

TECHNICAL SPECIFICATIONS FOR - 10 TANK PRE TREATMENT PLANT			
Scope: Design, Manufacture, Supply, Erection and Commissioning of 10 Tank Pre-treatment Plant for treatment of Aluminium alloy sheet consisting of a) 10 Processing Tanks b) Mono rail Crane of 2 Ton Capacity with supporting beams c) Effluent Treatment Plant in accordance with the Statutory Requirements of the Government of Kerala (Pollution Control Board) d) Compliance Certificate from the Pollution Control Board - Government of Kerala Tentative Schematic Drawings of Tank location, crane beam positions and ETP tanks are enclosed for reference. Drawings are indicative only.			
S.No	Specification	Requirement	Complied Yes / No
1	Processing Tanks [General requirements]		
1.1	Number of Treatment Tanks to be supplied.	Qty : 9 Nos (As listed below) 1) Degreasing Tank 2) Hot Rinsing Tank, 3) Cold Rinsing Tank 4) Etching Tank 5) Hot Rinsing Tank 6) Cold Rinsing Tank 7) Pickling Tank 8) Hot Rinsing Tank 9) Cold Rinsing Tank	
1.2	Inner Dimension of the Tanks [L X W X H]	2000 mm X 1000 mm X 1500 mm	
1.3	Maximum Working Level [Water level]	2800 litres	
1.4	Tank Construction		
1.4.1	Material of Construction	The tank should be constructed out of Polypropylene Rochling / reputed make of PPH sheet 15mm thickness. Necessary reinforcement required for outer surface of the tank with 96X48X4 mm MS rectangular tube to be provided with 5mm outer sheet covering of PP material. The firm should provide supporting document proving the life expectancy of 20 to 25 years, under normal maintenance & working conditions	
		The Tank shall be of rigid construction, and shall have the capacity to withstand the load as well as impact force of normal operations, without any damages.	
		The Tank shall be constructed out of material that can withstand the environmental conditions where the ambient Temperature ranges from 45 + / - 2 degrees centigrade and high humidity conditions	
1.4.2	Maintenace Requirement	The firm shall provide the necessary maintenance process required for the Tanks along with the Schedule of Maintenace to be carried out.	
2	Processing Tanks [Specific requirements]		
2.1	Degreasing & Etching Tanks	For Tanks 1 & 4 Listed at S.No 1.1	
2.1.1	Qty to be Supplied		
2.1.1.1	Degreasing Tank	Qty : 1 No	
2.1.1.2	Etching Tank	Qty : 1 No	
2.1.2	Each Tank Shall have the following requirements		
2.1.2.1	Heater	Capacity : 3 kW	
		Qty : 6 Nos / Tank	
		Material : Reputed ISI make of SS 304 Tubular Heater with TEFLON Sleeved to prevent Hard Deposit on Heater Surface.	
		Operating Temperature : The Heater Shall have the capacity maintain the Tank at an operational temperature of 40 ⁰ C to 70 ⁰ C [within a duration of 4 Hrs]	
2.1.2.2	Temperature Sensor	Qty : 1 No / Tank [Location at One Corner of the Tank]	
2.1.2.3	Temperature Controller	Qty : 1 [Location : Housed in the Control Panel]	
2.1.2.4	Lip Exhaust Duct	Material : Polypropelene / FRP	
2.1.2.6	Air Agitation Coil	Material : SS / PP - Piping with Inlet Valve.	
		The Air agitation System shall have the capcity for through stirring/agitation of the entire tank content .	
2.1.2.7	Inlet / Drain Valves	Material : PP /UPVC for working of the tank to be provided from the nearest source	
		The Inlet & outlet drain valves shall have sufficient diameter to allow filling & draining of the Tank in reasonable time.	
2.1.2.8	Supporting Blocks for Placing Material Bucket:	Material : PP to be provided on the tank for positioning the buckets	
		Quantity : 4 Nos / Tank - Positioned Symmetrically in the tank.	
