

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

SCHEDULE OF WORK

FINISHING SPECIFICATIONS FOR PROJECT 'MEHROTRA GOLF RESIDENCES'

- EXTERNAL SEWAGE AND STORM WATER DRAINAGE
- EXTERNAL WATER SUPPLY
- IWS PUMPS& ITS ACCESSORIES
- STP

SI.NO.	DESCRIPTION
A	EXTERNAL SEWAGE AND STORM WATER DRAINAGE
A.1	PIPING/SAUCER DRAIN WORKS.
1	Excavating trenches of required width for pipes, cables etc. including excavation for sockets and dressing of sides, ramming of bottoms, depth upto 1.5 M including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cms in depth including consolidating each deposited layer by ramming, watering etc. and disposing of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.
a	Pipes, cables etc. exceeding 80 mm dia but not exceeding 300 mm dia.
b	Pipes exceeding 300mm dia but not exceeding 600mm dia.
1.1	Extra for excavating trenches for pipes, cables, etc. in ordinary/hard rock exceeding 1.5 m in depth but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 metre)
a	Pipes, cables etc. exceeding 80 mm dia but not exceeding 300 mm dia.
b	Pipes exceeding 300mm dia but not exceeding 600mm dia.

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

2	Providing and laying non pressure NP3 class (Heavy duty) R.C.C. pipes conforming to IS 458 with collars jointed with stiff mixture cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc. complete. (all round and upto haunching shall be paid separately)
a	300 mm dia. R.C.C. pipe
b	450 mm dia. R.C.C. pipe
c	600 mm dia. R.C.C. pipe
2.1	Providing and laying non pressure NP2 class (Heavy duty) R.C.C. pipes conforming to IS 458 with collars jointed with stiff mixture cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc. complete. (all round and upto haunching shall be paid separately)(for hume pipe.)
a	300 mm dia. R.C.C. pipe
b	450 mm dia. R.C.C. pipe
3	Providing and laying Concrete Saucer drain of size of 600 mm or as/vendor specification and including cement concrete- 1.5 bed concrete as per standard design (refer std. details.).
3.1	Providing and laying Concrete Saucer drain of size 600 mm or as/vendor specification and including cement concrete- 1.5 bed concrete as per standard design (refer std. details.).

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

A.2	CHAMBERS WORKS.
4	Constructing brick masonry circular type manhole 0.91 m internal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand),inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarsesand) finished with a floating coat of neat cement, foundation concrete 1:3:6mix (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominalsize), and making necessary channel in cement concrete 1:2:4 (1 cement : 2coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with afloating coat of neat cement, all complete as per standard design :
	0.91 m - 1.60m deep with S.F.R.C. cover and frame (heavy duty, HD-25 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg., fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete.(Including Excavation and 12 mm thick cement plaster at the external surface.) :
A	With Sewer bricks conforming to IS : 4885
4.1	Constructing brick masonry circular manhole 1.22 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement :4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :
	1.58 m to 2.50 m deep with SFRC Cover and frame (heavy duty HD-25 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover andframe to be not less than 182 kg. fixed in cement concrete 1:2:4 (1 cement : 2coarse sand : 4 graded stone aggregate 20 mm nominal size) includingcentering, shuttering all complete. (Including Excavation and 12 mm thick cement plaster at the external surface.) :
a	With Sewer bricks conforming to IS : 4885

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

4.2	Constructing brick masonry circular manhole 1.52 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :
	Beyond 2.30 m deep with SFRC Cover and frame (heavy duty HD- 25 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg. fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete. (Including Excavation and 12 mm thick cement plaster at the external surface.) :
a	With Sewer bricks conforming to IS : 4885
4.3	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) RCC top slab with 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) foundation concrete 1:4:8 mix (1 cement: 4 coarse sand: 8 graded stone aggregate 40 mm nominal size) inside plastering 12 mm thick with cement mortar 1:3 (1 cement: 3 coarse sand) and outside plastering finished with a floating coat of neat cement making channels in cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per approved drawing and specification.
	Inside size 60x60 cms and 30 cms deep including SFRC Cover with frame (Light duty) 650x650 mm internal diamations total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) with FPS bricks.
a	With Sewer bricks conforming to IS : 4885(Location tapping for each plots.)

