Notice of Funding Opportunity (NOFO)
Summary Information

Federal Agency Name:	**U.S. Department of Transportation (US DOT)** **Federal Highway Administration (FHWA)** **Office of Acquisition and Grants Management (HCFA)** **1200 New Jersey Avenue SE** **Mail Drop: E62-204** **Washington DC 20590** **Attn: Sarah Tarpgaard, HCFA-32**
Funding Opportunity Title:	**Evaluation of Alternative Cementitious Materials (ACMs) that React with Carbon Dioxide in Making Concrete for Rigid Highway Pavements and Transportation Structures**
Announcement Type:	**This is the initial announcement of this funding opportunity.**
Funding Opportunity Number:	**Notice Number: DTFH6115RA00009**
Catalog of Federal Domestic Assistance (CFDA) Number:	**20.200 Highway Research & Development**
Key Dates:	**Notice Issue Date is June 18, 2015** **Application Due Date/Time is July 24, 2015** **at 12 noon Eastern Time.**
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NOTE: The FHWA uses www.grants.gov for receipt of all applications. Applicants must register and use the system to submit applications electronically. Applicants are encouraged to register in advance of the submission deadline and to register to receive notifications of updates/amendments to this Notice. Approval of user registrations for the site may take multiple weeks. It is the Applicant's responsibility to monitor for any updates to this Notice.

SECTION A - PROGRAM DESCRIPTION

The FHWA hereby requests an application from Solidia Technologies, Inc. (the planned Recipient) to result in the award of a new Cooperative Agreement, entitled, **"**Evaluation of Alternative Cementitious Materials (ACMs) that React with Carbon Dioxide in Making Concrete for Rigid Highway Pavements and Transportation Structures."

1. STATEMENT OF PURPOSE

The purpose of this planned Cooperative Agreement is to enable the continued collaboration between Solidia and the FHWA Office of Infrastructure Research & Development to further evaluate a patented and proprietary product in which the highway industry has a particular interest because of the sustainability of the process and the potential for improved performance in some highway applications. Specifically, the purpose of this planned Cooperative Agreement is to support the assessment of the applicability of the Solidia Cement and Solidia Concrete for use in highway applications. The FHWA intends to conduct independent evaluation and testing of the proprietary product in the Turner-Fairbank Highway Research Center (TFHRC) labs using concrete specimens and structural elements made by the Recipient under the Cooperative Agreement, as well as specimens made by FHWA at TFHRC.

2. LEGISLATIVE AUTHORITY

The authority to enter into a Cooperative Agreement for this effort is found in 23 US Code § 502 - Surface Transportation Research, Development, and Technology, paragraph (b)(3) which states,

> (3) cooperation, grants, and contracts.— The Secretary may carry out research, development, and technology transfer activities related to transportation—
>
> > (A) independently;
> > (B) in cooperation with other Federal departments, agencies, and instrumentalities and Federal laboratories; or
> > (C) by making grants to, or entering into contracts and cooperative agreements with one or more of the following: the National Academy of Sciences, the American Association of State Highway and Transportation Officials, any Federal laboratory, Federal agency, State agency, authority, association, institution, for-profit or nonprofit corporation, organization, foreign country, or any other person.

The authorization for the funding appropriations for the planned award are found in P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21), Section 51001(a)(1) HIGHWAY RESEARCH AND DEVELOPMENT PROGRAM as codified in 23 US Code § 503(b). The funding cite requires a cost share of 20% of the project cost pursuant to MAP-21 Sec. 51001(b)(1), as shown below.

> **SEC. 51001. AUTHORIZATION OF APPROPRIATIONS.**
>
> (a) IN GENERAL.—The following amounts are authorized to be appropriated out of the Highway Trust Fund (other than the Mass Transit Account):
>
> > (1) HIGHWAY RESEARCH AND DEVELOPMENT PROGRAM.—To carry out sections 503(b), 503(d), and 509 of title 23, United States Code, $115,000,000 for each of fiscal years 2013 and 2014.
> > {…}
>
> (b) APPLICABILITY OF TITLE 23, UNITED STATES CODE.—Funds authorized to be appropriated by subsection (a) shall—
>
> > (1) be available for obligation in the same manner as if those funds were apportioned under chapter 1 of title 23, United States Code, except that the Federal share of the cost of a project or activity carried out using those funds shall be 80 percent, unless otherwise expressly provided by this Act (including the amendments by this Act) or otherwise determined by the Secretary; and
> >
> > (2) remain available until expended and not be transferable.

3. BACKGROUND

In October 2012, FHWA entered into a Cooperative Research and Development Agreement (CRADA) with Solidia. The agreement resulted from a FHWA competitive announcement on FedBizOpps.gov requesting collaborators in “Advancing Innovation in the Area of Alternative Cementitious Materials.” The CRADA, which expires in October 2015, provides for research and collaborative testing on the new patented technology at Solidia’s facility and at the FHWA TFHRC.

FHWA and Solidia will work in cooperation to continue this collaborative research with the objective of assessing the applicability of the Solidia Cement and Solidia Concrete for use in highway applications. This technology has the potential to reduce the carbon footprint of highway infrastructure and improve performance in some highway applications. Therefore, FHWA has determined it necessary to award a cost-sharing Cooperative Agreement to Solidia to further develop this new, innovative, and more sustainable technology and apply the new technology to highway concrete pavements and structures.

4. GOALS

The goal of this agreement is to produce concrete highway infrastructure elements with a lower-CO_2 Alternative Cementitious Material (ACM) that reacts with carbon dioxide in making concrete with no Portland cement, and without dependence on hydration reactions with water, to enable assessment of the applicability of concrete manufactured with this technology in typical highway infrastructure applications. Under the Cooperative Agreement, the Recipient shall support the assessment of the practicality, performance, and durability of ACMs, and demonstrate how the ACMs can be specified and used in highway and transportation construction.

