	15	m
iv. Width	2	m
v. Average bed level of Nallah	1896	m
vi. Longitudinal bed Grade in Trench, 1 in	10	m
vii. Pond Level with 50% clogging	1895.00	m
viii. Highest Flood Level	1898.98	m
ix. Maximum Shingle Flushing Discharge	0.57	Cumec
x. Shingle Flushing Pipe Diameter	500	mm
xi Sill Elevation of Flushing Pipe	1892.90	m
xii Sill Elevation of Intake service Gate	1893.50	m
xiii Sill Elevation of bulk head Gate	1893.70	m
xiv Trash rack mesh openings	30.00	mm
xv Length of Intake well	3.50	m
xvi Width of Intake well	3.00	m
xvii Number of Gates in well	3	no
xviii Height of Intake well	6.28	m

6 Water Conductor System Supply Channel

i. Supply Channel- Length 14 m

ii. Type of Structure RCC Box Channel

iii.	Design Discharge	3.42	Cumec
iv.	Bed width	1.7	m
v.	Full Supply Flow depth	1.3	m
vi.	Free board	0.4	
vii.	Bed Grade	1 in	500
viii.	Velocity of Flow	1.59	m/sec

7 Desilting Tank

i.	Type of Structure	RCC common structure with Forebay	
ii.	Design Discharge	3.42	Cumec
iii.	Length (main tank)	23	m
iv.	Width	6	m
v.	Depth of water in main part of Tank (FSD)	2.90	m
vi.	Flushing discharge	0.57	cumec
vii.	Length (upstream transition)	12.9	m
viii.	Length (downstream transition)	0.00	m
ix.	Total Length including transitions	35.90	m
x.	Particle size removal	0.2 mm and above	
xi.	Silt Flushing Pipe Length	20	m
xii.	Type of Flushing	Through M.S pipe 500mm diameter	
xiii.	Flushing Control arrangement	500 mm Dia. Sluice Valve	

9 Forebay

i.	Type	RCC Rectangular Tank combined with Desilting Basin	
ii.	Full supply Water Level	1894.17	M
iii.	Minimum Draw Down Level (MDDL)	1891.27	M
iv.	Size		
	a) Length	21.80	M

	b) Width	6.5	M
	c) Overall Depth	7.58	M
v.	Design Discharge	3.42	Cumec
vi.	Maximum Water Level	1894.67	M
vii.	Spillway Crest Level	1894.17	M
viii.	Storage Capacity Time	2	Min
ix.	Live Storage	410	m ³
10	Penstocks		
i.	Number	1	Number
ii.	Diameter	1100	Mm
iii.	Maximum Thickness	12	Mm
	Each branch Diameter with Bifurcation		
iv.	at lower end	778	Mm
v.	Length of main Penstock	930.748	M
vi.	Length of each branch penstock	15	M
vii.	Design discharge in main Pipe	3.42	Cumec
viii.	Design Discharge in branch pipe	1.71	Cumec
ix.	Velocity of Flow	3.60	m/sec
x	Maximum Pressure rise	93%	
11	Power House		
i.	Type	Surface- RCC framed structure	
ii.	Head		
	a) Gross	83.17	M
	b) Net	74.85	M
iii.	Size of power house:		
	a) Length	25	M
	b) Width	15	M
	c) Height (m)	13	M
	d) Machine Hall floor level	1809.75	M

iv.	Installed capacity	1.5MW
v.	Turbines	
	a) Type	Horizontal Francis
	b) Number	2 Number
	c) Capacity each	0.75 MW
vi.	Type of Generator:	Synchronous
	Power house crane / lifting tackle	
vii.	capacity	18 Ton
viii.	Axis of turbine level	1811 M
12	Tailrace	
i.	Type	RCC Rectangular Section
ii.	Bed width	4 M
iii.	Max. Flow depth	0.7 M
iv.	Design Discharge	3.42 Cumec
v.	Bed Grade	1 in 850
vi.	Free board	0.6 M
vii.	Minimum Tail water Level	1811 M
viii.	Maximum Tail water level	1811.45 M
13	Power	
i.	Installed Capacity	1.5MW
ii.	Primary Energy	1.83MU
	Total Annual gross Energy Average	7.50MU
iii.	Year @ 75% dependability	
14	Switchyard	
i.	Voltage level/basic undulation level	3.3/11/33KV
ii.	No. of Bays	One
iii.	Size :-	
	(a) Length	13 M

