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Geographies of Trash

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In August 1966, *LIFE Magazine* published "Planet Earth by Dawn's Early Light," a photo-essay from the Gemini 10 shuttle flight. Capturing the earth from the most remote perspective to date, the series of photographs concluded with the image of a floating figure in silhouette: a single trash bag that contained the objects that NASA intended to leave behind before the mission's return flight to earth. At hundreds of miles above the surface of the planet, the plastic bag seemed reassuringly distant. Relegated to extraterrestrial space, the bag contained "matter-out-of-place," what anthropologist Mary Douglas designates as dirt, that which transgresses the boundaries of a social order and whose containment reaffirms the purity of what remains without.¹ The photo-essay closed with a short editorial on the larger menace of the "growing clutter of space trash" alerting readers to over 1,200 large objects in orbit and which "someday could cause a serious traffic problem in space."² The future, it seemed, might well depend on humanity's prescient efforts to regulate those vestiges of development. Otherwise, the editors of *LIFE Magazine* observed, just as cities had become clogged with animal waste and garbage, space trash could eventually become the proper concern of extraterrestrial street cleaners.

Similar material politics were underway on the ground, whereby experts have increasingly taken responsibility for the categorization and management of waste. "The days of haphazard collection and disposal practices appeared to be ending with the rise of sanitary engineers," describes the historian Martin Melosi.³



Figure 1. "Planet Earth by Dawn's Early Light," *LIFE Magazine*, August 1966.

This emerging profession utilized an urban epistemology of scientific management through "the careful accumulation of data, the design and evaluation of new equipment, and the organizational structure of public works departments."

In 1987, the Mobro 4000 infamously hauled 3000 tons of trash from New York to Belize and back until it was finally incinerated in Brooklyn and the ash buried where it originated. "Burn it, Bury it, Recycle it, or Send it on a Caribbean Cruise," These are the four things Ed Koch, former mayor of New York City, said could be done with garbage in the wake of the roaming Gar-barge episode. The mediagenic incident was emblematic of a "garbage crisis" that equated the significance of the question of space in waste management to the availability of disposal sites. Trash was regarded as the symbol of the aberration of a consumer society, the response to which was to remove

trash from domains of occupation to sites of containment. Once enclosed, odorless, and away, trash is matter-out-of-place in a world that centers on quantitative "matters of fact." Bruno Latour suggests that "facts" are the residue of the visualization regime of statistics. Hence, the designer is called to action, since the representation of these "facts" in the world ultimately shapes the discourse surrounding them. As Latour put it, "what does an aesthetics of matters of concern look like?"⁴

The Geographic

The Gemini and Mobro4000 episodes speak to the geographic scale of waste flows in "a society that has been completely urbanized." To speak of the urban then, as Henri Lefebvre notes in the *Urban Revolution*, "is to look beyond the city, to encompass an entire way of being, thinking and acting."⁵ However, much urban analysis does not address the geographies

Figure 2. A City Sized Issue. If the surface of all active municipal solid waste landfills in the state of Michigan were added together, the resulting territory would be nearly the size of a township, or comparable to some of the largest cities in the state such as Ann Arbor.

