

BOQ				
NAME OF PROJECT:		1X660 MW BHUSAWAL STPP		
NAME OF PACKAGE:		SEWAGE TREATMENT PLANT		
TECHNICAL SPECIFICATION:		PE-TS-415-673-A001		
S. No.	DESCRIPTION	HSN/ SAC CODE	UNIT	QTY
1.0	Total lump sum firm price for SUPPLY PART , SERVICES PART & MANDATORY SPARES comprising of design (i.e. Preparation and submission of drawing/ documents including " As Built " drawings and O&M Manuals), engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, maintenance tools & tackles, fill of lubricants & consumables, mandatory spares alongwith spares for erection, startup and commissioning as required, forwarding, proper packing, shipment and delivery at site, unloading, handling, transportation & storage at site, in site transportation, assembly, minor civil works, erection & commissioning, trial run at site and carrying out performance guarantee /Functional / Demonstration tests at site, training of customer/ client O&M staff & final handing over to end customer in flawless condition for project and package specified above complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification, amendment & agreements till placement of order.		Set	1
2.0	MAJOR BREAK-UP OF PRICES GIVEN IN 1.0 ABOVE.			
2.1	Total lump sum firm price for SUPPLY PART comprising of design (i.e. Preparation and submission of drawing/ documents including " As Built " drawings and O&M Manuals) , engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, maintenance tools & tackles, fill of lubricants & consumables, alongwith spares for erection, startup and commissioning as required, forwarding, proper packing, shipment and delivery at site and package specified above complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification, amendment & agreements till placement of order.	8421 2190	Set	1
2.2	Total lump sum firm price for the SERVICES PART comprising of unloading, handling, transportation & storage at site, in site transportation, assembly, minor civil works, erection & commissioning, final painting at site, trial run at site and carrying out performance guarantee /Functional / Demonstration tests at site, training of customer/ client O&M staff & final handing over to end customer in flawless condition for project and package specified above complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification, amendment & agreements till placement of order.	999411	Set	1
2.3	Total lumpsum firm price for Mandatory spares (enclosed as ANNEXURE A) comprising of manufacture, fabrication, assembly, inspection / testing (as applicable) at vendor's & sub-vendor's works, painting, forwarding, proper packing, shipment, delivery at site & guarantee as per tender technical specification above, amendment & agreements till placement of order.	8421 2190	Set	1

BOQ (MANDATORY SPARES)-ANNEXURE - A		
S.No.	EQUIPMENT	QUANTITY
MANDATORY SPARE LIST (MECHANICAL):		
1	LOW PRESSURE PIPING SYSTEM	
1.1	Valves	1 Lot (5% of the total population of each type, Size and class or minimum Two (2) of each type, size and class whichever is higher)
1.2	Valves including control valves	1 Lot (5% of the total population or minimum Two (2) of each type, material, size & Class, whichever is more)
Note: Complete valve along with actuator and all other accessories which are the part of original supply shall be also be supplied		
2	ELECTRIC HOIST	
2.1	Brake linings	Two (2) sets of each type
2.2	Rope guide and rope tighter	One (1) of each type
2.3	Limit switch	Two (2) of each type and size
2.4	Bearings for long travel wheels	Two (2) sets
2.5	Bearings for gear boxes for each type of hoist	Two (2) sets
2.6	Break liners for all the brakes	1 Lot (100% of total population of each type & size)
2.7	Oil seals	1 Lot (100% of total population of each type, size rating)
2.8	Brake springs for all brakes	1 Lot (100% of total population of each type, size rating)
2.9	Wire ropes for hooks	1 Lot (100% installed on each crane and hoist)
2.10	Solenoid coils for brakes	Two (2) sets
2.11	Overload relay for motors	Two (2)
2.12	Limit switches for hoists and travel mechanisms	Two (2) sets
2.13	Spare motors for hoists	Two (2)
2.14	Long travel machinery	
2.14.1	Gear wheel	One (1) set
2.14.2	Internal clip	Two (2)
2.14.3	Pinion	One (1)
Note: - "One (1) Set" is defined as 100% requirement for one hoist for the entire hoists of similar size & capacity.		