	(b) Width	10 M
15	Transmission Line	
	i. Voltage Level	11/33. KV
	ii. Length	4.5 Km
	iii. Sub-station	Budhal
16	Hard Cost of Project	15.57cr

<i>Na</i>	- <i>Not Applicable</i>
<i>MDDL</i>	- <i>Minimum Draw down Level</i>
<i>HFL</i>	- <i>Highest Flood Level</i>
<i>EL</i>	- <i>Elevation (Above Mean Sea Level)</i>
<i>OC</i>	- <i>Degree Celsius</i>
<i>RCC</i>	- <i>Reinforced Cement Concrete</i>
<i>RD</i>	- <i>Reduced Distance</i>
<i>FSL</i>	- <i>Full Supply Level</i>
<i>DPR</i>	- <i>Detailed Project Report</i>
<i>U/S</i>	- <i>Upstream</i>
<i>D/S</i>	- <i>Downstream</i>
<i>GTS</i>	- <i>Great Trigonometrically Survey</i>
<i>G-D</i>	- <i>Gauge –Discharge</i>
<i>T&P</i>	- <i>Tools &Plants</i>
<i>IDC</i>	- <i>Interest during Construction</i>
<i>Rs</i>	- <i>Indian Rupees</i>
<i>O&M</i>	- <i>Operation and Maintenance</i>
<i>%</i>	- <i>Percent</i>
<i>WDV</i>	- <i>Written Down Value</i>
<i>SLM</i>	- <i>Straight Line Method</i>
<i>LS</i>	- <i>Lump Sum</i>
<i>IRR</i>	- <i>Internal Rate of Return</i>
<i>PBDT</i>	- <i>Profit before Depreciation & Taxes</i>
<i>DSCR</i>	- <i>Debt Service Coverage Ratio</i>

SALIENT FEATURES(Banihal -I 2x0.65mw)

<i>1</i>	<i>Location</i>	
<i>i</i>	<i>State</i>	<i>Jammu & Kashmir</i>
<i>ii</i>	<i>District</i>	<i>Ramban</i>
<i>iii</i>	<i>Town/Tehsil</i>	<i>Banihal</i>

iv	Access Road	Jammu-Srinagar (NH-1A)		
v	Village	Banihal		
2	Geographical Coordinates			
i	Weir-Longitudes	75°12'2.22"E		
	Latitudes	33°25'37.69"N		
ii	Basin-Longitudes	75°12'6.73"E		
	Latitudes	33°25'28.85"N		
iii	Forebay-Longitudes	75°11'46.15"E		
	Latitudes	33°24'29.82"N		
vi	Powerhouse-Longitudes	75°11'48.66"E		
	Latitudes	33°24'26.99"N		
3	River Catchment			
i	Catchment up to Headwork's		57.7	Sq-km
ii	Nallah/Stream	Banihal		
iii	Tributary	Banihal/River Chenb		
4	Hydrology			
	Catchment area of Nallah up to			
i	Diversion Weir site		57.7	Sq-km
ii	Climate Data			
	a) Precipitation (Avg. Rainfall)		1200	mm
	b) Precipitation Max.		1900	mm
iii.	Atmospheric Temp.			
	a) Max.			34 ⁰ C
	b) Min.			(-) 5 ⁰ C
5	Medium Head Scheme			
5.1	Diversion Structure (Head works)			
5.1.1	Weir			
i.	Type of Structure	RCC Trench Weir		
ii.	Discharge at Intake		5.40	Cumec
iii.	Length		25	m
iv.	Width		2	m
v.	Average bed level of Nallah		1609	m
vi.	Longitudinal bed Grade in Trench, 1 in		10	m
vii.	Pond Level with 50% clogging		1607.10	m
viii.	Highest Flood Level		1612.27	m
ix.	Maximum Shingle Flushing Discharge		0.72	Cumec
x.	Shingle Flushing Pipe Diameter		600	mm
xi	Sill Elevation of Flushing Pipe		1604.90	m
xii	Sill Elevation of Intake service Gate		1605.50	m
xiii	Sill Elevation of bulk head Gate		1605.70	m
xiv	Trash rack mesh openings		30.00	mm
xv	Length of Intake well		3.50	m
xvi	Width of Intake well		3.00	m
xvii	Number of Gates in well		3	no

