



PROJECT DESCRIPTION

PROJECT: Orenco Elementary School
LOCATION: Hillsboro, Oregon
DESIGN TEAM: *Architect:* Mahlum Architects
Structural Engineer: KPFF Consulting Engineers
Geotechnical Engineer: David J. Newton, Associates
CONTRACTOR: Lease Crutcher Lewis Contractors



DESCRIPTION:

- Mixed 1- and 2-story classrooms, library and gymnasium
- Column loads up to 100 kips, braced frame footings up to 700 kips, bearing walls up to 4 kips per foot
- Liquefiable soils to 50' below footing grade
- 30" diameter Rammed Aggregate Pier® (RAP) elements to 28' below footing grade

Consideration was given to a rigid mat foundation, 70' long augercast piles, and RAP elements beneath conventional spread footings. The Geopier® System, with an allowable 5000 psf design bearing pressure for spread footings, was selected as the most cost-effective alternative for support of the building columns and walls. A floor slab on-grade was used.

The Geopier system was designed to provide a minimum 90 kip individual pier capacity with no degradation of that capacity due to liquefaction. At each RAP location, the potential for liquefaction was eliminated within a vertical column measuring at least 3½' in diameter and extending for the full depth of each 28' long RAP element. Analyses indicate that the RAP construction greatly reduced liquefaction potential at each pier location within a minimum 8' diameter column. The Owner determined that liquefaction-induced settlements that might occur below the depth of the RAP reinforcement, as estimated by the project geotechnical engineer, would be within acceptable limits. The Owner elected to accept possible floor slab damage due to liquefaction between RAP-reinforced areas.

A total of 274, 30" diameter RAP elements were installed in only 13 working days on-site.

REFERENCES:

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