30A Board

New Hampshire DOT
Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

Bureau of Materials & Research
August 22, 2016

Her Excellency, Governor Margaret Wood Hassan
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

1.) Authorize the Department of Transportation to amend a **sole-source** Cooperative Research and Development Agreement (CRADA) with the U.S. Army Engineer Research and Development Center (ERDC) Cold Regions Research and Engineering Laboratory (CRREL) (Vendor 177804), Hanover, NH, for a total additional fee not to exceed $48,850.00, for a cooperative investigation to develop a methodology to quantify the structural benefit from in situ fiberglass grid reinforcement to determine layer coefficient values used for reinforced pavement design in New Hampshire, effective upon Governor and Council approval. The original CRADA was approved by Governor and Council on November 20, 2013, Item #70. An amendment for a time extension only approved research project assignments, requiring no additional funds, was approved by Governor and Council on March 13, 2015, Item #16. 100% Federal Funds.

Funding is available as follows:

	FY 2017
04-96-96-962015-3036	
SPR Research Funds	
046-500464 General Consultants Non-Benefit	$48,850.00

2.) Further, authorize to amend the duration of the CRADA from May 1, 2017 to October 1, 2022, effective upon Governor and Council approval.

EXPLANATION

The Department is collaborating with CRREL to conduct a cooperative research study to determine layer coefficient values reinforced flexible pavement systems. CRREL is uniquely qualified to conduct this study because of its comprehensive knowledge of infrastructure including the performance of pavements, concrete and airfields in cold regions, along with testing capabilities and a reputation for an unbiased, science-based approach to complex issues. CRREL has successfully performed other studies for the Department in the past including research related to the causes and mechanics of pavement frost heaving in the vicinity of transverse pavement cracks, synthesizing commonly used and potential test

methods for evaluating hot-mix aggregates in term of pavement performance, testing to determine the effective resilient modulus on subgrade soils commonly found in the State for use in Mechanistic AASHTO pavement designs, developing a test program to characterize the use of reclaimed asphalt concrete as a base course material, and recently for assessing the performance of reinforcement grids in base course and asphalt concrete pavements.

In this previous study, deflection testing at various loads was conducted by CRREL along NH Route 101 near Epping/Brentwood to assess the performance grid reinforced asphalt pavement sections. Data from the highest loading was evaluated. This study will evaluate the results from the lower impact loads to back-calculate asphalt concrete layer moduli and provide coefficient values for fiberglass reinforced asphalt material.

This amended Agreement has been approved by the Attorney General as to form and execution. Copies of the fully-executed Agreement are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation. The Department has verified that the necessary funds are available.

It is respectfully requested that authority be given to enter into a sole-source Agreement for services as outlined above.

Sincerely,

Victoria F. Sheehan

Victoria F. Sheehan
Commissioner

Attachments

AMENDMENT 2

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA)

BETWEEN
U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY
AND
NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT)

In accordance with Article 8.7. Amendments and Modifications, the above stated CRADA dated 20 November 2013, is hereby further amended as follows:

I. Article 12. Duration of CRADA and Effective Date that reads: "In no case will this CRADA extend beyond May 1, 2017 is changed to read: "In no case will this CRADA extend beyond 1 October 2022."

II. Article 2.6.4. is replaced in its entirety with the following:

"2.6.4. For the work effort to be commenced in time, funds must be provided in advance. There are three ways funds may be sent to ERDC-CRREL:

a. Checks should mailed thirty days in advance and made payable to "U.S. Army Engineer Research and Development Center" and forwarded to:

United States Army Engineer Research and Development Center
ATTN: CEERD-RM-FA
3909 Halls Ferry Road
Vicksburg, Mississippi 39180-6199

