TallWood Design Institute

2018 Funding Announcement – Agricultural Research Service

We are pleased to invite Letters of Intent (LOIs) for research projects under the "Design, Manufacture and Construction of Next Generation Tall Wood Buildings" Program, funded by the USDA Agricultural Research Service. The 2018 call targets projects that can help achieve the research goals of the TallWood Design Institute, a collaborative effort between Oregon State University College of Forestry, University of Oregon College of Design, and Oregon State University College of Engineering. The Institute has been entrusted with spearheading innovations in education, research, design and manufacturing of wood products to assist in maintaining and building upon Oregon's leadership in modern timber construction in the United States and maximizing benefits to the local communities from this natural resource.

Preference Criteria
Selection of projects for funding will be based on the following criteria:

- Alignment with the thematic research priorities of the TallWood Design Institute (see below)
- Support for graduate students. This is a high priority for funding
- Multi-disciplinary partnerships between researchers, in particular those involving Oregon State University (OSU) College of Forestry (COF) /University of Oregon (UO) College of Design, or College of Engineering (COE) faculty
- Active collaboration with the private sector and projects that are strongly linked to and driven by industry needs. Projects that address current challenges or opportunities in the architectural design, structural engineering, mass timber product manufacturing or construction fields will be favored
- Projects should highlight the tangible benefits that projects will provide to the industry (design, engineering, manufacturing or construction sectors) over the next 2-5 years
- Projects that promote equity and inclusion of diverse perspectives and experiences

Background
Oregon State University and the University of Oregon collaboratively operate the TallWood Design Institute. The Institute brings together expertise in architecture, wood science, and engineering to undertake research and development and education related to innovative wood products and building systems capable of being produced in Oregon and the Pacific Northwest. The Institute has active partnerships underway with design professionals, engineers, wood products manufacturers and agencies related to building code development to drive innovation and testing for engineered structural wood materials, enhance wood utilization in the built environment, and enable the region to be highly competitive in emerging domestic and global markets.

Thematic Research Priorities
Research priorities focus around the central theme of increasing the amount of wood fiber being used in tall wood buildings and other appropriate mass timber applications. Research may focus anywhere along the supply chain where benefits can be derived -from materials to design, engineering, manufacture and construction. Projects may involve validation of existing international research for US consumption, or original research on new topics. Letters must explicitly articulate how they address one or more of the following themes. **PLEASE NOTE that for 2018, we are especially interested in projects that address any of the <u>top three themes</u>:**

SPECIAL EMPHASIS PRIORITIES FOR 2018:

- **Research related to fire, vibration, or durability performance *particularly with regard to moisture-related durability***
  A significant body of testing has been performed in Europe over the last 20 years related to the performance of CLT panels in various situations. Also, significant testing has been performed in New Zealand and Canada related to post-tensioned wood structures. Comprehensive review and validation of some of these studies would allow quicker development of prescriptive or performance criteria for code adoption. *For 2018, original research related to the moisture-related durability of mass timber products is of particular interest*.

- **Research that helps to develop modular systems including components or assemblies (panel + windows + finishes + EMP) for use in affordable housing, fast deployment housing, etc.**
  Modular construction offers significant potential benefits to the wood products manufacturing community. It allows a shift of labor from site to factory. It increases the addition of value to commodity products and significantly contributes to improving the labor market in rural communities. Of specific interest are modules for hotels, multi-family construction, affordable housing and fast deployment (emergency and military use). The use of CNC (computer numerical control) technologies or 3D printing to create new composite systems or connectors or allow embedding of monitoring components in structures is a related area of research interest with significant long term potential.

- **Research that addresses wood-related environmental concerns in the State of California**
  This call invites LOIs for wood-related research that addresses California's unique regulatory requirements given the size of this potential market for wood products and building systems. (For example: environmental concerns related to adhesives and other environmental impact topics, green building life cycle analysis, consumer perception of mass timber buildings, etc.).

OTHER THEMATIC PRIORITIES:

- **Research that proposes new or validates existing roof and/or floor systems where steel and concrete components can be entirely or partially replaced with wood products**
  New products that replace composite metal decks, site-cast concrete (flat slab, beam slab, flat plate), precast concrete (hollow core or solid slabs) and other commonly used floor and roof structural assemblies. Comparisons focusing on economics, technical performance and environmental impact should be an integral part of these research efforts. Projects can focus narrowly on the performance of specific components or broadly on entire assemblies.

