

# FEEDBACK ON 13<sup>TH</sup> INTERNATIONAL CONFERENCE ON CONCRETE PAVEMENTS (ICCP)

THE INTERNATIONAL  
SOCIETY FOR CONCRETE  
PAVEMENTS'



## 13<sup>TH</sup> INTERNATIONAL CONFERENCE ON CONCRETE PAVEMENTS

THE DEPOT  
MINNEAPOLIS, MINNESOTA, USA  
AUGUST 25-29, 2024



INTERNATIONAL  
SOCIETY FOR  
CONCRETE  
PAVEMENTS

MINNEAPOLIS, MINNESOTA, USA  
25 - 29 AUGUST 2024

# 13<sup>TH</sup> ICCP - General

- Innovative Paths Toward Lower Carbon in Concrete Pavements:











- 80 Technical Presentations (papers)
- 16 Podium Sessions & 4 Poster Sessions
- 10 Technical Workshops
- Field trip / site visit

- Worldwide attendance:

- 386 Delegates
- 21 Countries
- 39 US states

- South African representation:

- KBK Engineers
- N3 Toll Concession
- SNA Civil and Structural Engineers
- Raubex Construction
- CSIR

TIME	SUNDAY AUGUST 25	MONDAY AUGUST 26	TUESDAY AUGUST 27	WEDNESDAY AUGUST 28	THURSDAY AUGUST 29
7:00am		BREAKFAST - Depot Pavilion	BREAKFAST - Depot Pavilion	BREAKFAST - Depot Pavilion	
8:00am		PLENARY SESSION 	PARALLEL WORKSHOPS 1-5	PODIUM SESSIONS 9, 10	★ FIELD TRIPS/SITE VISITS  or  
9:00am		PODIUM SESSIONS 1, 2, 3		PODIUM SESSIONS 11, 12	
10:00am		LUNCH - Depot Pavilion	LUNCH - Depot Pavilion	LUNCH - Depot Pavilion	
11:00am		PODIUM SESSIONS 4, 5, 6	PARALLEL WORKSHOPS 6-10	PODIUM SESSIONS 13, 14	
12:00pm	REGISTRATION OPEN THROUGH WEDNESDAY	PODIUM SESSIONS 7, 8		PODIUM SESSIONS 15, 16	
1:00pm		NCC MEETING		POSTER SESSIONS 3, 4	
2:00pm		STUDENT POSTERS			
3:00pm					
4:00pm					
5:00pm					
6:00pm	WELCOME RECEPTION  	MINNESOTA TWINS vs. ATLANTA BRAVES 	★ BBQ RECEPTION 	★ AWARDS BANQUET AND RIVER CRUISE  	
7:00pm					
8:00pm					
9:00pm					★ Transportation Provided

# 13<sup>TH</sup> ICCP - Podium Session Topics

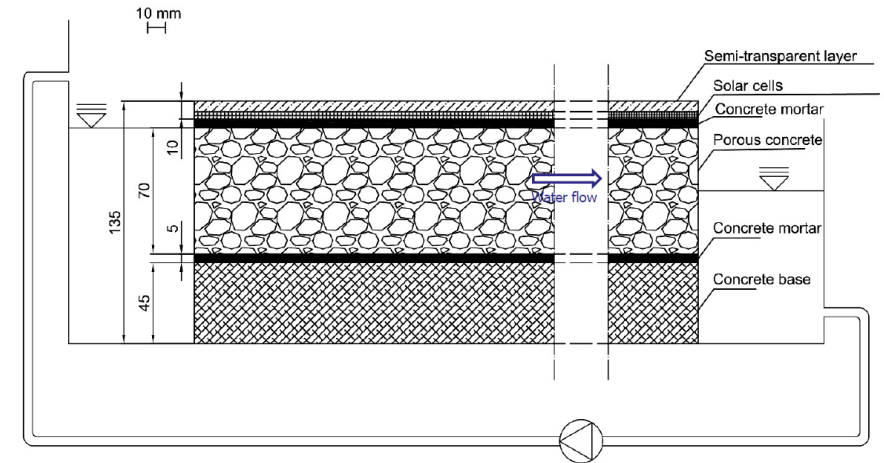
- Lower Carbon
- Testing and Instrumentation
- Design
- Performance Modelling
- Surface characteristics
- Sustainability and climate change
- Recycled materials
- Construction
- Materials
- Durability