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

4.4	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) RCC top slab with 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) foundation concrete 1:4:8 mix (1 cement: 4 coarse sand: 8 graded stone aggregate 40 mm nominal size) inside plastering 12 mm thick with cement mortar 1:3 (1 cement: 3 coarse sand) and outside plastering finished with a floating coat of neat cement making channels in cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per approved drawing and specification.
a	With Sewer bricks conforming to IS : 4885(Location near each manhole of storm water)
4.5	Construction of road gully chamber(C.B) of the following sizes in brick work with bricks of class 75 in cement mortar 1 : 5 (1 cement : 5 fine sand) necessary foundation concrete(1 : 4 : 8). Inside & outside plastering 12 mm thick with cement mortar 1 : 3 with a floating a coat of neat cement. Including the RCC top slab for fixing the grating including necessary excavation, dewatering, refilling, watering, ramming, removing, the surplus excavated material and making good the same complete as required. (Location-For Green Areas.)
	Internal size 450 x 450 x 600 mm deep; DI Grating with frame 450 x 450 mm (A-15; 32 kg)
A.3	HARVESTING PTS WORK.

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

4.7	Providing and executing reverse bore of rain water recharging comprising of rain water harvesting pit as per the the plumbing site plan drawing complete with PVC (6kg/cm ²) 200 mm dia slotted pipe having having 3mm slot adequate size of bore filled with 3-6mm gravels, compete with bail plug at bottom. The reverse bore shall be upto 300mm above water level and the execution of some shall be in accordance RWH detailed sketch and conservation manual of CPWD .Govt. of India . The cost shall be inclusive of all necessary excavation in all kind of soils, refilling and disposal of surplus earth with in the site or away from site as directed with out any extra cost including required nos. 750 x 750 mm, Medium Duty, Wt : 125 kg, Ductile Iron cover with frame for Filter chamber. Filter Media shall be comprising of 300 mm thick 50-150 mm boulders, 300 mm thick 5-10 mm gravel and 300 mm thick coarse sand at the bottom of Pit below in 300 mm thick layer at the bottom of Filter chamber, below effective depth. All three layers shall be separated by G.I Wire Mesh screen of appropriate size.
4.7.1	Size- 4 mtr. diameter 3 mtr. water depth WD
4.8	Constructing Disilting chamber/Oil Trap of brick work with bricks of class 75 with cement mortar 1:5 (1 cement:5 fine sand) plastering internal face with cement mortar 1:3 (1 cement: 3 fine sand and rough plaster on outer face with a floating coat of neat cement. R.C.C top slab with Heavy duty SFRC manhole cover and frame of 600 mm dia. The weight of cover to be not less than 58 kg & frame not be less than 58 kg as per standard design. Including excavation, dewatering, refilling, watering, ramming and removing the surplus excavated material complete as required. (All sizes are clear internal sizes). Depth shall be as per actual site condition and invert level.
4.8.1	Size 1500 x 1000 x 1000 mm water depth (Total Depth shall be as per invert level of site)
	SUB TOTAL OF --A
B	EXTERNAL WATER SUPPLY
5	Domestic Water supply/ Irrigation water supply/ treated water supply -Providing, laying and jointing in position HDPE PE 100 PN 6.0 main line pipe conforming to IS: 4984 and suitable for the respecting working pressure with all fittings complete. The jointing shall be butt fusion welding as per approved drawing and specification including excavation in all kind of soil, refilling, ramming, shoring, removing the excavated surplus material, providing adequate support to the pipe and making good the same complete as required. Rate shall include for dewatering necessary to execute the work. The pipe shall not be less than 1.0 m below ground level at any point.

