

# Mining Landscapes of Waste: Finding Imaginative Potential in Discarded or Salvaged Materials

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Our planet requires designs and construction methods that are energy efficient, environmentally stable, and socially responsible. Collaborative design teams of architects, engineers, consultants, and clients recognize typical construction activities consume enormous amounts of resources and produce vast quantities of waste. As the EPA reports, "building construction, renovation, use, and demolition together constitute about two-thirds of all non-industrial solid waste generation in the U.S." This presents opportunities to think and design outside the typical recycled and/or newly manufactured environmentally friendly material palettes often considered the go-to wheelhouse for sustainability.

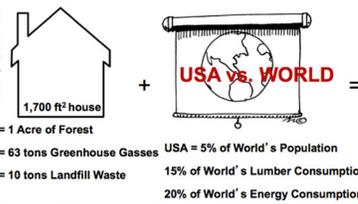
What if scrap materials, re-appropriation of salvaged materials, and typical soil spoils from excavation become inspiration? The volume of waste and how waste can be appropriated represents both stewardship of material economy and the resultant eclectic composition of found and/or reconditioned objects providing a unique combination of aesthetics and functionality. Research, experimentation, and physical design projects can demonstrate novel ways of using salvaged materials or bi-products. Declining and decaying landscapes can be reimagined through the functionalism and aesthetic nature of salvage-based design. Pedagogical approaches can introduce students and frame an understanding of the inspirational potential for salvaged materials, reducing waste, and addressing compound climate changes.

Designers in the twenty-first century are becoming increasingly aware of the long-term costs of consumption and waste in the building industry. They are not alone. There is an emerging consciousness of the global societal costs of our dirty little habit of mindlessly throwing things away. Faculty and students at The University of Oklahoma have exercised theory into practice by designing and constructing various projects from mining landscapes of waste into inhabitable spaces. Reclaimed wood, salvaged acrylic, and earthen construction practices were catalysts allowing multi-disciplinary collaborative teams opportunities to explore design concepts and materiality at full-scale, benefiting both students and the local community. The approach of sustainability as infectious to all phases of design and construction has led to three collaborative projects: [1] 2012 CASA Playhouse, [2] current construction of a Compressed Earth Block residence with Habitat for Humanity, [3] and the development of an interactive database for regional salvaged materials. This paper explores recent advancements in design and construction pedagogy of the aforementioned projects, demonstrating imaginative potential for reusing existing materials.

**COMPRESSED EARTH BLOCK (CEB)**

A multi-disciplinary research project consisting of OU College of Architecture, College of Engineering, and Cleveland County Habitat for Humanity to design, build, and collect data from a Compressed Earth Block residence adjacent to a conventionally wood framed residence. Initial research began in Fall 2010, progressed into Earthen Design & Construction courses, has received over \$150,000 from external and OU sources (including the 2012 EPA P3 award and grant), and will conclude with data collection upon completion of current construction.

**2 EARTH BLOCK**



**Smithsonian 40TH ANNIVERSARY**

**40 THINGS YOU NEED TO KNOW ABOUT THE NEXT 40 YEARS**

1. Unconventional Buildings Will Be Made Of Mud
2. Coral Reefs Will Be Overfished
3. The Death of the Day? July 14th
4. New Cars Will Be Green Aways, First

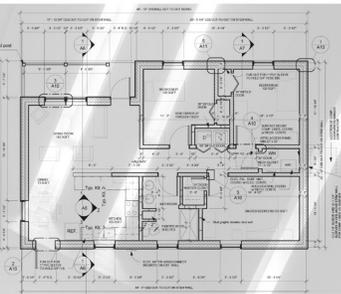


Students and faculty at start of 10 day raffle in Penn Square Mall, OKC. L to R: Hunter Roth (shop manager), Alma Sandoval, Trent Still (seated), Bud Hargado (standing next to Alma), Professor Daniel Butko and his wife Debra, Ryan Williams (kneeling on left), Hunter Read (seated), Professor Tony Cricchio, and Jason Tyler.