xviii	Height of Intake well	7.57	m
6	Water Conductor System Supply Channel		
i.	Supply Channel- Length	342.73	m
ii.	Type of Structure	RCC Box Channel	
iii.	Design Discharge	4.32	Cumec
iv.	Bed width	2	m
v.	Full Supply Flow depth	1.4	m
vi.	Free board	0.4	
vii.	Bed Grade	1 in	600
viii.	Velocity of Flow	1.58	m/sec
6a	Water Conductor System power Channel (D-shaped Tunnel)		
i.	Power Channel- Length	2142.00	m
ii.	Type of Structure	D-shape	
iii.	Design Discharge	3.60	Cumec
iv.	Bed width	2.1	m
v.	Full Supply Flow depth	1.4	m
vi.	Free board	0.4	
vii.	Bed Grade	1 in	1000
viii.	Velocity of Flow	1.25	m/sec
7	Desilting Tank		
i.	Type of Structure	RCC Rectangular Bowl Structure	
ii.	Design Discharge	4.32	Cumec
iii.	Length (main tank)	25	m
iv.	Width	7	m
	Depth of water in main part of Tank		
v.	(FSD)	3.14	m
vi.	Flushing discharge	0.72	cumec
vii.	Length (upstream transition)	15	m
viii.	Length (downstream transition)	9.80	m
ix.	Total Length including transitions	49.80	m
x.	Particle size removal	0.2 mm and above	
xi.	Silt Flushing Pipe Length	20	m
xii.	Type of Flushing	Through M.S pipe 500mm diametre	
xiii.	Flushing Control arrangement	500 mm Dia. Sluice Valve	
9	Forebay		
	Type	RCC Rectangular Tank	
i.			
ii.	Full supply Water Level	1603.91	m
iii.	Minimum Draw Down Level (MDDL)	1603.31	m
iv.	Size		
	a) Length	45.00	m
	b) Width	17.5	m
	c) Overall Depth	5.45	m
v.	Design Discharge	3.96	Cumec
vi.	Maximum Water Level	1604.41	m
vii.	Spillway Crest Level	1603.91	m

	viii.	Storage Capacity Time	2	min
	ix.	Live Storage	475	m ³
10		Penstocks		
	i.	Number	1	number
	ii.	Diameter	1150	mm
	iii.	Maximum Thickness	8	mm
		Each branch Diameter with Bifurcation		
	iv.	at lower end	813	mm
	v.	Length of main Penstock	93	m
	vi.	Length of each branch penstock	15	m
	vii.	Design discharge in main Pipe	3.96	Cumec
	viii.	Design Discharge in branch pipe	1.98	Cumec
	ix.	Velocity of Flow	3.81	m/sec
	x	Maximum Pressure rise	24%	
11		Power House		
	i.	Type	Surface- RCC framed structure	
	ii.	Head		
		a) Gross	44.61	m
		b) Net	42.09	m
	iii.	Size of power house:		
		a) Length	24	m
		b) Width	15	m
		c) Height (m)	13	m
		d) Machine Hall floor level	1557.75	m
	iv.	Installed capacity	1.30	MW
	v.	Turbines		
		a) Type	Horizontal Francis	
		b) Number	2	number
		c) Capacity each	0.65	MW
	vi.	Type of Generator:	Synchronous	
		Power house crane / lifting tackle		
	vii.	capacity	15	ton
	viii.	Axis of turbine level	1559	m
12		Tailrace		
	i.	Type	RCC Rectangular Section	
	ii.	Bed width	4	m
	iii.	Max. Flow depth	0.7	m
	iv.	Design Discharge	3.96	Cumec
	v.	Bed Grade	1 in	600
	vi.	Free board	0.6	m
	vii.	Minimum Tail water Level	1559.3	m
	viii.	Maximum Tail water level	1559.75	m
13		Power		
	i.	Installed Capacity	1.30	MW
	ii.	Primary Energy	1.50	mu

