EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 03 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section/ Chapter	Clause No.	Page No.		
PM1-01	VI/A	Annexure-A to subsection II C (Project Management)	1.01.00 (H)	6 of 6		**4D Model** 4D modelling is the integration of a 3D model with construction schedule in order to visualise the sequence and progress of construction. Referring to clause 8.03.04 GTR part C section VI, Agency to represent actual site progress of construction activity with respect to planned progress based on Schedule in 4D model to NTPC every month.

EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 03 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
PU2-1	VI / PART-A	A-12 PLANT UTILITIES	4.00.00 b) 14	05 of 11	13) Any other area/building in the scope of the Bidder and required to be protected with hydrant system.	13) Conveyors, TPs, crusher house and various other buildings of Limestone & Gypsum handling plant 14) Any other area/building in the scope of the Bidder and required to be protected with hydrant system.

EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 03 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
TG2-01	VI/A	IV	1.01.02 (Xi)	7 of 76	For increase in Station auxiliary power consumption comprising of all station Auxiliaries required for continuous station operation at 2 x 800 MW (i.e. 100% rated load of all the units). **Limiting Value** Not more than 20500 KW.	For increase in Station auxiliary power consumption comprising of all station Auxiliaries required for continuous station operation at 2 x 800 MW (i.e. 100% rated load of all the units). **Limiting Value** Not more than 20800 KW.

EPC Package for Lara Super Thermal Power Project, Stage II (2 X 800 MW)
Amendment No. 3 to Technical specification Section VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
WS2-01	VI/B	A-15	4.02.08	16 OF 43	New clause added	FRP tower shall be with proper sealing/isolation between cells to avoid short circuiting of air between adjacent cells of Cooling Tower and ensure that there is no reverse rotation of fan.
WS2-02	VI/B	A-15	4.01.00	13 OF 43	Hot water header: MS to IS:2062/ GRP (around cooling tower)	Hot water header: MS to IS:2062 (around cooling tower)

EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 03 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
C&I-2-01	SECTION – VI, PART-A	Annexure C to IIC Contract quantity	**2.07.00**	5 of 24	**Coal handling System (CHP) DDCMIS** The Control System of CHP DDCMIS has following process blocks: CHP stream-A block CHP stream-B block Separate RIOs shall be provided for each stream (A & B)	**Coal handling System (CHP) DDCMIS** The Control System of CHP DDCMIS has following process blocks: CHP stream-A block CHP stream-B block **Lime handling system block** Separate RIOs shall be provided for each stream of (A & B)
C&I-2-02	*SECTION – VI, PART-A*	*Annexure C to IIC Contract quantity*	**2.08.00**	6 of 24	iv. Limestone preparation and transfer from stage-I common system block	iv. Lime stone preparation ***~~and transfer from stage-I common~~*** *system* block
C&I-2-03	*SECTION – VI, PART-A*	*Annexure C to IIC Contract quantity*	**E 1.01.00 (** Table column no-04 description)	11 of 24	CHP /Biomas handling /GHP (no.)	CHP /Biomas handling /**LHP**/GHP (no.)

EPC Package for Lara Super Thermal Power Project, Stage II (2 X 800 MW)
Amendment No. 03 to Technical specification Section VI of Bidding Document No.: CS-9587-001R-2

Amendment No. SG2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
SG1-24	SECTION – VI, PART-A	SUB-SECTION-IIA-04	1.03.00	1 of 6	The FGD system shall have an independent absorber for each unit and interconnection with common limestone milling systems (as provided for of stage-I) for the two units and common gypsum dewatering system for the two units….	The FGD system shall have an independent absorber for each unit ~~and interconnection~~ with common limestone milling systems ~~(as provided for of stage-I)~~ for the two units and common gypsum dewatering system for the two units **of stage-II.**
SG1-25	SECTION – VI, PART-A	SUB-SECTION-IIA-04	2.05.00	2 of 6	Limestone to the absorbers of the two (2 no) units shall be supplied by the stage-I limestone slurry storage tanks with suitable interconnections. The slurry shall be pumped from the existing stage-I limestone slurry storage tanks to individual absorbers by dedicated limestone slurry pumps.	**Limestone to the absorber shall be supplied by a wet limestone grinding system. Limestone from Limestone Storage Silos shall be fed to the wet ball mill through gravimetric feeder. The classified limestone slurry from the mills shall be stored in two (2 nos.) limestone slurry storage tanks to be provided by the contractor, from where the slurry shall be pumped to the absorber by limestone slurry pumps.**
SG1-26	SECTION – VI, PART-A	SUB-SECTION-IIA-04	3.00.00	2 of 6	LIMESTONE GRINDING SYSTEM INTERCONNECTIONS (TO BE UTILISED AS COMMON FOR STAGE-I AND STAGE-II) There is no limestone grinding system…… limited to interconnections as above.	Refer '' Annexure-I_IIA-04_FGD_Revised LS Grinding System'' for the scope of limestone grinding system.
SG1-27	SECTION – VI, PART-A	SUB-SECTION-IIA-04	8.01.00	5 of 6	The contractor shall provide sumps of adequate capacity in each of the following area:	The contractor shall provide sumps of adequate capacity in each of the following area: A. Each Absorber Area

					A. Each Absorber Area B. Gypsum dewatering system	B. Gypsum dewatering system **C. Limestone Grinding System**
SG1-28	SECTION-VI, PART-B	SUB-SECTION-A-05	6.00.00	12 of 26	LIMESTONE GRINDING AND SLURRY PREPARATION SYSTEM 6.01.00 A common limestone and slurry preparation…… 6.07.04 Automatic flushing equipment for all lime slurry pumps and pipes shall be supplied.	Refer **''Annexure-II__B_A-05_Revised LS Grinding System''** for the scope of details on limestone grinding and slurry preparation system
SG1-29	SECTION – VI, PART-A	SUB-SECTION-IIA-04	9.01.00	5 of 6	One (1) number passenger cum goods elevator of minimum capacity of 1000kgs for each Absorber (to be provided in case height of absorber is higher than 15m) and One (1) number passenger cum goods elevator of minimum 1000 kgs for gypsum dewatering building and One (1) no. 680 Kg elevator for control room building shall be provided for easy access & movement of man/materials.	One (1) number passenger cum goods elevator of minimum capacity of 1000kgs for each Absorber (to be provided in case height of absorber is higher than 15m), **One (1) number passenger cum goods elevator of minimum capacity of 1000 kgs in each for Limestone Grinding System Building** and One (1) number passenger cum goods elevator of minimum 1000 kgs for gypsum dewatering building and One (1) no. 680 Kg elevator for control room building shall be provided for easy access & movement of man/materials.
SG1-30	SECTION – VI, PART-A	SUB-SECTION-IIA-04	11.00.00	5 of 6	11.00.00 BUILDINGS 11.01.00 Contractor shall provide buildings for Compressors, Gypsum Dewatering System & FGD control room. Slurry re-circulating pumps & Oxidation blowers shall be located in a shed provided with roof sheeting. The buildings/structure must be complete in all respect specially facilitating the smooth operation and maintenance of associated equipment's of above systems by providing adequate maintenance space, handling facilities, walkways, staircase etc.	11.00.00 BUILDINGS 11.01.00 Contractor shall provide buildings for **Limestone Grinding System,** Compressors, Gypsum Dewatering System & FGD control room. Slurry re-circulating pumps & Oxidation blowers shall be located in a shed provided with roof sheeting. The buildings/structure must be complete in all respect specially facilitating the smooth operation and maintenance of associated equipment's of above systems by providing adequate maintenance space, handling facilities, walkways, staircase etc.

SG1-31	SECTION-VI, PART-B	SUB-SECTION-A-05	15.01.00	24 of 26	15.01.00 Elevators shall be designed based on following criteria: (i) Type of service One (1) no. Passenger cum goods elevator per Absorber (higher than 15 m) and dewatering building	15.01.00 Elevators shall be designed based on following criteria: (i) Type of service- One (1) no. Passenger cum goods elevator per Absorber (higher than 15 m), **Mill Building** and dewatering building
SG1-32	SECTION-VI, PART-B	SUB-SECTION-A-05	15.01.00	24 of 26	(iii) (c) ELEVATOR CAPACITY 1000 kg (minimum)).For absorber (higher than 15 m), Dewatering Building.&680 KG For MCC cum control room building.	(iii) (c) ELEVATOR CAPACITY 1000 kg (minimum)~~)~~. For absorber (higher than 15 m), **Mill building,** Dewatering Building.& 680 KG **for** MCC cum control room building.
SG1-33	SECTION-VI, PART-B	SUB-SECTION-A-05	8.01.00	18 of 26	This Clause covers the design, manufacture and erection of all slurry pumps for the FGD system including the Absorber slurry recirculation pumps, Gypsum bleed pumps, Limestone slurry feed pumps and any other pump handling slurries.	This Clause covers the design, manufacture and erection of all slurry pumps for the FGD system including the Absorber slurry recirculation pumps, Gypsum bleed pumps, Limestone slurry feed pumps, **Mill circuit pumps** and any other pump handling slurries.
SG1-34	SECTION-VI, PART-B	SUB-SECTION-A-05	11.01.00	20 of 26	11.01.00 Agitators shall be supplied in tanks and vessels to prevent caking and settlement of particles out of the slurry, e.g. in the absorber vessel, limestone slurry tank, Auxiliary Absorbent tank, and sumps etc.	11.01.00 Agitators shall be supplied in tanks and vessels to prevent caking and settlement of particles out of the slurry, e.g. in the absorber vessel, limestone slurry tank, **limestone mill re-cycle tanks,** Auxiliary Absorbent tank, and sumps etc.
SG1-35	VI/A	VI/ Chaptor-01	**1.22.09**	22 of 38	1.22.09 Limestone Mills Not Applicable	1.22.09 Limestone Mills Refer ''Annexure-III_FGD Limestone M Spares''
SG1-36	SECTION – VI, PART-A	SUB-SECTION-VI CHAPTER - 01	**1.22.06**	20 of 38	**1.22.06** Slurry Pumps (Absorber Slurry Recirculation Pump, Gypsum Bleed Pumps, Limestone Supply Pumps and any other slurry pumps)	**1.22.06** Slurry Pumps (Absorber Slurry Recirculation Pump, Gypsum Bleed Pumps, **Mill Circuit Pump**, Limestone Supply Pumps and any other slurry pumps)
SG1-37	SECTION – VI, PART-A	SUB-SECTION-VI CHAPTER - 01	**1.22.08**	21 of 38	1.22.08 Feeders (if applicable)	1.22.08 Feeders ~~(if applicable)~~

EPC Package for Lara Super Thermal Power Project, Stage II (2 X 800 MW)
Amendment No. 03 to Technical specification Section VI of Bidding Document No.: CS-9587-001R-2

SG1-38	SECTION – VI, PART-A	SUB-SECTION-IV CHAPTER - 01	1.03.03	31 of 76	1.03.03 Flue Gas Desulphurisation System i) Not Used (ii) Not Used (iii) Not Used (iv) Pressure Drop across FGD (v)…….	1.03.03 Flue Gas Desulphurisation System **(i) Wet ball Mill capacity at rated fineness** The contractor shall demonstrate the guaranteed capacity of each limestone pulveriser under the following conditions: i) Limestone fineness :90% or higher (as per the requirement of the absorber) through 325 mesh (for spray tower process) OR 90% or higher (as per the requirement of the absorber) through 200 mesh (for jet bubbling process). ii) Limestone Quality : All available quality from the specified range. Contractor shall demonstrate the above capacity with the originally installed grinding elements in nearly worn-out condition as mutually agreed for the purpose of ascertaining wear life of any of the wear parts. **(ii) Wet ball Mill wear parts guarantee** Contractor shall demonstrate the life of wet ball Mill wear parts in line with requirements stipulated in Part B of the Technical Specification. The establishment of the above guarantee shall be based on the operating records available at the Power station and will be computed for each pulveriser based on actual total hours of operation. **(iii) Wet ball Mill ball consumption** Contractor shall guarantee ball consumption per ton of limestone throughput in line with requirements stipulated in Part B of the Technical Specification. Contractor shall furnish the minimum ball diameter below which the balls shall be replaced.

EPC Package for Lara Super Thermal Power Project, Stage II (2 X 800 MW)
Amendment No. 03 to Technical specification Section VI of Bidding Document No.: CS-9587-001R-2

						(iv) Pressure Drop across FGD (v)…….
SG1-39	VI/B	A-05	16 of 26	7.07.06	……2x100% horizontal centrifugal pumps shall be provided for pumping the waste water from waste water….The material of Casing shall be rubber lined or Hi-chrome steel. …..	……2x100% horizontal centrifugal pumps shall be provided for pumping the waste water from waste water **tank to the mixing tanks of HCSD system ~~if provided~~ or in any other area with suitable treatment so as to suit/not to disturb the destination fluid quality.** The material of Casing shall be rubber lined or Hi-chrome steel. ……
	VI/A	IIA-04	2 of 6	2.06.00	……..The waste water from the system shall be collected and neutralized using lime and shall be pumped for utilizing in the Spray water system being provided by the Contractor for spraying water on the dry bottom ash & fly ash conveying system or in the mixing tanks of HCSD System, if provided.	……..The waste water from the system shall be collected and neutralized using lime and shall be pumped ~~for utilizing in the Spray water system being provided by the Contractor for spraying water on the dry bottom ash & fly ash conveying system or~~ to the mixing tanks of HCSD System~~, if provided~~ **or in any other area with suitable treatment so as to suit/not to disturb the destination fluid quality**.
SG1-40	VI/A	IV	14 of 69	1.01.03.03 xi	xi. The Bidder shall furnish the correction curves, for Employer's approval covering the expected ranges of variations for all these parameters for the range of coal specified	xi. ~~The Bidder shall furnish the correction curves, for Employer's approval covering the expected ranges of variations for all these parameters for the range of coal specified~~ Correction to tested efficiency shall be provided as per provisions of the BS EN 12952-15:2003 code.

Annexure-I_IIA-04_FGD_Revised LS Grinding System

3.00.00 LIMESTONE GRINDING SYSTEM (COMMON FOR TWO (2X800 MW) UNITS OF LARA STAGE-II)

3.01.00 The contractors scope shall include a common limestone grinding system for the two units with interconnection from existing stage-I system and shall comprise of :

3.01.01 2X100% Limestone storage silos having minimum 24 hours storage capacity equivalent to the requirements of 2X800MW. The storage silo shall be complete with supporting steel structure, platforms, staircase, air canons, power operated gates, gravimetric feeders, level switches, air relief devices, etc.

3.01.02 2x100% wet horizontal ball mills with each mill sized to meet 110% of the maximum limestone requirement of two units at Design point.

3.01.03 Two (2) limestone slurry tanks, each tank sized to meet 12 hrs limestone slurry storage requirement for two units at Design point, complete with all accessories and Agitator(s).

3.01.04 2x100% limestone slurry pumps for each absorber connected to each of the limestone slurry tank (total 4 nos. of pumps for 2x800 MW). Each pump catering to slurry requirement of each unit's absorber.

3.01.05 Limestone slurry piping to each absorber, along with recirculation lines (if required), all isolation and control valves.

3.01.06 Each mill shall be fed from an dedicated Limestone bunker. The mill shall be complete with the following items, as a minimum requirement:

i. A bunker outlet gate

ii. A gravimetric limestone feeder along with its drive and all other auxiliaries

iii. 1 no. separator tank with agitator(s).

iv. 2x100% Mill circuit pump.

v. 1 set of hydro-cyclone

vi. A peripheral/central drive system with motor, speed reducer gearbox and other auxiliaries.

vii. An auxiliary motor for inching operation with speed reducer.

viii. Complete lubricating system with appropriate lubricating medium storage facility (i.e. 1 no. lube oil tank for storage of lube oil and/or 1 no. grease storage drum as required).

ix. Lube oil pumps, coolers, duplex oil filters, connecting piping and necessary load & remote indicating instruments. Each lube oil pump and cooler shall have a 100% identical stand-by.