2.1.2.9	Motor Driven Skimmer for removal of Oil / Foam & Floating particles	Motor Capacity : 0.04 kW, (Input Power - 3 Phase, 415 V)	
		Disc Material : SS 316. (1 No / Tank)	
		Disc Dimension : Dia- 400 mm, Height- 153 mm & Oil removal rate- 5 ltrs/min	
2.1.2.10	General Requirement for both Tanks	The tank should be thermally insulated from the surroundings.	
		Necessary Over flow pipes to be provided at the rear side of the tank.	
2.2	Hot Water Rinsing Tanks	For Tanks 2, 5 & 8 Listed at S.No 1.1	
2.2.1	Qty to be Supplied	Qty : 3 Nos	
2.2.2	Each Tank Shall have the following requirements		
2.2.2.1	Heater	Capacity : 3 kW	
		Qty : 6 Nos / Tank	
		Material : Reputed ISI make of SS 304 Tubular Heater with TEFLON Sleeved to prevent Hard Deposit on Heater Surface, to get 40 to 50 degree centigrade within the rated time	
2.2.2.2	Temperature Sensor	Qty : 1 No / Tank [Location at One Corner of the Tank]	
2.2.2.3	Temperature Controller	Qty : 1 [Location : Housed in the Control Panel]	
		Type of Controller : Closed Loop, with feed back	
2.2.2.4	Lip Exhaust Duct	Material : Polypropelene / FRP	
2.2.2.5	Air Agitation Coil	Material : SS / PP / PVC - Piping with Inlet Valve.	
		The Air agitation System shall have the capcity for thorough stirring/agitation of the entire tank content .	
2.2.2.6	Inlet / Drain Valves	Materila : PP / PVC for working of the tank to be provided from the nearest source	

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S.No	Specification	Requirement	Complied Yes / No
2.2.2.7	V - Blocks	Material : PP to be provided inside the tank for positioning the buckets containing components to be treated .	
		Quantity : 4 Nos / Tank	
2.2.2.8	Note :	The tank should be thermally insulated from the surroundings.	
		Necessary Over flow pipes to be provided at the rear side of the tank.	
2.3	Cold Water Rinsing Tanks	For Tanks 3, 6 & 9 Listed at S.No 1.1	
2.3.1	Number of Tanks to be Supplied	Qty : 3 Nos	
2.3.2	Each Tank Shall have the following requirements		
2.3.2.1	Air Agitation Coil	Material : SS / PP - Piping with Inlet Valve.	
		The Air agitation System shall have the capacity for thorough stirring/agitation of the entire tank content .	
2.3.2.2	Inlet / Drain Valves	Material : PP / UPVC for working of the tank to be provided from the nearest source	
2.3.2.3	V - Blocks	Material : PP to be provided inside the tank for positioning the buckets containing components to be treated .	
		Quantity : 4 Nos / Tank	
2.3.2.4	Note :	Necessary Over flow pipes to be provided at the rear side of the tank.	
2.4	Pickling Tanks (Nitric Acid)	For Tank 7 Listed at S.No 1.1	
2.4.1	No of Tanks to be Supplied	Qty : 1 No	
2.4.2	Tank Shall have the following requirements		
2.4.2.1	Air Agitation Coil	Material : SS / PP - Piping with Inlet Valve.	
		The Air agitation System shall have the capacity for thorough stirring/agitation of the entire tank content .	
2.4.2.2	Inlet / Drain Valves	Material : PP / UPVC for working of the tank to be provided from the nearest source	
2.4.2.3	V - Blocks	Material : PP to be provided inside the tank for positioning the buckets containing components to be treated .	