The following information must be included with the check:
Point of Contact: Sarah Kopczynski
U.S. Army Engineer Research and Development Center
Cold Regions Research and Engineering Laboratory
CEERD-RR
72 Lyme Road
Hanover, NH 03755-1290
Telephone: (603) 646-4761
Email: Sarah.E.Kopcznski@usace.army.mil
Technical support pursuant to: "C-13-CRL-01-02: Impact of Seasonal Conditions and Changing Climate on Structural Performance Pertaining to Pavement, Construction Materials, and Geotechnical Engineering."

b. EFT – For EFT information, email Leandra Murrell, email:
Leandra.K.Murrell@usace.army.mil.

c. Wire Transfer – For wire transfer information, email: Leandra Murrell email:
Leandra.K.Murrell@usace.army.mil."

III. Updates Article 8.10. NHDOT Point of Contact to:

Ann M. Scholz, P.E.
Research Engineer
New Hampshire Department of Transportation
Bureau of Materials & Research
PO Box. 483
Concord, NH 03302
AScholz@dot.state.nh.us
Phone: (603) 271-1659

IV. Article 2.2 Work Statements and Article 2.5. "Scope Change" adding the "Appendix D." Work Statement:

APPENDIX D
WORK STATEMENT

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT
BETWEEN
U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER (ERDC)
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY (CRREL)
AND
NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT)

Pursuant to Article 2.2 of this CRADA, this Work Statement defines a particular research activity (consistent with the scope and obligations set forth in Appendix A) to be conducted under the CRADA.

1.0. PROJECT TITLE: Assessing the effectiveness of lower impulse loads on reinforced asphalt pavements.

2.0. BACKGROUND: NHDOT installed fiberglass grid reinforcement in several flexible roadways throughout the state in an effort to address fatigue cracking and extend roadway service life. Currently, no field test method exists to evaluate the in situ

performance of asphalt reinforced pavements. During the fall of 2014, data was collected from six test sections (four test sections with fiberglass grid reinforcement and two control test sections) on NH Route 101 using impulse load testing equipment (Falling Weight Deflectometer [FWD] and Lightweight Deflectometer [LWD]) at increasingly higher load levels. This project proposal evaluates the FWD deflection measurements at the lower load levels and the LWD data to determine the potential benefit of reinforcing grid in the asphalt layer.

3.0. PROJECT OBJECTIVE: The objective of this project is to develop a methodology to quantify the structural benefit from in situ fiberglass grid reinforcement within the asphalt concrete layer to determine layer coefficient values for the reinforced asphalt layer used in NHDOT pavement design.

4.0. ERDC CRREL TASKS, SCHEDULE AND COST ESTIMATE:

4.1. CRREL will conduct all data analysis on existing datasets collected during field testing on New Hampshire Route 101 during fall 2014. Data was collected from two impulse loading instruments: the Falling Weight Deflectometer (FWD), and the Lightweight Deflectometer (LWD). During the original field testing, deflection data was collected with the LWD on an experimental basis. Using the sets of data from these two instruments, the analysis will focus on the three thin test sections where the asphalt concrete layer was approximately 6 in.

4.2. CRREL will apply a backcalculation approach on the FWD and LWD data to quantify the material layer properties and the effect of the fiberglass grid reinforcement within the asphalt concrete pavement layer. The results will be compared to the control test section (without fiberglass reinforcement).

4.2.1. The backcalculation will use available and accepted software packages. Examples of providers of backcalculation software include Dynatest International or the U.S. Army Corps of Engineers Pavement-Transportation Computer Assisted Structural Evaluation (PCASE).

4.2.2. CRREL will use the deflection data from the FWD and LWD to determine the stresses and strains within the asphalt material layer. This approach may be useful to quantify the contribution of the fiberglass reinforcing grid within the pavement layer and to determine the layer coefficient value(s).

4.3. Assessment of Asphalt Concrete Reinforcement Grid in Flexible Pavements estimated funding through CRADA is $48,850. Work on the project will commence upon receipt of the full funding level specified. If the project funding is less than the budgeted amount designated, the scope of work will be revised through modification.

