



April 10, 2018

Federal Highway Administration (FHWA)
C/O J. Don Martinez – Division Administrator
4001 Office Court, Suite 801
Santa Fe, NM 87507

Subject: CN 4101490, CN 610010, CN 4101520 - Request for Sole Source and Proprietary Use
Ductal Ultra High Performance Concrete (UHPC)

Dear Mr. Martinez:

The New Mexico Department of Transportation (NMDOT) is requesting approval of a Public Interest Finding (PIF) for the use of Ductal UHPC by LaFargeHolcim.

The PIF would allow the NMDOT to specify a patented or proprietary product for the use of UHPC for precast connections for bridge projects on the National Highway System for projects CN 4101490 (NM 93), CN 6101010 (I-40) and CN 4101520 (NM 434). The UHPC Connections for Prefabricated Bridge Elements and Systems is an innovation under FHWA's Every Day Counts 4 Initiative.

In accordance with 23 CFR 635.411, the 2015 Stewardship and Oversight Agreement between the FHWA and the NMDOT and the attached supporting information provided by the Bridge Bureau, the NMDOT requests FHWA approve this PIF.

Thank you,

A handwritten signature in blue ink, appearing to be "A. Armendariz".

Armando M. Armendariz
Division Director Design and Construction

XC: Anthony Lujan, Deputy Secretary
Kathy Crowell, State Bridge Engineer (Acting)
Frank Lozano, FHWA Operations Engineer
Robert Bency, Area Engineer
Marilyn Ochoa, Area Engineer
Thiet Nguyen, FHWA Bridge Engineer
Rhonda Lopez, CLE
Juan Rael, CLE
Ted Barela, BHI

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Project Overview | **Funding History** | **Amendment History**

Control # 4101490
 Lead Agency NM Dot
 Project Type Bridge - Rehab (14)
 Title ENDEE INTERCHANGE BRIDGE
 Limits NM 93 from Jct. I-40/NM 93 to Jct. I-40/NM93 milepost .1 to .2 (.1 mile)
 Description Bridge 07345
 BRIDGE REHABILITATION
 Production Date 05/21/2018
 Region/TIP D4 18-01
 Contact Chris Urioste
 Air Quality
 Local ID District 4
 Total Cost County Quay
 Construction 2018 Start
 Letting Date 07/20/2018

Phase	Fund Source	Prior FFY	FFY2018	FFY2019	FFY2020	FFY2021	Future FFY	Total
CON	ROAD FUND	-	-	\$197,054	-	-	-	\$197,054
CON	STATE	-	\$350,000	-	-	-	-	\$350,000
CON	STP FLEX (AC)	-	-	\$831,575	-	-	-	\$831,575
CON	STP OFF-SYS BRIDGES (AC)	-	-	\$221,371	-	-	-	\$221,371
CON	STP OFF-SYS BRIDGES_NC	-	\$1,400,000	-	-	-	-	\$1,400,000
Total Construction		-	\$1,750,000	\$1,250,000	-	-	-	\$3,000,000
Total Programmed		-	\$1,750,000	\$1,250,000	-	-	-	\$3,000,000



Project Overview | **Funding History** | **Amendment History**

Control # 6101010
 Lead Agency NM Dot
 Project Type Bridge - Replace + Add Capacity (10)
 Title I-40 NEAR COOLIDGE, NM.
 Limits I 40 from Exit 44 to Near Coolidge milepost 43.5 to 46 (2.5 mile)
 Description Bridge 06008
 Bridge 06009
 REPLACE INTERCHANGE AND DRAINAGE CBCS
 Production Date 11/26/2018
 Region/TIP D6 18-02
 Contact Sandra Chavez
 Air Quality
 Local ID District 6
 Total Cost County Mckinley
 Construction 2019 Start
 Letting Date 09/20/2019

Phase	Fund Source	Prior FFY	FFY2018	FFY2019	FFY2020	FFY2021	Future FFY	Total
ROW	NAT HWY PERF PROG	-	-	\$85,440	-	-	-	\$85,440
ROW	ROAD FUND	-	\$14,560	-	-	-	-	\$14,560
Total Right of Way		-	\$100,000	-	-	-	-	\$100,000
CON	NAT HWY PERF PROG	-	-	\$8,732,560	-	-	-	\$8,732,560
CON	ROAD FUND	-	\$1,219,757	-	-	-	-	\$1,219,757
CON	STP FLEX	-	\$2,024,607	-	-	-	-	\$2,024,607
CON	STP OFF-SYS BRIDGES	-	\$83,107	-	-	-	-	\$83,107
CON	STP RURAL < 5K	-	\$939,971	-	-	-	-	\$939,971
Total Construction		-	\$13,000,002	\$13,000,002	-	-	-	\$13,000,002
Total Programmed		-	\$13,000,002	\$13,000,002	-	-	-	\$13,000,002

[Comment on this Project](#)



Project Overview | **Funding History** | **Amendment History**

Control # 4101520
 Lead Agency NM Dot
 Project Type Bridge - Rehab (14)
 Title NM434 (MORA) BRIDGE
 Limits NM 434 milepost .15 to .25 (.1 mile)
 Description Bridge 00851
 BRIDGE REHABILITATION
 Production Date 01/21/2019
 Region/TIP D4 18-00
 Contact Chris Urioste
 Air Quality
 Local ID District 4
 Total Cost County Mora
 Construction 2019 Start
 Letting Date 03/15/2019