# 13<sup>TH</sup> ICCP - Workshop Topics

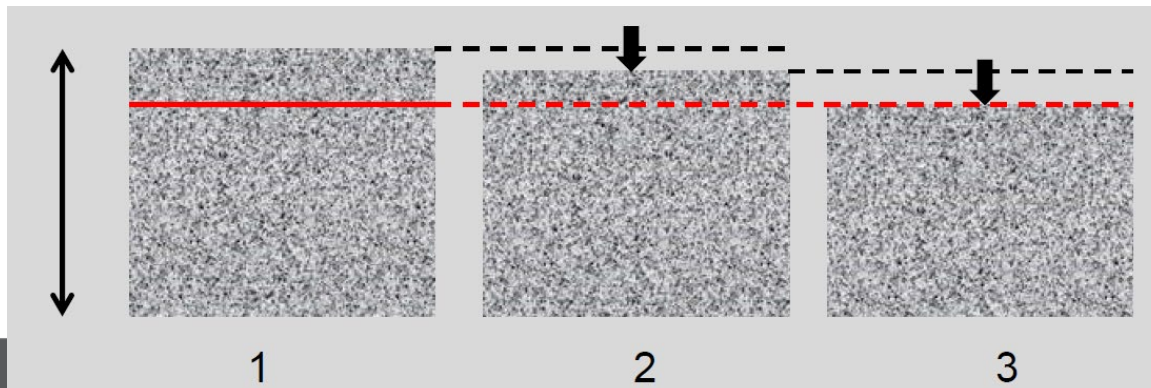
- Rapid Strength Concrete for Highways and Airport Pavements
- Advancements in Optimised Concrete Pavement Design
- Sustainability and Performance can Co-exist
- Impact of NRRA (National Road Research Alliance) on Advancing Concrete Pavement Technology
- Roller-compacted Concrete Pavements
- Airport Pavement – ACPTP (Airport Concrete Pavement Technology Program) Research Program
- Fiber-reinforced Concrete Materials for Pavements
- Concrete Pavement Preservation – Sustainable solutions for tomorrow, today
- Pavement Foundations: Review of foundation requirements and measurements
- Mine / Ready-mix Plant Tour

# 13<sup>TH</sup> ICCP - Some Highlights

- Harvesting energy through urban concrete pavements:
  - Hybrid prototypes using porous concrete layer & PV cells.
  - Water circulation cools down pavement (up to 1.8 times).
  - Counters the heat island effect, increase efficiency of PV cells & reduce concrete curling.
- Sustainability through design:
  - Artificial / machine learning models are tested as alternative to conventional ME design / Pavement ME software.
  - Concrete designed 20 mm thicker - allow for tolerance and diamond grinding every 20 years without need for resurfacing.
  - High probability of 60-year design life – Sustainable solution.



Source: Paper. Gennesseaux, Vizzari and Dumoulin



Source: Paper. Hodgkinson and Dowsing



# 13<sup>TH</sup> ICCP - Some Highlights

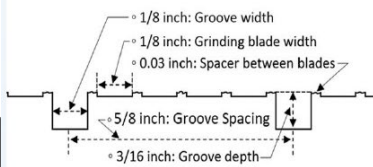
<https://www.igga.net/pavement-preservation-toolkit>

- Rehabilitation & re-use of existing concrete:
  - Old concrete rehabilitated - “treasure” (even when previously overlaid).
  - Retro-fitted dowels, cross / slot stitching, full / partial depth repairs etc.
  - Not new but extensively implemented in the USA.
  - Reduced costs and environmental impact thus increased sustainability.
- Surface texturing:
  - Move away from transverse grooving - excessive noise generation.
  - Performance optimised surface texture - wide range of options available.
  - Sustainability – reduced rolling resistance & emissions & conserve existing.



