



Alternative Fuels & Chemicals Coalition

Advocating for Public Policies to Promote the Development & Production of Alternative Fuels, Renewable Chemicals, Biobased Products, and Sustainable Aviation Fuels

Proposed Guidance to Offer States On Amending Infrastructure Construction & Repair Specifications to Allow for the Use of Advanced & Innovative Technologies, Materials, and Construction Methods

*Consistent With the
Bipartisan Infrastructure Investment and Jobs Act (Pub.L. 117–58)*

AFCC Contacts:

CJ Evans, Executive Director, Tel. 202-922-0144, email: cj@AltFuelChem.org

Rina Singh, PhD., Executive Vice President, Tel. 202-922-0144, email: rina@AltFuelChem.org

AFCC Request:

AFCC requests that the Federal Highway Administration (FHWA) and Center for Accelerating Innovation (CAI) consider providing the following direction and guidance to States as encouragement for States to amend existing construction and repair specifications to allow for the use of advanced, innovative, transformative, sustainable technologies and materials, and construction methods in all federally-funded surface transportation infrastructure projects.

Such Federal guidance – say, through a notice in the Federal Register – would help ensure consistency among the 50 states in infrastructure construction and repair specifications and the ability to benefit from the use of these advanced technologies, materials, and construction methods.

AFCC also requests that FHWA and CAI take steps to ensure that information is available to States on the benefits of using these technologies, materials, and construction methods – such as *better performance, cost effectiveness, improved integrity and longevity, reduced greenhouse gas emissions, and making use of balanced mix designs using recycled materials with no limits on the amounts of recycled material that can be used* – to allow States to better understand these benefits and, thus, be willing to incorporate and allow for their use in infrastructure construction and repair projects.

Overview:

From AFCC's 2022 request for report language to be included in the Bipartisan Infrastructure Act:

To effectively implement the programs in Sections 30005 and 30006 [of the Bipartisan Infrastructure Investment and Jobs Act], the Department of Transportation shall provide direction to encourage States to consider using advanced, innovative, transformative, and sustainable technologies and materials in all federally funded transportation projects. The Department shall also encourage States to adopt amendments to their infrastructure construction and



repair specifications within 180 days of enactment of this legislation to allow for the use of these technologies and materials in lieu of standard construction and repair methods.

States are encouraged to include the benefits of using these technologies and materials in assessing the performance and cost-benefits of bids and awarding contracts, such as better performance, cost effectiveness, improved integrity and longevity, and making use of balanced mix designs using recycled materials with no limits on the amounts of recycled material that can be used, which provide reduced greenhouse gas emissions, in lieu of only awarding contracts to the lowest bidder.

The Federal Highway Administration shall ensure that federal highway funds will be available, and won't be revoked, for States and localities using advanced, innovative, transformative, and sustainable technologies, designs, products, and materials in construction and repair projects.

Proposed Federal Guidance to States:

AFCC requests that FHWA and CAI offer the following guidance to States in selecting contractors and vendors, in reviewing bids, and allowing for the use of advanced technologies, materials, and construction methods:

“Each State is requested to consider requiring all contractors and vendors who propose to use advanced, innovative or transformative technologies, materials, or construction methods, in lieu of the construction and repair requirements that are set forth in the State’s infrastructure construction and repair specifications, to submit documentation satisfactory to the State, for the State’s review, describing the advanced technology’s, material’s, or construction method’s prior use, performance, effectiveness, and benefits, including data on improved infrastructure longevity, reduced cost and time to achieve equivalent or better results than standard construction or repair methods, increased use of recyclable materials, reduced energy use, and/or reduced greenhouse gas emissions.

“Contractors and vendors should be requested to provide the State with any approvals that the advanced technologies, materials, and construction methods have received from or for which technical guidelines have been published by the Federal Highway Administration, its Center for Advancing Innovation, State Transportation Innovation Councils, the American Association of State Transportation Offices, industry organizations such as the National Highways Builders Federation and International Concrete Repair Institute, or other States.

“The State is encouraged to use this documentation to determine whether the proposed technologies or materials may be used in the State’s infrastructure construction and repair projects in lieu of or in combination with the construction and repair methods set forth in the State’s specifications.

