	Carbonated Fly Ash Brick (C-Brick) Plant of 2 Lakh per Day Capacity at NTPC Ramagundam				
Bidding Document No: CS-3100-702-9				GEPNIC Tender Ref. No: 2025_NTPC_98848_1	DATE: 18.08.2025
	CLARIFICATIONS No 01 to TECHNICAL SPECIFICATIONS (TS) (Section VI)				
Sr. No.	Clause	Page No.	Description	Bidder's Queries	NTPC Reply
1	A.2 - 4	3 of 115	Arrangement for handling of raw material from NTPC's terminal point to the site shall be in the scope of bidder.	Bidder request to inform the each utility terminal point and location in the plot plan.	Utillities and Plot Plan marked in GLP enclosed with Amendment No 01 to Section VI.
2	A.3 - 2	4 of 115	Bidder shall carry out, civil, mechanical, electrical, and C&I erection - including interconnection with existing system and	Bidder request to share the details of existing system, where an interconnection is to be done by bidder. Also explain the interconnection with existing system.	Interconnection to be done from utility terminal point as mentioned in plot plan
3	A.3 - 9	4 of 115	Wherever existing pipe rack is used, it shall be the responsibility of bidder to adequately strengthen it and provide supporting analysis / calculations based on 'on site condition'.	In case of bidder uses the existing pipe rack, we request Customer to provide the details of such pipe rack to perform supporting analysis / calculations.	Details shall be provided during the detail engg. stageif such requirement arises.
4	A.3 - 10	5 of 115	This 3D Miniature Moving Model shall be delivered by the bidder at Netra or any location suggested by Netra with 3 months of award of this contract.	This 3D Miniature Moving Model shall be delivered by the bidder at Netra or any location suggested by Netra after completion of project as this will involve many other stake holders and 3 months will be a very short time to execute such requirements. Bidder request to accept the same.	As per TS
5	A.3 - 11	5 of 115	Before submitting bid, the bidder is advised to inspect and examine the site and its surroundings and should satisfy himself the quantities and nature of work, materials necessary for completion of the work and their availability, means of access to site and enable himself to prepare bid and see site conditions of operation at his own cost.	Bidder request a site visit on 1st July 2025. Please accept the request and inform the formalities for the site visit.	Site visit done during pre-bid on 05.08.2025
6	A.3 - 14	5 of 115	Bidder shall supply calibrated instruments, T&P, manpower, and all necessary requirements including raw materials for conducting PG Test etc.	The bidder shall provide calibrated instruments,T&P,manpower, and all other necessary resources required for conducting the Performance Guarantee (PG) test, excluding raw materials. The client shall be responsible for supplying the required raw materials and utilities. Kindly confirm.	As per TS
7	A.3 - 15	5 of 115	The bidder shall be responsible for insurance of the facilities until the handing over of the facilities to the owner.	Please note that the facilities belongs to NTPC and hence the insurance shall be in the scope of Customer (NTPC). Bidder shall also be responsible only for insurance of his personnel working at the Site, equipment, and materials. Please confirm.	As per TS
8	C	11 of 115	C. Drawings & Terminal Points:	Bidder request to provide the AutoCAD layout for the said plot plan along with the terminal point details and location.	Utillities and Plot Plan marked in GLP
9	C.3	14 of 115	Electrical – Single Line Drawing (SLD):	Please inform the details of existing HT swgr (6.6 kV FGD SWGR) such as model, make etc. to satisfy interfacing requirements.	BHEL Make/VM12 type
10	D.2	17 of 115	Size and exact location of flue gas tapping in existing flue gas duct, shall be decided by NTPC and Bidder with mutual consultation.	We request NTPC to inform the size and location of gas tapping from existing flue gas duct.	To be decided during detailed engineering
11	D.3	18 to 24 of 115	Mechanical Requirements MOC for Sr. 1 to 19	Wherever for Sr. No. 1 to 19 MOC name as specified in the TS out of MOC Name or Better, bidder will follow MOC Name and the same will be basis of estimation. (Ex. SS304 or Better, SS304 will be considered by Bidder). Any change in DDE will be discussed and mutually agreed upon.	As per TS

12	H.	103 of 115	H. Civil Requirements:	a) Bidder request to provide soil investigation report for Area-A and Area-B along with b) site conditions i.e.Ambient Temp, RH, Rain fall, b) Seismic Zone, Wind velocity for design of proposed plant is concerned.	a) Detailed Investigation shall be in the scope of the Bidder.Soil report of the nearby area attached for refrence only. B) Meterological data shall be obtained by the Bidder from IMD C) Pls refer Design and requirement Clause no 5,6 pg no 103 in this regard.
