

CIA TEAM

**INFRASTRUCTURE
PRESERVATION**

NJDOT – Shivani Patel

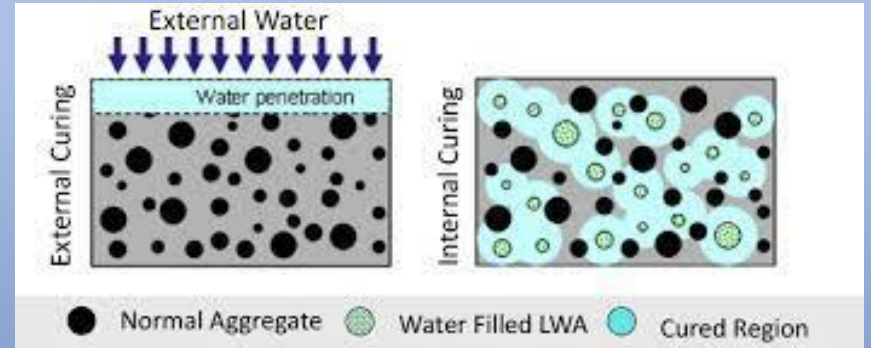
FHWA – Nunzio Merla



EDC-7 Enhancing Performance with Internally Cured Concrete (EPIC²)



Figure 45. Internally cured concrete being cast at Bartell Road in New York (Wolfe, 2010).



Purpose:

To implement the use of internally cured concrete to reduce shrinkage cracking and achieve long-term performance in concrete bridges, roads and repairs.

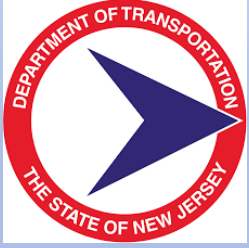


EDC-7
Enhancing
Performance
with Internally
Cured Concrete
(EPIC²)

Status:

- Special provisions revised following a peer review.





EDC-7 Enhancing Performance with Internally Cured Concrete (EPIC²)

Status:

- Continued communication with NYSDOT materials personnel





EDC-7
Enhancing
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Cured Concrete
(EPIC²)

Status:

- Participated in kick-off meeting for internal curing research project

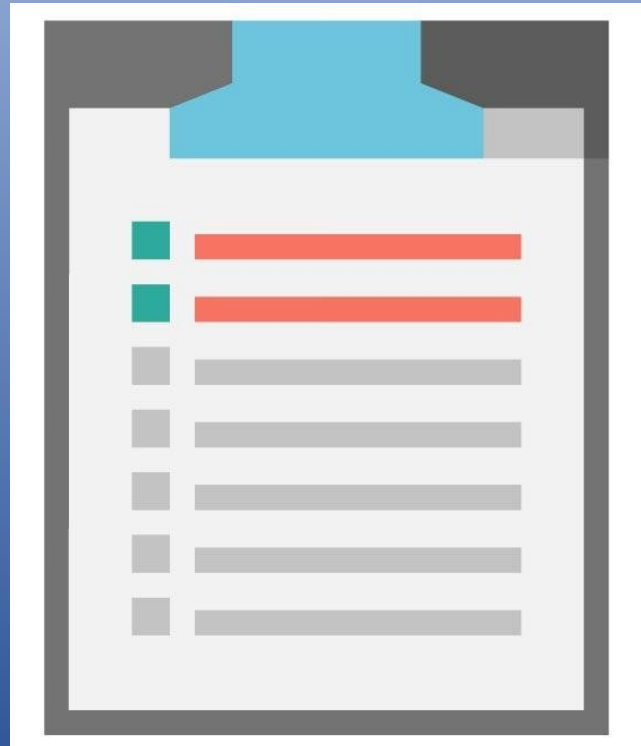




EDC-7
Enhancing
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Cured Concrete
(EPIC²)

Status:

- Expanding the list of candidate bridges





EDC-7 Enhancing Performance with Internally Cured Concrete (EPIC²)



Status:

- Investigating a new mix design

	SAP /(g/m ³)	W ₀ /(kg/cm ³)	W /(kg/m ³)	Cement /(kg/m ³)	S /(kg/m ³)	G /(kg/m ³)	Water-Reducing Agent
J0	0	0	165	470	668	1100	0.04%
G0	904	0	165	470	668	1100	0.04%
G1	904	0	196.7	470	668	1100	0.04%
Y0	904	132.01	165	470	668	1100	0.04%
Y1	904	132.01	89.70	470	668	1100	0.04%
Y2	904	31.74	165	470	668	1100	0.04%

2.3. Experimental Design

2.3.1. Flow Test of Concrete



EDC-7
Enhancing
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(EPIC²)

Next Quarter:

- Circulate draft special provisions
- Reach out to concrete suppliers
- Communicate with project designers



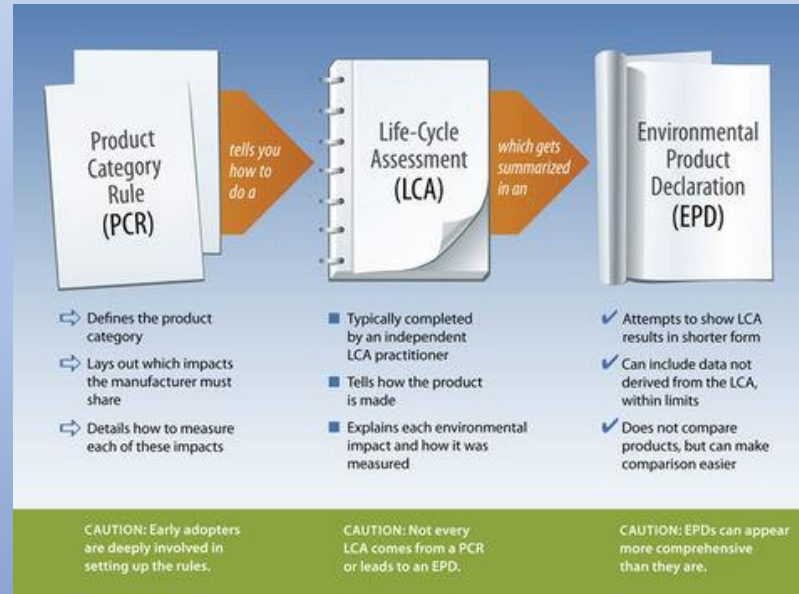


UPDATE on EDC-6 UHPC Innovation

- Bureau of Structural Engineering hosted HNTB training related to EDC-6 UHPC innovation
- Continuing the UHPC Overlay Performance Evaluation Program
- Non-destructive testing on:
 - I-295 NB & US 130 NB over Mantua Creek
 - NJ 159 WB over Passaic River in Morris County



EDC-7 Environmental Product Declarations (EPDs) for Sustainable Project Delivery



Summary of Environmental Product Declaration		Environmental Impacts			
		Impact name	Unit	Impact per m3	Impact per cyd
Central Concrete					
Mix	340PG9Q1	Total primary energy consumption	MJ	2,491	1,906
	San Jose Service Area	Concrete water use (batch)	m3	6.66E-2	5.10E-2
	EF V2 Gen Use P4000 3" Line 50% SCM	Concrete water use (wash)	m3	8.56E-3	6.55E-3
		Global warming potential	kg CO2-eq	271	207
		Ozone depletion	kg CFC-11-eq	5.40E-6	4.14E-6
		Acidification	kg SO2-eq	2.26	1.73
		Eutrophication	kg N-eq	1.31E-1	1.00E-1
		Photochemical ozone creation	kg O3-eq	46.6	35.7
Performance Metrics					
28-day compressive strength	4,000 psi				
Slump	4.0 in				

A sample EPD for a concrete mix design by Central Concrete Supply Co.
Credit: Central Concrete Supply

Purpose:

To identify and understand the environmental impacts from resource use, energy, and emissions in construction and consider alternatives using third party verified reports.



EDC-7
Environmental
Product
Declarations
(EPDs) for
Sustainable
Project Delivery

Status:

- EPD SME Team meeting was held in October





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Environmental
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Status:

- A work plan has been developed and finalized





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Next Quarter:

- Continue working on phase 1 efforts
- Identify additional SMEs