- **Complementary research that leverages large scale research efforts undertaken by other entities**
  Synergistic relationships with other research institutions and activities directly support one of the core values of the Institute. Research projects that can supplement and support existing large-scale high visibility research initiatives are highly effective and desirable. For example an ongoing research project on lateral load resisting systems for 10-story timber buildings could be used as a test bed for the validation of design methodologies, performance of floor systems, connections and others.

- **Research that validates existing or proposes new connections as standard solutions for vertical load carrying systems, and addresses some or all of seismic, fire, fatigue and moisture-related performance concerns**
  Plate-to-beam, beam-to-girder, girder-to-column connections and their performance at seismic-related displacements in high seismic areas are of significant concern to design professionals. Research that

will allow development of best practices for design and construction methods of these connections could significantly alleviate concerns, optimize performance and speed up code approvals.

- **Research that contributes to the development of alternative approaches to ELF (Equivalent Lateral Force) seismic design**
  Research on design methodologies that either reduce or eliminate the need for developing seismic factors (R, C_d Ω) for timber lateral load resisting systems offer a unique opportunity for wood experts to pioneer efforts related to codifying performance-based methodologies. Taking a leading role in this niche research area is a chance for the Institute to build a reputation for innovative code-oriented research.

- **Research that validates or proposes new hybrid systems that combine wood Vertical Load Carrying Systems with steel or concrete Lateral Load Resisting Systems**
  In order to speed up adoption of wood as a choice material for buildings, structural systems that could be classified as equivalent to existing systems approved by code would be highly desirable. Examples of such systems could include wood buildings with concrete core, wood buildings with steel brace or moment frame, etc. Hybrid components such as wood beam with embedded steel or concrete segments could also be included.

- **Large-scale, high-visibility research that can answer important technical questions and simultaneously serve in an awareness-building role**
  There are a number of research topics that would significantly contribute to increasing the use of wood in multi-story buildings; for example, any research related to diaphragm behavior, performance of wood braced systems (co-centric, eccentric and buckling resistant), and on the use of adhesives for connections in these systems. The opportunity to leverage funding in support of larger, existing projects and to expose the expertise and capabilities of the Institute to the national and international research and design communities is considered very important in the early life of the Institute.

- **Research that contributes to educating architects, engineers, builders and developers on modern timber construction**
  The Institute is intended to play a strong supporting role in industry product development and capacity building as well as encouraging greater use of wood in the built environment. Research that assists in developing market "pull" and manufacturing base "push" strategies is considered highly desirable.

Submission Information – Letters of intent are due by **12PM (noon) PT on December 8, 2017.** Submit the LOI using the required template in MS Word format electronically to Anthony S. Davis at anthony.davis@oregonstate.edu .

Financial Scope – Approximately $750,000 in funding is available. Detailed budgets are not required nor desired at the time of LOI submission although we strongly encourage you to use provided budget templates and guidance to estimate your project costs. You must declare whether your LOI is being submitted for a Major project level ($250,000K maximum award), Intermediate project level ($150,000 maximum award) or Discovery project level ($25,000 maximum). Major and Intermediate projects are designed for support of graduate students and you must indicate in the LOI template whether you intend to support a graduate student. Project durations can be a maximum of 2 years with a start date as soon as possible but no later than July 1, 2018. It is expected that funds will be expended as planned, however a one-year no-cost extension may be available upon request.

Eligibility - Faculty at Oregon State University College of Forestry and College of Engineering, and the University of Oregon College of Design, are eligible to apply. The lead principal investigator (PI) must have at least a half-time professorial ranked appointment.

Faculty are limited to submitting as lead PI on one Major **or** Intermediate project **and** one Discovery project in the current funding cycle.

Confidentiality – Letters of intent are not publicly disseminated.

Other Requirements – The lead PI must be available January 16, 2018 to attend the LOI review meeting in Corvallis and provide a brief presentation. Yearly in-person progress reports will be required if your project is selected for funding. These will be made at a round table event involving all three academic units affiliated with the Institute at which industry will be invited to participate.

Letter of Intent Preparation Instructions – LOIs must be submitted using the required template available at http://tallwoodinstitute.org/research. Formatting requirements are 8.5 x 11 inch, one-inch margins using Times New Roman font size 11.

