



S u s t a i n w a t e r

PUMP STATION

www.tikal-co.com



Mission

Preserve water resources from waste, non-use and pollution by providing innovative and affordable water treatment and irrigation systems that are more up-to-date with technology.



Vision:

Empowering our region to become a global role model in water resource protection by strategically addressing physical, chemical, and biological gaps.



Company overview

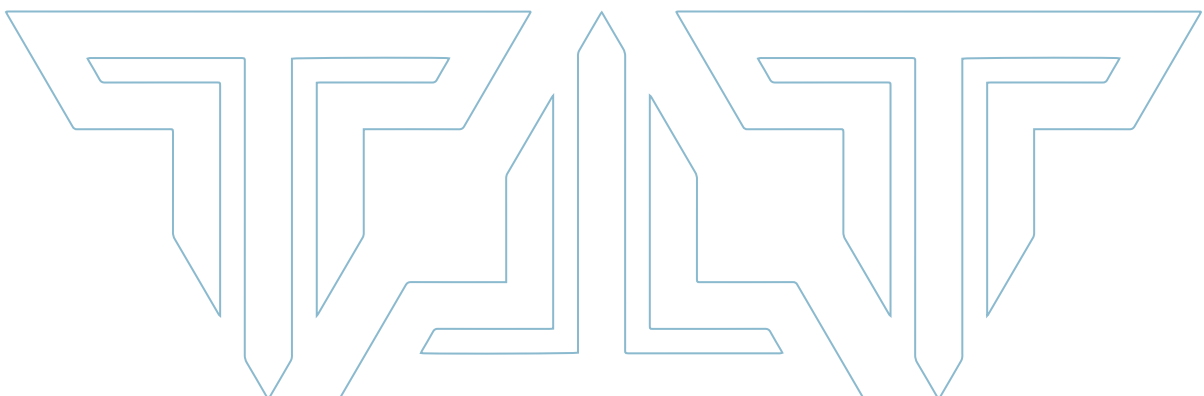
At Tikal Water & Irrigation Systems, we hold the belief that everyone deserves a sustainable environment free from pollution and resource wastage.

Tikal was Founded in 2019 by a group of engineers driven by initiative, innovation, and renewal, it was established to address the pressing challenges of untreated water, and unsustainable irrigation practices.

Our concern is to provide a range of integrated solutions and services that play a crucial role in physical, chemical, and biological challenges, and apply them through Vital national projects.

Tikal also attaches special importance to small communities by designing customized and intelligent solutions that allow using modern technologies and meet all needs and standards.

At Tikal, we aim to preserve and sustain water resources and are committed to delivering the latest solutions and services to our clients. To achieve this, we invest in research and development to enhance access to modern technologies and making a positive impact on the world.





Tikal Water Solutions

A. Utilities

«Through its water solutions, Tikal Company aims to simplify the process of preserving and benefiting from water resources by providing comprehensive and integrated solutions for most vital processes in water treatment, Through (Headworks) Tikal aims to provide Primary treatment one of the urgent roles in wastewater treatment, (Clarification) Our solution to remove of SS, Colloidal Particles, and impurities from raw water, Followed by)Filtration) to achieve the desired level of purity, and for Treatment and dispose of Sludge (Sludge treatment).

Tikal else provides physical solutions through (Pump Station) To prevent some harmful phenomena." these solutions have more than 71% coverage of basic water treatment processes and we aim to be up-to-date continuously.»



B. Small Communities:

TikalOne™, a pioneer division within our corporate framework, is strategically poised to revolutionize water treatment for small communities, ranging from 500 to 50,000 residents.

Born out of a commitment to excellence and guided by the principles of precision and innovation, TikalOne™ offers a visionary approach to integrated water solutions.

At its core, TikalOne™ is not just a brand; it's a scientific breakthrough in water treatment. Embracing the concept of modular intelligence, our bespoke systems, include Sea Water Reverse Osmosis (SWRO), Brackish Water Reverse Osmosis (BWRO), Munacibile water treatment (MW), MBBR (Moving Bed Biofilm Reactor), and SBR (Sequential Batch Reactor).

These units are designed to the distinctive characteristics of each water source. with cutting-edge, adaptable approach allows TikalOne™ to transcend traditional water treatment models. With a palette of technological sophistication and an unwavering commitment to sustainability,

TikalOne™ aspires to be the hallmark of professional water management, setting new standards for efficiency, reliability, and environmental consciousness.



TikalOne™

A photograph of a water treatment plant with various pipes, valves, and pumps. The image is overlaid with a blue tint. In the bottom left corner, there is a white geometric line graphic.

