

# Evaluation of Global Materials Partners

## Class F Fly Ash

Jon S. Belkowitz, PhD, PE  
Chief Technology Officer  
Intelligent Concrete, LLC

Email: [Jon@Intelligent-Concrete.com](mailto:Jon@Intelligent-Concrete.com)

# Overview

- **Background**
- **Purpose**
- **Mix Design**
- **Results**
  - **Slump**
  - **Compressive Strength**
- **Summary**
- **The Next Step**

# Background



- Jon Belkowitz, PhD

 **INTELLIGENT  
CONCRETE**

- Concrete Enthusiast



- Combined Levels of Testing

# Purpose

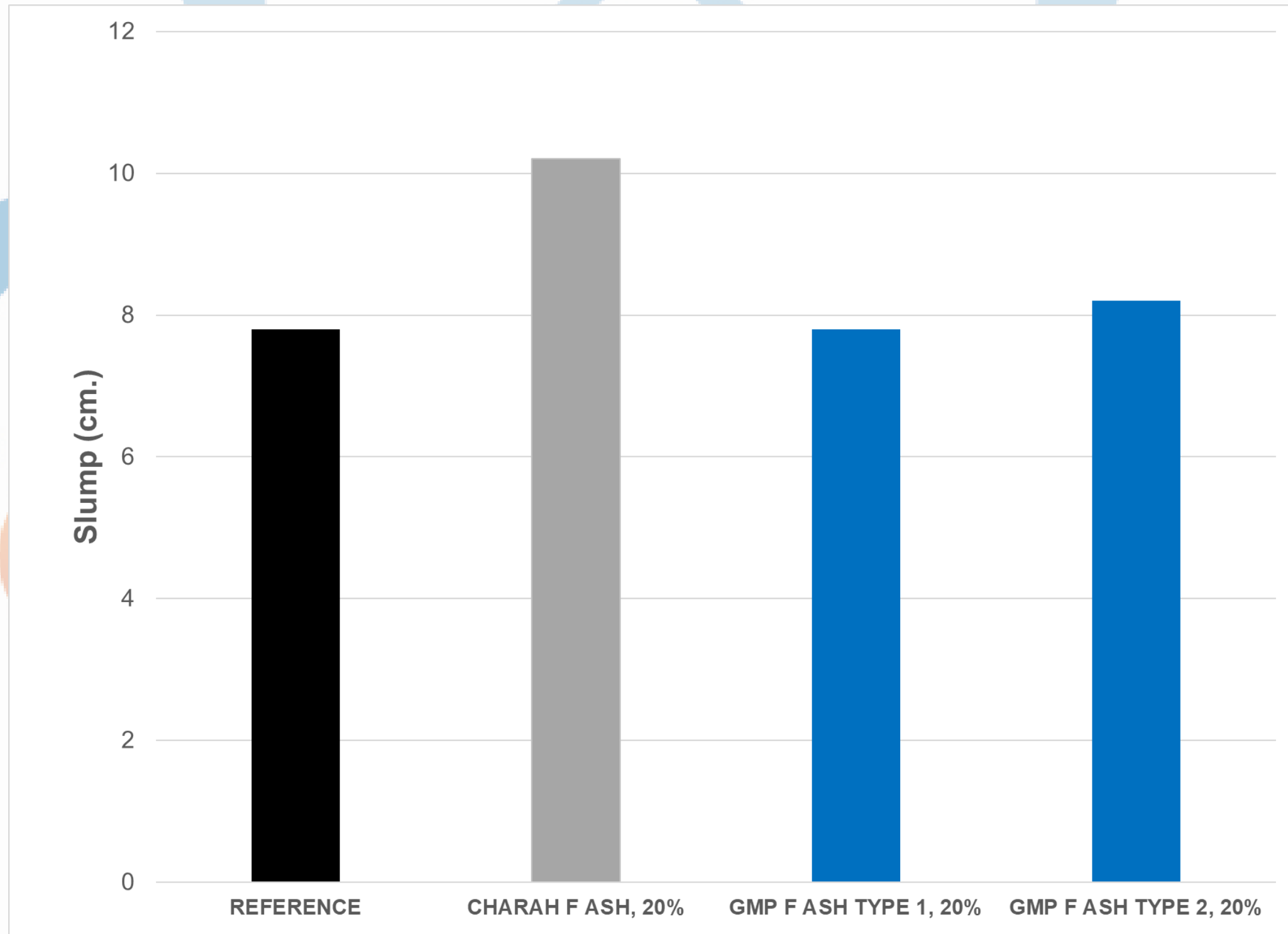
- **Evaluate the potential for the Global Materials Partners (“GMP”) Class F Fly Ash to enhance the hardened properties of mortars when compared to a series of references:**
  - **No Class F Fly Ash**
  - **Charah Class F Fly Ash at 20%**

