Project Salient Feature

1	**Project:**	**Junbesi Khola Hydroelectric Project**	
2	**Location**		
	River	Junbesi Khola	
	Province	Koshi	
	District	Solukhumbu	
	Municipality	Solu Dhudkunda Municipality	
	Ward no.	2	
	License boundary		
	Latitude	27^0 33' 15"N to 27^0 35' 08"N	
	Longitude	86^0 32' 40"E to 86^0 34' 29"E	
	Types of schemes	Run-of-River	
3	**Hydrology**		
	Catchment area km2	66.8	
	Average flow m3/s	4.68	
	Design flow m3/s (@ 45 percentile flow)	2.99	
	m3/s	0.123	
	Flood Dischagre m3/s	218	
4	**Auxiliary headworks**		
	River	Menjum	
a	Diversion weir		
	Type	Boulder lined free flow	
	Crest elevation	2661	m amsl
	Crest length	7.2	m
	100 years flood level	2661.75	m amsl
b	Intake		
	type	bottom intake	
	No of orifice	1	
	Size of orifice	0.5 m x 1.08 m	B x H
	Invert level	2659.62	m amsl
c	Flushing arrangement		
	Type	Ms teel pipe flushing	
	no of gate	1	
	Length	4.9	m
	diameter	0.5	m
	Thickness	6	mm
	Slope	1 in 10	
	Invert level	2659.45	m amsl
	Gate operation level	2662.3	m amsl
d	Approach Canal		
	Type	Heavy duty HDEP pipe	
	Length	36.89	m
	Diameter	0.4	m
	Inlet level at centre of pipe	2659.95	m amsl
	Outlet level at centre of pipe	2657.72	m amsl
	Inlet gate size	0.5 m x 1.05 m	B x H
	Invert level of gate	2659.45	m amsl
5	**Main headworks**		
	Weir		
	Type	Boulder lined free flow	
	Crest elevation	2655	m amsl
	Crest length	18	m
	High flood level	2656.39	m amsl
6	**Undersluice**		
	Number of bays	1	
	Sill level	2654	m amsl
	Invert level	2652.44	m amsl
	Width	1.95	m
	Height	1.56	m

7	**Intake**		
	Type	Side intake	
	Number of orifice	2	
	Size of orifice (Right side)	2.024 m X 1 m	B X H
	Size of orifice (Left side)	2.099 m X 1 m	B X H
	Invert level	2654	m amsl
	Design discharge	2.99	m3/s
8	**Graveltrap**		
	Number of bays	1	
	Minimum size of particle to settle	5	mm
	Size	5.84 m X 4.6 m	L X B
	Height	5	m
	Gate opening	1.0 m X 0.92 m	B X H
	Normal water level	2654.35	m amsl
	Spillway crest level	2655.5	m amsl
9	**Gravel flushing canal**		
	Type	Surfece	
	Length	41.95	m
	Breadth	1.4	m
	Height	2	m
	slop	1 in 50	
	Number of gates	2	
10	**Approach culvert**		
	Type	RCC Culvert	
	Number of bays	1	
	Length	10	m
	Size (width)	4.6	m
	Height	1	m
11	**Settling basin inlet**		
	Type	Hopper type intermitent flushing	
	Number of bays	2	
	Minimum size of particle to settle	0.2	mm
	Settling efficiency	90% (Camp method)	
	Inlet Transion	14.93	m
	Settling Zone	47.07	m
	Size (each bay)	4.20 m X 4.50 m	B X H
	Normal water level	2654.14	m amsl
	Gate opening	2.05 m X 1.0 m	B X H
	Gate Invert level	2653.01	m amsl

12	**Settling basin outlet**		
	Number of gates	4	
	Gate Opening	0.70 m X 0.90 m	B X H
	Invert Level	2652.84	m amsl
13	**Settling basin flushing**		
	Number of bays	2	
	Type	Canal	
	Size	16.60 m X 1.0 m	L X B
	Height	0.92	m
	Gate opening	1.0 m X 0.92 m	B X H
	Slope	1 in 4	m
	No of gates in each bay	2	
	Invert Level	2650.38	m amsl
14	**Conveyance tank**		
	Length (average)	7.01	m
	Height	2.53	m
	Breadth	8.90	m
	Normal water level	2653.89	m amsl
15	**Headrace pipe**		
	Type	Surface and buried pipe	
	Material	Steel pipe	
	Anchor blocks	36	
	Kholsi crossing	10	
	Road crossing	2	
	Saddle supports	189	
	Expansion Joints	22	
	Man hole	4	
	Exposed length	1557.65	m
	Buried length	1437.35	m
A	Diameter	1.55	m
	thickness	8	mm
	Length	1150	m
B	Diameter	1.50	m
	thickness	8	mm
	Length	1150	m
C	Diameter	1.45	m
	Thickness	8	mm
	Length	695	m
16	**Surge Pipe**		
	Type	Inclined pipe	
	Material	Steel pipe	
	Internal Diameter	2	m
	Thickness	8	mm
	Upsurge level	2668.15	m amsl
	Downsurge level	2639.95	m amsl
	Length	120	m
	Anchor blocks	2	