		Quantity : 4 Nos / Tank	
2.4.2.4	Note :	Necessary Over flow pipes to be provided at the rear side of the tank.	
2.5	Hot Air Drying Tanks		
2.5.1	Number of Tanks to be Supplied	Qty : 1 No	
2.5.2	Inner Dimension of the Tanks [L X W X H]	2000 mm X 1000 mm X 1500 mm	
2.5.3	Tank Construction		
2.5.3.1	Material of Construction	Material : SS 304 material, 2 mm inside , 1.6 mm out sideThk	
		Thermal Insulation : With Glass Wool Insulation of 75 mm thick	
2.5.4	The Tank Shall have the following requirements		
2.5.4.1	Heaters	12 KW Finned Air Heaters from reputed ISI make	
2.5.4.2	Operating Temp	Operating Temp. 75 - 100 Degree Centigrade	
2.5.4.3	Temp Controller	Digital Indicator cum Controller	
2.5.4.4	Power Supply	415 V, Three Phase, 50 Hz.	
2.5.4.5	Blower	1 Hp Blower for Hot Air Circulation.	
		Blower Motor Make : SIEMENS/ ABB / CROMPTON / BHARAT BIJLEE - Only	
2.5.4.6	Control Panel	All the controlling parameters related to drier tank should be controlled in centralized electrical control panel.	
2.5.4.7	Outer Housing	M S Powder Coated	
2.5.4.8	Door Lifting	Door Lifting by Pneumatic Cylinder	
3	Exhaust System: The firm shall supply exhaust sytem for ventillating the fumes produced during the treatment process, from the vicinity of the Tanks.	The Exhaust System shall consist of the following: 1) Blower 2) Ducting System 3) Wet Scrubber	
3.1	Blower		
3.1.1	Qty to be Supplied	Qty : 1 No	
3.1.2	Capacity	10,000 m ³ / hr	
3.1.3	Drive Motor	10 HP, 4 pole Blower motor.	
		Drive Motor Make : SIEMENS / ABB /CROMPTON / BHARAT BIJLEE - Only	
3.1.4	Material of Construction	Casing & pedestal-SS, Impellor-SS 316, Shaft –SS 316	
		Lining : 3 mm thick PP with bisphenol resin on the interior of casing	
3.2	The Blower Shall have the following requirements		
3.2.1	Drive Mechanism	Belt driven, V- belt - Fenner or equivalent	
3.2.2	Plumber block	WINCO OR equivalent	

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3.2.3	Bearing	SKF/ TIMKEN / NBC/FAG	
3.2.4	External painting	The Blower shall be painted with Primer Paint and final coat of Epoxy based paint	
3.3	Scrubber - Packed bed wet scrubber		
3.3.1	Qty to be Supplied	Qty : 1 No	
3.3.2	Capacity	10,000 m ³ / hr	
3.3.3	Material of Construction	15mm PP / FRP	
3.3.4	The Scrubber Shall have the following requirements		
3.3.4.1	Cross sectional area	2700 mm (+ / - 10mm) x 1250 mm (+ / - 10 mm)	
3.3.4.2	Height	About 2300 mm (+ / - 10 mm)	
3.3.4.3	Packing material	PP Pal rings	
3.3.4.4	Spray set	PVC/PP piping with spray nozzle	
3.3.4.5	Recirculation pump	PP construction, sealless	
3.3.4.6	Accessories	Mist eliminator	
		Make up with float, over-flow , drain , bleed off piping	
		Between spray set , pump set, tank with valves & fittings, inspection window & ladder, outlet chimney with weather cowl.	
3.3.5.7	Note :	The exhaust hoods are to be connected through a common duct to the blower motor assembly and the scrubber. The approx distance of location of fan / scrubber assembly should suit the requirement of the Process Tank Bed and the outlet from the exhaust system is led by a chimney to a height not less than 4m above the building.	
4	Electrical Control Panel & Cables		
4.1	Control panel type	1 No of Electrical control panel for centralised controlling of heaters, blowers, scrubbers etc shall be provided with push buttons, temperature closed loop control system, contactors etc at convenient location for operation	
4.2	Material of Construction	MS powder coated steel panel with instrument cooling fan with filter	
4.3	Provisions of control panel	Control Panel To be equipped with common protection MCCB of suitable capacity with Multifunction digital meter (showing energy, current and voltage) with RYB indicating lamps and controls for Heaters, Blower and scrubbers.	
4.4	Other features	The control panel shall be designed as per IS standards. All standard wiring practices such as cable ferruling, labeling, termination, etc shall be followed. All the cables shall have proper ferrules legibly indicated and should have entry through suitable glands. The construction of the panel shall facilitate easy maintenance and extra space (min. 10%) shall be provided for future expansion. All the MCBs, MPCBs, transformers, contactors shall have label being indicated on them in accordance with the approved circuit drawing. Proper earthing provision to be made in control panel.	
