SERVICES DESIGN TECHNOLOGY International

Water and Wastewater Services

Our Water Services

At SDT we understand the technical needs for the water industry. We provide multidisciplinary services to a variety of private and government sectors.

To best serve our clients, we have established a specialized team of water, wastewater, infrastructure, process, and civil utility engineers to offer direct experience in water networks, dams, water resources, and water savings. Our experienced professional and technical services teams, can help to meet our clients' needs and requirements and provide the optimal engineering and economical solutions.

Water and Wastewater Networks

The engineering consultancy services offered by SDT – Water& Environment Division include Construction Management, Engineering Design, Operation and Maintenance Solutions, Master Planning, Water, Drainage, Wastewater, Solid Waste and Environmental Impact Assessment.

Two important elements of community infrastructure are safe, reliable supply of water, and effective disposal of sewage. SDT is quite familiar with the technical challenges of the water industry in main urban cities of the region.

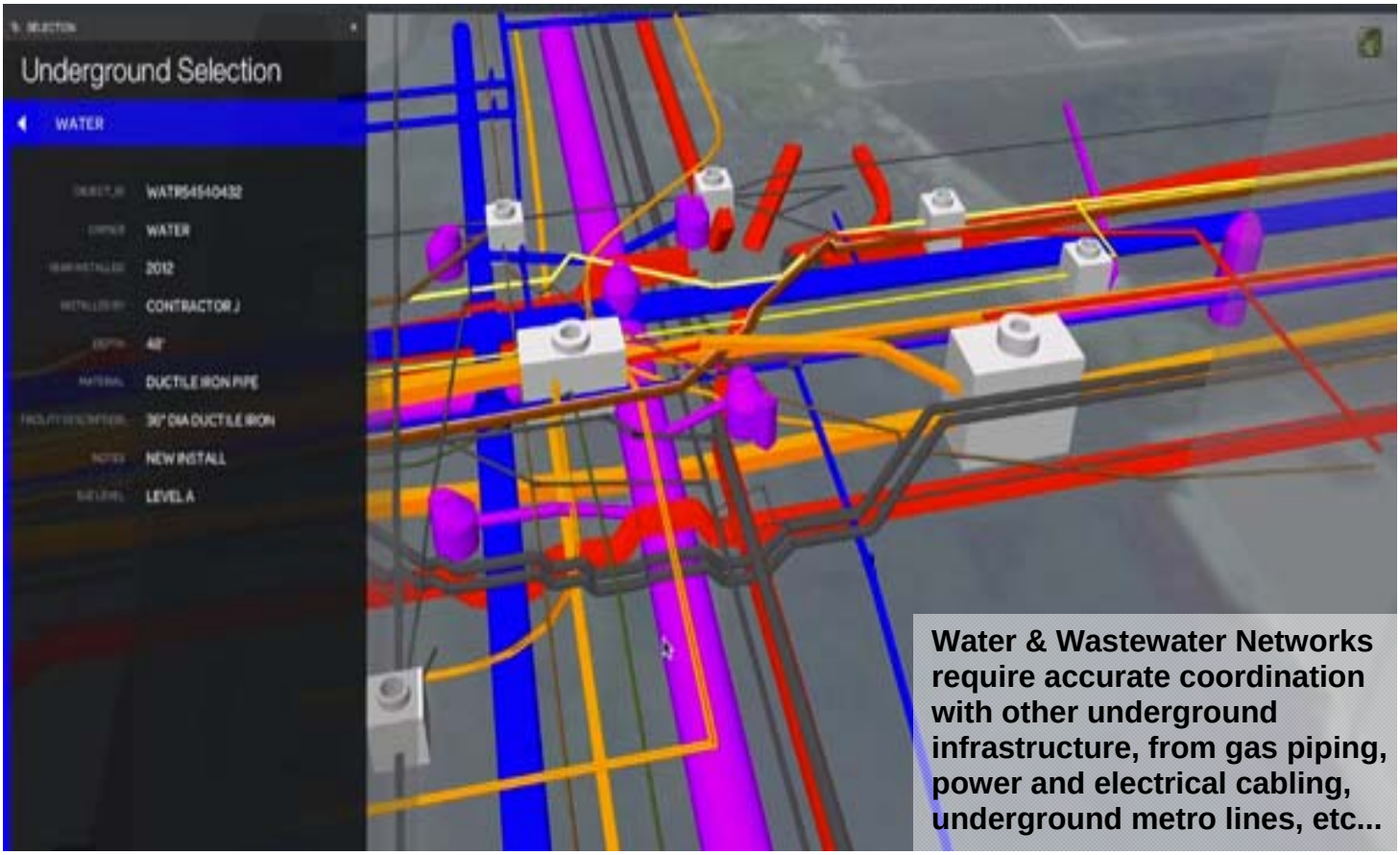
Our experience extends to:

- **Water and wastewater management**
- **Water treatment plants**
- **Integrated water cycle management**
- **Environmental management.**

