

## Reassembly

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The story of post-industrial urban decline in America is well known. Bustling cities fall victim to changing economic structures and globalization. Wealth moves out of city centers, leaving behind evacuated buildings and vacant lots where houses once stood and transforming vibrant neighborhoods into sparsely populated areas that lack the density necessary to sustain urban life. Municipalities deem abandoned buildings “blight” and assemble task forces to eradicate them. In response to this pressing urban reality, we have been developing a speculative approach to reusing buildings and materials called “reassembly.” Reassembly views a building’s materiality as a matter-of-fact, as a resource for architecture stripped of the negative assumptions commonly associated with disused properties. Building components are taken apart, moved around, piled up, and mixed with new construction to create alternative uses and forms.

In this paper, reassembly is presented in three projects by our practice, T+E+A+M: two speculative building proposals and one full-scale prototype. Detroit Reassembly Plant is a proposal for the Packard Plant, an abandoned automotive factory that is an icon of the city’s decline. Ghostbox imagines the reassembly of materials in a big box retail store to produce a landscape for living and an outdoor civic space. The third project, Clastic Order, is a series of full-scale prototypes that tests the use of recovered building materials and recycled plastic to produce building components. Each of these projects demonstrates how new approaches to sustainable material practice can challenge existing notions of environmentalism and fabrication. Resisting the relentless drive for the new, reassembly attributes worth to what is typically undervalued in post industrial contexts: disused buildings and matter. Materials embody narratives, histories, and cultural associations—not just as physical artifacts but as a form of visual currency. Reassembly works on both material and its image to align them with alternate histories and cultures.

### DETROIT REASSEMBLY PLANT

As of 2016, Detroit had over six square miles of vacant industrial space and over 84,641 blighted parcels, including residential and small commercial buildings as well as vacant

lots. In the cultural imaginary of the city, vacant properties and their debris are synonymous with neglect, crime, economic hardship, and the fallout from the city’s post industrial decline. In 2013, the Detroit Blight Removal Task Force was created with the sole purpose of reducing this excess. Its blight-mitigation efforts have led to absurd scenarios in which eight remaining houses on a block with 30 parcels may, in

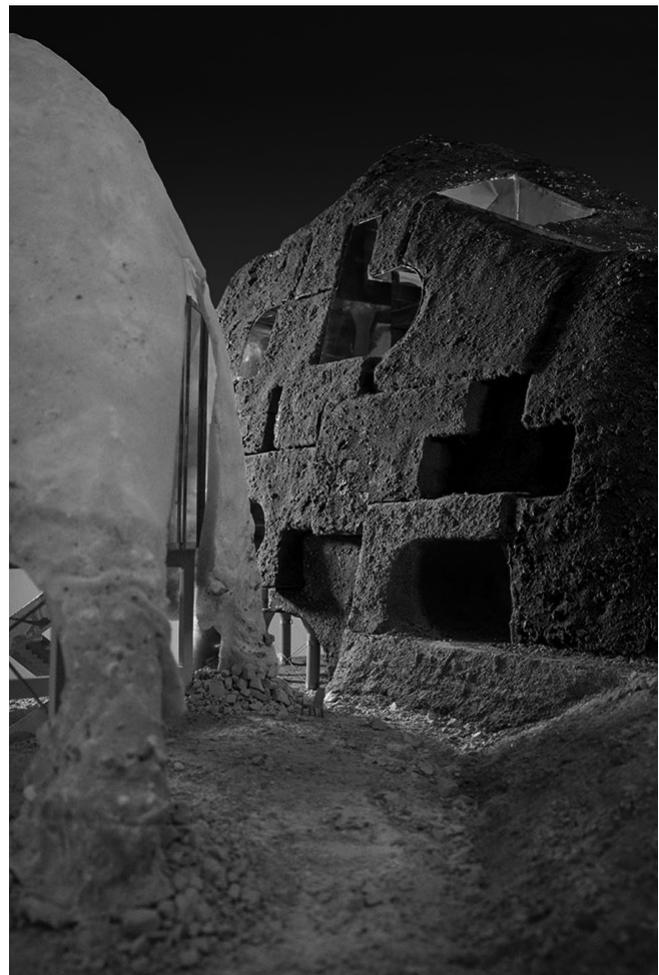


Figure 1: Detroit Reassembly Plant, T+E+A+M, Model detail. Courtesy of the architect.



