



VISHAL INFRASTRUCTURE LTD.

Head Office : # 52, R.V. Road, Basavanagudi, Bengaluru - 560 004. INDIA

Tel : +91 80 2625 4000, Fax : +91 80 2625 4025 E-mail : vishal1@vishalinfra.com



Ref No: -VIL-BLR/AAI/PrayagrajAP/2604/2025-26

Dated -26.04.2025

To,
M/s Ventilair Engineers Pvt Ltd.
Third Floor, Plot No. 61, Pocket 11A
Sector-23, Rohini, Punchsheel Enclave
New Delhi, North West Delhi.
Kind Attn.:- Mr. Pawan Sharma

Name Of Work- Design, Manufacturing, SITC of STP & WTP system for Prayagraj Airport.

Ref:- PO no. VIL/0923/PO/2024/0049, dated 24.04.2024.

Dear Sir,

In continuation to above mentioned Purchase order and discussion had with you during your visit on 23rd and 24th April 2025 at Prayagraj Airport office of VIL. During the meeting we reached at a mutual consent for change in scope of work, specifications, amendments and change in rate in few items.

The consent of both the parties is as under

WTP

- I. Item at SL No.3, 9, 10, 11, 12 and 13 of the above PO stands deleted.
- II. The rate of Item at SL No.7, of the above PO has been revised as Rs.6,50,000/- instead of earlier quoted Rs.5,00,000/-.
- III. The rate of Item at SL No.8, of the above PO has been revised as Rs.2,50,000/- instead of earlier quoted Rs.2,00,000/-.
- IV. The item SL No.33 of BOQ of STP stands shifted in the BOQ Item No.14 of WTP with no change in specification and rate.
- V. The item SL No.34 of BOQ of STP stands shifted in the BOQ item No. 15 of WTP with no change in specification and rate.

Contd...2...



VI. The Item at SL No.7, SL No.8, SL No.10, SL No.11, SL No.12, of the amended BOQ related with WTP has been added as newly items. The rate and quantities are given in the amended BOQ of WTP work.

STP

- I. Item at SL No.14, 15, 16, 17, 18, 19, 20, 21, 22 (a), (b), 29, 30,31,33 stands deleted from the above PO.
- II. There is no change in BOQ item no.2,4,5,6 related with STP and item no. 23,24,27 of BOQ item related with WTP.

The revised PO cost has been worked out as **Rs.72,76,000/- (Rupees Seventy-Two Lakhs Seventy Six Thousand Only) + GST 18%** and the revised BOQ of STP and WTP is enclosed herewith for execution of work.

The other terms and conditions remains unchanged except that the period of completion which is now fixed

Thanking you,

Yours Sincerely,

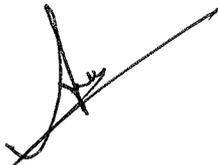
for **VISHAL INFRASTRUCTURE LTD.,**

AUTHORISED SIGNATURE

STP-WTP

SL No.	Description	Qty	Unit	Rate	Amount
1	Design, Manufacturing, SITC of STP/WTP Systems Complete as per Specification and Drawings of AAI/VIL enclosed herewith in Annexures				
	STP		BOQ		40 49 000.00
	WTP		BOQ		32 27 000.00
	(A)			Total	72 76 000.00
2	Maintenance Complete for 5Years after expiry of 2years DLP for SL No. 1 (I to IX) from the date of completion				
	1st Year	12	Months	Included in DLP	
	2nd Year	12	Months		
	3rd Year	12	Months		
	4th Year	12	Months		
	5th Year	12	Months		
	6th Year	12	Months		
	7th Year	12	Months		
	(A)			Total	.00
	(A) + (B)			Total	72 76 000.00
			GST	18%	13 09 680.00
				G Total	85 85 680.00