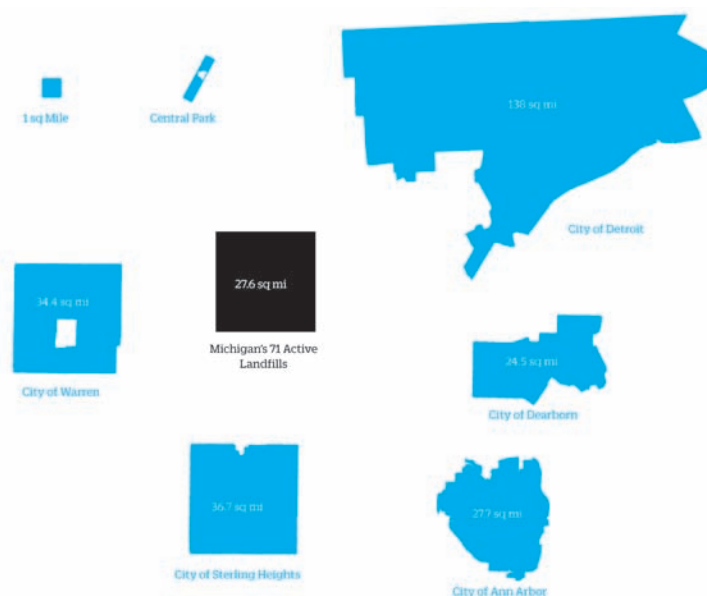
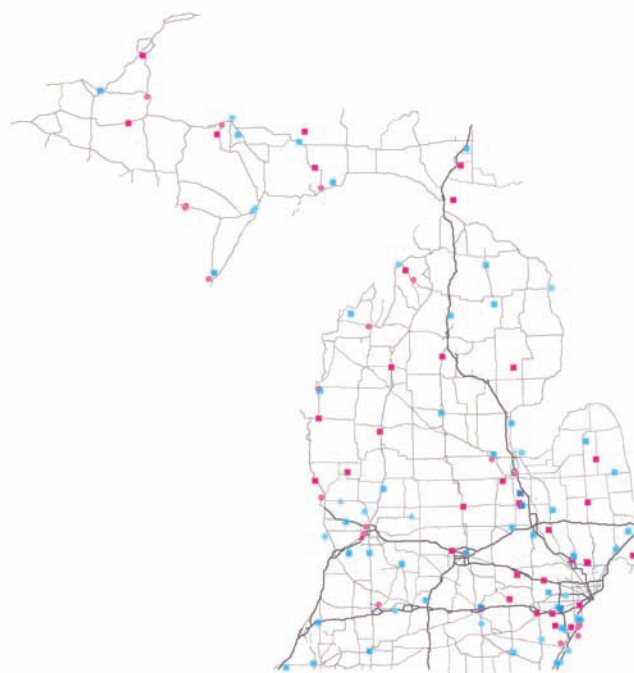


Figure 3. Location of Michigan Landfills in Relation to Major Roads. Easy access to road network and truck transport is key to the financial livelihood of a landfill.



over which negative effects extend beyond the city, what David Harvey refers to as an “externality field.”⁶ Indeed, “clean” urbanism has rested on the city’s capacity to divest itself of the environmental costs of rapidly expanding consumer culture by externalizing them to the scales of the region and territory.

The term “sanitary landfill” was first used in the late 1930s, at a time

when many American municipalities were seeking waste disposal options that could lessen the rising costs of public sanitation in a recently urbanized society.⁷ As Kevin Lynch observed, “The filthy cities of history, which sat in a clear countryside, are succeeded by clean cities encircled at some distance by their wastes.”⁸ The simplicity of the sanitary landfill belied its effectiveness and its

ubiquitous deployment. In section, a geosynthetic clay membrane with very low hydraulic conductivity is used for the lining of landfills in order to slow down fetid liquids from seeping into lakes, streams and ground water. At the end of each working day, workers cover the exposed trash reducing the odors of festering organic waste while keeping vermin from living amongst the rubbish. The totality is then

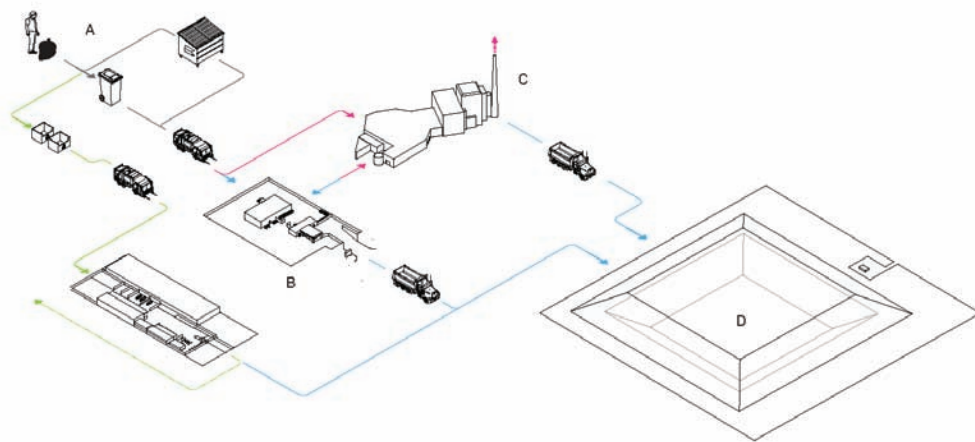


Figure 4. Networks of Municipal Solid Waste Management in Detroit: Household Waste, Transfer Station, recycling center, incinerator, and landfill.

