WE WORK FOR YOUR WELL-BEING

REVERSE OSMOSIS

IN THE WATER DISTRIBUTION NETWORK

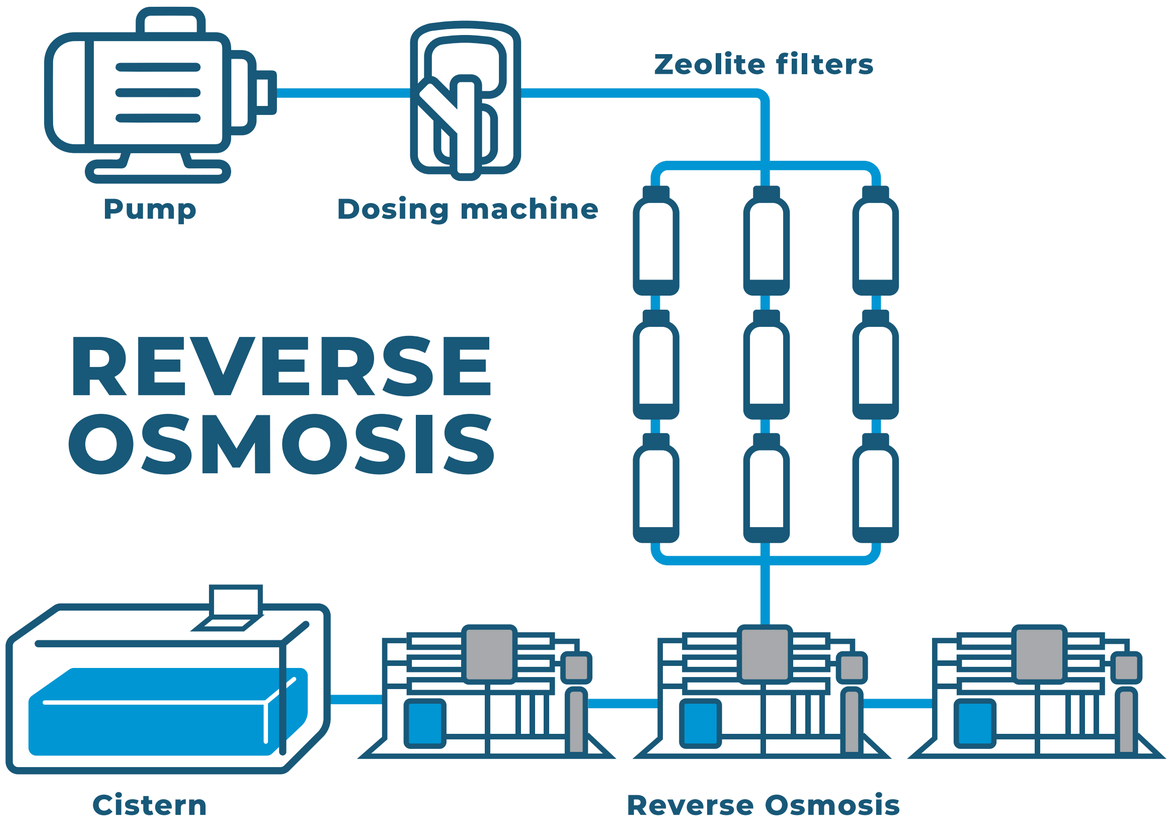
Work to be carried out in pipe replacement

PROJECT OBJECTIVE:

Supply of water treatment systems through membrane filtration with reverse osmosis for water supply in the residential area of Puerto Aventuras.

DEALING WITH WATER DESALINATION AND REUSE ARE VITAL CONSIDERATIONS IN THE FACE OF THE SCARCITY OF THIS PRECIOUS RESOURCE OR LIMITED ACCESS TO IT. AT THE SAME TIME, THEY EMERGE AS THE BEST BET FOR THE IMMINENT FUTURE OF A PLANET THAT REQUIRES DRASTIC SOLUTIONS TO HARMONIZE TOMORROW.