3	MANUAL HOIST	
3.1	Load chain wheel	One (1)
3.2	Load chain stripping fork	Five (5)
3.3	Hand chain wheel	Two (2)
3.4	Ratchet pawl	One (1)
3.5	Locking ratchet wheel	Two (2)
3.6	Guide roller	Two (2)
3.7	Brake disc	Two (2)
Note: - "One (1) Set" is defined as 100% requirement for one hoist for the entire hoists of similar size & capacity.		
4	VENTILATION SYSTEM	
4.1	Roof exhauster fans (for each type, rating and capacity)	1 Lot (5 % of total population or one (1) whichever is higher)
4.2	Supply air fans (wall mounted) (for each type, rating and capacity)	1 Lot (5 % of total population or one (1) whichever is higher)
4.3	exhaust air fans (wall mounted) (for each type, rating and capacity)	1 Lot (5 % of total population or one (1) whichever is higher)
MANDATORY SPARE LIST (ELECTRICAL):		
5	415V MOTORS	
5.1	Terminal plates for motors upto 30kw for each rating	1 Lot (1 no. For each type & rating of Motor)
5.2	Terminal plates for motors above 30kw for each rating	1 Lot (1 no. For each type & rating of Motor)
5.3	Heaters	1 Lot (1 no. For each type & rating of Motor)
5.4	Greasing arrangements	1 Lot (1 no. For each type & rating of Motor)
5.5	Motor of each type and rating	1 Lot (10% of the installed quantity or minimum 1 number whichever is higher)
5.6	Bearings (DE and NDE)	1 Lot (1 no. For each type & rating of Motor)
5.7	End shield cover driving of non driving end	1 Lot (1 no. For each type & rating of Motor)
5.8	Cooling fan	1 Lot (1 no. For each type & rating of Motor)
5.9	Motor terminal block	1 Lot (1 no. For each type & rating of Motor)
5.10	Complete set of coupling	1 Lot (1 no. For each type & rating of Motor)
MANDATORY SPARE LIST (CONTROL AND INSTRUMENTATION):		
6	MEASURING INSTRUMENTS	
6.1	ELECTRONIC TRANSMITTERS	
6.1.1	Transmitters of all types, ranges and model no. (for the measurement of Pressure, differential pressure flow, level etc.)	1 Lot (10% or 2 no. of each type and model, whichever is more)
6.1.2	Electronic cards / PCB's for each type and model and model of transmitters	1 Lot (10% or 5 nos. of each type, whichever is more)
6.2	TEMPERATURE ELEMENTS	
6.2.1	RTDs of each type & length	1 Lot (10% or 2 nos. whichever is more)
6.2.2	Thermocouples of each type like K-type, R-type, metal etc and length	1 Lot (10% or 2 nos. whichever is more)
6.2.3	Thermowell for T/C & RTDs	1 Lot (10% or 1 no. of each type, rating, length used in the system whichever is more)
6.2.4	Process actuated switch devices Including all types of pressure, differential pressure, flow, temperature, differential temperature, level switch devices	1 Lot (10% or 1 no. of each type and model whichever is more)
6.3	INDICATORS/RECORDERS	
6.3.1	Digital Indicators of each model, type & range (including relevant digital indicators of electrical system)	1 Lot (10% or 2 nos. min. whichever is more)
6.3.2	Vertical Indicators of each type & model	1 Lot (5% or 1 no. of each model whichever is more)
6.3.3	Recorders for each type and model	1 Lot (5% or 1 no. whichever is more.)
6.3.4	Consumables for continuous recorders Charts Ink capsules	1 Lot (25 rolls per recorder/ 25 nos per recorder/ 20 nos. per recorder / Ink Pads /Pens.)
