Materials Investigations

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Materials understanding is becoming more directly linked to architectural practice and to architectural education. Large-scale mock ups, prototypes of portions of assemblies, and design-build academic programs connect design decisions to understanding specific material properties. Tactile and visual qualities of a material are but a small fraction of the information regarding building materials that is available to and useful to designers and students.

We see our materials database and research projects as a bridge that connects students with area professionals on matters of innovative materials and sustainable materials. We receive little internal funding and therefore must seek grants for particular research projects. We have completed an analysis across twenty sustainable criteria for eight material applications for a new day care building. This work allowed the architects and building owner to select the materials that best aligned with project's specific sustainability priorities. We are currently completing a carbon analysis for an office building under construction and tracking the carbon emissions used in the construction of the building including: manufacturing and transportation of building materials, waste, on site energy, and transportation of workers. This analysis will allow the developer client to be more strategic with carbon emissions for future projects.

We have also documented and cataloged building materials made within 500 miles of our city in order to serve as a resource to area professionals doing work in the area. We have also recently completed a database of local manufacturers and fabricators; this is a valuable resource to our students as well as area architects and designers.

Additional programs that connect students with area professionals include: monthly materials newsletters, lectures, exhibits, and tours of local manufacturing sites. Part of our mission is to get students excited to know more about building materials and their visual and tactile qualities. We also know that we have a responsibility to increase their technical understanding of materials and the implications of their material choices on this fragile environment.

PROJECT ONE

H5h

This work was supported by the Architecture Center Houston Foundation.

We developed a database of materials made within 500 miles of our Houston, Texas.

This information is useful to all architects designing LEED certified buildings in this area.

This also helps support local manufacturing in our area and lower carbon and eneergy required to transport building materials to building sites.

This document is available on our web site.

cataloging local materials

RESEARCH PROJECT TWO

CARBON @ 3009 POB

This research project, supported by a local developer, involves the carbon analysis of the construction of a concrete frame office building.

We documented the carbon emissions form the manufacturing and transportation of the largest items according to the schedule of values, along with the transportation of all craftworkers to the site, the waste generated in thr construction process, as well as all electricity adn water used during construction. We are waiting for the building construction to be complete by September 2013.

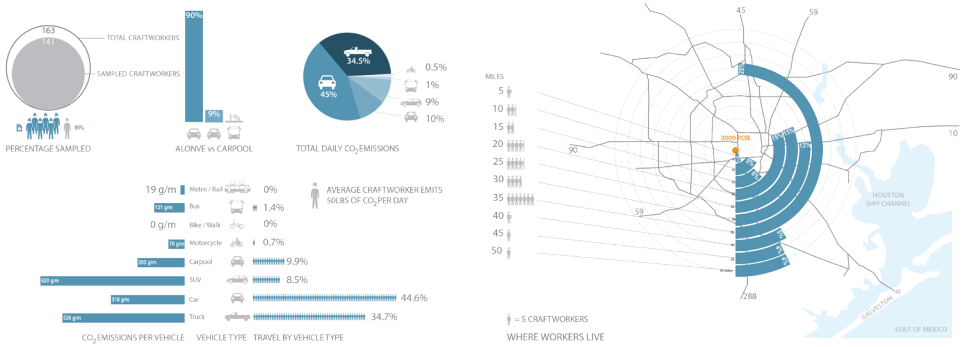
The information gathered in all projects is shared with the local professional and student communities through our web site, electronic documents, physical exhibits in our materials library, and lectures.

CONCRETE
Aggregate
C Ash
Cement
Plywood
Rebar
Reusable Steel Formwork
Sand
Wood Formwork

PRECAST GARAGE
Aggregate
Cement Gray
Cement White
Light Weight Gray
Limestone Gray
Limestone White
Mesh
Plates
Rebar
Sand Gray
Sand White

MISCELLANEUS STEEL
Aluminum Ladders
Benches
Card Reader Pedestals
Lavatory Tools
Metal Decking
Misc. Metals Fabricated Locally
Pipe Handrails at Stairs
Stainless Steel Pipe Rails
Steel Stairs
Structural Steel

CURTAIN WALL
Aluminum
Insulated Glass
Silicone
Steel Framing Reinforcements



carbon emissions analysis

We are exploring multiple ways to support our physical materials library and increase material understanding in our college through required student research and specific research projects. We are engaged with supporting the work of local professionals, including the architectural community, as well as contractors and developers, through these semester and academic year duration projects that provide opportunities for our students that link back to their increased awareness of the complexity of material decisions.

materials research collaborative

UNIVERSITY OF HOUSTON GERALD D. HINES COLLEGE OF ARCHITECTURE