13	J.	113 of 115	J. List of reputed manufacturers	Bidder request for following additional vendors for the below specified equipment. 1. Heat Exchangers - M/s Transfer India Pvt. Ltd, M/s Abacus Heat Transfers Ltd., HRS Process Systems, Kelvion, Positive Metering Pumps (I) Pvt Ltd. 2. Tanks & Vessels - M/s Sunrise Process Equipment, Chemtek Fiberglass. 3. CO2 compressor - M/s Newman, M/s Jyotech, M/s Kirloskar, M/s SIAD MI M/s Dresser, M/s Howden, M/s Burckhardt.	Subvendor approval, if required needs to be taken by bidder
14	Cl. No. -C.3.	14 of 115	Electrical – Single Line Drawing (SLD) Power tapping from FGD switchgear	We understand that client will provide main power supply for new CO_2 and Ash brick plant shall be from existing 6.6KV FGD switchgear outgoing spare feeder. Kindly confirm.	Supply from existing FGD switchgear to be tapped by bidder
15	Cl. No. -C.3.	14 of 115	Electrical – Single Line Drawing (SLD) Power tapping from FGD switchgear	Any feeder modification and feeder extension is not required in existing FGD switchgear. Kindly confirm	Presenlty, modification in existing switchgear is not required
16	Cl. No. -C.3.	14 of 115	Electrical – Single Line Drawing (SLD) interconnection from Existing FGD switchgear and new plant 6.6KV switchgear	1. Client to provide route length from FGD switchgear and new plant main 6.6KV switchgear or Location of existing FGD switchgear 2. We have utilized existing available cable rack for laying of new cable from FGD switchgear and new plant main 6.6KV switchgear	1. Route length appox. 500 meter (the locations already shown during pre-bid meeting) 2. Pipe rack and cable laying is in scope of bidder
17	Cl. No. -C.3.	14 of 115	Electrical – Single Line Drawing (SLD) One set of main 6.6KV switchgear for CO2 and Ash brick plant	We understand that the location of new plant main 6.6KV switchgear shall be located in new CO2 switchgear room. Kindly confirm.	Agreed. Presently, in plot A. From Plot A 6.6kV cable to be laid to plot-B step down transformer.To be finalised during detailed engineering
18	Cl. No. -C.3.	14 of 115	Electrical – Single Line Drawing (SLD) interconnection from new plant 6.6KV switchgear and Ash brick plant transformer	We have utilized existing available cable rack for laying of new cable from main switchgear to ash brick plant transformer incomer cables.	New cable rack to be laid
19	Cl. No. F -1, -6	39 of 115	**Design Philosophy:** All equipment shall be suitable for rated frequency of 50Hz with a variation of +3% & -5%, and 10% combined variation of voltage and frequency.	Frequency variation shall be considered +/-5% as per IS / IEC standard.	IEC standard to be followed
20	Cl. No. F -1, -10	39 of 115	**Design Philosophy:** For the purpose of electrical earthing calculations (soli electrical resistivity) and cable rating calculations (soil thermal resistivity) the data of the area shall be used.	Kindly provide soil resistivity of proposed site area.	Detailed Investigation shall be in the scope of the Bidder.Soil report of the nearby area attached for refrence only.
21	Cl. No. F -1, -16	40 of 115	**Design Philosophy:** There shall be classified for the degree extend of hazard from flammable materials.	Hazardous classification is considered equipment installed outside Switchgear room for CO2 capture area, area classification for Brick manufacturing plant shall be non-hazardous. Kindly confirm	Hazardous classification is in Bidder's Scope. The same shall be finilized during detailed engineering

22	Cl. No. F -1, -17	40 of 115	**Design Philosophy:** All electrical equipment in hazardous area shall be minimum suitable for ZONE-2, Gas group IIA/IIB/IIC, Temperature class T1….T6.		Hazardous classification is in Bidders Scope. The same shall be finilized during detailed engineering
23	Cl. No. F -1, -19	40 of 115	**Design Philosophy:** Lock out Tag out (LOTO) provision for all HT & LT feeders	LOTO is not considered in LT Feeders.	LOTO to be considered for both LT and HT switchgear
24	Cl. No. F -1, -22	40 of 115	**Design Philosophy:** HT/LT Switchgear shall be supplied by HT/LT breaker manufacturer only.	For LT Switchgear, we have considered make of LT panels shall be authorized system house vendor of breaker manufacturer with type tested design.	As per tender specs
25	Cl. No. F -3, -1	40 of 115	Electrical Load List (Indicative):CO2 Capture, Compression and Storage Block: Total Electrical Load – 500 kW (indicative for tender purpose only, to be finalized alongside 'Technology Provider' with approval of NTPC).	Total electrical loads of each package shall be as per actual system requirement within our battery limit as per load details from technology provider.	As per tender specs
26	Cl. No. F -4, -1	41 of 115	Electrical Load List (Indicative):CBrick Manufacturing Block: Total Electrical Load – 1,200 kW (indicative for tender purpose only, to be finalized at the stage of detailed engineering with approval of NTPC.		As per tender specs
27	Cl. No. F -5, -1	42 of 115	**-Scope:** 1. 6.6kV / 0.433kV, 1.25 MVA & 1MVA distribution transformers (1 nos each).	The rating of distribution transformer shall be sized as per actual system requirement within our battery limit. Kindly confirm	Actual load + 20% Design margin
28	Cl. No. F -22	68 of 115	**Basic Design & Detailed Engineering:** **Auxiliary Transformer (Oil Type):** Rating : 2500kVA 16000kVA Voltage Ratio : 11/0.433kV 33/11.5kV Noise level: As per NEMA TR-1		Actual load + 20% Design margin (6.6kV/0.433 kV)
29	Cl. No. F -5, -7	43 of 115	**-Scope:** 415/415 V, 3-phase dry type lighting transformers for normal lighting and emergency lighting system.	DG set is not in our scope. Hence Client to provide required emergency power supply for proposed plant.	LT supply to be taken from FGD LT switch gear for emergency supply
30	Cl. No. F -23, -10	75 of 115	**Basic Design & Detailed Engineering:** **23. Illumination & Lighting System:** These will be fed from emergency lighting panels (ELPs) which in turn will be fed 3-phase, 4-wire supply from the emergency lighting distribution boards (ELDB'S). These lights will go off for a few seconds in case of AC supply failure at Emergency Switchgear but shall be automatically restored when Emergency Switchgear is energized by Diesel generator set.		