For this reason, three reverse osmosis units will be installed to supply water in the residential area of Puerto Aventuras. Additionally, the replacement of all pipes distributing this water resource will be carried out in phases, complying with applicable regulations in both the water distribution network replacement and reverse osmosis fields. This will be achieved through the integration of desalination technologies, water and effluent treatment, ensuring access to water and social well-being. The project is estimated to be completed within a three-year period, implementing it in a modular fashion to cause minimal inconvenience to users. The installation of purified water dispensers at specific points throughout the development is also considered, allowing all users, including pets, to access quality water in common areas.



This investment focuses on pillars of environmental respect and sustainability, providing direct benefits to users. Reverse osmosis stands out as one of the most effective ways to remove water contaminants, such as chemicals, bacteria, and pathogenic microorganisms that could cause diseases. These benefits encompass both quantitative and qualitative aspects:

BENEFITS

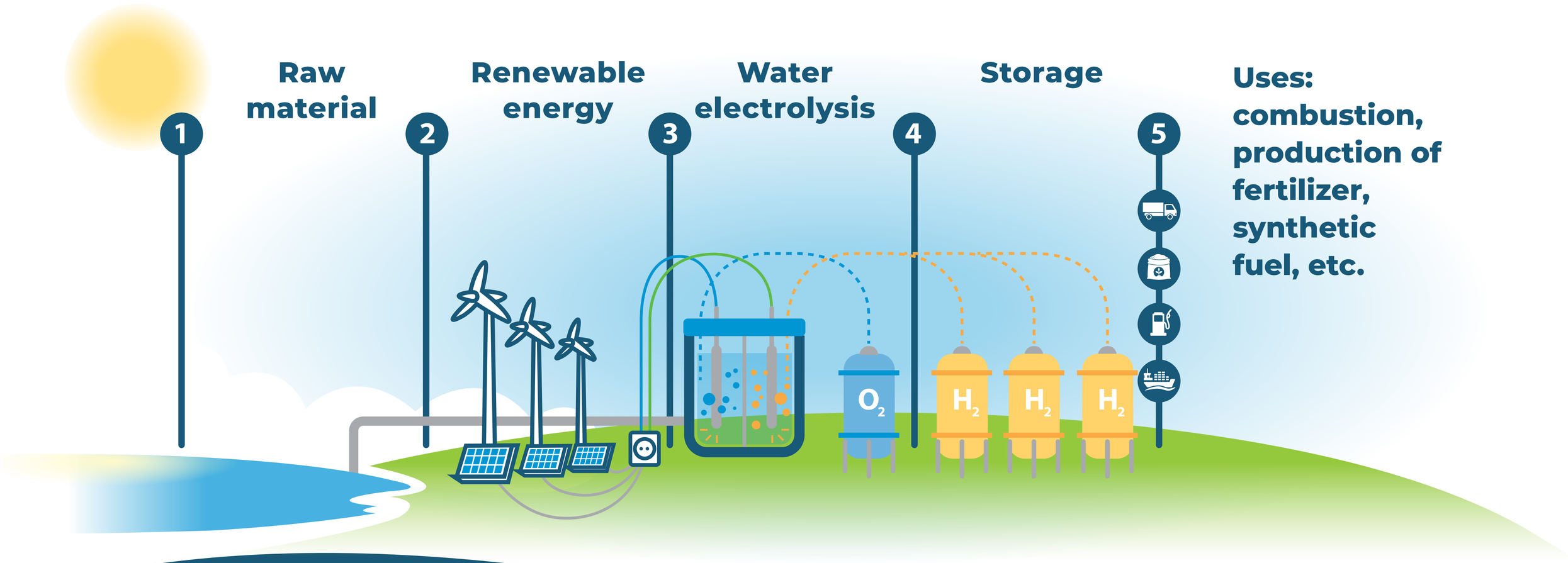
- REMOVES LEAD FROM WATER
- ELIMINATES PARASITES AND BACTERIA
- REDUCES SODIUM LEVELS
- REMOVES HARMFUL MOLECULES FOR THE BODY