3.01.07 All connecting pipes / chutes along with necessary valves between various systems of the mill and from hydro-cyclone to common slurry storage tanks shall also be in the scope of the contractor. Necessary pipes, pipe supports, trestles etc. as required for the routing of the pipes shall be under the contractor's scope. Any item not included above but necessary for safe and reliable operation of the milling system proposed by the contractor shall also be in the contractors' scope.

3.01.08 The complete Limestone Grinding System shall be installed inside a building to be provided by the Contractor as per specifications specified elsewhere. The building must be complete in all respect specially facilitating the smooth operation and maintenance of associated equipment's of above systems by providing adequate maintenance space, handling facilities, walkways, staircase& one (1) number passenger cum goods elevator of minimum capacity of 1000 kgs for easy access & movement of man/materials etc. The building shall be sufficiently ventilated.

Annexure-II__B_A-05_Revised LS Grinding System

6.00.00 LIMESTONE GRINDING AND SLURRY PREPARATION SYSTEM

6.01.00 Type

A common limestone and slurry preparation system is envisaged for 2 x 800 MW units. Contractor shall supply wet limestone grinding and slurry preparation system complete with all auxiliaries and slurry storage tank of proven design.

6.02.00 Limestone Silo:

6.02.01 The Contractor shall provide 2X100% Limestone storage silos each silo having minimum 24 hours storage capacity equivalent to the requirements of FGD system of 2X800 MW at Design point. The storage silo shall be complete with supporting steel structure, platforms, staircase, air canons power operated gates, gravimetric feeders, air relief devices, etc

6.02.02 The storage silos and hopper cones shall be fabricated of minimum 10 mm thick carbon steel with a SS lining of grade SS304 of minimum 4 mm thickness in the complete cones to ensure reliable discharge of material. The design of storage silos shall confirm to IS 9178 or any other proven international standards. The storage silo shall be capable of feeding the limestone by means of gravimetric feeder to the wet ball mills. The top of the unloading hopper shall be equipped with a grate to protect the downstream equipment from gravel lumps or tramp waste.

6.02.03 Each Silo shall be provided with three(3) no. of radar type level transmitters per silo.

6.02.04 Each silo shall be provided with minimum 3nos. of air canons at necessary location, capable of removing the jamming/clogging/blockage in the silos.

6.02.05 For dust free operation each silo should be provided with a covering arrangement and a self-cleaning bag filter system of suitable capacity containing blower, automatic/on-load cleaning system, etc.

6.02.06 For each silo facilities shall be provided for unloading the bunker, through feeder, to a truck at ground level, along with all necessary chutes and diversion chutes.

6.02.07 Lime stone silo with hopper may be fabricated at factory in segments, transported and welded at site.

6.03.00 Bunker Shut-off Gates

6.03.01 A bunker outlet chute shall be provided for feeding limestone from bunker to the feeder. The size of the opening chute shall be sufficient to ensure proper flow of the limestone. There shall be no reduction of section in the bunker outlet chute from bunker to feeder. The inlet chute shall be provided with suitable poke doors/holes in order to remove jamming/blockage. A motorized bunker shut-off gate shall be provided at the inlet to each feeder.

6.03.02 All parts of the gate in contact with limestone shall be of stainless steel construction.

6.03.03 The shut-off gates and its actuator shall ensure 100% closing of the gate even with ‘bunker full of limestone’.

6.03.04 Facility shall be provided to open/close the bunker outlet gate, through actuator, from remote as well as local.

6.03.05 NA

6.03.06 For each bunker facilities shall be provided for unloading the bunker, through feeder, to a truck at ground level, along with all necessary chutes and diversion chutes.

6.04.00 Gravimetric Feeders

6.04.01 Gravimetric feeders shall be sized to meet 110% of the maximum mill capacity.

6.04.02 The limestone feeder belt shall be of seamless rubber construction. It should be possible to adjust the belt tension from outside without opening the feeder body.

6.04.03 All parts in contact with limestone except belt shall be of stainless steel construction.

6.04.04 The feeder shall have adequate instrumentation to detect `loss of flow'.

6.04.05 The feeder shall have a motor/pneumatic operated gate at the outlet.

6.05.00 Wet Ball Mill

6.05.01 There shall be 2X100% wet ball mills for grinding of limestone. Each mill shall be sized to meet 110% of the maximum limestone requirement of 2x800 MW units under the following conditions, all occurring together.

(i)	Load	Design point flow
(ii)	Flow	110% of limestone requirement of two absorbers at Design point
(iii)	Input Limestone Size	1" (max.)
(iv)	Output Fineness	90% or higher (as per the requirement of absorber) through 325 mesh (for spray tower process) OR 90% or higher (as per the requirement of the absorber) through 200 mesh (for bubbling process)
(v)	Mill Wear Part Conditions	Near Guaranteed Wear Part Life.
(vi)	Limestone bond index(kWh/sh.T)	13 (min)

6.05.02 All integral auxiliaries of the mills like hydro-cyclones, separator tank & mill circuit pumps shall be sized to meet the above conditions. A 100% stand-by pump shall be provided for the mill circuit pump.

6.05.03 The mill hydro-cyclone set shall have sufficient redundancy. A minimum 10% spare hydro-cyclone shall be provided in each set of hydro-cyclone. Hydro-cyclones shall be of modular construction. It shall be possible to remove and replace individual hydro-cyclone with the set in service. Individual isolation valve shall be provided for each hydro-cyclone for this purpose. The hydro-cyclone shall be of proven design and shall be made of polyurethane, Urethane or with replaceable rubber lining. The hydro-cyclone shall be provided with replaceable rubber lining of thickness 12 mm for the feed chamber and 12 mm for the overflow launder.. The liners shall have a minimum wear life of not less than 8000 hrs.

6.05.04 All parts of the mill including mill body, trunnion, integral pipes, mill circuit pumps and

other parts in contact with limestone slurry shall be provided with replaceable rubber wear liners. The wear liners or wear parts shall have a minimum guaranteed wear life of not less than 8000hrs without reversal of the liners. The guaranteed capacity and fineness of the mill shall not be affected within the guaranteed life of the mil wear parts.

6.05.05 The material of the balls shall be chosen to ensure that the balls do not lose their original shape and to ensure minimum ball consumption. The contractor shall also guarantee ball consumption per ton of limestone throughput. The contractor shall furnish the minimum ball diameter below which the balls shall be replaced.

6.05.06 Facility shall be provided for on-load loading of steel balls to the mill.

6.05.07 The ball mill shall be driven by a peripheral /central drive system with motor, speed reducer gearbox and other auxiliaries. An auxiliary motor shall also be provided for inching of mills after trip and during maintenance.

6.05.08 The lube oil system shall have 100% stand-by arrangement for lube oil pumps and oil coolers of each circuit with independent pump / cooler. Wherever required duplex oil filters shall be provided.

6.05.09 The mill auxiliaries like separator tanks, mill circuit pump, and all connecting pipes handling limestone slurry shall have replaceable rubber linings.

6.05.10 The design and manufacturing of wet ball mill shall follow the latest applicable Indian/ International (ASME / EN / Japanese) Standards.

6.06.00 Limestone Slurry Preparation / Storage Tank

6.06.01 The contractor shall provide two (2 nos.) slurry storage tank, common for all mills. Each tank shall be sized to meet 12 hours continuous limestone requirement of the 2x800 MW units operating at Design point. For tank volume calculation, solid concentration (by weight) in the slurry shall be assumed, not more than 20% or actual required whichever is lower.

6.06.02 The storage tanks shall be equipped with sufficient number of agitators, to avoid settling of limestone, as per the proven practice of the supplier. The agitators shall be designed to meet the requirements stipulated in Cl. No. 11.00.00of this Sub-Section.

6.06.03 The limestone mill circulation tanks shall be installed indoor beneath the hydro cyclone stations. The slurry storage tank shall be located outdoor.

6.06.04 The slurry preparation tank shall be CS construction with replaceable chlorobutyl/bromobutyl rubber lining of minimum 5 mm thickness.

6.07.00 Limestone Slurry Supply Pumps& Piping

6.07.01 2x100% centrifugal type limestone slurry pump shall be provided for each unit. Each limestone slurry pump shall be sized to supply the limestone requirement of one (1 no.) unit, under the following conditions all occurring together.

(i)	Load	Design point

(ii)	Flow	110% of one absorber requirement with the limestone requirement at Design point.
(iii)	Head	As per system requirement.
(iv)	Margins	Flow 10% (minimum) Heads 15% (minimum)
(v)	Solids Concentration	Max. 30% by weight or actual as per suppliers practice, whichever is minimum.

6.07.02 The limestone slurry pumps shall be designed to meet the requirements stipulated in Cl. No.8.00.00. of this Sub-Section.

6.07.03 The limestone slurry pipes shall be sized to minimize erosion and avoid settling of the limestone at part load operation. The slurry pipes shall be lined with replaceable wear resistant natural rubber lining of minimum 6 mm thickness. Additional thickness of 2 mm in rubber lining shall be provided at bends.

6.07.04 Automatic flushing equipment for all lime slurry pumps and pipes shall be supplied.

1.22.09	**Limestone Mills**	
	1. Mill Wear Parts (Liners) & Grinding element	1 set
	Note : One set of Mill Wear Parts (Liners) above is defined as under :	
	1 Set = (Grinding elements needed for complete replacement of one mill) X (8000 x 1) / GWL, rounded off to nearest higher whole number. Where : GWL = Guaranteed wear life of Mill Wear Parts as offered by the bidder.	
	2. Mill Motor	1 no. of each type and rating
	3. Auxiliary Motor	1 no. of each type and rating
	4. Gear box internals (including Bearings and Seals)	2 sets *
	5. Complete Gear Box	1 set *
	6. Mill motor Bearings	1 set *
	7. Lube Oil / Grease System	
	7.1 Pump assembly	2 nos. of each type
	7.2 Motor	1 no. of each type and rating
	7.3 Pressure regulator	1 no. of each type
	7.4 Filters	2 nos. of each type
	7.5 Pump & Motor coupling	1 no. of each type

EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 03 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
MH-34	VI/PART-A	IIA-14	1.00.00	1 OF 2	**LIMESTONE HANDLING PLANT (LHP)** **Space provision to be kept for Limestone unloading, Conveying, crushing, storage and feeding to day silo.**	Refer "Annexure_LHP PART A"
MH-35	VI/PART-B	A-19			**Not Used**	Refer "Annexure_LHP PART B"
MH-36	VI/PART-A	VI	CHAPTER-09	1 OF 11	**Mandatory Spares for Limestone and Gypsum Handling**	**Refer "Annexure- Mandatory Spares for Limestone and Gypsum Handling"**
MH-37	VI/PART-A	IV	1.03.7.02.1	33 OF 76	**GUARANTEES** Add new clause	**GUARANTEES** **vi. Limestone unloading stream:** **Limestone Flow Path:** Bulk receiving unit/Box Feeder/Surface Feeder etc taking feed of incoming Limestone and discharging crushed Limestone into Limestone storage silos which in turn feeds Limestone to Limestone Day Silo through Limestone Conveyors, Bucket elevators, Diverter Plows including all intermediate equipments. Bidder shall also demonstrate the guaranteed tippling rate of Truck Tipplers **Major Equipment Capacity of Limestone handling plant:** Guaranteed capacity in T/Hr of the following: Bulk receiving unit/Box Feeder/Surface Feeder Limestone Crushers Vibrating Screen feeder Vibrating Feeder

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
						Performance tests and the procedure for performance testing of Limestone handling plant shall be as per Annexure-II.
MH-38	VI/PART-A	IV	1.01.07.02	25 OF 76	Station Auxiliary Power Consumption Add new clause	Station Auxiliary Power Consumption j. Total power consumption for all the equipments including auxiliaries at its guaranteed capacity of Limestone Flow Path Except following. - Lighting - Hoists - Limestone sampling unit - Sump Pumps - Elevators - DS, DE, Ventilation, SW System, Potable water system. **Duty factor for limestone handling plant shall be 0.2**
MH-39	VI/PART-A	IV	2.02.03 (a)	57 OF 77	**Power Consumption Measurement** (a.) The guaranteed power consumption as total sum of all the equipments as specified shall be measured during capacity test of the identified Flow Paths for both the streams separately. The load of the following items shall not be considered during measurement of Power Consumption for guarantee: Lighting Hoists Sump Pump Coal Sampling Unit	**Power Consumption Measurement** (a.) The guaranteed power consumption as total sum of all the equipments as specified shall be measured during capacity test of the identified Flow Paths for both the streams separately **(Single stream for Limestone Handling plant).** The load of the following items shall not be considered during measurement of Power Consumption for guarantee: Lighting Hoists Sump Pump

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
					Elevator DS, DE, Ventilation, SW system, Potable water system	Coal Sampling Unit**/Limestone sampling unit** Elevator DS, DE, Ventilation, SW system, Potable water system
MH-40	VI/PART-A	IV	2.03.11	**65 OF 77**	**Testing for Demonstration Requirements** Add new clause	**Testing for Demonstration Requirements** Limestone Crushers Vibration measurement (velocity and amplitude) is to be recorded at bearings as per appendix. Vibration is to be within allowable limits. No excessive rise of temperature of bearings One crusher is to be tested for output and size. Proper functioning of vibration monitoring system to be checked. Noise level measurement, for conformance to specified levels, to be done around the following equipments/ areas: (a.) Conveyor Discharge Terminal (including discharge chute, gearbox, coupling & motor). (b.) Limestone discharge chutes on intermediate floors in possible impact zones.
MH-41	VI/PART-A	IIA-16	1.01.05(E)	**5 OF 15**	b. Belt Conveyors (one no per set of three dewatering bins) for conveying the dewatered ash to the vibrating feeders & crushers or for loading into the trucks/mixing tanks near HCSD	b. Belt Conveyors (**Two no per set** of three dewatering bins: 2 x 50%) for conveying the dewatered ash to the vibrating feeders & crushers or for loading into the

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
					cum Fly ash silo , complete with conveyor supporting structures, stringers, short supports, deck plate, seal plate etc., drive motors, drive chain equipments, pulleys, idlers, screw take ups, internal and external belt wipers, pull chord switches, belt sway and zero speed switches, electro-hydraulic thruster brakes, flap gates ,all electrical etc., including all civil, structural works	trucks/mixing tanks near HCSD cum Fly ash silo , complete with conveyor supporting structures, stringers, short supports, deck plate, seal plate etc., drive motors, drive chain equipments, pulleys, idlers, screw take ups, internal and external belt wipers, pull chord switches, belt sway and zero speed switches, electro-hydraulic thruster brakes, flap gates ,all electrical etc., including all civil, structural works. In stead of two-way chute arrangement, Bottom ash from belt conveyors shall be conveyed through suitable single chute arrangement.
MH-42	VI/PART-A	I-A	4.19.1	13 OF 36	Notes to Clause no. 4.19.1 (i) An individual boiler unit……of 4.19.1 (a) above. (ii) The activity of design and engineering under 4.19.1 (a), (b), (c) **& (d)** should have been carried out by the Bidder/ its Sub-vendor(s) and not through any external design agency/agencies. (iii) The systems mentioned…… is also permissible. (iv) For reference fly ash handling systems …….. in its contract documents.	Notes to Clause no. 4.19.1 (i) An individual boiler unit……of 4.19.1 (a) above. **(ii)** The activity of design and engineering under 4.19.1 (a), (b) & (c) should have been carried out by the Bidder/ its Sub-vendor(s) and not through any external design agency/agencies. **The activity of design and engineering under 4.19.1 (d) should have been carried out either by the Bidder/ its Sub-vendor(s) or through design agency/agencies having experience for high concentration ash slurry disposal system.** (iii) The systems mentioned…… is also permissible. (iv) For reference fly ash handling systems …….. in its contract documents.

EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 03 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
MH-43	VI/PART-A	I-A	4.19.4	14 OF 36	New Clause EPC Organization in Collaboration with QAHPM	4.19.4 EPC organization in Collaboration with QAHPM (Qualified Ash Handling Plant Manufacturer): (Alternate route for Bidder/ its Sub- vendor who does not meet the requirements under clause 4.19.1 or 4.19.2) (a) The Bidder/Bidder's sub-vendor should be an Engineering, Procurement and Construction (EPC) organization and should have executed, in the last 10 years, industrial projects on EPC basis (with or without civil works) in the area of Power, Steel, Oil & Gas, Petro-chemical, Fertilizer, Flue Gas Desulphurisation and/or any other process industry with the total value of such projects being INR 4,000 million or more. At least one of such projects should have a contract value of INR 1,600 million or more. These projects shall be in successful operation for a period of not less than one (1) year. (b) The Bidder/Bidder's sub-vendor should also have a valid ongoing collaboration and technology transfer/Licensing agreement with a QAHPM meeting requirements of clause 4.19.1 on its own, valid minimum up to the end of the defect liability period of the contract. In such a case, Bidder/Bidder's sub-vendor can either source the AHP System from such manufacturer or manufacture/get

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
						manufactured the AHP System as per the design and manufacturing drawings released by such QAHPM. (c) Bidder shall be required to furnish a letter of support (Refer **Annexure- LETTER OF SUPPORT_4.19.4)** from Collaborator/ Licensor /Technology provider for successful performance of the AHP system valid up to the end of defect liability period of the contract as per the format enclosed in the bidding document, at the time of placement of order on the approved sub-vendor. Notes for Clause 4.19.4 i. QAHPM (Qualified Ash Handling Plant Manufacturer) means a manufacture meeting requirement stipulated at 4.19.1 ii. Technology Transfer/Licensing agreement The Technology transfer/Licensing agreement between the Bidder, Bidder's sub-vendor & QAHPM shall necessarily cover transfer/licensing of technological knowhow for AHP system in the form of transfer/licensing of design

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
						dossier, design software's, drawings and documentation, quality system manuals and imparting relevant personnel training to the Bidder/Bidder's sub-vendor.
MH-44				**247 OF 401**	Attachment 3K for Ash Handling Plant	Revised Attachment 3K for Ash Handling Plant
MH-45	**VI/PART-B**	**A-20**	**4.22.00**	**30 OF 93**	C. Capacity: 60 Ton **Unloading Cycle:3-4 minutes** Max. Tilting angle: 55 Main Structure: Steel IS 2062/IS 1570 Hydraulic cylinder Tubes: Honed/Roller Burnished of seamless with internal surface finish less than 0.4 micron Hydraulic Cylinder piston rod: C45/EN8 Seal & guide ring: PTFE	C. Capacity: 60 Ton Max. Tilting angle: 55 Main Structure: Steel IS 2062/IS 1570 Hydraulic cylinder Tubes: Honed/Roller Burnished of seamless with internal surface finish less than 0.4 micron Hydraulic Cylinder piston rod: C45/EN8 Seal & guide ring: PTFE
MH-46	**VI/PART-E**				Tender Drawing for LHS added	9587-001(R)-POM-A-031 Sheet-1 Rev-A

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES
1.00.00	**DETAILED SCOPE**
1.01.00	**Limestone Handling Plant (LHP)**
1.01.01	Limestone will be received to power plant through road by trucks. **Limestone received through Road** shall be unloaded by Two (2) numbers Truck Tipplers each of minimum **40T** capacity **(Gross weight 60 T minimum)** to discharge Limestone on to Box Feeders/Surface Feeders/Truck Unloading Hopper, complete with all mechanical, electrical and C&I, Civil & structural works for unloading Limestone by truck tipplers. Two (2) numbers Box Feeders/ Bulk-material Receiving Unit/ Surface feeder each of 200 TPH Capacity, for unloading of limestone from trucks/ self-tippling trucks/ loader shovels, complete with drives, accessories all mechanical, electrical and C&I, Civil & structural works, including its supporting foundations etc. This unit shall feed limestone onto the conveyor/bucket elevator before Limestone crusher house. Limestone shall be conveyed to usage point through single stream conveyors & Bucket Elevators of capacity 100% for conveying.
1.01.02	Limestone Belt Conveyors, Bucket Elevator complete, conveyor galleries along with its supporting structures, short supports, stringers, deck plate, seal plate, conveyor foundations, drive motors, drive units, pulleys, idlers, gravity take ups including guides, pits etc., internal and external belt cleaners, pull chord switches, belt sway, zero speed switches, electro-hydraulic thruster brakes, all electrical etc. including all civil, structural and architectural works, gallery supporting trestles and their associated foundations, as applicable.
1.01.03	One (1) number Limestone crusher house (CH) complete with all civil, structural, architectural and electrical works etc. accommodating suitable nos. crushers and associated Vibrating screening feeders, passenger cum goods elevator, conveyors, chute work along with actuator operated flap gates, monorails & hoists, hoist maintenance platform, external and internal staircases, hand rails and other equipment such as sampling unit, dust extraction system etc. as specified elsewhere.
1.01.04	2x100% of vibrating screening feeders in limestone crusher house to feed the limestone to crushers with drives, dust hoods, all mechanical, electrical accessories and supporting structures etc.
1.01.05	2x100% of hammer crusher complete with drives, accessories all mechanical, electrical civil & structural works, including crusher supporting foundations, vibration isolation system with springs and viscous dampers, vibration monitoring system etc.
1.01.06	Crushed limestone Silo, Junction Towers (if applicable) complete with all civil, structural, architectural, electrical and C&I works including chutes, monorails, hoists/chain pulley blocks, hoist maintenance platforms, external staircases, dust debris chutes etc. All over-ground junction towers (if applicable) shall have separate debris disposal chute up to the ground floor.
1.01.07	Complete chute work along with chute block switches and actuator operated flap gates, mobile discharge pulleys (as applicable) in all junction towers (if applicable) between various conveyors.
1.01.08	Suitable number of motorized travelling tripper / flow diverter plough/reversible belt feeder (as applicable) on each feeding conveyor for feeding the crushed limestone to the limestone storage Silo. Trippers shall be complete with all mechanical, electrical equipment, rails, chute work, rail supporting structure (along with structural stools, as required), cables with cable festooning arrangement, thruster brakes, rail clamps, electric hoist, actuator flap gates etc.

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES
	The Limestone storage shall be sufficient to store limestone equivalent to consumption of minimum 7 days at Design point (Generation of all units to be considered). Suitable number of Limestone Storage Silos to store limestone equivalent to consumption of minimum **7 days at Design point** (Generation of all units to be considered). The maximum capacity of each limestone storage silo shall not exceed 2000 MT. Suitable number of Vibrating feeders **along with suitable crushed limestone feed regulating mechanism** below silos shall be provided taking feed from silo and discharging onto onward conveyors/ Bucket elevators. Alternatively, Activator feeder (Un-coaler) may be provided. Each storage silo shall be equipped with suitable Air blasting/Vibrating Bin type arrangement to ensure proper flowability of Crushed Limestone.
1.01.09	**One (1) no.** of Limestone sampling unit, for as received limestone in crusher house complete with all accessories and electrical, civil, structural works, supporting structures, approach/maintenance platforms, hoists etc.
1.01.10	Suitable number of diverter plows and its actuating mechanism shall be mounted on each conveyor to feed limestone into limestone day silos. Alternatively, suitable nos. fixed Trippers on each conveyor to feed limestone into limestone day silos. Or any other alternate to ensure feeding of limestone from any of the bucket elevator outlet to any of the limestone day silos.
1.01.11	Minimum two (2) Nos. sump pumps in each Junction Tower (if applicable) complete with motors, local control panel, level switches, individual discharge piping with fittings and valves to ash disposal slurry sump.
1.01.12	Pressurized Ventilation system for all Switchgear rooms, MCC rooms complete with all mechanical, electrical, accessories, civil and structural works.
1.01.13	Exhaust fans to be provided in all battery rooms and all toilets complete with electrical, civil & structural works etc. Supply and exhaust fans along with required ducting shall also be provided for all underground Structures/junction towers (if applicable) complete with all mechanical, electrical, civil and structural works and associated foundations.
1.01.14	Two (02) numbers **conventional enclosure type** passenger cum goods elevator **having capacity of 16 persons (1088 kg) complying to IS:14665 (latest edition)** with drives, all electrical, mechanical, civil, structural & associated foundation works, accessories and electrical to serve various floors of Limestone crusher house and Limestone Storage Silos. **Staircase access for machine room shall also be provided by the bidder.**
1.01.15	One (1) number of inline magnetic separators (one no. on conveyor feeding to crusher house) and one (1) number of suspended magnets (one no. on conveyor feeding to crusher house) shall be provided. All the inline magnetic separators and suspended magnets shall be complete with reject chutes, reject trolleys, supporting arrangement and all mechanical, electrical, civil, structural works and accessories.
1.01.16	Two (2) numbers of metal detectors (min. one no. on conveyor feeding to crusher house and conveyor feeding to Limestone day silo at FGD plant) complete with all mechanical, electrical, civil, structural works and accessories.
1.01.17	Two (2) numbers of electronic type belt scales (min. one no. on conveyor feeding to crusher house and conveyor feeding to Limestone bunker at FGD plant) for continuous weighing, complete with all mechanical, electrical, civil, structural works and accessories.
1.01.18	Complete dust extraction system for control of fugitive dust in limestone Silos, junction towers (if applicable), crusher house complete with fans, drives, hoisting arrangements, ducting, piping, valves etc. electrical, accessories, civil, structural and architectural works.
1.01.19	Service water and potable water system for complete limestone handling plant. Water Pump houses & water tanks for service water, cooling water (as applicable) and potable water system.

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES
1.01.20	Cooling water system (as applicable) for scoop couplings, for complete limestone handling plant. Air cooled type scoop couplings are also acceptable.
1.01.21	Monorails and electrically operated hoist blocks as well as hand operated chain pulley blocks for servicing/installation/easy replacement of drive machinery, different types of pulleys for all conveyors, GTU and other equipment from ground level to their locations and vice-versa & landing inside the respective Buildings.
1.01.22	One (1) number of belt vulcanizing machine, suitable for all belt widths in limestone handling system , complete with all mechanical, electrical, accessories and consumables for one year of consumption. Further belt jointing facilities as specified shall be provided.
1.01.23	Minimum one (1) no. Weighing Bridge **of capacity 100 MT** for Road trucks / Tipplers shall be provided each in Limestone unloading area.
1.01.24	All buildings shall be complete with all electrical, civil, structural, architectural works, cable trenches, fire safety walls, foundation, earth mat, fencing, earthing for transformers. All cables, duct banks, trenches, cable trestles shall be complete with associated civil/ structural work and necessary civil foundations.
1.01.25	Drainage of LHP buildings, conveyor galleries and limestone storage Silos including all civil & structural works as detailed out elsewhere in the specification.
1.01.26	All equipment/fittings, supporting structure, along with insert plates, bolts, accessories, MS sleeves, base plates, grouting as may be required and proper alignment etc.
1.01.27	Complete un-used set of all special tools and tackles, which are necessary or convenient for erection, commissioning and overhauling of any equipment, covered under the scope.
1.01.28	First fill of all consumables, e.g.; oils and lubricants for one year toppings requirements.
1.01.29	Preservative shop coating, final painting of all structures and equipment.
1.01.30	All inserts, anchor bolts, foundation bolts for Contractor's equipment, platforms etc. in the entire LHP.
1.01.31	All necessary grouting & finishing of the floor after welding at all such pockets & elsewhere is in Contractor's scope.
1.02.00	**Bidder to note that the above list is not exhaustive and any work required for integration of complete system and ensuring its satisfactory running shall be in the scope of work and supply for this package.**
1.02.01	All electrical actuators used in this package shall necessarily be of non-intrusive field bus based integral actuators like Flap Gates, RPG, Dampers, Valves meeting requirements specified in Electrical Actuator referred in C&I section Part –B , section-VI of the specification, except for skid mounted / operated through only PLC/ local control panel systems like scoop coupling, tripper, paddle feeder, LSU where it is not possible to have above non-intrusive type actuators, the Contractor shall provide Electrical Actuators as per Standard practice.
1.02.03	For measurement of Pressure, Differential Pressure and Temperature in process line of LHP and GHP including all associated systems, Analog measurement with Fieldbus protocol (complying to Measuring Instruments (Primary and Secondary), Part-B, Section-VI) shall be provided. The above philosophy shall also be applicable for integral equipment like scoop coupling, if integral equipment supplier can provide the same. However, if integral equipment supplier provides proper technical justification for not able to do so then instruments as per Standard Practice of integral equipment supplier can be provided subject

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES
	to Employer's approval. The PT, DPT and TT shall be mounted on pipes in suitable rack/ canopy arrangement. The exact arrangement shall be as approved by Employer during detailed engineering.
1.02.04	For measurement of tank level in water application ultrasonic type level transmitter and for slurry based application Radar type level transmitter are to be provided. For specification of these instruments and all other measuring instruments shall be complying to specification requirements of Part-B, Section-VI.

CLAUSE NO.	TECHNICAL REQUIREMENT
1.0.0	**INTRODUCTION** Technical requirements specified in Sub section A-20 (Coal & Biomass and Gypsum Handling Plant) shall be followed for Limestone Handling System in general. This section of the specification provides specific technical requirements for Limestone Handling System.
2.0.0	**SYSTEM DESCRIPTION** **Unloading, Crushing and conveying System for Limestone** Two (2) numbers Box feeders/ Bulk material receiving unit/ Truck unloading system/ Surface feeder for unloading of limestone from trucks/ self-tippling trucks/ loader shovels. This unit shall feed limestone onto the conveyor before crusher house. The complete truck unloading system must not have any underground structures/facilities. A mechanized system shall be provided for unloading of limestone from trucks. The unloaded limestone shall be conveyed up to the limestone conveying stream before the limestone crusher. **"**As received" limestone shall be fed on the single stream conveyors from where the same shall be conveyed upto the crushers. The crushed limestone shall be conveyed by single stream conveyors/Bucket elevators up to the limestone storage Silo. From the limestone storage Silo, crushed limestone and feed the same onto double stream conveying system up to the limestone day silos.
3.2.0	**Crushing** In Limestone crusher house, limestone from incoming Conveyor shall pass through one (1) or two (2) numbers, as applicable, of (dedicated) Vibrating screening Feeders and one (1) or two (2) numbers, as applicable, of (dedicated) crushers respectively which shall crush limestone to (-) 20 mm size or to suit limestone pulverizer and system. Each stream shall have a set of Rod gates and Rack & Pinion Gates before Vibrating screen Feeders to permit maintenance of equipment, hoppers and chutes in one stream without affecting the operation of other stream. Limestone sampling unit shall be provided to sample the limestone from either stream. Passenger cum goods elevator shall be provided in Limestone Crusher House.
3.5.0	**Limestone Storage and Bunker/day silo feeding system** Crushed limestone shall be stored in Silos. The capacity of the storage shed/Silos shall be equivalent to limestone consumption for at least 7 days or storage capacity as indicated elsewhere, whichever is higher. Crushed Limestone of (-) 20 mm size (or size **to suit limestone pulverizer system)** would be fed to Limestone day silos through a series of belt conveyors and/or bucket elevators, passing through various Junction Towers and Diverter ploughs/ fixed trippers/reversible belt feeders. Alternately Suitable number of Vibrating feeders along with **suitable crushed limestone feed regulating mechanism below silos** shall be provided taking feed from silo and discharging onto onward conveyors/ Bucket elevators up to limestone day silos.
3.6.0	**SYSTEM PARAMETERS**

a. Maximum Belt speed of Limestone Conveyors: 2.0 m/s

b. **Belting and Pulleys for trough conveyors (for Limestone application)**

The belting shall be of either synthetic fabric such as Nylon-Nylon, Steel Cord, etc. with rubber covers of adequate flexibility to give a troughing angle of 35 deg.