31	Cl. No. F -5, -8	43 of 115	**-Scope:** 415V, 150A, 3-phase TPN, 25 kA for 1 sec. draw-out type Lighting Distribution Boards (LDBs) including spare feeders.	We have considered all LV PMCC and MCC shall be draw out type and all main DB's and small DB's including LDBs shall be non draw out type. Kindly confirm	As per tender specs
32	Cl. No. F -17, -7	62 of 115	All switchboards shall be of dust-proof and vermin-proof construction and shall be provided with a degree of protection of IP:5X as per IS/IEC 60947.	Please considered all MV switchboards shall be degree of protection of IP:4X as per IS/IEC	As per tender specs
33	Cl. No. F -16	59 of 115	**Basic Design & Detailed Engineering:** **MV Switchgear:** Degree of Protection :VT & Relay IP5X as per IS/IEC 60947, Remaining compartments IP 4X		As per tender specs
34	Cl. No. F -16	59 of 115	**Basic Design & Detailed Engineering:** **MV Switchgear:** - IAC FLR 11kV 40KA, 1 sec -Rated short circuit withstand current: 21kA 1sec for 33kV & 50kA 1sec for 11kV	We have considered system fault level of 6.6KV switchgear shall be 40KA for 3 sec. Kindly confirm	Accepted

35	Cl. No. F -5, -11	43 of 115	**Scope:** The formation of cable trench/tray shall be required for cable laying shall be under bidder's scope.	We understand that, new switchgear room shall be considered with G+1 arrangement. All Electrical switchgear, transformer, etc. shall be mounted in ground floor with cable trench and all control panel, VFD's, etc. shall be mounted in first floor with False floor arrangement. Kindly confirm	Shall be finalised during detail engg.
36	Cl. No. F -5, -14	43 of 115	**Scope:** 220 V DC protection to be used for protection and breaker control. 220V supply will be given from nearby SWGR from there party has to take the supply through control cable (2.5sqmm copper cable).	We understand that the required DC power for breaker control and DC lighting will provided by client at the outlet of existing DCDB. Further cables to new DCDB is in bidder scope. Kindly confirm.	DC source is available at FGD switchgear. Cable and its routing to the CO2 and C_brick is in scope of bidder
37	Cl. No. F -23, -11	75 of 115	**Basic Design & Detailed Engineering:** **Illumination & Lighting System:** DC Lighting System: These lighting fixtures will be fed from 220V DC LDBs which in turn will be fed from DC lighting panels.		
38	Cl. No. F -5, -15	43 of 115	**Scope:** 240V, 30kVA AC dual redundant with bypass UPS system (2 nos 1X100%) with Nickel cadmium battery, ACDB, cell booster for DCS /PLC /Instrumentation loads including spare feeders. Battery backup time of 3 hours.	1. UPS shall be sized as per actual system requirement with 20% margin. 2. VRLA type battery is considered for UPS. Kindly confirm the above points.	1. Accepted 2. Ni-Cd battey as per TS
39	Cl. No. F -5, -18	43 of 115	**Scope:** Complete lighting within the plant battery limit	We have considered lighting and Earthing shall be within our battery limit as per the BLOCK area marked (Area A and Area B) in tender plot plan. Any outside BLOCK area (i.e.. road / equipment / package / etc.) lighting / earthing are not considered in our scope. Kindly confirm	All road/street lights along the periphery of the plots are also included in bidder's scope. Quantity/type shall be finalised during detail engg. Outside area earthing is not in bidder's scope.This plant earthing mat shall be connect to existing NTPC plant mat through 40mm dia ms rod.
40	Cl. No. F -5, -20	44 of 115	**Scope:** Grounding system for complete plant and equipment are under Bidder's scope.		
41	Cl. No. F -5, -25	44 of 115	**Scope:** Tools and tackles for maintenance of all electrical equipment and systems.	As per OEM recommendation, tools and tackles for Electrical equipment will be considered (if applicable and required).	Accepted
42	Cl. No. F -6, -1	44 of 115	**Basic Design & Detailed Engineering:** Basic engineering calculations i.e., load analysis, load flow, short circuit, and voltage drop during motor start-up etc. for selection of electrical equipment's.	System study is considered within our supplied package only. Any study for existing unit are not considered in our scope.	Accepted
43	Cl. No. F -13, -2	55 of 115	**Basic Design & Detailed Engineering:** 2. 1.1KV grade PVC power cables shall have aluminum conductor (compacted type for sizes above 10 sq.mm), PVC Insulated, PVC inner sheathed (as applicable) armored/ unarmored, PVC outer sheathed conforming to IS:1554	Bidder understand, all LV power cables up to 10 Sq.mm copper conductor and above 10 Sq.mm aluminum conductor.	Accepted
44	Cl. No. F -6, -40	46 of 115	**Basic Design & Detailed Engineering:** 40. Paint shade shall be as follows: (a) TR set: Blue RAL 5012 (Legend in Block letters) (b) Motor: Blue RAL 5012 (c) Panel: Front and rear panels in Grey (RAL9002) End panel sides in blue (RAL 5012).	RAL 7032 paint shade is considered for all switchgear as per OEM type tested design.	As per tender specs

45	Cl. No. F -7	46 of 115	**Basic Design & Detailed Engineering:** **Instrument Transformer:** One minute power frequency Withstand voltage between Secondary terminal and earth: 5 kV - Rated dynamic current :125 kA (peak) - Rated system voltage (Um) :420 kV (rms) CT in 400kV GIS shall be min. 6 core & as per switchyard protection scheme. 8 Surge Arrestor	Bidder understand that, Bidder's scope is limited to 6.6KV and 415V level only as the supply of power for proposed plant will be made available by NTPC at 6.6kV level. Any other high voltage / extra high voltage is not applicable for us.	Accepted