PROLONGS THE USEFUL LIFE OF:

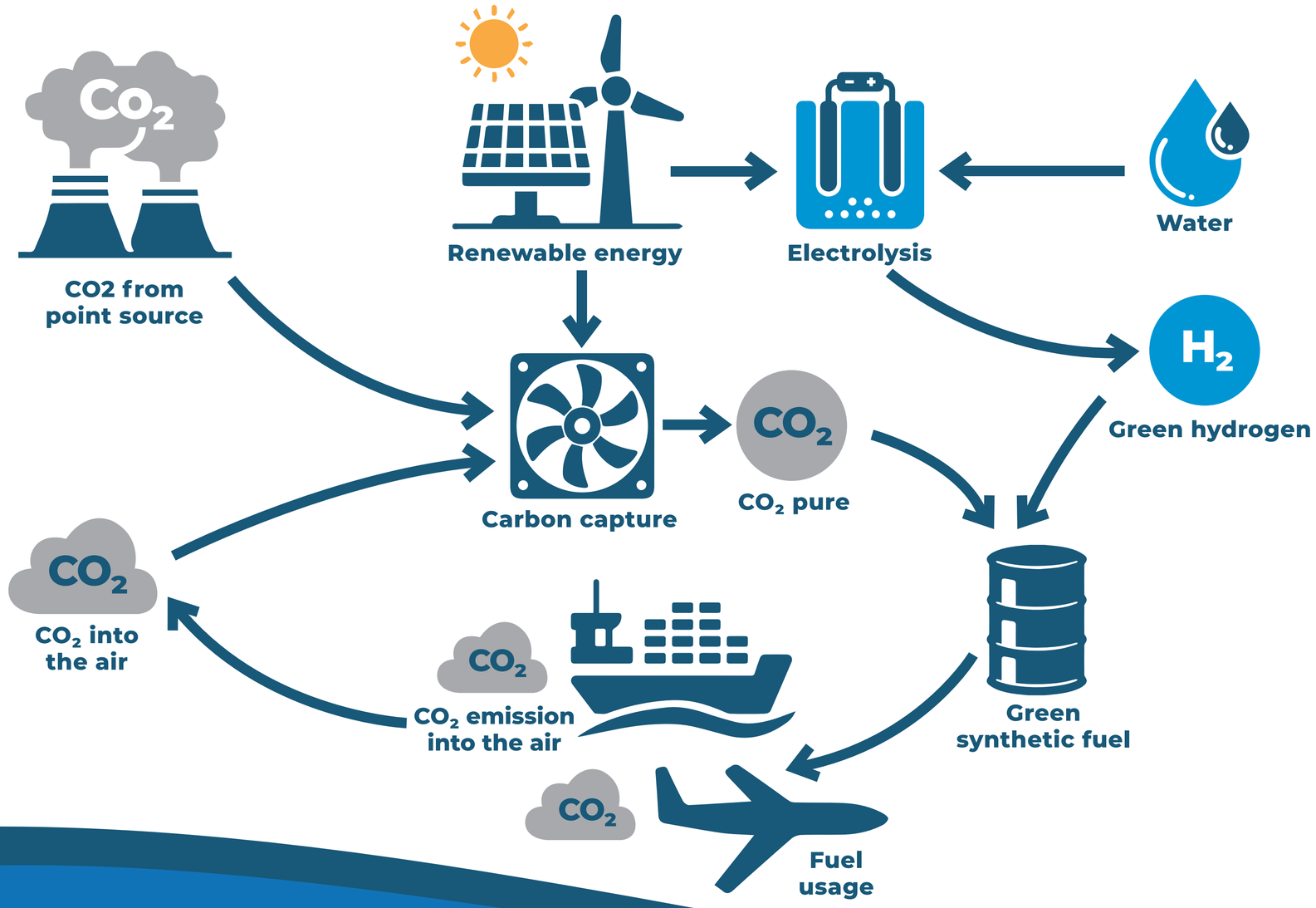
- PIPES
- CLOTHING
- HYDRAULIC EQUIPMENT
- APPLIANCES