5. STATEMENT OF OBJECTIVES

The Recipient shall develop and deliver highway infrastructure elements manufactured using a lower-CO_2 ACM produced via the patented and proprietary process. The Recipient shall work cooperatively with FHWA to support evaluation of the elements as highway infrastructure material. Support provided by the Recipient shall include, but not necessarily be limited to, delivery of information, raw materials, highway infrastructure elements and equipment. Elements produced may include but not be limited to precast concrete pavement slabs, bridge deck panels, beams, Jersey barriers and other concrete elements typical of those needed for highway and transportation applications.

> Note: FHWA anticipates initial activities to focus on precast concrete. Use of the technology for cast-in-place concrete may be tested if deemed appropriate by FHWA as work progresses.

The Recipient shall produce and enable production of concrete specimens and highway infrastructure elements cast and cured with CO_2 in multiple facilities, to include the FHWA TFHRC and/or facilities identified by collaborating highway agencies. FHWA intends to test the specimens and elements produced and/or use the items in FHWA-sponsored field trials.

The Recipient shall develop and submit the following equipment, samples and specimens of Solidia Cement and Solidia Concrete to FHWA for characterization, analysis and/or testing at TFHRC and/or to be used in FHWA-sponsored field trials:

a. To Provide for Characterization and Evaluation of Solidia Cement:

i. The Recipient shall submit samples of Solidia Cement from full-scale cement kiln runs for characterization and analysis by FHWA TFHRC along with its source information and known properties.
ii. The Recipient shall submit source, properties and a suggested protocol for performance tests and specifications for the cement itself. The question to be addressed is – how should the quality of the cement be assessed, specified, tested, and accepted before its use in concrete construction?

b. To Provide for Laboratory Characterization and Testing of Solidia Concrete Samples:

i. The Recipient shall submit Solidia Concrete samples for characterization and analysis by FHWA TFHRC and other highway/transportation laboratories with the objective of developing performance tests and performance specifications for use of the concrete in construction. Data from these tests will be compared with existing knowledge of portland cement concrete, and will be used in the design and analysis of larger-scale pavement and structural test specimens. The quantity of laboratory specimens shall be in the range of 100 to 200 specimens of different sizes and types depending on the number of tests planned and the number of laboratories participating in evaluations.

ii. The Recipient shall submit plain concrete specimens to be tested for materials properties such as strength, durability, and volume change. Specimens shall include small, medium, and large cylinders, prisms, and beams. Some specimens shall have embedded gage studs for monitoring of length change.

c. To provide for laboratory and/or field assessment of Solidia Concrete structural elements:

i. The Recipient shall submit concrete specimens required for structural evaluation, to include elements such as reinforced concrete slabs and beams for structural properties tests. Specimens required include:
    1. Small-scale material test specimens such as prisms or cylinders for testing compressive and tensile strength, elastic modulus, Poisson ratio, creep behavior (simple pull out tests with mild steel reinforcing bars and prestressing strand).
    2. Large-scale structural test specimens, such as 8 to 10 in. deep slabs as large as 10 ft. by 10 ft. in area, beam elements between 10 in. and 36 in. deep and between 8 ft. and 60 ft. in length. Beam elements may be reinforced with mild steel reinforcing bars, prestressing strand, or a combination of both. The purpose of the different specimen types, includes: bridge deck slab tests; flexural fatigue behavior; resistance to punching and/or one-way shear; ultimate strength under static loading; reinforced concrete beam tests; prestressing strand transfer length; beam-end cracking due to strand release; camber and long-term deflection; and other flexural, shear, and fatigue behavior testing.

d. To provide for evaluation of Solidia concrete production processes:

i. The Recipient shall provide, for temporary use by the Government at FHWA TFHRC, the necessary portable carbonation equipment, controls, and connections for industrial gas supply, so that FHWA or others can mix, cast, and carbonate concrete for evaluation and demonstration. The Recipient shall provide technical support, training, and travel needed for the efficient use of the equipment at FHWA TFHRC. (Note: See PROPERTY clause for details on title/ownership.)

The Recipient shall interact with FHWA and a Technical Working Group (TWG) to support assessment of whether and how the special characteristics of Solidia ACM can be specified and used to advantage in highway infrastructure construction. Of particular interest are characteristics such as lower embodied energy, the consumption of CO_2 in the curing process, and the rapid strength gain (eliminating the need for days or weeks of curing, or expensive admixtures for placing pavement or structures in service in one or two days.) The Recipient shall support assessing the applicability of the product in full-scale highway infrastructure applications, quantifying the net carbon footprint associated with its use, and on identifying and addressing key hurdles to implementation of the product in highway and transportation markets, with emphasis on precast applications.

The Recipient shall participate in quarterly interaction with the TWG at FHWA TFHRC and monthly web conference consultation to communicate with the TWG. The Recipient shall be prepared to update the TWG on project status during monthly and quarterly interactions. FHWA will arrange for TWG interactions with the Recipient, anticipated to occur quarterly in person at FHWA TFHRC and monthly by web conference. FHWA will coordinate a calendar for the meetings and arrange the Web conferences monthly and the in-person meetings quarterly mostly at TFHRC.

- The monthly TWG web conference will be informal with a brief report from the Recipient on progress, schedule, and discussion of any problems, etc. The Recipient shall provide an advance e-mail agenda of items to be discussed with any pertinent data and information.

- The Recipient shall attend the quarterly meetings in-person and include a presentation by the Recipient of progress and data from the Recipient. FHWA intends for quarterly meetings to occur in coordination with having specimens at FHWA TFHRC, testing, and data to observe and discuss. On occasion as mutually agreed upon, the meeting may occur at the Recipient's facility or other location to coordinate with relevant activities.

The Recipient shall provide draft interim and final reports annually for review by the TWG documenting the work performed under the Cooperative Agreement. Any final reports or TechBriefs to be published by the Government shall be Section 508 compliant.