46	Cl. No. F -8	47 of 115	**Basic Design & Detailed Engineering: Surge Arrestor:** Rated arrestor voltage 336 kV		
47	Cl. No. F -9, -1,-6,-14,-15	48 of 115	**Basic Design & Detailed Engineering:** **9. Motor:** 1.The enclosure of motors and motor control station shall be in accordance with the hazardous area classification and equipment selection in hazardous area as per IEC 60079 and its parts. 6. For 11kV & 3.3kV motor thermal class 155 (F) insulation. 14. 11 KV motors shall be offered with Separable Insulated Connector (SIC) as per IEEE 386. 15. 3.3 KV motors shall be offered with dust tight phase separated double walled (metallic as well as insulated barrier) Terminal box.	We have considered all motors shall be 415V only. Any HT motors is not applicable for this package.	To be finalised in Detailed engineering
48	Cl. No. F -18	49 of 115	**Basic Design & Detailed Engineering:** MOV's and Electrical cranes shall be fully equipped with integral motor control gear.	We have considered all MOV's shall be integral type. Please accept.	Accepted
49	Cl. No. F -10, -1,-2,-4	50 of 115	**Basic Design & Detailed Engineering:** **VFD:** The voltage level for the VFD shall be as follows: - 1. Up to 160 kW: 415V/690V, Low Voltage, Three Phase AC 2. Above 160kW: Medium Voltage, Three Phase AC 4. Bypass Arrangement of the VFD system if specified.	All VFD's shall be proposed with (wherever applicable) 415V without bypass starter as per process requirement. Any 690V VFD is not considered by bidder. Please confirm.	Accepted
50	Cl. No. F -10, -8	51 of 115	**Basic Design & Detailed Engineering:** **VFD:** 415 V/690 V LV VFD: The system shall be either Current Source Inverter (CSI) or Voltage Source Inverter (VSI) type with minimum Twelve (12) pulse design. For drives less than 100 KW Six (6) pulse can be offered meeting all other requirements.		
51	Cl. No. F -12, -3	54 of 115	**Basic Design & Detailed Engineering:** **HT Power Cables:** Copper/ Aluminum conductor used in power cables shall have tensile strength as per relevant standards. Conductors shall be multi stranded.	All HT cables shall be considered Aluminum conductor only.	Accepted
52	Cl. No. F -12, -15	55 of 115	**Basic Design & Detailed Engineering:** **HT Power Cables:** The standard length for HT power cables shall be 1000 meter for all single core cables and 750 meters for 3 core cables. The length per drum shall be subjected to a maximum tolerance of +/- 5% of the standard drum length. The Employer shall have the option of rejecting cable drums with shorter lengths.	Cable qty of each drum shall be considered as per actual requirement only.	As per tender specs

53	Cl. No. F -13, -15	56 of 115	**Basic Design & Detailed Engineering:** **LT Power Cables:** All LT power cables of sizes more than 120 sq.mm. shall be XLPE insulated and preferable sizes are 1Cx150, 1Cx300, 1Cx630, 3Cx150 & 3Cx240 sq.mm.	Noted. 3Cx185Sq.mm and 3Cx300Sq.mm also used for LT cables. Kindly confirm	Will be decided during detailed engineering
54	Cl. No. F -17, -6	62 of 115	**Basic Design & Detailed Engineering:** **LV Switchgear:** All switchboard frames and load bearing members shall be fabricated using suitable mild steel structural sections or pressed and shaped cold-rolled sheet steel of thickness 2.0 mm.	As per OEM type tested design, sheet steel thickness for LV panel is considered 1.6mm for non load bearing member and 2mm for load bearing member	As per tender specs
55	Cl. No. F -17, -28, -29	63 of 115	**Basic Design & Detailed Engineering:** **LV Switchgear:** MFM shall be with communication on Ethernet port. -Digital MFM 3-PH, 4-Wire (Programmable) CT, PT (Primary & Secondary)	MFM shall be considered incomer feeders of each MCC / PCC only.	As per tender specs, however to be finalised during detailed engineering
56	Cl. No. F - 19, -13	65 of 115	**Basic Design & Detailed Engineering:** Numerical Relays: All the numerical relays shall have communications on two ports, local front port for communication to laptop and one RJ45 port on IEC 61850.	All type of numerical relays monitored through DCS only. There are no requirement of extra laptop. Kindly confirm.	As per tender specs
57	Cl. No. F -22, -2	69 of 115	**Basic Design & Detailed Engineering:** **Auxiliary Transformer (Oil Type):** -Cooling ONAN - LT Auxiliary outdoor transformers up to and including 2500KVA,11kV shall have maximum losses of energy efficiency level 3 rating or better as per latest BEE guideline.	As per tender specification Cl. No. F-1- 11, we have considered all distribution transformer shall be dry type indoor mounted only. Kindly Confirm.	As per tender specs
58	Cl. No. F -22 ,-1	70 of 115	**Basic Design & Detailed Engineering:** **Auxiliary Transformer (Oil Type):** Oil preservation: Main tank and OLTC (if applicable) shall be provided with conservator tanks of adequate capacity	OCTC is considered for LV distribution transformer. Kindly confirm	As per tender specs
59	Cl. No. F -22 ,-1	71 of 115	**Basic Design & Detailed Engineering:** **Auxiliary Transformer (Oil Type):** Gaskets: HT transformers all the gaskets shall be weatherproof & hot oil resistant of 'O' ring of Nitrile rubber for all valves, flanges, HV, LV	As per tender Scope of supply and SLD, any HT transformer is not applicable for us. Kindly confirm	As per TS.