MAINTENANCE

- SAVINGS ON SWIMMING POOL SUPPLIES
- ELIMINATES WATER-BORNE MICROORGANISMS
- REDUCES CLEANING AND WATER USAGE IN RINSING
- STAIN-FREE ON SMOOTH SURFACES AFTER WASHING



CHAIN OF GREEN H2 VALUE



APPLICATIONS OF GREEN H2

	CURRENT CONSEQUENCES	BENEFITS OF OSMOSIS	APPROXIMATE QUANTIFICATION
TTS	• Salty or bitter taste. • Intense corrosion in metal fittings. • Irritation in the skin, eyes, and lips. • Dryness of the scalp.	• Water is tasteless. • Metal fittings have a longer lifespan. • Hydration of the skin, eyes, and lips. • Improves scalp moisturization (slowing hair loss).	• Savings on the replacement of faucets, showers, sinks, and metal pipes: $3,100 to $5,900. • Also, in the replacement of electrical equipment such as dishwashers, dryers, washing machines, and water pumps: $10,000 to $15,000. • Longer durability of clothing.
TOTAL HARDNESS	• Obstruction in pipes and fittings. • When heated, it produces scale. • Lower efficiency and frequent breakdowns in appliances, such as washing machines and dishwashers. • Increased consumption in pools. • Increased consumption of detergents, soap, and shampoo.	• Does not cause blockages in pipes or damage to fittings. • Does not lead to calcifications. • Detergents dissolve more easily. • May prevent skin irritation. • Leaves no stains on smooth surfaces when washed, for example, in car washing, glass, aluminum, etc. • Savings on supplies in pool maintenance. • Savings on cleaning supplies and water, as a lesser amount is required during rinsing.	• Savings on the purchase of water softeners, with costs ranging from $8,900 to $11,200. • Savings on the maintenance of water softeners, from $4,000 to $8,000. • Savings on the supply of salt for equipment, with an estimated cost of $276 MXN per 20 kilograms.
MICROBIAL CONTAMINATION	• In the future, due to urban proliferation in surrounding areas, the water table could be contaminated.	• Eliminates contaminating microorganisms that may exist in the water and could increase over time.	• Minimizes the risk of contracting skin and gastrointestinal diseases.

PARAMETERS OF THE WATER TO BE DELIVERED

PARAMETERS	UNIT	MAXIMUM PERMISSIBLE LIMIT NOM-127-SSA1-2021	CONDITIONS WITH OSMOSIS
PH	Range	6.5 a 8.5	7.0
TSS	mg/l	1,000.0	920
Total Hardness	mg/l	500.0	430
Nitrate (NO3)	mg/l	11.0	5.0
Chlorides (Cl)	mg/l	250.0	200.0
Sulfur Oxide (SO4)	mg/l	400.0	380.0
Sodium (Na)	mg/l	200.0	100.0