The Recipient shall submit the reports in a Word-file. The Recipient shall submit the first report near the end of Year 1. The report shall detail testing accomplished and data to date, and propose activities for Year 2. The purpose of the report is to enable the TWG to assess progress, identify hurdles, and to discuss the proposed work plan for Year 2.

The Recipient shall submit the second report near the end of Year 2. The report shall detail the tests, data and results for the record.

The areas of activity under the Cooperative Agreement may include:

- Engagement with public and private sector stakeholders;
- Production and laboratory characterization of a variety of test specimens;
- Production and laboratory testing of full-scale precast highway infrastructure components;
- Laboratory-scale production of Solidia Concrete by FHWA for purposes of independent evaluation of the concrete production process;
- Economic and environmental benefits analysis;
- Application of full-scale precast Solidia Concrete highway infrastructure components in trial field applications; and
- Development of draft generic specifications that would allow/enable use of Solidia Concrete in routine practice.

The Cooperative Agreement will specifically exclude:

- Further development and refinement of manufacturing and/or construction equipment and processes required to produce full-scale highway infrastructure components (e.g., Jersey barrier, bridge components, pavement slabs (cast-in-place or precast));
- Establishment of the manufacturing capabilities required to deliver highway infrastructure components (whether on a trial or production basis);
- Research and development to overcome any identified limitations of the product that would preclude its use in highway applications;
- Marketing of the product; and
- Actual or implied FHWA endorsement of the Recipient’s product.

<end of section>

SECTION B – FEDERAL AWARD INFORMATION

1. FUNDING AND NUMBER OF AWARDS

The FHWA anticipates making one award as a result of this Notice of Funding Opportunity.

The FHWA anticipates Federal funding to support two years of research activities may be made available for this Cooperative Agreement subject to the availability of funds.

FHWA anticipates fully funding the Cooperative Agreement.

Federal funding amount:	$1,000,000
Required Cost share amount:	$250,000
TOTAL VALUE	$1,250,000

2. TYPE OF AWARD

The planned award type is a Cooperative Agreement.

3. PERIOD OF PERFORMANCE

The period of performance for this Cooperative Agreement will be two years from the effective date of the award.

> Note: The Applicant may propose an alternative period of performance with justification for FHWA's consideration.

4. DEGREE OF FEDERAL INVOLVEMENT

The FHWA anticipates substantial Federal involvement between the FHWA and the Recipient throughout the course of this project. The FHWA intends to conduct independent evaluation and testing of the technology in the TFHRC labs, funded internally through pavement materials and structural research programs, using concrete specimens and structural elements made by Solidia under the Cooperative Agreement.

Technical Working Group (TWG) – FHWA will establish and manage a TWG with representation from several FHWA offices, as well as stakeholder organizations such as State DOTs and possibly the construction industry. FHWA will manage the TWG throughout the project and will arrange for TWG interactions with the Recipient anticipated to occur quarterly in person at FHWA TFHRC and monthly by web conference.

The TWG will:

- Review research plans, activities and data;
- Contribute to and review information and data developed;
- Assist with identification of the potential hurdles for highway application of the ACM technology;
- Discuss potential applications of the technology for concrete highway infrastructure elements; and
- Facilitate demonstrations of the technology at TFHRC or on agency highway projects if deemed appropriate.

The TWG will review the progress and data from FHWA evaluation of Solidia cement and concrete elements produced with Solidia cement. After one year of performance, the FHWA and Solidia in consultation with the TWG will review the planned agreement activities and make modifications as necessary to achieve maximum value from the second year of performance. At that time, FHWA may explore opportunities to use Solidia concrete in field highway demonstrations or projects.

Specific anticipated Federal involvement will include:

- Technical assistance and guidance to the Recipient;
- Use of FHWA/TFHRC resources;
- Development of a laboratory-scale production of Solidia Concrete by FHWA for purposes of independent evaluation of the concrete production process;
- Collaboration with federal research staff;
- Close monitoring of performance;
- Involvement in technical decisions; and
- Participation in status meetings including kick off meeting and annual technical and budget reviews.

<end of section>

SECTION C – ELIGIBILITY INFORMATION

1. ELIGIBLE APPLICANTS

This is a sole source requirement with application eligibility limited to Solidia.

2. COST SHARING OR MATCHING

Cost sharing or matching IS required.

The Federal Share of the cost of activities carried out under this agreement shall be 80 percent. Program income, if applicable, must be handled in accordance with SECTION F.

<end of section>

SECTION D - APPLICATION AND SUBMISSION INFORMATION

1. ADDRESS TO REQUEST APPLICATION PACKAGE

Applicants may obtain application forms at grants.gov under the Notice of Funding Opportunity Number cited herein.

The Applicant must complete and submit all forms included in the application package for this Notice as contained at www.grants.gov.

2. CONTENT AND FORM OF APPLICATION SUBMISSION

a. Applications must be prepared on 8½ x 11 inch paper. No foldouts.
b. A page is defined as one side of an 8 ½ by 11 inch paper. Therefore, a piece of paper with printing on both sides is considered two pages.
c. Text must be printed using a font size no less than 12 point font (Arial or Calibri).
d. Tables are permitted and text in tables must be doubled spaced.
e. Text in captions below charts, tables or figures must be not less than 10 cpi, and can be 2 lines of text long (limited by the width of the chart, table or figure) and single spaced.
f. Page margins must be a minimum of 1 inch top, bottom and each side.
g. Page numbers may be located within the 1 inch margins
h. A Header or Footer identifying the Applicant/Team and the Volume, may be located within the 1 inch margins
i. No cost/price data will be included in Volume I, but must be included in Volume II.

