APPENDIX – A

TO

SECTION – VII

(Employer's Requirements)

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CHAPTER – 1

SCOPE OF WORKS

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1 Project Particulars

Particular	Description
Design and Engineering	
Plant AC Capacity	100 MW
Minimum DC Capacity	126 MWp
Cell / Module Technology	Mono-crystalline
Origin of Cell / Module Manufacturer	Open
Solar Inverter/Power Conditioning Unit Type	String
Design life of PV Power Plant	25 years
O&M Period	10 years
Site Location and Water Body / Land Details	
Location	Getalsud Reservoir
Coordinates	23° 27’ 25” N, 85° 32’ 33” E
Village	Getalsud
Taluk	Ormanjhi/Angada
District	Ranchi
State	Jharkhand
Owner of Project	Solar Energy Corporation of India Limited
Ownership of Water Body & Land	Jharkhand Government
Owner of Water Body & Land	Water Resources Department, Jharkhand
Electrical Interconnection	
Interconnection Voltage Level	132 kV
Interconnection Point	Bay -111 & Bay-112 of 132/33 kV IRBA GSS (JUSNL) Short Circuit Levels: 132 kV Bus: 31.5 kA/s 33 kV Bus: 25 kA/3 sec 132 kV Switching Scheme - Double Bus Single Breaker Scheme

Plant End Power Transformer (132/33 kV) Capacity	2 x 50 MVA
Transmission Line from Plant till Interconnection Point	132 kV Double Circuit with ACSR ZEBRA Conductor Protection Scheme at Power Evacuation Switchyard at Plant End: Over Current Earth Fault Protection alongwith Distance Protection and other required protection schemes
Access	
Nearest Urban Area	Ranchi (30 km)
Nearest Highway	SH-1: Ranchi – Purulia (10 km)
Nearest Railway Station	Tatisilvai (20 km)
Nearest Domestic Airport	Birsa Munda Airport (40 km)
Performance Parameters	
Performance Ratio (PR) at 132 kV side of Plant Substation	84.4%
Capacity Utilization Factor (CUF) at 132 kV side of Plant Substation	22.6%
Other Details	
Construction Water	To be arranged by the Contractor. (Water usage from the reservoir requires prior approval from the Water Resources Department, prior to commencement of construction activity)
Construction Power	To be arranged by the Contractor (Permission form JBVNL for construction power shall have to be obtained prior to commencement of construction activities at site)
Bathymetric Survey Report	Carried Out by SECI (2020) – Excerpts from the Report enclosed as Annexure M

2 Brief Scope of Works

Scope of Supply & Work includes all design & engineering, procurement & supply of equipment and materials, testing at manufacturers works, multi - level inspections, packing and forwarding, supply, receipt, unloading and storage at site, associated civil works, services, permits, licences, installation and incidentals, insurance at all stages,

erection, testing and commissioning of 100 MW (AC) Floating Solar Photovoltaic Power Plant and performance demonstration on turnkey basis at Getalsud Reservoir, Jharkhand and 10 (ten) years comprehensive operation and maintenance from the date of Operational Acceptance.

All works shall be executed as per Technical Specifications given in Chapter – 2 of Appendix – A to Section – VII. Chapter – 3 of Appendix – A to Section – VII lays down Special Technical Conditions with reference to site specific design requirements. However, in case of any conflict in requirements between Chapter – 2 and Chapter – 3, Chapter – 3: Special Technical Conditions shall have precedence.

The details of Project location and reservoir are provided below:

S. No.	Description	Data
1	Name of Dam	Getalsud Reservoir
2	Co-ordinates	23° 27’ 25” N, 85° 32’ 33” E
3	Owner of Dam	Water Resources Department, Govt. of Jharkhand
4	Type of Dam - Multipurpose / Irrigation / Power generation	Drinking water requirements of Ranchi, Industrial Requirements and Power Generation
5	Storage Capacity overt the Years	**Designed Storage Capacity (1971)** – 288.63 million cubic metres at FRL 590.09 m **Revised Storage Capacity (2001)** – 267.57 million cubic metres at FRL 590.09 m **Hydrographic Survey (2020) –** 232.95 million cubic metres at FRL 590.09 m
6	Full Reservoir Level (FRL)	590.09 m
7	Minimum Drawdown Level (MDDL)	584.30 m
8	Dead Storage Level (DSL)	579.12 m
9	Maximum Depth at FRL	29.2 m
10	Area of reservoir	3475 Ha
11	Source of water	Subarnarekha River

