

Evaluating Concrete Properties for Performance

Clayton Schumaker – North Dakota DOT

Mix Design

Current Evaluation Properties

Aggregate Gradation

Sieve Size	Percent Passing
1 1/4	100
1	95 - 100
3/4	90 - 100
3/8	55 - 70
#8	31 - 42
#16	18 - 35
#50	0.0 - 10
#200	0.0 - 3.0

Cement

550 to 600 pounds Type II

Fly Ash

Maximum of 29 percent substitution by weight

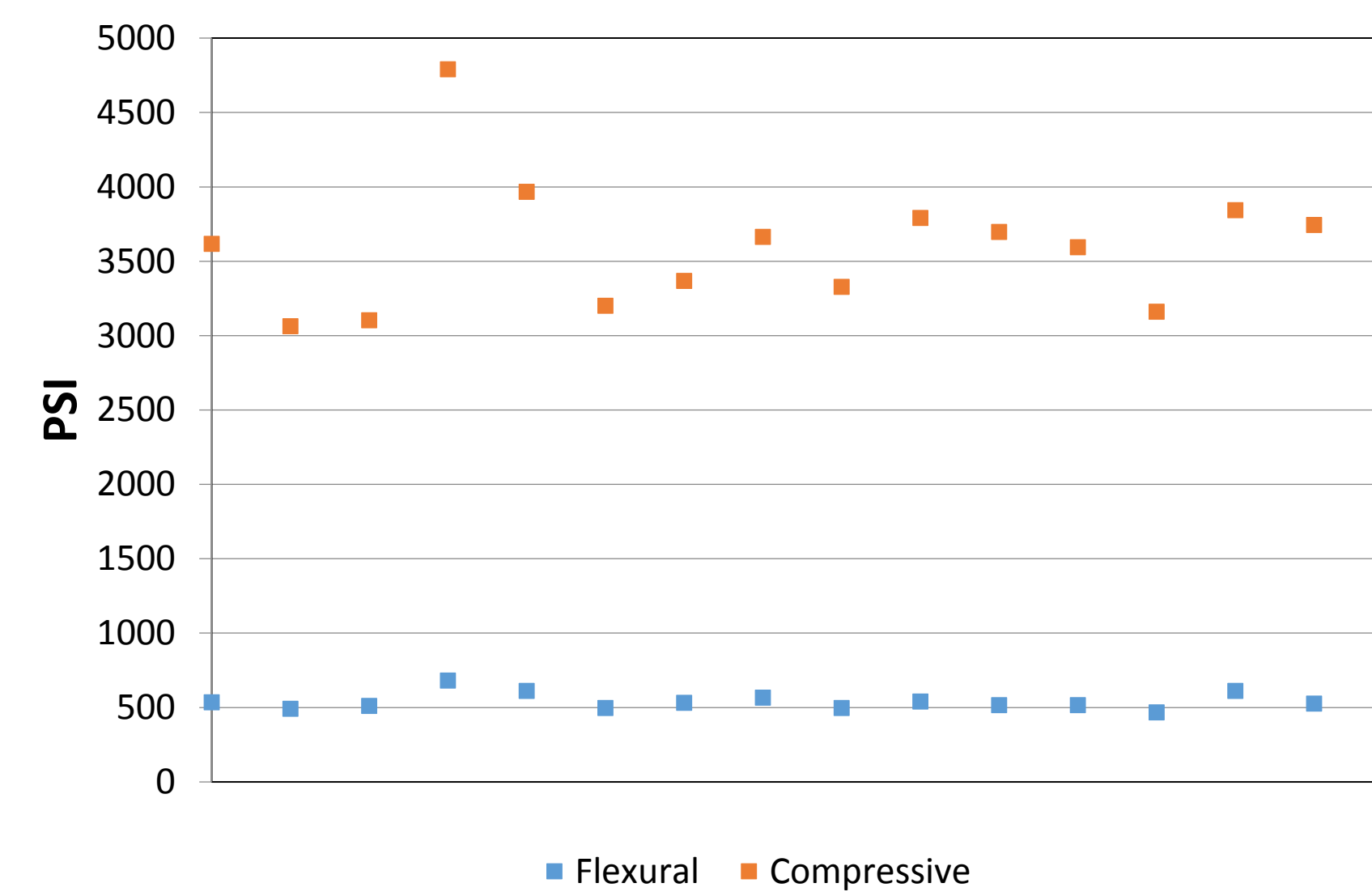
Maximum Water-Cement Ratio

Slip form paving	0.40
