

# What We Do WATERPROOFING SOLUTIONS.



## CHARLES RIVER DAM PUMP REHABILITATION. NASSAU, BAHAMAS| August, 2023

On the sunny island of New Providence, Bahamas, a wet well for the local water company was experiencing intense infiltration near the water well base due to malfunctioning pumps from the pump station. After injection grouting, infiltration was stopped, and thousands of dollars were saved.

The New Providence Water Development Company (NPWDCo) is a private utility company that provides water and wastewater services to the western side of New Providence Island in the Bahamas. New Providence's population is just over 70% of the entire population of the Bahamas, and is a well-established tourist destination that includes modern luxurious facilities and gated communities. As the population in this corner of the island has continued to grow, so has the need for upgraded infrastructure and more housing developments. In the early 2020s, a new housing development was constructed and an oversized pump station and precast wet well was installed with the knowledge that two more phases of the development are planned, anticipating much higher flows in the future.

### PROBLEM

The precast wet well is approximately 10' ID by 40' deep and is surrounded by a high water table. Shortly after installation, groundwater infiltration began entering the structure through the lower tiered riser joints. Over the span of a couple years, the defect continued to increase in size causing a rise in infiltration volume – up to 120 gallons of water per minute. Due to the size of the structure and high water table, complete replacement or any excavation was going to be extremely expensive, time and labor consuming, and very invasive to the community. NPWDCo and BHM Group tried to form, pour, and set a hydraulic cement block over one of the leaks, but shortly after it also sprung a leak. The team researched technologies and discovered some solutions, but they had trouble finding someone local to complete the work. In their research they came across Connecticut-based Savy & Sons – a full-service contractor specializing in Water & Wastewater Rehabilitation, Coatings & Linings, and Infrastructure Restoration. The Savy Team has over 100 years of combined experience in different aspects of waterproofing and restoration and was just the team for the job. After initial conversations about the wet well, the Savy Team flew to Nassau to assess the problem and quickly generated a game plan to ship equipment, materials, and crews down to the island to begin working on eliminating the groundwater infiltration. Upon mobilizing and entering the wet well, the Savy Team found that four pumps were being used: two pumps from pump trucks, and two from within the wet well – one of which was malfunctioning. The water infiltration was entering the wet well so fast that the three usable pumps could not keep up with dewatering. Once the fourth pump was fixed, the Savy Team was able to pump out 99% of the water infiltration and clean the structure to begin rehabilitation.

### SOLUTION

The Savy Team discussed multiple options with NPWDCo and BHM Group and concluded the best application for this project are injection grouts from Avanti International – a Texas-based injection grout manufacturer. The injection grouts Avanti manufactures are designed to stop leaks, stabilize soil, and control groundwater. After product consideration options, Avanti's AV-275 Soilgrout was chosen for the project. AV-275 Soilgrout is a low viscosity (30-55 cP), moisture activated, polyurethane resin designed to permeate soils and react quickly with moisture to bind together and waterproof loose granular soils, stop high water flows in below-grade structures, and fill voids. Once cured, AV-275 forms a dense, impermeable, rigid soil/grout matrix, withstands wet/dry cycles.

Due to the water infiltration rate being so high, AV-219 Fibrotite – also known as Oakum – was used to pack the defect of the heaviest gusher that was spraying 'water like a fire hose'. This allowed the infiltration to slow enough to allow for a safe work zone.



The Savy Team then proceeded to injection grout at all riser joints, pipe penetrations, and any other weak points to fully seal the structure. The job was comprised of three, twelve-hour days in the middle of August where temperatures were above 110 Fahrenheit. Extra safety precautions were taken due to the heat, especially inside the wet well. The Savy Team injected the wet well with around 30-gallons of AV-275. Due to its low viscosity and expansive nature, AV-275 was able to permeate the soils around the structure and fill any voids creating a waterproof barrier around the wet well.

Prior to injection grouting, it was estimated the 120-gallon a minute infiltration leak in this one wet well was costing NPWDCo around \$235,000 USD per year to treat approximately 62,000,000 gallons of clean groundwater. The Savy Team sealed the structure for around \$100,000 in labor and materials which NPWDCo will see a direct return on in about six months from the time of project completion.