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

	External work	
a	25 mm dia nominal bore	
b	50 mm dia nominal bore	
c	80 mm dia nominal bore	
5.1	Supply, installation , testing & commissioning in position 25 mm dia lawn hydrants consisting of 25 mm dia Ball valve, GI nipple (1.5 metre length) and threaded hose receiver complete as required. The item includes taking a connection from the HDPE ring main via a connector.	
5.2	Supply, installation , testing & commissioning of male/ female screwed end full way lever operated forged brass ball valve(PN 16) of brass body with forged brass ball & teflon seat tested to a pressure 24 Kg / sqcm with (threaded joints) complete as required.	
a	15 mm nominal bore(WITH EACH WATER POINTS.)	
b	50 mm nominal bore(FOR EACH JUNCTION OF IWS LINE.)	
5.3	Supply, Installation, Testing and commissioning of slim seal type C.I. Butterfly valve conforming to IS 13592 (Body : Grey Cast Iron, shaft : SS, Disc : SG Iron (Rilson coated), Liner : HT - EPDM) of approved make with PN 16 rating flange dimensions shall be confirming to IS 6392, washer, nuts & bolts. Rated to temperature of 85 Deg C and tested to a pressure not less than 24 Kg/Sq.cm.	
a	80 mm nominal bore(IN PLANT ROOM.)	
5.4	Constructing masonry Chamber 45x45x45 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with surface box with locakable arrangement, i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per approved drawing and specification :	
a	With common burnt clay F.P.S.(non modular) bricks of class designation	

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

	SUB TOTAL--B
C	IWS PUMPS& ITS ACCESSORIES
6	Supply, installation, testing and commissioning of set of Hydropneumatic pumps consisting of vertical in- line, multistage, centrifugal stainless steel pumps, suitable for automatic operation and delivering the specified disch at the specified head. Each Pump shall be of stainless steel casing, stainless steel impeller and stainless steel sh with gun metal isolation valve on the suction line and pressure gauge, gun metal check valve and gun metal isol valve on delivery line, complete with Stainless steel suction and delivery header piping of suitable size. The mo shall be suitable for 415 ± 10% volts, 3 phase, 50 Hz A.C. power supply. The set shall include an automatic Contr panel and Presssure vessel with common base frame with complete connecting accessories for satisfactory performance. The set shall be completely equipped for automatic operation with single variable fequency drive run the pump as per demand requirements and pumps will be arranged to run alternately in sequence and also cascade mode based on water demand.(Cost to include gun metal isolation valve,strainer on its suction line and pressure gauge, gun metal check valve and gunmetal isolation valve on its delivery line with end blind flanges fo each pump and Stainless steel suction and delivery header, pressure vessel, pressure switches, control panel an connecting accessories required for utmost satisfactory functioning as per satisfaction of engineer in charge)
	Nos. of Pumps : 2nos (1w+1s)
	Water Flow Rate :2 LPS each pump
	Head : 50 M
a	(Irrigation water Transfer Pump)
6.1	Submersiable Centrifugal Non-clog Drainage Pump - Supply, installation, testing and commissioning of continu duty submersible centrifugal non-clogging drainage pumps complete with 3 phase motor with all necess protection and mechanical seal etc. complete with all ancillaries including float type level controllers, electr control panels fabricatd from 14 gauge CRCA sheet volt meter ammeter with selector switch, TPMCB, 5 VA CL : C phase indicating lamps protected by 2 amp SP MCB, DOL starter, necessary wiring, cable alleys, earth interlocking, starter with Automatic float type level controller, provision of high level alarm, sequence tim potential free contact to starter for connection to BAS, both pumps may run simultaneously at pre determ level.
	Vendor to submit proposed pump model with duty curve.
	Nos. of Pumps : 2 nos (1 w+ 1 s)
	Water Flow Rate : 2.5 LPS each pump
	Head : 15 M
a	Location : Plant roon drainage to nearest drain points.