Upper image: Earthen Design and Construction course faculty, students, and COA Dean Graham (left) during testing phases at OU College of Engineering Fears Lab. Lower Image: CEB residence under construction August 2013.

**Earthen Construction: Smithsonian's #1 Future Prediction!**



Variety of images showing design, construction, and installation of playhouse project.

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in the name of environmental perspective

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The University of Oklahoma - College of Architecture

Series of images depict work days making Compressed Earth Blocks, structural test walls, and architectural mockup wall studies. Floor plan and wall section are referenced from student led construction documents (permit set).



Images show students and faculty working in a hybrid design-build / build-design environment. Approached as material stewardship with course pedagogy focused on hands-on kinesthetic learning. 4 enrolled students, 4 volunteer students, 1 assigned professor (Butko), 1 volunteer professor (Cricchio), and the shop manager (Roth) consulted a separate Design Review Committee and elementary school children to design, construct, and install the playhouse in 3 1/2 weeks.

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**www.architects ranch.com**

an online database of regionally salvaged materials catering to the 4 R's: Reduce, Reuse, Recycle, and Regional. Various local companies display materials.

**The Architects' Ranch**

- Architectural Salvage
- OKC Metro
- Tulsa Metro
- Sitework & Demolition - 2
- Concrete - 3
- Masonry - 4
- Metal - 5
- Wood & Plastics - 6
- Thermal & Moisture Protection - 7
- Doors & Windows - 8
- Furniture - 9
- Specialties, Equipment & Furnishings - 10, 11, 12
- Special Construction & Alternative Energy - 13
- Plumbing & Mechanical - 15
- Electrical - 16

**SALVAGED CEDAR, CYPRESS, OAK, AND ACRYLIC + \$500 + PASSION FOR DESIGN**

Salvaged 1200 lb of cedar salvaged from OU campus trees claimed during 2007 ice storm, milled and planed in COA model shop.  
Materials: 200 lb of cypress and oak salvaged from a local jobsite 300 lb of acrylic scraps donated by a local company

Purchased Materials: 36 lb of cypress to complete banding of each lift 184 lb of pressure treated lumber for base platform Coated fasteners, galvanized carriage bolts, stain, wood glue, galvanized steel pipe, and hinges and latches

Material Budget: \$500  
Actual money spent on supplies/materials: \$498

## 2012 CASA PLAYHOUSE PARADE ENTRY 1

COURT APPOINTED SPECIAL ADVOCATES CHARITY EVENT

**WHY SHOULD WE CARE? WHY DO WE NEED TO USE RECYCLED & RECAPTURED MATERIALS?**

Published reports and textbook *Fundamentals of Building Construction* define:

- 30% of world's energy use and 40% of greenhouse gasses
- 30% of U.S. raw materials consumption
- 2/3 of U.S. electricity consumption

**Buildings Generate:**

- 65-70% of total U.S. electricity consumption.
- 48% of total U.S. primary energy consumption.
- 136 million tons of construction and demolition waste in the U.S.
- 12% of potable water consumption in U.S.
- 40% (9 billion tons annually) of raw materials use globally.

**ENVIRONMENTAL & LOCAL IMPACT OF BUILDINGS**

Welcome to the Architects' Ranch.

Whether it is toxic drizzle in the news or the LEED certification system, architects and designers are increasingly becoming aware of how the materials they select have wide ranging and lasting impacts beyond the site boundaries of their projects and long after construction is complete. Clients are requesting construction methods, materials, and designs that are both environmentally and socially conscientious.

However, the overwhelming and ever-changing challenge for designers to make informed decisions is the lack of information available to them.

The Architects' Ranch research and well-curated Oklahoma and the south-central materials as well as local resources for all about the environmental and social manufacturers' sites and contact information.

Launched May 2011  
First year = 4,000 hits  
Second year = 8,300 hits  
Averages 700 hits/mo.