“States also are encouraged to take the benefits of using advanced technologies, materials, and construction methods into consideration in assessing the cost-



benefits of bids and awarding contracts in lieu of only awarding contracts to the lowest bidder.

“The **Proposed Model State Legislation** below is offered as a possible approach to allowing for the incorporation and use of advanced technologies, materials, and construction methods in infrastructure projects.

“The model state legislation is drawn from the ‘*United Facilities Guide Specifications, UFGS-09 97 23.17*, prepared by the Naval Facilities Engineering Command (or NAVFAC), **which is in current use** by NAVFAC, the United States Army Corps of Engineers, Air Force Civil Engineer Center, and National Aeronautics and Space Administration.”

Proposed Model State Legislation:

The language under the **Proposed Federal Guidance to States** above may be used as a starting place in drafting State legislation to incorporate and allow for the use of advanced technologies, materials, and construction methods in the State’s infrastructure construction and repair projects.

The outline below also may be used as a guide to the State’s requirements and procedures for the use of advanced technologies, materials, and construction methods in lieu of or in combination with the State’s infrastructure construction and repair specifications:

1.1 PRE-CONSTRUCTION REQUIREMENTS

1.1.1 Preconstruction Submittals

- 1.1.1.1 Type of project and Project Location
- 1.1.1.2 Type of Technologies, Materials, and/or Construction Methods Proposed for Use in Lieu of Current Construction and Repair Specifications
- 1.1.1.3 List of Proposed Subcontractors
- 1.1.1.4 List of Proposed Products
- 1.1.1.5 Health and Safety Plan
- 1.1.1.6 Testing Procedures and Equipment
- 1.1.1.7 Environmental Protection Plan

1.1.2 Shop Drawings [as appropriate]:

- 1.1.2.1 Application Areas
- 1.1.2.2 Repair Areas (if applicable)
- 1.1.2.3 Testing Locations
- 1.1.2.4 Installation Locations and Installation Details

1.1.3 Product Data

- 1.1.3.1 Manufacturer's Product Description
- 1.1.3.2 Manufacturer's Storage and Handling Instructions

1.1.4 Test Reports

- 1.1.4.1 Advanced Technology, Material, and/or Construction Method Selection and Use Plan



- 1.1.4.2 Pre-Project Test Locations, Methods, Tools
- 1.1.4.3 Daily Checklists
- 1.1.4.4 Final Acceptance Test Report and Maintenance Test Procedure

1.1.5 Certificates

- 1.1.5.1 Manufacturer's Certificate
- 1.1.5.2 Contractor's Certificate
- 1.1.5.3 Evidence of Acceptable Variation Certificate

1.1.6 Manufacturer's Instructions

- 1.1.6.1 Technical Guidelines
- 1.1.6.2 Safety Data Sheets (SDS)
- 1.1.6.3 Special Application Procedures for Extreme Temperatures

1.1.7 Closeout Submittals

- 1.1.7.1 Final acceptance Test Report

1.2 QUALITY ASSURANCE

1.2.1 Qualifications of Contractors, Subcontractors, and Vendors

Submit certificates/certifications documenting prior experience in use of the advanced technology/material, including test methods to be performed herein, and qualification statements for review and approval by the State for the contractors, subcontractors, and vendors that will be involved in project execution.

1.2.2 Minimum Performance Requirements.

Submit Manufacturer's certificate and/or adequate documentation of the following, as appropriate:

- 1.2.2.1 *Performance Characteristics* in Comparison to Using Standard Construction/Repair Methods
- 1.2.2.2 *Cost of Construction/Repair* in Comparison to Standard Construction/Repair Methods to Meet or Exceed Same Standards
- 1.2.2.3 *Time of Construction or Repair* in Comparison to Standard Construction/Repair Methods to Meet or Exceed Same Standards
- 1.2.2.4 *Structure Longevity* in Comparison to Standard Construction/Repair Methods to Meet or Exceed Same Standards
- 1.2.2.5 *Corrosion Rate Reduction* of Reinforcing Steel
- 1.2.2.6 *Water Penetration Rate Reduction* of Concrete
- 1.2.2.7 *Pullout Strength Increase of Concrete*
- 1.2.2.8 *Other Benefits* Compared to Standard Construction/Repair Methods [ability to use recycled materials and balanced mix designs, reduction of greenhouse gas emissions, etc.]