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

6.2	Supplying, installing, testing and commissioning of chlorine dosing system consisting of one HDPE tank of 200 litres capacity with a positive displacement diaphragm dosing pump having variable flowrate of 0-6 lph. The motor shall be suitable for operation at 240 V/Single phase/50 Hz. Supply. The pump shall be supplied complete with necessary agitator, polypropylene piping, valves, strainers, low level switch(Range 0-600mm) and injection fittings. The pump shall be speed & stroke control. (1Working+1Stand-by)
6.3	Supplying, installing, testing and commissioning of pH correction dosing system consisting of one HDPE tank of 100 litres capacity with a positive displacement diaphragm dosing pump having variable flowrate of 0-6 lph. The motor shall be suitable for operation at 240 V / single phase / 50 Hz.supply. The pump shall be supplied complete with necessary polypropylene piping, valves, strainers, low level switch and injection fittings. The pump shall be speed and stroke control Asia LMI / equivalent.(if required.)
6.4	Supply, installation, testing and commissioning of tanker inlet connection complete with 100 mm dia GI inlet piping, hose inlet connection, MS cabinet enclosure (epoxy painted after fabrication), pad locking arrangement, inlet flexible hose complete with all necessary arrangement.
6.5	Supply, installation , testing & commissioning of Water level indicators cum controllers of Stainless Steel Probe with Digital display panel for installation on storage tanks, and capable of providing 4 to 20 mA analog signal compatible with PLC signal inputs (probe should be provided with 20m cable with no connection joints in single run) and complete as per working requirements . All analog output from probe should be indicated in digital output panel placed in MCC panel and wiring should be done for interlocking , auto start / stop of pump complete as per specifications
6.6	Supply, installation , testing & commissioning of electronic water meter with direct reading dial in KL with all internal parts in gunmetal or brass, flanged distance piece for easy removal in future, strainer, 100mm dia Bourden type pressure gauge and isolation cock complete in all respects.
a	80 mm dia nominal bore for Borewell Line
b	50 mm dia nominal bore for Irrigation water supply
6.7	Supply, installation , testing & commissioning of mosquito proof brass overflow grating for underground/overhead water tanks.

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

a	100 mm dia
6.7.	Supply, installation , testing & commissioning of insect vermin -proof coupling to vent pipes of underground tank/overhead tank with threaded or flanged joints, including M.S. flanges, nuts, bolts, 3mm thick rubber insertions complete.
a	100mm dia
6.8	Supply, installation , testing & commissioning of suitable flexible neoprene rubber expansion joint , single arch with integral rubber flanges with SRR drilled as per BS-10, Table-D, complete.
a	65mm dia
b	80mm dia
c	100mm dia
6.9	Domestic water supply (Plant room suction & delivery headers) -Providing, fixing, jointing and testing in position the following SCH 40/80 CPVC pipe confirming to ASTM D -1785 and fittings as per ASTM D-2466/2467 whichever would be applicable as per pipes grade, cut to required lengths including all necessary fittings such as bends, tees, unions, reducers, flanges & plugs etc.
6.10	Supply, installation , testing & commissioning of male/ female screwed end full way lever operated forged brass ball valve(PN 16) of brass body with stainless steel ball & teflon seat tested to a pressure 24 Kg / sqcm with (threaded joints) complete as required.
a	20 mm nominal bore
b	25 mm nominal bore
c	32 mm nominal bore.
d	40 mm nominal bore
e	50 mm nominal bore
6.11	Supply, Installation, Testing and commissioning of slim seal type C.I. Butterfly valve confirming to IS 13592 (Body : Grey Cast Iron, shaft : SS, Disc : SG Iron (Rilson coated), Liner : HT - EPDM) of approved make with PN 16 rating flange dimensions shall be confirming to IS 6392, washer, nuts & bolts. Rated to temperature of 85 Deg C and tested to a pressure not less than 24 Kg/Sq.cm.
a	65 mm nominal bore
b	80 mm nominal bore
c	100 mm nominal bore