**Welcome to Tikal Water & Irrigation Systems,
where innovation meets
efficiency in water treatment.**

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Tikal Water & Irrigation Systems: Pump Stations Excellence

What is a Pump Station?

In water treatment, a pump station, also known as a lifting station, plays a crucial role in the movement of water within the treatment system. The lifting process, facilitated by pump stations, involves raising the water from a lower elevation to a higher one, overcoming gravitational forces to ensure the efficient transportation of water through various stages of the treatment process. Here's an insightful look into the components and processes that make Tikal Pump Stations unparalleled in performance:



• Pump/Lifting Station:

A pump station, often referred to as a lifting station, is a facility equipped with pumps and associated control systems designed to lift water from a lower elevation to a higher elevation or to overcome hydraulic head losses in a water conveyance system. Pump stations are integral components of water distribution systems, wastewater treatment plants, and various industrial processes where the movement of water against gravity is necessary.

• Components of a Tikal Pump Station:

1. Pumps:

The primary components responsible for lifting or moving water. Various types of pumps, such as centrifugal pumps or positive displacement pumps, may be used based on the specific requirements of the system.

2. Piping:

The network of pipes that conveys water from the source to the pump station and then to its destination. Piping is designed to handle the flow rate and pressure requirements.

3. Valves:

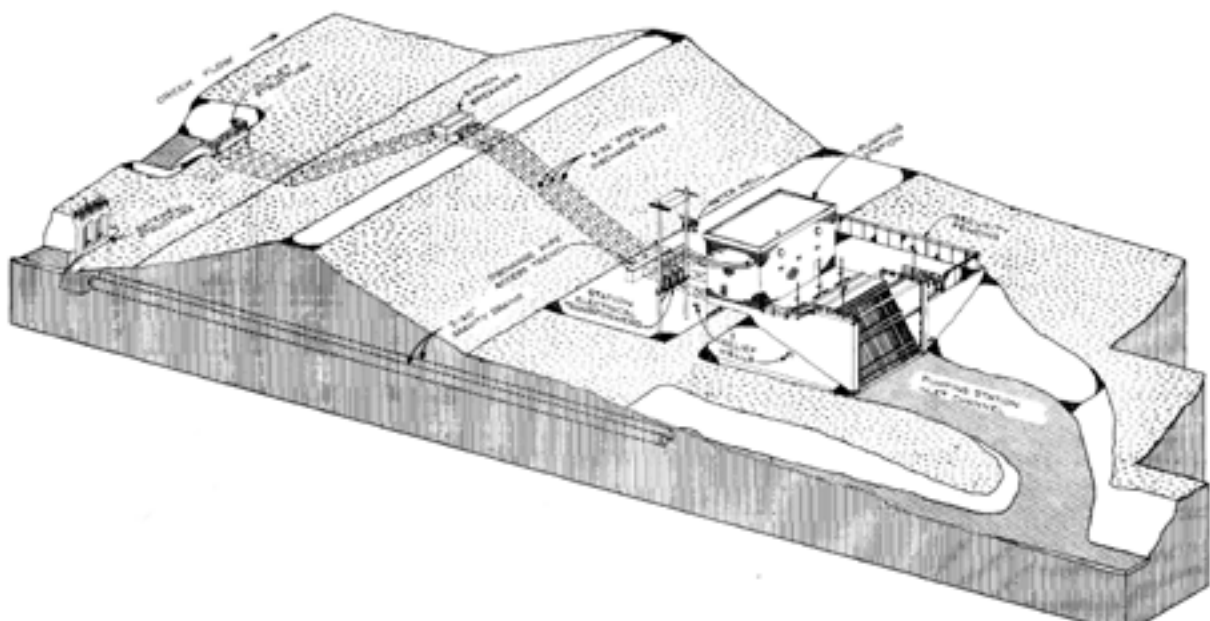
Valves control the flow of water within the pump station, allowing operators to regulate the rate of pumping and adjust pressure levels.

4. Control Systems:

Automated control systems monitor and manage pump operation, ensuring optimal performance, energy efficiency, and protection against potential issues like pump cavitation or system overloads.

5. Electrical Components

Electrical systems provide power to the pumps and control the operation of various components within the pump station.



• The Lifting Process:

The lifting process in water treatment involves the movement of water from a lower elevation to a higher elevation, overcoming the force of gravity. This process is essential for transporting water through treatment stages, overcoming natural topographical variations, and maintaining a consistent flow in the distribution system. The lifting process is typically achieved using pumps located within pump stations.