The application package must consist of the following in this order:

1) **Volume 1 – Technical Application** as described below – 40 page limit (single spaced)
   - Part I – Technical and Management Approach (*included* in the pages limitation)
   - Part II – Staffing Approach (*included* in the pages limitation; resumes are *not included* in the pages limitation and can be an Attachment to Volume I)
   - Part III - Technical Information (*excluded* from page limitation)

2) **Volume 2 – Budget Application** as described below - no page limit
   - Part I – Application Forms
   - Part II – Cost Information and Other Financial Information

Submit your application in the following format:

Volume 1 - Technical Application

Volume 1 – Technical Application as described below (see page limitations above)

OPTIONAL: An Applicant may include, at their option, to facilitate displaying the organization of their application, a one-page cover page, and a second page to include both a Table of Contents and/or a Listing of Tables/Figures. These pages are for orienting evaluators to the contents of the application package and will not be evaluated and are not included in the Volume I page limitation.

In the event a technical application exceeds the page limitation, the Government will evaluate only the first pages identified within the limitation above.

1. Part I – TECHNICAL AND MANAGEMENT APPROACH: Provide a description of the work to be performed which will serve as the Statement of Work for the award. Provide a detailed technical and management plan describing in detail how you would proceed if awarded this Cooperative Agreement, i.e., how you propose to perform each task you define in the Statement of Work. Discuss and describe the ability of the proposed project to meet the purpose and objectives of this program, and the manner in which they will be addressed by your project. Discuss and describe proposed performance metrics/milestones/deliverables. Provide a table listing all proposed milestones/deliverables and estimated dates, based on time from award.

   Note: The first year SOW should be detailed in the required tasks and resources, and the second year more general since the planned SOW for second year will be subject to modification and focusing based on the review of progress and data and the comments from the TWG.

   Note: For the schedule, sufficient time should be allowed for any testing and evaluations to be performed at the TFHRC or by other cooperating research agency conducting testing and evaluations.

   At a minimum, the proposed Statement of Work shall include the following deliverables during performance of the agreement:

   a. To Provide for Characterization and Evaluation of Solidia Cement:

      i. The Recipient shall submit samples of Solidia Cement from full-scale cement kiln runs for characterization and analysis by FHWA TFHRC along with its source information and known properties.
      ii. The Recipient shall submit source, properties and a suggested protocol for performance tests and specifications for the cement itself. The question to be addressed is – how should the quality of the cement be assessed, specified, tested, and accepted before its use in concrete construction?

b. To Provide for Laboratory Characterization and Testing of Solidia Concrete Samples:

i. The Recipient shall submit Solidia Concrete samples for characterization and analysis by FHWA TFHRC and other highway/transportation laboratories with the objective of developing performance tests and performance specifications for use of the concrete in construction. Data from these tests will be compared with existing knowledge of portland cement concrete, and will be used in the design and analysis of larger-scale pavement and structural test specimens. The quantity of laboratory specimens shall be in the range of 100 to 200 specimens of different sizes and types depending on the number of tests planned and the number of laboratories participating in evaluations.

ii. The Recipient shall submit plain concrete specimens to be tested for materials properties such as strength, durability, and volume change. Specimens shall include small, medium, and large cylinders, prisms, and beams. Some specimens shall have embedded gage studs for monitoring of length change.

c. To provide for laboratory and/or field assessment of Solidia Concrete structural elements:

i. The Recipient shall submit concrete specimens required for structural evaluation, include elements such as reinforced concrete slabs and beams for structural properties tests. Specimens required include:
    1. Small-scale material test specimens such as prisms or cylinders for testing compressive and tensile strength, elastic modulus, Poisson ratio, creep behavior (simple pull out tests with mild steel reinforcing bars and prestressing strand);
    2. Large-scale structural test specimens, such as 8 to 10 in. deep slabs as large as 10 ft. by 10 ft. in area, beam elements between 10 in. and 36 in. deep and between 8 ft. and 60 ft. in length. Beam elements may be reinforced with mild steel reinforcing bars, prestressing strand, or a combination of both. The purpose of the different specimen types, includes: bridge deck slab tests; flexural fatigue behavior; resistance to punching and/or one-way shear; ultimate strength under static loading; reinforced concrete beam tests; prestressing strand transfer length; beam-end cracking due to strand release; camber and long-term deflection; and other flexural, shear, and fatigue behavior testing.

d. To provide for evaluation of Solidia concrete production processes:

i. The Recipient shall provide, for temporary use by the Government at FHWA TFHRC, the necessary portable carbonation equipment, controls, and connections for industrial gas supply, so that FHWA or others can mix, cast, and carbonate concrete for evaluation and demonstration. The Recipient shall provide technical support, training, and travel needed for the efficient use of the equipment at FHWA TFHRC. (Note: See PROPERTY clause for details on title/ownership.)

2. Part II –STAFFING APPROACH: Provide a project organizational chart identifying proposed staff members assigned to the project. The chart must be supported with narrative text to include the title and a brief description of each position's responsibilities, as well as the proposed level of effort and allocation of time (% in relation to their other duties) for each position on a yearly basis and in summary format. The level of effort may be displayed (single spaced) in a table format. One table can be presented if the level of effort will be constant over all years, and the table is annotated as such. The hours in this table must be consistent with the information presented in Volume II, Parts I and II, as part of the detailed budget plan. Provide resumes for the proposed personnel to include name, experience, education and proposed role in project.

