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DAMS · GEOTECHNICAL

Kerr Dam, Pryor, Oklahoma

DA Smith core drilled through concrete into bedrock inside the lowest level of Kerr Dam's powerhouse near Pryor, Oklahoma.

CLIENTS	LOCATION	YEAR	WORK
Grand River Dam Authority, Oklahoma State University	**Pryor, Oklahoma**	**2021**	**Dams, Geotechnical**

DA Smith completed specialized geotechnical drilling and foundation investigations at the Grand River Dam Authority's US Federal Energy Regulatory Commission-regulated Robert S. Kerr Hydroelectric Dam on the Neosho River at Lake Hudson near Pryor, Oklahoma. The initial program, conducted on behalf of Oklahoma State University, involved PQ3 core drilling from within the lowest level of the dam's powerhouse, extending through mass concrete and into the underlying bedrock foundation. Compact electric-hydraulic drilling equipment was used to operate within the powerhouse's confined working spaces. Borehole permeability testing was performed at selected bedrock intervals using inflatable straddle packers, and the holes were grouted upon completion.

DA Smith returned in 2023 to complete five additional geotechnical borings from surface into the bedrock beneath and surrounding the dam. Vertical and inclined boreholes were advanced through natural and engineered materials using hollow-stem auger and casing advancer methods, followed by PQ3 wireline coring to depths of up to 215 feet. Soil sampling and testing, along with Lugeon water pressure testing, were

conducted at regular intervals to characterize subsurface and foundation conditions.

The investigation presented unusual drilling challenges due to pressurized natural gas encountered in the subsurface. DA Smith developed and deployed a specialized high-pressure gas diverter and blowout preventer (BOP) system that allowed gas to be contained at the borehole collar and safely diverted to a remote discharge location. Personal and remotely operated gas monitors with networked communications provided continuous monitoring and documentation of gas concentrations throughout drilling operations.

Two boreholes were completed with piezometers, while a third incorporated a combined piezometer and packer-isolated gas venting system. Geologic oversight and core logging were provided by Rizzo International, Inc., under subcontract to DA Smith, with downhole geophysical logging performed by Colog, Inc.

The drilling and instrumentation programs were completed safely and efficiently, providing critical geotechnical, hydrogeologic, and gas-related data to support evaluation of the dam's foundation conditions and long-term safety.