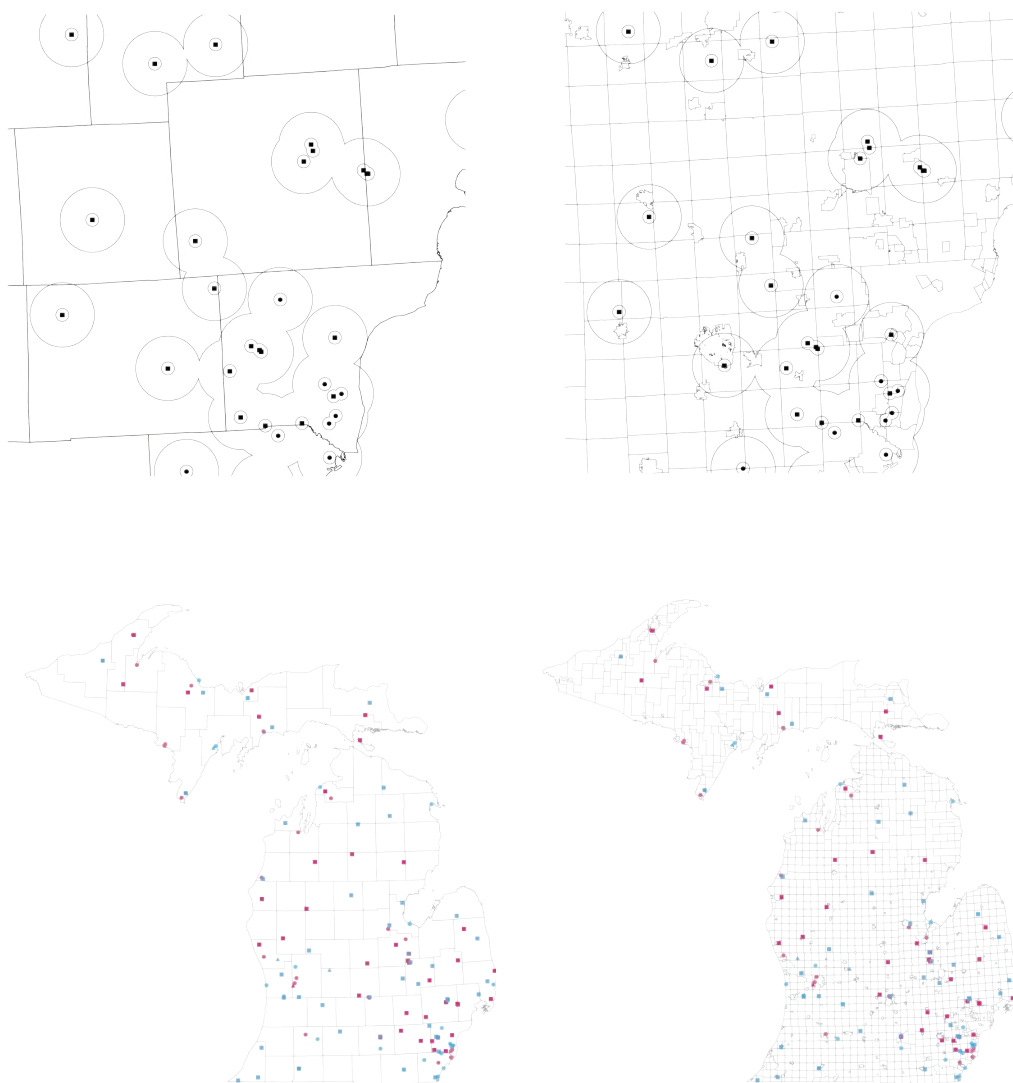
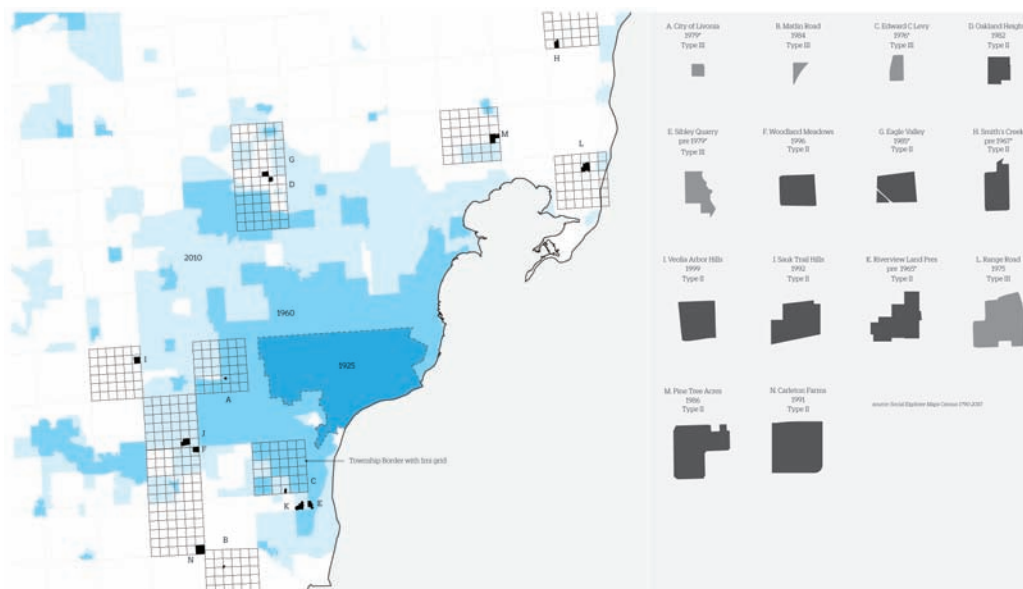


