STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Step 2

Please submit this completed application, the supplemental budget spreadsheet, and any relevant supporting documentation by the deadline indicated in your Step 1 notification letter to Sustainability-Committee@Illinois.edu.The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact the SSC at Sustainability-Committee@Illinois.edu.

General Information

Project Name: "Corncrete"
Total Amount Requested from SSC: $47,000
Project Topic Area(s): Energy Education ☐Food & Waste
Land Water Transportation

Contact Information

Project Lead

Applicant Name: Mark Taylor
Unit/Department: Architecture
Email Address: mstaylor@illinois.edu
Phone Number: 773 818 2951

Financial Contact *(Must be Full-time University of Illinois Staff Member)*

Contact Name: Mark Taylor
Unit/Department: Architecture
Email Address: mstaylor@illinois.edu
Phone Number: 773 818 2951
Organization Code: 767000

Facilities Management Contact *(If Applicable)*

Contact Name: Name of Applicant or Project Lead
Email Address: Preferred Email Address

Primary Project Team

Name	Department	Email
Tim Mies	Crop Science	tmies@illinois.edu
Kyle C. Smith	Mech. Science and Eng.	kcsmith@illinois.edu
Name	Department/Organization	Email Address
Name	Department/Organization	Email Address

Project Description

Please provide a brief background of the project, the goals, and the desired outcomes:

In April 2017 three faculty members received $14,522 from the University Research Board to conduct preliminary investigations into the use of Crop Residue. The results of those initial investigations have proved very positive and we are now seeking the support of the SSC to facilitate the collection of more "waste" material to build on the progress made to date. The primary aim of the project is to utilize agricultural "waste" material and see if it can be used as a building product. Historically hemp has been used in conjunction with a lime binder (see Hempcrete). However the cultivation of hemp is currently very restricted in the US so the team has been looking to other grass materials with similar properties to hemp. Initial investigations have found that corn stalks could be equally as good as hemp, if not better.

With several thousands of acres of corn grown on the University's South Farm, the university is uniquely positioned to reap the benefits of developing an insulation product that is not reliant on fossil fuels for its production. In addition, when built into a wall assembly "grasscrete" will have the ability to sequester carbon in the wall itself.

In addition to developing and testing the properties of "grasscrete" the team desires to build a small structure: a "Field Station" to understand the performance of the material outside of a laboratory.

How will the project improve the sustainability of the Illinois campus and how will the project go above and beyond campus standards?

The Project will divert a waste product and direct it into higher value end product.
Students will be involved at all stages of the project: Material acquisition, processing, design and fabrication

Where will the project be located? Will special permissions be required to enact the project on this site? If so, please explain and submit any relevant letters of support with the application.

The project will be mobile allowing the project to be seen and built on campus and eventually used at a location on the University's south farm.

Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments affiliated directly or indirectly by the project. This includes any entity providing funding (immediate, future, ongoing, matching, in-kind, etc.) and any entities that will be benefitting from this project. Please attach letters of commitment or support at the end of the application.

The team has not yet formally approached other researchers working on the South Farms. However, if the application is successful the research being carried out by Steve Long and Sarah Taylor Lovell could benefit from having a "Field Station" located near the crops they are studying.

Please indicate how this project will involve or impact students. What role will students play in the project?

Students will gain a hand on experience of working with a sustainable building material. They will be involved at all stages of the project: Material acquisition, processing, design and fabrication.

Financial Information

In addition to the below questions, please submit the supplemental budget spreadsheet available on the Student Sustainability Committee website. Submission of both documents by the submission deadline is required for consideration of your project.

Have you applied for funding from SSC before? If so, for what project?

I believe this is my second application to the SSC. My first application was "Element House at the Energy Farm" which was submitted in 2014 this project morphed into the relocation of the Gable Home by way of a Scope Change.

If this project is implemented, will there be any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs? Please note that SSC provides funding on a case by case basis annually and should not be considered as an ongoing source of funding.

No ongoing funding requirements are expected

Please include any other sources of funding that have been obtained or applied for. Please attach any relevant letters of support as needed in a separate document.

No other sources of funding have been obtained for this phase of the project.

Environmental, Economic, and Awareness Impacts

In addition to the below questions, please indicate specific measurable impacts as applicable on the supplemental budget spreadsheet.