3. Part III – TECHNICAL INFORMATION: Provide the following supporting technical information:

a. A review of available (published or unpublished) information and data concerning the manufacture, performance, and use of Solidia Cement.

b. A listing and brief summary of any applicable patents, copyrights, and trademarks held by Solidia or its partners in developing markets for its products.

c. A detailed technical discussion and computation, based on Solidia data or other published or unpublished information, of the embodied energy required and the balance of the production and consumption of CO_2 in making precast concrete in thicknesses of at least 6 in. Show on a sound technical basis the amount of energy and CO_2 release that might be saved by using the Solidia Cement technology in making concrete elements for highway and transportation applications. Provide an example calculation of the embodied energy required and the balance of the production and consumption of CO_2 in making a typical precast, one-cubic yard non-reinforced concrete pavement slab and a precast, one-cubic yard reinforced concrete beam specimen containing a total of two percent of reinforcing steel by volume. Indicate the Solidia cement content used in the calculation in pounds per cubic yard. Compare the resulting energy and CO_2 balances with that of the same size precast elements made with

the same amount of portland cement per cubic yard (with no SCMs) and again for both elements with the substitution by weight of 20 percent of Class F fly ash for portland cement.

d. Any other items deemed necessary to the review of the application and proposal.

Volume 2 - Budget Application

Volume 2 – Budget Application as described below - no page limit

OPTIONAL: An Applicant may include, at their option, to facilitate displaying the organization of their application, a one-page cover page, and a second page to include both a Table of Contents and/or a Listing of Tables/Figures. These pages are for orienting evaluators to the contents of the application package and will not be evaluated and are not included in the Volume I page limitation.

a. Part I - APPLICATION FORMS

1. SF424
Note: Applicants may leave fields 5a, 5b, 6, 7, and 13 blank on the form.

2. SF424A
Note: Section A:
   - Block 1(a): Print opportunity title listed on page 1;
   - Block 1(b): Print CFDA number listed on page 1;
   - Block 1(c): Print Total Federal Funds Requested in dollars; and,
   - Block 1(d): Print Total Cost Share in dollars, and leave columns (e), (f), and (g) and rows 2, 3, and 4 blank.

3. SF424B

4. SFLLL
Note: The form must be completed and submitted even if no lobbying to report. If no lobbying to report insert none or n/a in the relevant blocks.

b, Part II – COST INFORMATION AND OTHER FINANCIAL INFORMATION

Provide a separate detailed budget plan for each year and summarize the information for all years for all activities. Spreadsheets can be formatted similarly to the format in DOT Form 4220.44, located at: http://www.fhwa.dot.gov/aaa/pdfs/frm4220_44.pdf.

The detailed budget plan must include each of the following items/sub-items:

1. Detailed budget clearly delineating and supporting all estimated costs: with columns for Federal Share, Cost Share (if applicable) and Total Costs (per year and in summary form) as follows:

a. Labor Rates- Direct labor-by-labor categories to include hours, rates and escalation. Anticipated promotions for any personnel must be included with the escalation calculation. The annual direct labor escalations rate and its basis should be clearly stated with the proposal. Discuss your proposed rate as compared to historical experience and include when and how escalation will be calculated/implemented.

b. Indirect Rates- Discuss your proposed rates for all years. Identify all the various specific indirect rates including what they are (pool and base), and what they are based on (e.g.; labor overhead based on direct labor dollars) and how they are applied/calculated. Provide dollar values as well as percentages. Please also provide any audit information to support these rates (for example, a copy of signed Department of Health of Human Services rate agreement).

Note: Per 2 CFR 200.414(f), Indirect (F&A) Costs, an Applicant may elect to propose a de minimis indirect rate of 10% of modified total direct costs.

c. Other Direct Costs- Applicants must provide a breakout and justification of Other Direct Costs by Category (travel, equipment, etc.). If subcontractors/sub-recipients (lower-tiered organizations and/or individual consultants) will be used in carrying out this project, the following minimum information concerning such, must be furnished:

i. Name and address of the organization or consultant.
ii. Description of the portion of work to be conducted by the organization or consultant.
iii. Cost details for that portion of work.
iv. **Applicant's cost/price analysis of each sub-recipient/contractor(s) showing how their price is fair and reasonable; and Applicant's cost/price analysis of each sub-recipient/contractor(s) showing how their price is fair and reasonable (this includes any sub-recipient/contractor(s) that will be included in the Federal share or the non-Federal share);** and
v. Letter of commitment from each sub-recipient/contractor(s) (this includes any sub-recipient/contractor(s) that will be included in the Federal share, the non-Federal share or in a non-paid (volunteer) capacity).

d. Provide detail and support for cost share as part of overall project budget.

e. Clearly delineate cost share match versus Federal share.

Note: Travel necessary for the TWG or other federal or State agency employees will be provided outside of the Cooperative Agreement.

Note: The applicant shall include travel costs as necessary to provide for quarterly interaction with the TWG at FHWA's TFHRC, and monthly web conference consultation to communicate with the TWG.

Note: For budgeting purposes assume that costs of the Solidia Cement, the portable carbonation equipment, and its transportation to TFHRC or other demonstration sites will be borne under the Cooperative Agreement – but that the costs of the industrial gas and other construction materials and construction labor at locations other than the Solidia NJ facilities will be provided by others.

2. Identify any exceptions to the anticipated award terms and conditions as contained in Section F, Federal Award Administration Information. Identify any preexisting intellectual property that you anticipate using during award performance, and your position on its data rights during and after the award period of performance.

3. The use of a Dun and Bradstreet (D&B) Data Universal Numbering System (DUNS) number is required on all applications for Federal grants or cooperative agreements. Please provide your organization's DUNS number in your budget application.

4. A statement to indicate whether your organization has previously completed an A-133 Single Audit and, if so, the date that the last A-133 Single Audit was completed.

5. A statement regarding Conflicts of Interest. The Applicant must disclose in writing any actual or potential personal or organizational conflict of interest in its application that describes in a concise manner all past, present or planned organizational, contractual or other interest(s), which may affect the Applicants' ability to perform the proposed contract in an impartial and objective manner. Actual or potential conflicts of interest may include but are not limited to any past, present or planned contractual, financial, or other relationships, obligations, commitments or responsibilities, which may bias the Applicant or affect the Applicant's ability to perform the agreement in an impartial and objective manner. The AO will review the statement(s) and may require additional relevant information from the Applicant. All such information, and any other relevant information known to DOT, will be used to determine whether an award to the Applicant may create an actual or potential conflict of interest. If any such conflict of interest is found to exist, the AO may (a) disqualify the Applicant, or

(b) determine that it is otherwise in the best interest of the United States to contract with the Applicant and include appropriate provisions to mitigate or avoid such conflict in the agreement pursuant to 2 CFR 200.112.