PHASES OF THE PROJECT

Stage 1 (Plan 3- 4)	A desalination plant with an installed capacity of 1,000 m3/day of brackish water will be installed, scalable up to an additional 25% of its installed capacity. It will be supplied with well water with the goal of obtaining water that complies with the Mexican Official Standard NOM 127-SSA-1. Regarding the distribution of potable water, the rehabilitation of pipelines in plan 3 will commence, and inspections will be carried out to determine the need for rehabilitation of the pipelines in plan 4.	1
Stage 2 (Plan 1- 2)	Another desalination plant with an installed capacity of 1,200 m3/day of brackish water will be installed, with the possibility of expanding up to an additional 25% of its installed capacity. The desalination plant will be supplied with well water to meet the standards of NOM 127-SSA-1. Concerning the distribution of potable water, the rehabilitation of pipelines in plans 1 and 2 will be initiated.	2
Stage 3 (Plan 6)	A desalination plant with an installed capacity of 200 m3/day of brackish water will be installed, with the possibility of scaling up to an additional 25% of its installed capacity. The desalination plant will be supplied with well water to ensure compliance with the Mexican Official Standard NOM 127-SSA-1. Regarding the distribution of potable water, the rehabilitation of pipelines corresponding to plan 6 will begin.	3
Stage 4 (Plan 4)	In case of an increase in water demand due to higher housing density, the installed capacity in this plan will be expanded by an additional 1,000 m3/day of brackish water, ensuring that the obtained water complies with the Mexican Official Standard NOM 127-SSA-1 for human consumption.	4

*These consumptions may vary according to the complex's requirements and can be projected on an annual basis.

TASKS FOR PIPE REPLACEMENT

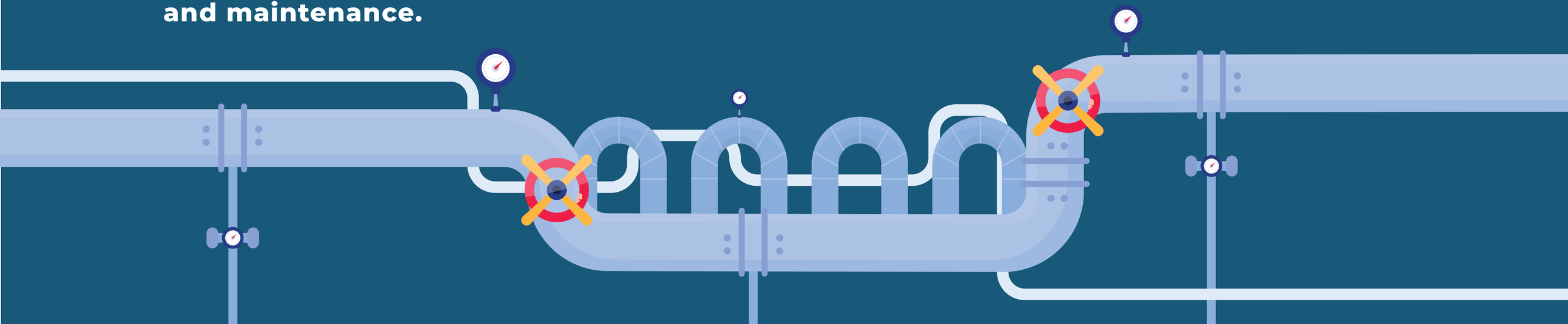
For the Execution of the Work entitled: Pipe Replacement, the procedure for the project work will be as follows:

- Boreholes
- Street Cutting
- Excavation with Equipment
- Installation of Pipes and Household Connections
- Backfilling
- Replacement of Concrete