Belt Width: 800 mm (Min) for 150 MTPH Limestone conveyors before Crushing

Belt Width: 650 mm (Min) for 150 MTPH Limestone conveyors after Crushing

Belt ratings shall be selected in such a way that there are only one (1) ratings for Nylon/Nylon belting. Minimum number of plies shall be three (3). Other details of belting shall be as specified elsewhere in the specification. This however excludes and belting of belt feeders. Belting shall be completely interchangeable among same rating of belt.

c. For Pulley, following minimum parameters shall be followed:

(1.) Maximum allowable deflection of shaft at hubs: 5 Minutes
(2.) End disc plate thickness : 12 mm (min.)
(3) Shell plate thickness: 12 mm (min.)
(4.) Diameter:
(i) All drive pulleys : 630 dia (min)
(ii) All balance pulleys : 500 dia (min)

Further approval from belt manufacturers shall be obtained by the contractor regarding the adequacy of the pulley diameters.

d. All mechanical, Electrical, civil and structural system design shall consider:
Round the clock operation of Limestone Handing Plant.
i) The limestone delivered to power station shall be of size 250mm and below. However, occasionally 1-2% limestone of 400 mm lump size may also be encountered.
ii) Due to open cast method of mining involved, the limestone may contain shale and sand stone as high as 20%. Also, occasionally, metal pieces like broken shovel teeth, brake shoe, wires etc. may also come along with limestone.
iii) The limestone as received' shall contain varying percentage of fines. This may form adhesive lumps particularly during monsoon when surface moisture is at its maximum value. The sizing and selection of all equipment shall take care of above.
iv) For volumetric computations of limestone handling system, the bulk density of limestone shall be taken as 1400 kg/m3. However, for torque & drive requirements the density of limestone shall be taken as 1700 kg/m3.

e. LHP EQUIPMENT

Design capacities & margins

Sl	Equipment	Duty requirement	Design capacity as % of duty requirement
1	Crushers	2x100%	110%
2	Vibrating screen feeders	2x100%	110%
3	Vibrating feeders	2x100%	110%

CLAUSE NO.	TECHNICAL REQUIREMENT

f.

Idler Bearings

(a)	Carrying	Ball Bearing of deep groove type or seize resistance type of min. 30 mm size, lubricated for life for Limestone Conveyors
(b)	Return	Ball Bearing of deep groove type or seize resistance type of min. 20 mm size, lubricated for life for Limestone Conveyors

g. **Dust extraction system for Limestone Handling area**

Dust extraction system for limestone handling system shall be dry type comprising of dust collection hoods, ducting, fans, bag filter and dust collection hopper. The Limestone dust collected in dust collection hopper shall be periodically emptied back to the conveyor leaving the building.

4.0.0 **LIMESTONE CRUSHER AND VMS**

4.1.0 General

Hammer mill type crusher shall be provided for sizing the input limestone to a size which shall be suited for their limestone pulverizer and system. Crusher shall be supplied complete with accessories and subsystems.

4.2.0 Codes and standards

The design, manufacture, inspection and testing of Limestone Crushers shall comply with all the currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. The Limestone Crushers shall conform to the latest edition of applicable standards and codes. Nothing in this specification shall be construed to relieve the contractor of the required statutory responsibility. In case of any conflict in the standard and this specification, the decision of the Employer shall be final and binding.

4.3.0 Design requirements

i. The crusher shall be of hammer mill type and shall be designed based on following clauses and the data sheet enclosed.
ii. The crusher design should be such that the crushing action is accompanied by the minimum of attrition.
iii. Uniform crushing impact shall be assured.
iv. The crusher shall be capable of delivering the normal rated output even when handling damp limestone having maximum moisture content. No clogging or building up of material on the crushing element shall develop.
v. Temperature sensing devices shall be installed on both bearings of each of the crusher to trip the crusher incase temperature goes beyond allowable limit.
vi. Zero speed limit switch shall be provided for protection against any un-crushable material. It shall sense the speed of rotor and shall trip the rotor when actual speed falls below the design speed.
vii. Crusher shall be provided with vibration monitoring (VMS) system. Specification of VMS shall be as specified elsewhere.

4.4.0 Construction requirement

CLAUSE NO.	TECHNICAL REQUIREMENT

i) ROTOR

The rotor shall consist of Forged steel shaft, with integral discs or key fitted discs on shaft. Hammers shall be held by spring dowel bushes & shall be arranged around the circumference of the rotor. The number of hammers and number of rows shall be selected as per requirements. The rotor shall be balanced statically.

ii) GRINDING WALL

The grinding walls shall be arranged symmetrically around either side of the rotor and carried by spindles supported in bearings attached to the casing. The wall shall consist of grinding wall supports and wear resistant grinding plates/Impact plates bolted on. For product size control, distance between the grinding plates and hammer shall be adjustable.

iii) HAMMER

The hammer shall be in two parts- head and arm. The hammer head shall be of wear resistant steel material. The hammer arm shall be of forged alloy steel. In the event of wear, only the hammer head shall be replaced. Arms shall be selected so that they have long life and do not require frequent replacement.

iv) FRAME /HOUSING

The housing shall be split type. Housing shall be fabricated from MS steel plates of weld able quality and shall be stiffened suitably. Maximum accessibility shall be provided for routine inspection and replacement of parts. For these purposes, the doors shall be of hinge connection with effective dust sealing arrangement. Hydraulically operated top cover of crushers shall be provided for quick inspection and replacement of hammers. The entire inside surface of crusher coming in contact with limestone shall be provided with abrasion resistant liners.

v) DRIVE

The hammer crusher will be driven through Electric motor and Fluid coupling. V Belt drive arrangement is also acceptable.

The material of construction for major components of crusher shall not be inferior to the quality and standards as mentioned in data sheet.

Design and construction features of hammer mill crushers offered by the bidder shall be similar to the crushers which are already working satisfactorily for same or higher capacity.

4.5.0 Vibration monitoring system should be offered for crushers as indicative below:

Sl. No	Equipment	Type	No.	* No. of location per equip.	Equipment bearing type
1.	Limestone Crusher	Radial ring	4	(2 Nos.) 1 at DE & 1 at NDE	As per manufacturer's design

Vibration shall be measured at each location in Horizontal as well as vertical direction.

CLAUSE NO.	TECHNICAL REQUIREMENT
	To monitor vibration of crusher, vibration monitoring system including key phasors shall be provided. To mount vibration sensors suitable arrangement including vibration pads and notches in the shaft of Crusher for mounting Key Phasor shall also be provided.
5.0.0	**LIMESTONE SAMPLING UNIT**
5.1.0	The design, manufacture, inspection and testing of limestone Sampling Unit shall comply with all the currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. The limestone Sampling Unit shall conform to the latest edition of standards and codes. Nothing in this specification shall be construed to relieve the contractor of the required statutory responsibility. In case of any conflict in the standard and this specification, the decision of the Employer shall be final and binding. The sampling system shall be designed as per following standard: ASTM C50/ ASTM D2013: Standard practice for sampling, sample preparation, packaging and marking of limestone and limestone products.
5.2.0	Limestone sampling unit shall be automatic & provided at place specified elsewhere. The limestone & Limestone sampling units suitable to give “Samples” conforming to IS: 16143 (Part 2) shall be selected by the Contractor for taking samples from any of the two streams running at guaranteed capacity. The different Equipment selected for limestone/Limestone sampling unit shall be such that there shall be no loss of fines and moisture from the samples. The capacity, make and model of all equipments of limestone sampling unit shall be subject to approval of Project Manager.
5.3.0	The normal input feed size shall be considered as (-) 250 mm for Limestone sampling unit before limestone & Limestone crusher. However occasionally (-) 400 mm lumps may also arrive. limestone lump size after crusher (as fired limestone) shall be (-) 20mm. However occasionally (-) 50 mm lumps may also arrive in as fired limestone.
5.4.0	Cross belt type Primary samplers (separate for each conveyor) shall be rugged, able to withstand severe shock loads and operate trouble free. Belt feeders shall be provided for entire sampling path upto sample collector. The feeders shall meter the flow accurately by using VFD, produce a non-plugging condition and resist sticky and wet limestone. For rejects path also, belt feeders shall be preferred. Screw conveyors for the same shall be accepted only where space constraints do not permit distribution of limestone/ limestone rejects to receiving conveyors below. Sample crushers (make subject to Employer’s approval) shall be provided for reducing the main input feed limestone/limestone to 95% minus 8 mesh size and 99% minus 4 mesh size. Single stage crushing shall be provided. There should be no re-circulation of fines in the crushers. ‘Lot size’ shall be equivalent limestone/limestone quantity handled in 8 hours operation assuming average conveyor loading at 75% of rated conveyor capacity. However, Limestone sampling system shall also be suitable for taking one gross sample for each lot of “3500 Te” limestone (approx. equal to one rake load).
5.5.0	The traversing mechanism and all electric parts shall have dust tight protection. Belt feeders shall be positively self cleaning and have dust tight construction. It shall be provided with flanged belt, rubber lagged head pulleys and inspection doors. No chain/belt drives shall be accepted. The crusher’s base should be built of reinforced concrete and be sufficiently large in mass. The primary / secondary samplers shall be of dust tight construction and self contained type. The sample chutes shall have minimum valley angle of 60 degrees to horizontal and shall be of stainless steel plates. The chutes shall be suitable to handle wet sticky limestone as specified elsewhere. The welding of chutes shall be done externally only. The inside surface of the material near welds shall be smooth. Radius at corners not less than 1" shall be provided in chute work. All solid connected members shall be by means of bolting flanges with at least 6 mm thick standard grade neoprene gasket material between the metal flanges. No control gates to regulate the flow of material shall be incorporated in the chute work. Bias connections shall be provided at suitable locations. The materials rejected from

CLAUSE NO.	TECHNICAL REQUIREMENT

samplers shall be returned to main conveyor stream. Minimum 4 nos. sample collecting bins shall be provided with auto indexing. The bins shall be provided with air tight connection. The system shall be suitable for operation through standalone PLC and Local control panel provided by Contractor.

6.0.0 **Silo for storage of Limestone**

Storage shall be provided to store with adequate air space. The Silo shall be used for main storage facilities of Limestone for further conveying to downstream conveyors. It shall have facilities for receiving Limestone from belt conveyors/bucket elevators at the top of the Silo and shall house the conveyor drive equipment and accessories and the associated handling arrangements.

The design of storage silos shall confirm to IS 9178 (part 1 of 3). Each Silo shall be provided with level transmitter.

Silo shall be fabricated of minimum 12 mm thick (including corrosion allowances) with proper lining (minimum 4 mm thickness) in the complete conical portion to ensure reliable discharge of material. Material of the Silo/Bin shall be suitable for limestone storage and as per the applicable standard.

Each storage silo shall be equipped with suitable Air blasting/Vibrating Bin type arrangement to ensure proper flowability of material.

CLAUSE NO.	TECHNICAL REQUIREMENT	
	DATA SHEET : LIMESTONE CRUSHER	
1.0.0	**GENERAL**	
1.1.0	Type	Hammer Mill type Crusher for Limestone
	Material to handle	
1.2.0	Input Limestone Parameters	(-) 250 mm, occasionally 1-2% of 400 mm size
1.2.1	Extent of oversized lumps (occasional) in feed coal	
	(a) Maximum percentage	1 to 2%
	(b) Maximum lump size	400 mm
1.3.0	Feeding Arrangement	Through Vibrating screen feeder (However, the crusher hall be designed/sized considering zero passage of limestone through screen)
2.0.0	**DESIGN AND CONSTRUCTION (FOR LIMESTONE CRUSHER)**	
2.1.0	Drive arrangement	Electric motor, scoop type hydraulic coupling, gearbox.
2.2.0	Rotor Balancing	Static
2.3.0	Type of sealing	Labyrinth, dust tight arrangement
2.4.0	Type of bearings	Spherical roller
2.5.0	Lubrication	Manual through grease gun OR with recommended grade of oil in which case the Plummer block shall be designed with oil filling, oil draining and visual oil checking facilities
2.6.0	Tramp collection	Required
2.7.0	Output size adjustment facility	Required
2.8.0	Top cover of crushers	Hydraulically operated
3.0.0	**MATERIAL OF CONSTRUCTION**	
3.1.0	Rotor Shaft	Forged steel
3.2.0	Hammer heads	Wear resistant cast alloy steel
3.3.0	Hammer arm	Forged alloy steel

CLAUSE NO.	TECHNICAL REQUIREMENT	
3.4.0	Housing/frame	Steel as per IS:2062
3.5.0	Breaking blocks	Cast steel/MS fabricated
3.6.0	Liners	
	(a) Material	Suitable for duty requirement
	(b) thickness	As required

CLAUSE NO.	TECHNICAL REQUIREMENT	
	DATA SHEET : LIMESTONE SAMPLING UNIT	
1.0.0	**GENERAL**	
1.1.0	Type	Automatic
2.0.0	**DESIGN & CONSTRUCTION**	
2.1.0	Codes & Standard	ASTM C-50 for Limestone
2.2.0	Uncrushed feed size	(-) 250 mm
2.3.0	Crushed feed size	(-) 20 mm
3.0.0	**CHUTES**	
3.3.1	Min. angle	60 deg
3.3.2	Cross section	Square/rectangular with rounded corners.
3.3.3	Joints	Bolted flanges with 6 mm thick standard grade neoprene gasket.
4.0.0	**CRUSHER**	
4.4.1	Uncrushed (as received) feed size	(-)250 mm
4.4.2	Crushed feed size	(-) 20 mm
4.4.3	Output size	ASTM C-50 for Limestone
4.4.3	Stages of size reduction	Single stage crushing
5.0.0	**BELT FEEDER**	
5.5.1	Belt	Flanged type, FR grade
5.5.2	Pulleys	Rubber lagged head pulley
5.5.3	Drive	Electric Motor

CLAUSE NO.	TECHNICAL REQUIREMENT

OPERATION & CONTROL PHILOSOPHY

1.00.00 The specifications as brought out in various Sub-sections for mechanical equipment shall be applicable to the system of proposed Limestone handling plant and specifically to all mechanical including their operation & control philosophy. However, some specific parameters of the entire system as a whole and the major equipment are brought out as under.

2.00. **OPERATION AND CONTROL PHILOSOPHY**

The Limestone handling system shall be controlled from CHP DDCMIS system as defined in C&I section of Specifications.

4.01.00 Following paths shall be applicable for operation and Control for Lime handling system. Any one of the following conveying paths will be selected by operator at a time:

(1) Road unloading to Limestone storage Silo

(2) Limestone storage Silo to Limestone day silo

(3) Combination of above

Balance general guidelines/ philosophy shall be as per applicable for CHP system.

