

# Research Committee 2024-2025 Overview

Corey Haeder  
*Committee Chair*  
Rinker Materials

# Mission & Goals

The goal of the Research committee is to provide the concrete drainage industry with advances that build, defend and enhance precast specifications enabling pipe and box culverts to increase our competitive advantage.

Investigating alternate product claims arming our industry with relevant information proving concrete pipe and box culverts are the most resilient, sustainable, and durable product available to the market.



# Research Committee Snapshot

## Committee Leadership



**Corey Haeder, P.E.**  
*Chair*  
Rinker Materials



**Bill Washabaugh, P.E.**  
*Vice Chair*  
Northern Concrete Pipe



**Margarita Takou, PhD., P.E.**  
*Liaison*  
ACPA

## Members (36)

Rinker Materials (7)  
Oldcastle Infrastructure (5)  
County Materials (4)  
Northern Concrete (3)  
Vianini Pipe  
Thompson Pipe Group  
Scituate Concrete  
MBCC Group  
Hamilton Kent  
Geneva Pipe Company  
CTLGroup  
CP&P  
Coastal Pipeline Products  
Besser  
Afinitas  
ACPA (6)

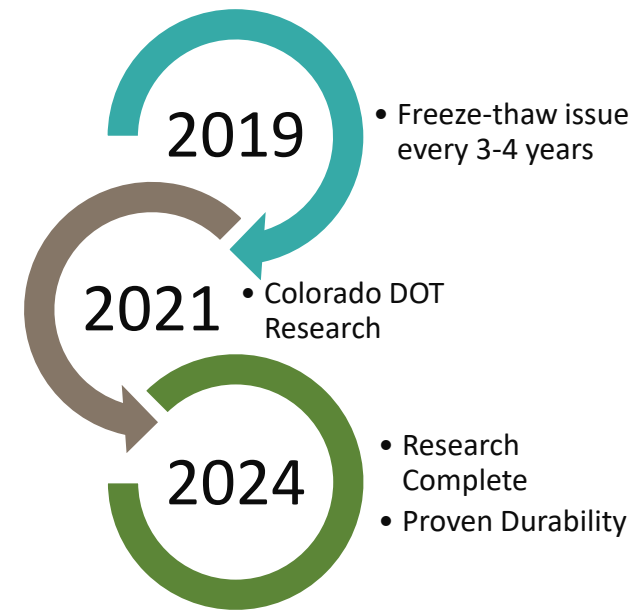


## Freeze Thaw Project Complete

- Developed trust and relationships
- Proven durability with state-of-the-art research
- Use results as needed



Figure 57. Sandcastles ready to collapse due to saturation by the incoming tide. Excess water fills air voids and results in loss of suction stress between particles and results in slumping (free image Pixabay).



## MAIN POINTS

- Low W/C + fine compaction voids = F-T durability
- "If it stands – it is durable" - SEM Analysis small voids – capillary suction
- Sandcastle Comparison



**MEMBER'S ONLY WEBINAR ON MARCH 27TH**





# EFFECT OF CRACKS ON PIPE PERFORMANCE

1. Literature Review - Survey - Sample Fab
2. Chloride Ion & Carbonation Movement
3. Corrosion Initiation - Drawn Wire and WWF
4. Corrosion Rates & Autogenous Healing
5. Corrosion Propagation
6. Corrosion Model to Predict Service Life
7. Impact of Corrosion on Pipe Performance



## Effects of Cracks on Pipe Performance

**WHY THIS IS LIKE NO OTHER**

- ♦ Examine the durability/service life of reinforced concrete pipe
- ♦ Determine how corrosion initiates and propagates in typical drycast concrete pipe and in the presence of cracking
- ♦ Develop a service-life model and recommend model inputs to account for cracking