60	Cl. No. F -22	72 of 115	**Basic Design & Detailed Engineering:** - NGR (Neutral Grounding Resistor) (As per system requirement)	For off site package, additional NGR is not required and not considered.	Accepted
61	Cl. No. F -23, -22	76 of 115	**Basic Design & Detailed Engineering:** **Illumination & Lighting System:** Lighting Mast shall be of continuously tapered polygonal cross section hot dip galvanized.	As per proposed plant area (Area A and Area B), we understand that high mast tower is not required as area lighting will be considered as per requirement. Kindly confirm	Will be decided during detailed engineering
62	A.5. Facilities provided by NTPC:		Accommodation in NTPC Township: On 'chargeable basis', subject to availability.	Bidder request to owner please provide free of cost accommodation in NTPC Township.	Bidder to comply the stipulations of Technical Specifications.
63	A.3. Scope of Work:		In addition to the codes and standards specifically mentioned in the relevant technical specifications for the equipment / plant / system, all equipment parts, systems and works covered under this specification shall comply with all currently applicable statutory regulations and safety codes of the Republic of India.	Bidder requests that all statutory approvals fall under the customer responsibility, while the bidder will provide all necessary technical support. Please confirm bidder's understanding.	Bidder to comply the stipulations of Technical Specifications.

64	General		Geotech investigation and Soil Bearing Test (SBT), if required shall be carried out by Bidder through NTPC approved Geotech agency as mentioned in Appendex-1.	Bidder request customer to provide detailed soil investigation report, contour survey.	a) Detailed Investigation shall be in the scope of the Bidder.Soil report of the nearby area attached for refrence only. b) Bidder is requested to visit site for better understanding of the site conditions. Detailed topo survey shall be in the scope of the Bidder.
65	H. Civil Requirements Design and		6. Wind Resistant Design: - The basic wind speed shall be considered as 50 m/s.	Bidder requests the customer to confirm whether the basic wind speed, as per IS code, is 44 m/s (Wind Zone 3).	Basic wind speed shall be as per Latest IS Code IS 875 : Part 3
66	H. Civil Requirements Design and Standards		5. Earthquake Resistant Design: All structures and equipment shall be designed for seismic forces in accordance with IS: 1893 (Part 1 to Part4). The damping factor (as a percentage of critical damping) to be adopted shall not be more than following: (i) Steel structures-2%, (ii) Reinforced Concrete structures-5%.	Bidder considered as per IS code seismic zone 3	Technical specifications are clear in this regard.Bidder to comply the same.
67	H. Civil Requirements Design and Standards		Filling, Compaction, Levelling and Grading of site (as required) and ensuring their correctness is the responsibility of Bidder.	Bidder request to customer to provide counture survery for the site.	Bidder is requested to visit site for better understanding of the site conditions. Detailed topo survey shall be in the scope of the Bidder.
68	H. Civil Requirements Scope of Work		Disposal of surplus excavated soil outside the site boundary as directed by NTPC.	Bidder assumes Disposal of excavated earth shall be within 500 m distance from the plot premises	Bidder to comply the stipulations of Technical Specifications.
69	A.3. Scope of Work:		8. As required and with express approval of NTPC, dismantling / demolition of existing structure at site earmarked as Area-A (CO2 Capture, Compression, and Storage Block and Area-B (C-Brick Manufacturing Block) alongside area clearance, transport and handing over of dismantled material to NTPC (within plant premises), site levelling and grading, cleaning of vegetation (including statutory clearance, if required) shall be in the scope of bidder.	Bidder not envisaged any dismantling / demolition / removal / rerouting of above ground, underground structures.	Bidder to comply the stipulations of Technical Specifications.
70	H. Civil Requirements Scope of Work		Bricks: Bricks shall be table moulded/ machine made of uniform size, shape and sharp edges and shall have minimum compressive strength of 75 kg/cm2. Burnt clay fly ash bricks and fly ash lime bricks shall conform to IS:13757 and IS:12894 respectively. Minimum fly ash content in fly ash-based bricks shall be minimum 25%. Common burnt clay bricks shall conform to IS: 1077.	Bidder request customer to allow the usage of AAC blocks / Burnt clay fly ash bricks / fly ash lime bricks.	Bidder to comply the stipulations of Technical Specifications. Technical specifications are clear in this regard.
71	H. Civil Requirements Scope of Work		Plinth Protection, Storm water drainage system in and around all structures covered under this contract and connecting to the nearest owner’s storm water drain.	Bidder shall considered only 1m plinth protection all around the building, structure & equipment.	Bidder to comply the stipulations of Technical Specifications. The same shall be finalized during detailed engineering which is in Bidders Scope
72	H. Civil Requirements Scope of Work		Construction of temporary office, store, workshop, laboratory etc.	Bidder requests Customer to provide space for construction sheds, offices, fabrication yard, stores and material stacking area inside the plant premises free of cost	The Plot earmarked for the project is marked in the plot plan . Bidder is requested to plan his facilities within that area.