4.06.00 **Conveyor System**

a. Each conveyor shall be protected against damage to the edge of the belt due to excessive sideways movement by providing an adequate number of belt sway switches. In addition, each conveyor shall be provided with one (1) No. speed detection device (zero speed switch). The zero speed switches shall be designed to sense belt speed. In case of speed of belt goes below 85% of rated speed, it shall trip the conveyor.

b. All the conveyors shall be protected from reverse running due to power failure by providing mechanical or electrical locking system.

c. The starting sequence of the conveyors shall follow a direction opposite to that of flow of material i.e.:

In case of direct conveying of limestone to Day Silo, start from day silo conveyor and end up with conveyors below below truck unloading system of Limestone

d. Any individual equipment (belt conveyor etc.) should not be allowed to start unless the equipment immediately following the same in the direction of flow of material is already in operation.

e. Stop/tripping of any equipment from running condition shall trip all preceding equipment in the system, except crushers but shall not affect succeeding ones which shall continue to operate.

f. Adequate number of pull-cord switches shall be provided at suitable intervals along the length of each belt conveyor, which shall enable the respective conveyor to be stopped immediately. Each pull chord switch shall be identified by a specific number on HMI in the main control room. Each belt sway switch shall also be identified by a specific number on HMI in control room.

CLAUSE NO.	TECHNICAL REQUIREMENT

g. Means shall be provided to pre-warn personnel working nearby when starting any conveyor

h. Interlocking of various conveyors shall be achieved with Flap Gate, discharge pulleys, Rack & Pinion gate, limit switches and zero speed switches.

i. Crushers shall be provided with speed and vibration monitoring instruments. Crushers shall trip in case speed/ vibration is going beyond tolerable limits of design. Temperature sensing devices shall be installed on all bearings of each of the Crushers to trip the ring granulator in case of temperature goes beyond limit. Audio-visual annunciation shall be provided in main control room and locally also.

j. Once a conveyor trips, flap gate directing limestone from this conveyor shall change over its position with a time delay and shall come back to the original position again. This is to prevent jamming of gate.

k. Where ever scoop type coupling provided for HT motors, the coasting time of respective conveyor, thrustor brake, actuator selection and the chute size and skirt size shall be so selected such that there is no spillage of limestone from any down stream conveyors during next start.

(u) Wherever the conveyor/belt feeder is provided with the movable discharge pulleys in place of flap gates, the starting of the conveyor/belt feeder will be interlocked with the position of the movable discharge pulley.

4.07.00 **Interlocking**

1. The following conveyors / equipment will come under interlock scheme :-

   (1) All conveyors

   (2) All flap gates

   (3) Belt feeders

   (4) Rack & Pinion Gates

   (5) Metal detectors

   (6) Magnetic Separators and suspended Magnet

   (7) Crushers

   (9) Belt scale

   (11) Bucket Elevators

   (12) BRU/Surface Feeder/Truck Unloading etc

2. The following equipment will not come under interlock of the conveyor scheme.

   a. All dust extraction systems & service water system.

   b. Ventilation systems

CLAUSE NO.	TECHNICAL REQUIREMENT

4.08.00 **Annunciation System:**

DDCMIS based annunciation system is envisaged in CHP DDCMIS complying the specification requirements outline in C&I subsection for system/drives of Lime handling system. Wherever group annunciation is provided, alarm status of individual equipment shall be available for operator.

4.12.00 **Limestone Sampling system**

(a) Limestone/Limestone Sampling Unit shall be controlled through PLC provided by the Contractor and shall be interfaced with CHP DDCMIS for monitoring and operation.

(b) Controls and interlocks for proper material flow shall be provided similar to conveyor system/Coal sampling system. Mimic shall be provided in the Operator Work Station (OWS) at main CHP control room. Further, All necessary automatic controls shall be provided for meeting the requirements of ASTM-D-2234

S.N.			ITEM	QUANTITY	Unit
1			**Mechanical**		
A)			**IDLERS**		
1	i)		35° Troughing idlers complete with base frame and mounting brackets etc.	2.5%	of population of each type
	ii)		Rolls for (i) above	1%	of population of each type
2	i)		Troughing idlers complete with base frame & mounting brackets ctc.(for belt feeder).	30%	of population of each type
	ii)		Rolls for (i) above	30%	of population of each type
3	i)		35^0 impact idlers complete with mounting brackets and base frame etc.	25%	of population of each type
	ii)		Rolls for (i) above	25%	of population of each type
4			35^0 troughing training idler complete with base frame and brackets etc. (if used)	10%	of population of each type
5			Transition idler complete as in (1) above	10%	of population of each type
6			Flat return idlers complete with mounting brackets etc.	2%	of population of each type
7			Flat return idlers complete with mounting brackets etc.(for belt feeders)	30%	of population of each type
8			Flat return trainer complete with mounting brackets etc.	10%	of population of each type
9			Belt cleaning spiral rubber disc return idler complete with mounting brackets etc.	20%	of population of each type
10	i)		Two roll 10° troughing return idler assy	2%	of population of each type
	ii)		Rolls for (I) above	2%	of population of each type

S.N.			ITEM	QUANTITY	Unit
11			SS idlers	25%	of population of each type
12			Any other type of idlers	10%	of population of each type
B)			**CONVEYOR GEAR BOXES**		
	i)		Input shafts with pinion	1	set of each type and rating
	ii)		Oil seals	2	sets of each type and rating
	iii)		Bearings	1	set of each type and rating
	iv)		Hold back device	2	nos. of each type and rating
	v)		Cooling fan with cover	2	nos.of each type and rating
	vi)		Complete gear box assy with hold back device	1	set of each type and rating for population upto 10 nos.
				2	set of each type and rating for population more than 10 nos.
C)			**CONVEYOR DRIVE AND CONVEYOR BELT**		
a)			**Gear Coupling**		
	i)		All type of drive couplings including gear Coupling	2	nos. of each type
	ii)		Bolts for gear coupling	2	sets of each size
	iii)		Seal kit for gear coupling (o-ring)	2	sets of each type
	IV)		Conveyor Drive Motor	1	No. of each type and rating for population upto 10 nos.
				2	No. of each type and rating for population more than 10 nos.
b)			**Fluid Coupling**		

S.N.			ITEM	QUANTITY	Unit
	i)		Fluid Coupling complete	1	no. of each type and size
	ii)		Multi Disc assembly (for fluid coupling)	4	nos each type and size
	iii)		Resilient Drive plate assy.	1	no. of each type and size
	iv)		Bearings	1	no. of each type and size
	v)		Seal kit for fluid coupling	2	sets of each size
	vi)		Fusible plug	10	nos. of each size
	vii)		Complete actuator and engaging assembly (including motor, gear box etc.)	1	set of each type
	viii)		Oil Cooler assembly (if applicable)	1	set of each type
	ix)		Oil pump-motor set (if applicable)	1	set of each type
	x)		Oil filters	5	sets of each type
	xi)		Oil/Cooler valves (if applicable)	2	nos. of each type
c)			**Belting**		
			Conveyor Belt		
	i)		Main Conveyors	1	drum length of 250 m of each type, size and rating
d)			**Brakes**		
	i)		Brakes	1	no of each size & type
	ii)		Brake shoes	2	sets of each size
e)			**PULLEYS**		
	i)		Pulleys complete with shaft excluding bearing & plummer blocks (complete with lagging)	1	no. of each type and size in pulley drum and shaft dia.(for population upto 10 Nos)

S.N.			ITEM	QUANTITY	Unit
				2	no. of each type and size in pulley drum and shaft dia.(for population more than 10 Nos)
	ii)		Plummer Block complete with bearings & sleeves	2	no. each type and size
	iii)		SS Pulleys complete with shaft excluding bearing & plummer blocks (complete with lagging)	1	no. of each type and size in pulley drum and shaft dia.
f)			**BELT CLEANERS AND SKIRT BOARD**		
	i)		Modular segments for belt cleaner	5	%of total population of each type & size
	ii)		Modular segments skirt rubber for skirt board	5	%of total population of each type & size
	iiI)		Skirt Rubber	5	%of total population of each type & size
	iv)		Complete belt cleaner (internal / external)	2	%of total population of each type & size
G)			**IN-LINE MAGNETIC SEPARATORS**		
	i)		Cleated conveyor belt	1	set
	ii)		Motor, gear box drive assy. complete	1	set
	iii)		Pulleys with plummer block & bearings	1	set of each size & type
	iv)		Sheaves	1	no. of each size & type
	v)		V-belts	2	no. of each size & type
H)			**LIMESTONE SAMPLER**		
	i)		Plummer block	1	no. of each type and size
	ii)		Hammers	1	set of each type and size

S.N.			ITEM	QUANTITY	Unit
	iii)		Liner plate	1	set
	iv)		Cutter lip	1	no.
	v)		Cutter seal	1	no.
	vi)		V-belts (for crusher)	1	sets
	vii)		Hammer pins	1	sets of each type and size
	viii)		Pulley	1	no. of each type and size
	ix)		Conveyor belt	1.2	times length of each type and rating
	x)		Gear box assembly for conveyor	1	no. of each type and rating
	xi)		Gear box drive assy, for primary and secondary samplers	1	set of each type and rating
	xii)		Hydraulic pump with motor and coupling	1	set of each type
	xiii)		Hydraulic motor	1	set of each type
	xiv)		Hydraulic cylinder	1	set of each type
	xv)		Cylinder sealing kit	2	set of each type
	xvi)		Set of hoses	2	set of each type
	xvii)		Coupling with grid for primary sampler	2	sets
	xviii)		Screw conveyor gear box assembly	1	set
I)			**LIMESTONE CRUSHER**		
	i)		Plummer Block assembly complete including bearing, lock nut, lock washer etc.(DE+NDE)	2	set
	ii)		Shaft seal	4	sets
	iii)		Hammer sets	10	sets or 750 Nos whichever is more (1 set means hammers required for one crusher)

S.N.			ITEM	QUANTITY	Unit
	iv)		Rotor assembly complete consisting of rotor shaft & keys, End discs, Centre discs, distance rings, suspension bars, disc clamping nuts and shaft extension etc. but without hammers, bearings and pillow blocks	1	set
	v)		Cage bars/Perforated screen plates as applicable	4	sets
	vi)		Breaker plate	4	sets
	vii)		Liners	2	sets
	viii)		Suspension bars	4	set
	ix)		Kick-off plate	4	set
	x)		Screen plate upper & lower	4	no. each
	xi)		Tramp iron pick up plate	2	no. each
	xii)		Fluid coupling		
	a)		Fluid coupling complete	1	set
	b)		Bearings	2	set
	c)		Seal kit (sealing rings)	2	sets
	d)		Fusible plugs	8	nos.
	e)		Oil pump motor set (if applicable)	1	set of each type
	f)		Oil filter	3	sets
	g)		Complete actuator and engaging assembly (including motor, gear box etc.)	1	set
	h)		Cooler assembly (if applicable)	1	no.
	i)		Oil / Water valves	2	nos. of each type
	j)		Gear Coupling/ other flexible coupling of crusher drive along with bolts and sealing kit, as applicable	2	sets
	l)		Multi Disc assembly (for fluid coupling)	2	sets. of each type and rating
	m)		Resilient Drive plate assy	2	sets. of each type and rating

S.N.			ITEM	QUANTITY	Unit
J)			**VIBRATING (GRIZZLY/SCREENING) FEEDER**		
	i)		Bearings	2	no. of each type & size
	ii)		Seals	2	no. of each size
	iii)		Liners	1	sets.
	iv)		Screen plates	10	sets
	v)		Complete vibrating assembly consisting of all rotating parts including drive & driven unbalanced shafts including bearings, casing, spring, vibrating blocks, main shaft, sheave & unbalanced weights as applicable.	1	set of each type and rating and direction
	vi)		Hoses (if applicable)	2	set
	vii)		Drive unit assembly (including electric motor, hydraulic pump, hydraulic motor, , flexible shaft, gear box, as applicable)	1	set
	viii)		Base springs, rubber pads	2	sets. of each type & size
	ix)		V belts	4	sets. of each type & size
k)			**ELECTRIC HOISTS**		
	i)		Brake linings	2	sets of each type
	ii)		Rope guide & rope tightner	1	no. of each type
	iii)		Limit switch	2	nos. of each type & size
	iv)		Gear box/gear set	2	sets of each type
	v)		Motor/geared motor	1	no of each type & rating
	vi)		Drum bearing	1	set of each type & rating

S.N.			ITEM	QUANTITY	Unit
I)			**FLAP GATES (INCLUDING THAT OF TRIPPERS)**		
	i)		Limit switch	8	nos. of each type & rating
	ii)		Actuator (complete with motor, gear box, limit switches etc.)	1	nos. of each type & rating
	iii)		Oil seals of Actuator	2	nos. of each type & rating
	iv)		Flap gate shaft	1	nos. of each type & rating
	v)		Pressure nut	12	nos. of each type & size
m)			**RACK & PINION GATE**		
	i)		Limit switch	2	no. of each type & size
	ii)		Rollers with bearings	2	no. of each size
	iii)		Motor gear box assembly	1	set of each type
	iv)		Actuator (complete with motor, gear box, limit switches etc.)	1	nos of each type & rating
n)			**DUST SUPRESSION, SERVICE WATER, POTABLE WATER, COOLING WATER**		
	a)		Pump impeller with key & nut	1	set of each type & size
	b)		Pump Shaft	1	no of each type & size
	c)		Bearings	1	sets each type & size
	d)		Wearing rings	2	sets of each type & size
	e)		Shaft sleeve	2	sets of each type & size
	f)		Bushings	2	sets of each type & size

S.N.			ITEM	QUANTITY	Unit
	g)		Coupling bolts & nuts (with bushes) 2 sets	1	sets each type & size
	h)		Spray nozzles	50	nos.of each type & size
	i)		Spray nozzles (for plain water dust suppression)	25	nos.of each type & size
	j)		Solenoid valves	5	% of each type and size
	k)		Globe valve / plug valves	10	% of each type and size
	l)		Gate valve	2	nos. of each size
	m)		Strainers	1	no. of each type
	n)		Motor	1	No. of each type and rating
	o)		Compressor		
	(i)		Air filter element	8	Nos.
	(ii)		Oil filter	6	Nos.
	(iii)		Discharge Check Valve	3	Nos.
	(iv)		Oil Pump Parts (including distance ring, eccentric rings, Pump element, Pin, Key O, Ring) as applicable	2	Sets
	(v)		Inlet Valve Assembly	2	Nos.
	(vi)		Electronic regulator	3	Nos.
o)			**VENTILATION SYSTEM**		
	i)		V-Belt	1	set of each type
	ii)		Pre-filter element of pressurizing fans	2	sets of each type
	iii)		Foundation Rubber pads	1	sets of each type & size
	iv)		Bearings	1	sets of each type & size
	v)		Plummer Blocks	1	set of each type & size

S.N.			ITEM	QUANTITY	Unit
	vi)		Motor	1	Each type and Rating
p)			**TRAVELLING TRIPPER**		
	I)		Complete drive assembly including gear box, coupling, brake etc.	1	set
	ii)		Complete internals of speed reducer (including input shaft, output shaft, gearset)	1	set of each size & type
	iii)		Bearings for reducer	2	sets
	iv)		Drive axle with wheels, plummer blocks, bearings etc.	1	set
	v)		Oil seals	2	nos. of each size
	vi)		Non-drive axle with wheels plummer blocks, bearings etc.	1	set of each type
	vii)		Flap gate actuator with motor, gear box, position / thrust switches	1	set of each type
	viii)		Chain assembly wiith sprockets	1	set of each type & size
	ix)		Festoon Roller assembly for flexible cable	4	Nos
	x)		Pulleys and plummer block bearings	1	no of each type
	xi)		Plummer block with bearing for cable reel drums	1	set of each type
	xiii)		Drive Motor	2	No.
	xiv)		Cable reel drive motor complete (if applicable)	1	No.of each type and rating
q)			**BUCKET ELEVATOR**		
	1		Buckets	10	% of total population
	2		Belt for bucket elevator	10	% of total population
	3		Linkages/ Bucket fixing bolts	20	% of total population
r)			**DIVIDER PLOWS**		
	1		PLOWS	20	% of total population
	2		Actuator Assy (complete with motor, gear box,limit switches etc.)	1	no

S.N.			ITEM	QUANTITY	Unit
s)			**ELEVATOR**		
	a.		**Brake**		
			1. Tool to brake	1	No.
			2. Fan	1	No.
			3. Magnet coil with housing pads	2	Nos.
			4. Brake pads	6	Nos.
			5. Adjusting sleeve	2	Nos.
			6. Fixed brake disc	2	Nos.
	b.		**Worm Gear**		
			1. Worm gear	1	no.
			2. 'O' ring	2	nos. of each type
			3. Sealing ring	2	nos. of each type
	c.		**Door Front**		
			1. Bearing	2	Nos.
			2. Roller	3	Nos.
			3. Bushing	2	Nos.
	d.		**Limit Cams**		
			1. Sensor	1	No
			2. Switch	2	Nos.
			3. Switch arm	2	Nos.
	e.		**CAD**		
			1. Guide roller	50	% of the total ones installed each type or minimum 1 no. whichever is higher
			2. Switch	1	no.
	f.		**Sliding Door**		
			1. Rollers	4	nos. of each type
	g.		**Machinery**		
			1. Guide roller	2	nos.