Figure 2: Detroit Reassembly Plant, T+E+A+M, Model detail. Courtesy of the architect.



Figure 3: Ghostbox, T+E+A+M, Model detail. Courtesy of the architect.

the name of progress, be further winnowed down to only four. Emptiness is added to emptiness as trucks cart razed structures to regional landfills and waste processing facilities. Recognizing architecture's capacity to work on and produce both materials and images, "reassembly" aims to reverse current perceptions of Detroit. Where others see an excess of ruins, we see an abundant resource for building materials.

The Detroit Reassembly Plant was designed for "The Architectural Imagination," the 2016 exhibition in the U.S. Pavilion at the International Architecture Biennial in Venice, Italy. Curators Cynthia Davidson and Monica Ponce de Leon chose four sites in Detroit and commissioned twelve architectural practices to imagine alternative futures for their use. Our project reimagines the vacant, iconic Packard Plant as a rich stockpile of concrete, brick, and other construction materials. Guided by considerations of structural soundness, program needs, and the cost of demolition, the existing buildings are selectively demolished to retrieve these materials. The concrete rubble and other materials

are then mixed with plastics and additional postconsumer material recovered from Detroit's waste streams. Broken bricks, concrete chunks, fragments of glass and other materials from the site are collected, sorted, and granulated. Off-site waste materials from consumer, industrial, and agricultural streams are also processed and mixed with the Packard's own materials.

The new cast forms introduce a range of material qualities to the existing Packard Plant buildings. Flecks of brick and concrete fold together the building's history with less familiar colors and textures, such as milky translucency, bright plastic hues, and reflective metallic sheen. The resulting aggregate mixtures become new building materials that can be cast in various new forms, using the remaining column grids as support for formwork and falsework. The resulting formal types include mega-masonry mountains with hypostyle interiors, monolithic cast-in-place shells that drape over the plant's columns and beams, room-sized cast-in-place blocks that sit within existing structural grids, and

free-standing conical sheds. These structures host a range of programs: material processing, production and fabrication of new aggregates, public exhibitions, and a research institute for developing advanced building technologies with these new materials.

The Packard Plant has always been a site of experimentation and innovation: it was the first factory constructed from reinforced concrete; it made automobiles, Detroit's signature contribution to American industrial ingenuity; and more recently, art and music projects have flourished within its vast spaces. The Detroit Reassembly Plant retains this spirit of innovation and change, approaching construction technology as experimental, prototypical, and extensible. It replaces the modernist paradigm of material economy and spatial efficiency with an approach to building that is materially rich and spatially varied. It substitutes the solid perimeter of the factory enclave with a porous campus of buildings, landforms, and open spaces. By remixing and reassembling Detroit's unwanted materials, architecture and its image become the city's primary exports.

### GHOSTBOX

Abandoned, shuttered big box stores proliferate the ex-urban American landscape. By some estimates there are over 1 billion square feet of empty retail space in the country. T+E+A+M's contribution to the 2017 Chicago Architecture Biennial, titled "Ghostbox," stages a domestic landscape in one of these abandoned "big box" stores. By partially disassembling the existing retail building, the design reclaims its material components and reassembles them in place, creating different scales of occupation. Piled up debris becomes a new ground for individual dwellings. The outer wall of the original big box creates a zone for shared domestic functions. An open-air civic space centers on the building's excavated corner, anchored by a totem of consolidated deadstock. These spatial modifications erode the boundaries between interior and exterior, allowing people, materials, and things to move freely.

As with Detroit Reassembly Plant, this project also proposes "reassembly" as an approach to this problem of vacancy. While other strategies for recovering abandoned big box stores often focus on the programmatic, our project takes on the existing structure as a physical object and a familiar image. Ghostbox affords new associations to these familiar elements by introducing image itself as a material system. Large-scale printed imagery of geological textures and sky recontextualizes the architecture and destabilizes the relationship between physical materials and their representation. The aim is not a wholesale transformation of what was there, nor a romanticization of the building's history. Rather, Ghostbox reassembles the existing conditions into a vibrant backdrop for collective life, allowing new stories to unfold.