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

6.12	Supply, installation , testing & commissioning of gun metal vertical non return valve conforming to IS 778 of approved quality (screwed end) including union, nipple, fixing on pipe complete as required.(PN 16)
a	65 mm nominal bore
b	80 mm nominal bore
6.13	Providing, fixing, testing and commissioning of CI 'Y' strainer for pressure of 16 kg / sq.cm with bronze perforated sheet basket including rubber gasket, flanges (test pressure of 24 kg / sqcm), nuts, bolts and washers, panting of the same complete as required and suitable for system pressure.
a	100 mm dia
b	150 mm dia
A	<u>SEWAGE TREATMENT PLANT</u>
	Design, supplying, installing, testing & commissioning of Sewage Treatment Plant for 55 KLD STP electro
	mechanical system based on MBBR technology. (excluding all Civil & construction work)
	Anticipated effluent parameters before treatment:
	PH 7.5 - 8.5
	BOD 250-400 mg/lt
	SS 200-450 mg/lt.
	COD 600-800 mg/lt.
	Total N less tha 35 mg/l
	Phosphorus less tha 10 mg/l
	Oil & Grease upto 50 mg/lt
	Desired Sewage discharge standard after ACF are as below:
	PH 6.5 – 8.5
	BOD5 Less than 10 Mg/L
	S. Solids Less than 20 mg/l
	COD Less than 60 Mg/L
	Total N less than 10 mg/l
	Phosphorus less than 1 mg/l
	Oil & Grease Less than 10 Mg/L
	Sewage treatment plant shall include the following Civil Units : (Client Scope)

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

-	Bar Screen cum Oil & Grease Chamber
-	Sewage equalization tank
-	Final Treated Water Tank
-	Foundation/Plateform for Pre Fabricated Tanks and Electromechanicals
1	Supply, installation, testing & commissioning of 2 Nos SS 304 Perforated Coarse Type Bar Screen Size 600mm x 600mm with suitable garbage lifting arrangement. Make: Jash/Huber/ 3SW/JHONSON
2	Supply, installation, testing & commissioning of level switch
	Make : Minilac/ Pune techtrol
3	Supply, installation, testing & commissioning of Submersible, non clogging type pumps capable of handling solids minimum 20 mm having CI casing & impeller with SS Shaft complete with mechanical seal & all accessories, motor of required capacity. Delivery header with isolation valve, pressure gauge on delivery line with isolation cock. Pumps shall have following duty
3.1	Submersible Sewage Transfer Pumps
	Flow Rate (each) = 3 m ³ / hr
	Head = 8-10 Mtr
	Make : Willo/Grundfoss/ITT
	Cost shall be inclusive of PVC Flexible Pipe 50mm dia , rope for lifting pump from sump to outside.
4.0	Providing and fixing horizontal,centrifugal sludge recirculation pump . The pumps shall have CI casing, CI Impeller with mechanical rotary shaft seal. Motor to be suitable for including all necessary piping valves and other accessories complete as required. Solid Handling capacity 7-10mm
4.1	Sludge Recirculation Pump (Anoxic To SST)
	Capacity : 8 Cum/hr.
	Head :8-12 mtrs.
	Make : Kirloskar/M&P
5.0	Air diffusion system shall include the following:
5.1	Supply, installation, testing & commissioning of twin lobe, rotary Air blower capable of delivering 55 cum/hr of free air at required pressure driven through "V" belt or directly coupled through flexible coupling to a TEFCmotor of suitable HP Suitable for 415 ± 10% volts, 3 phase, 50 cycles A/C supply. Blower Make- Everest/Akash/Kay/Beta
	Air Blowers
	Flow Rate (each) = 55 m ³ / hr @ 5000mmwg

