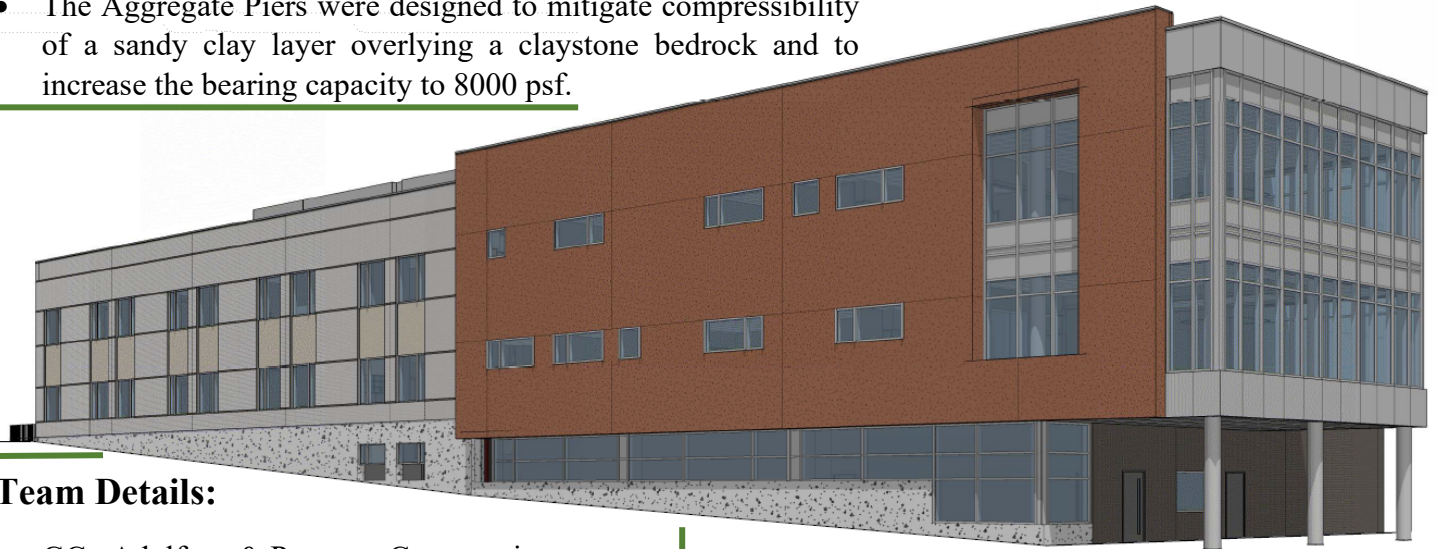


**Project Description:**

The project consisted of a new 3-story rehabilitation hospital located in Englewood, Colorado. Aggregate Piers were proposed in conjunction with the project Geotechnical Engineer as a value engineer alternate to deep foundations. Not only did the piers save on project cost but also on overall schedule.

- 168 Aggregate Piers installed
- The Aggregate Piers were designed to mitigate compressibility of a sandy clay layer overlying a claystone bedrock and to increase the bearing capacity to 8000 psf.



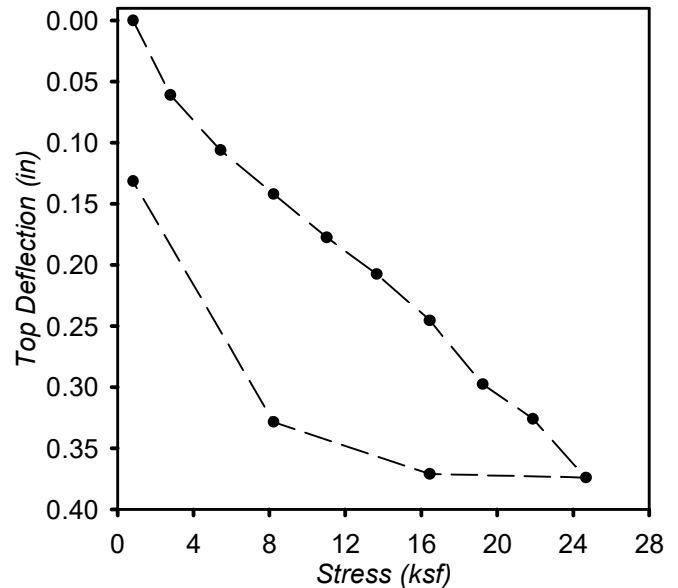
**Team Details:**

- GC– Adolfson & Peterson Construction
- Architect – BSA Life Structures
- Structural – KL&A Engineers & Builders
- Geotechnical – Kumar & Associates, Inc.