	<i>Total Annual gross Energy Average</i>	
	iii. <i>Year @ 75% dependability</i>	6.75 mu
14	Switchyard	
	i. <i>Voltage level/basic undulation level</i>	3.3/11/33KV
	ii. <i>No. of Bays</i>	One
	iii. <i>Size :-</i>	
	(a) <i>Length</i>	13 m
	(b) <i>Width</i>	10 m
15	Transmission Line	
	i. <i>Voltage Level</i>	11/33. KV
	ii. <i>Length</i>	3 km
	iii. <i>Sub-station</i>	Banihal
16	Hard Cost of Project	14.03cr.

SALIENT FEATURES**1 LOCATION**

(i)	State	Jammu & Kashmir
(ii)	District	Ramban
		NH-1D Jammu-Srinagar
(iv)	Access Road	Highway
(v)	Village	Pogal
(vi)	Geographical Coordinates	
		H/W
	i) Longitudes	75°16'16.33"E
	ii) Latitudes	33° 20' 24.54" N

2 RIVER CATCHMENT

(i)	Catchment up to Headwork's	28 Sq.Km
(ii)	River	Pogal Nallah
(iii)	Tributary	Chenab

3 HYDROLOGY

	Catchment area of the Nallah up to	
(i)	Diversion Weir site	28 Sq.Km
	Precipitation (Avg. Rainfall)	1400mm
(ii)	Climate Data	
	Atmospheric Temp.	
	Max.	36°C
	Min.	-8°C

4 MEDIUM HEAD SCHEME

(a)	Diversion Structure (Head works)	
	Weir	
i)	Type of Structure	Conventional RCC Weir
ii)	Length	15.5 m
iii)	Maximum Discharging Capacity	93.0 Cumecs

Promoter: Jammu & Kashmir Energy Development Agency

Head over Crest	2.20 m
Weir Crest Top Elevation	1620.67 m

5 Under-sluice

Type of structure	RCC Single bay
Discharge Capacity	54.16 Cumecs
No. of Bays	1 No
Width of each Bay (1 bay only)	3.50m
Sill Elevation	1618.00 m
Bottom Sill depth from intake invert	1.5 m

Intake

6 Head Regulator Intake

Type of structure	RCC structure with Breast Wall
Designed Discharge	3.50 Cumecs
No. of Bays	2.0 No
Width of each Bay	2.30 m
Sill Elevation	1619.50 m
Bottom Sill depth from intake invert	0.50m
No. of Gates	2.0 No
Width of Gate	2.30 m
Height of Gate	1.2 m

Water Conductor System Supply Channel

7.0 RD Zero to 190.39m

Type	M.S pipe 1.55m dia.
i) Length	190.39 m
Designed Discharge	3.23 Cumecs

Promoter: Jammu & Kashmir Energy Development Agency

	Normal Full Supply Water Level	1.20m
ii)	Drop from Intake	0.50 m
iii)	Bed Grade	1 in 600
7	De-silting Tank RD 190.39 to 256.39m	
i)	Type of Structure	RCC Single bay
ii)	Length (main tank)	53.0m
iii)	Width	4.70 m
iv)	Depth of water in main part	3.50m
v)	Flushing discharge	0.65 Cumecs
vi)	Length (upstream transition)	8.00m
vii)	Length (downstream transition)	5.00m
viii)	Total Length including transitions	66.00 m
ix)	particle size removal above	0.20 mm
x)	Design Discharge	3.23Cumecs
xi)	Type of Flushing	Through Gutter/Free flow Pipe
xii)	Flushing Control arrangement	400 mm Dia. Sluice Valve