6. A statement to indicate whether a Federal or State organization has audited or reviewed the Applicant's accounting system, purchasing system, and/or property control system. If such systems have been reviewed, provide summary information of the audit/review results to include as applicable summary letter or agreement, date of audit/review, Federal or State point of contact for such review.

7. Terminated Contracts - List any contract/agreement that was terminated for convenience of the Government within the past 3 years, and any contract/agreement that was terminated for default within the past 5 years. Briefly explain the circumstances in each instance.

8. Describe how your organization will obtain the necessary resources to fund and fulfill the proposed cost share, as applicable.

9. The Applicant is directed to review Title 2 CFR §170 (http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title02/2cfr170_main_02.tpl) dated September 14, 2010, and Appendix A thereto, and acknowledge in its application that it understands the requirement, has the necessary processes and systems in place, and is prepared to fully comply with the reporting described in the term if it receives funding resulting from this Notice. The text of Appendix A will be incorporated in the award document as a General Term and Condition as referenced under this Notice's Section F, Federal Award Administration Information.

10. Disclose any violations of Federal criminal law involving fraud, bribery, or gratuity violations. Failure to make required disclosures can result in any of the remedies described in 2 CFR 200.338 entitled Remedies for Noncompliance, including suspension or debarment. (See also 2 CFR Part 180 and 31 U.S.C. 3321).

11. If a nonprofit or not-for-profit status, please provide evidence of this status preferably from the Internal Revenue Service

3. UNIQUE ENTITY IDENTIFIER AND SYSTEM FOR AWARD (SAM)

The Applicant is required to: (i) be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency.

The Federal awarding agency may not make a Federal award to an Applicant until the Applicant has complied with all applicable unique entity identifier and SAM requirements. If an Applicant has not fully complied with the requirements by the time the Federal awarding agency is ready to make a Federal award, the Federal awarding agency may determine that the Applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another Applicant.

4. SUBMISSION DATES AND TIMES

The application must be received electronically through www.grants.gov by the application due date/time listed on page 1 of this Notice of Funding Opportunity.

The deadline stated on page 1 is the date and time by which the agency must receive the full and completed application, including all required sections.

A late application will not be reviewed or considered unless the AO determines that doing so is in the FHWA's best interest.

5. INTERGOVERNMENTAL REVIEW

An application under this Notice of Funding Opportunity is not subject to the State review under E.O. 12372.

6. FUNDING RESTRICTIONS

The FHWA will not reimburse any pre-award costs or application preparation costs under this proposed Agreement.

7. OTHER SUBMISSION REQUIREMENTS

In the event of system problems or technical difficulties with the application submittal, Applicants should contact the FHWA point of contact designated on page 1. If Applicants are unable to use the system due to technical difficulties, Applicants must e-mail applications to the FHWA point of contact listed on page 1 no later than the application deadline cited above.

<end of section>

SECTION E - APPLICATION REVIEW INFORMATION

1. CRITERIA

The Government will evaluate applications on following criteria:

MERIT: FHWA will evaluate the application against the following technical evaluation criteria. These criteria are distinct from eligibility criteria (see Section C) that are addressed before an application is accepted for review.

> The FHWA will evaluate the applicant's approach to meeting the objectives and its capability to successfully perform the work.

COST: Relative cost will be considered in the award decision. The budget application will be analyzed to assess cost reasonableness and conformance to applicable cost principles. This evaluation factor will not be rated.

Funding availability will also be considered in the award decision.

2. REVIEW AND SELECTION PROCESS

FHWA will utilize the following merit review process to evaluate applications:

A panel of agency experts will evaluate the technical application using the merit criteria listed above. The panel will individually evaluate the technical application. The panel will then collectively determine the application's technical acceptability or unacceptability.

Agency personnel from the FHWA Office of Acquisition and Grants Management will evaluate the cost criteria listed above, and conduct a risk assessment of the Applicant prior to award as described below.

The Government reserves the right to not make an award to the Applicant based on the results of the risk assessment.

The AO is the official responsible for final award selection. The Government is not obligated to make any award as a result of this notice.

Risk Assessment

The Government will assess the risks posed by an Applicant before they receive an award. This Risk Assessment will include evaluation of some or all of the following items relative to the Applicant and/or sub-applicants as applicable:

(1) Applicant's financial stability;

(2) Applicant's quality of management systems and ability to meet the management standards prescribed in 2 CFR Part 200;

(3) Applicant's history of performance;

Note: History of performance includes the Applicant's record in managing Federal awards, if it is a prior Recipient of Federal awards, including timeliness of compliance with applicable reporting requirements, conformance to the terms and conditions of previous Federal awards, and if applicable, the extent to which any previously awarded amounts will be expended prior to future awards. The Government will evaluate the relevant merits of the Applicant's history of performance based on its reputation and record with its current and/or former customers with respect to quality, timeliness and cost control. The history of performance will be reviewed to assure that the Applicant has relevant and successful experience and will be considered in the risk assessment. In evaluating history of performance, the Government may consider both written information provided in the application, as well as any other information available to the Government through outside sources.

(4) Applicant's audit reports and findings from audits performed on the Applicant pursuant to 2 CFR Part 200 Subpart F—Audit Requirements or the reports and findings of any other available audits;

(5) Applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities;

(6) Applicant's potential for conflict of interest if applicable; and

Note: The FHWA will review information provided by the Applicant, and any other relevant information known to DOT, to determine whether an award to the Applicant may create an actual or potential conflict of interest. If any such conflict of interest is found to exist, the AO may (a) disqualify the Applicant, or (b) determine that it is otherwise in the best interest of the United States to award to the Applicant and include appropriate provisions to mitigate or avoid such conflict in the Agreement pursuant to 2 CFR 200.112.