Source: [www.igga.net](http://www.igga.net)

**Next Generation Concrete Surface**

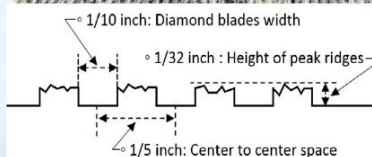


**Standard Bridge Deck Texture**



**L Grinding + T Grooving**

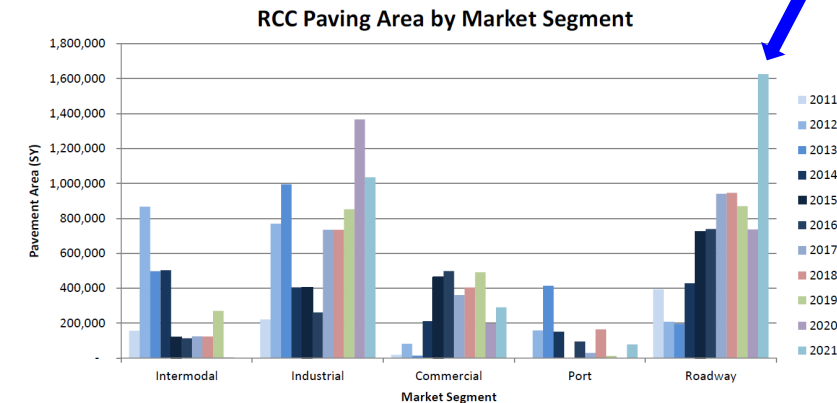
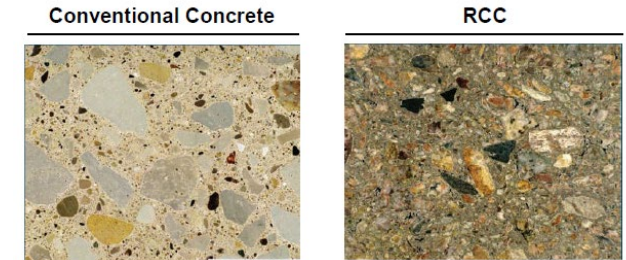
**Longitudinal Diamond Grind**



Source: FDOT: Ohoon Kwon, Richard Hewitt

# 13<sup>TH</sup> ICCP - Some Highlights

- Increase in Roller-compacted Concrete (RCC) on USA roads:
  - Rapid construction, early loading and opening & cost-effective.
  - Placed like asphalt, no forms / reinforcing / dowels.
  - Curing & saw-cutting critical for success, trowelled surface now popular.
- Recycled Aggregate Concrete (RAC) :
  - Research indicate slightly reduced strength and stiffness (depends on %).
  - Increased water and chloride permeability resistance (reclaimed asphalt).
  - Construction of RAC in two successive lifts tested – proven to work.
- Drive towards performance engineered mixtures:
  - Incorporate tests that correlate to service life durability.
  - Optimisation of aggregate grading is critical for performance.
- Interesting that JPCP (normal unreinforced jointed) concrete pavements are constructed throughout most states. CRCP (continuously reinforced) mainly constructed in the Southern States (Texas in particular).