8 Water Conductor System (Power channel)

RD 256.39m to RD 1502.89 m

i)	Type	M.S pipe
ii)	Design Discharge	2.69 Cumecs
iii)	Velocity of Flow	1.76 m/sec
iv)	Full supply Depth	1.07 m
v)	Dia of pipe	1.50 m
Vi	Free board	0.40 m
vii)	Bed Grade	1 in 600

9 Forebay

i)	Full supply Water Level	1617.54 m
ii)	Minimum Draw Down Level (MDDL)	1616.46 m
iii)	Size	
	Length	40m
	Depth	5.36 m
iv)	Design Discharge	2.96 Cumecs
v)	Maximum Water Level	1617.94 m
	Spillway Crest Level	1617.54 m
vi)	Storage Capacity Time	2 Min.
vii)	Live Storage	355M ³

10 Penstocks

i)	Number	1 No
ii)	Diameter	0.9 M
	Thickness	8 MM
	Each branch Diameter with Bifurcation at	
iii)	lower end	630 mm
iv)	Length of main Penstock	194m
v)	Length of each branch penstock	10.0m
vii)	Centerline Level at inlet	1523.35 m
viii)	Design discharge in main Pipe	2.96 Cumecs
ix)	Design Discharge in branch pipe	1.48 Cumecs
	Velocity of Flow	4.83 m/sec

11 Power House

- | | | |
|-------|--------------------------|-----------|
| (i) | Type | Surface |
| (ii) | Head (m): | |
| | Gross | 91.33m |
| | Net | 86.84 m |
| (iii) | Size of power house: | |
| (a) | Length (m) | 21. 0m |
| (b) | Width (m) | 13.0m |
| (c) | Height (m) | 13m |
| (d) | Machine Hall floor level | 1523.26 m |
| (e) | Installed capacity | 2.00M W |

12 Turbine (s):

- | | | |
|------|---|--------------------------|
| | | Horizontal |
| i) | Type | Francis |
| ii) | Number | 2 nos. |
| iii) | Capacity | 2 x 1000 KW |
| (iv) | Type of Generator: | Synchronous |
| v) | Power house crane / lifting tackle capacity | EOT Crane, 18 T capacity |

13 Tailrace

- | | | |
|-------|-----------------------|-------------|
| (i) | Shape | Rectangular |
| (ii) | Tail Water Level | |
| | Maxi. | 1526.20 m |
| | Mini. | 1525.70 m |
| (iii) | Size of Tailrace duct | 3 x 1.30 m |

14 POWER

- | | | |
|-----|--------------------|---------|
| (i) | Installed Capacity | 2.00 MW |
|-----|--------------------|---------|

Promoter: Jammu & Kashmir Energy Development Agency

(ii) Primary Energy	2.81 MU
(iii) Total Annual Energy Average Year	10.66 MU

15 SWITCHYARD

(i) Voltage level/basic undulation level	3.3/11KV
(ii) No. of Bays	One (1)

(iii) Size

(a) Length	17m
(b) Width	13m

16. TRANSMISSION LINE

Voltage Level	11/33kV
Length	11/33Km
Sub-station	11/33kV sub-station of PDD at Ramsu

17 Hard Cost of Project	17.14 Cr.
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1 Location

i	State	Jammu & Kashmir
ii	District	Ramban
iii	Tehsil	Banihal
iv	Access Road	NH-1A Jammu-Srinagar Highway Via Paristan/Magarkote link Road
v	Village	Paristan

2 Geographical Coordinates

i	Weir-Longitudes	75° 17'21.52"E
	Latitudes	33°19'22.21"N
ii	Basin-Longitudes	75° 17'14.01"E
	Latitudes	33°19'26.39"N
iii	Forebay-Longitudes	75° 16'04.32"E
	Latitudes	33°19'29.82"N
vi	Powerhouse-Longitudes	75° 15'56.94"E
	Latitudes	33°19'34.91"N