(7) Applicant's eligibility to receive Federal funding. Per the guidelines on government-wide suspension and debarment in 2 CFR Part 180, the Government will confirm that the Applicant and any named sub-applicants are not debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

Pursuant to 2 CFR Part 200.205, prior to making a Federal award, the Federal awarding agency is required to review information available through any OMB-designated repositories of government-wide eligibility qualification or financial integrity information, such as Federal Awardee Performance and Integrity Information System (FAPIIS), Dun and Bradstreet, and "Do Not Pay." The Government's review of this information will occur as part of the risk assessment.

3. ANTICIPATED ANNOUNCEMENT AND FEDERAL AWARD DATES

The FHWA anticipates making award on or about **September 15, 2015.**

<end of section>

SECTION F – FEDERAL AWARD ADMINISTRATION INFORMATION

1. FEDERAL AWARD NOTICES

If your organization's application is selected for award, you will be notified and sent an award document for signature. Applicants not selected for award will be notified in writing by FHWA.

Only the AO can commit the FHWA. The award document, signed by the AO, is the authorizing document. Only the AO can bind the Federal Government to the expenditure of funds.

Notice that an Applicant has been selected as a Recipient does not constitute approval of the application as submitted. Before the actual award, FHWA will enter into negotiations concerning such items as program components, staffing and funding levels, and administrative systems, if necessary. If the negotiations do not result in an acceptable submittal, the FHWA reserves the right to terminate the negotiation and decline to fund the Applicant.

2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

General terms, conditions, and governing regulations that apply to this agreement are available online at: http://www.fhwa.dot.gov/aaa/generaltermsconditions.cfm

The online list dated March 6, 2015 of "GENERAL TERMS AND CONDITIONS FOR ASSISTANCE AWARDS" shall apply to the resulting award.

Special terms and conditions follow:

a. PUBLIC ACCESS TO DOCUMENTS

The Applicant agrees that the resulting deliverables/documentation submitted to the FHWA under this Agreement may be posted online for public access and/or shared by FHWA with other interested parties. The FHWA anticipates the documents cited herein may be posted on an FHWA website or other appropriate website.

b. INDIRECT COSTS

Indirect costs are allowable under this Agreement in accordance with the Recipient's Federally Negotiated Indirect Cost Rates as documented in writing and approved by the Recipient's cognizant Government agency, or as negotiated for this agreement and listed below.

*Type**	*Indirect Rate*	*Period*	*Rate (%)*	*Base*
(* Information to be filled in at award ***)**				

*Types of Rates: Pred - Predetermined; Fixed - Fixed; Final – Final; Prov: Provisional/billing; or De minimus.

In the event the Recipient determines the need to adjust the above listed rates, the Recipient will notify the AO of the planned adjustment and provide rationale for such adjustment. In the event such adjustment rates have not been audited by a Federal agency, the adjustment of rates must be pre-approved in writing by the AO.

This Indirect Cost provision does not operate to waive the limitations on Federal funding provided in this document. The Recipient's audited final indirect costs are allowable only insofar as they do not cause the Recipient to exceed the total obligated funding.

c. DATA RIGHTS

The Recipient must make available to the FHWA copies of all work developed in performance with this Agreement, including but not limited to software and data. Data rights under this agreement shall be in accordance with 2 CFR 200.315, Intangible property.

d. PERSONALLY IDENTIFIABLE INFORMATION (PII)

Personally Identifiable Information (PII) as defined at CFR Part 200.79 and 2 CFR 200.82 will not be requested unless necessary and only with prior written approval of the AO with concurrence from the AOR.

e. **AVAILABLE FUNDING**

The total estimated amount of Federal funding that may be provided under this Agreement is $_____ (to be filled in at award) for the entire period of performance, subject to the limitations shown below:

(1) Currently, Federal funds identified on page 1 of the award document, are obligated to this agreement.

(2) Subject to availability of funds, and an executed document by the AO, the difference between the current funding and the total estimated amount of Federal funding may be obligated to this Agreement.

(3) The FHWA's liability to make payments to the Recipient is limited to those funds obligated under this Agreement as indicated above and any subsequent amendments.

f. KEY PERSONNEL

Pursuant to 2 CFR 200.308(c)(2), the Recipient must request prior written approval from the AO for any change in Key Personnel specified in the award. The following person(s) are/have been identified as Key Personnel:

Name	Title/Position
(* to be filled in at award ***)**	

g. PROGRAM INCOME

Pursuant to 2 CFR 200.307, Program income earned during the agreement period must be added to the Federal award and used for the purposes and under the conditions of the Federal award, unless otherwise approved by the AO. Program income must not be used to offset the Federal or Recipient contribution to this project.

h. SUBAWARDS

Note: Recipients with a procurement system deemed approved and accepted by the Government or by the AO are exempt from the requirements of this clause. See 2 CFR 200.317 through 200.326.

Unless described in the application and funded in the approved award, the Recipient must obtain prior written approval from the AO for the subaward, transfer, or contracting out of any work under this award. This provision does not apply to the acquisition of supplies, material, equipment, or general support services.

The following subawards are currently approved under the Agreement:

Name
(*** to be filled in at award ***)

Approval of each subaward is contingent upon a fair and reasonable price determination, and approval by the AO for each proposed subcontractor/sub-recipient. Consent to enter into subawards will be issued through a formal amendment to the Agreement.

i. ORDER OF PRECEDENCE

The Recipient's technical and budget applications are accepted, approved, and incorporated herein as Attachments A and B. In the event of any conflict between this agreement document and the Recipient's proposal and/or application, this Agreement document shall prevail.

j. DESIGNATION AS RESEARCH OR NON-RESEARCH AGREEMENT

This agreement is designated as: RESEARCH

k. CONFERENCE SUPPORT RESTRICTIONS

The Recipient must obtain written approval from the AOR prior to incurring any costs for conference support. See the definition of conference as contained in 2 CFR 200.432.