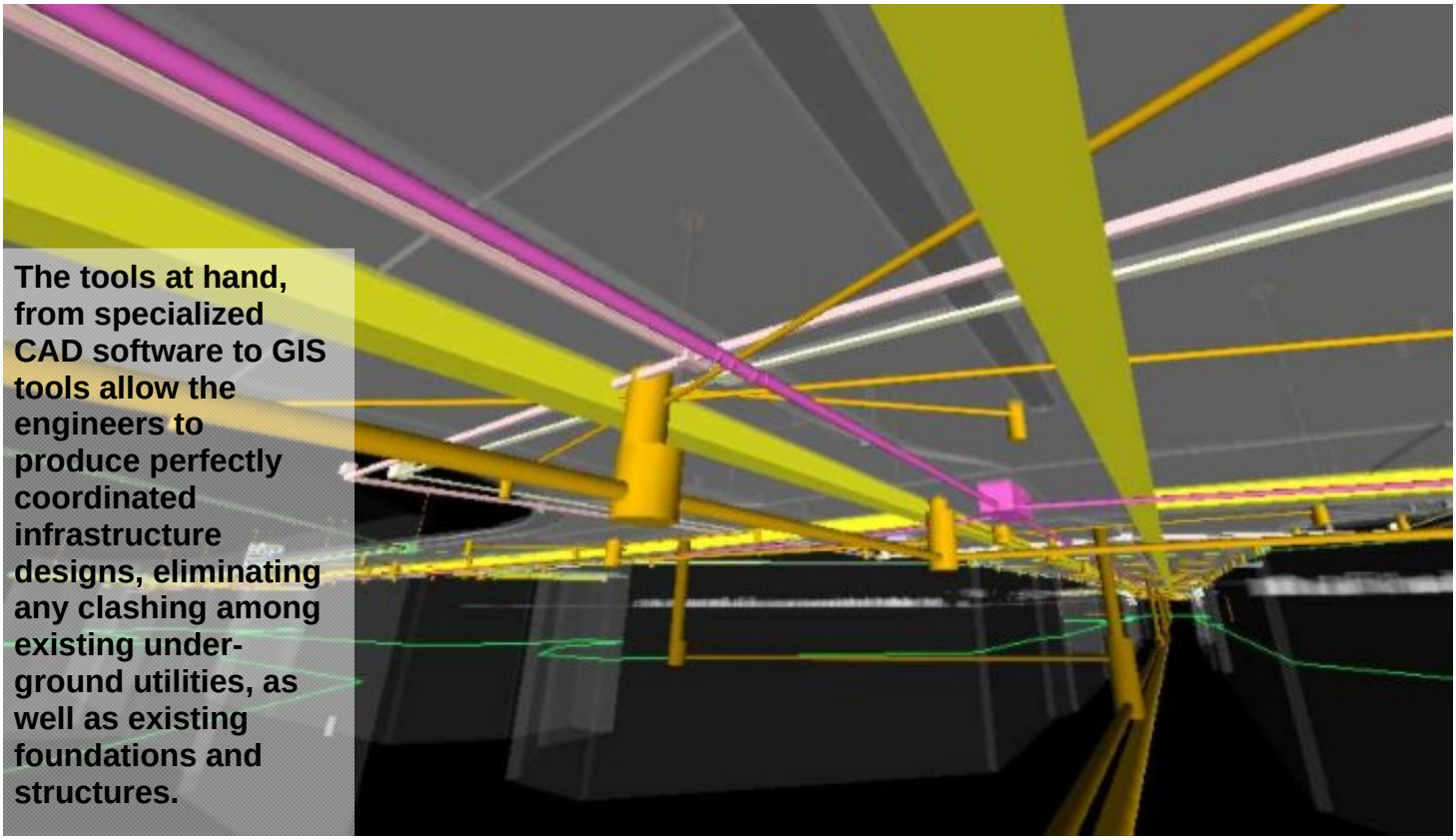
At SDT we are capable of delivering the following:

- **Evaluation of water consumption needs**
- **Inventory of existing and potential water resources**
- **Feasibility study**
- **Master Plan for water distribution, design of the water network (conduits and manholes)**
- **Detection of leaks in the existing networks**
- **Study of the rehabilitation of sources and wells**
- **Study and design of water reservoirs and pumping stations**
- **Technical specifications**
- **Supervision of site works**

Water and Wastewater Networks



Water & Wastewater Networks require accurate coordination with other underground infrastructure, from gas piping, power and electrical cabling, underground metro lines, etc...



The tools at hand, from specialized CAD software to GIS tools allow the engineers to produce perfectly coordinated infrastructure designs, eliminating any clashing among existing under-ground utilities, as well as existing foundations and structures.

Water Resources

Our technical expertise helps our clients identify and evaluate their options and implement workable, cost-effective solutions for both new water sources and wastewater and stormwater discharges. We provide analytical studies for water quantity and quality. The results are integrated solutions for securing long-term water systems in ways that meet current and future requirements taking into consideration the internal and external stakeholders.

Water Savings

SDT engineers are experienced in consulting and designing to efficient use of water in a project. At SDT, we search for all of the opportunities available in order to create the most efficient and cost-effective solution. Our services are available for individual systems within a project or we can create comprehensive solutions which involve an integration of several systems.

Our services provide the typical deliverables of construction plans, specifications, and cost estimates for system installation. We can also provide all of the necessary studies and documentation for any environmental and sustainable project.

Wastewater Treatment

From tailored project-based local solutions to municipal treatment plants, SDT engineers can design an efficient solution that accommodates any population, including extensions capabilities for future expansion that cater for future population growth.

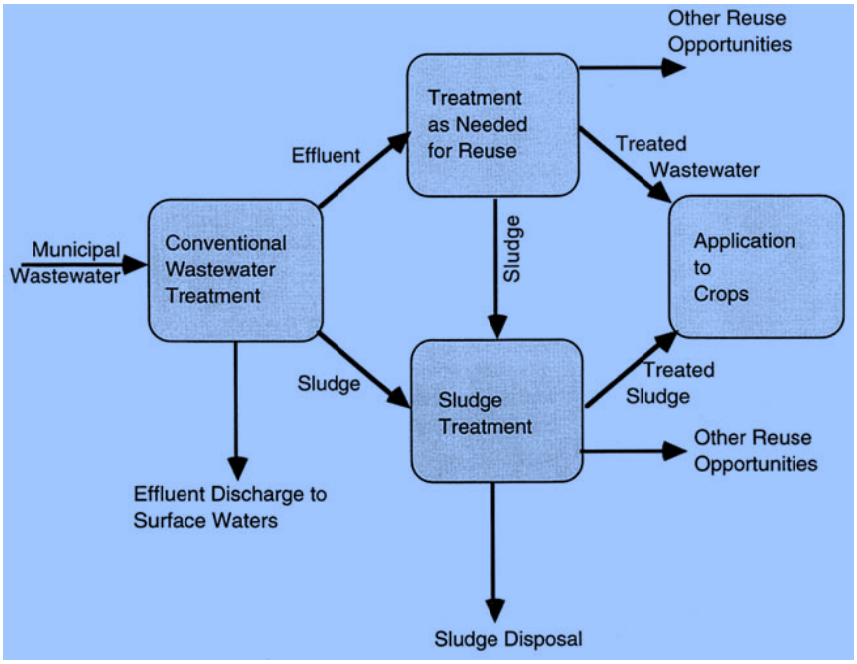
The latest treatment technologies that result in efficient treatment of wastewater as well as simple and maintainable operation are two essential criteria for the design of municipal wastewater treatment plants.