3 River Catchment

i	Catchment up to Headwork's	36 sq.km
ii	Nallah/Stream	Paristan
iii	Tributary	River Chenab

4 Hydrology

	Catchment area of Nallah up to	
i	Diversion Weir site	36 sq.km
ii	Climate Data	
	a) Precipitation (Avg. Rainfall)	1200 mm
	b) Precipitation Max.	1900 mm

iii. Atmospheric Temp.

a) Max. 34⁰Cb) Min. (-) 4⁰C**5 Medium Head Scheme**

5.1 Diversion Structure (Head works)

5.1.1 Weir

i. Type of Structure

RCC Trench Weir

ii. Discharge at Intake 3.48 Cumec

iii. Length 20 m

iv. Width 2 m

v. Average bed level of Nallah 1626 m

vi. Longitudinal bed Grade in Trench, 1 in 11.10 m

vii. Pond Level with 50% clogging 1624.80 m

viii. Highest Flood Level 1629.09 m

ix. Maximum Shingle Flushing Discharge 0.36 Cumec

x. Shingle Flushing Pipe Diameter 600 mm

xi. Sill Elevation of Flushing Pipe 1622.60 m

xii. Sill Elevation of Intake service Gate 1623.20 m

xiii. Sill Elevation of bulk head Gate 1623.40 m

xiv. Trash rack mesh openings 30 mm

xv. Length of Intake well 3.50 m

xvi. Width of Intake well 3.00 m

xvii. Number of Gates in well 3

xviii. Height of Intake well 6.69 m

6 Water Conductor System Feeder Channel

i. Supply Channel- Length 197.52 m

ii. Type of Structure RCC Box

iii. Design Discharge	3.12 Cumec
iv. Width	1.65 m
v. Full Supply Flow depth	1.40 m
vi. Free board	0.4 m
vii. Bed Grade 1 in	700
viii. Velocity of Flow	1.36 m/sec

7 De-silting Tank

i. Type of Structure	RCC Rectangular Single bay
ii. Design Discharge	3.12 Cumec
iii. Length (main tank)	25 m
iv. Width	6.0 m
Depth of water in main part of Tank (FSD)	2.64 m
vi. Flushing discharge	0.48 cumec
vii. Length (upstream transition)	13.05 m
viii. Length (downstream transition)	8.50 m
ix. Total Length including transitions	46.55 m
x. Particle size removal	0.2 mm and above
xi. Silt Flushing Pipe Length	60 m
xii. Type of Flushing	Through M.S pipe 400mm diameter
xiii. Flushing Control arrangement	400 mm Dia. Sluice Valve

8 (A) Water Conductor System power Channel

i. Length	406.57 m
ii. Type of Structure	RCC Box
iii. Design Discharge	2.64 Cumec
iv. Bed width	1.75 m
v. Full Supply Flow depth	1.45 m
vi. Free board	0.4 m

vii. Bed Grade 1 in	1200 m
viii. Velocity of Flow	1.07 m/sec

(B) Water Conductor System Headrace Tunnel

i. Headrace Tunnel- Length	1361 m
ii. Shape	D- Shaped
iii. Design Discharge	2.64 Cumec
iv. Bed width	1.75 m
v. Full Supply Flow depth	1.45 m
vi. Free board	0.4
vii. Bed Grade 1 in	1200 m
viii. Velocity of Flow	1.07 m/sec

**9 Forebay
Type**

i.	RCC Rectangular Tank
ii. Full supply Water Level	1622.46 m
iii. Minimum Draw Down Level (MDDL)	1620.41 m
iv. Size	
a) Length	29.00 m
b) Width	5.8 m
c) Overall Depth	6.42 m
v. Design Discharge	2.88 cumec
vi. Maximum Water Level	1622.96 m
vii. Spillway Crest Level	1622.46 m
viii. Storage Capacity Time	2 min
ix. Live Storage	346 m ³

