Intake and Discharge Technologies
Reference List

IDE Technologies | Your Water Partners

Introduction

IDE Technologies, a global leader in the construction of large-scale desalination plants, brings unparalleled expertise in the design and execution of seawater intake and discharge systems. With a commitment to hitting budget and timeline goals, IDE leverages advanced construction methods to optimize performance, ensure environmental compliance, and maintain cost efficiency throughout the plant's life cycle.

Drawing on a proven track record with technologies such as pipe jacking, segment lining, cofferdam construction, dredging, and excavation, IDE customizes its solutions to meet the specific needs of each client. Comprehensive bathymetric and geotechnical surveys underpin these designs, ensuring they are both robust and resilient against environmental challenges.

By integrating cutting-edge technology and innovative engineering practices, IDE minimizes ecological disruption, protects marine life, and ensures the long-term preservation of aquatic ecosystems. This approach balances operational efficiency, environmental stewardship, and the successful management of execution constraints, enabling IDE to consistently deliver projects on time, within budget, and to the highest standards.

Microtunneling Pipe Jacking

Microtunneling pipe jacking is an advanced construction technique used to install pipelines beneath the seabed with no environmental impact.

The process begins with the use of a Tunnel Boring Machine (TBM), a remotely controlled device that excavates a tunnel beneath the seabed which is launched from a jacking pit located onshore. As the TBM excavates the tunnel, it simultaneously pushes prefabricated pipes into the newly created space, thus maintaining a stable underground pipeline.

Pipe jacking technology, while effective for constructing underground water intake and discharge systems, presents several challenges that must be carefully managed. One of the primary limitations is the limited pipe length, which is constrained by the jacking force required to push the long pipe through the ground.

Soil conditions are also critical to the success of pipe jacking operations. In harder soils, there is increased wear on the TBM cutting tools, necessitating more frequent replacements.

These replacements can be particularly challenging, often requiring interventions under hyperbaric or non-hyperbaric conditions, depending on the depth and pressure of the surrounding environment. The harder the soil, the more frequent and complex the tool replacements become, potentially extending the project's duration and increasing costs. These challenges highlight the importance of thorough off-shore soil analysis, and careful planning to mitigate project risks.

With nearly **30 kilometers** of pipe jacking installations completed worldwide, IDE demonstrates unmatched expertise and versatility in this specialized field. Our extensive experience guarantees the delivery of reliable, innovative solutions for even the most complex intake and discharge projects, providing a consistent and dependable source of fresh water to millions of people.

Microtunneling Segment Lining

Segment lining is a highly specialized construction technique, unimpeded by length or challenging soil conditions, used to create underwater tunnels with precision while ensuring compliance with complex environmental regulations. This method utilizes a Tunnel Boring Machine (TBM), a remotely controlled device that excavates beneath the seabed with exceptional accuracy over long distances.

Guided by advanced navigation systems, the TBM meticulously follows a predetermined tunnel path, ensuring precise execution. As the MTBM advances, it continuously installs precast concrete segments to form the tunnel's lining. These segments are designed to fit together like puzzle pieces, creating a strong, watertight barrier that protects the tunnel from the immense pressures of the surrounding earth and water.

Segment lining offers distinct advantages and challenges when compared to pipe jacking. Unlike pipe jacking, segment lining is not restricted by length and diameter, making it the preferred choice for longer and larger-scale tunnel projects and more challenging environmental requirements. This flexibility is one of its key advantages, allowing for the construction of extensive tunnels without the constraints associated with other methods.

In harder soils, the TBM cutting tools are subject to significant wear and tear, necessitating frequent replacements. These replacements can be challenging, often requiring hyperbaric or non-hyperbaric procedures, depending on the project's depth and soil conditions. Despite these challenges and its higher cost, segment lining remains a valuable option for large-scale projects, offering the capability to construct longer tunnels with greater flexibility.

IDE Technologies has demonstrated exceptional expertise in segment lining, successfully implementing this advanced technology in two major desalination plants under challenging conditions. Our experience includes managing long tunnel sections and navigating hard rock environments. This track record highlights IDE's capability to apply segment lining technology to large-scale desalination projects, ensuring reliable, efficient, and successful outcomes.

Cofferdam and Dredging

Cofferdam technology is essential for construction projects near water bodies, providing a confined and dry work environment by temporarily diverting or controlling water flow. Typically constructed from materials like steel, concrete, or earth, cofferdams act as barriers that isolate the construction site from surrounding water, enabling safe and efficient excavation or foundation work.

The design of a cofferdam depends on factors such as water depth, surf and soil conditions.