DELETED



NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
WATER TREATMENT PLANT					
1.0	Supply, Installation, Testing and Comissioning In-line vertical multistage centrifugal clear water pump set SS-304 casing, SS-304 impeller, SS-316 shaft, CI base with CED coating, complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900 RPM, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply (with mechanical seal), pressure gauges with gummtal isolation cocks, vibration elimination pads, etc. mounted on a CI base frame bolted to cement concrete foundation etc. complete in all respects and as per technical speicification.				
	No. of Pumps : 2 (1W + 1S)				
	Capacity : 32 M ³ /HR of Each Pump				
	Head : 30 M	Set	1		-
A	Filter Feed Pump				-
2.0	Supply, Installation, Testing and Commissioning of compact packaged type skid mounted, self contained variable frequency drive hydropneumatic system complete as per following technical specification complete as required:-				-
	(i) In- line vertical multistage centrifugal clear water pump set with SS-304 casing, SS-304 impeller with SS-316 shaft ,CI base with CED coating complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900rpm, suitable for operation on 415 Volts ±10%, 3 phase, 50 Hz A.C. supply complete.				-
	(ii) The entire system shall be mounted on a common base frame i/c common suction and common delivery of G.I heavy class pipe headers with flanges, interconnecting piping with all required Conrol Valves, Non-return valves, pressure guage with isolation cock etc. and all required accessories.				-
	(iii) Pressure vessel of non corrosive FRP composite construction lined with NSF and/or FDA listed material, like high density polyethylene with fully replaceable polyurethane. Air cell burst pressure of minimum of 5 times the vessel operating pressure and prototype cycle tested for 80,000 cycles with charging connections to discharge pipe line with necessary flanges, gaskets, isolating valve, nuts/ bolts etc. with suitable foundation bolts & other accessories, complete.				-
	(iv) Panel mounted microprocessor multi pump contoller with large graphical display and Flying variable frequency drive (VFD) mounted inside a panel complete with pressure sensor transmitter. The graphical display capable to show number of pumps running & also communicate with other controllers following with open protocol through RS485 port. System should be capable to compensate for frictional losses at lower flows. All alarms should be displayed in the controller. The panel should also have provision for manual / automatic alternate (cyclic) operation of pumps, ON/OFF switch, complete.				-
	(v) Necessary foundationing bolts, vibration elimination pads and other accessories complete as required.				-
	Duty of each pump suitable for:-				-
	No. of Pumps : 2nos. (1 W + 1 S)				-
	Capacity : 20 m ³ /hr of Each Pump				-
	Head : 60 Meters				-
A	Air Vessel : 1 Nos of Min. 100 Liters Cap.	Set	1	9,15,000.00	9,15,000.00
	Domestic Water Supply pump				-
3.0	Supply, installation, testing and commissioning dry motor submersible pumps of suitable rating, with non-clog free flow open CI impellers, CI casing, solid handling capacity of upto at least 28mm suitable for operation on 415 volts +10% , 3 Phase, 50Hz, A.C supply, speed 2900 RPM including oil chamber, guide wire for lifting & lowering of pump, G.I. galvanized lifting chain, complete. The pump sets shall be supplied with required accessories & as per specification with the following :				-
	(a) Flat submersible Electrical cables 4 sqmm from pump set to control panel (position of panel marked on enclosed drawings):- 1 Set				-
	(b) Electrical control panel duly fabricated with CRCA sheet of 2 mm thickness with gland plate of 3 mm thickness having all necessary accessories & safety devices of standard specifications and suitable for receiving incommer cable from main plumbing panel to connct sump pump panel complete as required. (Panels with sump pumps near each sump as per site conditions). --1 No.				-
	Each set consist of 2 nos.of pumps - 1 working & 1 stand by (Complete set as above with 2 nos. pumps including cost for valves, piping, Control Panel and Cabling, Level Controllers etc as required and as specified) 2.The entire system alongwith pumps & control panel must be sourced from single manufacturer only for unit responsibility.				-
	Discharge - 250 LPM Each				-
A	Total head - 15-18 Meters	Set	1		-

NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

VENTILAIR					
S.No.	DESCRIPTION	UNIT	Qty.	Rate	AMOUNT
					-
4.0	Supply, installation, testing & commissioning of vertical Multigrade Filter fabricated from 6mm thick MS Plate shell and 8mm thick MS plate dished ends with 3mm non toxic, non leaching rubber lining tested to 4.0 Kg/m ² , G.I (Class - C) face piping with necessary flanges, gaskets, isolating valves, accessories,nuts & bolts. with suitable foundation bolts & other accessories, mounting frame, complete with testing and commissioning etc. as required & as specified with the following:				-
	Discharge : 32 m ³ /Hour				-
	Filtration Rate : 17500 lit./m ² /h				-
	Dia : 1.8 m I.D.	No.	1	2,80,000.00	2,80,000.00
					-
5.0	Supply, installation, testing & commissioning of vertical Activated Carbon Filter fabricated from 6mm thick MS Plate shell and 8mm thick MS plate dished ends with 3mm non toxic, non leaching rubber lining tested to 4.0 Kg/m ² , G.I (Class - C) face piping with necessary flanges, gaskets, isolating valves, accessories,nuts & bolts. with suitable foundation bolts & other accessories, mounting frame, complete with testing and commissioning etc. as required & as specified with the following:				-
	Discharge : 32 m ³ /Hour				-
	Filtration Rate : 17500 lit./m ² /h				-
	Dia. : 1.8 m	No.	1	2,80,000.00	2,80,000.00



NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

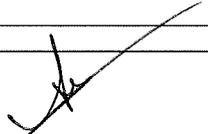
BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	Chlorinator.				-
6.0	Supply, Installation, Testing and Commissioning Sodium hypo chloride dozing system consisting of 2 nos. electronic dosing pumps (1W+1S) of approved make with all accessories, suitable to doze chemical solution complete with HDPE holding tank of min. 300 litre with all standard accessories & structural arrangement including suitable foundation bolts & other accessories etc. complete as per technical specifications.	No.	1	20,000.00	20,000.00
	UV Protection				-
7.0	Supply, installation, testing & commissioning of Online UV system with IP-54 rated cabinet housing in sheet steel with electrophoretic dipcoat priming and powder coated finish, and SS-316 treatment chamber material, with electronic ballast type, suitable for operation on 230 volts, 50Hz, for installation on the pressurized discharge line, suitable for tertiary treated wastewater of min. transmissivity of 65% complete with testing & commissioning as required and as specified.				-
	Capacity : 32000LPH REVISD TO CAPACITY 20,000LPH	Each	1	6,50,000.00	6,50,000.00
				REVISED	
8.0	Piping/Valves & Accessories : Providing and fixing all piping (as described below) and isolation control valves, Check valves, multiport valves for making the system complete. GI piping : Interconnecting pipe line after delivery header of pump/ filter. All valves to be metallic construction and rated for PN 16 rating. Forged brass ball valves and CI Butterfly, check valves etc.	Lot	1	2,50,000.00	2,50,000.00
				REVISED	
9.0	Providing and fixing reinforced neoprene rubber vibration eliminators/expansion joints (to provide relief from stresses at pipe flanges) suitable for upto 20 kg/cm ² pressure, as per specification of the manufacturer complete as required and as specified complete as per directions of the engineer-in-charge.				-
	DELETED				
	80mm dia	each	4		-
	100mm dia	each	2		-
10.0	Providing and fixing insect-proof coupling to vent pipes of overhead tank with threaded or flanged joints including 80mm flange, nuts, bolts, 3mm thick rubber insertions complete.				-
	DELETED				
	100mm dia	each	4		-
11.0	Design, manufacture, supply, installation, testing and commissioning of the Plumbing panel, front operated, cubicle construction, Floor mounted type 2 mm thick and top /bottom gland plate thickness 3 mm, CRCA sheet. Compartmentalized with hinged lockable doors, dust and vermin proof, powder coated finish with 9 tank process of approved shade, Cable alley, inter-connections, having Switch gear and accessories mounting, internal wiring, earth terminals, Top/ Bottom cable entry, numberings etc. suitable for operation of 415 volts, 3 phase, 50 Hz, AC Supply with enclosure protection class IP 54 complete as required and as specified with the following:				-
	INCOMER				-
	Each Incomer shall consist of :				-
	100 Amps, Four pole, 16 KA MCCB with rotary handle on door.				-
	Voltmeter (0-500 Volts) with selector Switch & protected by MCB's.				-
	Ammeter (0-100 Amps) with selector Switch & CT's etc.				-
	Set of (R,Y,B) LED phase and ON & OFF indication Lamps.				-
	BUSBAR				-
	1 Set 100 Amps 4P busbars of aluminium with Rear cable termination.				-
	OUTGOING				-
	Domestic Water Supply hydropneumatic pumps set for shopping complex (1w+1s) pumps				-
	Suitable rating MPCB (Motor Duty) 1.1 KA with rotary handle on door suitable for 10 HP and for Connection to Built up Hydro Panel.---2No.				-
	Raw Water Supply pumps set (2 Nos. Pump - 1 set)				-
	Pump feeder shall consist of :				-
	Suitable rating MPCB with DOL Starter for outgoing feeder of 7.5 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor---2 Nos				-
	Ammeter (0-100 Amps) with selector Switch & CT's etc.				-
	Set of ON / OFF LED indication Lamps protected by MCB.				-
	Salt saturator & Chlorine dosing system				-
	Each pump set feeder shall consist of :				-
	10 Amps. DP, 10 KA "C" curve MCB with DOL Starter suitable for single phase 240 V, 50 Hz AC supply. Inter locking with filter feed pump treated water pump suitable for 0.5 HP ---2Nos.				-

NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	Set of ON / OFF indication Lamps protected by MCB.				-
	For Drainage Sump Pumps Plant Room area - 2 Nos.(1W +1S)				-
	<u>Pump feeder shall consist of :</u>				-
	10 Amps. TP MCB with rotary handle on door suitable for Connection to Built up Panel.--1No				-
	Ammeter (0-100 Amps) with selector Switch & CT's etc.				-
	Set of ON / OFF LED indication Lamps protected by MCB.				-
	NOTE:-1. All MCCB shall have 100% Ics =Icu 2.Panel shall be provided with NO-NC Potential free contact for BMS compliance complete as required. (2)Complete with control wiring by FRLS PVC insulated copper conductor cable				-
	The item includes all end terminations, cables, cable trays, earthing conductor etc to complete the job as per the technical specifications.				-
	Complete Set as mentioned above	lot	1		-
12.0	Supply, installation, testing and commissioning of Centralised PLC control panel front operated cable construction, wall mounted type, fabricated out of 2 mm thick CRCA Sheet, with hinged lockable doors, dust and vermin proof, powder coated of approved shade, inter-connections, having, internal wiring, earth terminals, Top / Bottom control cable entry, numberings etc.comprises of touch-screen display board (Min.Diag. size 8") along with all accessories for complete Programmable logical controls & indications, having necessary interlocks, Inputs/Outputs, required number of repeater amplifiers, all audio-visual alarms as per the requirements listed below i/c emergency stop push button on the panel etc. The panel shall have BMS compatible Modbus protocol complete as required and as per technically specified.				-
	<u>Water level indicators and controllers :The hydrostatic pressure sensor (Water level indicator) is working on hydrostatic pressure measurement principle made of Stainless Steel for installation in storage tanks, and capable of providing 4 to 20 mA analog signal compatible with PLC signal inputs and all control outputs to MCC panel (Plumbing/Water supply),complete as per working requirements for equipment detailed below.</u>				-
	<u>Fire Static Underground tanks- 1 No.</u>				-
	Real-Time water level indication monitoring				-
	Low Level audio-visual alarm at less than 30% total capacity.				-
	<u>Raw Water Underground tanks- 1Nos.</u>				-
	Real-Time water level indication monitoring				-
	Low Level audio-visual alarm at less than 30% total capacity.				-
	High Level audio-visual alarm at more than 100% total capacity.				-
	Auto cut-out of raw water pumps at 100%				-
	<u>Domestic Water Underground tanks- 1 No.</u>				-
	Real-Time water level indication monitoring				-
	Low Level audio-visual alarm at less than 30% total capacity.				-
	High Level audio-visual alarm at more than 100% total capacity.				-
	Auto cut-out of domestic water hydrouneumatic pumps at 100%				-
	Complete Set as mentioned above	set	1		-
13.0	Providing & Placing Electric Insulated rubber mat non-skid type with grooved top size 1m x 2m and 12 mm thick as per IS: 5424 as required suitable for 1100 volts complete in all respect.	metre	2		-
14.0	Supply, Installation, Testing and Commissioning 'Cation' anion exchange process water softener fabricated from minimum 8 mm thick M.S. plate on min. shell and 10 mm thick M.S. plate on dished ends (Quality of Steel as per IS:2062 Grade B, thickness as per ASME Section 8) complete with initial charge of filter media and resins, face piping accessories, diaphragm valves of approved specifications, HDPE Brine tank of min. 500 Liters, piping testing and commissioning complete with resins of approved quality and make and regeneration assembly complete with valves, ejector, brine suction valves and piping. All internal parts of the softener shall be rubber lined as per technical specifications.				-
	Minimum expected rate of flow : 16m3/Hour				-
	Expected raw water hardness : app. 150-200 ppm				-
	Expected treated water hardness: less than 5 ppm (Zero Commercial Hardness)				-
	Max. working pressure : 4 Kg/cm ²	No.	1	7,50,000.00	7,50,000.00



NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.
BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
15.0	Supply, Installation, Testing and Commissioning Salt Saturator assembly (for supply of salt solution) consisting of HDPE tanks with automatic agitators and all required accessories for holding and supplying salt for softener complete in all respects, including providing and fixing vertical, inline multistage centrifugal pumping set with stainless steel SS-316 L stage casing and SS-316 L impellers with stainless steel shaft and suction & discharge casing . The effective capacity of the system to be of minimum 10% greater than actual salt required for approx. 3 Days with complete structural arrangement including RCC foundation etc. as per instructions of engineer-in-charge and approved fabrication shop drawings.				-
	(i) Recommended no. of tanks = 1 Nos.				-
	(ii) Total Capacity of each Tank = 750 Liters	No.	1	30,000.00	30,000.00
	(complete set as mentioned above)				-
					-
16.0	Supply, Installation, Testing and Comissioning In-line vertical multistage centrifugal clear water pump set SS-304 casing, SS-304 impeller, SS-316 shaft, CI base with CED coating, complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900 RPM, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply (with mechanical seal), pressure gauges with gunmetal isolation cocks, vibration elimination pads, etc. mounted on a CI base frame bolted to cement concrete foundation etc. complete in all respects and as per technical speicification.				-
	No. of Pumps : 2 (1W + 1S)				-
	Capacity : 32-M ³ /HR of Each Pump - Revised 14.4Cum /Hr of each pump.				-
	Head : 30 M	Set	2	70,000.00	1,40,000.00
	KSB make, SP Norms - 14 / 3.7KW				-
A	Filter Feed Pump - For Filters				-
					-
17.0	Supply, Installation, Testing and Comissioning In-line vertical multistage centrifugal clear water pump set SS-304 casing, SS-304 impeller, SS-316 shaft, CI base with CED coating, complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900 RPM, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply (with mechanical seal), pressure gauges with gunmetal isolation cocks, vibration elimination pads, etc. mounted on a CI base frame bolted to cement concrete foundation etc. complete in all respects and as per technical speicification.				-
	No. of Pumps : 2 (1W + 1S)				-
	Capacity : 32-M ³ /HR of Each Pump - Revised 14.4Cum /Hr of each pump.				-
	Head : 30 M	Set	2	70,000.00	1,40,000.00
	KSB make, SP Norms - 14 / 3.7KW				-
A	Filter Feed Pump - for Softners				-
					-
18	Supply, installation, Testing & commissioning PSF as per VEPL make as per approved TDS & spec.as per agreement between AAI & VIL complete MOC MS FRP lined fabrication having 10 mm thickness shell & dish end should be of 12 mm thickness. Rate of filtration- 17500 Ltr/sqm/hr 1500 mm dia	Each	1	2,50,000.00	2,50,000.00
					-
19.0	Supply, Installation, Testing and Comissioning In-line vertical multistage centrifugal clear water pump set SS-304 casing, SS-304 impeller, SS-316 shaft, CI base with CED coating, complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900 RPM, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply (with mechanical seal), pressure gauges with gunmetal isolation cocks, vibration elimination pads, etc. mounted on a CI base frame bolted to cement concrete foundation etc. complete in all respects and as per technical speicification.				-
	No. of Pumps : 2 (1W + 1S)				-
	Capacity : 32-M ³ /HR of Each Pump - Revised 14.4Cum /Hr of each pump.				-
	Head : 30 M	Set	2	70,000.00	1,40,000.00
	KSB make, SP Norms - 14 / 3.7KW				-
A	Feed Pump - for Cooling Tower				-
					-
20	Supply, installation, Testing & commissioning Flowmeter of Everest Make ESI - Emag 110 as per approved TDS & spec.as per agreement between AAI & VIL complete one for Soft water and second for filtered water.	Each	2	52,000.00	1,04,000.00
					-
21	Commissioning of WTP system complete including handing over to VIL/AAI.	Job	1	1,00,000.00	1,00,000.00
					-
TOTAL					40,49,000.00
SEWAGE TREATMENT PLANT (STP)					-
					-

NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	Designing, providing, installation, testing and commissioning of Sewage treatment plant (STP) with sewage handling capacity 450 m3 per day including all piping (PVC SH 40/80) gaskets sleeves based on MBBR technology system complete in all respects, including all equipments and consumable materials of STP and including construction of tanks in civil. The rate shall be inclusive of operation and maintenance. The raw sewage collection sump with double bar SS screen shall be a part of the STP. The STP shall be designed as water retaining structures including necessary chemical dosing as required by the manufacturer's design. All the equipment, piping, pumps, blowers and electrical to be housed in a plant room, inlet, outlet overflow, vent, C.I. cover, drain channel, sump to house pumps. The design basis considered to size the treatment plant is as follows including as required in the specification etc. Contractor shall ensure submission of detailed GA drawings (Plan & Section), P & I diagram, schematic diagram for the above mentioned component and additional component if so required for the complete working of the STP and got it approved by Engineer in charge.				-
	Sewage from toilets and and Recycled Water coming out from STP would be resued for Cooling Tower and flushing purposes. Following are the inlet and outlet parameters for the same:				-
	Inlet Parameters				-
	COD : 400-450 mg/l				-
	BOD : 300-350 mg/l				-
	TSS : 200-450 mg/l				-
	Oil & Grease : 50-140 mg/l				-
	pH : 6.5-8.5				-
	Outlet Parameters				-
	COD : < 50 mg/l				-
	BOD : < 10mg/l				-
	TSS : < 20 mg/l				-
	Oil & Grease : <2 mg/l				-
	pH : 6.5-9				-
	Odor and Colour: Unobjectable				-
	NH4-N: < 5 Mg/Ltr				-
	N-Total: < 10 Mg/Ltr				-
	Fecal Coliform(MPN/100ml):< 100 Mg/Ltr				-
	The sewage treatment Plant shall consist of the following tank.				-
	Equalization Tank.				-
	Sludge Holding Tank.				-
	Anoxic Tank.				-
	MBBR tanks.				-
	Tube Settler tank.				-
	Clear Water Tank.				-
	Treated Water Tank.				-
	Soft Water Tank.				-
	Raw Sewage Relift Pumps (Equalisation Tank)				-
22.0	Supply, installation, testing & commissioning of dry motor submersible pumps of suitable rating, with non-clog free flow rope Sump impeller, CI casing solid handling capacity of minimum 40mm suitable for operation on 4.5 v/lts ± 10% , 3 Phase, 50Hz, A.C supply, speed 2900 RPM synchronous speed of approved make including oil chamber, S.S.-304 lifting chain complete. The pump sets shall be supplied with required accessories, valves, fittings, cables and control panel etc. & as per specification below:				-
	Necessary cables from pump set to control panel,- 1 Set				-
23.0	Electrical control panel suitable for controlling the pumps having all necessary accessories & safety devices (Drain protection) of manufacturers specifications and suitable for receiving incoming and outgoing cables complete as reqd (Panels will be installed near each sump as per site conditions),- 1 No.				-
	No. of Pumps : 2(1W + 1S)				-
	Capacity :25 m3/hour of each pump				-
	Head : 10 M				-
	Note:-1 set consists of 2 nos. of pumps (1Working + 1Standby)	Set	1		-
	Air Blower				-
24.0	Supply, installation, testing & commissioning of rotaty positive displacement roots type Air blower (Casing CI) with in filter and TEFC induction motor 400 / 440 volts, 50 cycle connected to blow with "V" belt and mounted on common base frame and providing cement concrete foundation and complete with first fill oil & of following specification.				-

NAME OF WORK : - CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	No. of Pumps : 2(1 W + 1S)				-
	Capacity : 600 m3/hour				-
	Head : 5-6 M				-
	Note:-1 set consists of 2 nos. (1 Working + 1Standby)	Set	1		-
	Air Diffusers				-
25.0	Supply, installation, testing & commissioning of membrane diffusers in EPDM / High Grade Silicon material (Covered Fine Bubble as per requirements) with connections to air piping by the threaded means, of disc type required as per process requirements complete with testing and commissioning etc.as specified and as required.	Each	1		-
	Sludge Return / Relift pump				-
26.0	Supply, installation, testing & commissioning of Horizontal non clog centrifugal Sludge Return / Relift pumps for the transfer of sludge from secondary settling tank with Cast Iron impeller and cast steel shaft with mechanical seal, with TEFC induction motor of class "F" insulation & efficiency class IE-2, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply, 2900 RPM of approved make complete in all respects with cement concrete foundation and as per specification.				-
	No. of Pumps : 2(1W + 1S)				-
	Capacity : 15 m3/hour of each pump				-
	Head : 15-20 M				-
	Note:-1 set consists of 2 nos. of pumps (1Working + 1Standby)	Set	1		-
	Sludge Loading / Disposal pump				-
27.0	Supply, installation, testing & commissioning of Screw Type Sludge loading / Disposal pump in cast iron body, hardened steel SS angle helical rotor and shaft, with safety release valve, Non return valve and all necessary accessories with TEFC induction motor of class "F" insulation & efficiency class IE-2, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply complete in all respects with cement concrete foundation and as per specification.				-
	No. of Pumps : 2 (1W + 1S)				-
	Capacity : 5 m3/hour of each pump				-
	Head : 20-30 M				-
	Note:-1 set consists of 2 nos. of pumps (1Working + 1Standby)	Set	1		-
	Flash mixer for anoxic tank				-
28.0	Supply, installation, testing & commissioning of flash mixer in anoxic tank for mixing the effluent in the tank complete in all respect as per technical specifications.	Each	1		-
	In-line vertical multistage centrifugal clear water pump				-
29.0	Supply, installation, testing & commissioning of In-line vertical multistage centrifugal clear water pump set of approved make with SS-304 casing, SS-304 impeller, SS-316/SS431 shaft, CI base with CED coating, complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900 RPM, suitable for operation on 415 volts ±10%, 3 phase, 50 Hz, A.C. supply (with cartridge type mechanical seal), pressure gauges with gunmetal isolation cocks, vibration elimination pads, etc. mounted on a MS base frame bolted to cement concrete foundation complete in all respects and as per specification.				-
	No. of Pumps : 2(1 W + 1S)				-
	Capacity : 25m3/hour of each pump - Revised 14.4Cum /Hour of each pump				-
	Head : 30 M				-
	Note:-1 set consists of 2 nos. of pumps (1 Working + 1Standby)	Set	1	1,40,000.00	1,40,000.00
	KSB make, SP Norms - 14 / 3.7KW			REVISED	
A	Filter feed pump				-
	No. of Pumps : 2(1 W + 1S)				-
	Capacity : 10m3/hour of each pump				-
	Head : 30 M				-
	Note:-1 set consists of 2 nos. of pumps (1 Working + 1Standby)	Set	1		-
B	Softner feed pump				-
	No. of Pumps : 2(1 W + 1S)				-
	Capacity : 32 m3/hour of each pump				-
	Head : 35 M				-
	Note:-1 set consists of 2 nos. of pumps (1 Working + 1Standby)	Set	1		-
C	Softner Water Transfer pump.				-
	Hydropneumatic Pumping System With Variable Frequency Drive				-

NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.					
BILL OF QUANTITY - PLUMBING WORKS.					
S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
30.0	Supply, Installation, Testing and Commissioning of compact packaged type skid mounted, self contained variable frequency drive hydropneumatic system complete as required & as per specification with the following:-				-
	(i) In- line vertical multistage centrifugal clear water pump set with SS-304 casing, SS-304 impeller with SS-316/SS431 shaft ,CI base with CED coating complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900rpm, suitable for operation on 415 Volts ±10%, 3 phase, 50 Hz A.C. supply complete.				-
	(ii) The entire system shall be mounted on a common base frame i/c common suction and common delivery of G.I heavy class pipe headers with flanges, interconnecting piping with all required Control Valves, Non-return valves, pressure gauge with isolation cock etc. and all required accessories.				-
	(iii) Pressure vessel of non corrosive FRP composite construction lined with NSF and/or FDA listed material, like high density polyethylene with fully replaceable polyurethane. Air cell burst pressure of minimum of 5 times the vessel operating pressure and cycle tested for 80,000 cycles with charging connections to discharge pipe line with necessary flanges, gaskets, isolating valve, nuts/ bolts etc. with suitable foundation bolts & other accessories, complete.				-
	(iv) Control Panel with programmable logic controller (PLC) for cyclic operation of pumps + Variable Frequency Drive. The Pump working sequence should change after every operation. Contractor overload relays and MCBs should conform to IEC 898 – 1995/ specifications. Blinking indications for pumps start, trip, low level trip, health supply should be provided in the panel along with the ammeter & voltmeter. Control panel should also consist of cooling fan.				-
	(v) Pressure switches bellow type fitted with micro switch and having maximum pressure and differential scale should confirming BS-6134 standards and IP55 protection class.				-
	(vi) All required Ball Valves, Non-return valves, flexible connectors etc. and all required accessories, Heavy Duty G.I. Manifold to make the system completely operational as a skid mounted system. Ball valves to be used should be Hot Pressed brass OT-58 with stainless steel ball and P.T.F.E seal and O-Ring. NRVs to be used should be with Springs and O-Ring arrangement.				-
	Complete manifold system shall be factory assembled & totally mounted on a common base frame with following duties:				-
A	Flushing Water Supply				-
	Duty of each pump suitable for:-				-
	No. of Pumps : 2 nos. (1 W + 1 S)				-
	Capacity : 30 m³/Hour of Each Pump REVISED 28.8 m ³ /Hour of Each Pump				-
	Head : 60 Meters				-
	Air Vessel : 1 No of Min. 100 Liters Cap.				-
	MAKE : KSB MOVITEC / VF. 004/09-B2B 50ES015F5R				-
	Note:-1 set consists of 2 nos. of pumps (1 Working + 1Standby)	Set	1	9,15,000.00	9,15,000.00
				REVISED	
B	Irrigation water supply Pump - HPN				-
	No. of Pumps : 2 nos. (1 W + 1 S)				-
	Capacity : 10 m³/Hour of Each Pump REVISED 5 m ³ /Hour of Each Pump				-
	Head : 50 Meters				-
	Air Vessel : 1 No of Min. 100 Liters Cap.				-
	Note:-1 set consists of 2nos. of pumps (1Working + 1Standby)	Set	1	5,00,000.00	5,00,000.00
				REVISED	
	Dual Media Filter				-
31.0	Supply, installation, testing & commissioning of vertical Multigrade Filter fabricated from 10 mm thick MS Plate shell and 12 mm thick MS plate dished ends with 3mm non toxic, non leaching rubber lining tested to 3.0 Kg/m ² , G.I (Class - C) face piping with necessary flanges, gaskets, isolating valves, accessories,nuts & bolts. with suitable foundation bolts & other accessories, mounting frame, complete with testing and commissioning etc. as required & as specified with the following:				-
	Discharge : 25m ³ /Hour Each				-
	Filtration Rate : 17000 lit./m ² /h				-
	Dia. : 1.5 m	Each	1	2,50,000.00	2,50,000.00
					-
	Activated Carbon Filter				-
32.0	Supply, installation, testing & commissioning of vertical Activated Carbon Filter fabricated from 10 mm thick MS Plate shell and 12mm thick MS plate dished ends with 3mm non toxic, non leaching rubber lining tested to 3.0 Kg/m ² , G.I (Class - C) face piping with necessary flanges, gaskets, isolating valves, accessories,nuts & bolts. with suitable foundation bolts & other accessories, mounting frame, complete with testing and commissioning etc. as required & as specified with the following:				-
	Discharge : 25 m ³ /Hour Each				-

NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	Filtration Rate : 17000 lit./m ² /h				-
	Dia. : 1.5 m	Each	1	2,50,000.00	2,50,000.00
33.0	Supply, Installation, Testing and Commissioning 'Cation' anion exchange process water softener fabricated from minimum 8 mm thick M.S. plate on minimum 10 mm thick M.S. plate on riser ends (Quality of Steel as per IS: 2062 Grade, thickness as per ISME Section 8) complete with initial charge of filter media and resins, face piping accessories, diaphragm valves of approved specifications, HDPE Brine tank of min. 500 Liters, piping testing and commissioning complete with resins of approved quality and make and regeneration assembly complete with valves, ejector, brine suction valves and piping. All internal parts of the softener shall be rubber lined as per technical specifications.				-
	Minimum expected rate of flow : 16m ³ /Hour				-
	Expected raw water hardness : app. 150-200 ppm				-
	Expected treated water hardness: less than 5 ppm (Zero Commercial Hardness)				-
	Max. working pressure : 4 Kg/cm ²	No.	1		-
34.0	Supply, Installation, Testing and Commissioning Salt Saturator assembly (for supply of salt solution) consisting of HDPE tanks with automatic agitators and all required accessories for holding and stopping salt for softener complete in all respects, including providing and fixing vertical, inline multistage centrifugal pumping set with stainless steel SS-316 4 stage casing and SS-316 L impellers with stainless steel shaft and suction & discharge casing. The effective capacity of the system to be of minimum 10% greater than actual salt required for approx. 3 Days with complete structural arrangement including RCC foundation etc. as per instructions of engineer-in-charge and approved fabrication shop drawings.				-
	(i) Recommended no. of tanks = 1 Nos.				-
	(ii) Total Capacity of each Tank = 750 Liters	No.	1		-
	(complete set as mentioned above)				-
	Dosing System at Chlorine contact tank & Anoxic tank				-
35.0	Supply, installation, testing & commissioning of chemical dosing system of approved make with all accessories, suitable to doze chemical solution upto 1 ppm doze (of Sodium Hypochloride solution) to a filtered water flow of 2,000 lph. against a pressure of 1.5 kg/cm ² complete with FRP moulded solution holding tank of min. 100 litre with all standard accessories & structural arrangement including suitable foundation bolts & other accessories etc. complete as required and as specified.				-
	System : Metering Type				-
	Capacity : 0-4 LPH				-
	Feed solution: Hypochlorite/pH Dosing / polyelectrolyte				-
	Conc. of solution : 0.1				-
	MOC of tank & Capacity: FRP - 200 Liters				-
	Nos. of pumps : 2 (1w+1s)				-
	Note:-1 set consists of 2 nos. of pumps (1Working + 1Standby)	Set	1	20,000.00	20,000.00
36.0	Piping/Valves & Accessories : Providing and fixing all piping (as described below) and isolation control valves, Check valves, multiport valves for making the system complete. uUPC Submerged Air piping MS(Heavy Duty) Epoxy : Air piping & pumped effluent riser (non-submerged) PVC (10KG)piping : Pumped effluent (submerged) & tank overflow pipe line PVC (10KG)piping : Interconnecting pipe line after delivery header of pump/ filter. All valves to be metallic construction and rated for PN 16 rating. Forged brass ball valves and CI Butterfly, check valves etc.	lot	1	3,50,000.00	3,50,000.00
	Drainage Sump Pumps for Plant Room Drainage				-
37.0	Supply, installation, testing & commissioning of compact dry motor submersible pumps of suitable rating with non-ferrous open impeller, handling capacity of 28 mm suitable for operation on 415 volts +1% 3 Phase, 50Hz, A.C supply, speed 2900 RPM of approved make including oil chamber, M.S. galvanneal lifting chain complete. The pump sets shall be supplied with required accessories & as per specification with all accessories and control system.				-
	Necessary cables from pump set to control panel (position of panel marked on enclosed drawings).- 1 Set				-
	Electrical control panel suitable for controlling two pumps having all necessary accessories & safety devices of manufacturers specifications and suitable for receiving incomer and outgoing cables complete as reqd (Panels will be installed near the sump as per site conditions). --1 No.				-
	Plant room drainage sump pump				-
	No. of Pumps : 2 (1W + 1S)				-
	Discharge: 15 m ³ /hr				-

NAME OF WORK :- CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	Total Head : 15 metre				-
	Note:-1 set consists of 2 nos. of pumps (1Working + 1Standby)	Set	1		-
					-
	Sludge Handling Mechanism (Centrifuge)				-
38.0	Supply, installation, testing & commissioning of basket type centrifuge of 20" DIA SS304 basket with MS body consisting following specifications:				-
	Basket : 20" (500mm) Ø x 9.8" (250mm) depthx3mm thick, SS304 perforated shell				-
	Basket type : 1200 RPM.				-
	Basket bottom: 14 mm thick CI with inside & outside 1.5mm S.S.304 Cladding				-
	Body Bottom shell : 3mm thick MS Plate with Epoxy Paint Body Top shell : 3mm thick MS Plate with Epoxy Paint Body Lid : 3mm thick MS Plate with Epoxy Paint				-
	Body bottom : 14mm thick M.S. Plate with Epoxy Paint				-
	Shaft : EN-8 supported with 3 nos imported bearings. It has greasing hole to do greasing in stationary condition.				-
	Top bearing: (30309- Spherical roller type) Bottom bearing : (30308 – roller type)				-
	Nos. : 1	Set	1		-
					-
	UV for Supply to Treated water Line				-
39.0	Supply, installation, testing & commissioning of Online UV system with IP-54 rated cabinet housing in sheet steel wth electrophoretic dipcoat priming and powder coated finish, and SS-316 treatment chamber material, with electronic ballast type,suitable for operation on 230 volts , 50Hz, for installation on the pressurized discharge line, suitable for tertiary treated wastewater of min. transmissivity of 65% complete with testing & commissioning as required and as specified.				-
	Capacity :- 25000LPH. - REVISED 20000LPH - REVISED MODEL - HF5-HD	Each	1	6,50,000.00	6,50,000.00
				REVISED	
	Bar Screens				-
40.0	Supply, installation, testing & commissioning of manually cleaned Bar Screens, to remove coarse and fine material from wastewater made up of FRP complete as required including handle for lifting.				-
	Screen (for 0.3 m/s inlet velocity and 0.75 m/s outlet velocity, with 8 to 10 mm c/c spacing of bars.	Each	1		-
					-
	BIO- Media				-
41.0	Supply, installation, testing & commissioning of suspended/floating bio-media(moving bed bio-media/MBBR media) as per technical specifications with PVC/PP material of construction , with max. operating temperature of 55°C, complete as per requirement.				-
	Media Required : 50 cu.m	cum	50		-
	TUBE PACK MEDIA 10 CU.M(HEXAGONAL)	cum	10		-