Figure 5. Location of Michigan Landfills in Relation to Major Roads in relation to county and township lines.

Figure 6. The 14 active Metro Detroit landfills occupy the outer rings of the townships in which they are located.



capped with a green carpet. At the geographic scale, landfills are located in social and spatial peripheries rendering them barely noticeable to urban centers. Non-represented and non-formalized, waste disposal sites operate outside environmental design imaginaries.

If the externalization of trash limits design's agency to intervene, can the geographic representation of waste re-inscribe such systems within design practices? Subsequently, if the abstraction of space conceals the social, political, and ecological attributes of trash, can the materialization of such sites—their dimensions, forms, relations—bring waste systems into the domain of public controversies?

Geographies of Trash

Geographies of Trash responds to this geographic provocation. The research developed within the context of *Research on the City*, an initiative at the University of Michigan Taubman College of Architecture and Urban Planning to incentivize interdisciplinary research on the challenges of the contemporary city. For its 2011–2012 inaugural cycle, *Research on the City* explored Detroit in five interdisciplinary teams. Within this context, the *Geographies of Trash* project aims to extend the framework of Research on

the City to that of the urban project at a geographic scale (Figure 5).

The research proceeded through the interrelated acts of *representing* and *projecting* geographies of trash. Drawing on the editorial lines of the journal *New Geographies*, this research responds to a condition in which designers are increasingly compelled to transform larger contexts and to address problems that had been confined to the domains of engineering, ecology, or regional planning. From greek *geōgraphia* (*ge* 'earth' + *-graphia* 'writing'), the geographic embodies the concomitant acts of re-representation (mapping the earth) and re-forming (writing the surface of the earth)—and which, by making space visible and formal, seek to bring it back into public debate.

REPRESENT maps the materialist, political, and economic geographies of waste in Michigan. The approach endorses Latour's "assembly of entities," which "extend the number of parts necessary for the gathering of the thing and then multiply the number of assembling principles that gather them together in a functioning whole."⁹ In this framework, Latour takes the word network not to describe things in the world that have the shape of a net but "to designate a mode of inquiry that learns to list the unexpected beings

necessary for any entity to exist." The notion of networks," Latour adds, "points to a transformation in the way action is located and allocated, and, what had seemed self-contained is now widely redistributed."¹⁰ Latour illustrates this in reference to the U.S. space shuttle Columbia disaster. After it tragically burst upon reentry into the Earth's atmosphere, a meticulous reconstruction was initiated in a large hangar in the Kennedy Space Center. Each element is assigned a role and then placed into relation with one another on a grid. Over the course of this reconstruction, "you discover a swarm of entities [of referentialities and performance] that seem to have been there all along but were not visible before, and that appear in retrospect necessary for its sustenance."¹¹

What is produced on the ground is a dynamic assemblage. Trash-space is totally transformed once it is portrayed simultaneously in the world and within a vast network of technologies, sites, actors, and legislations. The mapping of the network traces the relations of trash and space, following the logics of containment and boundaries from the street, to curb pick up, incinerators, transfer stations, and sanitary landfills. From this perspective, waste management is not matter-out-of-place. Rather, trash sites are territorially embedded:

they are inscribed within the peripheries of the township and county grids, and in their turn, further produce boundaries in space.