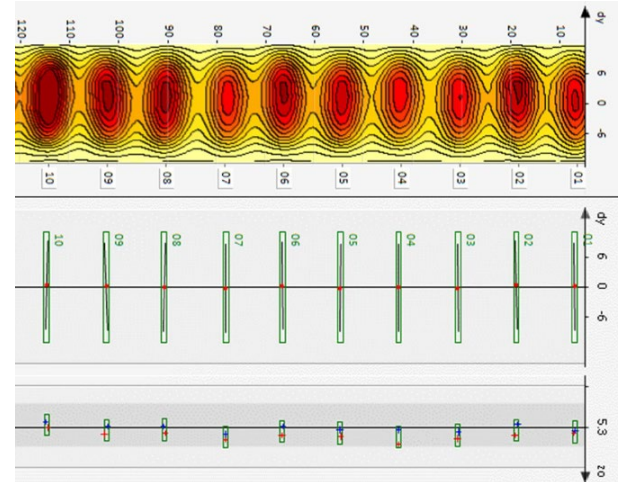


*Recent advances in RCC Roadway Construction in the USA. Zollinger, C.*

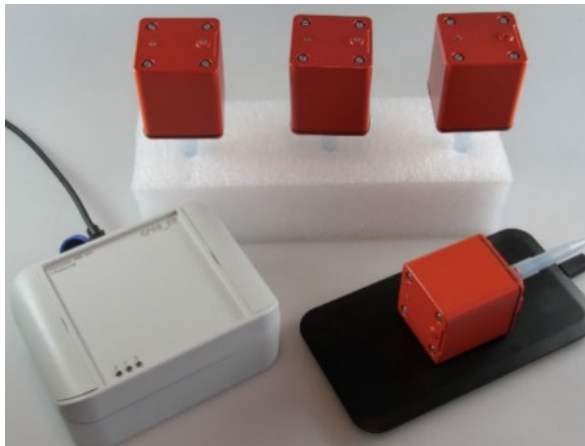


# 13<sup>TH</sup> ICCP – Test Equipment

- MIT-dowel-scan (demonstrated at MnRoad):
  - Non-destructive, fast & accurate - creates heat map.
- Capillary Pressure Sensor System (CPSS):
  - Controlled concrete curing – avoid early shrinkage cracks.
- Sensors measuring real-time concrete strength:
  - Casted into concrete, alternative to conventional testing.



Source: MDOT Poster. 13<sup>th</sup> ICCP.



Source: <https://www.kesslerdcp.com>



Source: INDOT Poster. Mazumder, Cruz, Nelson.



Sensor



Datalogger



# 13<sup>TH</sup> ICCP - MnRoad Field Trip

- MnRoad (near Albertville) in Minnesota is a cold region testing facility / pavement test track and laboratory operated by MnDOT.
- Over 50 unique test sections ( $\pm$  9.5 miles) on several roadway segments (low volume and freeways).
- MnRoad research aim to make roads:
  - Last longer & perform better.
  - Cost less to build and maintain.
  - Constructed faster with minimal impact on environment.
- More information:

<https://infopave.fhwa.dot.gov/Mnroad/index>



Source: <https://www.dot.state.mn.us/mnroad>

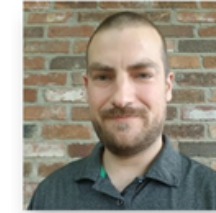




# Small Group Site Visit

- Local site visit after conference to I-94 highway east of St. Paul.
- Concrete overlay on top of existing concrete.
- Valuable to see and experience a construction site and closely interact with some of the role players.
- Special thanks to Dan & Matt from the Concrete Paving Association of Minnesota (CPAM) for the opportunity.