IMPORTANT CONSIDERATIONS

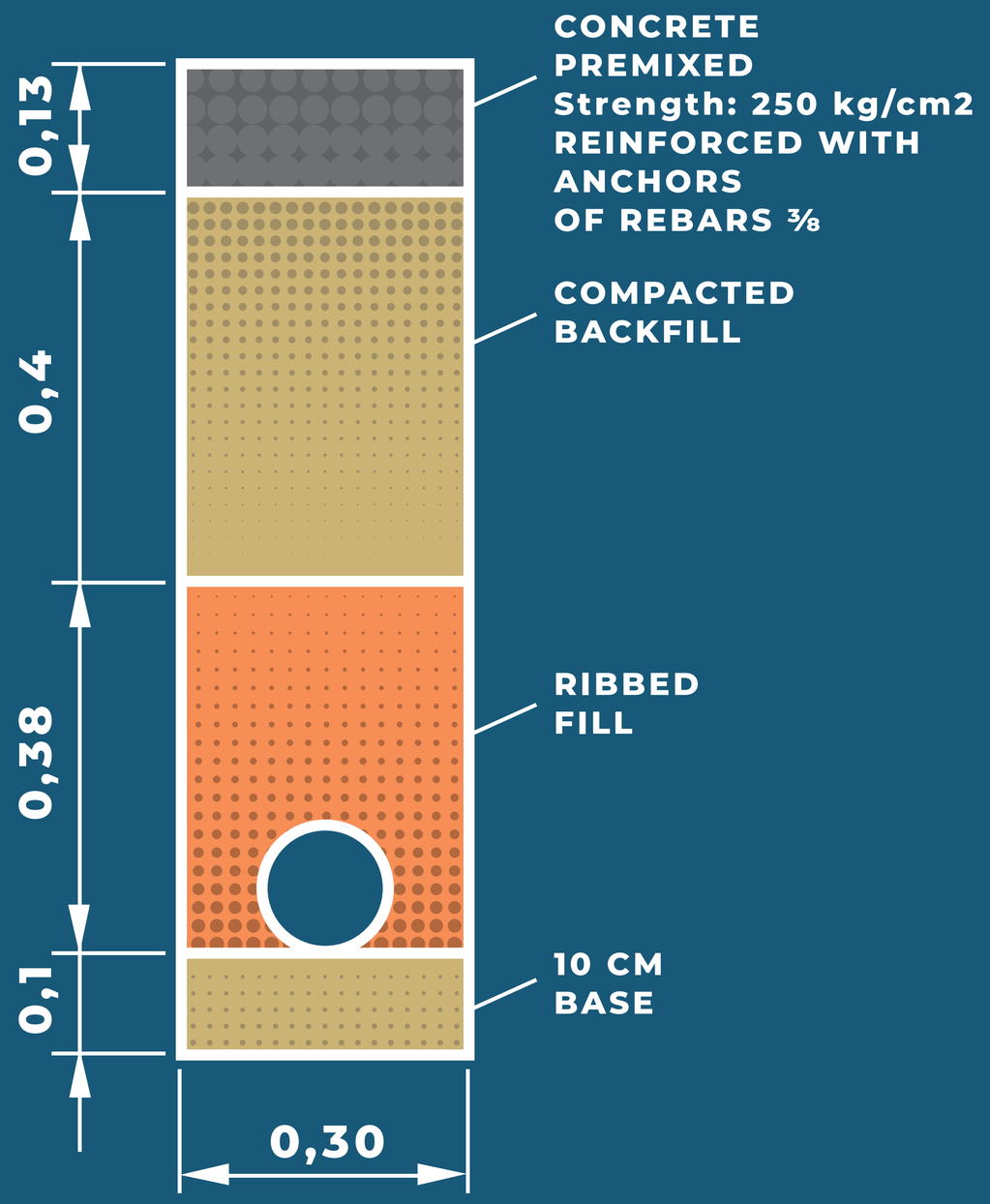
Adhering to the guidelines established in the current standards (NOM-013-CONAGUA-2000. Drinking Water Distribution Networks - Tightness Specifications and Test Methods), where it is mentioned:

The distribution network is the part of a Water Supply System composed of feeding pipe(s), circuits, open lines, and accessories installed in the streets of the localities. It is through this network that water is delivered to household connections for distribution to users. Its proper functioning depends on a suitable design, careful selection of materials, skilled labor for installation, strict adherence to construction specifications, proper supervision of construction execution, and efficient operation and maintenance.



The lack of attention to the aforementioned aspects results in the lack of tightness in the distribution networks, which can lead to leaks and the introduction of other fluids into the water distribution pipelines, such as hydrocarbons, oils, greases, and wastewater, among others. This contamination compromises the quality of the water distributed to the service users.