# Baseline Mortar Mixture

Material	Unit	REF	CHARAH	GMP Type 1/2
			CLASS F FLY ASH, 20% REPL OF TYPE 1L	
Type 1L	pcy	595.0	595.2	595.2
Class F Fly Ash	pcy	-	148.8	148.8
Concrete Sand	pcy	1637	1488	1488
w/c	-	0.47	0.47	0.47
Water	pcy	280	350	350

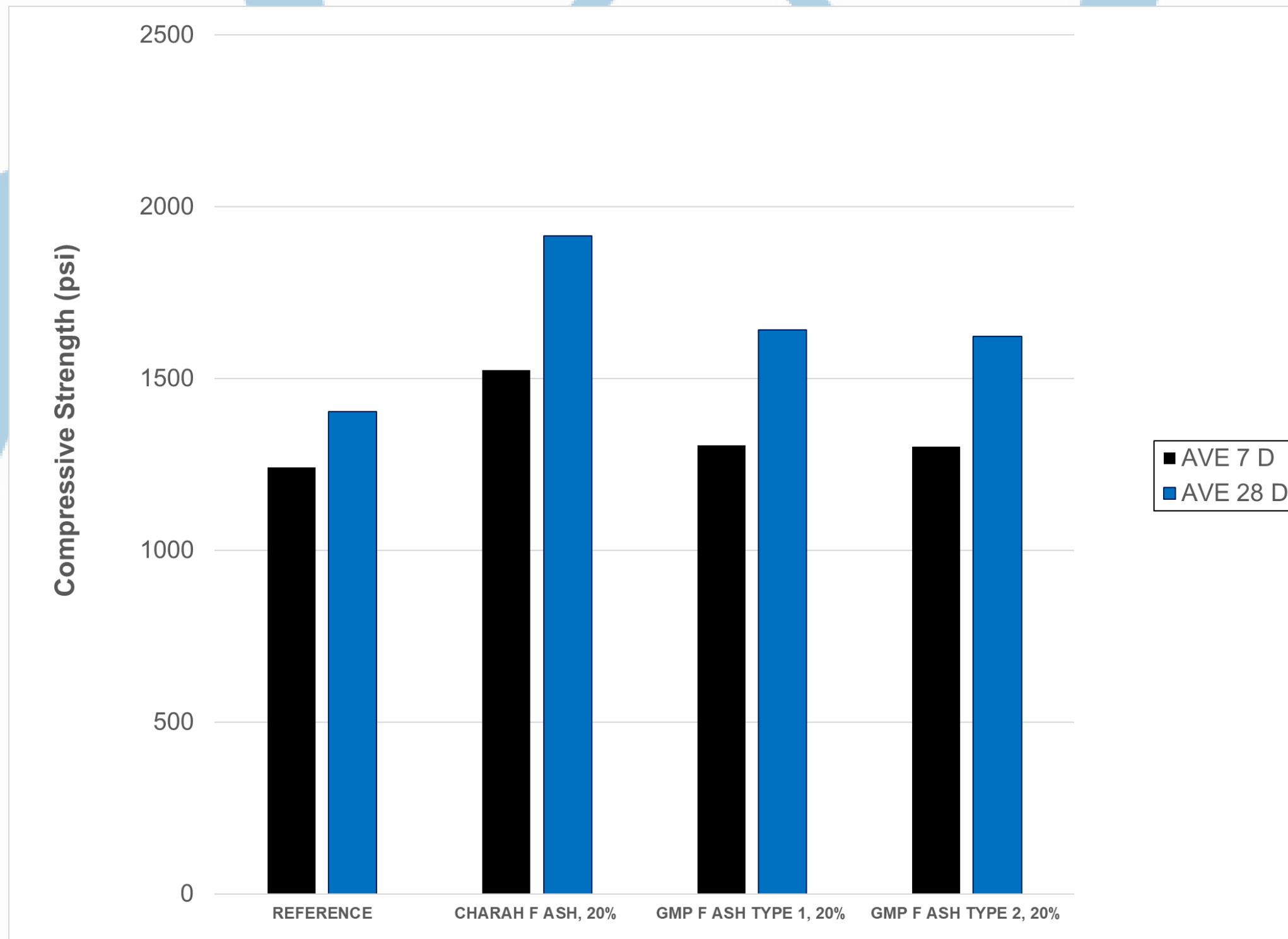
# Results

## *Slump*



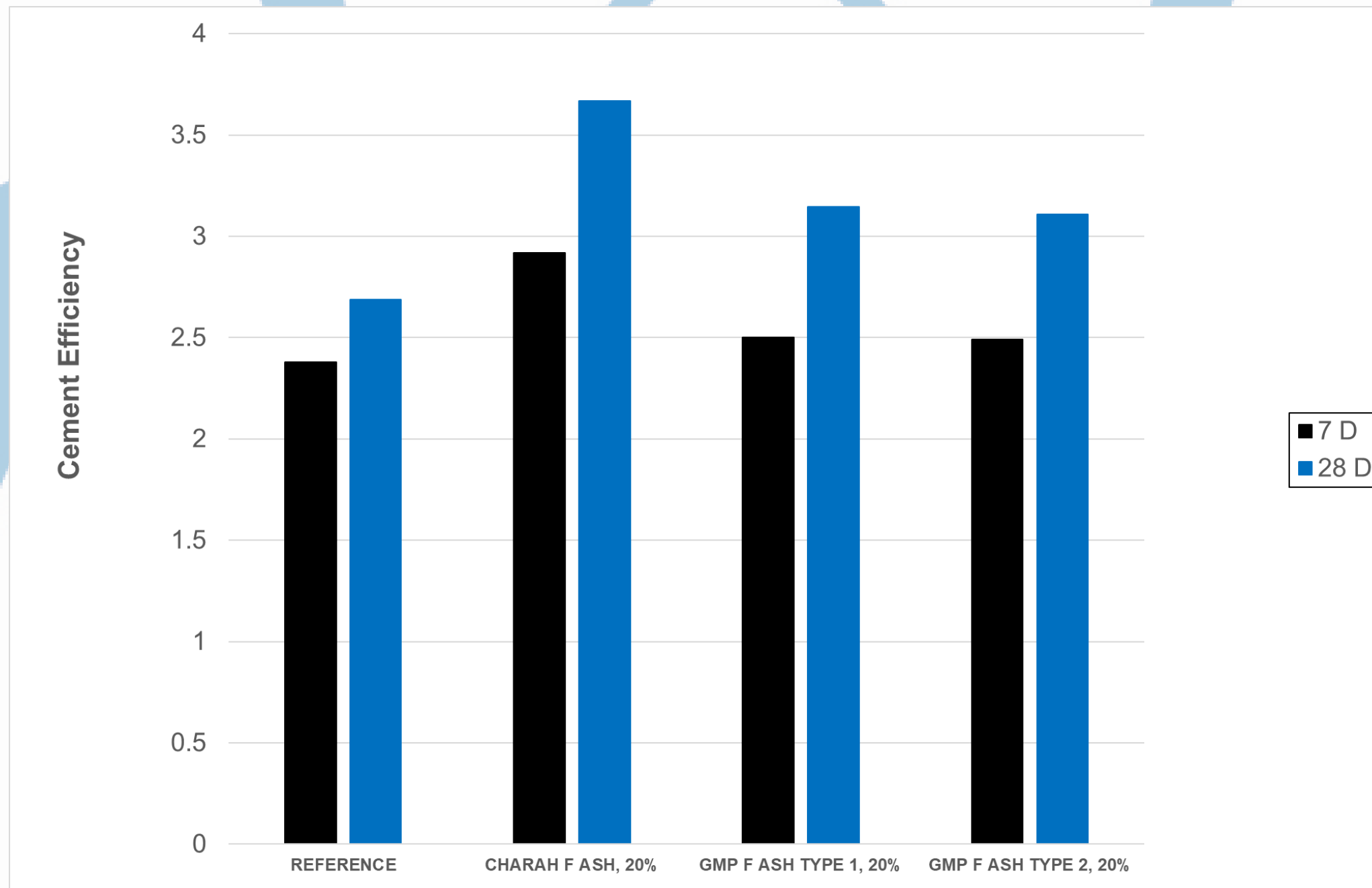
# Results

## *Compressive Strength*



# Results

## *Cement Efficiency*





# Summary

- **With the addition of GMP F Ash, we saw a maintenance in slump.**
- **Adding GMP F Ash improved strength development at 7-day and at 28-days.**
- **Preliminary analysis shows that GMP F Ash can be utilized to replace Charah Class F Fly Ash.**
- **When compared to the reference, the GMP F Ash induces a strength gain and increase in cement eff. That would allow a reduction in powder content and a cost savings.**

# The Next Steps

- **Interpreting the data**
- **Determine the Demographic to go after**
  - **Pavement**
  - **Residential**
  - **Precast**
- **Cost Analysis in Bulk Form**
- **Production for DEMOs and PILOT PROJECTS**
- **Communicating to RMX Providers**
  - **Commercial, Residential**
  - **Certification Process**