Flow Dynamics India®

Water & Wastewater Treatment Solutions,
Swimming Pool Building -A Technology Provider

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WATER AND WASTE WATER TREATMENT





Flow Dynamics India®

Water & Wastewater Treatment Solutions,
Swimming Pool Building -A Technology Provider

ENSURING
EXCELLENCE IN WATER TREATMENT

About Flow Dynamics India

At Flow Dynamics India (FDI), we are committed to advancing India's clean water supply systems in a sustainable manner. We view it as our responsibility to improve infrastructures and provide technological solutions that contribute to increasing access to safe drinking water.

We treat water with the utmost respect by adhering to environmental protection and conservation measures.

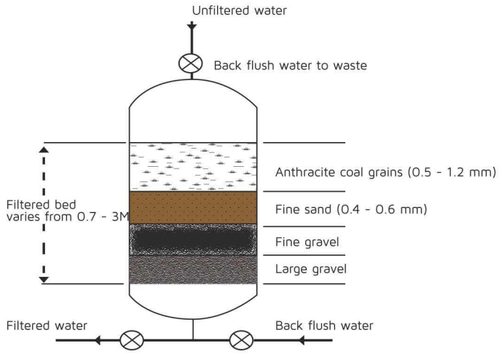
Flow Dynamics India (FDI) is a progressive water treatment, wastewater treatment, and water recycling solution provider. With over more than a decade of experience influencing the quality of water and the quantity of depleting water resources, we understand the importance of each and every day of effort.
Whatever your water and wastewater requirements, Flow Dynamics India provides solutions and a comprehensive range of services. We are able to bring global expertise and innovation together and tailor them to specific local needs.

We deliver pragmatic business solutions that leverage our unmatched combination of cutting-edge technologies, engineering, years of experience, and support capabilities. As one of the leading technology provider in the water management industry, we take an integrated approach to providing a broad range of services in collaboration with clients and government authorities. FDI provides solutions with following systems those are integrated inhouse. Our most qualified technical staff ensures international quality of installation and commissioning. In order to complete the cycle, we have a separate business vertical that takes care of 24x7 O&M of any plant.

WASTE WATER TREATMENT

- Municipal Waste water
- Green STP
- Industrial Waste water
- Recycle & Reuse
- Zero Liquid Discharge

- Municipal Water
- Institutional Plant
- DM/RO Plant
- EDI System
- Pressure System
- Process Water
- Filtration Systems
- Softening Plant
- Hot Water Generation System
- Pharmaceuticals Grade Water Generation Plant
- Ultra Pure Water (UPW)
- Water for Injection (WFI)
- Kidney Dialysis Plant

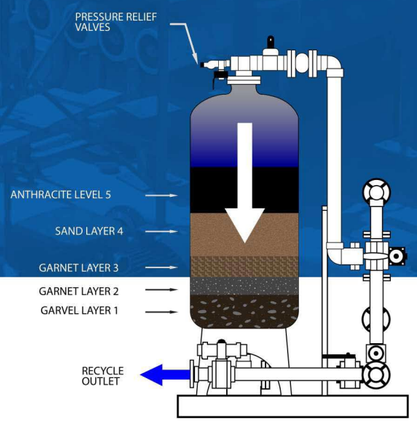


MULTI **GRADE FILTER**

A Multi Grade Filter is a modern concept in water treatment that consists of vertical or flat weight sand filters with different layers of coarse and fine sand (stones and rock) in a fixed proportion.

It's a deep filter bed with adequate pore sizes for storing both large and small suspended solids, as well as unbroken contaminations like residual particles.

ACTIVATED **CARBON FILTER**



Carbon filtering is a type of filtration that employs chemical adsorption to remove pollutants and impurities from a bed of activated carbon.

Activated carbon works by trapping pollutant molecules in the fluid to be processed within the pore structure of the carbon substrate, a mechanism known as adsorption.

Carbon filtration is widely used in the removal of siloxanes and hydrogen sulphide from biogas, as well as for water purification, air filtration, and industrial gas processing. It's also used in a variety of other items, such as respirator masks, sugarcane purification, and the recovery of precious metals, especially gold. It's also used in cigarette filters and vehicle exhaust ventilation systems.

Chlorine, sediment, volatile organic compounds (VOCs), taste, and odour are all removed most effectively by active charcoal carbon filters. Minerals, salts, and dissolved inorganic compounds are not removed effectively.