S.N.			ITEM	QUANTITY	Unit
			2. Pinion	1	no.
			3. Rubber inserts	6	nos.
			4. Grove ring	6	nos.
			5. Brake motor	1	no.
	h.		**Cable trolley**		
			1. Ball bearing	2	nos. of each type
T)			**DUST EXTRACTION SYSTEM**		
	1		Fan with Motor	1	nos. of each type & rating
	2		Plummer Blocks	2	sets of each type
	3		Bearing of fans & motor	1	set of each type
	4		Pulley	2	nos of each type
	5		Belts	2	sets of each size
	6		Filter spares (each set shall consist of total no. of bags in one filter assembly)	4	set of each type
	7		Motor terminal blocks with studs for all motors	1	set of each rating and type of motor
	8		Filter pulsation Solenoid valve with coil	2	nos of each type
U)			**BELT WEIGHER**		
	1		Set of cards	2	nos. of each type
	2		Load Cells	2	nos. of each type
	3		Display Unit	2	nos. of each type
	4		Speed sensor	1	nos. of each type
	5		Cables for load cells & speed sensor	2	sets
	6		Transducer, if applicable	2	nos. of each type
	7		Complete belt weigher assy. with control and display units	1	set
V)			**VIBRATION MONITORING SYSTEM (if applicable)**		
	1		Vibration pick up	2	Nos

S.N.			ITEM	QUANTITY	Unit
	2		Pick up cable	1	length
	3		Vibration monitor module and other cards	1	no. of each type
	4		Power supply	1	no.
	5		Relays	2	nos. of each type
	6		Indicating lamps / LEDs	5	nos. of each colour
W			**Surface Feeder/Bulk Receiving Unit**		
	1		Drive unit assembly (including shaft and drum/ pulley as applicable)	01	Set
	2		Bearings(one no of each type and size)	01	No
	3		Side seals	01	Set
	4		Leveler blade	01	No
X			**TRUCK TIPPLER**		
	1		Hydraulic cylinder	01	No
	2		Seal kits	01	Set
	3		Hydraulic Power Pack	01	Set
	4		Hydraulic Pumps (One no each type)	01	No
	5		Drive unit assembly	01	Set
	6		Bearings(one no of each type and size)	01	No
II			"ELECTRICAL and C&I"		
A)			CONVEYORS		
	1		Belt Sway Switch assy	5	% of each type
	2		Pull cord switch assy.	15	% of each type
	3		Zero speed switch assy.	15	% of each type
	4		Chute Block switch assy.	15	% of each type
	5		Position switches for trippers, paddle feeders	10	% of each type
	6		Sensor/probe for zero speed switch	20	%(min. 1 no)of each type and speed range
	7		Micro/limit switch of pull cord switch, belt sway switches, chute block	20	%(min. 1 no)of each type

S.N.			ITEM	QUANTITY	Unit
			switches		
	8		Motor terminal block with studs for all motors	1	set. of each type and rating of motor
C)			CRUSHING EQUIPMENT		
	1		Set of pressure, temperature flow switches, zero speed/under speed switches, limit and other switches etc.)	2	nos. of each type and rating
	2		Motor terminal block with studs for all motors	1	set. of each rating and type of motor
	3		Motor Cooling Fan	1	no. of each type
	4		Motor bearing	1	set of each type
	5		Water pump motor (if applicable) along with motor bearing	1	Set of each type and rating
D)			MAGNETIC SEPARATORS		
	1		Rectifier with surge absorber	1	set
	2		Rectifier transformer	1	no.
	3		Auxiliary and power relays	2	nos. of each type
	4		Control transformers	2	no. of each type
	5		Ammeter	2	nos. of each type
	6		Under current relay	1	no. of each type
	7		Isolating switch	1	no. of each type
	8		Motor terminal block with studs for all motors	1	set. of each rating and type of motor
	9		Complete control unit including rectifier transformer	1	No.
	b)		SUSPENDED MAGNET		
	1		Rectifier with surge absorber	1	Set
	2		Rectifier transformer	1	No
	3		Auxiliary and power relays	2	No. of each type
	4		Control transformers	1	No. of each type
	5		Ammeter	2	No. of each type
	6		Under current relay	1	No. of each type
	7		Isolating switch	1	No. of each type

S.N.			ITEM	QUANTITY	Unit
	8		Complete control unit including rectifier transformer	1	No.
E)			LIMESTONE SAMPLER		
	1		Set of various limit switches	2	nos. of each type
	2		PLC cards & power supply unit	1	Complete set
	3		Zero speed switch	1	no. of each type
	4		Solenoid valves with coils	2	nos. of each type and size
	5		Motor terminal block with studs for all motors	1	set. of each rating and type of motor
B)			TRAVELLING TRIPPER		
	1		Brake assembly for traverse drive complete	2	sets
	2		Set of limit switches	2	nos. of each type
	3		Cable tension switches with lead	2	sets of each type
	4		Anti-collision device	1	set of each type
	6		Motor terminal block with studs for all motors	1	set. of each rating and type of motor
	7		Festoon roller assembly	2	sets
	8		Cable reel drive motor complete	1	no.
	9		Flexible Trailing cable (power & control)	1	length each type (largest)
	10		Carbon brushes for slip ring current collector of cable reeling drum (CRD)	2	sets
G)			METAL DETECTOR		
	1		Cards	1	set complete
	2		Relays	2	nos. of each type
	3		Coils of metal detector	2	sets
	4		Cables for search coils	1	set
	5		Complete MD assy with panels	1	set
C)			BELT WEIGHER		
	1		Set of cards	2	nos. of each type
	2		Load Cells	2	nos. of each type

S.N.			ITEM	QUANTITY	Unit
	3		Display Unit	2	nos. of each type
	4		Speed sensor	1	nos. of each type
	5		Cables for load cells & speed sensor	2	sets
	6		Transducer, if applicable	2	nos. of each type
	7		Complete belt weigher assy. with control and display units	1	set
D)			CONTROL PANEL		
			(control desk, hoists, dust suppression system, sump pumps, fluid couplings etc.)		
	i)		Control supply transformers	1	no. of each type & rating
	ii)		Relays and timer	1	no. of each type & rating
	iii)		Contactors	1	no. of each type & rating
	iv)		Ammeters	1	no. of each type & rating
	v)		Voltmeters	1	no. of each type & rating
	vi)		LEDs	5	nos. of each type & rating
	vii)		Control switches	1	no. of each type
	viii)		Selector switches	1	no. of each type
	ix)		Push button (complete with contact elements)	1	no. of each type & colour
	x)		Auxiliary contactors	1	complete set
	xi)		Control fuse base with carrier complete set for panel	1	complete set
	xii)		Any special meter	1	no. of each type
	xiii)		Bi-metallic overload relay	2	complete sets
	Note		Spares already covered under respective equipment spares shall not be duplicated under control panel spares.		
E)			VIBRATION MONITORING		

S.N.			ITEM	QUANTITY	Unit
			SYSTEM (If Applicable)		
	i)		Vibration pick up	2	Nos
	ii)		Pick up cable	1	length
	iii)		Vibration monitor module and other cards	1	no. of each type
	iv)		Power supply	1	no.
	v)		Relays	2	nos. of each type
	vi)		Indicating lamps / LEDs	5	nos. of each colour
F)			DUST SUPRESSION, SERVICE WATER, POTABLE WATER, COOLING WATER (for hydraulic coupling or any other purpose), DUST EXTRACTION SYSTEM		
	i)		Flow switches	2	nos. of each type
	ii)		Pressure switches	2	nos. of each type
	iii)		Level switch	2	nos. of each type
G)			SUMP PUMP		
	I)		Level switch	1	set. of each type
H)			ELEVATORS		
	i)		Contactors	4	nos. of each type
	ii)		Auxiliary Transformer, control transformer	1	nos. of each type & rating
	iii)		Relays	4	nos. of each type & rating
	iv)		Resistor	6	nos. of each type & rating
	v)		Switch	1	no. of each type
	vi)		Rectifier	10	nos.
	vii)		Limit switch	4	nos. of each type
	viii)		Battery Charger	1	no. of each type
	ix)		Tone frequency transmitter	1	set. of each type
	x)		Tone frequency receiver	1	set. of each type
	xi)		Control Cards	1	set of each type

S.N.			ITEM	QUANTITY	Unit
N)			VIBRATING SCREENING FEEDER		
	i)		Motor terminal block with studs for all motors	1	set. of each rating and type of motor
	ii)		Cards of variable frequency drive of vibrating screening feeders	1	set

Note :

1. Unless stated otherwise a 'set' means items or sub-items required for each type/size range of the assembly/ sub-assembly, required for replacement in one main equipment. It is further intended that the assembly/ sub-assembly which have different orientation (like left hand or right hand, top or bottom), different direction of rotation or mirror image positioning or any other reasons which result in maintaining two different sets of the spares to be used for the subject assembly/ sub-assembly, these shall be considered as different types of assembly/ sub-assembly.
2. Wherever quantity has been specified as percentage (%), the quantity of mandatory spares to be provided by contractor shall be the specified percentage (%) of the total population of the plant. In case the quality so calculated happens to be a fraction, the same shall be rounded off to next higher whole number.
3. Whenever the quantities have been indicated for each type, size, thickness, material, radius, range etc., these shall cover all the items supplied and installed and the breakup for these shall be furnished in the bid.
4. In case spares indicated in the list are not applicable to the particular design offered by the bidder, the bidder should offer spares applicable to offered design with quantities generally in line with the approach followed in the above list.
5. Price of each and every item is to be given separately

Letter of Support/Technology Transfer/Licensing agreement to be executed by the Bidder/Contractor, Bidder's Sub vendor and Collaborator & Technology Provider/Licensor (QAHPM) meeting the requirement of clause 4.19.4 of sub-section-I-A, Part A

1. We, the Collaborator & Technology Provider/Licenser, and the Contractor *and *his Sub-Vendor, do hereby declare and undertake that we shall be jointly and severally responsible to the Employer for the design, execution, and successful performance of the complete Ash handling System and all the contractual obligations including the technical guarantees for the complete Ash handling System, as specified under the said Contract(s) to the satisfaction of the Employer.

2. We the Collaborator & Technology Provider/Licenser do hereby undertake, declare, and confirm that we shall be fully responsible for the successful performance of the ash handling System and undertake to carry out all the obligations and responsibilities under this Technology transfer/Licensing agreement to discharge the Contractor's obligations stipulated under the Contract.

3. Further the manner of achieving the objectives set forth in paragraph 1 above shall be as follows:

   (a) We, the Collaborator & Technology Provider/Licenser shall be fully responsible for complete design, engineering, preparation of all designs, design calculations, design documents/drawings, and manufacturing drawings including all its internals; preparation of all P&IDs & process flow diagrams; Selection of auxiliaries, and interfacing/ integrating with their auxiliaries so as to ensure satisfactory, reliable, safe and trouble free performance meeting all stipulated technical requirements as well as all guaranteed parameters specified in the Contract for Ash handling System.

   (b) We, the Collaborator & Technology Licenser shall extend our quality surveillance/ supervision/ quality control to the Contractor during manufacture, erection, commissioning, and performance testing, both at Contractor's/Sub-vendor'' works and/ or at Employer's project site and shall depute technical experts from time to time to the Contractor's/ Sub-vendor's works/ Employer's project site, as mutually agreed upon between the Employer and the Contractor.

   (c) In the event the Collaborator & Technology Provider/Licenser and the Contractor and his Sub-Vendor fail to demonstrate that the ash handling System meets the guaranteed parameters and demonstration parameters as specified in the contract, the Collaborator & Technology Provider/Licenser and the Contractor and his Sub-Vendor shall promptly carry out all the corrective measures related to engineering services at their own expense and shall promptly provide corrected design to the Employer.

   (d) We, the Collaborator & Technology Licenser shall participate in Technical Coordination Meetings (TCMs) from time to time, as and when required by the Employer.

4. We, the Contractor and his Sub-Vendor and the Collaborator & Technology Provider/Licenser do hereby undertake and confirm that this Technology transfer agreement/Licensing agreement **shall** be valid until the end of the defect liability period.

5. The Contractor will be fully responsible for the complete design, engineering, supply, erection, commissioning, quality of all the equipment/main assemblies/components manufactured at their works or at their Vendors' works or constructed at site, and their repair or replacement, if necessary, for incorporation in the Plant and timely delivery thereof to meet the completion schedule under the Contract.

Signatures of Contractor, Contractor's Sub-Vendor, Collaborator & Technology Provider/Licenser

1. For M/s .....
   (Contractor)
   (Signature of the Authorised Representative, Official Address) .....
2. For M/s.....
   (Contractor's Sub-Vendor)
   (Signature of the Authorised Representative, Official Address) .....

3. For M/s .....
   (Collaborator & Technology Provider/Licenser)
   (Signature of the Authorised Representative, Official Address)

Attachment-3K

EPC PACKAGE FOR
LARA STPP STAGE-II (2X800 MW)
BIDDING DOCUMENT NO. CS-9587-001R-2
(For Qualification as per Clause No. 4.19 of Sub-Section-IA, Part-A of Section-VI)

Bidder's Name and Address :

To
Contract Services ,
NTPC Limited.
NOIDA-201301

1.0 We are qualified under clause no. 4.19.1 of Sub-Section-IA, Part-A, Section-VI of Bidding Documents.

2.0 We are a supplier of ash handling system(s) and have executed ash handling system(s) involving design, engineering, manufacturing/got manufactured, supply, erection /supervised erection and commissioning/ supervised commissioning for the following systems:

We also confirm that the activity of design and engineering for the systems described 2.1(a), 2.1(b) & 2.1(c) of this Attachment-3K have been carried out by us & not through external design agency/agencies.