NAME OF WORK : - CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
CONSUMABLES FOR OPERATION AND MAINTENANCE					
42.0	Supply & consumption of consumables, solutions, chemicals, etc. for STP operation and maintenance including successful operations for 2 weeks upto commissioning stage / certification of STP.	Lot	1		-
ELECTRICAL SYSTEM					
43.0	Design, manufacture, supply, installation, testing and commissioning of the Electrical Control Panel for STP, from open ended cable construction, Floor mounted type, fabricated out of 2mm thick CRCA Sheet, Compartmentalized with hinged lockable doors, dust and weather proof, Powder coated finished with time tank process of approved shade after tank treatment, Cable alley, inter-connections, having Switch gear and accessories mounting, internal wiring, earth terminals, Top cable entry, numberings etc. suitable for operation of 415 volts, 3 phase, 50 Hz, AC Supply with enclosure protection class IP 54 complete as required and as specified with the following:				-
INCOMER					
1 no. incomer shall consist of :					
200 Amps, three pole, 35 KA MCCB with rotary handle on door.					
Ammeter (0-100 Amps) with selector Switch & CT's etc.					
Voltmeter (0-250 Volts) with selector Switch & protected by MCB's.					
Set of (R,Y,B) LED phase and ON & OFF indication Lamps.					
BUSBAR					
1 Set of 250 Amps 4P Aluminium bus bar complete with cable termination					
OUT GOING FOR :-					
Raw sewage relift pump at equalization tank (2Nos. (1w+1s))					
<u>Pump feeder shall consist of :</u>					
Suitable rating MPCB with DOL Starter for outgoing feeder of 5 HP. with rotary handle on door suitable for Connection to Built up Panel.--1 No.					
Air Blower (2 Nos. (1w+1s))					
<u>Each pump set feeder shall consist of :</u>					
Suitable rating MPCB with star delta Starter for outgoing feeder of 10HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor---2 Nos					
Ammeter (0-10 Amps) with selector Switch & CT's etc.					
Sludge return pump (2nos.(1w+1s))					
<u>Each Pump feeder shall consist of :</u>					
Suitable rating MPCB with DOL Starter for outgoing feeder of 5 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor--2 Nos					
Filter feed pump (2nos. (1w+1s))					
<u>Each Pump feeder shall consist of :</u>					
Suitable rating MPCB with DOL Starter for outgoing feeder of 6 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor---2 Nos					
Ammeter (0-10 Amps) with selector Switch & CT's etc.					
Softner feed pump (2nos. (1w+1s))					
<u>Each Pump feeder shall consist of :</u>					
Suitable rating MPCB with DOL Starter for outgoing feeder of 5 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor---2 Nos					
Ammeter (0-10 Amps) with selector Switch & CT's etc.					
Softner feed pump (2nos. (1w+1s))					
<u>Each Pump feeder shall consist of :</u>					
Suitable rating MPCB with DOL Starter for outgoing feeder of 8 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor---2 Nos					
Ammeter (0-10 Amps) with selector Switch & CT's etc.					
Hydropneumatic system for flushing water pump(2nos. (1w+1s))					
10 Amps. TP MCB with rotary handle on door suitable for 15 HP Connection to Built up Hydro Panel.---1No.					

NAME OF WORK : - CONSTRUCTION OF NEW TERMINAL BUILDING AT PRAYAGRAJ AIRPORT.

BILL OF QUANTITY - PLUMBING WORKS.

S.No.	DESCRIPTION	UNIT	Qty.	VENTILAIR	
				Rate	AMOUNT
	Hydropneumatic system for Irrigation water pump(2nos. (1w+1s))				-
	10 Amps. TP MCB with rotary handle on door suitable for 3 HP Connection to Built up Hydro Panel.---1No.				-
	Plant room sump pump (2nos. (1w+1s))				-
	10 Amps. TP MCB with rotary handle on door suitable for Connection to Built up Panel.--1No				-
	Dosing system (At CCT and Anoxic tank)				-
	<u>Pump feeder shall consist of :</u>				-
	10 Amps. SP, 10 KA "C" curve MCB with DOL Starter suitable for single phase 240 V, 50 Hz AC supply. Inter locking with filter feed pump treated water pump suitable for 0.5 HP --- 4 Nos.				-
	Set of ON / TRIP indication Lamps protected by MCB.				-
	Flash mixer at Anoxic tank				-
	<u>Pump feeder shall consist of :</u>				-
	10 Amps. SP, 10 KA "C" curve MCB with DOL Starter suitable for single phase 240 V, 50 Hz AC supply. 1 Nos.				-
	Set of ON / TRIP indication Lamps protected by MCB.				-
	Centrifuge				-
	<u>Pump feeder shall consist of :</u>				-
	Suitable rating MPCB with Star delta Starter for outgoing feeder of 5 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor--- 1No.				-
	UV system (1 no.)				-
	<u>Pump feeder shall consist of :</u>				-
	10 Amps. DP MCB 10 KA suitable for Connection to UV System--1No.				-
	Sludge Loading Pump (2nos.(1w+1s))				-
	<u>Each Pump feeder shall consist of :</u>				-
	Suitable rating MPCB with DOL Starter for outgoing feeder of 2 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor--2Nos				-
	NOTE:-1. All MCCB shall have 100% Ics =Icu				-
	2.Panel shall be provided with NO-NC Potential free contact for BMS compliance.				-
	The item includes all end terminations, cables, cable trays, earthing conductor etc to complete the job as per the technical specifications.				-
44.0	Complete Set as mentioned above	Set	1		-
45.0	Supply, installation, Testing & commissioning Flowmeter of Everest Make ESI - Emag 110 as per approved TDS & spec.as per agreement between AAI & VIL complete	NO	1	52,000.00	52,000.00
46.0	Testing, Commissioning of STP system complete including handing over to VIL/AAI.	JOB	1	1,00,000.00	1,00,000.00
	TOTAL				32,27,000.00