One full-scale modulus load test was performed with the following results:

- Design load per pier = 81 kips
- Total settlement at 150% of the design load = 0.37”

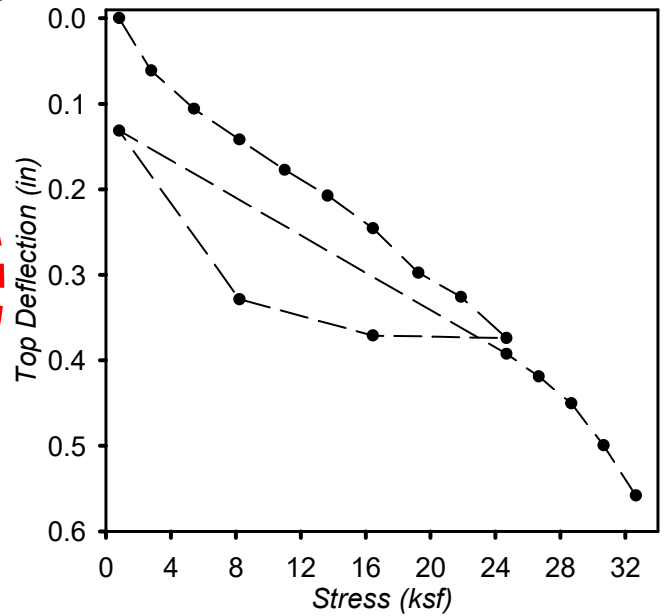
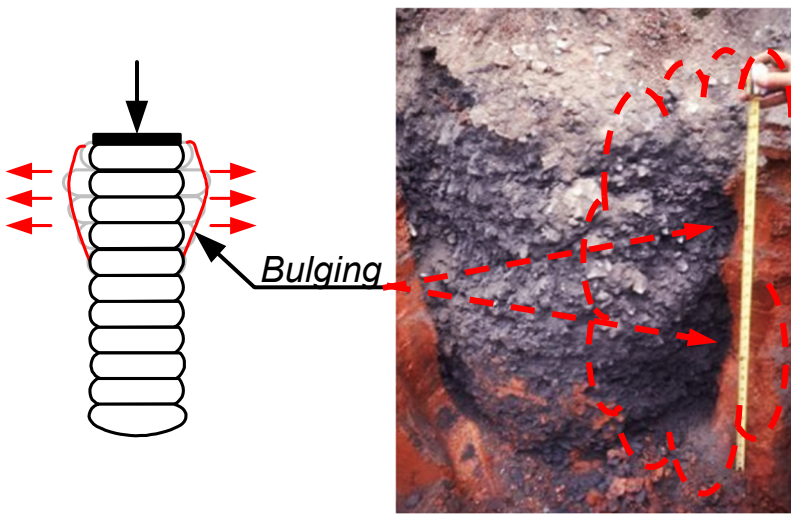


### Loading – unloading cycle load test:

During the execution of the load test, the behavior for one loading cycle was studied. To do this, first a total maximum load of 150% of the design load was applied to the pier. Then, the pier was unloaded down to 5% of the design load, then 200% of the design load was applied.

As shown in the plot below, the response of the aggregate pier was linear up to 28 ksf which is about 175% of the design stress. The change on the slope at this stress percentage means that bulging had just started.

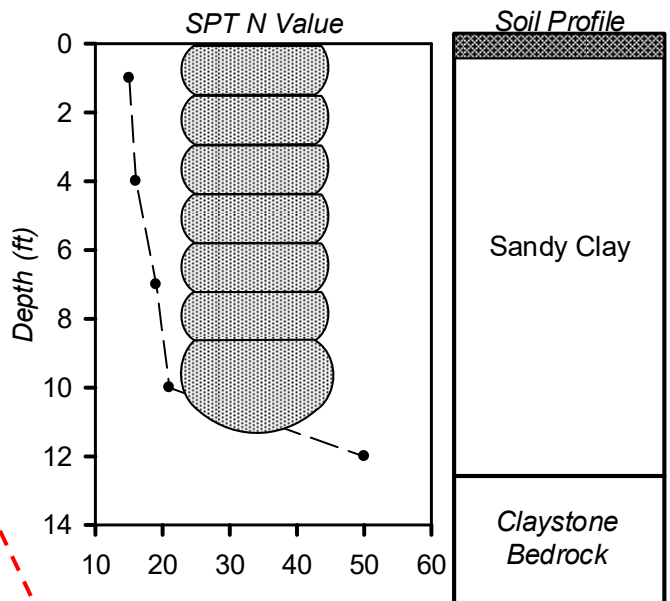
The design settlement was 1” and the maximum measured settlement at 200% of the design load was 0.55”.



### Soil Profile:

The soil profile showed a 10’ thick layer of sandy clay. Below, a dense claystone rock with SPT N values of 50 or more was encountered.

The aggregate pier design was made considering that all the aggregate piers were going to penetrate down into the claystone bedrock.



Spoils from the upper sandy clay layer