PROJECT RE_

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PROJECT RE_{...}

facilitates a partnership between three non-profits: a university affiliated design build entity, a material repurposing center, and an apprentice training program. Its mission is to:

**REUSE MATERIALS**
incorporate used materials and promote deconstruction to facilitate landfill diversion

**RESTORE COMMUNITIES**
utilize participatory design processes to strengthen capacity of community residents

**REBUILD LIVES**
teach people trade skills and professional knowledge for securing a living wage
PEDAGOGICAL FRAMEWORK

Students were asked to develop the project featuring reused and repurposed materials. The design showcases multiple, marketable building products that can be brought into mass production. Processes employed were refined for use in educational community workshops and job training to reinforce the public interest dimension of work.

6 SEMESTER + 1 SUMMER PROCESS
CURRICULUM with 3 CORE years + 2 ADVANCED STUDIO OPTION years

DESIGN BUILD + PUBLIC INTEREST DESIGN

8 FOURTH / FIFTH YEAR UNDERGRADUATES
1 FACULTY DIRECTOR + 2 FELLOWS

4 GRADUATE CONSTRUCTION MANAGEMENT STUDENTS + 1 FACULTY

EACH INVEST 1 SEMESTER or up to 2 YEARS

18 CU STUDIO + 9-12 CU CONSTRUCTION ADMIN CO-REQUISITE

8 GRADUATE DRAMA LIGHTING DESIGN COLLABORATORS + 1 FACULTY

2 NON-PROFIT PARTNERS

SUPPORT from 4 FOUNDATIONS + 3 CORPORATIONS

PROFESSIONAL CONSULTANTS + CITY INSPECTORS
CONCEPT

The space will be used by the non-profit partners as a **community workshop, job training facility, and fabrication center** for value added projects ranging in scale from furniture to buildings. Products and housing prototypes developed at PROJECT RE_ will be used to sustain the center and fund the next community outreach projects.

CONTEXT

Location diagram with 2010 US Census data

Simplified business concept diagram generated by faculty program director

Excerpts from a student generated publication to raise awareness of local construction waste issues
The three year process involved close collaboration between partners and stakeholders. Activities included client space planning sessions, design reviews, a public build event, construction updates, and a public exhibit to raise awareness.
Undergraduate students worked closely with graduate construction management students to coordinate scheduling and site logistics. Graduate school of drama students contributed extensive knowledge of lighting design and equipment.
The students gained experience working with professional consultants including structural and mechanical engineers; HVAC, electrical, and fire suppression system subcontractors; steel fabricators; and lighting designers.
Students worked with a cross section of construction industry professionals, including fabricators, journeymen, laborers, and craftsmen. A master carpenter demonstrated carpentry techniques and a high level of craft for students. Apprentices-in-training assisted with construction as an exercise in learning and honing their carpentry skills from modular framing to refined finishes.
**DESIGN CRITERIA**  Through research, students explored spatial relationships and program necessary to meet project goals.

**DESIGN PROCESS**  In the Fall of 2012, students met with the clients to understand their needs. By 2015, the project included the efforts of 22 undergraduate students, 1 faculty director, 2 fellows, 15 graduate construction management students, 12 graduate drama lighting students, 2 supporting faculty, and over 140 contributors. Students learned collaborative working methods that will be valuable in professional practice.
The studio teaching pedagogy is predicated on full-scale prototyping. Mock-ups were built by undergraduate and graduate construction management students to test design and construction principles. Each iteration and element was evaluated according to scope, quality, cost, and time.

A second corner explored detailing and finishes. Particular attention was paid to reused material elements, including scrap and reclaimed lumber exterior cladding, hopper windows, church pew diffusers, under cabinet light fixtures, and slate wall.

PROTOTYPING
**STORAGE WORKSHOP**
- stone cutting training
- custom cut stone components

**METAL SHOP**
- metal work training
- custom hardware production
- CNC plasma cutter training

**WOODSHOP**
- carpentry training
- community workshops + demonstrations
- prototyping of value-added products
- tool usage and safety procedures
- used building material processing training

**STONE CUTTING SHOP**
- stone cutting training
- custom cut stone components

**PREFABRICATION AREA**
- value added product and housing assembly

**DIGITAL FAB LAB**
- production for value added products
- introduction to digital design tools
- CNC router training

**TOOL STORAGE + SPRAY BOOTH**
- lockable storage for tools
- ventilated room for protecting finish work

**STUDIO**
- design workspace
- project coordination + collaboration
- pin-up space + drawing storage

**GALLERY**
- display of community workshop projects
- showcase value-added products
- advertise Project RE_mission + goals

**COMMUNITY ROOM**
- community workshops + demonstrations
- meetings + presentations + public events
- sustainability + business development classes

**ENTRY**

Project RE_plan
A material repurposing center identified underutilized items in their inventory and materials typically diverted to landfills. Students invested time in designing processes for giving them new life. Each building element is a marketable building product or strategy.
The process for etching salvaged hollow-core door panels was refined for use during CNC technology tutorials. The self-scaffolding entry frame was digitally designed and fabricated. Hand craft was essential to produce metal hardware and the canopy frame; and shape ergonomic features of the ladder and chair. High technology research was completed by students and low technology processes were executed through job training.
LIGHTING DESIGN

Essential lighting for evening events was designed in partnership with graduate drama students.
DESIGN FOR DECONSTRUCTION

Modular, panelized construction allows the project to be rearranged or disassembled for reuse to reduce waste. Framing commenced with a public build event where clients, community members and apprentices-in-training assisted with construction.
Mechanical, electrical, and fire suppression systems were integrated into the ceiling planes and canopy by consultants as per student drawings. Design integrated complex systems within common affordable building strategies.
CEILING MODULATES LIGHT

Pews from deconstructed churches are reused as diffusers for light and mechanical ventilation. Pew processing was completed by students and apprentices in training. Light fixtures were salvaged or donations from a professional consultant.
The tool shed and spray booth are clad with reused fiberglass and church pew seats.
Prefabricated panels transform scrap lumber waste from construction sites and reclaimed lumber deconstructed from a warehouse into a viable building product. Project construction was used to test the prefabrication process for assembly by apprentice-level workers.

A. Ebony stained plywood backing panel
B. Empty space for screwing cladding panel to studs at 16" OC.
C. Long pieces arranged to alternate light and dark stains
D. Shorter pieces of various lengths added to vary pattern vertically
E. Cladding panel edge
F. After panel installation, reclaimed lumber pieces screwed to fill space B

Diagrams developed by students for explaining cladding layout to apprentices
DOOR FLEXIBILITY

Large doors swing open to offer flexibility in use. They can be opened when community events or construction activities require more space or become part of the wall when closed, providing thermal and acoustic separation.

Doors open out to woodshop

Doors open in toward rooms

Doors closed diagram

Perspective of steel doors frames in context

Closed doors become part of the wall

Steel frame delivery

Custom casters

Hinges and column plates

Community room doors open for evening event

Column installation

Site welding

Prepare for cladding

Community event Site welding Prepare for cladding
COMMUNITY OUTREACH

PROJECT RE_ is being utilized to design new projects. Prototyping is underway for two garden sheds for a community nursery and community events will be held in the coming months.