All other concrete	0.47

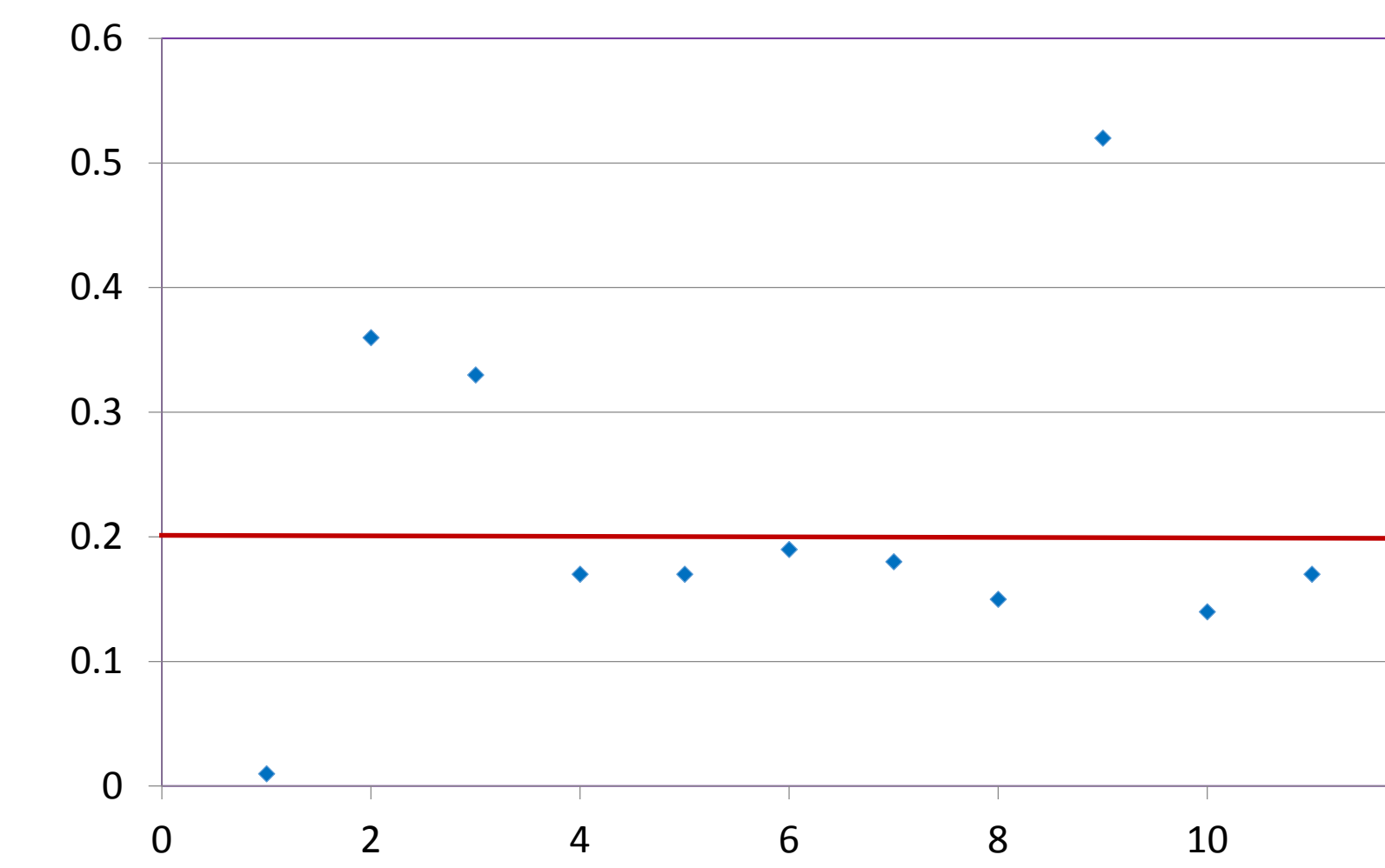
Strength requirement @ 7 days

Compressive strength	3000 psi
Flexural strength	450 psi

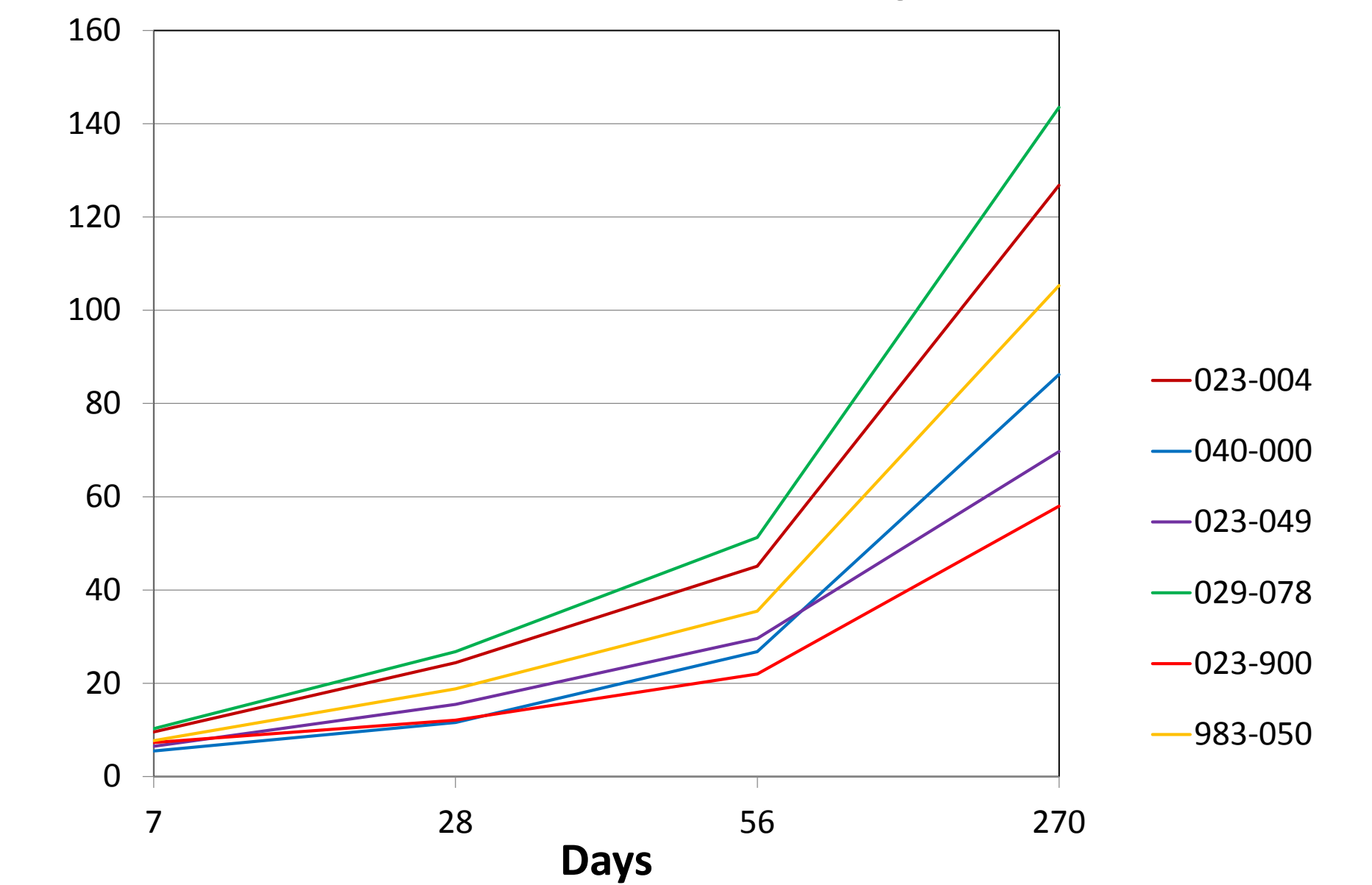
Strength @ 7 days



Super Air Meter



Surface Resistivity