To prevent sinkholes in the excavations of the trenches, the following procedure will be followed.



THE WORKS ARE DETAILED AS FOLLOWS

- Boreholes for detecting sanitary drainage, electricity, telecommunication, or other types of ducts. Includes: concrete cutting, excavation with mechanical means, manual removal of material type B with dimensions of 80x80x100 cm, backfilling, labor, and tools.
- Cutting of pavement or concrete up to 5 cm thick, using mechanical means. Includes: disc cutter, labor, tools, and equipment.
- Demolition with an electric breaker for concrete floor or stamped hydraulic pavement with variable thickness. Includes: marking the surface to be demolished, equipment, labor, and tools.
- Hauling in a dump truck of material resulting from excavation to an assigned location. Includes: manual loading.
- Excavation of trenches from 0.00 to 1.10 m deep, of any type of material in a dry state, with a width of 50 cm, using a disc trencher. Includes: labor, tools, and equipment.
- 10 cm base with selected material from excavation. Includes: refining, screening, compaction, supply and application of water, material, labor, and tools.

Supply, installation, and jointing of hydraulic PVC pipe with a diameter of 2-1/2", RD 32.5, S.I. Includes: consumable materials, labor, freight, hauling, warehouse-to-worksite maneuvers, tools, and equipment.

Compacted ribbed backfill by manual or mechanical means in trenches, using material from excavation, up to 30 cm above the pipe, in layers not exceeding 20 cm. Includes: materials, labor, tools, and equipment.
Backfill in trenches with material from excavation compacted in 20 cm layers, using mechanical equipment. Includes: hauling and application of water, materials, labor, tools, and equipment.

Partial hydrostatic testing of 2-1/2" diameter hydraulic PVC pipe, RD-32.5. Includes consumable materials, labor, freight, warehouse-to-worksite maneuvers, machinery, equipment, and tools.

Replacement of stamped concrete floor with a thickness of 12 cm, pre-mixed f'c=200 kg/cm², anti-slip stamped finish as shown in the field, direct shot placement, vibration, expansion joint cuts where necessary, and caulking in 2.00 x 2.00 m modules. Approximately, integral colorant, final finish with acrylic sealer. Includes: materials, waste, labor, tools, and equipment.
Temporary signaling with plastic caution tape with the legend "danger" in red, with concrete deadmen and PVC pipes. Includes material supply, installation, labor, and tools.

Placement of preventive signs for the protection of works, 57x178 cm in any type of engineering-grade reflective material and screen-printed with the "men working" or "machinery working" or "lane reduction" logo, or obstacles on the street. Includes sign supply.

Water Drainage: Pumping of dewatering with self-priming 4-inch gasoline-powered water pumps, hoses for suction and discharge with threaded couplings, metal clamps, with a capacity of 80 l/min. Includes: transportation of the equipment to the site of use, operation, personal protective equipment, signaling, rough cleaning of the worksite, and everything necessary for its proper execution.

HOUSE CONNECTIONS

Cutting of pavement or concrete up to 5 cm thick, using mechanical means. Includes: disc cutter, labor, tools, and equipment.
Demolition with an electric breaker for concrete floor or stamped hydraulic pavement with variable thickness. Includes: marking the surface to be demolished, equipment, labor, and tools.
Hauling in a dump truck of material resulting from excavation to an assigned location. Includes: manual loading.

Excavation of trenches from 0.00 to 0.60 m deep, any type of material in a dry state, with a width of 30 cm, using manual means. Includes: labor, tools, and equipment.
Supply and installation of treated HDPE pipe of 3/4" (5.00 m), with a 3" x 1/2" clamp to the meter box. Includes: consumable materials, labor, and tools.