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

5.2	Plant room Air piping (Submerged) in uPVC complete with all fittings such as tees, crosses, plugs, sockets, elbows, reducers, paint,supports & clamps, puddle flanges etc cutting chases & making good the wall wherever required. Contactor to submit detailed P & I indicating their proposal.
5.3	Non-clog type air dispersion system capable of handling required air with oxygen transfer efficiency. Air dispersion grid shall be assembled in modular form so that they can be replaced / repaired easily. (Coarse and Fine bubble membrane diffusers.
	Make : Rehau/Walkton/EDI/OTT
	Note :
	Air dispersion system shall be provided for MBBR Tank, Equalization Tank and Sludge Holding Tank.
6.0	Mixer for Anoxic Tank
7.0	Providing and fixing all interconnecting piping (as described below) and isolation control valves for making the system complete. The piping material shall be MS 'C' class.
	MS Epoxy : Non submerged air piping & pumped effluent riser (non-submerged)
	uPVC: Submerged air line.
	UPVC Piping : Interconnecting pipe line after delivery header of pump / filter
	Make : Jindal-Hissar/Tata/Supreme/Astral
8.0	Supply, installation, testing and commissioning of MBBR media. The media shall be enough for proper functioning of STP. [MBBR System to be in two reactors]
9.0	Supply, installation, testing and commissioning of PVC tube deck settling media to be installed in Tube Settler Tank alongwith retainer plates and suitable sludge removal arrangement either by pumps or any other suitable arrangement. Capacities, length, width,depth, of the media shall be enough for proper functioning of STP.

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

10.0	Supplying, installing, testing and commissioning of Chlorine dosing system consisting of one HDPE tank of 100 litres capacity with a positive displacement diaphragm dosing pump having variable flowrate of 0-6 lph. The motor shall be suitable for operation at 240 V/single phase/50 Hz. Supply. The pump shall be supplied complete with necessary polypropylene piping, valves, strainers, low level switch and injection fittings. The pump shall be speed & stroke control.
	Dosing Pump: Asia LMI/Walkton/Prominent/Grundfos
11.0	Supplying, installing, testing & commissioning of centrifugal pumps , CI body, CI impeller. motor, pressure gauge with isolation cock, Isolation valve, NRV on delivery line. Isolation valve, stainer at suction. The pump shall be suitable for 415±10% volts 3 phase AC supply
11.1	Filter feed pumps:
	Capacity : 3.1 Cum/hr.
	Head : 25-30 Mtrs
	Make : Kirloskar/M&P
11.2	Treated Water Transfer pumps:
	Capacity : 5 Cum/hr.
	Head : 25-30 Mtrs
	Make : Kirloskar/M&P
12.0	Supplying, installing, testing and commissioning of FRP vessel filter with all necessary accessories . Filter shall be suitable for minimum working pressure of 5 kg / cm ² and shall include media, standard fittings like pressure gauges, sampling cock, rinse drain, vacuum breaker etc.
12.1	Multigrade pressure sand filter
	Flow rate : 3.1 Cum/hr
	Filtration velocity : 15 cum/hr/sqm
	Filter Diameter : 525 mm.
	HOS : 1550 mm
	filtering sand, anthracite, pebbles and gravel media
	MOC: FRP
	Make: Pentair/Aventura