Food and beverage costs are not allowable conference expenses for reimbursement under this Agreement.

Note: Costs of meals are allowable as a travel per diem expense for individuals on travel status and pursuant to the Travel clause of this Agreement.

l. AGREEMENT PERFORMANCE REQUIREMENTS SUMMARY

N/A

m. DISPUTES

The parties to this Agreement will communicate with one another in good faith and in a timely and cooperative manner when raising issues under this provision. Any dispute, which for the purposes of this provision includes any disagreement or claim, between the FHWA and the Recipient concerning questions of fact or law arising from or in connection with this Agreement and whether or not involving alleged breach of this Agreement, may be raised only under this Disputes provision.

Whenever a dispute arises, the parties will attempt to resolve the issues involved by discussion and mutual agreement as soon as practical. In no event will a dispute which arose more than three months prior to the notification made under the following paragraph of this provision constitute the basis for relief under this article unless FHWA waives this requirement.

Failing resolution by mutual agreement, the aggrieved party will document the dispute by notifying the other party in writing of the relevant facts, identify unresolved issues and specify the clarification or remedy sought. Within five working days after providing written notice to the other party, the aggrieved party may, in writing, request a decision from one level above the AO. The AO will conduct a review of the matters in dispute and render a decision in writing within thirty calendar days of receipt of such written request. Any decision of the AO is final and binding unless a party will, within thirty calendar days, request further review as provided below.

Upon written request to the FHWA Director, Office of Acquisition and Grants Management or designee, made within thirty calendar days after the AO’s written decision or upon unavailability of a decision within the stated time frame under the preceding paragraph, the

dispute will be further reviewed. This review will be conducted by the Director, Office of Acquisition and Grants Management. Following the review, the Director, Office of Acquisition and Grants Management, will resolve the issues and notify the parties in writing. Such resolution is not subject to further administrative review and to the extent permitted by law, will be final and binding. Nothing in this Agreement is intended to prevent the parties from pursuing disputes in a United States Federal Court of competent jurisdiction.

n. GOVERNMENT PROPERTY

Property requirements are contained in 2 CFR Part 200, Property Standards.

Under this Cooperative Agreement, the FHWA intends to provide the following Government-furnished property to the Recipient for temporary use under the agreement period of performance. Title shall remain with the Government:

- Concrete forms and molds for specialized specimens.

Under this Cooperative Agreement, the Recipient shall provide the following Recipient-acquired property to the FHWA for temporary use under the agreement period of performance. Title shall remain with the Recipient:

- Carbonation equipment constructed by the Recipient. (Note to Applicant: This may be newly constructed equipment constructed as part of this Cooperative Agreement, or the Applicant may opt to provide existing equipment on loan for specific curing and evaluation trials at FHWA/TFHRC.)

The FHWA anticipates specimens provided by the Recipient to FHWA for testing will be consumed during testing, or remain the property of the Government for continued testing.

3. REPORTING

ADDRESSES FOR SUBMITTAL OF REPORTS AND DOCUMENTS

The Recipient must submit all required reports and documents, under transmittal letter referencing the Agreement number, as follows:

Submit an **electronic copy** to the Agreement Officer at the following address:

Federal Highway Administration
Office of Acquisition and Grants Management
1200 New Jersey Ave., SE
Mail Stop E65-101
Washington, DC 20590
Attention: **Sarah Tarpgaard**
Sarah.Tarpgaard@dot.gov

Submit an **electronic copy** to the AOR at the following address:

(Fill-In Address at the time of Award)

QUARTERLY PROGRESS REPORT

The Recipient must submit an electronic copy of the Research Performance Progress Report (SF-RPPR), to the AOR and the Agreement Officer on or before the 30th of the month following the calendar quarter being reported. Final RPPRs are due 90 days after the end of the Agreement period of performance. The SF-RPPR content directions and budget formats are available online:

http://www.nsf.gov/bfa/dias/policy/rppr/format_ombostp.pdf

The quarterly progress report must include the required certification pursuant to 2 CFR 200.415.

Calendar quarters are defined as:		Reports due on or before:
1st :	January – March	April 30th
2nd:	April – June	July 30th
3rd:	July – September	October 30th
4th:	October – December	January 30th

Include the following information as attached pages:

a. SF-425, Federal Financial Report, and

b. SF-425A, Federal Financial Report Attachment (if applicable).

ANNUAL BUDGET REVIEW AND PROGRAM PLAN

The Recipient must submit an electronic copy of the Annual Budget Review and Program Plan to the AOR and the Agreement Officer 60 days prior to the anniversary date of this Agreement. The Annual Budget Review and Program Plan must include the required certification pursuant to 2 CFR 200.415. The Annual Budget Review and Program Plan must provide a detailed schedule of activities, estimate of specific performance objectives, include forecasted expenditures, and schedule of milestones for the upcoming year. If there are no proposed deviations from the Approved Project Budget, the Annual Budget Review must contain a statement stating such. The Recipient must meet via teleconference or web conference with the FHWA to discuss the Annual Budget Review and Program Plan. Work proposed under the Annual Budget Review and Program Plan must not commence until AO's written approval is received.

SECTION G – FEDERAL AWARDING AGENCY CONTACTS

Address any questions to:

Sarah Tarpgaard, Agreement Officer
Federal Highway Administration
Office of Acquisition and Grants Management
Email Sarah.Tarpgaard@DOT.gov
Phone 202-366-5750

Secondary point of contact is:

Sarah Berman, Team Leader
Federal Highway Administration
Office of Acquisition and Grants Management
Email Sarah.Berman@DOT.gov
Phone 202-366-4233

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