Replacement of concrete sidewalk with a thickness of 10 cm, using pre-mixed concrete with a strength of f'c=200 kg/cm2. The finish will match the sample provided in the field, with pouring done directly on-site, followed by vibration and the creation of expansion joint cuts where necessary. The service includes materials, waste management, labor, tools, and equipment.

BYPASS FROM OSMOSIS TO 8" NETWORK

INSTALLATION OF 8" PIPE FOR BYPASS FROM OSMOSIS TO 8" NETWORK

Boreholes for detecting sanitary drainage, electricity, telecommunication, or other ducts. Includes: concrete cutting, excavation with mechanical means, manual removal of material type B with dimensions of 80x80x100 cm, backfilling of the pit, labor, and tools.

Cutting of pavement or concrete up to 5 cm thick using mechanical means. Includes: disc cutter, labor, tools, and equipment.

Demolition of concrete floor or stamped hydraulic pavement using an electric breaker, with variable thickness. Includes: marking the surface to be demolished, equipment, labor, and tools.
Hauling of excavated material in a dump truck to the assigned location. Includes: manual loading.

Excavation of trenches with depths ranging from 0.00 to 1.10 m, using a disc trencher, for any type of material in a dry state. The width of the trenches will be 50 cm. Includes: labor, tools, and equipment.
Creation of a 10 cm base using selected material from the excavation. Includes: refining, screening, compaction, supply and application of water, material, labor, and tools.

Supply, installation, and jointing of hydraulic PVC pipe with a diameter of 8", RD 32.5, S.I. Includes: consumable materials, labor, freight, hauling, maneuvers from the warehouse to the worksite, tools, and equipment.

Compacted ribbed backfill by manual or mechanical means in trenches, using material resulting from the excavation, up to 30 cm above the top of the pipe, in layers not exceeding 20 cm. Includes: materials, labor, tools, and equipment.

Backfill in trenches with material resulting from the excavation, compacted in 20 cm layers, using mechanical equipment. Includes: hauling and application of water, materials, labor, tools, and equipment. Partial hydrostatic test of 8" diameter hydraulic PVC pipe, RD-32.5. Includes consumable materials, labor, freight, maneuvers from the warehouse to the worksite, machinery, equipment, and tools.

Replacement of stamped concrete floor with a thickness of 12 cm, pre-mixed with a compressive strength of f'c=200 kg/cm2. The finish will be non-slip, following the sample in the field. The pouring will be done directly on-site, followed by vibration, with cuts for expansion joints as necessary, and application of caulking in modules of approximately 2.00 x 2.00 m. Integral colorant will be used, and the final finish will be done with acrylic sealer. The service includes: materials, waste management, labor, tools, and equipment.

Temporary signaling with red plastic caution tape bearing the legend "danger," accompanied by concrete deadmen and PVC pipes. The service includes material supply, installation, labor, and tools.

Placement of a preventive sign for works protection, with dimensions of 57x178 cm, made of any type of engineering-grade reflective material. The printing will include screen printing with the logo of men working, machinery in operation, lane reduction, or obstacles on the street. The service covers the supply of the sign, its transportation, and the labor required for installation.

Water drainage releases: pumping with self-priming 4-inch gasoline-powered water pumps, 8.00 hp, suction and discharge hoses with threaded couplings, metal clamps, with a capacity of 80 l/min. Includes: transportation of the equipment to the utilization site, operation, personal protective equipment, signaling, rough cleaning of the worksite, and everything necessary for its proper execution.

Installation of a junction with an 8"x8" PVC tee, 8" resilient gate valve with stainless steel screws, spigot end gaskets, a bell, and repair couplings. Includes material supply, installation, labor, and tools.

Installation of a chamber for the operation of an adjustable telescope-type valve, ranging from 61 to 92 cm. Includes material supply, installation, labor, and tools.

proyecto azul

THANK YOU because indirectly you are supporting PROYECTO AZUL, as a portion of the profits will go to support water projects for places that lack this water resource.

Una asociacón de GrupoWasser