Carbon filters can eliminate particles with sizes ranging from 0.5 to 50 micrometres. As part of the filter definition, the particle size will be used. The flow rate control determines the effectiveness of a carbon filter. The pollutants are exposed to the filter media for a longer period of time when the water is able to pass through the filter at a slower rate.

WATER **SOFTENING PLANT**

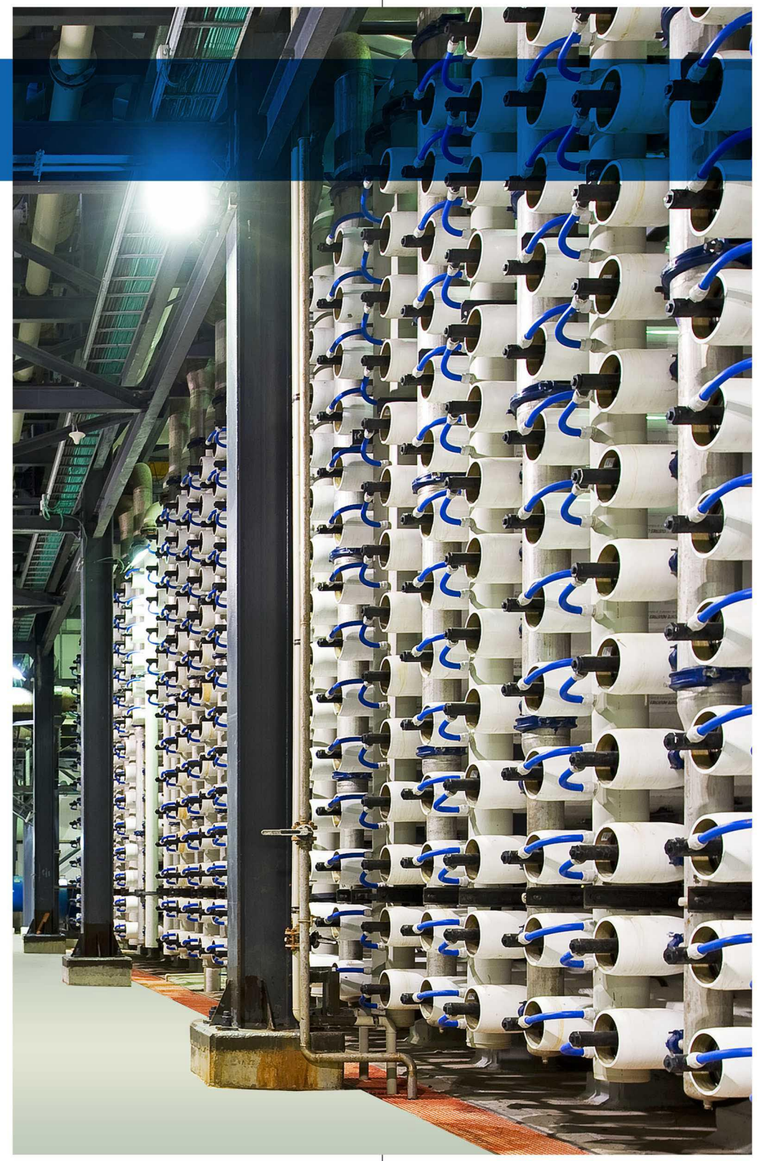
The removal of calcium, magnesium, and some other metal cations from hard water is known as water softening. By minimising or removing scale build-up in pipes and fittings, soft water often increases the life of plumbing. It is useful in domestic use as well, as the soft water demands less soap for the same cleaning effort.

Water softening is traditionally achieved with lime or ion-exchange resins, but nanofiltration and reverse osmosis membranes are increasingly being used.

REVERSE **OSMOSIS PLANT**

A reverse osmosis plant is a manufacturing facility that conducts the desalination of water. To desalinate one cubic metre of water, an average modern reverse osmosis plant needs six kilowatt-hours of electricity. A large amount of salty briny waste is generated as a result of the process.

The challenge for these plants is to reduce energy usage, use renewable energy sources, develop the desalination process, and advance in the waste management sector to deal with the waste.



MICRO**FILTRATION**

Microfiltration is a physical filtration process that removes microorganisms and suspended particles from process liquid by passing a contaminated fluid through a special pore-sized membrane. It is often combined with other separation processes such as ultrafiltration and reverse osmosis to produce a product stream free of unwanted contaminants.