17	**Penstock Pipe**		
	Material	Steel pipe	
	Anchor blocks	7	
	Saddle Supports	35	
	Expansion Joints	3	
A	Type	Surface	
	Diameter	1.45	m
	Length	239.02	m
	Thickness	8 mm to 18 mm	
B	Type	Buried	
	Diameter	1.45	m
	Length	201.11	m
	Thickness	8 mm, 18 mm to 28 mm	
18	**Wye**		
	Type	Steel pipe	
	Pipe Diameter Inlet	1.45	m
	Pipe Outlet	1.06	m
	Thickness	30	mm
	Bifurcation Angle	59.87	Degree
19	**Branch pipe after Wye branch**		
	Type	Steel pipe	
	Pipe Diameter	1.06	m
	Length	24.16	m
	Thickness	20	mm
20	**Reducers at Wyee**		
	Type	Steel pipe	
	Units	2	
	Intel Diameter	1.06	m
	Length (each)	1.6	m
	Outlet Diameter	0.75	m
	Thickness	20	mm
21	**Branch pipe after reducers**		
	Type	Steel pipe	
	Pipe Diameter	0.75	m
	Length	8.16	m
	Thickness	20	mm
22	**Powerhouse**		
	Type	Surface	
	Dimension	25.51 m X 16.70 m X 15.18 m	L X B X H
	Machine floor level	2432.70	m amsl
23	**Tailrace**		
	Type	Canal/Free flow	
	Size	3.52 m X 1.52 m	B X H
	Length	32.72	m
	Bed slope	1 in 100	
	Minimum tailwater level	2430.24	m amsl
	Normal operating level	2430.24	m amsl
	Maximum tailwater level during operation	2430.94	m amsl
	HFL at tailwater level during 1000 year return period flood	2430.73	m amsl
24	**Turbine**		
	Type	Horizontal axis two jet Pelton turbine	
	Number of units	2	
	Net Head	211.49	m
	Rated net head	211.49	m
	Rated discharge	1.44	m3/s
	Turbine efficiency	90.10%	
	Rated capacity	2694	kW
	Rated speed	500	rpm
	Turbine axis level	2433.98	m amsl

25	**Generator**		
	Type	Synchronous 3 phase	
	Rated output	2600	KVA
	Voltage	6.6	kV
	Frequancy	50	Hz
	Power factor	0.8	
	Generator efficiency	96.50%	
26	**Transformer**		
	Type	Outdoor, Two winding step up	
	Number of units	1	
	Rated output	7.5	MVA
	Voltage ratio	33/6.6	kV
	Transformer efficiency	99.50%	
27	**Powerhouse switchyard**		
	Type	AIS Outdoor	
	Dimension	12.87 m X 15.78 m	L X B
28	**Transmission line**		
	Transmission voltage	33	kV
	Length	6	km
	No of pole	130	
	Type of pole	Steel tubular	
	Conductor	ACSR (Dog)	
	Size of conductor	100	mm2
	Connection point	Switchyard of Upper Solu HPP	
29	**Interconnecting switchyard**		
	Average size (dimension)	63.60 m x 17.23m	
	Type	AIS Outdoor	
	Low voltage switch gear	33	kV
	Interconnecting transformer	7.5	MVA
	Interconnecting voltage	132	kV
	Interconnection point	132 kV common bus bar of Upper Solu HPP	
30	**Common transmission Line**		
	Starting point	Switchyard of USHP	
	Type	Single circuit	
	Voltage level	132	kV
	Length	12	km
	Conductor type	ACSR (Bear)	
	No of tower	41	
	End point	NEA Tingla substation	
31	**Power and energy**		
	Installed capacity	5.2	MW
	Gross head	221.02	m
	Net head at design discharge	211.49	m
	Dry season energy	6.64	GWh
	Wet season energy	25.66	GWh
	Total annual energy	34.55	GWh
	Net annual enery at delivery point	32.3	GWh