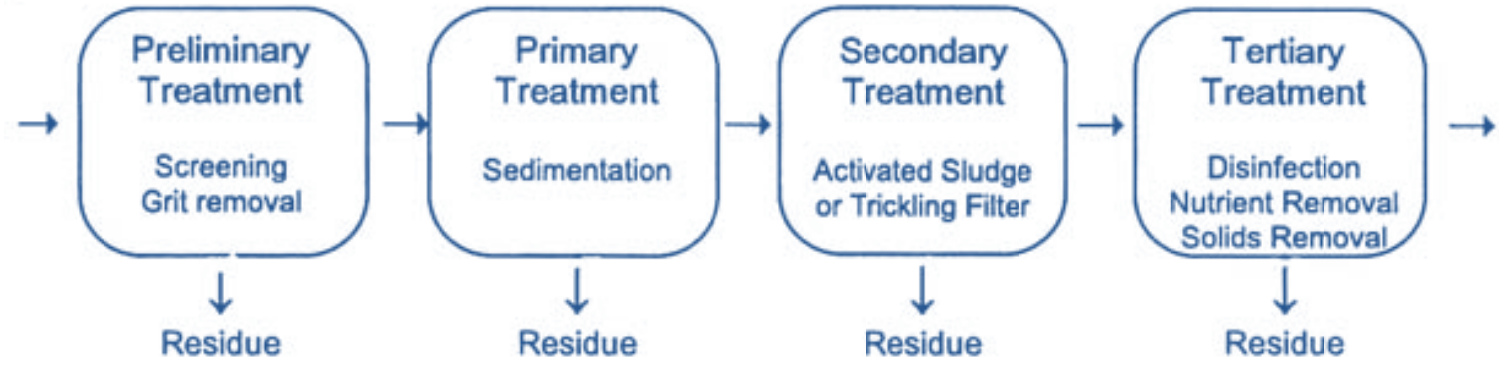
Treatment Technologies

Following conventional wastewater treatment (preliminary, primary, and secondary), municipal wastewater is discharged to surface waters or reused, or before discharge to surface waters (not illustrated).

Additional treatment may be needed before reuse. Sludge from wastewater treatment processes are treated and then disposed or reused in crop production or other applications.

Tertiary treatment can even ensure potable-quality water for domestic applications.





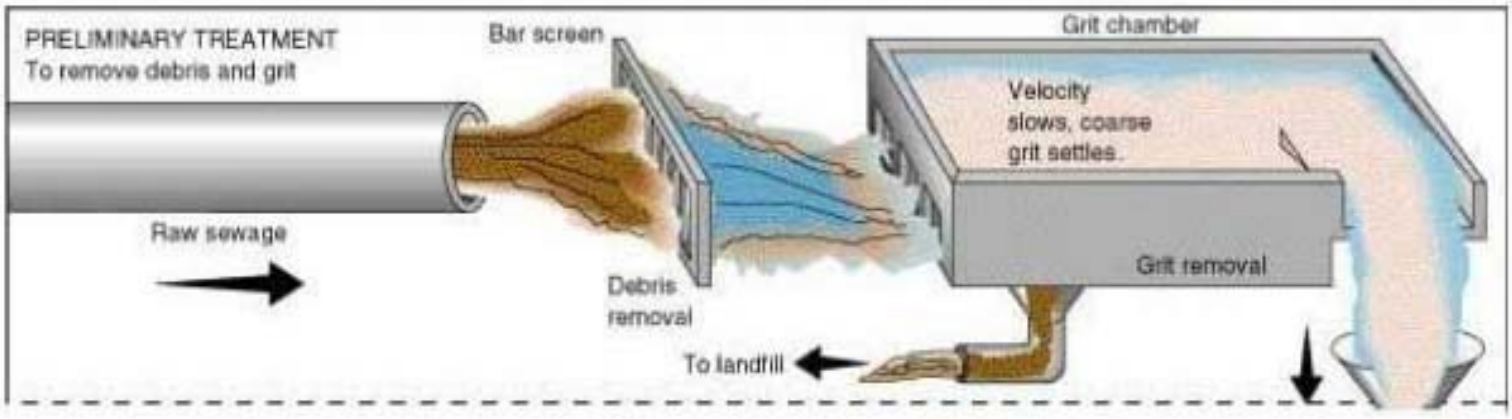
Preliminary treatment effects minimal change in wastewater quality. Primary treatment typically removes about one-third of the BOD and one-half of the suspended solids in domestic wastewaters. Combined primary and secondary treatment is required to achieve 85 percent reduction in both BOD and suspended solids concentration to meet the regulatory definition of secondary treatment.

SDT ensures that the design of each phase commits to meet internationally recognized codes and standards.