1.2.3 Evidence of Acceptable Variation Certificate

Submit documentation of any variations from this section that certifies that the variation will not prevent the advanced technology, material, or



construction method from achieving the minimum performance requirements.

1.3 REGULATORY REQUIREMENTS

1.3.1 Environmental Protection

Submit an environmental protection plan for the use of the advanced technology, material, and/or construction method that addresses all requirements of the Safety Data Sheets for the products utilized and assures compliance with all applicable regulations.

1.4 DELIVERY, STORAGE, AND HANDLING

Store and handle products in accordance with the manufacturer's instructions. Submit manufacturer's storage and handling instructions as part of the product data submittal.

1.5 SAFETY METHODS

Comply with all applicable OSHA and local authority standards for personal protection, including the required record keeping and training. Submit compliance plan as part of the Health and Safety plan submittal.

1.6 ENVIRONMENTAL CONDITIONS

1.6.1 Weather and Substrate Conditions

Consider present and forecasted weather conditions for each structure prior to product use. The substrate temperature, air temperature, humidity and other environmental conditions must be within the limits recommended by the manufacturer for proper application. Document all relevant environmental conditions and include in the Daily Checklist submittals.

1.7 EQUIPMENT, TOOLS, AND MACHINES

Stipulate that the methods, tools, and equipment approved by the manufacturer shall be used in incorporating advanced technologies, materials, and construction methods into state infrastructure construction and repair projects.

1.8 SEQUENCING AND SCHEDULING

1.8.1 Preparation of [Soil, Surfaces, etc.] Prior to Use of the Advanced Technology, Material, and/or Construction Method

1.8.2 Surface Preparation

1.8.3 Other Preparations

1.8.4 Pre-Application Testing

1.8.4.1 *Testing Procedures and Equipment*

Submit a list of all proposed testing procedures and test equipment within two weeks of the contract award.

1.8.4.2 *Testing Procedure Approval*

Testing procedures, test equipment, measurement techniques, and locations must be submitted to the Designer of Record for review and approval prior to testing.

1.8.4.3 *Testing and Test Results Report*



All test data and the test results must be submitted to the Designer of Record for review and approval prior to proceeding with use of the advanced technology, material, and/or construction method.

1.8.5 Advanced Technology, Material, and/or Construction Method Selection and Use Plan

Prepare and submit a specific plan for the use of the advanced technology, material, and/or construction method. Include the product selections, the purposes for the use of the advanced technology, material, and/or construction method, the project areas in which the advanced technology, material, and/or construction method will be used, the methods for its use and equipment required, the sequence and timing of each step required in the use of the advanced technology, material, and/or construction method, and the usage rates that are based on the pre-application testing results.

Include all pre-application testing data and analysis in the plan. Include shop drawings identifying the testing locations. Identify areas that require pre-project and post-project tests. Submit the Advanced Technology, Material, and/or Construction Method Selection and Use Plan for review by the Designer of Record.

1.8.6 Advanced Technology, Material, and/or Construction Method Use

Use the advanced technology, material, and/or construction method in accordance with manufacturer's specifications and the approved plan.

Monitor and record the quantity, methods, surface and sub-surface temperatures, and any other data or observations required by the plan.

Inspect the project areas in which the advanced technology, material, and/or construction method was used to ensure proper installation, application and use.

1.8.7 Post-Application Testing and Minimum Performance Requirements

Perform post-application testing a minimum of 60 days after completion of the construction or repair using the advanced technology/material.

Perform post-application testing utilizing the same instrumentation and test procedures at the same locations as those utilized during the pre-application testing.

Include the post-application testing results in the Final Acceptance Test Report.

The minimum acceptable performance criteria are included in paragraph MINIMUM PERFORMANCE REQUIREMENTS.