73	General		Soil stabilization	Bidder shall not considered any soil stabilization.	The same shall be as per the detailed geotechnical investigation report which is in the scope of Bidder.
74	Architectural		Architectural Schedule	Bidder request to owner please provide the Architectural schedule.	The same shall be finalized during detailed engineering which is in Bidders scope.
75	General		Soil Investigation	Bidder request Customer to provide Soil Investigation report for Area A and Area B for basis of estimation.	Detailed Investigation shall be in the scope of the Bidder.Soil report of the nearby area attached for refrence only.
76	A.2. Project Outline: point no 2	3 of 115	Therefore, each block is planned to include its own Control Room, PLC, and Electrical MCC etc. The approximate distance between Area-A and Area-B is 1 KM.	1. Bidder understand that separate PLC systems are required for area A & area B and there will not be any communication required between those two blocks. 2. If any communication is required, then please provide clarity.	Pls refer technical specification/page 84/clause 15
77	A.3. Scope of Work: sr no 2	4 of 115	Bidder shall carry out, civil, mechanical, electrical, and C&I erection - including interconnection with existing system	Bidder shall provide MODBUS communication provision with in of AREA A PLC system or AREA B PLC system. Beyond this, the hardware and software required for the interconnection or integration with existing plant control system is excluded from Bidders scope.	
78	16. Fire Detection & Protection System	24 of 115	i) Bidder shall provide both fire detection and fire protection system including fire extinguishers, as required for CO2 solvent, auxiliary chemicals, plant mechanical / electrical / C&I equipment etc., as per TAC/NFPA/IS 3034/OISD and approved/accepted by NTPC.	Fire alarm & detection system shall be provided for MCC/Control room as per IS 2189 standard.	As per TS.
79	16. Fire Detection & Protection System	24 of 115	ii) Fire alarm cum control panel shall be extended to and interfaced with main plant / main security PLC for information exchange.	1. Fire alarm detection panel shall be provided for MCC/Control room. This panel shall have provision of MODBUS 485 communication. 2. Beyond this communication port, any interface or integration with main plant / main security PLC is excluded from Bidders scope.	The Alarm/indication to be made available in CISF room.
80	25 Fire Detection & Alarm System	81 of 115	2. The fire alarm cum control panel shall also be interfaced with CISF and main plant fire station for information exchange. If required, same shall be finalized at the stage of detailed engineering.		
81	G. Control & Instrumentation Requirements:	83 of 115	3. The operation of plant shall be done through PLC based dedicated control systems - to be provided with local start / stop & indication on control room operator workstation.	There shall be package PLC also for few systems and these package PLC systems shall be supplied as per Package OEM standard. These package PLC shall communicate with Main Plant PLC system over MODBUS communication.	Pls refer technical specification/page 91/Note
82	G. Control & Instrumentation Requirements: 1.	84 of 115	13. Spare field instruments with sensors: 2.5% of population of each type and size with minimum one (1) number of each type. 14. Other supplementary items to be provided: (i) Power Supply Modules & Power Packs, Cooling Fans: 1 No of each type and size, (ii) MCB, Contactors, Connectors: 1 No of each type and size, (iii) Fuses & Relays: 100% of each type & each rating.	1. Bidder understand that these spares asked in tender are required for O&M. Bidder requested to provide list of O&M spares to estimate. 2. All these supplementary items shall be provided as loose along with PLC system & details are as below …(i) Power Supply Modules & Power Packs - 10% of installed QTY …, Cooling Fans: 1 No of each type and size …. (ii) MCB, Contactors, Connectors: 1 No of each type and size, ….(iii) Fuses & Relays: 10% of each type & each rating. Please accept	1 &2. The specified spares are to be handed over by the vendor upon completion of the Operation & Maintenance (O&M) phase.

83	G. Control & Instrumentation Requirements: 1.	84 of 115	8. Above PLC based systems shall be supplied with UPS of minimum 5KVA capacity for each control room. (Actual capacity of UPS may vary based on the number of connected devices / equipment with the system, which will be finalized during detail engineering without any additional cost to NTPC).	Canopy shall be provided only for outdoor instruments. MOC of canopy shall be sheet steel.	As per technical specifications.
84	Measurement Instruments:	93 of 115	8. FRP canopies for field mounted electronic/ electrical instruments e.g., transmitters, positioners, temperature element heads and junction boxes etc.		
85	G. Control & Instrumentation Requirements: 1.	85 of 115	19. The redundancy in control system components (Network Switches, controller, etc.) Power supply system components shall be designed by the contractor to ensure that malfunction of any single Control system component/ power supply system component etc. shall not lead to loss of any major auxiliary or loss of control function or loss of protection function.	IO level redundancy is not considered. All IO's in PLC system shall be non-redundant .	Agreed.
86	G. Control & Instrumentation Requirements: 1.	85 of 115	20. All the electronic modules PCB should have conformal coatings that can provide protection against extreme moisture, corrosive gases and aggressive dust, or combinations thereof.	Conformal coating shall be provided for PLC system modules as per OEM proven standard.	As per technical specifications.
