

Annexure-III

1. SECTION-A: BILL OF QUANTITIES & CONNECTED FORMS

1.1 FORM-1: BILL OF QUANTITIES

The activities/items of work to be carried out under the overall Scope of DPR preparation for the Siang Upper Hydro Electric Project, Stage-II, Arunachal Pradesh (the Project) in Siang Basin of Arunachal Pradesh have been categorized into following 2(two) broad groups.

For Group 1, the amount shall be the sum total of the amounts arrived at based on the unit rates quoted by the Bidder for the items of works as per the Bill of Quantities annexed at A & B below and, for Group 2 the Bidder shall quote Lump Sum Fixed Price/Amount for the Scope of Works mentioned therein and elsewhere in the Terms of Reference till completion of appraisal of the DPR in all respect by the CEA, CWC, GSI and/or MOP and other statutory authorities.

Sl. No.	Description	Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)	Rate of Service Tax @ in percentage (%)	Amount of Service Tax (in INR)	Total Amount (in INR) (In Figures)	Total Amount (in INR) (In words)	Remarks
(I)	(II)	(III)	(IV)	(V)	(VI) = (III) + (V)	(VII)	(VIII)
1.	Group-1: Topographical, Geological, Geophysical, Seismological, Construction Material Survey and Investigations including Testing of Materials as per the Bill of Quantities (BOQ) annexed at A & B below.						Units, Quantities and Unit Rates are as per Annexure-A & B.
2.	Group-2: Preparation of quality Detailed Project Report including all Hydrological Survey and investigations, Compilation of data, Design, Drawings, Construction Planning, Cost Estimation and Financial Evaluation for the Project						The Unit and Quantity are Lump Sum and Amount quoted shall remain fixed for the scope of work as described.
Grand Total:							

Annexure A to Group 1

Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
1)	Topographical survey, Hydrographic Survey, preparation and submission of contour plans / maps of:					
	(i) Establishment of permanent Bench Mark at suitable locations with respect to the nearest Bench Mark of the Survey of India (SOI) including construction of cement concrete survey pillars 0.6mX0.6mX1.0m and providing & fixing Brass plates thereon of size 10cmX15cm and punching thereon.	No.	50			
	(ii) Shifting of survey reference with close traverse to the project area from the nearest Bench Mark of the Survey of India (SOI).	km	20			
	(iii) Topographical Survey of Reservoir area above water level in 1: 5000 with contour interval of 3m covering up to MWL+20m	Ha	6000			
	(iv) Hydrographical Survey of Reservoir area below water level in 1: 5000 with contour interval of 3m	Ha	500			
	(v) Dam and Spillway ,Intake, Dam toe Power House and Diversion Tunnel area extending up to dam top + 50m in 1 : 500 with contour interval of 2 m.	Ha	250			
	(vi) Head Race Tunnel, Surge Shaft, Pressure Shaft, Adit, Tail Race System, Power House, Transformer Cavern/Yard, Pothead Yard, etc. area in 1: 500 with 2m contour interval.	Ha	700			
	(vii) Quarry and Borrow Areas in 1:500 with 2m contour interval.	Ha	500			



Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
	(viii) Areas of Plant, Colony, Office Complex etc in 1:500 with 2m contour interval.	Ha	2000			
	(ix) River Cross Sections (part above water level on both side of river to be done by Topographic Survey):					
	a) Upstream: Survey and maps of river X-Sections at every 50m interval up to MWL + 5m for a distance of 2km from dam axis in horizontal scale of 1: 500 and vertical scale of 1:100.	No.	40			
	b) Downstream: Survey and maps of river X-Sections at every 50m interval up to historical/observed High Flood Level (HFL) + 5m for a distance of 6 km from dam axis in horizontal scale of 1: 500 and vertical scale of 1:100.	No.	120			
	(x) River Cross Sections (Part below water level to be done by Hydrographic Survey):					
	a) Upstream: Survey and maps of river X-Sections at every 50m interval up to MWL + 5m for a distance of 2km from dam axis in horizontal scale of 1: 500 and vertical scale of 1:100.	No.	40			
	b) Downstream: Survey and maps of river X-Sections at every 50m interval up to historical/observed High Flood Level (HFL) + 5m for a distance of 6 km from dam axis in horizontal scale of 1: 500 and vertical scale of 1:100.	No.	120			



Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
	(xi) River Long (L) Section (By Hydrographic Survey): Survey and maps of river L-Section along the deepest river bed level on upstream and downstream from the dam axis in horizontal scale of 1:10000 and vertical scale of 1:100.	Km	10			
	(xii) Geological Maps: Contour plan/map for Geological Mapping on a scale of 1:1000 in 2m contour interval, covering major project structures/components such as Dam, Intake, Surge Shaft, Power House and 1:2000 in 5m contour interval covering other components such as HRT, Diversion Tunnel, Tail Race System, Adits, Pressure Shaft etc. and areas if any, as required by the Geological Survey of India (G.S.I.).	Ha	1000			
	(xiii) Survey and maps of access & other roads on scale of 1:1000 in 2m contour interval.	Ha	2000			
	(xiv) Providing and installation of cement concrete survey pillars of size 0.15mX0.15mX1.20m at sites of all the major structures and their components and along periphery of reservoir submergence area.	No.	100			
2)	Geological Mapping of the Reservoir, up to 50 meters above the FRL (or as required on Land Sat imageries with field checks incorporating details like; geological units, critical zones, geological consideration) in 1:5000/ 10,000 scale based on remote sensing data and structural discontinuities, etc.	Ha	8000			

Annexure-B to Group 1

Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
1)	Drilling of Px, Hx, Nx, Bx, Ax, Ex vertical/inclined holes with standard diamond core drilling machine including driving, lowering of casing of required size where necessary and water percolation test at 3m intervals with core recovery and preserving the core in proper boxes (Maximum depth of single hole 150.0m) in areas other than river water stretch as directed by Engineer-in-Charge.	RM	3000			
2)	Drilling of Px, Hx, Nx, Bx, Ax, Ex vertical/inclined holes with standard diamond core drilling machine including driving, construction of temporary floating platform, lowering of casing of required size where necessary and water percolation test at 3m intervals with core recovery and preserving the core in proper boxes (Maximum depth of single hole 150.0m) in river water stretch as directed by Engineer-in-Charge.	RM	600			
3)	Retention of hole by providing PVC pipe 50mm dia including installation in over burden / fractures / shear zones only.	RM	1200			



Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
4)	Drilling of Px, Hx, Nx, Bx, Ax, Ex vertical/inclined holes from inside the drift with standard diamond core drilling machine including local enlargement and development of drift if required, driving, lowering of casing of required size where necessary and water percolation test at 3m intervals with core recovery and preserving the core in proper boxes as directed by Engineer-in-Charge.	RM	775			
5)	Excavation of Drifts of size 2.0m X 2.5m or equivalent area in all kinds of rock including shear zones by drilling and blasting, providing required supports and arrangements for lighting and ventilation, mucking and disposal of excavated materials in regular layers complete with all lifts and leads as per direction of Engineer-in-Charge. Convergence measurements as per necessity shall also be made.	RM	3680			
6)	Geophysical Survey – Seismic Refraction survey/profiling method/ Ground-Penetrating Radar (GPR) method or other acceptable method at sites of Dam, Power House, Pressure Shaft, Surge Shaft and Water Conductor System etc.	RM	10000			
7)	Hydro Fracture Tests for evaluating in-situ stress.	No. of holes	20			



Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
8)	Dilatometer test for evaluating of in-situ stress.	No.	20			
9)	Flat Jack Tests for evaluating in-situ stress.	No.	20			
10)	Construction Material Survey including all laboratory tests as per IS Code 383, Alkali Aggregate Reactivity & Petrographic Examination as per IS Code 2386 of rock/stone from any of the institutes of national repute mentioned at Clause 2 of Part-V (TOR) for assessment of suitability for use in project works					
	(i) Coarse aggregates	No. of samples	15			
	(ii) Fine aggregates (sand)	No. of samples	15			
11)	Excavation of Drifts for construction material survey of size 1.5m X 2.0m X 3.0m (B x H x L) in all kinds of rock by drilling and blasting, providing required supports and arrangements for lighting and ventilation, mucking and disposal of excavated materials in regular layers complete with all lifts and leads as per direction of Engineer-in-Charge.	No.	20			
12)	Excavation of pits and trenches for collection of construction material samples including disposal of muck for all lead and lift as indicated by the	Cum	2000			



Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
	Engineer-in-charge.					
13)	In situ and laboratory tests to the followings for foundation rock/strata from any of the institutes of national repute mentioned at Clause 2 of Part-V (TOR).					
	(i) Dry and Saturated Compressive strength (laboratory)	No.	50			
	(ii) Dry and Saturated Tensile strength (laboratory)	No.	50			
	(iii) Standard Penetration Test	No.	50			
	(iv) Packer Permeability Test.	No.	50			
	(v) Deformation modulus and modulus of elasticity (laboratory).	No.	50			
	(vi) Unconfined Compressive Strength of the intact rock and rock mass (laboratory).	No.	50			
	(vii) Shear strength parameters, C and ϕ (phi) (laboratory).	No.	50			
	(viii) Slake Test	No.	50			



Sl. No.	Items of work	Unit	Quantity	Rate (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)		Amount (Including all applicable taxes, duties, levies etc. except Service Tax) (in INR)
				In figures	In words	
	(ix) Test for determining presence of Sulphate in Rock	No.	50			
	(x) Petrographic analysis of river silt samples with colour photo micrograph	No.	60			
14)	In-Situ Shear and Deformability Tests					
	a) Measurement of in-situ parameters for Rock to Rock Parameters	No.	25			
	b) Measurement of in-situ parameters for Rock to Concrete Parameters	No.	25			
	c) Measurement of Deformability Modulus	No.	25			
15)	Groutability test in foundation rock in pattern holes including all cost towards all labour, plant, materials, equipment, operation and services required for drilling & grouting, execution of water pressure tests, etc. Minimum number of primary holes in pattern shall be 5(five) and bottom of grout holes shall be at least 30.0m in bedrock. The spacing of holes may be reduced up to 1.5m and sequence of water pressure testing and grouting may be followed up to tertiary holes, if required.	No.	3			

Preparation of Detailed Project Report and Related Activities. Siang Upper Hydro Electric Project, Stage-II (3750 MW), Arunachal Pradesh, India.	 ISO 9001, 14001 & OHSAS 18001	Part-VI Bill of Quantities & Connected Forms and Schedule of Payments
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Note:

1. The quantities of works indicated in the above BOQ are approximate. The Unit Rates and the Lump Sum fixed price quoted by the Bidder shall remain firm. The Contractor may have to carry out additional works including drilling and drifting as may be required by the Statutory Authorities of CEA, CWC, GSI &/or MOP and as directed by the Engineer-in-Charge. In case of increase and decrease in the quantities of any/or all BOQ items of work, the unit rate quoted by the Contractor shall be applicable for such deviations. No additional claim whatsoever due to such deviation(s) shall be entertained. However, if the quantities are increased by more than 25%, reasonable additional time for completion of such increased work shall be mutually decided and granted by the Engineer-in-Charge without levy of penalty.
2. Rates / amounts quoted by the bidder shall be inclusive of all prevailing Indian & Non-Indian Taxes, Duties, Levies etc. as per Clause 55 (Part-IVA of General Conditions of Contract) of Detailed Bid Document.
3. Rates quoted in relevant items of BOQ for drifting shall include all cost towards open excavation for drift portal erection, ventilation & lighting inside the drift, support & safety measures, etc., amongst others. Similarly, the relevant BOQ item for drilling shall include all cost towards enlargement & development of drift, if any to facilitate drilling operation inside drift, amongst others.
4. Quantity for Item No. 1(ii) of Annexure A to Group 1 shall be measured upto 2(two) decimal places.

Date _____

Signature _____