Such acts aspire to shift public debate away from matters of fact—from the moral arguments of “garbage crises,” which rehearse managerial-technological fixes to the assertive desire of protecting the environment—and towards matters of concern—contesting and redrawing the boundaries of waste sites and systems. Architectural design’s capacity to make abstract concerns imageable allows the designer to engage and reconfigure the aesthetic assumptions upon which urban waste management rests.

PROJECT operationalizes the mappings of trash concerns to propose five situated yet generic architectural strategies of trash-formations at different scale. The specificity of the site makes for a more believable and materialist scenario, while the generic potential of the form allows the five projects to be imagined throughout the American territorial grid. The five discrete projects, CAP, COLLECT, CONTAIN, PRESERVE, and FORM, engage alternative imaginaries for landfilling, recycling, burning, re-using and reducing. The five projects engage issues implicit in the socialization of trash, such as monumentality, value, scales of management, social relations, ecology, and geography. By making formal, this section explores design’s agency and seeks to open up disciplinary and public debates on the geographies of urban systems.

CAP

The Resource Conservation and Recovery Act of 1976 dictated stricter environmental specifications on the country’s landfill. Faced with higher management costs, 70% of America’s landfills closed between 1978 and 1988. Those that survived grew into “mega-fills” to capitalize on economies of scale. The EPA estimated that a landfill handling less than 25 tons a day costs more than \$40 a ton, whereas a landfill with a capacity

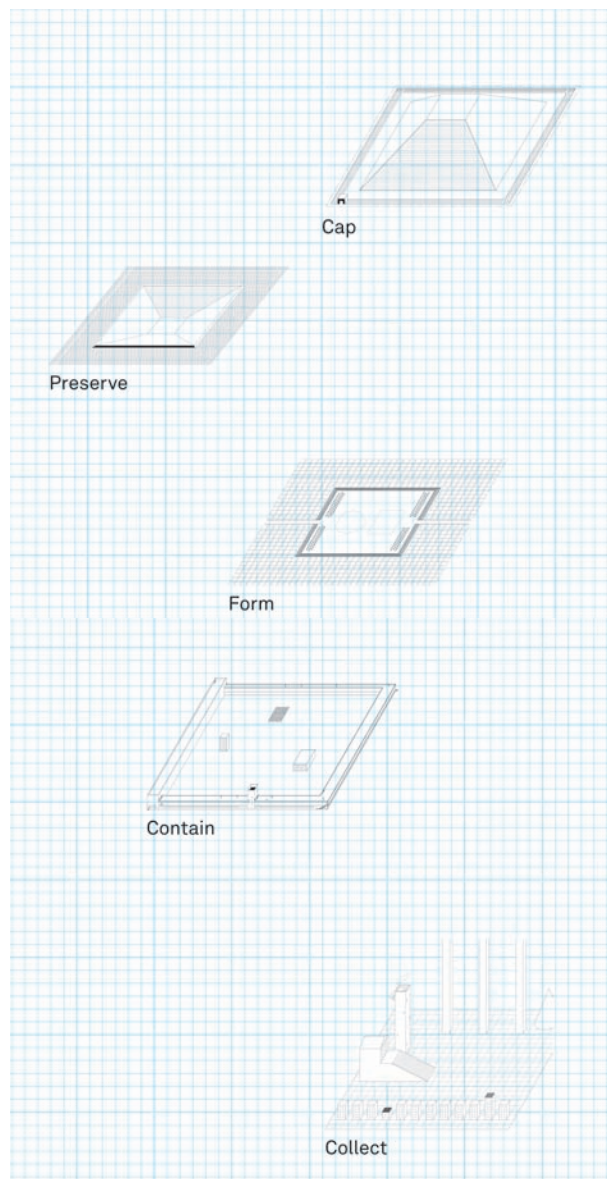


Figure 7. Axonometric icons of the five proposed projects: CAP, PRESERVE, FORM, CONTAIN, and COLLECT.

greater than 400 tons a day costs less than \$10 a ton.