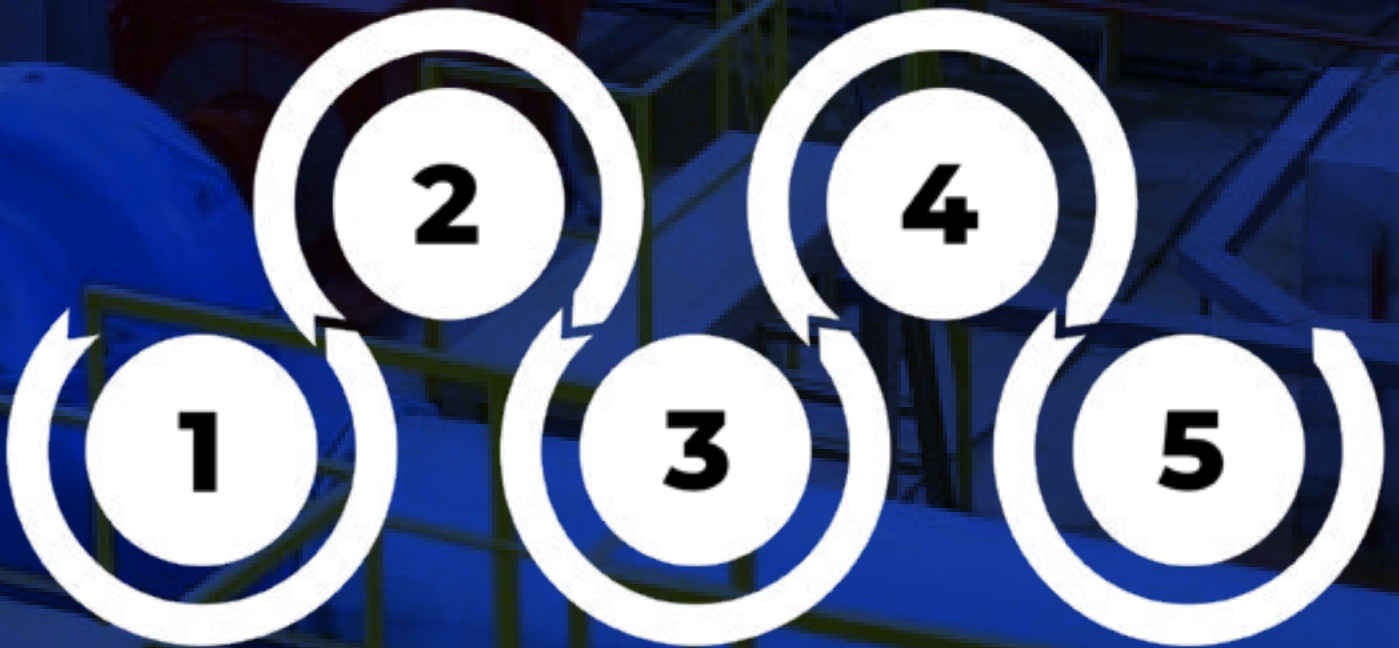
Key Steps in Lifting Process:

Pumps within the pump station are activated to lift the water. The type of pump used depends on factors like flow rate, head requirements, and the characteristics of the water being lifted.

The pressurized water is then transported through the piping system to its destination, which could be a treatment facility, storage reservoir, or distribution network.

2. Pump Operation:

4. Transportation:



1. Intake and Inlet:

Water is initially drawn from a lower elevation, such as a reservoir or a collection basin, through intake structures or inlets.

3. Pressure Generation:

As the pumps lift the water, they generate pressure in the piping system, allowing the water to move against gravity.

5. Discharge:

At the higher elevation or destination, the water is discharged from the piping system, and the lifting process is completed.

• Importance of Pump Stations:

Pump stations are critical for maintaining water supply and treatment processes in situations where natural elevations or distances between water sources and treatment facilities make gravitational flow impractical.

Crucial for water supply in challenging terrains, Tikal Pump Stations find applications in municipal water supply, wastewater treatment, industrial processes, and irrigation systems.

Tikal Pump Station Solution Advantage

1. Hydraulic Design:

Ensuring that pumps are appropriately sized to meet flow rate and head requirements.

2. Energy Efficiency:

Implementing measures to optimize energy usage and reduce operational costs.

3. Reliability and Redundancy:

Incorporating redundant pumps and systems to ensure reliability and continuity of service.