Preliminary Treatment Process

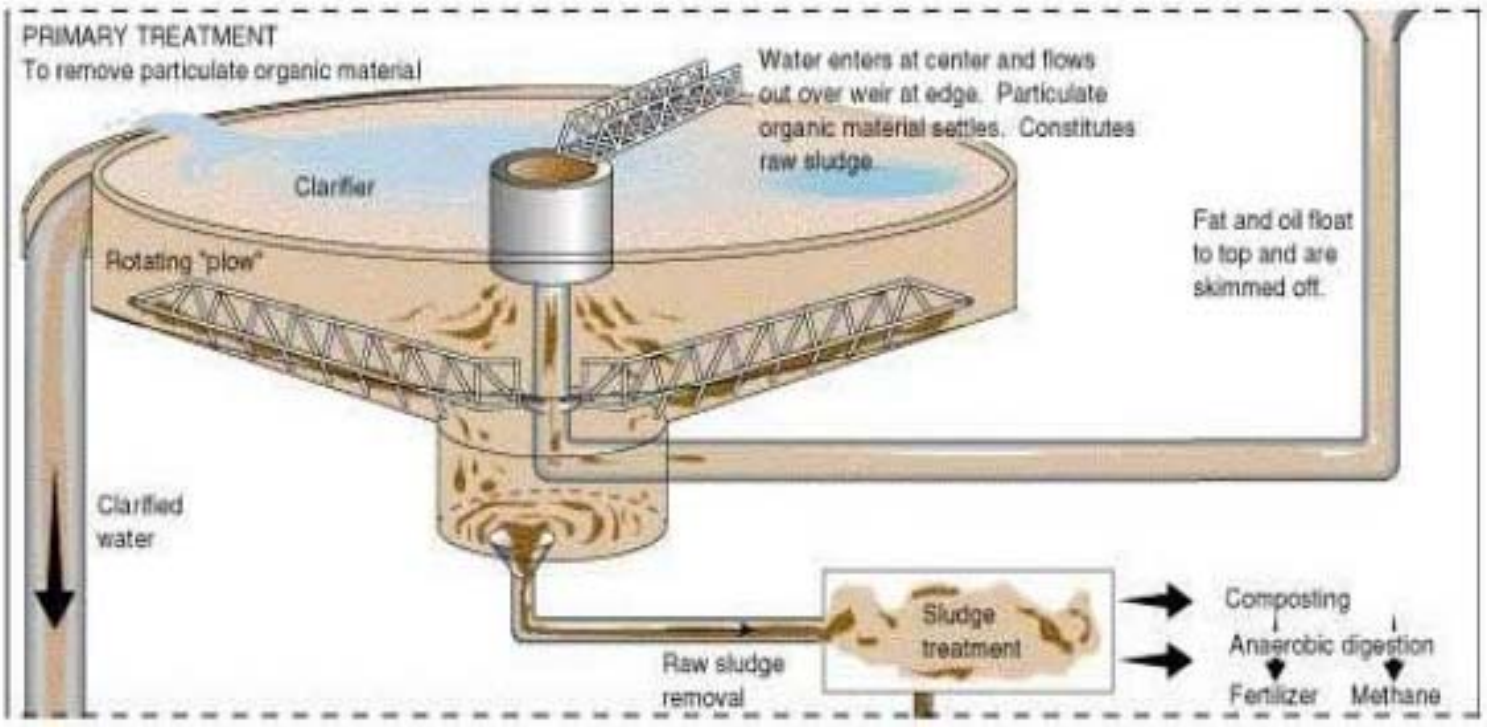
The preliminary treatment process consists of the following:

- **screening**
- **grit chamber**
- **floatation units**
- **skimming tanks**

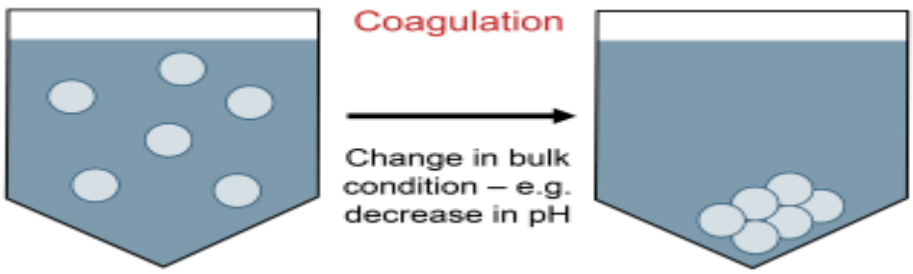


Primary Treatment Process

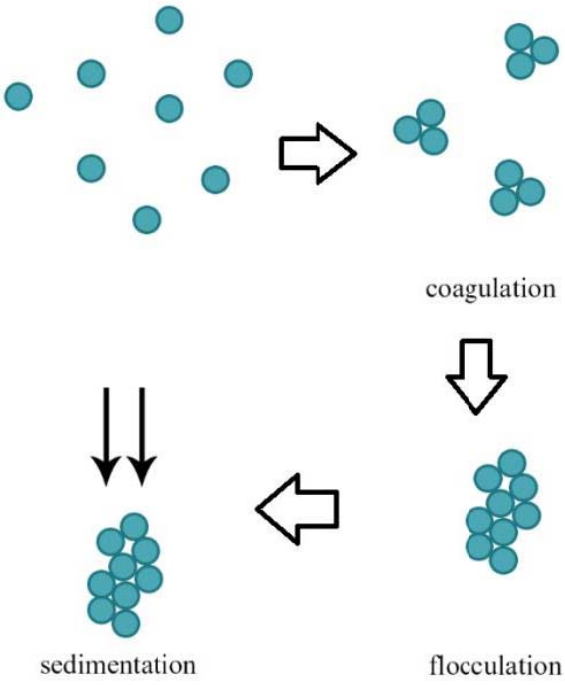
The primary treatment process consists of the following:
a) Sedimentation tank - primary settling tank