Please follow the format and guidelines in the provided LOI template. Letters of intent that do not follow guidelines may be returned without review.

Components of the template include:

A. Cover page – 1-page maximum, follow template

B. Project description – 3-pages maximum for Discovery projects, 5 pages maximum for Major and Intermediate projects, following the elements numbered and organized as described below and in the template in the following areas:

1. ***Introduction and justification***
   In layperson's terms describe the justification and merit for the proposed work. Clearly identify the connection of the proposed work to the priority research themes of the TallWood Design Institute.
2. ***Research location, methods and personnel***
   Describe your research plan in enough detail for reviewers to understand that the project is likely to be completed successfully. Clearly outline the role that graduate students will play.
3. ***Anticipated outcomes and impacts***
   In layperson's terms describe the planned outcomes and deliverables. Cleary identify the tangible industry impacts over the short and medium term. Describe your planned activities for communicating results/impacts.
4. ***Timeline***
   Provide a timeline that summarizes research tasks and major milestones. Include outreach activities.
5. ***Partner linkages and support***
   Describe proposed partnerships between OSU and UO faculty, between COF and COE faculty, and/or with businesses or agencies outside OSU and UO.
6. ***Diversity, Equity, and Inclusion***

Describe how this project will address equity and inclusion of diverse perspectives and experiences?

C. Bibliography and references cited (1-page maximum)

LOI Evaluation Process/Timeline

- Major and Intermediate project review and selection process :
    - Lead PI will be asked to give a short presentation on January 16, 2018 to the external review panel followed by Q & A session
    - An external review committee made up of a dozen industry representatives from the structural engineering, wood products manufacturing, construction, business and architecture fields will review and rank the LOIs.
    - The Dean of the College of Forestry will select projects for funding and notify PIs no later than the end of February
- Discovery projects will be reviewed and selected by a committee consisting of the Associate Director for the Institute, the Associate Dean for Research at COF, the COF Wood Science & Engineering Department Head, the UO Director of Design, TallWood Design Institute, and the OSU COE Civil Engineering Department Head, with notification by end of February

Full Proposal Instructions - If your LOI is selected for funding, your submitted LOI will serve as the proposal document. Because these are federal dollars, a detailed budget and budget justification are required along with unit and institutional sponsored programs research offices (OSU and UO) reviews and approvals. The CoF Research Office (CoFRO) will assist with budgeting, cost share and facilitate institutional approvals. A budget template is available at http://tallwoodinstitute.org/research.

The project title and concept cannot change from the original submitted LOI. You must adhere to the budget category that you declared in your LOI (Major, Intermediate, Discovery) with stated maximum requested budget category detailed above. The lead PI and CoPIs cannot be changed from the LOI without prior approval from the College of Forestry Research Office.

The ARS funds are federal and all budgeted costs must be allocable and allowable as per federal uniform guidelines. Funds will be dispersed to University of Oregon using a subaward process.

- Fully funded PIs (12 month appointments) should not budget salary.
- Faculty who are appointed at 9 months or at less than 1.0FTE can include salary up to 1.0FTE.
- Funds associated with intellectual merit cannot be sub-awarded to 3rd party entities. Costs for outside services or procurement are allowed.
- Indirect costs are not allowed and should not be included in budgets.
- Graduate students
    a. Include GRA salary and fringe in the requested budget – follow your institutional and college guidelines
    b. CoF graduate students must be fully appointed at 0.49FTE
    c. Graduate student major professor name & affiliation must be described.

d. Tuition support is not allowed as a direct expense and will be shown as match from the affiliated unit for the College of Engineering and the College of Forestry.

- Cost Share – 20% cost share (matching) is required on total project costs. Cost share can be met using a combination of salary, tuition and unrecovered indirect costs based on the negotiated institutional cost rate agreement (NICRA) research rate. The matching requirement is often met using unrecovered indirects alone. Federal dollars cannot be used as match. Subawarded funds must include the 20% required cost share. Examples are: $250K Major project requires $62,500 match; $125K Intermediate project requires a $31,250 match; and a Discovery project at $25K requires a $6,250 match. No 3rd party or in-kind match is allowed.

Full Proposal Award Information – Awardees will be required to present and submit annual progress reports. Additional reporting requests will be made at the time of awards. Institutional financial and other federal post-award reporting will be managed through sponsored programs offices.

Contact information

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