4. Safety Measures:

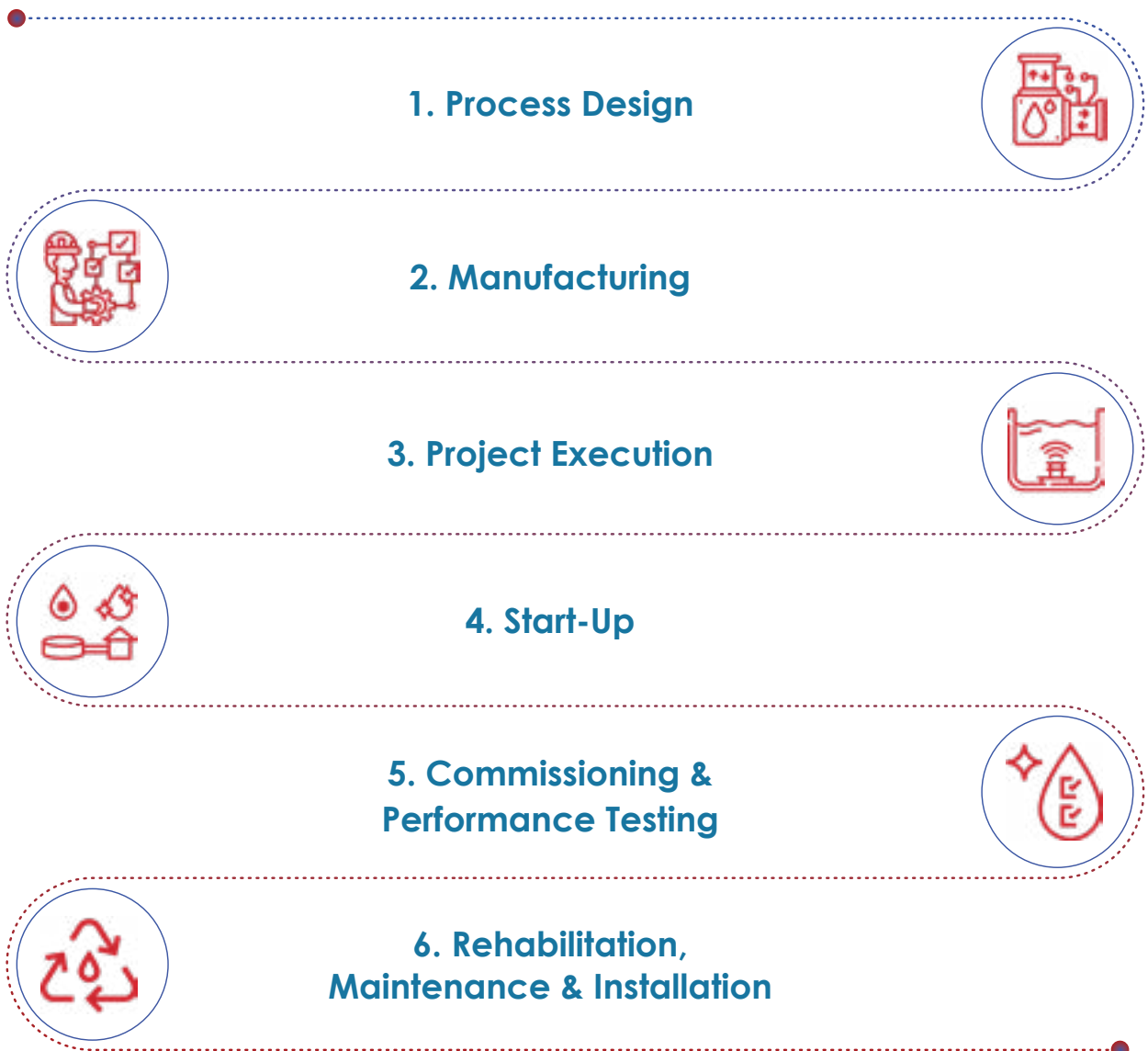
Implementing safety features to protect against equipment failure, overloads, and other operational risks.



What Tikal Provide in Pump Station?

Tikal is your comprehensive solution provider for Pump and Lifting Stations, offering services encompassing:

Service | Product Offering



A photograph of two large, vertical, cylindrical industrial tanks, likely for water treatment, set against a clear blue sky. The tanks are supported by concrete bases and have ladders attached to their sides. In the foreground, there are various pipes, valves, and a control panel. The entire image has a blue color overlay.

Tikal Products

1. Water Hammer System:

Water hammer, also known as hydraulic shock, is a phenomenon that occurs in water distribution systems when there is a sudden change in the velocity of water flow. This change in velocity can result from rapid valve closure, pump startups or shutdowns, or sudden changes in flow direction. Water hammer manifests as a pressure surge or shock wave that travels through the piping system, leading to potential damage to pipes, valves, and other components.

