

Reinforcing the Backbone of the Pecos

A Low-Impact Drilling Solution for Critical Infrastructure and Environmental Resilience

PROJECT: Red Bluff Reservoir Dam (Rio Grande River Basin)

CLIENT: Confidential Client

LOCATION: Orla, Texas

SERVICE: Sonic Drilling – Multi-Port Sleeve Pipe Installation Support

CHALLENGE

The Red Bluff Reservoir Dam, located along the Pecos River in Orla, Texas, plays a critical role in regional water management, irrigation, and flood control. As the only major reservoir on the Pecos River in Texas, it is vital to agricultural operations and water supply for downstream users in this arid region.

Over time, erosion, aging infrastructure, and seepage through the dam's earthen embankment prompted a full-scale rehabilitation project led by a confidential client. The project's goal is to construct a new grout curtain to control seepage through the dam's foundation and prevent further degradation of this essential structure.

However, the sensitivity of the embankment meant traditional drilling methods could entail unacceptable risks, including damage to the structure or uncontrolled material loss. The client needed a precision drilling solution that would protect the dam while supporting the installation of a subsurface seepage barrier.



SOLUTION

Cascade was brought in to support the foundation rehabilitation using sonic drilling. Cascade's role involved drilling vertically through the embankment and installing Multi-Port Sleeve Pipes (MPSPs) to the top of bedrock. This casing system allows for controlled treatment of discrete zones through post-installed grouting.

Cascade anticipated encountering a mix of caprock, soil-like zones, and bedrock at various depths. To ensure efficient, reliable performance across these variable geologic conditions, the TruSonic™ system was selected as the optimal solution.

The TruSonic™ system offered critical advantages:

- Minimal deviation in variable subsurface conditions.
- Superior sample quality to verify geologic conditions.
- Dry drilling capability, reducing risks to embankment stability.
- Larger tooling diameters, allowing integration of MPSPs and grout barriers without compromising borehole quality.

This approach significantly reduced the risk of embankment disturbance and helped site crews execute their grouting strategy with greater confidence and precision.

PROJECT EXECUTION

The project required the installation of MPSPs across a wide area of the dam, with depths exceeding 110 feet in some locations. Cascade deployed four sonic drilling rigs—truck-mounted and track-mounted—to maximize mobility and efficiency across the site. By utilizing a dual-system setup (6x7 and 7x8 tooling), the team was able to:

- Maintain straight, vertical boreholes even in challenging materials.
- Transition efficiently from shallow to deeper installations.
- Install barrier grout bags and perform tremie grouting in a continuous operation.

To maintain peak production, crews implemented a standardized procedure for borehole alignment, sampling, and standpipe installation. Each rig operated with a dedicated pipe tender and platform technician to ensure continuous support and minimize downtime. No safety incidents or operational delays were reported, and the client expressed high satisfaction with the quality and pace of work.

RESULTS

While the project is ongoing, Cascade's contributions have been instrumental in helping the client advance toward key project milestones. The installed MPSPs have enabled precise, controlled grouting, essential for stabilizing the dam's foundation without compromising the embankment.

This case marks one of the largest grout curtain projects Cascade has supported to date, reinforcing its reputation as the driller of choice for critical dam infrastructure across the United States.

CONCLUSION

Cascade successfully delivered on its commitment to safety, efficiency, and quality at the Red Bluff Reservoir Dam. The sonic drilling and MPSP installation approach not only met the client's technical needs but also supported broader goals for embankment protection and grouting accuracy. With a track record of performance on major high-hazard dams, Cascade continues to lead the way in foundation support solutions for critical infrastructure.