4.5	Centralised Control Panel	The control panel should have the provision of displaying all the controlling parameters of all the tanks including drier tank.	
4.6	Cables	Suitable sized cables as per IS standard to be laid from control panel to each equipment through cable tray/conduit .	
4.7	Power supply	BEML shall provide 3Phase 415V, 50HZ power supply . It is contractor scope to supply and lay cable from that point to control panel using suitable sized cable with necessary protection.	
4.8	Makes of Electrical Switchgears & Push buttons	SCHNEIDER / SIEMENS/ ABB / L&T/HAGER	
4.9	Make of Cables	FINOLEX/ HAVELLS / POLYCAB/ RR KABEL	
4.10	Make of Contactors	SCHNEIDER / SIEMENS/ ABB	
5	Crane :	MONO RAIL CRANE	
5.1	Type :	Wire Rope Type Hoists mounted on Monorail,	
5.1.1	Qty to be Supplied	Qty : 1 No	
5.1.2	Operational Length of Monorail	25 m	
5.2	Hoists		
5.2.1	Lifting Capacity of Hoist	2 Ton	
5.2.2	Number of Hoists	Qty : 1 Nos	
5.2.3	Height of lift	4 Metres	
5.2.4	Travel Length	25 metres straight path	
5.2.5	Type of suspension	Motor driven trolley	
5.2.6	No of falls	2	
5.2.7	Application description :	Dust/moisture/hazardous	
5.2.8	Hoist operation and movement	Motor operated with VVF drive for Long travel and Hoist	
5.2.9	Speed of hoist	Creep Speed for all motions through VFD AC drives as per standard. Operating speeds for the hoist : I. Main Hoist : 3 m/min main speed & 1.0 m/min micro speed (adjustable) II. Long travel : 6-9 m/min main speed & 2-3 m/min micro speed (adjustable)	
5.2.10	Rope drum	Rope drum shall be of seamless pipe and will be duly machined and grooved to accommodate full length of wire rope in one layer. The drum will be mounted on anti-friction ball / roller bearings.	
5.2.11	Motor used in Hoists	The motors shall be totally enclosed fan cooled squirrel cage induction motor suitable for hoist operation. The class of insulation for the motors shall be of Class "F" or better. All motors to be designed adequately using crane duty motor suitable for 3-Phase, 415V, 50Hz AC power supply	

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5.2.12	Hook:	Drop forged "C" type swiveling hook conforming to IS:3813 supported on thrust bearings. Hook shall be provided with suitable safety latch. Each hook shall be rated for 3T and shall be drop forged.	
5.2.13	Wire rope	6x37 (or) 36 construction, Hemp core steel wire rope conforming to IS:2266 having tensile strength of not less than 160-175 kg/mm2.	
5.2.14	Limit switch	Limit Switch: Snap action type limit switches (2 nos.) shall be provided for hoisting motion and two way lever type for LT motion. Limit switches shall be provided to prevent over hoisting and over lowering of hook. Additional limit switch to prevent over winding shall be provided and it should be anti-gravity type.	
5.2.15	Brake:	"FAIL TO SAFE" Electromagnetic Disc type AC brake for hoisting and long travel motions	
5.2.16	DSL	Long Travel : DSL system for long travel shall be of PVC Flexible festoon type trailing cable system moving on „C" track (Ambient temperature : 50 Degree centigrade).	
5.2.17	Power supply	The 3 phase electrical supply for the power shall be at 415V±6% at 50 HZ. All the systems shall be properly earthed as per code.	
5.2.18	Pendant	The hoist shall be operated only by means of push button operated pendant at a height of 1.0m from the ground level & with an offset of approximately 1.5 m from the centre of the monorail, allowing operator to operate the hoist while on the walkway.	