• Tikal design Features:



1. Pressure Surges

- Water hammer results in rapid changes in pressure within the piping system.

2. Shock Waves:

- The phenomenon generates shock waves that can travel through the pipes.

3. Noise Generation:

- Water hammer often produces audible noise, which can be used as an indicator of its occurrence.

4. Potential for Damage:

- If not properly managed, water hammer can cause damage to pipes, fittings, and other system components.

5. Water Hammer Arrestors:

- Deployment of water hammer arrestors absorbs shock waves and reduces the intensity of pressure fluctuations.

6. Check Valves with Dampeners:

- **Feature:** Check valves equipped with dampeners, Controls the speed of valve closure, mitigating water hammer effects.

7. Pipeline Material Selection:

- **Feature:** Careful choice of pipeline materials, Materials with flexibility to absorb energy and resist damage.

8. Pipeline Sloping:

- **Feature:** Proper pipeline slope design, facilitates gradual flow changes, reducing the likelihood of water hammer.

9. Surge Analysis Software:

- **Feature:** Implementation of surge analysis software, Conducts simulations to identify potential water hammer scenarios and guides system design.

10. Valve Sizing and Selection:

- **Feature:** Precise valve sizing and selection, matches valves to system parameters, optimizing performance and reducing water hammer potential.



Water Hammer System Advantage

Tikal Surge tanks, also known as expansion tanks or water hammer arrestors, are designed to mitigate the effects of water hammer in a water treatment system.

Tikal Surge tanks provide a cushion or reservoir for absorbing excess pressure and preventing damage.

- **Pressure Regulation:** Surge tanks help regulate and stabilize pressure fluctuations caused by water hammer.

- **Protection of System Components:** By absorbing excess pressure, surge tanks protect pipes, valves, and other system components from potential damage.



- **Noise Reduction:** Surge tanks can contribute to reducing the noise associated with water hammer, providing a quieter operation.

- **Enhanced System Reliability:** The use of surge tanks enhances a water treatment system's overall reliability and longevity by minimizing the impact of pressure surges.

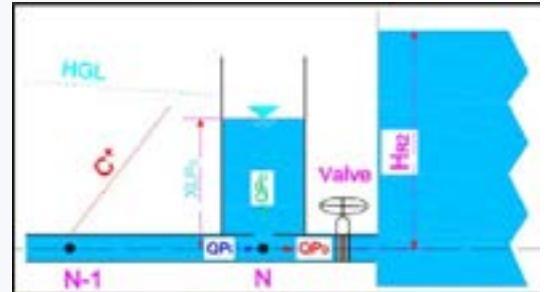
• Tikal Considerations in Surge Tank Design:

- 1. Volume:** The size of the surge tank should be designed to accommodate the expected pressure surge.
- 2. Location:** Surge tanks should be strategically located in the system to be effective in absorbing and regulating pressure fluctuations.
- 3. Materials:** Surge tanks must be constructed from materials compatible with the water being treated to prevent corrosion or contamination.

Tikal provide 3 Types of Tanks:

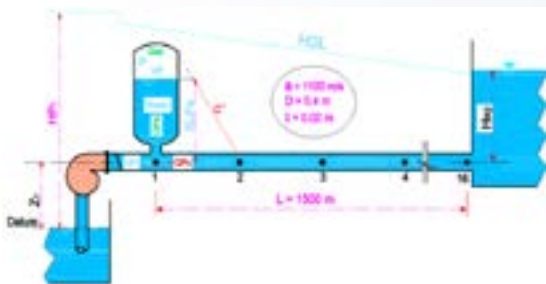
1. Open Surge Tank:

- **Description:** An open surge tank is an exposed tank that allows air to be in direct contact with the water.
- **Operation:** Air entrained in the water provides the compressibility needed to absorb pressure surges.
- **Application:** Commonly used in systems where space is not a limitation, such as wastewater treatment plants.