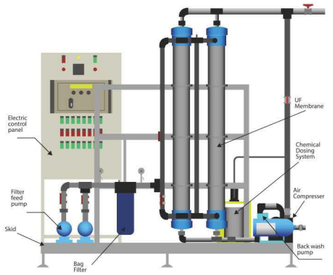
Microfiltration is often used as a pre-treatment for ultrafiltration and as a post-treatment for granular media filtration. The average particle size for microfiltration is between 0.1 and 10 micrometres.

NANO**FILTRATION**

A comparatively new membrane filtration method, Nanofiltration (NF) is most widely used with low total dissolved solids water, such as surface water and fresh groundwater, to soften (remove polyvalent cations) and remove disinfection by-product precursors such as natural and synthetic organic matter.

For simultaneous concentration and partial (monovalent ion) demineralization, nanofiltration is becoming more commonly used in food processing applications such as dairy.

ULTRA**FILTRATION**



Ultrafiltration (UF) is a form of membrane filtration in which a semipermeable membrane is used to separate two fluids separated by pressure or concentration gradients. Water and low molecular weight solutes move through the membrane in the permeate, while suspended solids and high molecular weight solutes are stored in the retentate (filtrate). Purifying and concentrating macromolecular (103-106 Da) solutions, especially protein solutions, is accomplished using this separation method in industry and research.

Ultrafiltration is similar to microfiltration in several respects. Both of these are distinguished by particle capture or size exclusion. It differs significantly from membrane gas separation, which separates based on various levels of absorption and diffusion rates. The molecular weight cut-off (MWCO) of the membrane used defines ultrafiltration membranes. Ultrafiltration may be performed in a cross-flow or dead-end configuration.

PUMPING **SOLUTIONS**

Water pressure booster pumps are used on new construction and retrofit projects to provide sufficient water pressure to the upper floors of high-rise buildings. We design a complete pumping system for any application & integrate it.

WASTEWATER **TREATMENT TECHNOLOGIES**

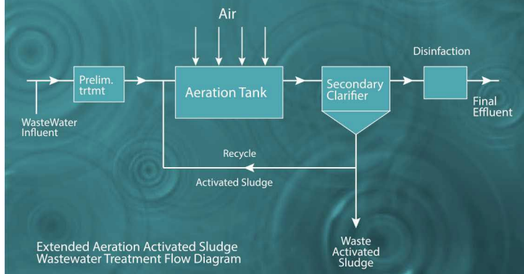
FDI has inhouse engineering facility that keeps adding value to various technologies in the industry.

A method incorporating modified activated sludge procedures for sewage treatment is callled Extended Aeration. When the waste load is small, this method is preferred, as mechanical simplicity compensates for lower operating performance.

Longer mixing time with aged sludge, compared to standard activated sludge, results in a more robust biological environment that is ideally suited to efficiently handling waste load volatility from variable occupancy situations. Supplemental feeding, such as sugar, is often used to keep sludge microbial communities alive during periods of low occupancy; however, population reaction to different food characteristics is unpredictable, and supplemental feeding increases waste sludge volumes. When sludge volume exceed storage capacity, septic tank pumping trucks can be used to remove it.

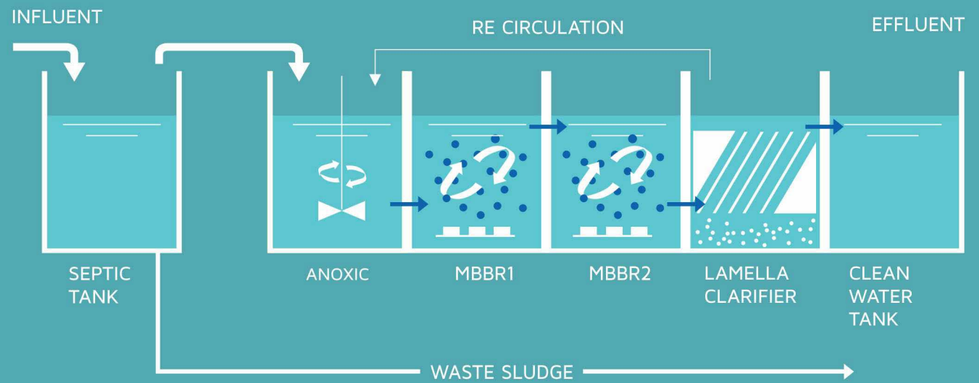
OXYMAX

(Activated Sludge Process/ Extended Aeration)



