



# Case Study

## Granadilla Water Tank

Ensuring a reliable water supply for communities in Costa Rica

### Background A 20,000m<sup>3</sup> water tank feeding an upstream population

The main aqueduct in Costa Rica is operated by the Costa Rican Institute of Aqueducts and Sewers (AYA). A gravitational distribution water line feeds a 20,000 m<sup>3</sup> water tank – the Granadilla Water Tank - and a second tank of 5,000 m<sup>3</sup> tank, supplying water to a considerable population upstream.

A solution was required to control filling and protect overflow at the main tank, while prioritizing water consumption in the upstream supply-line and preventing pressure-surges when closing. The valve would need to be controlled locally and remotely from the AYA control center.

### Challenges Controlling fill rate and sustaining pressure levels to maintain upstream supply

When the Granadilla tank filled at an uncontrolled rate – (for example, due to heavy rainfall), upstream pressure would drop significantly, to the point that the water supply was insufficient to meet demand, putting the AYA in breach of Costa Rican law.

The specifications of the water tank limited possible valve options - the space available for installation was small, with no space left for an additional flowmeter. So, a single valve was required to both control the rate at which the water tank was filled and sustain the necessary pressure levels to maintain a constant water supply upstream. The valve closing-rate also had to be controlled to avoid water hammer caused by pressure surges. In addition, an old piston-actuated valve previously installed in the system needed to be replaced, as it had a high failure rate.



The old valve is being removed

### Solution A level-control, pressure-sustaining hydraulic valve and flow meter

To meet the various challenges of the Granadilla water tank, the team at A.R.I. – Dorot decided to use a level-control, pressure-sustaining hydraulic valve, with a flow meter incorporated into its upstream port.

A Dorot Series 300 20" \ 500mm valve was installed, providing the following control functions:

- Pressure sustainment
- Delayed-opening (differential) level control, using an altitude-control pilot-valve
- Solenoid-valve for remote-control closure via the SCADA system
- Electro-magnetic insertion flow-meter, calibrated to operate with the valve

When the upstream pressure drops below the required levels, the Dorot valve is automatically modulated to sustain the minimal pressure required to comply with both demand and local regulations, while filling the tank, preventing overflow and maintaining a controlled pace when closing.

### Installation Dorot S300-I-WM-20-AL \ PS \ EL is commissioned



<https://www.youtube.com/watch?v=Qo1h5obRuwo>