### CLASTIC ORDER

Clastic Order is T+E+A+M's first attempt at reassembly at full-scale. This free-standing column is made by combining reclaimed construction debris with post-industrial plastic waste. Produced for the Designing Material Innovation exhibition at the California College of the Arts curated by Jonathan Massey, the project demonstrates the emerging structural and aesthetic strategies of reassembly.

The geological term "clastic" describes a type of stone made of older rock fragments, or clasts. Here, familiar fragments of buildings (brick, concrete, glass, pipes, and fittings) are the clasts which mottle the stone-like surface of the columns. Each column is monolithic, fabricated as a continuous cast with a process similar to slip-forming concrete, a technique used to cast uninterrupted structures such as building cores, shear walls, and silos. Each column cast begins on the ground in an insulated mold filled with loose material. The plastic is brought to its melting point at which time it binds the inorganic aggregates into a solid mass. The heat sources and formwork are gradually raised as each section is completed, producing continuous full-scale columns.

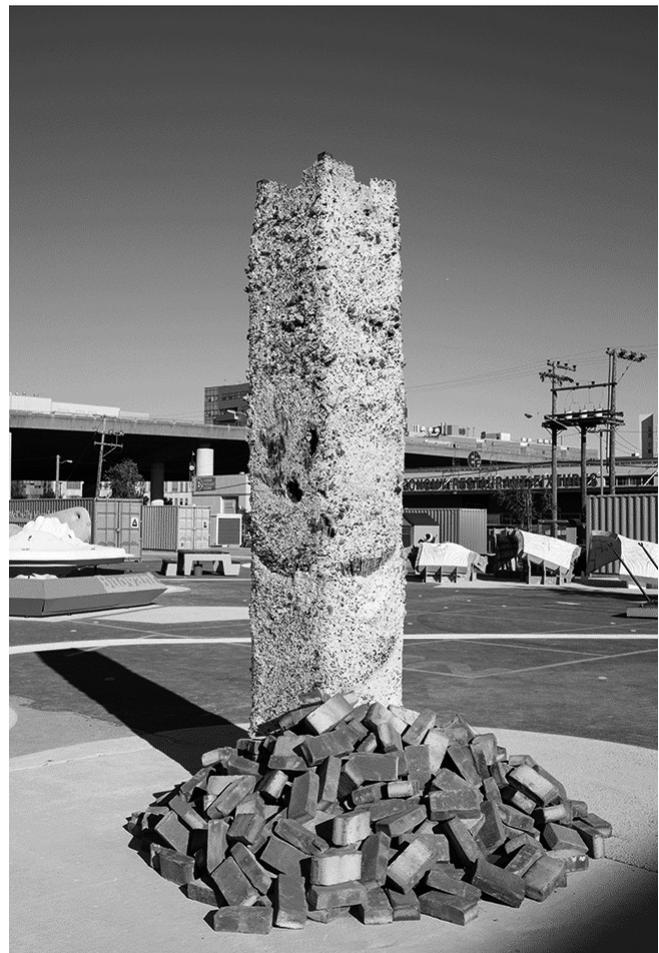


Figure 4: Clastic Order, T+E+A+M, Installation View, San Francisco, CA. (Photo courtesy of T+E+A+M).



Figure 5: Clastic Order, T+E+A+M, Installation Detail, San Francisco, CA. (Photo courtesy of T+E+A+M).

While the classical orders of architecture established mathematical rules of proportion, spacing, and sequence of parts, Clastic Order suggests an approach to design based on material behavior under heat and gravity. By varying the ratios of components in the mixture and the application of heat, a range of colors and textures is produced across the columns. Since the waste plastics and building debris are reclaimed locally, the material properties of the resulting casts reflect regional waste streams.

### CONCLUSION

Reassembly brings together material fragments that have prior values, uses, and histories, into new architectural forms. As a strategy for material reuse at the scale of building, reassembly cultivates a visual and material aesthetic through the unresolved relationship of parts to whole. Distinct from other forms of architectural recovery such as adaptive reuse, preservation, and restoration, reassembly is not nostalgic. It builds alternate futures from the latent physical and aesthetic potential in found buildings and contexts.