

PROJECT PROFILE

GEOTECHNICAL ENGINEERING SERVICES FOR CORRECTIONAL FACILITY

D'Appolonia provided consulting geotechnical engineering services to Westmoreland County in southwestern Pennsylvania for the planning, design and construction of a \$30 million, multi-story correctional facility. The proposed site of the facility was a reclaimed strip mine with 30 to 40 feet of existing uncontrolled fill consisting primarily of strip mine spoil underlying the planned foundation elevation.

D'Appolonia evaluated various building foundation and retaining wall alternatives considering technical feasibility and construction cost and recommended alternatives for site construction. These recommendations included:

- Reinforced concrete, drilled shaft foundations extending to rock 40 to 60 feet below the ground surface totaling 160 columns with loads as high as 1,000 kips.
- A mechanically stabilized earth (MSE) retaining wall, approximately 22 feet high and 600 feet long, most of which was to be located parallel to and within four feet of the correctional facility building.



Construction of cast-in-place, reinforced concrete drilled shafts through mine spoil and foundation preparation for the MSE retaining wall. Temporary casings were installed through the mine spoil to prevent caving and to facilitate construction and monitoring.

A subsurface exploration and laboratory testing program was conducted for the purpose of evaluating soil and rock strength and mine spoil compressibility and volume expansion potential. Analyses to develop foundation design

parameters and to estimate foundation and retaining wall settlements and lateral deflections were performed. Technical specifications were prepared and design/construction review services were provided for the MSE retaining wall.

Full-time construction monitoring services and periodic engineering consultation were provided during site grading activities, retaining wall construction and foundation installation.

D'Appolonia maintained a full-time staff of engineers and certified technicians at the site to conduct materials testing, data collection, instrumentation, geologic and environmental site hazard exploration, construction monitoring and documentation.

D'Appolonia typically monitors construction of its designs and the designs of others to document that work is conducted in conformance with the intent of the design engineer and is consistent with project plans and specifications.



MSE retaining wall construction immediately adjacent to the building footprint. Casings behind the retaining wall facing were used to isolate drilled shafts for foundation support from the reinforced soil fill and to reduce downdrag forces from mine spoil consolidation.