12	Silt Level / Sedimentation report (If any)	The sedimentation rate of the reservoir was estimated to be 0.702 MCM/year by the Central Water Commission, Govt. of India (2001). Total height of silt column was estimated to be around 1.602 m from the reservoir bed as of 2020.
13	Usable Reservoir Area	Approx. 172 Ha
14	Flood occurrence in past years	As per the information gathered from the reservoir authorities, since its commissioning, no major flood has occurred.
15	Highest water level of reservoir	In the year 1998 – 590.09m (Reached FRL) In the year 2006 – 590.40m (Crossed FRL) In the year 2017 – 590.49m (Crossed FRL)
16	Possible Floating Solar PV (FSPV) Power Plant location	On the storage reservoir
17	Water flow velocity at tentative project location	Maximum velocity value shall be considered after performing flood routing studies using software simulations or hydraulic model study to derive flow path and critical velocities. Additionally, water current velocity shall be measured at upstream and downstream of proposed site for at least 30 days using suitable Acoustic Doppler Current Profiler (ADCP) /Current Meter. The velocity measurements should be undertaken at surface, at half of the water depth, and at 0.5 m above the reservoir bed.
18	Statutory approvals required for setting up of the project.	1. Consent from the JUSNL /JBVNL for the evacuation of the power generated by Floating Solar Grid Interactive Floating Solar Power Projects. 2. Consent to establish the project during construction and consent to operate the project after the commissioning of the plant from Jharkhand Pollution Control Board (JPCB) 3. Approval of the Electrical Inspectorate, Government of Jharkhand for commissioning of the transmission line and the Floating Solar power project installed at the Project Site. 4. Certificate of Commissioning of the Floating Solar Grid Interactive Power Project issued by JBVNL.

		5. SNA/JREDA registration certificate, if required. 6. Permission from all other statutory and non-statutory bodies required for the Project. 7. Clearance from Department of Forest, Ecology and Environment, if required.
19	Water body approvals, agreement and charges, if any	Consent/ Approval shall be sought from Water Resources Department, GoJ before construction

Note: *All works shall be executed as per Technical Specifications given in Chapter – 2 of Appendix – A to Section – VII.*

The Reservoir Level details of Getalsud reservoir has been attached as Annexure-G.

3 Design and Engineering

3.1 Contractor shall prepare the detailed design basis report (DBR) along with relevant standards (with respective clause description), PERT Chart and MDL. Contractor shall submit a copy of the same to Employer for review and approval prior to detail engineering.

3.2 All documents and drawings (soft copy) shall be submitted to the Employer for review and approval. Every drawing shall also be submitted in '*.dwg' format. In case of design calculations done in spread sheet, editable (working) soft copy of the spread sheet shall also be submitted along with 'pdf' copies during every submission. The Employer shall return to the Contractor with category of approval marked thereon. Five nos. of hard copies of approved documents and drawings shall be submitted to the Employer.

- Category-I: Approved
- Category-II: Approved subject to incorporation of comments. Re-submit for approval after incorporation of comments
- Category-III: Not approved. Re-submit for approval after incorporation of comments
- Category-IV: Kept for record/ reference
- Category-IV (R): Re-submit for record/ reference after incorporation of comments

(**Note**: Approval of document neither relieves the Vendor/ Contractor of his contractual obligations and responsibilities for correctness of design, drawings, dimensions, quality & specifications of materials, weights, quantities, assembly fits, systems/ performance requirement and conformity of supplies with Technical Specifications, Indian statutory

laws as may be applicable, nor does it limit the Employer/ Purchaser's rights under the contract)

3.3 Submission of basic design data, design documents, drawings and engineering information including GTP and test reports to Employer or its authorized representative for review and approval in hard copy and soft copy from time to time as per project schedule. The documents typically include, but not limited to, the following:

- Solar insolation data and basis for generation
- Flood routing study, Water flow path and critical velocity studies using software simulations or hydraulic model study
- Detailed technical specifications (GTP) of all the equipment
- General arrangement and assembly drawings of all major equipment
- Schematic diagram for entire electrical system (DC, AC and auxiliary systems)
- GTP & G.A. drawings for all types of structures/ components, Floats, Anchoring mechanisms, 33 kV switchgears & other interfacing panels
- Test reports (for type, routine and acceptance tests)
- Relay setting charts
- Design calculations and design templates for Floats, Anchoring and Mooring mechanism
- Shadow analysis
- Concrete mix design report for different grades of concrete to be used for construction
- Bathymetric survey report including topographical survey data in digital format (Excel file) and Contour plan of the area.
- Geotechnical (on-shore & off-shore) and Geophysical (off-shore) investigation reports
- Array/ Plant Layout
- GA, & detail drawings for architectural, civil, structural and RCC works for the entire project which shall include various buildings and facilities like office cum master control room (MCR), roads, Foundation and plinth for Open installations for LCR/ ICR (as applicable), Weather protection canopy/ shed over open equipment installations, Sewerage, Water supply & module washing system networks, Security room & watchman cabin(s), Fire protection system, Boundary & transformer yard fencing, MMS structure & foundation works etc.
- Transmission line drawings and erection plans as per DISCOM/ STU guidelines