

16-7121

25-16-013-PIF

MEMORANDUM

STATE OF ALASKA

Department of Transportation & Public Facilities
Design & Engineering Services – Central Region
Highway Design

TO: Charles Deininger
Chief Contracts Officer

DATE: October 6, 2015

THRU: Robert A. Campbell, PE
Director, Central Region

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SUBJECT: Public Interest Finding

AMATS: Abbott Rd Rehabilitation - Lake Otis
to Birch

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FROM: Carla J. Smith, PE
Project Manager

Project No. 0506003/Z539420000

Introduction

The Alaska Department of Transportation and Public Facilities (ADOT&PF) is seeking a Public Interest Finding (PIF) to brand specify proprietary equipment for use in the subject federally funded capital project for research purposes.

ADOT&PF is proposing to brand specify Novocon 0730 Steel Fibers, unique cold drawn flat end reinforcement steel used to improve crack resistance, ductility and toughness of standard concrete for this project. The Novocon flat end steel fibers were used exclusively in laboratory testing of steel fiber-reinforced rubberized concrete (SFRRC) that was proposed and approved by the Research Advisory Board for use in testing and construction during the Research Development & Technology Transfer FFY15 project nomination period.

0730 Flat End Steel Fibers –Manufactured by Novocon, Distributed by Propex Global

Estimated Cost per Pound: \$ 0.98

Estimated Project Quantity: 8,000 pounds

Estimated Total Cost: \$7,840.00

Project Background

The construction cost estimate for the Abbott Road Rehabilitation project is in the range of \$10,000,000 to \$20,000,000. Scheduled advertisement for construction is anticipated for December 2015.

Recent studies have been conducted in order to help mitigate the freeze thaw cycle on PCC. In order to increase the strength and ductility of concrete, research has been conducted with mixtures of concrete, rubber and the inclusion of steel fibers. Extensive testing and multiple mix designs have been produced in order to optimize the percentages of all materials. Using the Novocon Steel Fibers a specific mix design has been created that will deliver compressive strength comparable to standard PCC, but with increased flexibility that has been shown to minimize first cracking and rutting.

With laboratory testing complete the SFRRRC material has been approved by the Research Advisory Board for testing on the subject project. During the rehabilitation of Abbott Road, a trial section of SFRRRC material will be placed and monitored. The trial section will continue the research of SFRRRC by providing data in regards to constructability, costs, performance, and design life of the material.

Justification for Public Interest Finding

Based on extensive research the Novocon 0730 was determined to provide the highest compressive and flexural strength between several different steel fibers. With that determination further research was conducted in order to optimize the mix quantities and design. If Novocon 0730 FE Steel Fibers are not used in the SFRRRC then it cannot be guaranteed that the results found during lab testing can be achieved. (Lab testing is funded by ADOT&PF.)

Key Advantages of Novocon 0730 FE steel fibers over traditional methods include:

- Increase in flexural strength of concrete based on first crack loading
- Increase in toughness, which represents higher ductility and resistance to dynamic movement
- Increase in compressive strength
- Increase in stud resistance compared to standard Alaska roadway statistics
- Increase in freeze-thaw resistance compared to standard concrete

Use of Novocon 0730 Steel Fibers will be crucial for continuation of testing and research for SFRRRC placement in Alaska roadways to determine if they provide cost effective evidence of improvement over traditional Portland cement concrete practices.

Finding of Public Interest

It is hereby found to be in the Public's best interest and consistent with the Code of Federal Regulations Title 23, Section 635.411 and ADOT&PF Policy and Procedure 10.02.013 to specify the identified proprietary items in this federally funded project.

Submitted by: Carla Smith 10/6/15
Carla Smith, P.E. Date
Project Manager

Recommended by: [Signature] 10/15/15
Robert A. Campbell, P.E. Date
Regional Director

Approved by: [Signature] 11/13/15
Charlie Deininger Date
Chief Contracts Officer

Smith, Carla J (DOT)

From: Bingham, Newton J (DOT)
Sent: Monday, October 05, 2015 3:17 PM
To: Smith, Carla J (DOT)
Cc: Aboueid, Mahear A (DOT); Morton, Kenneth M (DOT); Amundsen, James (DOT); Bosin, Anna D (DOT)
Subject: Fiber Reinforced Concrete Prall Test Results.
Attachments: Special Concrete Prall.pdf

Carla,
Attached are prall test results with the average less than 25 cm³ which was stated to be the upper limit desirable as asphalt pavement is in this same range of 20-25.

So based on these test results, I recommend that this type of experimental concrete developed by UAA be evaluated in a short test section of the Abbott Road project and monitored for performance as a research evaluation.

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