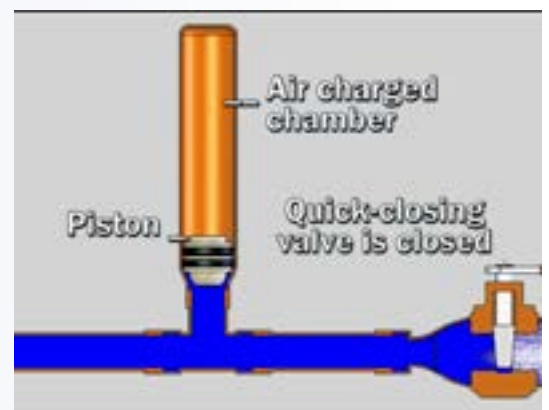
2. Closed Surge Tank:

- **Description:** A closed surge tank is sealed, and the air and water are separated by a diaphragm or bladder.
- **Operation:** The diaphragm or bladder acts as a flexible barrier, providing compressibility to absorb pressure surges.
- **Application:** Suitable for systems where space is limited, and there is a need to prevent air contact with the water, such as in potable water distribution systems.



3. Air Chamber:

- **Description:** An air chamber is a simple, vertical pipe installed in the system with an air pocket at the top.
- **Operation:** The air pocket allows for the compression of air, providing a cushion against pressure surges.
- **Application:** Commonly used in residential plumbing systems to reduce water hammer effects.



Tikal Products

Tikal Provides HeadWorks Products into Some Systems

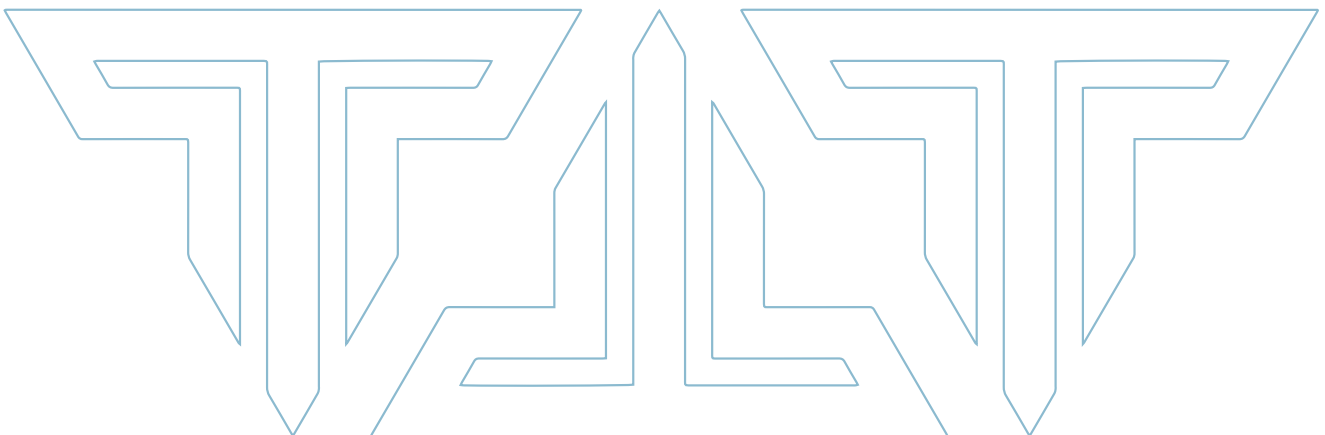
2. Screening System:

Tikal screening system in a pump station is a mechanism designed to remove large debris and solids from the incoming water before it reaches the pumps. The purpose of the screening system is to prevent these larger particles from entering and potentially damaging the pumps or other downstream equipment.

Screens are typically positioned at the inlet of the pump station, capturing debris such as leaves, sticks, plastic, and other large objects that may be present in the water.

- **Location of Screening System:**

The screening system is typically positioned at the entry point of the pump station, just before the water enters the pumps. This strategic placement ensures that larger debris is intercepted and removed early in the process, preventing potential damage to the pumps and other equipment.



Tikal Provide 3 Types of screens:

1- Basket Screen:

- Description: Basket screens are designed with a basket-shaped structure that captures and retains larger debris and solids present in the incoming water. The basket is typically made of sturdy materials, and its design allows for easy removal and cleaning of accumulated debris.

- Application: Basket screens are effective in preventing the entry of larger objects like leaves, twigs, and plastic items into the pumps. They are suitable for pump stations dealing with variable debris loads.



2- Bar Screen:

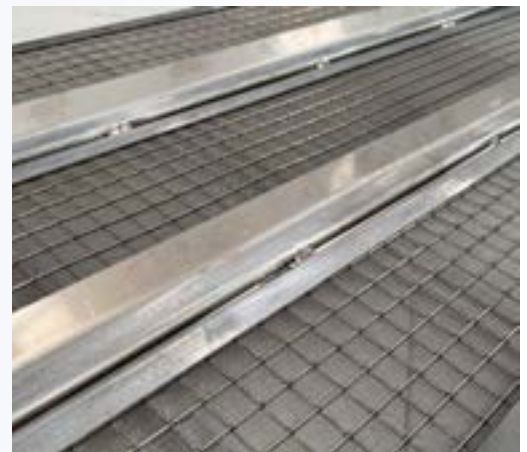
- Description: Bar screens consist of parallel or inclined bars spaced at regular intervals. The bars are strategically positioned to intercept and collect larger particles, preventing them from reaching the pumps. Bar screens can be either fixed or mechanically cleaned, depending on the design.