Concrete

Steel

Anode:  $\text{Fe} \rightarrow \text{Fe}^{2+} + 2e^-$

Cathode:  $\text{WO}_2 + \text{H}_2\text{O} + 2e^- \rightarrow 2\text{OH}^-$

Corrosion product:  $\text{Fe}(\text{OH})_2$

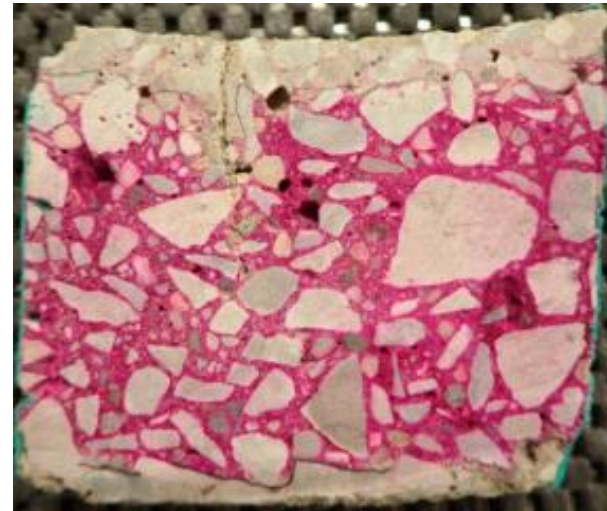
Conventional current

Electrons

WJE—ACPA Program Information

# Interim Conclusions

- Field service of concrete pipe has been very good.
- Cracks less than 0.004" do not adversely affect chloride diffusion.
- Cracks (moderate size) do not have a major influence on carbonation
- Fine cracks can heal (AH) - Large cracks up to 0.080" might but less reliable.
- Corrosion prediction is highly complex such that modeling is not practical
- Need to recognize differences in wet-cast and dry-cast concrete pipe
- Good news:
  - Generally, in-service conditions are favorable for concrete pipe durability
  - Cracks are likely to have minimal relative impact
  - Nothing indicates the need for more restrictive limits on crack widths





# Laboratory Studies (ongoing)

- Carbonation resistance of 100%RH Dry-Cast concrete with and without cracks
- Corrosion rate measurements of submerged and half-submerged samples (data reduction) & Autopsies
- Define Model inputs – identify knowledge gaps
- Model corrosion in contact with deicer solutions
- Crack width identification (accuracy)
- Write-up Draft Final Report **(JUNE 2025)**

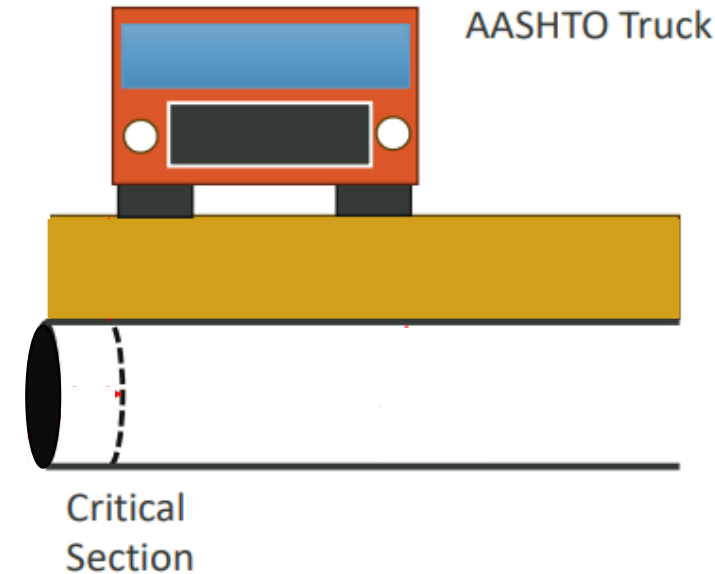
*Video update from WJE (~16 minutes) available on Smartsheet or contact Research Committee leaders for a link.*



# Resiliency Project Status (stuck in negative hell)

- ASTM E60 pushing for general guide
- ASTM E05 (fire) jurisdiction ballot
  - 29 Move to E05
  - 86 Keep in E60 (approved)
- State DOTs requesting webinars
- Need to publish a paper that can be used at state level
- Where do we go from here ???