5.2.19	Buffers	Rubber buffers shall be provided for long travel motion	
5.2.20	General Requirement	The unit shall be dust proof	
5.2.21	Material of Construction of structure and Mono rail	Fabricated from rolled steel sections	
5.2.22	Structural steel and Erection for Crane		
5.2.22.1	Vertical columns & Cross beam	5 set of steel vertical columns with cross beams on each side equally spaced for 25m bay length as shown in the schematic drawing. The column and cross beams shall be Jindal/TATA make column section as per IS 2062. Firm shall design the columns based on safe working load for capacity of 2 tonne with provision to fix LT rail and power cable and shall obtain approval from BEML before proceeding erection. Contractor shall provide necessary support for stability of the beams and columns. Schematic drawing is indicative only.	
5.2.22.2	LT / Monorail :	Firm shall design I section for monorail based on safe movement of Hoist over full length of 25 m with end stopper as per schematic drawing (only for reference) and shall obtain approval from BEML before proceeding further. (Steel - Jindal/Tata).Schematic drawing is indicative only.	
5.2.22.3	Fixing/Grouting of columns	Steel columns needs to be fixed on the existing concrete floor by making suitable RCC foundation. It is complete responsibility of vendor to carry out related civil works for fixing the columns on the existing floor.	
5.2.22.4	Height of Monorail	The operational height of Monorail shall be suitable for the Process, with sufficient clearance for the movement of the bucket for treat process from the first tank to the last tank.	
5.2.22.5	Paint	Complete structure shall be painted with one coat of suitable primer and two coats of weather proof epoxy paint. The final coat shall be GOLDEN YELLOW Colour	
5.2.22.6	Inspection and testing	a) The crane to be tested on full load and 25% overload along with load cell (display unit) at vendor premises and deflections to be noted / recorded. The vendor shall test crane with full load/ 25% overload at BEML site and all relevant readings to be recorded.	
		b) Load Test at BEML, Palakkad : Full testing and getting the test certificate for crane from local authority (Kerala Govt. licensed Inspector for Factories and Boilers) is in the preview of the supplier. However Loads for the testing will be provided by BEML.	
5.2.23	Makes for Crane and Electrical control panels		
5.2.23.1	Bearings	Make: SKF / FAG / NTN	
5.2.23.2	Gearboxes	Make: BONFINGLOLI / PREMIUM TRANSMISSION/SEW EURO DRIVE/DEMAG	
5.2.23.3	Steel wire rope	Make: USHA MARTIN/ Fort William/RA wire rope	
5.2.23.4	Limit Switches	Make: L&T / SIEMENS / SOC/DEMAG/ELEKTROMAG	
5.2.23.5	Motors	Make: CG / BBL / ABB /SIEMENS / KIRLOSKAR/ MARATHON	
5.2.23.6	Electrical Switchgears & Pendent push buttons	Make: SCHNEIDER / SIEMENS/ ABB / L&T/	
5.2.23.7	Variable Voltage Variable Frequency Drive	Make: SIEMENS / SCHINDER / FUJI	
5.2.23.8	Brakes	Make: PETHE/DEMAG/SOC/ELEKTROMAG/EME/AGE	
5.2.24	Documents and drawings:		
	a) Vendor should provide information and design details/calculations. The vendor shall submit to BEML all GA, electrical circuit drawings and BOM details of the hoist within 3 weeks from the date of purchase order for approval before proceeding for fabrication. Manufacturing certificates shall be submitted for review for all bought-out items.		
5.2.25	b) Vendor should submit the documents viz., operational manual, maintenance manual, preventive maintenance check list along with recommended periodicity, bill of materials(should include item, model no., make, quantity, brief description etc.) and as built wiring diagram, values of VFD parameters along with supply.		
	Erection and commissioning at site :		
5.2.26	a) All PPEs like Safety helmets, Lifeline(Safety Belts), safety-gears for welding/cutting etc. shall be arranged by the Vendor at Erection & Commissioning work.		
	b) The vendor should arrange all the required tools and tackles for erection and commissioning at the site. The Vendor and his personnel shall abide by all safety regulations issued by BEML from time to time.		
	General terms and conditions		
	a) Maintainability and safety aspects shall be duly considered in the design and layout of the equipment.		
	b) DSL fixing on RCC beam for which required hankering bolts, grouting plates and grouting work is included in the scope.		
5.2.26	c) LT rail leveling and packing plate to be provided for total bay length		
	d) DSL Indication lamps shall be provided.		