Which aspects of sustainability does your project address, and how? Does the project fit within any of the iCAP goals? If so, how does the project go beyond the university status quo standards and policies.

The Project will be a demonstration of Energy Efficiency derived from an renewable organic resource as opposed a petro-chemically derived insulation.

How will the environmental impacts of your project be measured in the near and long term? What specific monitoring and evaluation processes will you be using to track outcomes and progress?

The required testing equipment, outlined in the budget, will allow the team to measure the environmental impact of the material being developed.

What is the plan for publicizing the project on campus? In addition to SSC, where will information about this project be reported?

The team plans to visually document the project through every phase and update the Illinois News Bureau at key stages of the project.

What are your specific, measurable outreach goals? How will these be measured?

The South Farms are a popular stop for visitors to the University of Illinois. Our aim is the project will be a feature of any tour to the Farms. A record of those who visit the project will be kept.

Do you have any additional comments or relevant information to aid in evaluation of this application?

Following meetings with members of the Food and Waste Working Group further consideration has been made as to what the end product of the investigation will be. The team is now more resolute in building a “Field Station” that could be moved around the South Farms as needed. A Flat Rack Bale Wagon: https://e-ztrail.com/products/bale_wagons.php has been identified as probably the most suitable base for such a task. The full design of the “Field Station” is still awaiting the input of students once the Phase 2 Application has been approved. Below are a couple of images to help the Committee get a better feel for where the project is heading.

Reference: Garden Office: http://www.roundhillshepherdhuts.co.uk/our-huts/

STUDENT SUSTAINABILITY COMMITTEE

Step II Application

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GENERAL INFORMATION

Project Title:	"CornCrete	
Total Amount Requested from SSC:		
Amount Requested as:	0	(LOAN or GRANT)

SCOPE, SCHEDULE, AND BUDGET VERIFICATION

If the project required you to obtain information from Facilities & Services Planning Division, please include that here and attach any supporting documentation.

Scope & Schedule

What is the plan for project implementation? Describe the key steps of the project including the start date, target completion date, target date for submitting a final report, and any significant tasks

Task	Timeframe (# of weeks to completion)	Estimated Completion Date
Testing of Material in Laborotary	8 Weeks	June 30th 2018
3D Printing Test	2 Weeks	June 30th 2018
Produce 400 Cubic Feet of Organic Insulation Material	1600 student hours (10 weeks)	Nov 30th 2018
Building Design Development	Fall Semester 2018 (16 Weeks)	Dec 18th 2018
Mixing Lime Binder with Plant Material	4 Weeks During Final construction	June 30th 2019
Base, Walls and Roof Structure	8 Weeks	June 30th 2019

Budget

List all budget items for which funding is being requested under the appropriate category in the following table. Include cost and total amount for each item requested. Please be as detailed as

Item	Cost Per Item	Quantity	Total Request
Equipment & Construction Costs			
Lime Binder	$25.00	100	$2,500.00
Base	$3,500.00	1	$3,500.00
Framing and Sheathing for Walls	$2,000.00	1	$2,000.00
Roof	$2,000.00	1	$2,000.00
Testing Equipment	$6,000.00	1	$6,000.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$16,000.00
Publicity & Communication			
The Team will cover any expenses here			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00
Personnel & Wages			
Undergraduate Hourly Labor	$12.00	1,600	$19,200.00
Graduate Hourly Labor	$15.00	120	$1,800.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$21,000.00

Project Budget per F&S

N/A			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

General Supplies & Other

Building Design Development	$7,000.00	1	$7,000.00
3D Printing Test (Personnel and Workshop fee)	$3,000.00	1	$3,000.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$10,000.00

TOTAL BUDGET	**$47,000.00**

ENVIRONMENTAL AND ECONOMIC IMPACTS

Please include any other sources of funding that have been obtained or applied for, and please attach any relevant letters of support.

No other source of funding have been secured for this phase of the project

Please estimate the greenhouse gas impact this project will have, if applicable. Use the University of Illinois at Urbana-Champaign Energy Management website to determine the cost of energy on campus and the following chart to determine GHG emissions.

Electricity: 1.672 CO2lb/kWh	Diesel: 22.2 CO2lb/gallon
Steam: 244.9 CO2lb/klb	Gasoline: 19.4 CO2lb/gallon
Chilled Water: 144.6 CO2lb/mmbtu	

End of Application