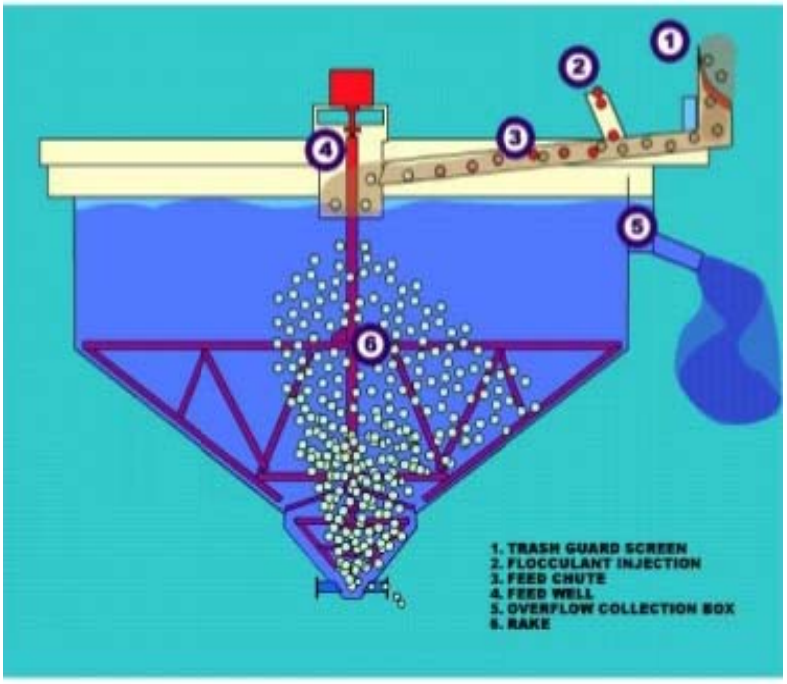


b) Coagulation - secondary settling tank



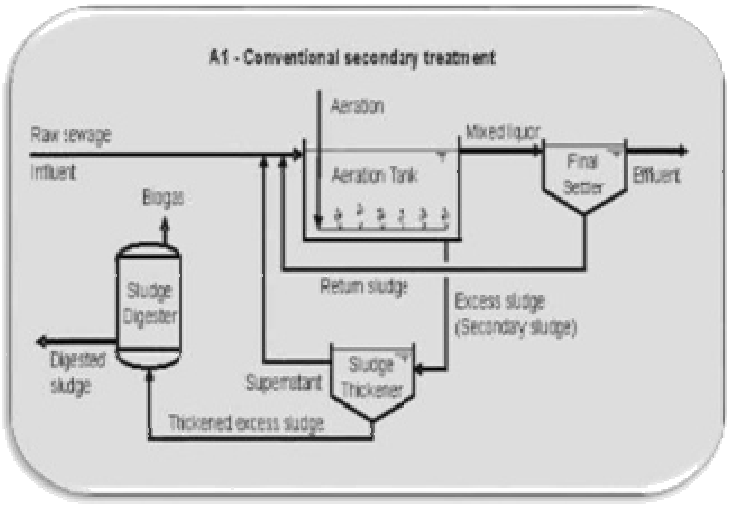
c) Flocculation

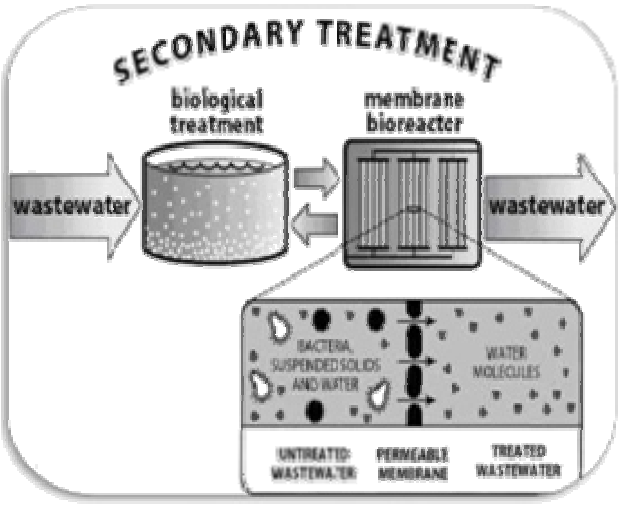


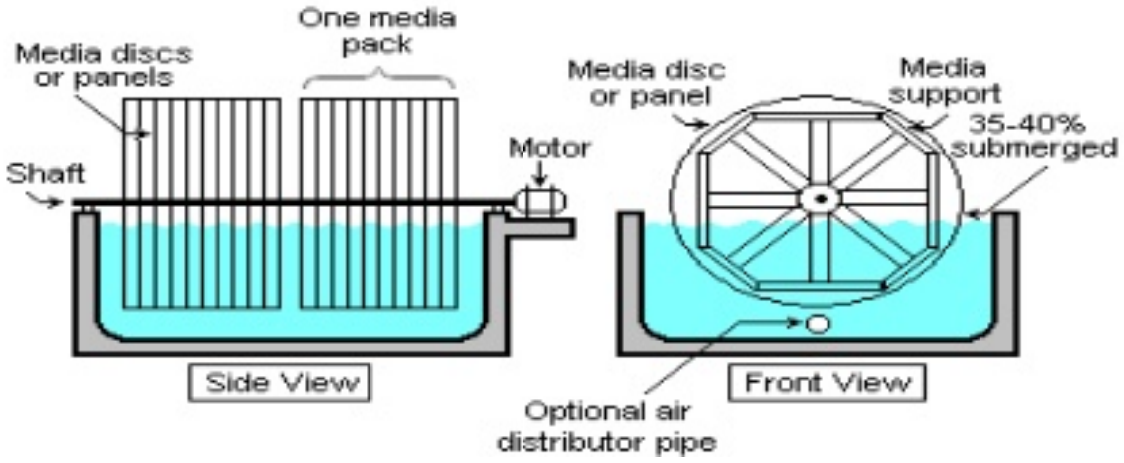


Common high-rate processes include:

- **Trickling Filters or Bio Filters**
- **Rotating Biological Contactors (RBC)**







Primary Treatment Process

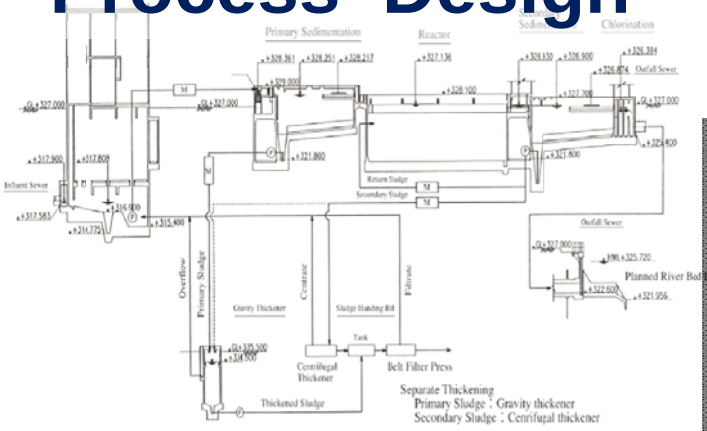
Tertiary and/or advanced waste water treatment is employed when specific wastewater constituents which cannot be removed by secondary treatment, must be removed.