## Acknowledgement:

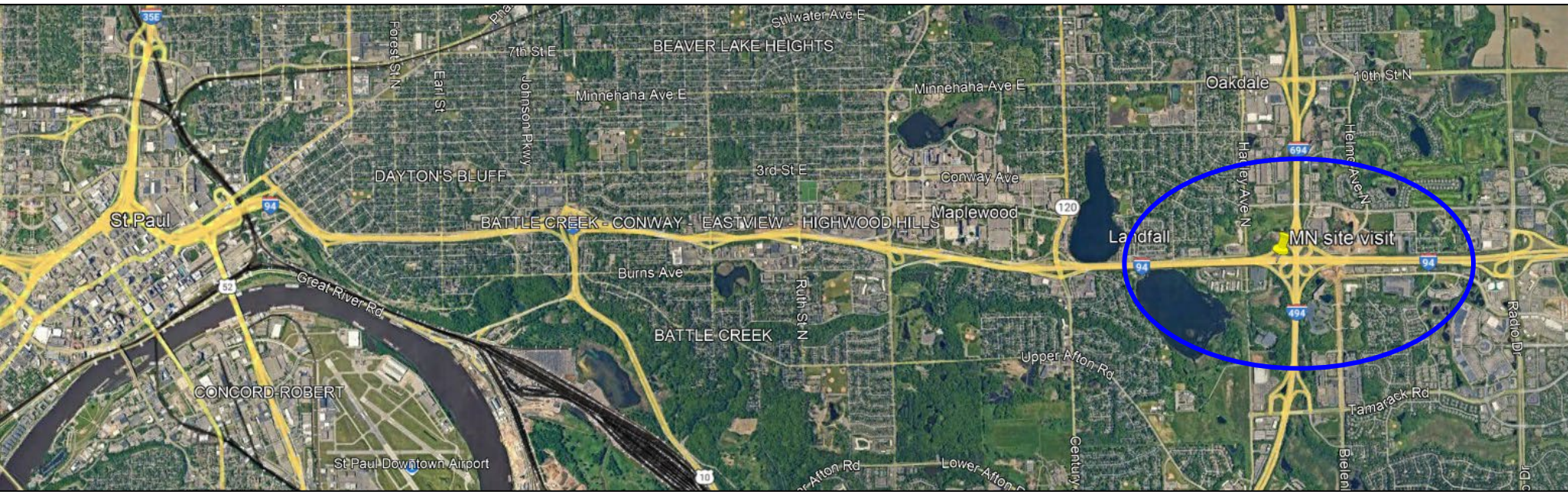


**Dan Labo, P.E.**  
Executive Director  
[djlabo@cpamn.com](mailto:djlabo@cpamn.com) | 763.213.7731

- 15+ years experience with road and highway construction and maintenance
- CPAM Executive Director since March 2024
- CPAM Director of Engineering Services from 2021 to 2024
- MnDOT Project & Resident Engineer – 10 years
- Masters in Engineering Management – St. Cloud State University
- Bachelors of Science – Civil Engineering – University of North Dakota



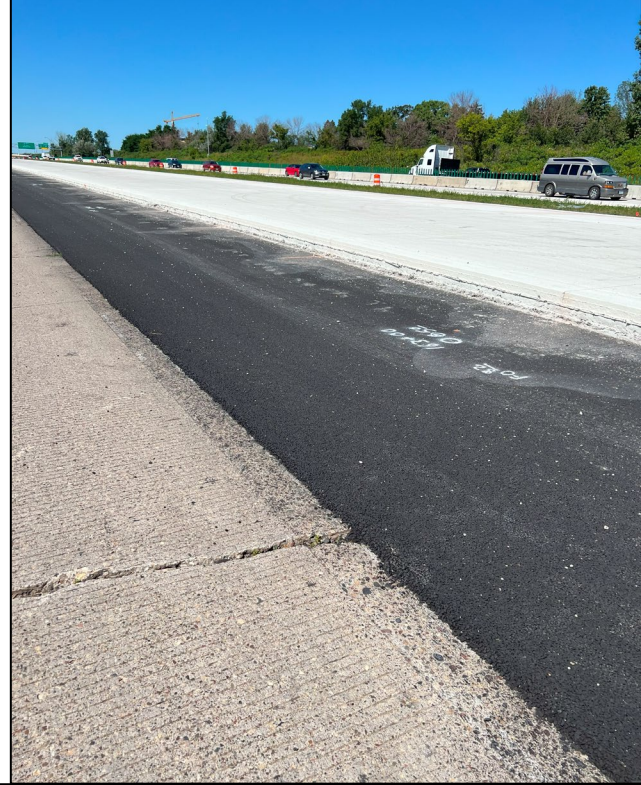
- **Matt Zeller, P.E.**  
Concrete Promoter (Part Time)  
[mjzeller@cpamn.com](mailto:mjzeller@cpamn.com) | 651.253.1652
- Over 30+ years experience with road and highway construction
- CPAM Executive Director from 2004 – 2024
- CPAM Engineering Director – 3.5 years
- MnDOT Assistant Concrete Engineer – 9 years





# Small Group Site Visit

- Permeable asphalt (PASSRC) placed on top of existing concrete before new concrete overlay – defects not repaired, only cleaned.
- Astro-turf drag used for texturing.
- Glass beads used for macro texture measurements.
- Also visited the concrete batch plant for the project.







Thank you