4.4 The payment scheduled for the project costs will be invoiced in the following manner:

4.4.1. Invoice 1 - On start-up - $48,850.

4.4.2. Pursuant to Article 2.6, incremental deposits are permissible but the amount deposited must stay ahead of ERDC costs.

5.0. DELIVERABLES:

The following are listed as deliverable products:

5.1. Asphalt concrete layer moduli estimated from back-calculation procedures;

5.2. Coefficient values for fiberglass reinforced asphalt material used for pavement design;

5.3. Technical presentation of study findings to NHDOT prior to finalizing a written technical report;

5.4. Technical written report of data analysis approach and findings.

6.0. NH DOT TASKS:

NHDOT is requested, on an as needed basis, to provide background information, explanation of the construction of the test sections, or clarification of the laboratory testing of the soil borings collected during the 2014 field testing.

7.0. PERIOD OF PERFORMANCE:

The project period of performance is twelve months upon receipt of funding.

8.0. TECHNICAL POINTS OF CONTACT:

8.1. ERDC-CRREL:

Lynette A. Barna (Project Leader)
Research Civil Engineer
U.S. Army Engineer Research and Development Center
Cold Regions Research and Engineering Laboratory
72 Lyme Road, Hanover, NH 03755
Phone: (603) 646-4503
Email: Lynette.A.Barna@usace.army.mil

8.2. NHDOT:

Ann Scholz, P.E.
Research Engineer
New Hampshire Department of Transportation
Bureau of Materials & Research
PO Box 483, 5 Hazen Drive
Concord, NH 03302-0483
Telephone: (603) 271-3151
Email: AScholz@dot.state.nh.us

IN WITNESS WHEREOF, the Parties have caused this CRADA to be amended, as above, and to be executed by their duly authorized representatives as follows:

For: U.S. Army Cold Regions Research and Engineering Laboratory

By _____ 12 August 16
Robert E. Davis, Ph.D. Date
Director

For: New Hampshire Department of Transportation:

By _____ 8/19/2016
Peter E. Stamnas, P.E. Date
Director of Project Development

APPROVED

By _____
For: New Hampshire Governor and Executive Council Date
Deputy Secretary of State

APPROVED

By _____ 9/12/16
For: New Hampshire Office of the Attorney General Date

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

DELEGATION OF AUTHORITY TO ENTER INTO COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS AND TO LICENSE, ASSIGN, OR WAIVE RIGHTS TO INTELLECTUAL PROPOERTY

1. Pursuant to the authority contained in 15 United States Code (U.S.C.), Section 3710a, Executive Order 12591, Section 1 (b)(1) dated 10 April 1987, and Army Regulation (AR) 70-57, Army Domestic Technology Transfer, paragraph 1-8, and pursuant to the authority redelegated to me by the Assistant Secretary of the Army (Research, Development and Acquisition) on 4 December 1987, I hereby delegate (1) the authority to enter into, on behalf of the Department of the Army, Cooperative Research and Development Agreements, and (2) the authority to license, assign, or waive rights to intellectual property developed by or assigned to the Department of the Army to:

Director, U.S. Army Engineer Research and Development Center
Director, U.S. Army Engineer Coastal and Hydraulics Laboratory
Director, U.S. Army Engineer Geotechnical Laboratory
Director, U.S. Army Engineer Structures Laboratory
Director, U.S. Army Engineer Environmental Laboratory
Director, U.S. Army Engineer Information Technology Laboratory
Director, U.S. Army Engineer Construction Engineering Laboratory
Director, U.S. Army Engineer Cold Regions Research and Engineering Laboratory
Director, U.S. Army Engineer Topographic Engineering Center

2. This authority may not be redelegated further.

3. The foregoing delegation of authority becomes effective on 1 February 2000.

JOE N. BALLARD
Lieutenant General, USA
Commanding

DEPARTMENT OF THE ARMY
ENGINEER RESEARCH AND DEVELOPMENT CENTER, CORPS OF ENGINEERS
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY
72 LYME ROAD
HANOVER, NEW HAMPSHIRE 03755-1290