2.1 (a) Bottom Ash Handling System (Strike out whichever is not applicable)

(i) Wet Bottom Ash handling system comprising a jet pump system in conjunction with water impounded Bottom Ash Hopper designed for the conveying capacity of 50 tonnes/hour (dry ash basis) or more per jet pump for pulverised coal fired boilers.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity per Jet pump (TPH) referred by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder per Jet Pump (TPH)	Name of Manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

---

Note : (a) The reference Bottom Ash Handling System is of the same type i.e. jet pump system as is being offered by us for the present plant
(b) Clients certificate enclosed in support of
(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

OR

2.1 (a) (i) Wet Bottom Ash Handling system comprising a submerged scrapper chain conveyor system designed for the conveying capacity of 20 tonnes/hour (dry ash basis) or more per conveyor, for pulverised coal fired boilers:

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity per Scrapper conveyor (TPH) referred by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder per Jet Pump (TPH)	Name of Manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

Note : (a) The reference Bottom Ash Handling System is of the same type i.e. submerged scrapper chain conveyor system as is being offered by us for the present plant.
(b) Clients certificate enclosed in support of
(i) Details about above (Yes/No.)
(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

2.1(b) **Pneumatic Fly Ash Handling System(Strike out whichever is not applicable)**

(i) Pneumatic Fly ash handling system for conveying fly ash from ESPs of a single pulverised coal fired boiler unit, by pressure conveying system designed for 30 TPH or more conveying capacity.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity (TPH) specified by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder (TPH)	Name of manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

Note : (a) The reference Pneumatic Fly Ash Handling Systems are of the same type i.e. pressure system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above Yes/No.

(ii) Successful operation of above plants for at least two (2) years. Yes/No.

OR

2.1(b)(ii) Pneumatic Fly ash handling system for conveying fly ash from ESPs of a single pulverised coal fired boiler unit, by vacuum conveying system designed for 30 TPH or more conveying capacity per vacuum extractor.

Sl.	Name of	No. of Units	Design	Offered Ash	Name of	Date of Commissioning	Remarks

No.	Plant with location	with MW Capacity in which system installed	conveying capacity (TPH) specified by client (Documentary evidence attached)	conveying capacity by bidder (TPH)	manufacturer (Experience list enclosed)	and No. of years in successful operation

Note : (a) The reference Pneumatic Fly Ash Handling Systems are of the same type i.e. vacuum system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years (Yes/No.)

And

2.1(c) Pneumatic Fly Ash Transportation System for transporting Fly Ash from a pulverized Coal and Boiler unit having capacity of not less than 20 TPH for a conveying distance of not less than 500 mtr. including fly ash storage silo.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design Fly Ash transportation capacity (TPH) and conveying distance specified by client (Documentary evidence attached)		Offered Ash transportation capacity and conveying distance		Name of manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks
			Capacity	Conveying	Capacity	Conveying			

TPH	distance Mtr.	TPH	distance Mtr.

Note : Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

2.1 (d) Complete high concentration ash slurry disposal system for handling not less than 40 tonnes of ash per hour for pulverized coal fired power stations which includes, among others, ash slurry pumps & piping system with associated controls.

S.No	Name of plant with location	No of units with MW capacity in which system installed	Total quantity of ash handled (TPH)	Scope of work alongwith scheme (enclosed with bid)	Name of manufacturer (Experience list enclosed)	Date of commissioning and No of years in successful operation	remarks

Note : Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

3.0 We are qualified under clause 4.19.2 of Sub-Section-IA, Part-A, Section-VI of Bidding Documents.

We have executed Ash Handling Plants for pulverised coal fired boiler units generating not less than 40 TPH of ash per Boiler which includes bottom ash handling system comprising either a jet pump system in conjunction with water impounded Bottom Ash Hopper or submerged scrapper chain conveyor system involving design and engineering either through bidder/its sub vendor or through design agency/agencies, manufacture/got manufactured, supply, erection/supervised erection and commissioning/ supervised commissioning for the following plants (Refer clause no. 4.19.2(a) of Sub-Section-IA, Part-A, Section-VI of bidding documents).
The details of type and minimum equipment rating of such equipment are given below :

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in	Total Ash generation	Total ash handling capacity	Type of Bottom Ash	Name of design and Engineering	Name of manufacturer (Experience	Date of Commissioning and No. of	Remarks

	which system installed	per boiler (T/Hr)	(bottom+fly ash) (Tonnes/hour) per boiler	Handling System Supplied	agency (Experience) list enclosed)	list enclosed)	years in succ-essful operation

---

Note : Client's certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

We confirm that we* (or our proposed sub-vendor) have valid collaboration/association agreement for either the total requirement or the balance part under clause 4.19.1 (a), which we/ our sub vendor itself is not able to meet, with M/s ..... The details of type and minimum equipment rating of such equipment are given below :

3.1 (a) Bottom Ash Handling System (Strike out whichever is not applicable)

(i) Wet Bottom Ash handling system comprising a jet pump system in conjunction with water impounded Bottom Ash Hopper designed for the conveying capacity of 50 tonnes/hour (dry ash basis) or more per jet pump for pulverised coal fired boilers.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity per Jet pump (TPH) referred by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder per Jet Pump (TPH)	Name of Manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

---

Note : (a) The reference Bottom Ash Handling System is of the same type i.e. jet pump system as is being offered by us for the present plant
(b) Clients certificate enclosed in support of
(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

OR

3.1 (a) (ii) Wet Bottom Ash Handling system comprising a submerged scrapper chain conveyor system designed for the conveying capacity of 20 tonnes/hour (dry ash basis) or more per conveyor, for pulverised coal fired boilers:

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity per Scrapper conveyor (TPH) referred by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder per Jet Pump (TPH)	Name of Manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

Note : (a) The reference Bottom Ash Handling System is of the same type i.e. submerged scrapper chain conveyor system as is being offered by us for the present plant.
(b) Clients certificate enclosed in support of
(i) Details about above (Yes/No.)
(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

3.2 We have executed ash handling plant for pulverised coal fired boiler unit, generating not less than 40 TPH of ash per Boiler which includes fly ash handling system for conveying fly ash from ESPs in dry form (involving pneumatic conveying systems of vacuum or pressure type) involving design and engineering either through bidder/it's sub vendor or through design agency/agencies, manufacture/got manufactured, supply, erection/supervised erection, and commissioning/ supervised commissioning for the following plants (Refer clause no. 4.19.2(b) of sub-section-IA, Part-A, Section-VI of bidding documents).
The details of type and minimum equipment rating of such equipment are given below :

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Total Ash generation per boiler (T/Hr)	Total ash handling capacity (bottom+fly ash) (Tonnes/hour) per boiler	Type of Fly ash Handling System Supplied	Name of design and (Experience agency (Experience) list enclosed)	Name of manufacturer and No. of list enclosed)	Date of Commissioning years in successful operation	Remarks

Note : Client's certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

We confirm that we* (or our proposed sub-vendor) have valid collaboration agreement for either the total requirement or the balance part under clause 4.19.1 (b), which we/ our sub vendor itself is not able to meet, with M/s ..... The details of type and minimum equipment rating of such equipment are given below :

3.2 a(i) Pneumatic Fly ash handling system for conveying fly ash from ESPs of a single pulverised coal fired boiler unit, by pressure conveying system designed for 30 TPH or more conveying capacity.

S.No	Name of plant with location	No of units with MW capacity in which system installed	Design conveying capacity (TPH) specified by client (Documentary evidence attached)	Offer ash conveying capacity by bidder (TPH)	Name of manufacture (experience list enclosed)	Date of commissioning and No. of years in successful operation	Name of design and engineering agency (experience list enclosed)	Remarks

Note : (a) The reference Pneumatic Fly Ash Handling Systems are of the same type i.e. pressure system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above Yes/No.

(ii) Successful operation of above plants for at least two (2) years. Yes/No.

OR

3.2 a(ii) Pneumatic Fly ash handling system for conveying fly ash from ESPs of a single pulverised coal fired boiler unit, by vacuum conveying system designed for 30 TPH or more conveying capacity per vacuum extractor.

S.No	Name of plant with location	No of units with MW capacity in which system installed	Design conveying capacity (TPH) specified by client (Documentary evidence attached)	Offer ash conveying capacity by bidder (TPH)	Name of manufacture (experience list enclosed)	Date of commissioning and No. of years in successful operation	Name of design and engineering agency (experience list enclosed)	remarks

Note : (a) The reference Pneumatic Fly Ash Handling Systems are of the same type i.e. vacuum system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years (Yes/No.)

And

We confirm that we* (or our proposed sub-vendor) have valid collaboration/association agreement for either the total requirement or the balance part under clause 4.19.1 (c), which we/ our sub vendor itself is not able to meet, with M/s ..... The details of type and minimum equipment rating of such equipment are given below :

3.2 b Pneumatic Fly Ash Transportation System for transporting Fly Ash from a pulverized Coal and Boiler unit having capacity of not less than 20 TPH for a conveying distance of not less than 500 mtr. including fly ash storage silo.

S.No	Name of plant with location	No of units with MW capacity in which system installed	Design transportation capacity (TPH) specified by client (Documentary evidence attached)	Offer ash transportation capacity by bidder (TPH)	Name of manufacture (experience list enclosed)	Date of commissioning and No. of years in successful operation	Name of design and engineering agency (experience list enclosed)	remarks

---

Note : Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

3.3 We confirm that we* (or our proposed sub-vendor) have valid collaboration/association agreement for either the total requirement or the balance part under clause 4.19.1 (d), which we/ our sub vendor itself is not able to meet, with M/s ..... The details of type and minimum equipment rating of such equipment are given below :

Complete high concentration ash slurry disposal system for handling not less than 40 tonnes of ash per hour for pulverized coal fired power stations which includes, among others, ash slurry pumps & piping system with
associated controls.

S.No	Name of plant with location	No of units with MW capacity in which system installed	Total quantity of ash handled (TPH)	Scope of work alongwith scheme (enclosed with bid)	Name of manufacturer (Experience list enclosed)	Date of commissioning and No of years in successful operation	remarks

Note : Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

4.0 We are qualified under clause 4.19.4 of Sub-Section-IA, Part-A, Section-VI of Bidding Documents.

We confirm that we* /our proposed sub-vendor is an EPC organization in Collaboration with QAHPM (Qualified Ash Handling Plant Manufacturer):

a. The Bidder/Bidder's sub-vendor is an Engineering, Procurement and Construction (EPC) organization and have executed, in the last 10 years, industrial projects on EPC basis (with or without civil works) in the area of Power, Steel, Oil & Gas, Petro-chemical, Fertilizer, Flue Gas Desulphurisation and/or any other process industry with the total value of such projects being INR 4,000 million or more. At least one of such projects have a contract value of INR 1,600 million or more. These projects shall be in successful operation for a period of not less than one (1) year.
   i. Name of EPC Sub-Vendor:
   ii. Area of Project:
   iii. Total value of Project:
   iv. Total value of one such project:
   v. No of years of successful operation:

b. The Bidder/Bidder's sub-vendor have a valid ongoing collaboration and technology transfer/licensing agreement with a QAHPM meeting requirements of clause 4.19.1 on its own, valid minimum up to the end of the defect liability period of the contract. In such a case, Bidder/Bidder's sub-vendor shall either source the AHP System from such manufacturer or manufacture/get manufactured the AHP System as per the design and manufacturing drawings released by such QAHPM.
   Name of QAHPM (Qualified Ash Handling Plant Manufacturer):
   Details of QAHPM (Qualified Ash Handling Plant Manufacturer):

i. Bottom Ash Handling System (Strike out whichever is not applicable)

Wet Bottom Ash handling system comprising a jet pump system in conjunction with water impounded Bottom Ash Hopper designed for the conveying capacity of 50 tonnes/hour (dry ash basis) or more per jet pump for pulverised coal fired boilers.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity per Jet pump (TPH) referred by client	Offered Ash conveying capacity by bidder per Jet Pump (TPH)	Name of Manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

			(Documentary evidence attached)				

Note : (a) The reference Bottom Ash Handling System is of the same type i.e. jet pump system as is being offered by us for the present plant

(b) Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

OR

Wet Bottom Ash Handling system comprising a submerged scrapper chain conveyor system designed for the conveying capacity of 20 tonnes/hour (dry ash basis) or more per conveyor, for pulverised coal fired boilers:

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity per Scrapper conveyor (TPH) referred by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder per Jet Pump (TPH)	Name of Manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

Note : (a) The reference Bottom Ash Handling System is of the same type i.e. submerged scrapper chain conveyor system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

AND

(ii) **Pneumatic Fly Ash Handling System(Strike out whichever is not applicable)**

Pneumatic Fly ash handling system for conveying fly ash from ESPs of a single pulverised coal fired boiler unit, by pressure conveying system designed for 30 TPH or more conveying capacity.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity (TPH) specified by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder (TPH)	Name of manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

Note : (a) The reference Pneumatic Fly Ash Handling Systems are of the same type i.e. pressure system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above Yes/No.

(ii) Successful operation of above plants for at least two (2) years. Yes/No.

OR

Pneumatic Fly ash handling system for conveying fly ash from ESPs of a single pulverised coal fired boiler unit, by vacuum conveying system designed for 30 TPH or more conveying capacity per vacuum extractor.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design conveying capacity (TPH) specified by client (Documentary evidence attached)	Offered Ash conveying capacity by bidder (TPH)	Name of manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks

Note : (a) The reference Pneumatic Fly Ash Handling Systems are of the same type i.e. vacuum system as is being offered by us for the present plant.

(b) Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years (Yes/No.)

And

Pneumatic Fly Ash Transportation System for transporting Fly Ash from a pulverized Coal and Boiler unit having capacity of not less than 20 TPH for a conveying distance of not less than 500 mtr. including fly ash storage silo.

Sl. No.	Name of Plant with location	No. of Units with MW Capacity in which system installed	Design Fly Ash transportation capacity (TPH) and conveying distance specified by client (Documentary evidence attached)		Offered Ash transportation capacity and conveying distance		Name of manufacturer (Experience list enclosed)	Date of Commissioning and No. of years in successful operation	Remarks
			Capacity TPH	Conveying distance Mtr.	Capacity TPH	Conveying distance Mtr.			

Note : Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

AND

iii) Complete high concentration ash slurry disposal system for handling not less than 40 tonnes of ash per hour for pulverized coal fired power stations which includes, among others, ash slurry pumps & piping system with associated controls.

S.No	Name of plant with location	No of units with MW capacity in which system installed	Total quantity of ash handled (TPH)	Scope of work alongwith scheme (enclosed with bid)	Name of manufacturer (Experience list enclosed)	Date of commissioning and No of years in successful operation	remarks

Note : Clients certificate enclosed in support of

(i) Details about above (Yes/No.)

(ii) Successful operation of above plant(s) for at least two (2) years. (Yes/No.)

c. Bidder confirms to furnish letter of support from Collaborator/ Licensor /Technology provider for successful performance of the AHP system valid up to the end of defect liability period of the contract as per the format enclosed in the bidding document, at the time of placement of order on the approved sub-vendor.

Bidder confirms that the Technology transfer/Licensing agreement between the Bidder, Bidder's sub-vendor & QAHPM shall cover transfer/licensing of technological knowhow for AHP system in the form of transfer/licensing of design

dossier, design software's, drawings and documentation, quality system manuals and imparting relevant personnel training to the Bidder/Bidder's sub-vendor.