10 Penstocks

i. Number	1
ii. Diameter	1000 mm

iii.	Maximum Plate Thickness	10-8mm
	Each branch Diameter with Bifurcation	
iv.	at lower end	710 mm
v.	Length of main Penstock	245 m
vi.	Length of each branch penstock	15 m
vii.	Design discharge in main Pipe	2.88 cumec
viii.	Design Discharge in branch pipe	1.44 cumec
ix.	Velocity of Flow	3.67 m/sec
x	Maximum allowable Pressure rise	30%

11 Power House

i.	Type	Surface- RCC framed structure
ii.	Head	
	a) Gross	104.54 m
	b) Net	100.71 m
iii.	Size of power house:	
	a) Length	25 m
	b) Width	15 m
	c) Height (m)	13 m
	d) Machine Hall floor level	1512.75 m
iv.	Installed capacity	2.00 MW
v.	Turbines	
	a) Type	Horizontal Francis
	b) Number	2
	c) Capacity each	1 MW
vi.	Type of Generator:	Synchronous, 3.3 KV
	Power house crane / lifting tackle	
vii.	capacity	18 ton
viii.	Axis of turbine level	1516.0 m

12 Tailrace

i.	Type	RCC Rectangular Section
----	------	-------------------------

	ii. Bed width	4 m
	iii. Max. Flow depth	0.7 m
	iv. Design Discharge	2.88 Cumec
	v. Bed Grade 1 in	1100
	vi. Free board	0.6 m
	vii. Minimum Tail water Level	1517.47 m
	viii. Maximum Tail water level	1517.97 m
13	Power	
	i. Installed Capacity	2.00 MW
	ii. Primary Energy	2.67 MU
	iii. Total Annual gross Energy Average Year @ 75% dependability	11.46 MU
14	Switchyard	
	i. Voltage level/basic undulation level	11/33KV
	ii. No. of Bays	One
	iii. Size :-	
	(a) Length	13 m
	(b) Width	10 m
15	Transmission Line	
	i. Voltage Level	11.33 KV
	ii. Length	8.5 km
	iii. Sub-station	Ramsu
16	Hard Cost of Project	18.55 Cr.(without IDC)

SALIENT FEATURES

1. Location

(i)	State	Jammu & Kashmir
(ii)	District	Ramban
(iii)	Town	Ramsu
(iv)	Access Road	NH-1D Jammu-Srinagar Highway
(v)	Village	Ukhral
(vi)	Geographical Coordinates	
	i) Longitudes	H/W 75°15' 16.99"N
	ii) Latitudes	33° 19' 34.78" E
		F/B 75° 14' 48.03"E
		33° 19' 45.03"N
		P/H 75° 14' 49.78"E
		33° 19' 48.10"N

2. River Catchment

(i)	Catchment up to Headwork's	74.00 Sq-.Km
(ii)	River	Ukhral
(iii)	Tributary	River Chenab

3. Hydrology

i)	Catchment area of the Nallah up to Diversion Weir site	74.00 Sq-Km
ii)	Precipitation (Avg. Rainfall)	1200 mm
iii)	Climate Data	
	Atmospheric Temp.	
	Max.	32 ⁰ C
	Min.	-12 ⁰ C

4. Medium Head Scheme

(a) Diversion Structure (Head works) *Weir*

i)	Type of Structure	Conventional RCC/Boulder Weir
ii)	Length	28 m
iii)	Maximum Discharging Capacity	146 Cumecs
iv)	Head over Crest	2.0 m
v)	Weir Crest Top Elevation	1434.13 m

5. Under sluice

i)	Type of structure	RCC two bays
ii)	Discharge Capacity	135 Cumecs
iii)	No. of Bays	2 No

iv)	Width of each Bay	3.75m
v)	Sill Elevation	1431.00 m
vi)	Bottom Sill depth from intake invert	1.5 m
6. Head Regulator Intake		
i)	Type of structure	RCC structure with Breast Wall
ii)	Designed Discharge	8.06 Cumecs
iii)	No. of Bays	2.0 No
iv)	Width of each Bay	3.30 m
v)	Sill Elevation	1432.50 m
vi)	Bottom Sill depth from intake invert	1.5m
vii)	No. of Gates	2.0 No
viii)	Width of Gate	3.30 m
x)	Height of Gate	1.60 m