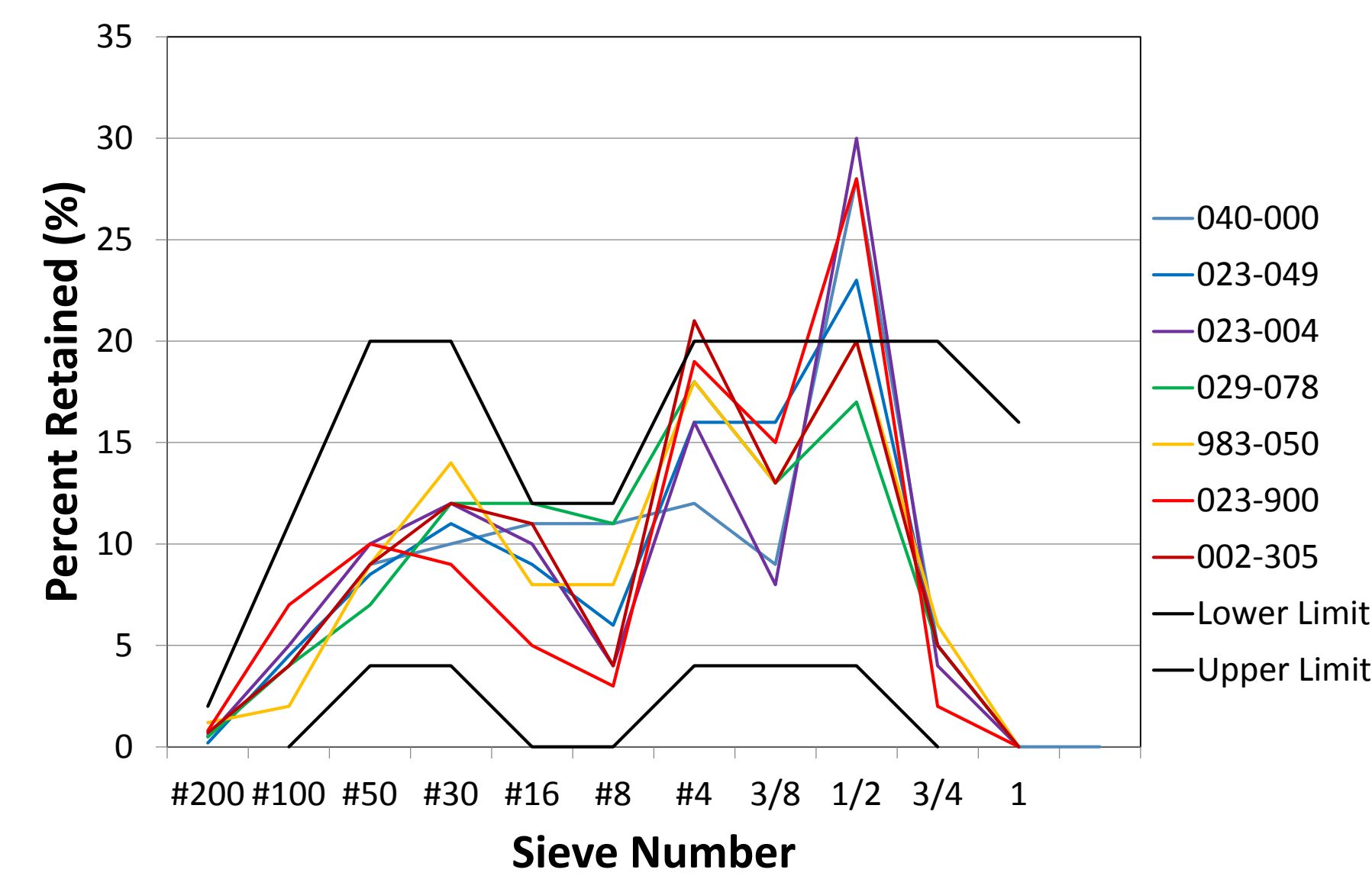


28 Day Surface Resistivity (kΩ-cm)

High	< 12
Moderate	12 - 21
Low	21 - 37
Very Low	37 - 254
Negligible	> 254

Tarantula Curve

2015 Aggregate Gradations



2016 Aggregate Gradations