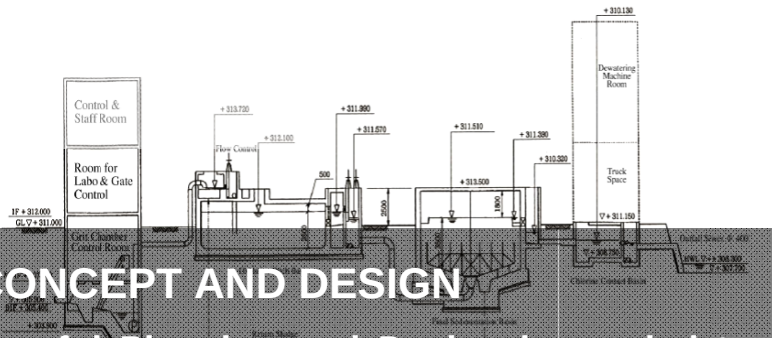
Individual treatment processes are necessary to remove nitrogen, phosphorus, additional suspended solids, refractory organics, heavy metals and dissolved solids.

Tertiary treatments processes are:

- **De-chlorination and disinfection**
- **Reverse Osmosis**
- **Ion Exchange**

Process Design





CONCEPT AND DESIGN

Careful Planning and Design is needed to ensure that each and every treatment process achieves its intended target, and is capable of transforming the entire flow of influent (incoming waste flow) quality into a pre-determined effluent.

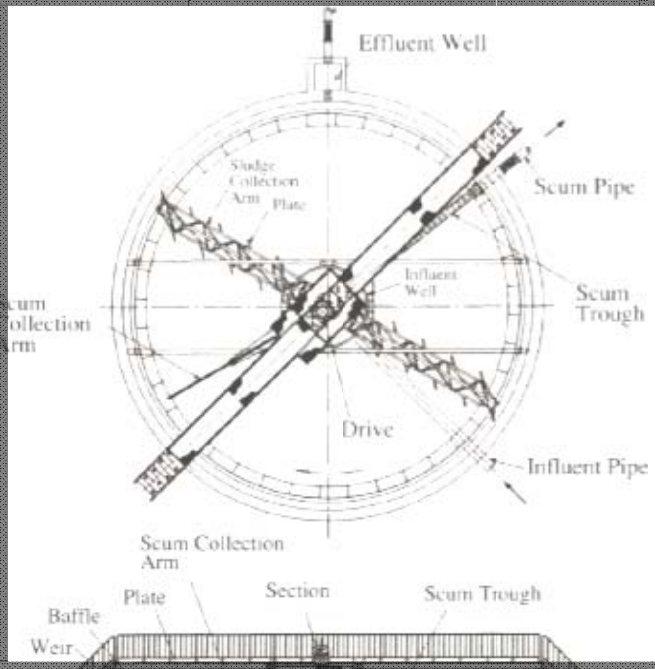
Detailed Calculations are performed according to the following criteria:

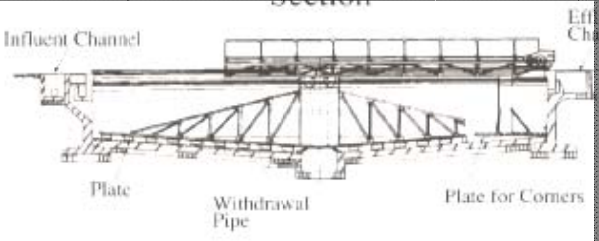
- Population and Population Growth Rate

- Intended Capacity and Allowance for Future Expansion

- Influent wastewater quality and the desired level of treatment (usually related to the intended use of the treated water)

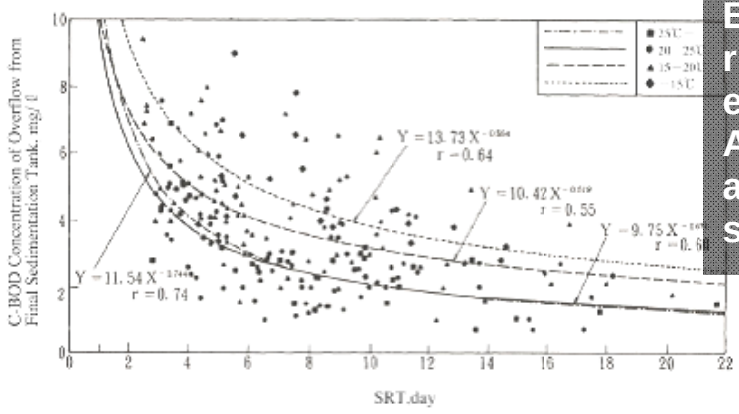
- Internationally recognized codes and standards, as well as engineering and modeling calculations as required for each treatment phase.

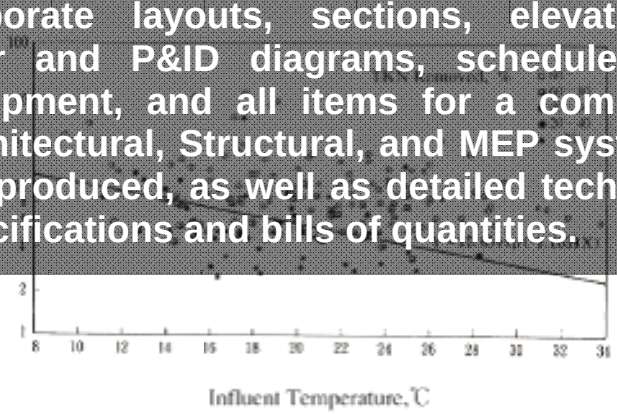




The construction details of each treatment phase structures and elements are developed accordingly, and arranged to each site according to the available allocated plot.

Elaborate layouts, sections, elevations, riser and P&ID diagrams, schedules of equipment, and all items for a complete Architectural, Structural, and MEP systems are produced, as well as detailed technical specifications and bills of quantities.