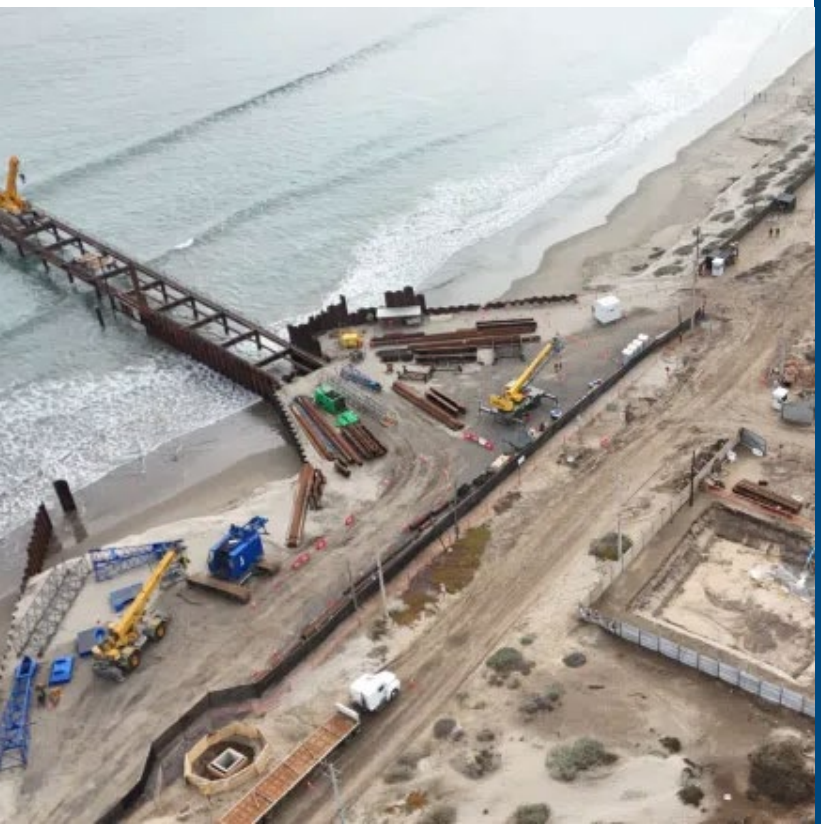
While effective in isolating construction zones, cofferdams require careful planning to ensure structural stability throughout the marine execution works, and minimize environmental impact.

Sea dredging for pipe laying is a crucial process in underwater infrastructure projects, enabling the installation of pipelines on the seabed. The technology involves the removal of sediment, rocks, and other materials from the seabed to create a trench where the pipeline will be laid. This is typically achieved using specialized vessels equipped with various marine tools. These tools are designed to excavate the seabed material and either relocate it to another area or store it.

IDE Technologies brings extensive experience in implementing seabed piping marine projects using cofferdam and dredging techniques. IDE has successfully executed eight intake pipes across three major projects, showcasing their capability to manage large-scale marine works challenges. This expertise highlights IDE's proficiency in handling complex underwater construction challenges, ensuring efficient and reliable installation in demanding environments.

Jetty and Dredging

A jetty is an effective solution for challenging shoreline, or high surf conditions that limit operations to short windows of time throughout the year. The process begins with the construction of the temporary jetty. This provides a stable platform for excavators to dig a trench from the side of the jetty to the sea. Concurrently, dredgers extend the trench along the intake and discharge route to the desired depth and alignment. Onshore HDPE pipeline segments are welded together to form a continuous pipe. This assembled pipe is then pushed from the jetty into the trench and placed in its final location in the sea, ensuring a precise and efficient installation of the intake and discharge infrastructure. By utilizing a temporary jetty, projects can overcome adverse conditions, maintain timelines, and achieve successful commissioning.



IDE Technologies is executing an intake and discharge project for the Aconcagua desalination plant in Chile. By employing two jetties, IDE overcame the region's challenging coastal conditions, which limit the working season, and provided stable platforms for the excavation and trenching operations required for the intake and discharge pipelines.

The innovative approach allowed IDE to manage the project effectively, ensuring that the installation of the HDPE pipelines was completed on schedule and with minimal environmental impact. This strategic use of temporary jetties showcased IDE's capability to adapt to difficult conditions and deliver high-quality infrastructure solutions.

Pipe jacking

Project name	Sorek, Israel	Sorek 2, Israel	Eilat, Israel	Western Galilee, Israel
Project description	2 Intake pipes / 1 Discharge pipe	2 Intake pipes / 1 Discharge pipe	2 Intake pipes / 1 Discharge pipe	2 Intake pipes / 1 Discharge pipe
Pipe lenght onshore (meters)	6,024	5,760	300	3,200
Pipe lenght offshore (meters)	3,854	5,016	1,092	2,700
Pipe MOC	Concrete	Concrete	Concrete	Concrete
Onshore pipe outer diameter [mm]	3,100	3,100	2,160	2,500
Offshore pipe outer diameter [mm]	3,100	3,100	2,160	2,500

Segment lining

Project name	Hadera, Israel	Western Galilee
Project description	1 Discharge pipe	1 Discharge pipe
Pipe lenght onshore (meters)	N/A	N/A
Pipe lenght offshore (meters)	2,000	3,350
Pipe MOC	Concrete	Concrete
Onshore pipe outer diameter [mm]	N/A	N/A
Offshore pipe outer diameter [mm]	3,900	3,900

Cofferdam & Dredging

Project name	Hadera, Israel	Ashkelon, Israel	Larnaca, Cyprus	Larnaca, Cyprus extension
Project description	3 intake pipes	3 intake pipes	1 intake pipe	1 intake pipe
Pipe lenght onshore (meters)	4,050	1,500	750	750
Pipe lenght offshore (meters)	N/A	3,900	1,200	800
Pipe MOC	GRP/HDPE	GRP/HDPE	GRP/HDPE	HDPE
On shore pipe outer diameter [mm]	1,800	1,600	800	800
Offshore pipe outer diameter [mm]	N/A	1,600	1,200	1,200

Temporary Jetty / Dragging and Excavation

Project name	Aconcagua, Chile
Project description	2 Intake pipes / 1 Discharge pipe
Pipe lenght onshore (meters)	7,300
Pipe lenght offshore (meters)	1,750
Pipe MOC	GRP/HDPE
On shore pipe outer diameter [mm]	1,200/1,800
Offshore pipe outer diameter [mm]	1,200