REPLY TO
ATTENTION OF:

August 12, 2016

Executive Office

Ms. Ann M. Scholz, P.E.
NH Department of Transportation
Materials & Research Bureau
Box 483, 5 Hazen Drive
Concord NH 03302-0483

Dear Ms. Scholz,

This letter is in response to your request for information concerning the United States Government and specifically, the U.S. Army Engineer Research and Development Center (ERDC) -Cold Regions Research and Engineering Laboratory (CRREL), being self insured. The following rules are equally applicable to any official government activity:

1. The Government is a self-insurer with respect to loss or damage to government property and the liability of government employees. In the absence of express statutory authority, appropriated funds are not available to purchase such insurance coverage. (Rule summarized in GAO B-158766, Feb. 3, 1977.)

2. The Federal Tort Claims Act (28 USC 2671 et seq.) provides the exclusive remedy for tort claims against the United States. Under it, the Government agrees to assume responsibility for negligent acts or omissions of ERDC-CRREL employees acting within the scope of their employment.

3. The Government may not accept "hold harmless" or "indemnification" clauses in its agreements because the law prohibits the Government from entering into agreements where the Government's liability is indefinite, indeterminate, or potentially unlimited. Such agreements violate both the Antideficiency Act, 31 USC 1341 and the Adequacy of Appropriations Act, 41 USC 11, the latter because it can never be said that sufficient funds have been appropriated to cover the contingency.

Please e-mail Mr. Gary Pasternak at gary.a.pasternak@usace.army.mil if you need further information on this subject, but I hope this satisfies your needs regarding the issue above.

Sincerely,

ROBERT E. DAVIS, PhD, SES
Director

Attachment
USAGE Delegation Letter dated Feb. 1, 2000

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New Hampshire DOT
Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

JEFF BRILLHART, P.E.
ACTING COMMISSIONER

Bureau of Materials & Research
January 30, 2015

Her Excellency, Governor Margaret Wood Hassan
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Authorize the Department of Transportation to amend a **sole-source** Cooperative Research and Development Agreement (CRADA) with the US Army Engineer Research and Development Center (ERDC) Cold Regions Research and Engineering Laboratory (CRREL) (Vendor 177804), Hanover, NH, by extending the completion date from March 31, 2015 to December 31, 2015, effective upon Governor and Council approval. The original Agreement was approved by Governor and Council on November 20, 2013, Item #70. This is a time extension only, requiring no additional funds.

EXPLANATION

The Department is collaborating with CRREL to conduct a cooperative research study evaluating the potential structural benefits of including reinforcement grid in the base course layer or asphalt concrete layer of flexible pavement systems. A number of installations have occurred in New Hampshire; however, to date the actual benefits have not been quantified. CRREL is uniquely qualified to conduct this study because of its comprehensive knowledge of infrastructure including the performance of pavements, concrete and airfields in cold regions, along with testing capabilities and a reputation for an unbiased, science-based approach to complex issues. CRREL has successfully performed other studies for the Department in the past including research related to the causes and mechanics of pavement frost heaving in the vicinity of transverse pavement cracks, synthesizing commonly used and potential test methods for evaluating hot-mix aggregates in term of pavement performance, testing to determine the effective resilient modulus on subgrade soils commonly found in the State for use in Mechanistic AASHTO pavement designs, and developing a test program to characterize the use of reclaimed asphalt concrete as a base course material.

On November 20, 2013, the original CRADA was approved by Governor and Council (Item #70; copy of resolution attached) with a funding allocation of $120,000 for FY 2014 and $28,000 for FY 2015.