Extended Aeration Activated Sludge Wastewater Treatment Flow Diagram

MOVING BED **BIO REACTOR** (MBBR)



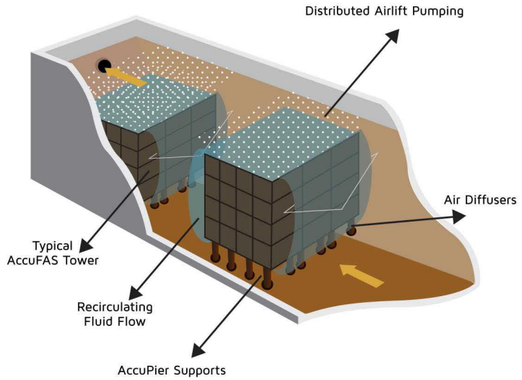
The Moving Bed Bio Reactor MBBR system is made up of an aeration tank (similar to an activated sludge tank) and special plastic carriers that provide a surface for biofilm to grow on. The carriers are made of a substance with a density of 1 g/cm3, which is similar to that of water. High-Density Polyethylene (HDPE), for example, has a density of about 0.95 g/cm3. The aeration device would mix the carriers in the tank, ensuring good communication between the substrate in the influent wastewater and the biomass on the carriers. A sieve on the tank's outlet is needed to prevent the plastic carriers from escaping the aeration.

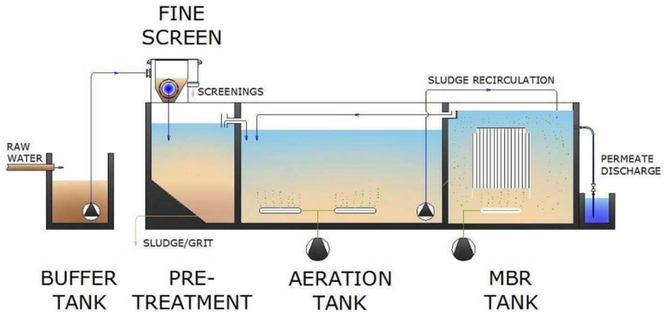
Other benefits over activated sludge systems include:

- Longer Sludge Retention Time (SRT) for better nitrification
- Reduced sludge generation
- Less space Requirements
- Resistant to toxic shock
- Process output unaffected by secondary clarifier, as there is not sludge return line

SUBMERGED AEROBIC FIXED FILM REACTOR (SAFF)

A technology that uses an aerobic fixed film process that combines submerged attached growth and activated sludge. This system is intended to be installed in a two-compartment system, with the first compartment removing the bulk of BOD and the second compartment polishing it. Inside the treatment module, rigid block-type media is submerged, providing surface space for microbial growth.





MEMBRANE BIO REACTOR (MBR)

A Membrane Bio Reactor (MBR) is a wastewater treatment system that combines a membrane process such as microfiltration or ultrafiltration with a biological wastewater treatment system such as activated sludge. It is also commonly used in the treatment of urban and industrial wastewater.

MBR processes may generate high-quality effluent that can be discharged to marine, soil, or brackish waters or reclaimed for urban irrigation when used with domestic wastewater.

Other benefits of MBRs over traditional processes include their limited footprint and the ease with which they can be retrofitted and upgraded.

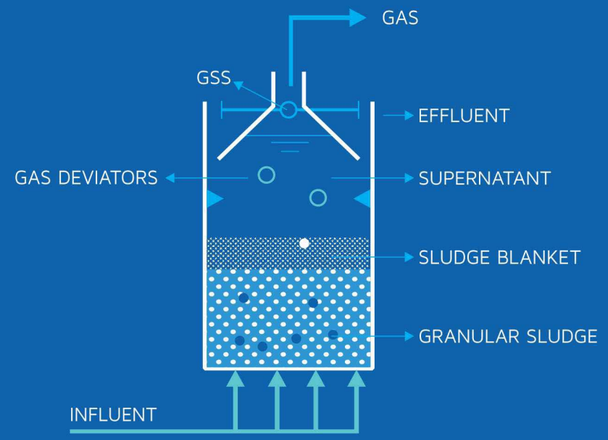
When compared to traditional settlement separation systems, MBR processes can work at higher Mixed Liquor Suspended Solids (MLSS) concentrations, allowing the reactor volume to be reduced while maintaining the same loading rate.