LETTER OF SUPPORT FOR SATISFACTORY PERFORMANCE OF …… (Name of System) FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2X800 MW) EPC PACKAGE

TO:

[EMPLOYERS NAME & ADDRESS]

Sub: Letter of Support submitted From …….. (name of the Associate /Collaborator) undertaking the responsibility for satisfactory performance of …..(Name of System)

Dear Sirs,

1. In accordance with the Award of the Contract by …… (Name of System) to M/s. ……. (Name of the sub-vendor), we the aforesaid Associate /Collaborator) shall be fully responsible for the satisfactory performance of the …….. (System name).

2. Further, the manner of achieving the objective set forth in point 1 above shall be as follows:
   For …….. (System name):

(A) We shall provide and shall be fully responsible for design, engineering & commissioning, manufacturing and assembly drawings of…….. (System name). …….. (System name) shall be manufactured and supplied as per above design provided by us and the drawings approved by Employer.

(B) We shall depute technical experts to Bidder's/sub-vendor's works for supervision during manufacturing, assembly, erection, commissioning and final testing (as and when necessary) of the……. (System name).

(C) We shall promptly carry out all the corrective measures and shall promptly provide corrected design and shall undertake replacements, rectifications or modifications to the equipment as required in case the equipment fails to demonstrate successful performance as per contract at site.

(D) We shall participate in Technical Co-ordination meetings (TCMs) from time to time, as and when required by Employer

3. We, the Associate /Collaborator* do hereby undertake and confirm that this Letter of Support shall be valid for a period of seven (7) years or up to the end of defect liability period of the contract, whichever is later.

.

Signature of the Authorised Representative:……..…
For M/s ……..

(Associate*/*Collaborator*)

Name ……..……
Designation ……..

Date:……

Common Seal of the Company

*: Strike off whichever is not applicable.

For Qualification as per Clause No. 4.19.3 of Sub-Section-IA, Part-A of Section-VI

In conformity with the requirements specified under clause 4.19.3(a) Sub section-IA, Section -VI, Part-A of Horizontal centrifugal pump module, we have offered Ash Slurry pumps manufactured by M/s ..... who have in the past supplied and installed ash slurry pumps for similar duty application and have at least two (2) nos. pumps of the same models that are being offered having capacity not less than 1000 cubic meters per hour at each of two (2) different stations which are in successful operation for at least two (2) years prior to the date of Techno-Commercial bid opening. In support of the above, we furnish below the following details.

i) Name of Ash Slurry pumps manufacturer :

ii) The above pump manufacturer have supplied and installed at least two (2) nos. Ash slurry pumps of parameters as specified in Clause 4.19.3(a), sub section-IA, Section-VI, Part-A — Yes / No

iii) Details of the Power Plants at which Ash Slurry Pumps of the above make as specified in Clause 4.19.3(a), sub section -IA, Section-VI, Part-A

a) Name of the Power Plant :

b) Pump Model :

c) Size of Pumps :

d) Number of pumps :

e) Capacity of the pump (m3 / hr.) :

f) Total dynamic Head of the pump (mwc) :

g) Concentration (by wt.) of the slurry and the

maximum particle size handled :

h) Date of commissioning of ash handling system :

i) Whether the pumps are in successful operation prior to Techno-Commercial bid ` opening(Attach certificate from Client) :

In conformity with the requirements specified under clause 4.19.3(b) Sub section-IA, Section -VI, Part-A of positive displacement pumps for high concentration slurry disposal System, we have offered high concentration slurry disposal pumps manufactured by M/s ..... who have in the past supplied and installed positive displacement pumps for high concentration slurry disposal System for similar duty applications and have at least two (2) nos. pumps of same models that are being offered having capacity not less than 150 m3/hr which should have been in successful operation for at least two (2) years prior to the date of Techno-Commercial bid opening. In support of the above, we furnish below the following details.

i) Name of high concentration slurry disposal pumps manufacturer :

ii) The above pump manufacturer have supplied and installed at least two (2) nos high concentration slurry disposal pumps of parameters as specified in Clause 4.19.3(b), sub section-IA, Section-VI, Part-A — Yes / No

iii) Details of the Power Plants at which high concentration slurry disposal Pumps of the above make as specified in Clause 4.19.3(b), sub section -IA, Section-VI, Part-A

a) Name of the Power Plant :

b) Pump Model :

c) Size of Pumps :

d) Number of pumps :

e) Capacity of the pump (m3 / hr.) :

f) Total dynamic Head of the pump (mwc) :

g) Concentration (by wt.) of the slurry and the

maximum particle size handled :

h) Date of commissioning of ash handling system :

i) Whether the pumps are in successful operation prior to Techno-Commercial bid ` opening(Attach certificate from Client)

LETTER OF SUPPORT FOR SATISFACTORY PERFORMANCE OF …… (Name of Equipment) FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2X800 MW) EPC PACKAGE

TO:

[EMPLOYERS NAME & ADDRESS]

Sub: Letter of Support submitted From …….. (name of the Associate /Collaborator*/Technology provider*/Licensor*/Qualified equipment manufacturer*) undertaking the responsibility for satisfactory performance of …..(name of the equipment).

Dear Sirs,

4. In accordance with the Award of the Contract by …… (Name of the Contractor) to M/s. ……. (Name of the sub-vendor), we the aforesaid Associate /Collaborator*/Technology provider*/Licensor*/Qualified equipment manufacturer*, (M/s …….) shall be fully responsible for the satisfactory performance of the …….. (Equipment name).

5. Further, the manner of achieving the objective set forth in point 1 above shall be as follows:
   For …….. (Equipment name):

(E) We shall provide and shall be fully responsible for design,engineering & commissioning, manufacturing and assembly drawings of…….. (Equipment name). …….. (Equipment name) shall be manufactured and supplied as per above design provided by us and the drawings approved by Employer.

(F) We shall depute technical experts to Bidder's/sub-vendor's works for supervision during manufacturing, assembly, erection, commissioning and final testing (as and when necessary) of the……. (Equipment name).

(G) We shall promptly carry out all the corrective measures and shall promptly provide corrected design and shall undertake replacements, rectifications or modifications to the equipment as required in case the equipment fails to demonstrate successful performance as per contract at site.

(H) We shall participate in Technical Co-ordination meetings (TCMs) from time to time, as and when required by Employer

6. We, the Associate /Collaborator*/Technology provider*/Licensor*/Qualified equipment manufacturer* do hereby undertake and confirm that this Letter of Support shall be valid for a period of seven (7) years or up to the end of defect liability period of the contract, whichever is later.

.

Signature of the Authorised Representative:……..
For M/s …….

(Associate*/*Collaborator/*Technology provider/*Licensor/ Qualified equipment manufacturer*)

Name ……
Designation …….

Date:……

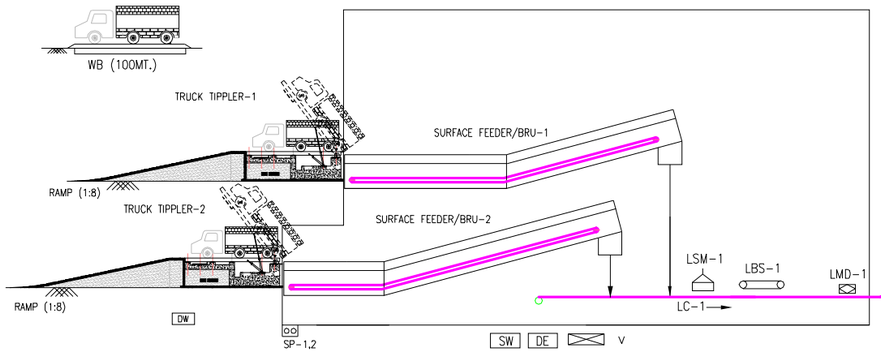
Common Seal of the Company

*: Strike off whichever is not applicable.

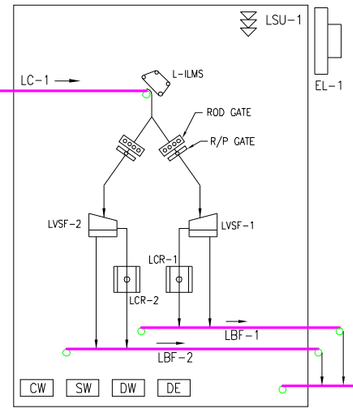
COLLABORATOR'S/LICENSOR/ASSOCIATED EXPERIENCE FOR ASH HANDLING SYSTEM

	1	2	3	4
Name and address of the collaborator/licensor/associate				
System for which collaboration/licensing/association made				

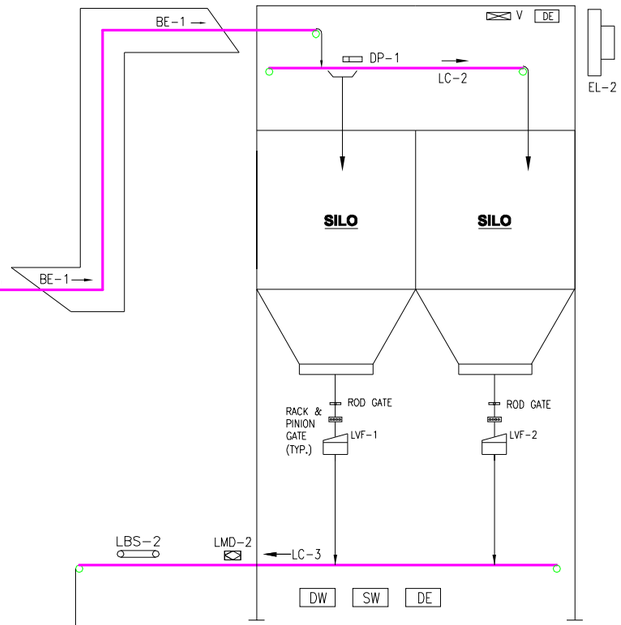
M/s ……..(Our collaborator/licensor/associate) are a supplier of ash handling systems having executed ash handling systems involving design, engineering, manufacture/got manufcatured, supply, erection/supervision of erection and commissioning/supervision of commissioning for the following systems. We also confirm that the activity of design and engineering for the systems described in this Attachment- 3K have been carried out by the collaborator/licensor/associate of the relevant system, himself and through external design agency/agencies.



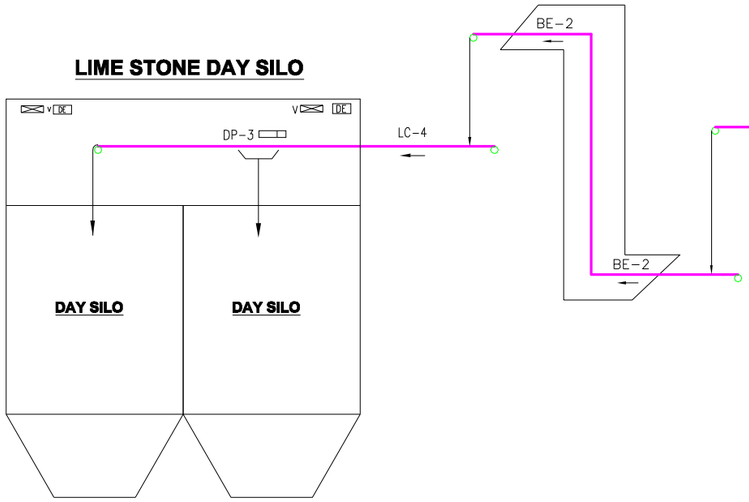
LIME STONE CRUSHER HOUSE



CRUSHED LIME STONE MAIN STORAGE SILO



LIME STONE DAY SILO



EQPT. DESIGN.	EQUIPMENT	QTY.	CAPACITY
RG	ROD GATE	2	
RPG	RACK AND PINION GATE	2	
LVF	LIMESTONE VIBRATING FEEDER	2	
LVSF	LIMESTONE VIBRATING SCREEN FEEDER	2	
LC 1,2,3&4	LIMESTONE CONVEYOR	4	150 TPH RATED COPACITY
EL	PASSENGER CUM GOODS ELEVATOR AT LCH	2	CONVENTIONAL TYPE ELEVATOR
LMD – 1 & 2	LIME STONE METAL DETECTOR	2	
LSM	SUSPENDED MAGNET	1	
SF	SURFACE FEEDER / BRU	2	150 TPH
LCR	LIME STONE CRUSHER	2	150 TPH RATED CAPACITY
LBS	LIME STONE BELT WEIGH SCALE	2	
L-ILMS	IN LINE MAGNETIC SEPARATOR ALONG WITH TRAMP IRON CHUTE	1	
LBF-1/2	LIME STONE BELD FEEDER	2	150 TPH RATED CAPACITY
TRUCK TIPPLER	TRUCK TIPPLER	2	
BE-1&2	BUCKET ELEVATOR	2	150 TPH RATED CAPACITY (PIT LESS)

LEGEND	
	LIME BELT FEEDER
SW	SERVICE WATER SYSTEM
DW	DRINKING WATER SYSTEM
DE	DRY DUST EXTRACTION SYSTEM
SP	SUMP & SUMP DRAINAGE PUMPS
LC	LIME STONE BELT CONVEYOR
	ROD GATE
	RACK & PINION GATE
LCR	LIME STONE CRUSHER
EL	CONVENTIONAL TYPE ELEVATOR
LBS	LIME STONE BELT SCALE
LSU	LIME STONE SAMPLING UNIT
L-ILMS	LIME STONE MAGNETIC SEPARATOR (IN LINE)
LMD	LIME STONE METAL DETECTOR
V	VENTILATION
DP	DIVERTER PLOW
LSM	SUSPENDED MAGNET

NOTES :

1. THE SCHEME SHOWN IS INDICATIVE. THIS DRG. IS MEANT TO SHOW ONLY LIMESTONE FLOW PATH AND DOES NOT INDICATE COMPREHENSIVE SCOPE OF WORK.
2. ALL CONVEYORS SHALL BE PROVIDED WITH ACCESSORIES SUCH AS PULL CORD, BELT SWAY AND ZERO SPEED SWITCHES, BELT WIPER UNITS, TENSIONING DEVICES ETC. ALL BUCKET ELEVATORS SHALL BE PROVIDED SUITABLE PROTECTION DEVICES AS PER TECHNICAL SPECIFICATION. THESE ARE NOT SHOWN IN THE FLOW DIAGRAM FOR CLARITY.
3. ALL ACCESSORIES, ITEMS OF WORK, THOUGH NOT INDICATED BUT REQUIRED TO MAKE THE SYSTEM COMPLETE FOR ITS SAFE, EFFICIENT, RELIABLE AND TROUBLE FREE OPERATION AND MAINTENANCE SHALL ALSO BE INCLUDED IN BIDDER'S SCOPE UNLESS SPECIFICALLY EXCLUDED.
4. SERVICE WATER, POTABLE WATER, COOLING WATER, DUST EXTRACTION & VENTILATION SHALL BE PROVIDED AS PER TECHNICAL SPECIFICATION REQUIREMENT.
5. THE MAXIMUM CAPACITY OF EACH LIMESTONE STORAGE SILO SHALL NOT EXCEED 2000 MT. NUMBER OF LIMESTONE STORAGE SILOS AND CAPACITY SHALL BE DECIDED DURING DETAIL ENGINEERING BASED ON REQUIREMENTS OF TECHNICAL SPECIFICATIONS.

FOR TENDER PURPOSE ONLY

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
A	RELEASED FOR TENDER	Priyanka	MK							

CLEARED BY

एन टी पी सी NTPC

NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: **LARA SUPER THERMAL POWER PROJECT**
STAGE–II (2×800MW)

TITLE: EPC PACKAGE–LIMESTONE HANDLING SYSTEM
LIME STONE FLOW DIAGRAM

SIZE	SCALE	DRG.NO.	REV.
A3	--	9587-001 (R)-POM-A-031 (SH-1)	A

CAD FILE NAME : 9587-001(R)-POM-A-031 (SH-1).dwg