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

12.2	Activated Carbon Filter
	Flow rate : 6.5 Cum/hr
	Filtration velocity : 15 cum/hr/sqm
	Filter Diameter : 525 mm.
	HOS : 1550 mm
	filtering sand, anthracite, pebbles and gravel media
	MOC: FRP
	Make: Pentair/Aventura
13.0	Supply, installation, testing and commissioning of Filter Press with interconnecting piping and poly dosing system.(Capacity 0-6 LPH)
	Filter Press Make : Sachin/3SW/Shivam
	Dosing Pump Make: Asia LMI/Walkton/Prominent/Grundfos
14.0	Supply, installation, testing & commissioning of positive displacement type screw slurry pump with MS casing, SS-strator with internal rubber lining, gland packing seal, solid handling capacity upto 7 to 10% of the effective percentage of sludge and direct drive with motor. Make : Roto/Rotomac
	Sludge Feed Pump
	Capacity : 1 m ³ /hr
	Head : 40 mtrs. (1W+ 1S)
14	Insrtumentation
	Supply and fixing of following instrument
a)	Providing and fixing full bore type Electro-magnetic flow meter of 50 mm dia designed at maximum speed of 3-4 m/sec at the sewage inlet and outlet Make : Forbe Marshal/Walkton/ Hach
b)	Providing, installing, testing and commissioning of Online digital type pH meter. Make: Aster/Hanna

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

c)	Providing and fixing of suitable size pressure gauge boudron type glycerin filled. Make : H-guru/Equivalent
	TOTAL CARRIED TO SUMMARY OF A
B	List of Pre Fabricated Tanks (MSEP)
1.0	Anoxic Tank (1 No) (Min 5 KL water volume)
2.0	MBBR Tanks (2 Nos.) (8.25 KL water volume each)
3.0	Tube Settler Tank (1 No.) (Min 5 KL water volume)
4.0	Chlorine Contact Tank (1 No.) (Min 5 KL water volume)
5.0	Sludge Holding Tank (1 No.) (Min 5 KL water volume)
	TOTAL CARRIED TO SUMMARY OF B
C	Electrical Panel- Motor Control Centre
1.0	Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre fabricated out of 16 gauge CRCA sheet steel. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Quoted rates shall be inclusive of cable (in accordance to specification) with earthing from panel to each motor / equipment. Make : Adlec/Tricolite/BEW/Ambit/Diamond
	Motor Control Centre
	Incoming
	250 amps TPN MCCB with the following accessories:
	a) 0-500 volts 96 x 96 mm square electronic voltmeter with selector switch shall be protected by 2 amps TP MCB. 1 Set
	b) 0-100 volts 96 x 96 mm square electronic ammeter with selector switch and 100./5 amps 10 VA CL:1 CTs 1 Set
	c) Phase indicating lamps shall be protected by 2 amp SP MCB 3 sets.
	Bus Bar
	250 amp TPN (15 KA) Al bus bar with heat shrinkable insulation sleeves.
	Outgoing

RAJAT ANAND & ASSOCIATES

SHIVPURI, DOUBLE PHATAK, MORADABAD

Mob. : 08909650380

	a) Required Nos of required capacity TP MCB for direct on line starter/star delta starters and out going feeders to all the pumps/ blowers etc. (including standbys). Each compartment shall contain auto/ manual selector switch and indicating lamp with MCB's for 'ON/OFF/TRIP' status of motor.
	b) Spare MCB's of following capacities
	I. 32 amps TPN MCB's 3 Nos.
	a) All MCCB's / MCB's shall be of 15 KA breaking capacity and suitable for motor duty application.
	b) All motor starters shall be provided with Auotmatic level controller.
	c) DOL starters shall be used for moters below 10 HP and Star-Delta Starters for other motors.
	d) Provision shall be made for providing potential free contacts to all pumps starters
	MCC for all STP equipments/ pumps as described in sub head-A with provision for all future pump air blower etc.
2.0	Supplying, installing, testing & commissioning of Cables , Conector, Cable Trays, to make Electrical Installation Complete.

ELECTRICAL SPECIFICATION

S.	TRANSFORMER NOS.	Load	TRANSFORMER REQUIRED	TRANSFORMER SUGGESTED
Nos		(IN kVA)	(IN kVA)	(IN kVA)
1	Transformer-1	1810.5	1810.5	400 kVA X 5

❖ All works to be carried out according to the drawings provided by consultant.