UPFLOW ANAEROBIC SLUDGE BLANKET (UASB)

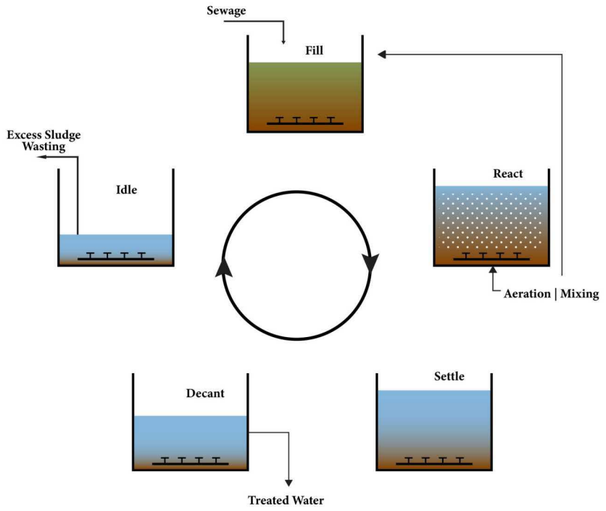
The Upflow Anaerobic Sludge Blanket (UASB) technology, also known as the UASB reactor, is a form of anaerobic digester used to treat wastewater. The UASB reactor is an anaerobic clarigester that has developed into a methanogenic (methane-producing) digester. The Extended Granular Sludge Bed (EGSB) digester is a related but different technology to UASB.

UASB uses an anaerobic method while forming a blanket of granular sludge that suspends in the tank. The anaerobic microorganisms process the wastewater as it flows upward through the rug. With the aid of flocculants, the blanket is suspended by the upward flow coupled with gravitational settling action. Around three months, the blanket reaches full maturity. Small sludge granules begin to form, their surfaces coated in bacterial aggregations. The flow conditions establish a selective environment in which only those microorganisms capable of binding to each other survive and proliferate in the absence of any support matrix. The aggregates eventually coalesce into thick, compact biofilms known as "granules."

As a by-product, biogas with a high concentration of methane can be collected and used as an energy source to generate electricity for export and to finance its own operating costs. When the technology is in operation, it must be constantly monitored to ensure that the sludge blanket is preserved and not washed away (thereby losing the effect). Heat produced as a by-product of electricity production can be used to heat the digestion tanks



SEQUENCING BATCH REACTOR (SBR)



Sequencing batch reactors (SBR) or sequential batch reactors are a type of activated sludge process for the treatment of wastewater. SBR reactors treat wastewater such as sewage or output from anaerobic digesters or mechanical biological treatment facilities in batches. Oxygen is bubbled through the mixture of wastewater and activated sludge to reduce the organic matter (measured as biochemical oxygen demand (BOD) and chemical oxygen demand (COD)). The treated effluent may be suitable for discharge to surface waters or possibly for use on land.

While there are several configurations of SBRs, the basic process is similar. The installation consists of one or more tanks that can be operated as plug flow or completely mixed reactors. The tanks have a "flow through" system, with raw wastewater (influent) coming in at one end and treated water (effluent) flowing out the other. In systems with multiple tanks, while one tank is in settle/decant mode the other is aerating and filling. In some systems, tanks contain a section known as the bio-selector, which consists of a series of walls or baffles which direct the flow either from side to side of the tank or under and over consecutive baffles. This helps to mix the incoming Influent and the returned activated sludge (RAS), beginning the biological digestion process before the liquor enters the main part of the tank.

The treatment process is divided into five stages:

- Fill
- React
- Settle
- Decant
- Idle

ZERO LIQUID DISCHARGE

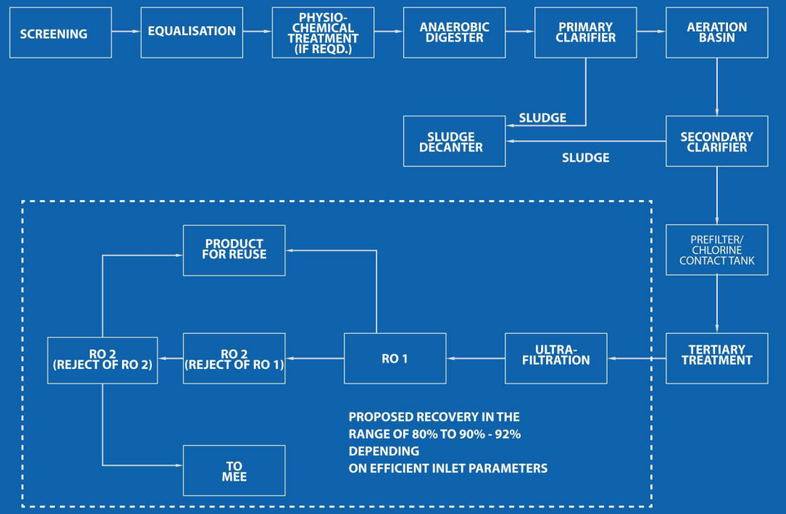
ZLD (Zero Liquid Discharge) is a treatment method that aims to eliminate all liquid waste from a system. The aim of ZLD is to minimise wastewater costs while still producing clean water that can be reused, saving money and benefiting the environment. ZLD systems purify and recycle nearly all of the wastewater generated using advanced wastewater treatment technologies.