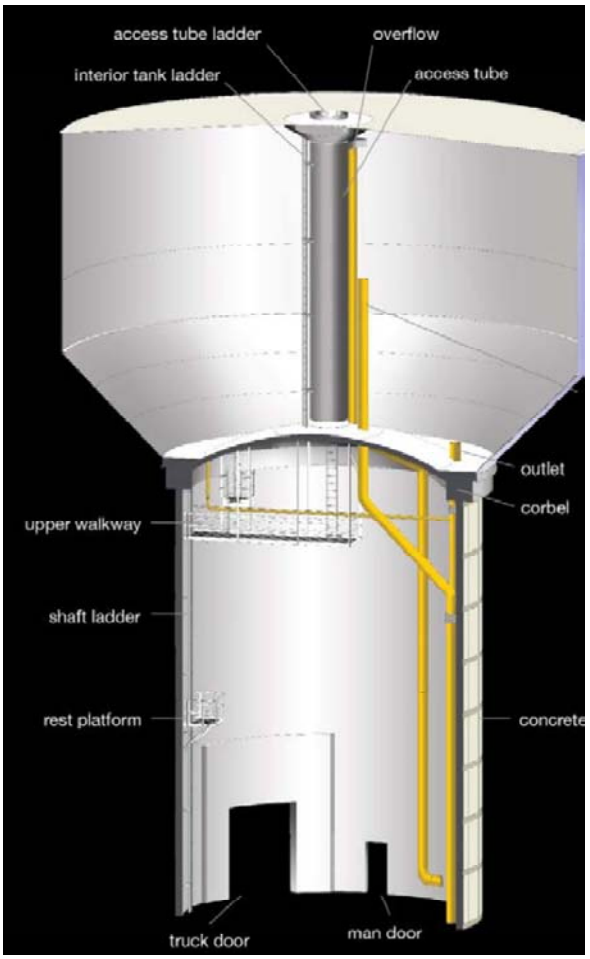




Structural Analysis and Design

The structural analysis and design of the water and wastewater network components is done using the latest edition of Autodesk ROBOT structural analysis professional and CSI ETABS / SAFE, and is according to the latest versions of international codes and standards (Such as: American Concrete Institute ACI, Euro-codes, and other local codes and norms).
The structural components include the following:

- **Underground circular and rectangular water tanks**
- **Elevated water towers**
- **Sump pits**
- **Manholes**
- **Trenches and catch basins**
- **Water treatment plants**
- **Sewage treatment plants**
- **Pipe and services encasements**
- **Culverts**



Projects


AKKAR
WWTP,
North,
Lebanon.
300,000 cu.m. / day


WEST BEKAA
WWTP,
Bekaa,
Lebanon.
150,000 cu.m. / day

Projects *(...continued)*

AREEJ URBAN DEVELOPMENT,

Water & Wastewater Infrastructure and treatment.

Tyr, Lebanon.

500 cu.m. / day

KSARA WWTP

with Water and Wastewater Infrastructure

Bekaa, Lebanon.