- Application: Bar screens are versatile and can effectively capture a wide range of debris sizes. They are commonly used in pump stations where continuous or intermittent cleaning is required.

3- Mesh Screen:

- Description: Mesh screens utilize a fine mesh or perforated plate to capture smaller debris particles while allowing water to pass through. The mesh size can vary based on the application, and the screens are designed to be easily removable for cleaning.

- Application: Mesh screens are ideal for preventing smaller particles, such as sand and small vegetation, from entering the pumps. They are commonly used in pump stations where fine debris removal is critical.



Selection Criteria for Screen Types:

1- Debris Size and Type:

- Basket screens are effective for larger debris, while mesh screens are suitable for smaller particles. Bar screens offer versatility for a range of debris sizes.



2- Cleaning Mechanism:

- Consider the cleaning requirements – whether manual, mechanical, or automatic. Basket screens are manually cleaned, bar screens can be mechanically or manually cleaned, and mesh screens are usually manually cleaned.

3- Flow Characteristics:

- Understand the flow characteristics of the incoming water. Bar screens may be preferred for high-flow situations, while mesh screens are effective for fine debris in lower-flow scenarios.



4- Maintenance Frequency:

- Evaluate the maintenance frequency. Mesh screens may require more frequent cleaning due to their finer filtration, whereas basket screens may handle larger debris loads before requiring attention.

Screening System Advantage

1. Efficient Debris Removal:

- The variety of screen types ensures efficient removal of debris, maintaining pump efficiency.

2. Customization:

- Tikal provides multiple screen types, allowing customization based on the specific needs and conditions of the pump station.



3. Preventive Maintenance:

- Early removal of larger debris prevents damage to pumps, reducing the need for extensive maintenance.

4. Long-Term Equipment Protection:

- The screening system contributes to the longevity of pumps and downstream equipment by preventing potential damage from debris.

Tikal Products

Tikal Provides HeadWorks Products into Some Systems

3. Controlling “Gates”:

In pump stations, controlling flow by gates refers to the use of gates or valves to regulate and control the flow of water through the system. These gates are strategically placed at various points in the pump station and are operated to manage the volume and pressure of water within the system. The control gates play a crucial role in optimizing the operation of the pump station and ensuring that water is efficiently moved through the treatment process.

• Tikal Control Flow System:



Design Features:

1. Inlet and Outlet Gates:

- Feature: Installation of gates at both the inlet and outlet points of the pump station.
- Data: Allows precise control over the entry and exit of water, regulating the overall flow through the system.

2. Valve Operation:

- Feature: Flexibility in manual or automatic operation of gates.
- Data: Provides operators with the option to manually adjust gate settings or automate the process for consistent and efficient flow control.

3. Flow Diversion:

- Feature: Capability to divert or direct the flow of water.
- Data: Allows for strategic management of water flow, directing it to specific treatment processes or storage facilities as needed.

4. Pressure Control:

- Feature: Instrumental in maintaining optimal pressure levels.
- Data: Prevents issues like water hammer and excessive pressure, ensuring the integrity of the pumping and distribution system.

Gates Advantage

1. Flow Optimization:

- Tikal gates contribute to the optimization of water flow through the pump station.

2. Emergency Shutdown:

- Tikal gates facilitate quick shutdown in emergencies.

3. Distribution to Multiple Processes:

- Essential for distributing water to various treatment processes or areas.

4. Customization and Integration:

- Tikal's system allows for customization and seamless integration.

5. Energy Efficiency:

- Tikal's flow control contributes to energy-efficient operations.

6. Remote Monitoring and Control:

- Integration with remote monitoring systems.

7. Durability and Reliability:

- Tikal's design prioritizes durability.

Conclusion:

In conclusion, Tikal's control flow system, with its advanced design features and advantages, stands as a crucial component in pump stations, ensuring precise and efficient regulation of water flow for optimal system performance.

4. Cranes:

Tikal crane system typically refers to the equipment used for the installation, maintenance, and repair of pumps, Basket Screen, and other components within the pump station.

