NRMCA Lab Evaluation – Ground Glass Pozzolan

In this limited study the performance of concrete made with 20% Ground Glass pozzolan (GGP) was evaluated. The control mixture had 20% Class F fly ash. The target *w/cm*, and the total cementitious content were 0.50, and 550 lb/yd^3 respectively.

Experimental Results

Designation	0.50FA20	0.50GGP20
Yield Adjusted Proportions		
Total Cementitious	550	547
Low Alkali Portland cement, lb/yd^3	440	438
Fly Ash, lb/yd^3	110	0
GGP, lb/yd^3	0	109
Coarse Agg. (No.57), lb/yd^3	1850	1841
Fine Aggregate, lb/yd^3	1417	1412
Mixing Water, lb/yd^3	275	273
High Range Water Reducer, oz/cwt	2.00	3.00
Air Detrainer, oz/cwt	0.00	0.60
w/cm	0.50	0.50
Fresh Concrete Properties		
ASTM C1064, Temperature, °F	78	77
ASTM C143, Slump, in.	5 1/2	5 1/2
ASTM C138, Density, lb/ft^3	151.5	150.9
ASTM C138, Gravimetric Air, %	2.0	2.5
ASTM C231, Pressure Air, %	2.1	2.3
Strength (ASTM C39)		
2 day avg, psi	2,978	2,622
7 day avg, psi	3,744	3,499
28 day avg, psi	4,890	4,890
56 day avg, psi	5,590	5,279
Moist cured Bulk Resistivity (Modified ASTM C1876)		
28 day avg, Ω-m	90.1	140.6
56 day avg, Ω-m	92.4	222.4

Observations

The GGP mixture had a slightly higher water demand than the control fly ash mixture which was compensated with a slightly higher HRWR dose. GGP entrained air which was addressed with air detrainer. Compared to the control mixture the GGP mixture had similar compressive strength, and higher bulk resistivity at tested ages.

This is a limited study as opposed to a comprehensive evaluation. These results are applicable only for the materials evaluated. This report should not be taken as an endorsement for any product.