Their forms followed the logics of “airspace,” the maximum fillable area of a site following angles of repose. Every day, bulldozer drivers crafted the open face of trash into a big green mound. Landfills are further evicted from urban imaginaries by being located in urban peripheries along major highway arteries. What alternative forms and symbols can we project on the landfill site?

CAP formalizes the metrics of the landfill operations into a geographic monument. The project rationalizes

the process of landfilling—cell construction, material stacking and truck circulation—to give shape to a ziggurat of trash cells. Culminating the 20-mile automotive Mound Road Corridor, the monument serves as a marker of the de-centralizing and wasteful forces of Detroit’s urbanization. By giving form to the landfill, CAP reclaims the infrastructure of waste as a project of urban imagination and civic pride.

COLLECT

Solid waste management is a vertically-integrated industry (Figure 13). As their revenue depends on drawing

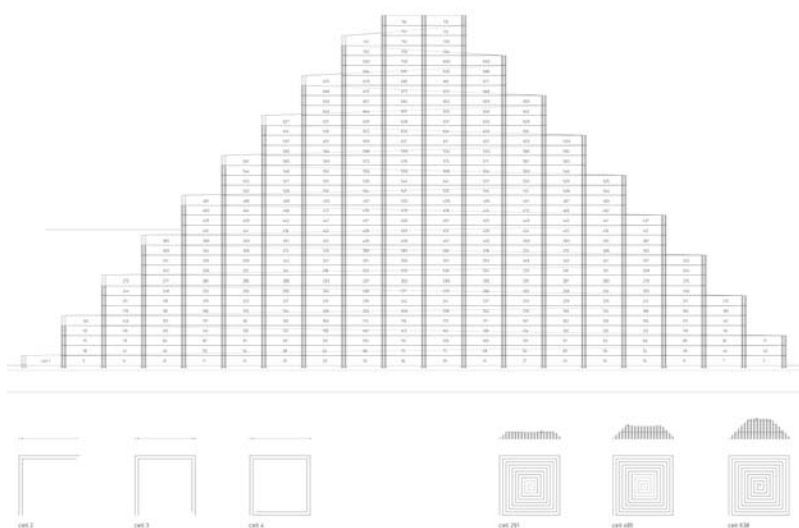


Figure 8. CAP Section. The form of the landfill monument derives from airspace metrics, defined as the volume of space on a landfill site that is permitted for the disposal of solid waste.



Figure 9. CAP Aerial View. The geographic monument marks the end of Mound Road (left).



Figure 10. CAP Ground View. At the base of the ziggurat, the tipping fee station is transformed to a monumental public access point (below).

a line between what is valuable and what is not, landfill owners enact strict protocols for access, and reinforce a distinction between corporate management and scavengers. Highly controlled access points prevent scavengers or other unauthorized

intruders from gaining access to a landfill site, partly for public safety and partly in response to the exigencies of underwriters. The exteriors of the sites are impervious to the public, ringed with high fences and often with barbed wire to discourage curiosity.

Recycling programs produce revenue twice in the process—once out of charging waste producers for collection fees, and a second time for selling the recycled materials.

