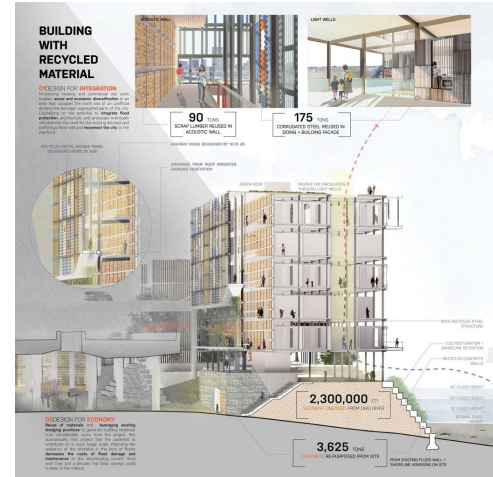


## ASSIGNMENT BRIEF #8 Resources

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### Measure 8: DESIGN FOR RESOURCES

Sustainable design includes the informed selection of materials and products to reduce product life-cycle embodied energy and carbon, and environmental impacts while enhancing building performance and optimizing occupant health and comfort. Adaptive reuse and renovation/preservation dramatically reduces a building's material consumption and carbon footprint.



**Narrative:** Describe the project's construction, material selection criteria, considerations and constraints. What efforts were made to reduce the amount of material used and waste and the environmental impact of materials over their lifetime? Discuss specific materials used.

**Suggested Graphics:** Wall section of the building envelope design and either a hygro-thermal analysis or life cycle assessment.

**Metric:** Estimated carbon emissions associated with building construction (lbs CO<sub>2</sub>/sf, using The Construction Carbon Calculator, Athena Impact Estimator for Buildings, Tally®, or other)

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### ASSIGNMENT:

1. Locate Environmental Product Disclosures (EPD) for three (3) primary building materials. If EPDs cannot be located, write a letter to the manufacturer telling them this information is important and necessary, stating why it impacts your design.
2. Research who is making the products you want to use. What is their culture? What impact (positive or negative) does this industry have on this community?
3. Identify the carbon footprint of three (3) primary building materials per unit and compare to an alternative material.

*For Final Presentation:*

4. Run estimated carbon emissions calculation on building structure using available software.

5. In less than 100 words, describe the project's construction, material selection criteria, considerations and constraints. What efforts were made to reduce the amount of material used and waste and the environmental impact of materials over their lifetime? Discuss specific materials used.

#### **DELIVERABLES:**

- **CO2 Graphic** - CO2e associated with building construction
- **Photo Essay** of the community/people who make the products you use
- **Narrative on Design for Resources** (<100 words)

#### **SUBMITTAL:**

Submit as PDF via university interface (Blackboard, Canvas, Edmodo, Google...) using the following NAAB file format:

**COURSENO\_INSTRUCTOR\_yourlastname\_yourfirstname\_ASSIGNMENT08\_YEARTERM**

#### **DUE:**

#### **Resources:**

WUFI <https://web.ornl.gov/sci/buildings/tools/wufi/>

EC3 Carbon Calculator <https://www.autodesk.com/redshift/embodied-carbon-calculator/>

ACSA AIA COTE Top Ten Studio Guide

<https://www.acsa-arch.org/competitions/2021-cote-competition/studio-guide/#tools>

#### **Associated NAAB Content:**

#### **Program Criteria**

PC.2 Design—How the program instills in students the role of the design process in shaping the built environment and conveys the methods by which design processes integrate multiple factors, in different settings and scales of development, from buildings to cities.

PC.3 Ecological Knowledge and Responsibility—How the program instills in students a holistic understanding of the dynamic between built and natural environments, enabling future architects to mitigate climate change responsibly by leveraging ecological, advanced building performance, adaptation, and resilience principles in their work and advocacy activities.

PC.5 Research and Innovation—How the program prepares students to engage and participate in architectural research to test and evaluate innovations in the field.

PC.6 Leadership and Collaboration—How the program ensures that students understand approaches to leadership in multidisciplinary teams, diverse stakeholder constituents, and dynamic physical and social contexts, and learn how to apply effective collaboration skills to solve complex problems.

PC.7 Learning and Teaching Culture—How the program fosters and ensures a positive and respectful environment that encourages optimism, respect, sharing, engagement, and innovation among its faculty, students, administration, and staff.

PC.8 Social Equity and Inclusion—How the program furthers and deepens students' understanding of diverse cultural and social contexts and helps them translate that understanding into built environments that equitably support and include people of different backgrounds, resources, and abilities.

### **Student Criteria**

SC.1 Health, Safety, and Welfare in the Built Environment—How the program ensures that students understand the impact of the built environment on human health, safety, and welfare at multiple scales, from buildings to cities.

SC.2 Professional Practice—How the program ensures that students understand professional ethics, the regulatory requirements, the fundamental business processes relevant to architecture practice in the United States, and the forces influencing change in these subjects.

SC.3 Regulatory Context—How the program ensures that students understand the fundamental principles of life safety, land use, and current laws and regulations that apply to buildings and sites in the United States, and the evaluative process architects use to comply with those laws and regulations as part of a project.

SC.4 Technical Knowledge—How the program ensures that students understand the established and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects.

***Illustration Credit COTE Top Ten Winner 2020***

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*School: Clemson University*