Phase	Fund Source	Prior FFY	FFY2018	FFY2019	FFY2020	FFY2021	Future FFY	Total
CON	STATE	-	-	\$100,000	-	-	-	\$100,000
CON	STP OFF-SYS BRIDGES	-	-	\$400,000	-	-	-	\$400,000
Total Construction		-	-	\$500,000	-	-	-	\$500,000
Total Programmed		-	-	\$500,000	-	-	-	\$500,000



April 10, 2018

To: Armando Armendariz, Director
1120 Cerrillos Road
Santa Fe, NM 87507

Re: Public Interest Finding: Title 23 CFR 635.411 – Ductal UHPC, CN 4101490, CN 6101010, CN 4101520.

Dear Mr. Armendariz,

The New Mexico Department of Transportation is currently completing the design for three (3) bridge projects. They are CN 4101490, CN 6101010 and CN 4101520. Each project will require the use of ultra-high performance concrete (UHPC) for precast connections. Through the study and design phase of the projects, the Department has determined that the sole source product Ductal® UHPC by LaFargeHolcim is required for use on these projects, and approval to use this product is requested. Note that UHPC Connections for Prefabricated Bridge Elements and Systems (PBES) is an innovation under FHWA's Every Day Counts 4 Initiative. Here is a summary of each project.

The purpose of CN 4101490 is to quickly replace the deficient deck on the existing prestressed concrete girder bridge over I-40 at the Endee interchange in Quay County by utilizing full-depth precast concrete deck panels. Full-depth precast deck panels are an innovation under FHWA's Every Day Counts 2 Initiative on PBES. At the request of District 4, precast deck panels are being used to minimize impacts to local businesses at the Endee interchange by limiting the total time of construction to thirty (30) calendar days. Placement of a conventional cast-in-place deck would take far in excess of 30 calendar days and cause unacceptable impacts to the local business owners. Installation of the full-depth precast panels requires the installation of shear stud connectors to fully develop and transfer live load shear from the deck to the girders. To develop this live load shear transfer capability, UHPC is required, as its high strength (in excess of 21,000 psi) provides for transfer of the live load shear over the short length of the shear stud connectors. Conventional concretes and grouts will not develop adequate strength to provide this live load transfer. An analysis has been performed based on nationwide cost data for UHPC connections. Forty (40) cubic yards of UHPC (Item 512008 – Ultra High Performance Concrete) will be required for this project at a unit cost of \$4,000 per cubic yard, for a total cost of \$160,000. The use of UHPC saves time and money and simplifies the installation of the panels by eliminating the need to post-tension and grout the precast deck panels together. Post-tensioning and grouting the precast deck panels will cost more than the use of UHPC (approximately \$210,000 from preliminary cost estimate for this project).

CN 6101010 is a bridge replacement project on I-40 in Coolidge, New Mexico. A twin 14'x14' CBC underpass will be replaced with twin adjacent box girder bridges to carry I-40 over a local road. Ductal® UHPC will be used to tie the adjacent box girders together which will eliminate the need for post-tensioning and grouting the box girders together, thus saving time and money, and reducing traffic impacts and simplifying the installation.

CN 4101520 is a bridge superstructure replacement on NM 434 near Mora, New Mexico, where the existing channel beams will be replaced with precast concrete slabs of matching depth. Ductal® UHPC will be used to tie the adjacent slabs together which will eliminate the need for post-tensioning and

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grouting the slabs together, thus saving time and money, and reducing traffic impacts and simplifying the installation.

At present, Ductal® UHPC product is the only available product that has been identified as being suitable for use in this application. The Department has used UHPC for one project involving UHPC girders, but the concrete mix for this application was designed for precast girders and not for field mixing and placement. The Department does not currently have a non-proprietary mix for UHPC connections.

The Ductal® UHPC product has been used successfully on bridge projects in nineteen (19) States in 2016 and 2017 alone, including many projects in New York and Pennsylvania.

I, Kathy Crowell, State Bridge Engineer (Acting) of the New Mexico Department of Transportation, do hereby certify that in accordance with the requirements of 23 CFR 635.411(a)(2), that this patented and proprietary product is essential to meet the requirements of the above mentioned projects, and is considered to be in the public interest by furthering the FHWA's Every Day Counts initiative in reducing construction times and impacts to motorists and businesses.

I appreciate your time and consideration in this matter. If you should have any questions, please feel free to contact me at 505-490-1190.

Sincerely,

Kathy Crowell
State Bridge Engineer (Acting)
New Mexico Department of Transportation

cc: Max Valerio, FHWA
Thiet Nguyen, FHWA
Marilyn Ochoa, FHWA
Robert Bency, FHWA
Antonio Jaramillo, NMDOT
Juan Rael, NMDOT
Rhonda Lopez, NMDOT
Ted Barela, BHI
David E. Trujillo, District 4
Heather Sandoval, District 4
Larry Maynard, District 6
Lisa Vega, District 6