87	G. Control & Instrumentation Requirements: 1.	85 of 115	23. Integration signals: For Integration purposes the contractor shall determine all the optimal hardwired and soft signals required to achieve data transfer for integration purposes and hence collect this data. The contractor shall obtain the necessary approval for Licenses authorizing the use of communication equipment at specified frequencies, if required. Central PLCs must be abled to get interface with other PLC/DCS as per the future requirements via Ethernet or Modbus RS 485 protocol.	Please provide the more clarity on integration signal exchange requirement.	Pls refer technical specification/ page 85/SN 22/Bullet 1 in line with page 91/Note
88	G. Control & Instrumentation Requirements: 1.	86 of 115	As a customer support, the Contractor shall periodically inform and upgrade the Anti-Virus software of the workstations/servers/switches/firewall as applicable till completion of the warranty period and also till the completion of the AMS period.	Bidder scope shall be limited till completion of the warranty period	As per technical specifications.
89	1.5b Analog output modules	89 of 115	Analog outputs shall have the following features: Shall be of 4 / 8 analog output channels.	Please accept 16 Channel analog output modules also as 16 channel Analog input module is acceptable in clause no 1.4b (page no 88)	Agreed
90	Measurement Instruments: sr 03.	93 of 115	temperature elements with temperature transmitters etc. are to be provided.	Temperature transmitters shall be provided only for the close loops. Rest all temperature elements shall be directly connect to PLC system. Please accept.	As mentioned in technical specification / page 93, same shall be accepted on required basis meeting functional redundancy, availability and reliability requirements .
91	Measurement Instruments: sr 07.	93 of 115	Handheld communicators/calibrators, Universal type intrinsically safe dust-proof along with battery and battery charger shall be suitable for all make / model nos. of transmitters and positioners. Otherwise, 1 no. handheld configurators shall be provided for each different type of instrument.	Bidder shall supply one no of common HART communicator for the instruments with in Bidders battery limit.	As per technical specifications.

92	13 Large Video Screen / Video Wall Cube	98 of 115	The Bidder shall provide 80" Full HD Single Chip DLP Laser Light Source based Video Wall Cube having software license (if any required) for 'C Brick Plant'. Min Brightness up to 1800 Lumens, Aspect Ratio: 16:9, Rear Access Aspect Ratio: 16:9, Rear Access Inputs: DVI/ HDMI/ Analog D-Sub 15 pin/ Display Port, 10 Meter HDMI-HDMI cable to connect OWS to Video Wall Cube.	1. Bidder shall provide 80" LED TV/LVS instead of Laser Light Source based Video Wall Cube. 2. Separate OWS is not considered for LED TV. It shall connect to OWS of PLC system.	1. As per technical specifications. 2. Vendor has to provide LVS with dedicated OWS .
93			PLC system	Please accept below makes 1. Microverse Automation 2. Mitsubishi	Pls refer technical specifications / page 4/ clause 5, The Bidder shall obtain approval of manufacturer/ sub vendors for all equipment required in the package from NTPC.
94			Fire Detection System	Please accept below makes 1. Honeywell thorough system integrator 2. Tyco through system integrator	
95			CCTV System	Please accept below makes 1. Honeywell 2. Infinova 3. Hickvision 4. Dahua Technology	
96	D.3. Mechanical Requirements		Spares for mechanical item for CO2 Capture, Compression and Storage Block	As per received tender bidder to provide O&M spares for the comprehensive O&M period of 1 year. As tender has not specified spare quantity for mechanical items, bidder will provide O&M spares based on OEM's/supplier's recommendation. Please confirm.	O&M spares for the comprehensive O&M period of 1 year to be provided by bidder. List of recommended spares to be furnished by bidder.
97	D.3. Mechanical Requirements		Columns	As per the received tender for column packing, Metallapak Plus / Flexipac or equivalent is mentioned. We understand that Licensor's recommended packing are also accepted along with above mentioned packing. Please confirm.	Licensor's recommended packing are aceeptable with relevant document approval.
98	J. List of reputed manufacturers		Vendor List	As per the received tender documents, limited vendor list is received for eg. vendors for heat exchangers, blowers, compressors, and columns have not been mentioned. Bidder understand that bidders are permitted to propose their own suitable approved vendors. Kindly confirm if this understanding is acceptable.	Sub-Vendor approval to be taken during detailed engg.
99	D.1 - Plant Capacity & Design Considerations	16 of 115	-	For CO2 Capture Process Design - Flue gas composition with FGD to be considered?	Flue gas composition with FGD to be considered for design purpose.
100	D.1 - Plant Capacity & Design Considerations / D.3 - Mechanical Requirement	16&18 of 115	-	Temperature Range provided in **D.1 - S. No. 7** is 50-70 deg C. Temperature Range provided in **D.3. - S. No. 1** is 100 Deg C What is the Operating Temperature of Flue Gas to Be Considered?	Temperature Range provided in D.3. - S. No. 1 to be considered for design purpose
101	D3 - Mechanical Requirement	18 of 115	-	Modifications allowed to the no. of items mentioned in Section D.3 to suit the tender requirement?	Approval to be taken by bidder, if required during detailed engineering

102	Civil	04 of 115	A.3. Scope of Work: pt. no.8: As required and with express approval of NTPC, dismantling / demolition of existing structure at site earmarked as Area-A (CO2 Capture, Compression, and Storage Block) and Area-B (C-Brick Manufacturing Block) alongside area clearance, transport and handing over of dismantled material to	Bidder requested please provide the details of existing structure drawing for demolition work	Existing structures for demolition marked in GLP
103	Civil	11 of 115	C. Drawings & Terminal Points: C.1. Plot Plan:	Contour survey for area levelling work for both the Area A & Area B and provide the FGL for Area A & Area B	Contour Survey- Bidder is requested to visit site for better understanding of site conditions. FGL- Same shall be finalised during detailed engineering
104	Civil	11 of 115	C. Drawings & Terminal Points: C.1. Plot Plan:	Pleas provide marked plot plan with dimension for both the Area A & area B	Plot Plan for Area A and B marked in GLP
105	Civil	04 of 115	A.3. Scope of Work: pt. no.9: Bidder shall provide new pipe rack for this project. However, with appropriate design, bidder can consider common rack for 'Flue Gas Duct', 'Steam Pipe' and 'Water Pipes' (DM, SW, Fire Water etc.). Wherever existing pipe rack is used, it shall be the responsibility of bidder to adequately strengthen it and provide supporting analysis / calculations based on 'on site condition'	Bidder requested please mark the piping & Pipe rack routing for following: 1)Steam Piping from terminal point to Area A & Area B 2)CO2 piping from Area A to Area B 3) Cable routing from terminal point to Area A to Area B	a) All the details marked in the Plot plan attached. b) From Plant A to Plant B Routing shall be finalized during detailed engineering which is in Bidders Scope. Also, bidder is requested to visit site for better understanding of visit.