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	e) All works shall be carried out under close supervision of qualified supervisor of the Vendor		
	f) COMMISSIONING: The firm should depute their service personnel for commissioning of the equipment within the stipulated time from the receipt of the equipment at BEML. It shall be the entire responsibility of the firm to supply commission & carry out trials to the entire satisfaction of BEML Ltd.		
	g) Drawings and Manuals : Final assembly drawings for the LT and Hoist system and Operating and Maintenance manuals have to be submitted by the vendor after completion of the work. It includes two sets of hard copies of drawings and one set of drawing soft copies		
6	Bucket :		
6.1	Qty to be Supplied	Qty : 2 No	
6.2	Dimension of the Bucket [L X W X H]	1600 mm X 600 mm X 1400 mm	
6.3	Material of Construction	Fabricated from SS 304 square mesh & SS square tube frame work	
6.4	Number of Opening in Bucket	02 Nos 1) Top Side 2) Front Side with suitable locking, for easy loading and unloading of components	
7	Loading / Unloading stand for Material Bucket		
7.1	Qty to be Supplied	Qty : 2 No	
7.2	Material of Construction	Fabricated MS structure.	
7.3	Size	Should accommodate the Material Bucket	
7.4	V - Blocks	Material : PP to be provided on the Stand for positioning the Material buckets	
		Quantity : 4 Nos / Stand	
8	Effluent Treatment plant		
8.1	The Effluent Treatment Plant Shall have the following requirements		
8.1.1	Technology	Semi automatic	
8.1.2	Number of Tanks (Acid / Alkali)	Qty : 2 No	
		1) Collection tank,	
		2) Neutralization tank	
8.1.3	Construction of Tanks	Collection and Neutralization tanks shall be constructed of Concrete under ground tanks With chemical proof tilings. Construction tanks will be done on existing concrete floor. It is vendor scope to construct tanks and make good of surface.	
8.1.4	Capacity	6000 ltrs each	
8.1.5	Dosing pump with tanks	3 nos	
8.1.5.1	Dosing pump with tanks quantity	Qty : 3 Nos	
		1) Acid dosing Tank	
		2) Alkali dosing Tank	
		3) Polyelectrolyte dosing Tank	
8.1.5.2	Dosing Tanks Capacity	200 ltrs each	
8.1.5.3	Material of Construction	PP	
8.1.5.4	Dosing pump	ISI Certified Single phase dosing pump of reputed make	
8.1.6	Air-agitation	PP / PVC piping , placed at bottom of the tank With control valve	
8.1.7	Sensor and meters	Immersion type PH sensor- 1 no - reputed make	
		PH meter -1 no - reputed make	
		Level switch- reputed make	
8.1.8	Transfer pump		
8.1.8.1	Quantity	Qty : 2 No	
8.1.8.2	Capacity	100 ltr/min	
8.1.8.3	Type	Magnetic coupled & Immersion type	
8.1.9	Clarifier		
8.1.9.1	Quantity	Qty :1 No	
8.1.9.2	Construction	SS 304 construction - conical bottom with valve to take sludge out	
		MS angle / channel frame work with double coat of epoxy paint.	
8.1.10	Sludge transfer pump		
8.1.10.1	Quantity	Qty :1 No	
8.1.10.2	Capacity	1.5 HP (For transfer semi-solid waste to filter press)	
8.1.10.3	Construction	Helical rotor type, SS 316 housing and rotor	
8.1.11	Filter press		
8.1.11.1	Filter press Type	Recess type	
8.1.11.2	Type of Element	PP plates	
8.1.11.3	Plate size	615 mm X 615 mm	
8.1.11.4	Number of plate	Qty : 20 Nos	

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8.1.11.5	Cake holding capacity	200 ltrs	
8.1.11.6	Filtering area	10 sq mtrs	
8.1.11.7	Closing device	2 HP Power Hydraulics	
8.2	PUMP Makes for sludge and transfer pump	Kirloskar/ Grundfos/ shakti	
8.3	ETP Output water pipe line	Vendor shall supply and lay 50M suitable sized UPVC pipeline for Treated water pipe line from the ETP to usage point.	