6.3.5	Consumables for multi point recorders	
6.3.5.1	Charts	1 Lot (5 nos. per recorder)
6.3.5.2	Ink pads	1 Lot (5 nos. per recorder)
6.3.5.3	Print mechanism/ print head assembly	1 Lot (10% or 5 nos. of each type whichever is more)
6.3.6	Level transmitters (displacer type)	
6.3.6.1	Electronic cards / PCB's of level transmitters	1 Lot (10% of total quantity used or 1 for each type/rating whichever is more)
6.3.6.2	Level transmitters	1 Lot (10% of total quantity used or 1 for each type/rating whichever is more)
6.3.7	PD type flow transmitters	1 Lot (10% of total quantity used or 1 for each type/rating whichever is more)
6.4	SWITCHES	
6.4.1	Switches (Pressure, DP, Level, Flow, Temperature etc)	1 Lot (10% of each type of total nos. used in the system or minimum 1 no. of each type, model & range whichever is more)
6.5	Rotameter	1 Lot (10% of each type of total nos. used in the system or minimum 2 no. of each type, model & range whichever is more)
6.6	SOLENOID VALVE	
6.6.1	Assembly	1 Lot (10% of total quantity used or minimum 2 no. of each type whichever is more)
6.6.2	Coil	1 Lot (10% of total quantity used or 5 no. whichever is more)

6.7	E/P Converter	1 Lot (10% of each type of total nos. used in the system or minimum 2 no. of each type, model & range whichever is more)
6.8	SPECIAL INSTRUMENTS	
6.8.1	Nucleonic /non-nucleonic density meter, solid flow meter etc.	1 no. and spare parts as per manufacturer
6.9	Electrical Transducers	1 Lot (10% of total quantity used or minimum 1 no. of each type and range whichever is more)
7	PROCESS CONNECTION PIPING (for impulse piping /tubing, sampling piping/ tubing and air supply piping as applicable)	
7.1	Valves of all types and models	1 Lot (10% or 2 no. of each type, class, size and model whichever is more.)
7.2	2 way, 3way, 5way valve manifolds	1 Lot (10% or 2 no. of each type, class, size and model whichever is more.)
7.3	Fittings	1 Lot (10 nos. of each type)
7.4	Purge meters	1 Lot (10 % of each model or 2 Nos. whichever is more)
7.5	Filter regulators	1 Lot (10% of each model or 2 Nos. whichever is more)
7.6	Impulse pipe & tubing of all type	1 Lot (20 mtrs each type & size)
7.7	Impulse line root valve	1 Lot (10% of total quantity used or 4 no. whichever is more for each type and rating of each size)
7.8	SS tube	1 Lot (40 mtrs of each type/size)
7.9	Fitting for SS tube	1 Lot (40 nos. of each type/size)
8	INSTRUMENTATION CABLE, INTERNAL WIRING AND ELECTRICAL FIELD	
8.1	Pre fabricated cable of each type	1 Lot (10% of installed quantity)
8.2	Pre fabricated cable connector	1 Lot (10% or 1 no. of each type and model, whichever is more.)
8.3	Other cables	1 Lot (10% of each type, pair and size of actual installed quantity)
9	ELECTRICAL ACTUATORS	
9.1	Actuators	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)
9.2	Power unit for modulating actuator	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.3	DC-DC unit/power pack units	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.4	Electronic cards	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.5	Brake assembly	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.6	Brake coils	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.7	Position feed back transmitters	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.8	Control unit	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.9	Torque and limit switch assembly of each unit	1 Lot (10% or 2 nos. of each type, whichever is more.)
9.1	O-ring	1 Lot (1 set of each size)
9.11	Motor	1 Lot (1 no. of each type & rating)
9.12	Auxiliary contact	1 Lot (10% of total quantity used or 2 nos. whichever is more for each type and rating of each size)
9.13	Seal kit	1 Lot (1 set of each type & size)
10	CONDUCTIVITY	
10.1	Conductivity Sensor/cell for each type of Cell Constant	1 Lot (20% of the total no. used in the system or minimum 2(two) nos. whichever is higher.)
10.2	Conductivity Transmitter Complete Set	1 Lot (20% of the total no. used in the system or minimum 2(two) nos. whichever is higher.)
10.3	pH	
10.3.1	pH Sensor	1 Lot (20% of the total no. used in the system or minimum 2(two) nos. whichever is higher.)
10.3.2	pH Transmitter Complete Set	1 Lot (20% of the total no. used in the system or minimum 2(two) nos. whichever is higher.)