250,000 cu.m. / day

Projects *(...continued)*

LUWANDA WWTP

Angola

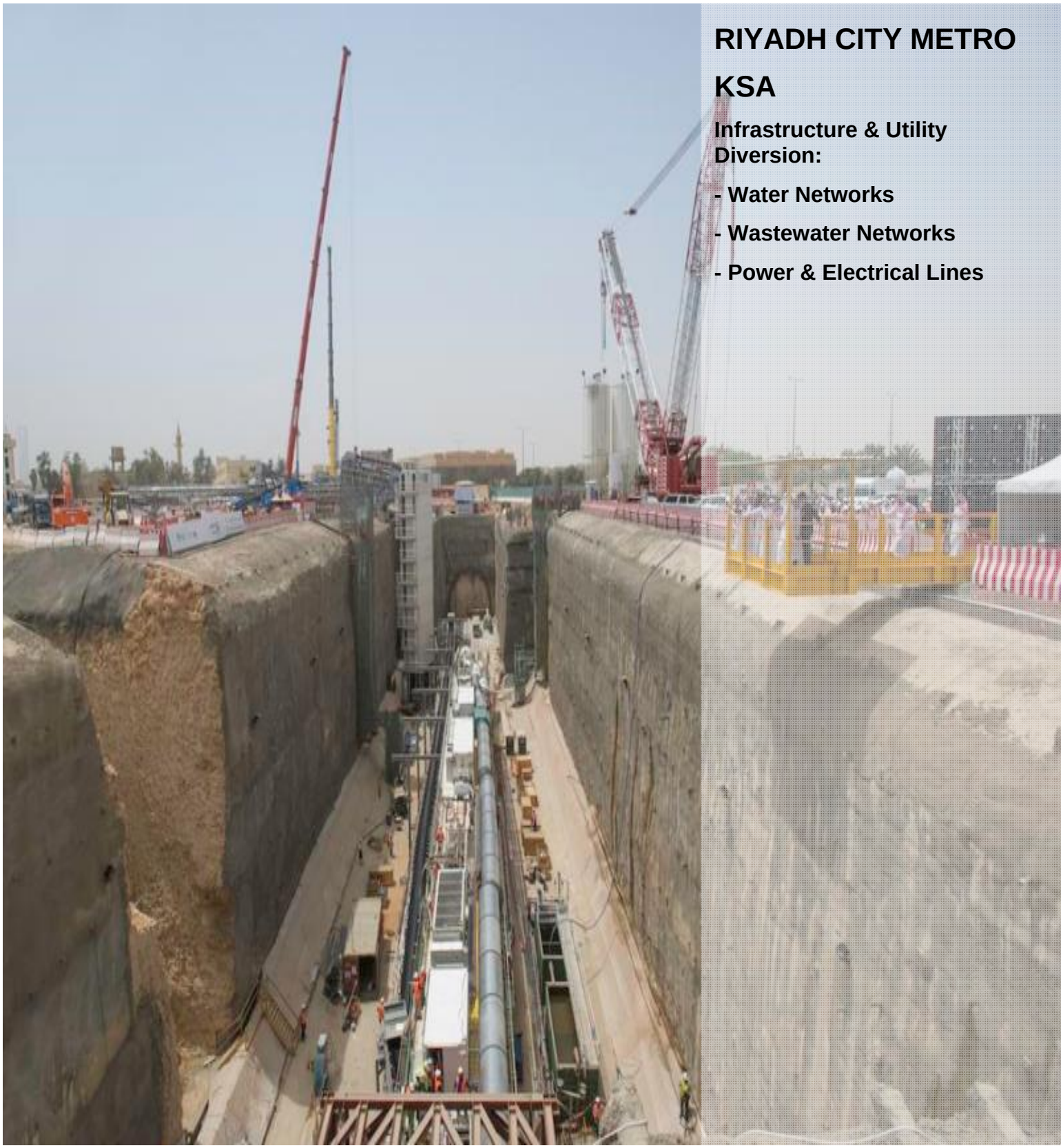
600,000 cu.m. / day

BIE WWTP

Angola

500,000 cu.m. / day

Projects *(...continued)*



RIYADH CITY METRO

KSA

Infrastructure & Utility Diversion:

- Water Networks

- Wastewater Networks

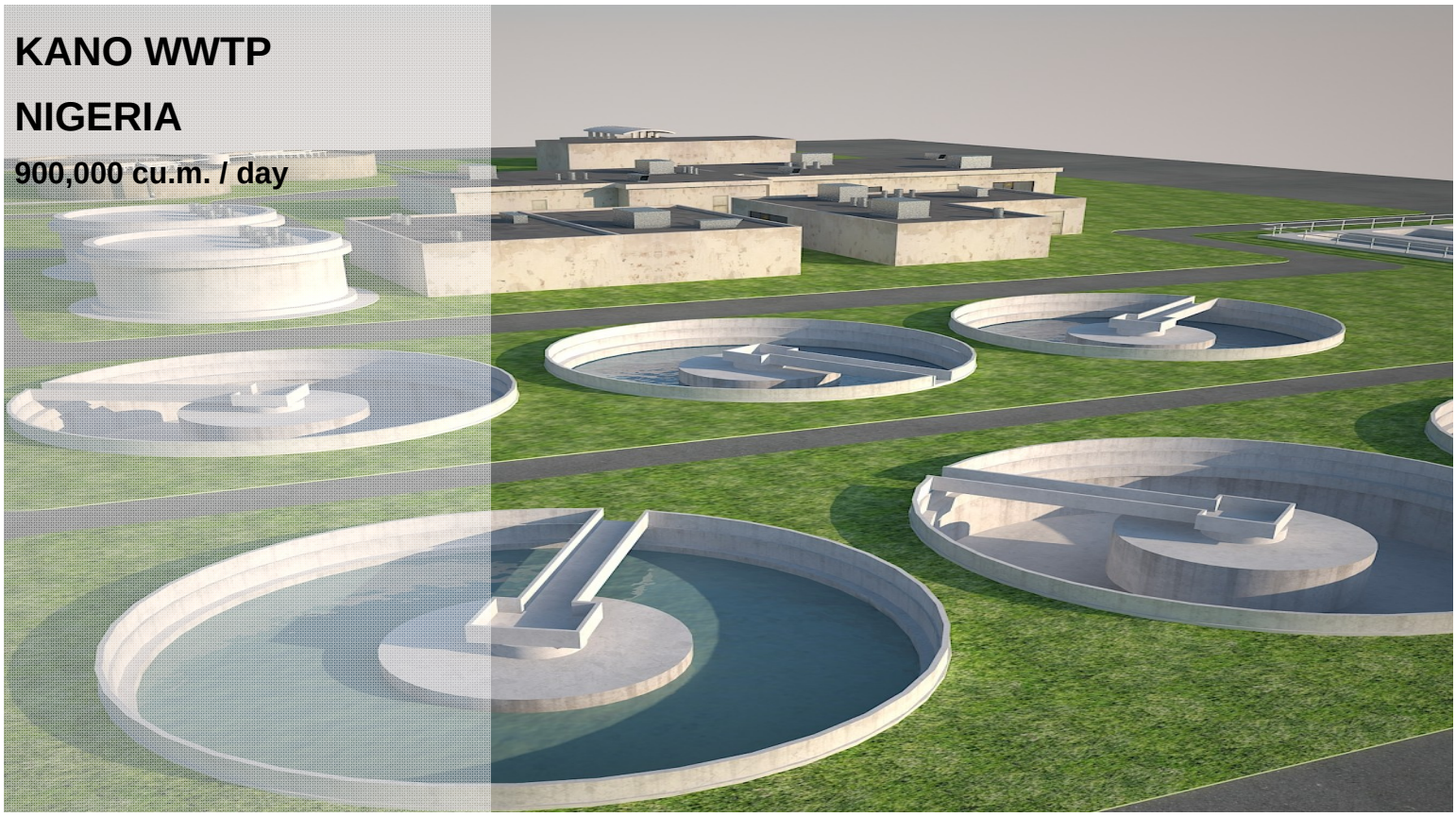
- Power & Electrical Lines

Projects *(...continued)*

ERBIL WWTP

IRAQ

500,000 cu.m. / day



KANO WWTP

NIGERIA

900,000 cu.m. / day

Projects *(...continued)*

JANNAT DEVELOPMENT

Karbala', Iraq

Full Infrastructure Solution:

- Water network
- Wastewater network
- Fire Fighting
- Irrigation
- Water Treatment
- Wastewater Treatment
- Power Distribution & Electrical Lines

DIRIYYA VALLEY

Riyadh, KSA

- Water & Irrigation Networks
- Wastewater Network
- Power & Electrical Lines
- Wastewater Treatment

SERVICES DESIGN TECHNOLOGY International

About SDT

SDT international was established in 1991as an engineering consultancy company that provides comprehensive range of services in the Structural, Mechanical, Electrical, Infrastructure, Environmental and Plumbing design.

For the past 26 years, we have been a pioneering force in the planning, design and implementation of development projects in the Middle East, UK and Australia.

With six offices in six countries, we employ high caliber specialized engineers capable to apply innovative approaches to design and deliver practical and cost effective solutions.

UK . Lebanon . KSA . Qatar . Dubai . Australia

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