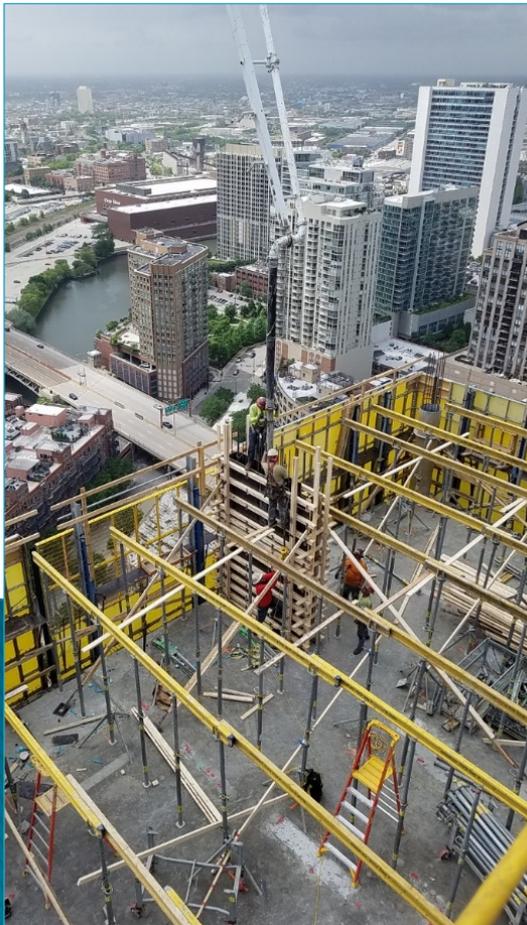




This Isn't Pumping Well – Do We Really Need *More* Super??

ACI Spring Virtual Convention



Mike Hufnagel – 369 Grand

Walt Flood IV, M.S., P.E., FACI



Outline

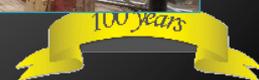
- Highrise Overview
- ‘Typical’ Concrete
- Things to be Aware of



Justin Ford – RPM



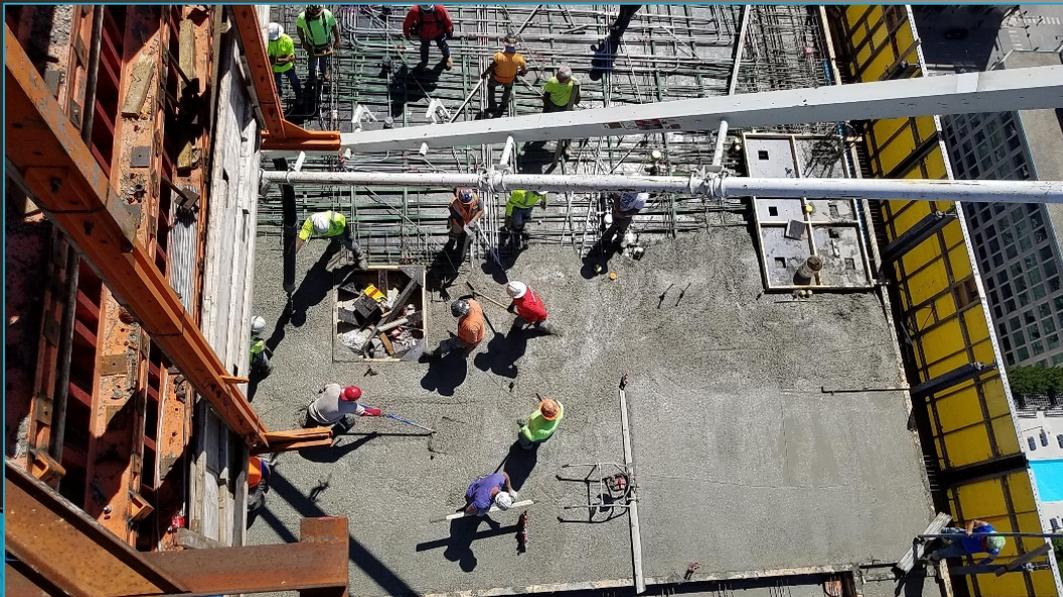
Jeremy Egebrecht – 300 N Michigan



Highrise Overview

3 Day Cycle:

- Day 1: Place second ½ of columns
- Day 2: Place Shearwalls (Core)
- Day 3: Place Deck (am), ½ of columns (pm)



