

According to John Smith of Wingfoot Rental & Development the pile and cradle system would install at a rate of 40 linear feet of line per week while the lightweight backfill and geosynthetics system installed at a rate of 100 linear feet per week. This provided a significant savings on this project. John estimates that using Haydite on this project provided a savings of \$4.5 million.

General Engineering Properties of Haydite 3/4" to No. 4 Aggregate Grading

Aggregate Property	Measuring Method	Test Method	Commonly Used Specifications for ESCS	Typical Values For Haydite Aggregate	Typical Values For Ordinary Granular Fills
Soundness Loss	Magnesium Sulfate	AASHTO T 104	<30%	<2%	<6 %
Abrasion Resistance	Los Angeles Abrasion	ASTM C 131	<40 %	26.2%	10 - 45%
Chloride Content	Chloride Content of Soils	AASHTO T 291	<100 ppm	18.5 ppm	
Grading	Sieve Analysis	ASTM C 136	3/4 x No.4	3/4 x No.4	
Compacted In-Place Unit Weight (Bulk Density)	Density Test	ASTM D 698 Modified*	<70 lb/ft ³	58.0	100 -130 lbs/ft ³
Stability (Phi Angle, φ)	Triaxial-Consolidated Drained	Corps of Engineers EM 1110-2-1906 Appendix X	35° - 45° +	49°	30° - 38° (fine sand - sand and gravel)
Loose Unit Weight (Bulk Density)	Loose	ASTM C 29	Dry <50 lb/ft ³ Saturated <65 lb/ft ³	46 lb/ft³	89 -105 lb/ft ³
pH	pH Meter	AASHTO T 289	5 - 10	8.8	5 - 10

* Measured by a one point proctor test conducted in accordance with a modified version of ASTM D 698 "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort." Because of the cohesionless nature of coarse lightweight aggregate, the standard shall be modified as follows: The aggregate sample shall be placed in a 0.5 cubic foot bucket at the moisture content that the aggregate will be delivered to the jobsite. The sample shall be placed in three equal layers and compacted by dropping a 5.5 pound rammer from a distance of 12 inches 25 times on each layer.

For Additional Information About Geotechnical and Other Advantages of Expanded Shale