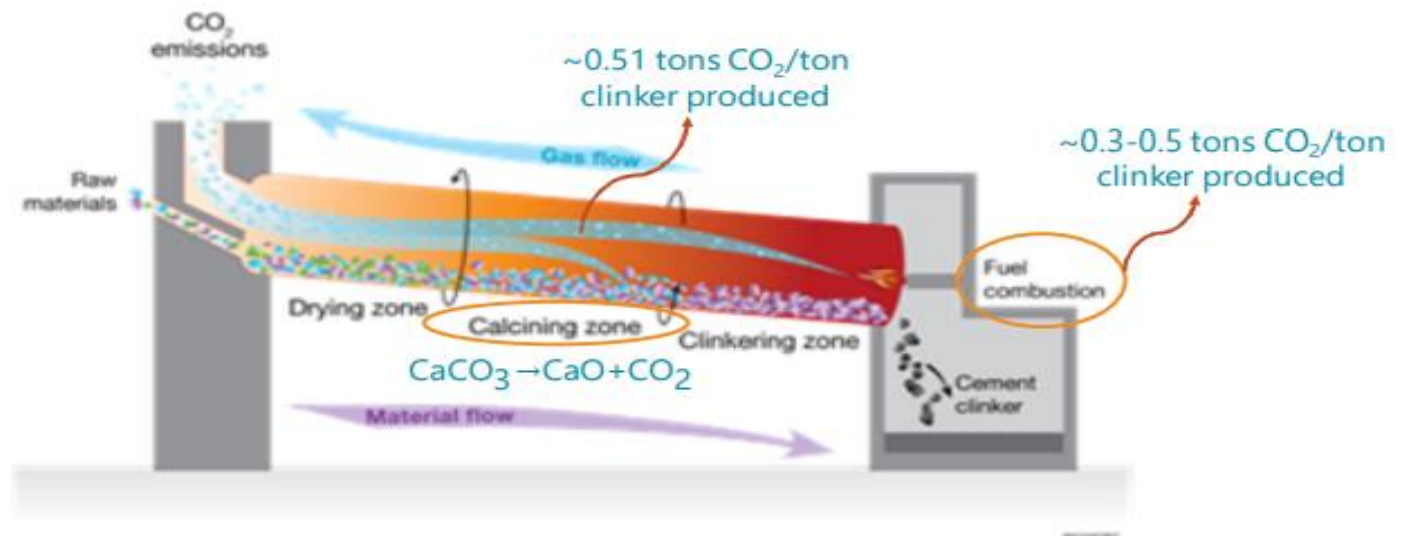
ITEM	SUB	ACTION
<a href="#">001</a>	80	<a href="#">The Jurisdiction of WK77797 - New Guide for Resilience-Based Design of Culverts Exposed to Wildfire Events</a>
		*** Item Approved ***
TECHNICAL CONTACT: Margarita Takou		
WORK ITEM: AD04650		
Affirmative		86
Negative		29
Abstain		161
%Affirmative		74.78





# Type 1L Cement Study

- Impact of Type 1L variability on durability and sustainability
- Compare C150 (Type I/II) and C595 (Type 1L)
- **Cold Hard Facts** for discussions with Cement Producers
- Does 1L improve EPD?  
Is it really **GREEN**?



# Type 1L Cement Study (March 10, 2025)

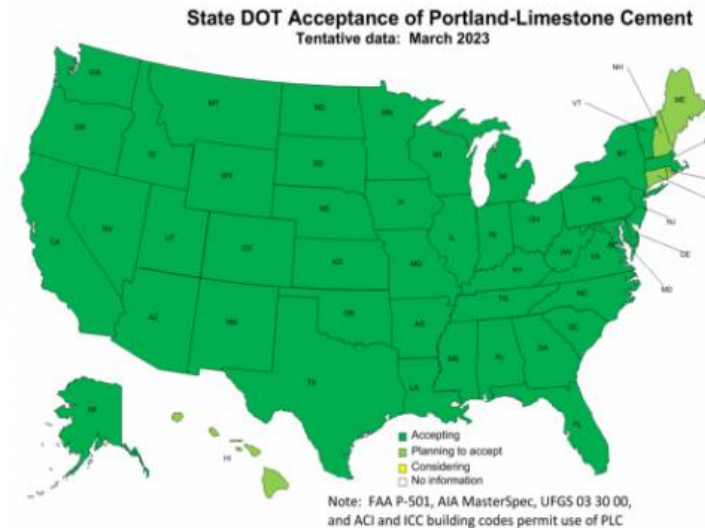
Phase 1: Literature review and data collection

Phase 2: Sample study and testing

Phase 3: Durability, longevity & sustainability

*Phase 4: Shipping Segregation*

47 state DOTs +  
FAA, AIA, UFGS, ACI,  
and ICC codes



# Microplastics Project

*QUESTION: Does plastic drainage pipe shed nurdles? If so – how much?*

*Need a Researcher*

MTSU

University of Virginia

??

Goal – cast doubt on use  
of plastic pipe . . .





# Questions?



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Research Committee Chair

Rinker Materials