106	Civil	-	Statutory requirement for BOCW	Bidder assume that BOCW not applicable	BOCW is applicable
107	7	16 of 115	Flue gas composition	For CO2 Capture Process Design - Flue gas composition with FGD to be considered?	Flue gas composition with FGD to be considered for design purpose.
108	7 / 1	16 -18 of 115	-	Temperature Range provided in **D.1 - S. No. 7** is 50-70 deg C. Temperature Range provided in **D.3. - S. No. 1** is 100 Deg C What is the Operating Temperature of Flue Gas to Be Considered?	Temperature Range provided in D.3. - S. No. 1 to be considered for design purpose
109	N/A	18 of 115	-	Modifications allowed to the no. of items mentioned in Section D.3 to suit the tender requirement?	Approval to be taken by bidder, if required during detailed engineering
110	General	-	Geotech investigation and Soil Bearing Test (SBT)	Please provide geotechnical report along with soil bearing capacity	Detailed Investigation shall be in the scope of the Bidder.Soil report of the nearby area attached for refrence only.
111	General	-	Site visit	During site visit, it was observed that some fabrication work is going on at Area-B (C-Brick Area). We understand that NTPC will provide clean and clear site	fabrication yard will be vacated
112	General	11 of 115	Plot plan	Please provide dimmensional plot plan of both sites A &B, in AutoCAD format and also mark the position of terminal points	Utillities and Plot Plan marked in GLP
113	Drawing & terminal points	-	-	Please provide topographic survey drawing of both sites A & B showing details of existing roads and drains	Bidder is requested to visit site for better understanding of the site conditions. Detailed topo survey shall be in the scope of the Bidder.
114	Civil woks	-	-	Please provide FGL, FFL and FRL level for bothsites Area-A and B to be considered	The same shall be finalized during detailed engineering.
115	General	-	-	Please provide details of existing buildings to be dismantled along with dimmensions	Details of structure to be demolished marked in the Plot plan
116	General	-	-	Please provide location of dumping yard where the dismantled material to be dumped	Disposal shall be finalized during detailed engineering as directed by NTPC.A lead of 5 to 7 km may be considered for dumping of debris generated during demolition of sheds falling in the area identified for C brick plant.

117	General	-	-	We understand that the clearence for tree cutting to be provided by NTPC. Additionally, please clarify upto which girth of trees has to be removed by bidder. Pls Clarify	a) Clearance for tree cutting shall be provided by NTPC. b)Plants shrubs bushes, weeds, trees (with girth less than 30 cm measured at height of 1m above ground level) etc. if any shall be completely removed along with their roots and disposed off by bidder.
118	General	-	-	Please provide layout drawing showing right of way for steam pipeline from terminal point to CO2 plant area	All ll the details marked in the Plot plan attached
119	General	-	-	Please provide the routing layout of piperack from boiler to Plant A and Plant A to Plant B	(a) All the detailed marked in the Plot plan attached. b) From Plant A to Plant B Routing shall be finalized during detailed engineering which is in Bidders Scope. Also, bidder is requested to visit site for better understanding of visit.
120	-	-	-	Please specify steam pressure available at terminal point	Approximately 10 Bar
121	-	-	-	For 6.6kV HT switchgear, please clarify no. of outgoing feeder tht need to be provided for new switchgear	02 feeders to be provided from existing 6.6kV HT FGD switchgear
122	-	-	-	Both Area-A and Area-B 415V LT MCC is having one incomer or two incomer	One 415V cable to be laid from FGD LT SWGR to CO2 area for critical drives and existing 415 LT supply can be used at old Ash Brick plant. Details to be finalised during engg.
123	-	-	-	communication between PLC and main plant DCS is required or not. If it is required, then please clarify the mode of communication whether it is hard wired or wireless and in OPC communication. Firewall is required or not	No communication between package PLC and main plant DCS is required.
124	-	-	-	For CO2 Capture Process Design - Flue gas composition with FGD to be considered?	Flue gas composition with FGD to be considered for design purpose.
125			QR related	Seeking the Qualification criteria of previous tenders, its requested, the qualifying requirements for the Tender " Design and Set Up of 'Carbonated Fly Ash Brick (C-Brick) Plant of 2 Lakh per day capacity' at NTPC Ramagundam" to include experience in the Oil & Gas/Hydrocarbon sector to ensure wider participation and promote competitiveness.	QR mentions Process industry. Oil and Gas is a part of process industry, as it is reliant on process control. So no correction in QR is required.