ZLD technologies also assist plants in meeting discharge and water reuse criteria, allowing companies to:

- Comply with the government's strict discharge regulations.
- Ncrease the water recovery rate
- Treat and recover useful items such as potassium sulphate, caustic soda, sodium sulphate, lithium, and gypsum from waste streams

Thermal technologies including evaporators (Multi Stage Flash (MSF), Multi Effect Distillation (MED), and Mechanical Vapour Compression (MCV)) and crystallizers are used to enter ZLD and retrieve their condensate.

ZLD PROCESS FLOW CHART



EWD Clients

INDUSTRIAL

- Asian Tubes Limited
- Combine Reality Pvt Ltd
- Corel Pharma Chem
- Gautam Freight Pvt.Ltd
- Jyoti Minerals Pvt Ltd
- Kanti Fashion
- Macro Polymers Ltd
- Nisol Manufacturing Unit
- Olegar Enterprise
- Oxygen Bio Research Pvt Ltd
- Amneal Pharmaceuticals Pvt Ltd
- Oxygen Healthcare Pvt Ltd
- Pavit Ceramics Pvt Ltd
- R Y Midas Agro Product
- Safety & Analytics Research Center
- Secure Meters Pvt Ltd
- SNK Logistics Pvt. Ltd.
- Techsture Technologies
- Ultratech Cement Limited
- Vivante Purefoods Pvt Ltd

INSTITUTIONAL

- Bhagwati Banquets & Hotel Ltd
- Club Babylon
- Lords Hotel
- Bellevue Hotel
- V. R. Mall Surat
- Double Tree By Hilton
- Duet Hotels
- Florence Hotel
- GHV Hotels Pvt Ltd
- Gujrat JHM Hotels Ltd
- Mundra Hotel
- Hirise Hospitality Pvt Ltd
- Fortune Landmark
- Mass Hospital
- Mudra Institute of Communications, Ahmedabad
- The Grand Regency
- Comfort Inn
- Gujarat State Police Housing Board
- SDA University
- Sanskar Dham
- Sardardham
- Club O7
- The Fern Residency
- Shree Mahalasa Saunsthan
- Tornascent Care Institute
- Tree Top Resorts And Spa Pvt Ltd
- Fire Station Building at Naroda
- Yashnand Engineers And Contractor

COMMERCIAL

- Venus Infrastructures & Devlopers Ltd
- Shivarth
- Aaryan Arcade Ltd.
- True Value Builders
- Amaya Properties LLP
- Bakeri Projects Pvt Limited
- Shivalik Shilp II
- Twin Star
- Friends Bulk Handlers LLP
- Shivalip Shilp
- Junagadh Medical College & Hospitals
- KP Epitome
- Shilp Corporate Park
- Decora Madhuban
- Ratnakar 9 Square
- Navratna Corporate Park
- One World West
- Safal Real Estate Devlopers
- Sangam India Limited
- Shilp Aaron Buildspace LLP
- AR Mall
- Shivalik Satyamev
- Shilp Epitome
- Shree Marutinandan Inn
- Swagat Developers

RESIDENTIAL

- Dwarkesh Fragrance
- EWS Housing
- Hari-Om Elegance
- Jewel Residency
- Kalhar Blues & Greens
- Nila Infrastructure
- Krupal Bachpan
- Parkview Infrastructure
- Pushti Heights
- Eklinglji Developers
- Rio Colina
- Sangath Skyz
- Satyamev Developers
- Shilp Group
- Shivalik Group
- Shivarth The ACE
- Silver Classic
- Spenser X
- STANZA
- Super City
- The Address
- The Waterside
- Times Square Villa
- Vishnudhara Greens