10.3.3	Sensor recharger	1 Lot (20% of the total no. used in the system or minimum 2(two) nos. whichever is higher.)
11	DISSOLVE OXYGEN	
11.1	Dissolve Oxygen Sensor Complete Set	1(one) no.
11.2	Dissolve Oxygen Analyser Complete Set	1(one) no.
12	OTHER HARDWARE	
12.1	Stainer each type	2(two) nos.
12.2	Sample Cooler	2(two) nos.
12.3	High Pressure Reducing Valve	5(five) nos.
12.4	Cation column	5(five) nos.
12.5	Pressure Gauge, Pressure Switch, Temperature Gauge, Temperature Switch, Isolating Valve, Solenoid Valve, Rota Meter etc.	1 Lot(10% of total quantity of each item and type/rating used in the system or minimum 1(one) no. whichever is higher.)
12.6	Annunciation System	
12.6.1	Each type of PCB	1 Lot (1(one) No. each)
12.6.2	Lamp Box with Facia & Lamps (LED type)	5 (five)Nos.
12.6.3	Hooter	1(one) No.
12.7	Auxiliary/Power Contactor, Push Button, Indicating Lamp, Fuse etc. for Chiller Unit	1 Lot (10% of total quantity of each type of items used in the system or minimum 2(two) nos. whichever is more.)
13	RADAR TYPE LEVEL TRANSMITTER	
13.1	Transmitter/Receiver	1 Lot (10% or 1 no. of each type transmitter/ receiver)
13.2	Electronic card	1 Lot (10% or 1 no. of each type electronic card)
14	CONTROL PANEL AND LOCAL/ REMOTE CONTROL DESK (AS APPLICABLE)	
14.1	Recorder	1 Lot (1(one) No. each type and model)
14.2	Bar graph indicator	1 Lot (10% of total quantity used in the system or minimum 1(one) no. whichever is more for each type and model.)
14.3	Digital indicator	1 Lot (10% of total quantity used in the system or minimum 1(one) no. whichever is more for each type and model.)
14.4	Mosaic/Conventional Type Push button Station	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)
14.5	Mosaic Type Push button Station with LED Indication	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)
14.6	Mosaic Type LED Indication Station	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)
14.7	Simaphore Indicator	1 Lot (2(two)Nos. each type)
14.8	ANNUNCIATION SYSTEM (For offsite / Auxiliary Plants)	
14.8.1	Each type of PCB (for non-PLC driven system)	1 Lot (1(one) No. each)
14.8.2	Lamp Box with Facia & Lamps (LED type)	1 Lot (10% with minimum 2 nos.)
14.8.3	Hooter	1 (one) No.
15	Power cylinder	
15.1	Actuator Seal Kit	1 Lot (2(two) nos. for each type of Power Cylinder)
15.2	Gasket	1 Lot (2(two) nos. for each type of Power Cylinder)
15.3	Complete Set of Power Cylinder	1 Lot (1(one) no. each type for all application)
15.4	Position Transmitter complete set	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)
15.5	Power Cylinder Positioner complete Set	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)

15.6	Complete Set of Solenoid Valve for Power Cylinder	1 Lot (2Nos. for each type & ratings)
15.7	Solenoid Coil for Pneumatic type Power Cylinder	1 Lot (5 Nos. for each type & ratings)
15.8	Position Limit Switch for Pneumatic type Power Cylinder	1 Lot (10Nos. for each type & ratings)
15.9	Air Lock Relay	1 Lot (10Nos. for each type)
15.10	Signal Air Booster Unit	1 Lot (2Nos. for each type)
16	Terminal block/ box	1 Lot (10% of total quantity used for each type and rating)
17	MCBs	1 no. of each type & rating
18	Relays interposing relay	1 Lot (10% or 2 nos. of each type and model whichever is more)
19	Fuses	1 Lot (100 % of each type and rating)
20	Cooling fans for power supply	1 Lot (10% or 2 nos. of each type and model whichever is more)
21	MANDATORY SPARES NOT COVERED ABOVE	Bidder to supply 10% electronic modules/ cards or any other electronic components required for system.
Note:		
A)	If any item as listed above under mandatory spare list is not applicable, then bidder to supply its equivalent spares.	
B)	If any item which is considered as not applicable by bidder and if the same is found to be applicable during detailed engineering, bidder to supply the same without any cost implication.	