

RESEARCH REPORT

COMPRESSIVE STRENGTH TESTING OF STALITE $\frac{3}{4}$ INCH STRUCTURAL LIGHTWEIGHT AGGREGATE

The purpose of this test is to determine the compressive strength of STALITE $\frac{3}{4}$ inch structural lightweight aggregate for use as it applies to geotechnical applications. The test is designed to determine the actual particle strength of the structural lightweight aggregate. The test is not an indication of the allowable bearing pressure that can be achieved using the aggregate, since such a determination has many variables, which cannot be addressed by this test.

Testing Apparatus:

STALITE'S Quality Control Laboratory constructed a steel box to use for testing the aggregate. The box was constructed of $\frac{1}{2}$ inch steel with welded joints. The inside dimensions of the box were 11 inches wide by 11 inches long by 8 inches tall. The loading plate for the box was constructed of $\frac{3}{4}$ inch steel and had sufficient clearance on all sides as to prevent binding during loading.

Test Method: Compacted Aggregate

STALITE $\frac{3}{4}$ inch structural lightweight aggregate was dried to a constant mass in an oven at 110° C. The material was placed in the steel box and moistened. The material was placed into the box in 3 layers and compacted using a 5.5 lb proctor hammer having 12 inches of fall. The aggregate was compacted similar to ASTM D-698 having 2 blows per in² of surface area. The compacted aggregate was then covered with the loading plate and placed in a Forney calibrated load frame. The load frame was used to load the aggregate to the failure criterion of $\frac{1}{2}$ inch deflection. The $\frac{1}{2}$ inch of deflection was used as the failure criterion, giving a safety factor of 2 for the geotechnical applications.

Test Method: Rodded Aggregate

STALITE $\frac{3}{4}$ inch structural lightweight aggregate was dried to a constant mass in an oven at 110°C . The material was placed in the steel box and moistened. The material was placed into the box in 3 layers and rodded 62 times per layer using a tamping rod. The rodded aggregate was then covered with the loading plate and placed in a Forney calibrated load frame. The load frame was used to load the aggregate to the failure criterion of $\frac{1}{2}$ inch deflection. The $\frac{1}{2}$ inch of deflection was used as the failure criterion, giving a safety factor of 2 for the geotechnical applications.

Test Material Properties:

The STALITE $\frac{3}{4}$ inch structural lightweight aggregate had a SSD specific gravity of 1.45 and a damp loose density of 49.5 pcf. The gradation of the aggregate used was as follows:

Sieve Opening	Percent Passing
1"	100
$\frac{3}{4}$ "	98
$\frac{1}{2}$ "	49
$\frac{3}{8}$ "	24
No. 4	4
No. 8	3

Test Results:

Material	Type	Area	Load	PSF	PSI
$\frac{3}{4}$ inch	Compacted	121 in^2	34690 lb	41,328	287
$\frac{3}{4}$ inch	Rodded	121 in^2	33160 lb	39,456	274