9	Miscellaneous works :		
9.1	Platform for the Tanks	Firm shall make suitable concrete platform of height 25cm on existing concrete floor for positioning of all the tanks. Necessary civil works is under vendor scope.	
9.2	Service materials	All service lines as per site condition and schematic drawing including cables complete is vendor scope.	
9.3	Exhaust ducting -	Fan / scrubber assembly from any end of the process line in the exhaust ducting to be provided by vendor scope.	
9.4	Walk way:	Firm shall provide PVC / FRP moulded MS structure walkway of width 1 metre for the complete length with slopping ends on either sides as mentioned in schematic drawing.	
9.5	Drain line	PP pipes connecting the drain valves of tanks to their respective headers segregated for Alkali, Acid & acid / alkali rinse should be provided as per site condition.	
9.6	Power cabling	Supply & Laying of suitable sized Cables in cable trays connecting Control panel to various equipments is vendor scope. In addition to above Supply & Laying of suitable sized Cables connecting Control panel to nearest electrical feeder is vendor scope.	
9.7	Air line	Compressed air line connection from nearest pneumatic line to air agitations unit in tanks through PP with necessary control valves is vendors. Approximate distance from first tanks to nearest line is 10M.	
9.8	Water inlet line	Vendor shall supply and lay UPVC / PP pipes on the wall / floor from nearest point raw water line to all the Tanks with suitable connectors and control valves. Approximate distance from nearest water line point to First Tank is approx 30M.	
9.9	Vendor shall quote inclusive of any additional modification in pipe line layout , structural and civil works at proposed location if required as per site condition.		
10	NOTE : The Scope covers:-		
10.1	Civil work:All necessary Civil works including the construction of platform, foundation for crane columns, concrete tanks for ETP, pipe laying,cable laying etc are under vendor scope. Also firm should quote inclusive of all civil work necessary for commissioning the Pretreatment plant with ETP.		
10.2	Detailed design, supply and supervision during erection, commissioning and providing performance guarantee of the Aluminium processing tank and ETP as per norms to meet KSPCB, CGPCB and universal accepted technical standards and Specifications		
10.3	It is not the intent of this specification to completely specify all the details of design and construction. Nevertheless, the equipment supplied by the contractor shall conform to the high standards of Engineering design, design workmanship in all respects. If any specification and design data mentioned in this document is not relevant to your design, the alternative with latest technology, higher updated standard, cost effective and environment friendly can be suggested with adequate document proof.		
10.4	BEML shall provide electricity power supply 3Ph, 415V, 50Hz at single point. Cable from that point to main control panel and is vendor scope.		
10.5	Supplier to visit BEML Bangalore Complex Ejector & Air Cleaner Assembly shop for understanding GA and Sequence of the Processing and sequence of Tank laying, if required. Supplier to submit GA Drawing and get approved by BEML before manufacturing the same.		
10.6	Firm shall submit 3 sets of all test reports,GA drawings,pipe line drawings,Crane drawings , ETP Layout/DarwingsOperational and Maintenance manuals on completion of the work.		
10.7	The contractor is responsible to get approval from Kerala State Pollution Control Board for their installation and the supplied system to meet the norms of Kerala PCB as well as Central Govt Pollution control board. However fees/Charges paid to be statutory organization shall be reimbursed on submission of payment receipt.		
10.8	Vendor shall coordinate with BEML to not to disturb existing Pipe line/ Electrical cables during execution of work. Vendor shall rectify any damages caused during execution of work.		
11	Warranty & After sales service:		
11.1	12 months from the date of commissioning and handing over of complete plant.		
11.2	The seller has to provide product / aggregates / spares support for a minimum period of 15 years.		
11.3	Firm should agree for AMC after completion of the Warranty period for a period of minimum 3 years.		
11.4	Firm shall carryout daily operations of the newly established ETP on a single / one shift basis for a period of one year from the commissioning at free of cost. During the one year operation, firm shall comply with pollution control board requirement and shall submit test reports complying with ETP parameters on monthly basis. Firm shall follow BEML rules and regulations during above period. Firm shall quote considering the above requirement.		