



## Grain Storage Bins & Rail Facility Northgate, North Dakota

**The installation of the Geopier GP3® system provided an increase in allowable bearing pressure from 2,000 psf to at least 3,000 psf and provided positive total and differential settlement control of the mat foundation**

**Description:** Construction of six 49 foot diameter, 59 foot tall Behlen metal grain bins with 488,000 bushel storage capacity. Maximum mat loading of 2,925 psf and ring wall loading of 12 kips per foot.

**Subsurface Conditions:** Medium stiff, sandy lean clay to a depth of about 18 feet, underlain by stiff to very stiff clay.

**Geopier Solution:** The Geopier GP3® system was selected to avoid overexcavation and replacement of up to nine feet of soil. The installation of Rammed Aggregate Pier® (RAP) elements provided an increase in allowable bearing pressure from 2,000 psf to at least 3,000 psf and provided positive total and differential settlement control of the mat foundation. A total of 242 RAP elements were installed eight feet on center to depths of 8 to 13 feet below the ring wall and slab. The piers were installed in only seven working days on site. The Geopier system provided significant cost savings and schedule advantages as compared to conventional overexcavation and replacement that would otherwise have been required.



### PROJECT TEAM

**Geotechnical Engineer:**  
Zeltinger Geotechnical Budinger & Assoc.

**Structural Engineer:**  
SCAFCP

**General Contractor:**  
The Haskins Company

**Geopier Installer:**  
Peterson Contractors, Inc.

**Geopier Designer:**  
GFC-West