7. Water Conductor System(Supply Channel) RD 0.0 to 262.0 m

i)	Type	RCC (2.45x2.15)m
ii)	Length	262 m
iii)	Designed Discharge	7.05 Cumecs
iv)	Normal Full Supply Water depth	1.75 m
v)	Bed Grade	1 in 700
vi)	Velocity of Flow	1.69m /sec

8. Desilting Tank	RD 262 to 334.60 m
i) Type of Structure	RCC Single bay
ii) Length (main tank)	56.20m
iii) Width	8.96 m
iv) Depth of water in main part	4.00 m
v) Flushing discharge	1.20 Cumecs
vi) Length (upstream transition)	10.00m
vii) Length (downstream transition)	6.4 m
viii) Total Length including transitions	72.60 m
x) particle size removal above	0.20 mm
xi) Design Discharge	7.05Cumecs
xii) Type of Flushing	Through Gutter/Free flow Pipe
xiii) Flushing Control arrangement	600 mm Dia. Sluice Valve

9. Water Conductor System (Power RCC Box channel) RD 334.6 to RD 942.70 m

i)	Type	RCC Box Channel
ii)	Design Discharge	6.20 Cumecs
iii)	Velocity of Flow	1.41 m/sec
iv)	Full supply Depth	1.75 m
v)	Width	2.60 m

vi)	Free board	0.40
vii)	Bed Grade	1 in 1050

10. Forebay

i)	Full supply Water Level	1432.08m
ii)	Minimum Draw Down Level (MDDL)	1430.33 m
iii)	Size	
	Length	40mx11.70m
	Depth	7.46 m
iv)	Design Discharge	6.82 Cumecs
vi)	Maximum Water Level	1432.68
vii)	Spillway Crest Level	1432.08
viii)	Storage Capacity Time	2 Min.
x)	Live Storage	818M ³

11. Penstocks

i)	Number	1 No
ii)	Diameter	1400 mm
iii)	Thickness	8 mm
iv)	Each branch Diameter with Bifurcation at lower end	990 mm
v)	Length of main Penstock	80m
vii)	Length of each branch penstock	12m
ix)	Centerline Level at inlet	1392.68 m
x)	Design discharge in main Pipe	6.82 Cumecs
xi)	Design Discharge in branch pipe	3.41 Cumecs
xii)	Velocity of Flow	4.43 m/sec

12. Power House

(i)	Type	Surface
(ii)	Head (m):	
	Gross	36.03 m
	Net	34.12 m
(iii)	Size of power house:	
(a)	Length (m)	23.6m
(b)	Width (m)	14.7m
(c)	Height (m)	13m
(d)	Machine Hall floor level	1392.4
(iv)	Installed capacity	1.75M W
(v)	Turbine (s):	
	Type	Horizontal Francis
	Number	2 nos.
	Capacity	2 x 875kW

(vi)	Type of Generator:	Synchronous
(vii)	Power house crane / lifting tackle capacity	EOT Crane, 18 T capacity of hook
13.	Tailrace	
i)	Shape	Rectangular
ii)	Tail Water Level	
	Maxi.	1396.05 (max)
	Mini.	1395.35 (min)
iii)	Size of Tailrace duct	5.7x1.3 m
14.	Power	
i)	Installed Capacity	1.75 MW
ii)	Primary Energy	2.35 MU
iii)	Total Annual Energy 75% Year	10.18 MU(Gross)
15.	Switchyard	
i)	Voltage level/basic undulation level	3.3/11KV
ii)	No. of Bays	One (1)
iii)	Size	
	(a) Length	17.1 m
	(b) Width	13m
16.	Transmission Line	
i)	Voltage Level	11kV
ii)	Length	7Km
iii)	Sub-station	11kV receiving-station of JKPDD at Ramsu
17.	Hard Cost of Project	14.47 Cr