The crane system is designed to handle the lifting and positioning of heavy equipment, facilitating efficient and safe operations within the pump station.

- **Location of Crane System:**

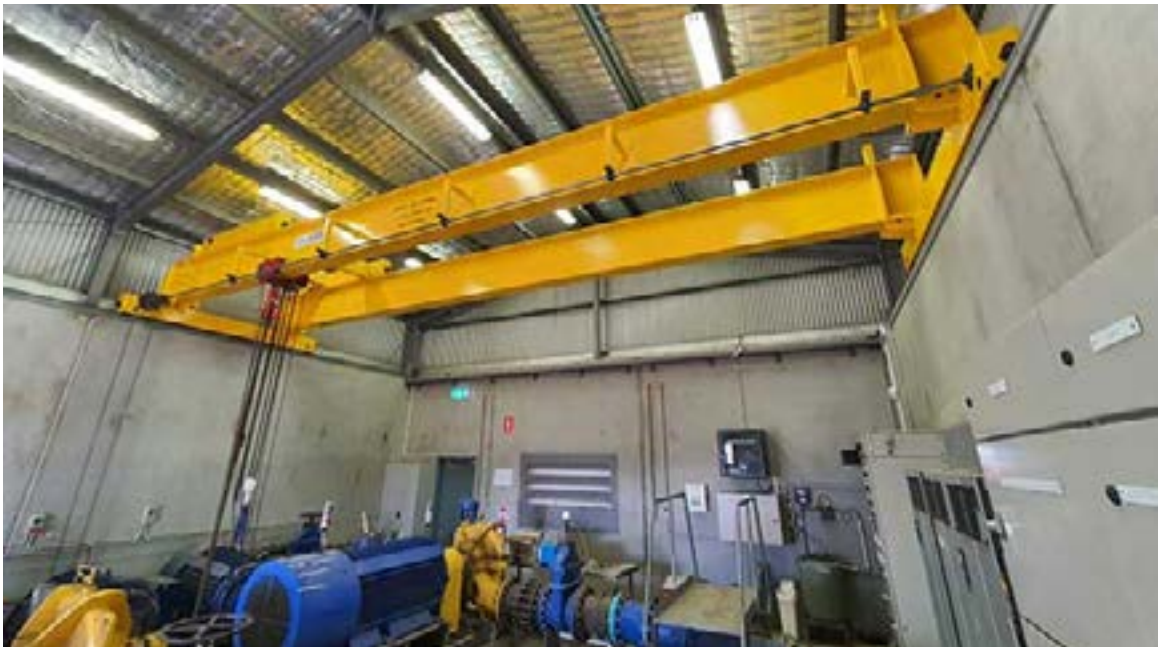
The crane system is usually located within or adjacent to the pump station, positioned to provide access to the various components that require lifting or maintenance. This can include the pump assembly, motors, impellers, and other heavy equipment involved in the water pumping process.



Tikal Provide 3 Types of screens:

1. Overhead Bridge Cranes:

- **Description:** Overhead bridge cranes are suspended from an overhead structure and can move horizontally along tracks. They typically have a hoist and trolley for vertical and horizontal movement, respectively.
- **Application:** Overhead bridge cranes are commonly used in pump stations with sufficient headroom for the crane system.



2. Jib Cranes:

- **Description:** Jib cranes consist of a horizontal member (jib or boom) that is attached to a vertical support structure. They can rotate to provide coverage in a specific area.
- **Application:** Jib cranes are often used in pump stations where a specific lifting area needs coverage, and the crane needs to rotate for versatility.



Tikal Supply Lifting Beams and Spreader Bars: These attachments are used to distribute the load evenly when lifting large or irregularly shaped objects.



Tikal crane system in a pump station is a vital tool for handling the installation, maintenance, and repair of heavy equipment, particularly pumps. The type of crane system chosen depends on factors such as the layout of the pump station, available space, and specific lifting requirements. The crane system plays a crucial role in ensuring the reliability and efficiency of pump operations within the water treatment facility.



Why Choose Tikal?



• Innovation:

Embracing cutting-edge technology in design and execution.



• Safety:

Implementing features to prevent equipment failure and operational risks.



• Reliability:

Ensuring robustness through redundant systems.



• Efficiency:

Optimizing energy usage and overall operational costs.

Tikal other Solutions?



Your Challenges Are Our Concerns.

 01019689990

 info@tikal.co.com

 contact@tikal.co.com

 www.tikal-co.com

 Gamal AlDin Dwidar Street 1, AlHadiqah Ad Dawleyah, Nasr City, Cairo