

**STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION**

**STATE MATERIALS OFFICE
STRUCTURAL MATERIALS LABORATORY**

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**REPORT OF SURVEY RESULTS FOR THE USE OF
NONTRADITIONAL CEMENTS**

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BACKGROUND

The topic for the 2008 Anna Maria Workshop is *Sustainable Cements: Challenges, Opportunities and Applications*. The goal of this year's workshop is to foster discussion on the current use of state-of-the-art non-traditional (sustainable) cements. The Florida Department of Transportation (FDOT) currently has a standard specification for road and bridge construction which thoroughly addresses the allowable uses for Portland cement and concrete for FDOT owned structures. Most state DOTs have similar documents that address the allowable use for Portland cement concrete in structures.

The FDOT has recognized that non-traditional / non-Portland based cement concrete is often used on a limited basis by DOTs, if at all. Subsequently, the decision was made to survey relevant government agencies to identify the various applications for non-traditional cements currently being used in the highway transportation system. This report presents the results from a questionnaire sent via electronic mail to the Department of Transportation (DOT) materials list serv, which includes the email addresses of the respective state materials engineers for each of the 50 State DOTs and the 13 Provincial and Territorial ministries responsible for transportation in Canada.

EVALUATION PROGRAM

The questionnaire provided was designed to solicit responses from Department of Transportation personnel to determine if they use, or have an interest in using, nontraditional cements as part of construction operations. The questionnaire included the following four questions which were considered to be necessary to assess the use and application of nontraditional cements in the highway transportation system:

1. Does your agency currently allow the use of any non-Portland Cement materials for use on DOT Projects as a binder or repair material? Non-Portland Cements could be magnesium activated cements, low-lime cements, alkali activated cements or sulfate activated cements.
2. If so, what are the typical applications?
3. Has there been any research performed by your Department on any type of non-Portland Cement Materials?
4. If there was a national specification developed for the use of non-Portland cements, would you be willing to use this specification on a DOT project?

RESULTS

Of the 50 state DOTs and the 13 Provincial and Territorial ministries, there were a total of 27 respondents which included 26 states and one ministry of transportation. Table 1 is a summary of the results for each question.

Table 1. Summary of results from responding agencies

Question Number	Answered "Yes"	Answered "No"	No response
1	15	12	0
3	7	20	0
4	22	4	1

The survey was designed to solicit a “yes or no” answer for each question. Of the 15 respondents that responded “yes” when answering Question One, each listed repair applications as a primary use. These uses were generally identified as bridge deck repair and rapid patching applications. Question Two, “If so, what are the typical applications?” was designed to seek additional information on the typical uses for non-traditional cements.

Finally, Question Four, “If there was a national specification developed for the use of non-Portland cements, would you be willing to use this specification on a DOT project?”. sought input on the potential use of a national specification. , Eleven responses indicated the “possible” use of a national specification for non-Portland cements . For the purposes of this survey, possible responses are considered to be a “yes” answer as the relevant agency is considering the use of a non-traditional cements in their state.

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Table 2. Survey Results

Organization Name	Answers to Questions				Comments
	1	2	3	4	
Alabama	No	N/A	No	Possibly	That depends on a lot of variables as yet not quantified
California	Yes	Repairs	Yes	Possibly	Typical applications are patching spalls in deteriorated bridge decks.
Colorado	Yes	Repairs	No	Yes	We use ASTM C 928 for concrete patching materials
Connecticut	No	N/A	No	Yes	
Florida	Yes	Repairs	Yes	Yes	We allow the use of use non Portland cement based materials primarily for repair of bridge decks and structural concrete members. We allow the use of MAPC for the repair of high-stress areas segmental bridges. We've recently completed a research program which was used to update the FDOT Standard Specification regarding repair materials
Idaho	Yes	Repairs	Yes	No	
Illinois	No	N/A	No	Yes	
Iowa	No	N/A	No	Possibly	
Kansas	Yes	Dowel Bar retrofit	No	Yes	NTPEP is developing a specification for repair materials
Louisiana	No	N/A	No	No	
Maine	No	N/A	No	Possibly	We would need more information / research before allowing it on a project
Massachusetts	No	N/A	No	Possibly	
Michigan	Yes	Yes	Yes	Possibly	Bridge deck repair, Very limited research
Minnesota	No	N/A	No	Possibly	We would need to see research on the subject
Missouri	No	N/A	No	Possibly	
New Hampshire	No	N/A	No	Yes	

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New York	Yes	Concrete Repair / PCC pavement repair	Yes	No	#3 NTPEP 2002 #5 - NYS has an expensive materials testing program which evaluates products for their suitability on Department project applications. Since our specifications are performance based - if a given material meets the minimum requirements of the specification (regardless of the type of cement it consists of) it can be determined acceptable for use
North Carolina	No	N/A	No	Yes	
Ohio	No	N/A	No	No	Although they answered no on the survey, Florida and Ohio have shared information regarding the use of non-Portland cement based repair materials used in both states.
Ontario MTO	Yes	Repairs	Yes	Yes	Some testing was performed on ciment fondu (high aluminum cement)
Rhode Island	No	N/A	No	Possibly	
South Dakota	Yes	Repairs	No	Unknown	Materials that meet ASTM C 928 can be used on patching of bridges with PCC pavements
Texas	Yes	Repairs	Yes	Yes	The typical use is for bridge deck repairs and armor joint repair
Utah	No	N/A	No	Possibly	
Washington	No	N/A	No	Yes	
West Virginia	Yes	Repairs	No	Yes	Repair around modular expansion joints
Wisconsin	Yes	Repairs	No	Possibly	Repair of Bridge Decks