The currently proposed amendment to the Agreement extends the completion date from March 31, 2015 to December 31, 2015. Field testing performed by the researchers from CRREL was dependent on weather conditions and assistance from highway maintenance crews for traffic control and drillers from the Department's Geotechnical Section. Wet weather predictions and conditions caused delays of field testing along NH Route 101 near Epping/Brentwood. A second round of field tests is planned along Pickering Road in Rochester in March/April to verify that pavement strength captured in the spring 2014

is comparable to the frost conditions noted. Additional time is required for data analysis and final report.

This amended Agreement has been approved by the Attorney General as to form and execution. Copies of the fully-executed Agreement are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

Your approval of this resolution is respectfully requested.

Sincerely,

David J. Brillhart, PE
Acting Commissioner

Attachments

New Hampshire DOT
Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

CHRISTOPHER D. CLEMENT, SR.
COMMISSIONER

JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

Bureau of Materials & Research
October 21, 2013

Her Excellency, Governor Margaret Wood Hassan
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Authorize the Department of Transportation to execute a **sole-source** Cooperative Research and Development Agreement (CRADA) with the US Army Engineer Research and Development Center (ERDC) Cold Regions Research and Engineering Laboratory (CRREL) (Vendor 177804), Hanover, NH, for a total fee not to exceed $148,000.00, for a cooperative investigation to assess the performance of reinforcement grids in base course and asphalt concrete pavements in New Hampshire, effective upon Governor and Council approval, through March 31, 2015. 100% Federal Funds.

Funding is available as follows:

	FY 2014	FY2015
04-96-96-962015-3036		
SPR Research Funds		
046-500464 General Consultants Non-Benefit	$120,000.00	$28,000.00

EXPLANATION

The Department is collaborating with CRREL to conduct a cooperative research study evaluating the potential structural benefits of including reinforcement grid in the base course layer or asphalt concrete layer of flexible pavement systems. CRREL is uniquely qualified to conduct this study because of its comprehensive knowledge of infrastructure including the performance of pavements, concrete and airfields in cold regions, along with testing capabilities and a reputation for an unbiased, science-based approach to complex issues. CRREL has successfully performed other studies for the Department in the past including research related to the causes and mechanics of pavement frost heaving in the vicinity of transverse pavement cracks, synthesizing commonly used and potential test methods for evaluating hot-mix aggregates in term of pavement performance, testing to determine the effective resilient modulus on subgrade soils commonly found in the State for use in Mechanistic AASHTO pavement designs, and developing a test program to characterize the use of reclaimed asphalt concrete as a base course material.

Reinforcement grids within base courses and asphalt concrete layers are purported to provide structural benefits to flexible pavement systems. A number of installations have occurred in New Hampshire; however, to date the actual benefits have not been quantified. This research will provide the Department with a comparative assessment of the performance of such systems in real-world conditions, with the goal of determining whether similar applications can reduce the required asphalt and aggregate thicknesses as claimed by grid manufacturers, thereby reducing the overall cost of pavement reconstruction.

Deflection testing and back-calculation of structural parameters will occur along Pickering Road in Rochester and NH Route 101 near Epping/Brentwood to assess the performance of reinforced base course materials and asphalt pavement sections, respectively. In addition, the ability of the reinforcing grids to reduce or arrest fatigue and reflective cracks caused by traffic loadings, age hardening of the asphalt materials, and temperature cycling will be evaluated. The overall outcome from the proposed study supports an important performance objective, *Improving Asset Conditions*, identified in the NHDOT Balanced Scorecard, by improving the quality and longevity of pavements.

This Agreement has been approved by the Attorney General as to form and execution. The Department has verified that the necessary funds are available. Copies of the fully-executed Agreement are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

Project funding is 80% federal funds with 20% state match. Turnpike toll credit is being utilized for match requirements, effectively using 100% federal funds.

It is respectfully requested that authority be given to enter into a sole-source Agreement for test and evaluation services as outlined above.

Sincerely,

Christopher D. Clement, Sr.
Commissioner

Attachments