Mike Hufnagel – 369 Grand



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Highrise Overview

High-Strength Highrise in Chicago

- Uses post-tensioned decks
- Technician on pump (monitor concrete)
- Technician on the deck (monitor deck)



Andersen Pumping



Hipolito Arroyo - 300 N Michigan

'Typical' Concrete

- High Slump: all 8+ inches
Deck mix 6–9 ksi
Columns and Shear walls 10–18 ksi
- Measure Flow like SCC
Not technically SCC, though behave like it
Apply –slow– shear to move it



Things to be Aware of

If it stop moving, you're doomed

3 Day Cycle:

- Day 1: Place second ½ of columns
- Day 2: Place Shearwalls (Core)
- Day 3: Place Deck (am), ½ of columns (pm)



Hipolito Arroyo – 300 N Michigan

Things to be Aware of

When pumping gets difficult

Natural Response:

- Make it wetter!!

Once flow gets too high, potential issues

- Segregation
- Air entrapment



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100 years

Things to be Aware of



Hipolito Arroyo – 300 N Michigan

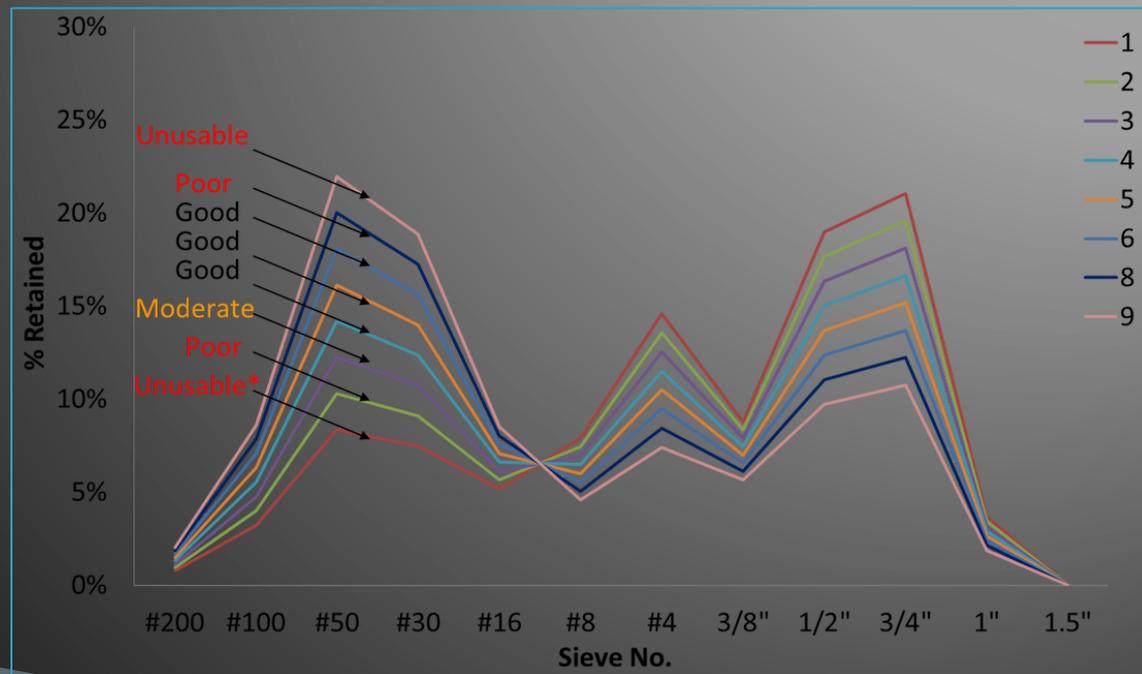


Things to be Aware of



Things to be Aware of

Mix becomes highly susceptible to changes in gradation, especially the sand



Dr. Ley's Tarantula Curve

Things to be Aware of

Ultimately – Ballet which requires:

- Knowledge of the Plant Operator
- Attention of the Plant QC
- Training of the Pump Operator
- Communication with Onsite Testing Lab
- Cooperation and efficiency on the Deck



Hipolito Arroyo – 300 N Michigan



Conclusion

How to avoid?

Discussion up front;
work to establish realistic
slump targets

Dance the ballet!



Andersen Pumping

Thank you!

