An ACI Center of Excellence for Nonmetallic Building Materials

38800 Country Club Drive
Farmington Hills, MI 48331
+1 (248) 848 3170
info@nonmetallic.org
www.nonmetallic.org

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NEx Request for Proposals Notice

NEx encourages you to submit proposals focused on the topic described below:

Project ID: SG24.05.

Project Title: Design standard for polymer concrete structures.

Background

Polymer concrete offers advantages over hydraulic-cement concrete in applications requiring characteristics such as very rapid strength development, high resistance to chemical attack, and extremely low permeability. However, the use of a polymeric binder results in a composite with different stress-strain behaviour compared with hydraulic-cement concrete. For example, polymer concrete is susceptible to "creep rupture", which means that the strength under sustained load is a fraction of the strength measured in a standard short-term strength test. Also, there is a lack of information on the development length of embedded reinforcement (metallic or fiber-reinforced polymer bars). There is a need to develop a design specification for polymer concrete structures that will result in safety margins similar to those found in the design of hydraulic cement concrete structures. Given that the applicability of polymer concrete is limited compared with hydraulic-cement concrete, the design specification should address the design strength of commonly used polymer-concrete members.

A structural design specification is fundamental to economical and safe use of polymer concrete structural members for specialized applications. In the absence of such a design standard, designers may take a conservative approach resulting in higher construction cost than is necessary. On the other hand, failure to account for the unique mechanical and temperature-dependent properties of polymer concrete can result in unsafe structural members. A structural design specification for polymer concrete will be of direct benefit to engineers, producers, and owners involved in the production or procurement of polymer concrete structural members. In the development of this design specification, gaps in available standard test methods may be identified. The product of this research could form the basis for an ACI design standard for polymer concrete.

Proposal Request

We invite proposals from qualified/experienced researchers, engineering firms, and research institutions to undertake the development of Design specifications for polymer concrete structures. The design specification shall encompass material properties, structural design considerations, construction methods, and quality control measures. The PI shall work with ACI Committee 548 to review and incorporate the newly developed standard as a committee document.

NEx Mission Statement

Collaborate globally to expand and accelerate the use of nonmetallics in the built environment to drive innovation, research, education, awareness, adoption, and deployment.
NEx is committed to achieving its mission through Research and Development, Standards and Guidelines, Professional Development, and Advocacy and Awareness.

Funding Policy

NEx will impose a limit of 15% on indirect costs (overhead) by research organizations for any research it funds. The organization must waive the remainder of the indirect costs.

Award Amount

NEx does not impose any limit on the overall funding request; however, the anticipated budget for this project is to be around $30,000-$50,000. Proposals with higher budget estimates will be accepted with information on budget spending relevant to the value added to the project scope. Co-funding and co-sponsoring proposals with other organizations are welcomed.

Proposal Evaluation

NEx research proposals will be evaluated by the NEx Steering Committee. A winning proposal will be forwarded to the NEx Board of Directors with recommendations for funding.

Proposal evaluation criteria will include technical content, methodology, PI's relevant experience, potential impact/ industry adoption, budget and time, proposed deliverables, and outcome. NEx anticipates the completion of this project within 15 months duration.

Awarded Proposals

- The awarded proposal is expected to commence within the first quarter of 2024.
- NEx will enter into a contract with the researching entity. As part of the contract, it is mandated that the overhead or indirect return be set at no more than 15% of the direct cost of the research funding requested from NEx. Any overhead over the maximum allowed 15% that is waived by the researching entity shall be considered as cost sharing and shall be indicated on the budget table as waived overhead, separate from other co-funding. Non-compliant proposals in this regard shall be returned without review.
- The schedule of payments contingent upon milestone deliverables will be contained in the contract and will include, at a minimum, a final report deliverable to NEx. Progress reports, if required, will be identified in the final contract.
- If principal investigators (PI) from two organizations are collaborating on the research, the award must be to a single organization, which will then subcontract with the second organization.
- NEx will only consider funding research that involves the use of proprietary products if the goal of the research is to advance knowledge in a particular area of study and not solely on a proprietary product.
- In case of any co-funding arrangement with other organization(s), commitment letter(s) from co-funding organization(s) is required before funds are dispersed from NEx.
- The results of NEx-funded research will be owned by NEx, and possibly by other co-founding organization(s). PI should obtain approval from NEx before publishing any results.

Where and How to Submit Proposals

Submitted proposals will be evaluated by the NEx Steering Committee and the NEx Staff. Anyone who evaluates a proposal is required to agree and abide by NEx policies on confidentiality and conflict of interest.

Please email the proposal and supporting information to info@nonmetallic.org, by end of the day, **September 5, 2023**. The email subject line and file name shall include project ID (see top of page 1) and the name of the proposing organization (For example: "SG23.xx University of xyz").

If you have any questions regarding the proposal requirements or process, please contact NEx Technical Director, Aparna Deshmukh (aparna.deshmukh@nonmetallic.org).

Required Proposal Content

Proposals submitted to the NEx shall be provided in one unprotected pdf file and shall contain:

1. **Section 1: Executive summary (maximum 2 pages)**
   - 1.1. NEx RFP ID:
   - 1.2. Proposal Title:
   - 1.3. Principal Investigator (name, affiliation, address, phone, email):
   - 1.4. Objective of the proposal (300 words or less)
   - 1.5. Description of significance/impact of the project (300 words or less)

2. **Section 2: Main body (maximum 5 pages)**
   - 2.1. Background
   - 2.2. Project description (include enough detail to understand how the project will be performed)
   - 2.3. Schedule (include matrix of tasks and schedule of completion, including quarterly progress and final reports, and semi-monthly teleconference updates)
   - 2.4. List of deliverables/anticipated products, such as new material specifications, new documents, published papers, presentations, NEx/ACI University Webinar, or conference proceedings.
   - 2.5. Budget (table of funding that includes all support such as):
     - Total budget
     - Any co-funding from organizations other than NEx (monetary, in-kind)
     - Net value of waived institution overhead or planned co-funding.

3. **Section 3: Supporting Documents (maximum 2 pages each)**
   - 3.1. Qualifications of the investigator, co-investigator(s), if any, and/or institutions.