Can we imagine a recycling process that utilizes the economic value

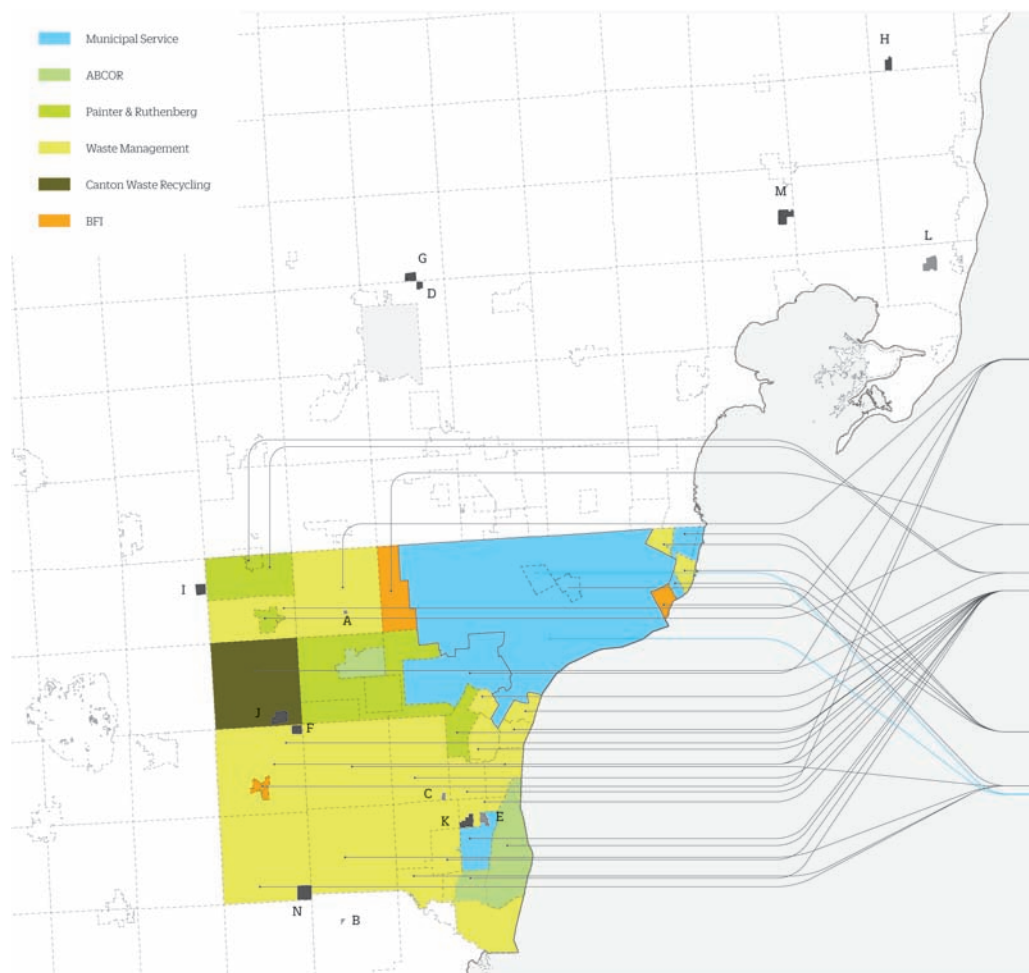


Figure 11. COLLECT Map. Distribution of waste management companies and their respective landfill sites in South East Detroit.

of recycling to mobilize social capital and social space in the city, precisely at the moment when Detroit is defined by its loss of population, revenue, and urban services?

COLLECT localizes the surplus value of recycling, juxtaposing at the scale of the neighborhood. The project converts the Russell Woods neighborhood park into a ground for the collection, sorting, and redistribution of solid waste. Away from the consumer-scavenger binary, the system of trash serves as ground for the construction of new subjectivities. In the process, the neighborhood waste economy becomes the locus of a collective project.

CONTAIN

Trash is hauled over long distances—usually to disassociate undesired costs/externalities from more affluent

areas to less privileged ones. Can we productively limit the flows of waste? At the height of Detroit's urbanization, a 1917 report from the Detroit Bureau of Governmental Research summarized the importance of waste management in a rapidly growing city. The authors of this report recommended a rationalization and consolidation of street-services within smaller geographic zones.¹² Scientific routing established a logistical field of dispersed nodes with greater articulation in the hierarchy of waste flows. Waste was poured from trucks into waiting rail cars, and hastened out of the public environment, to a site for disposal. Trash had become untethered from its immediate surroundings; instead the act of throwing a thing away anticipated an indefinite form of containment somewhere beyond civic life.

Can we imagine a municipal scale of trash management—one in which trash yields positive values? How do we integrate waste management technologies into forms of urban interface and construction at the scale of the block?

The project frames a desire to build cities out of their own waste. A 1922 report by The Detroit Bureau of Governmental Research proposed the reuse of some of the one million cubic yards of ash, street sweepings, and refuse that were being disposed of annually. The authors recommended that trash disposed of in the dumping site by the riverfront be used to construct a boulevard and new piers, extending the city into a yet undeveloped marshland.¹³ Reformers in Detroit called on residents to separate out what could be useful for construction purposes.

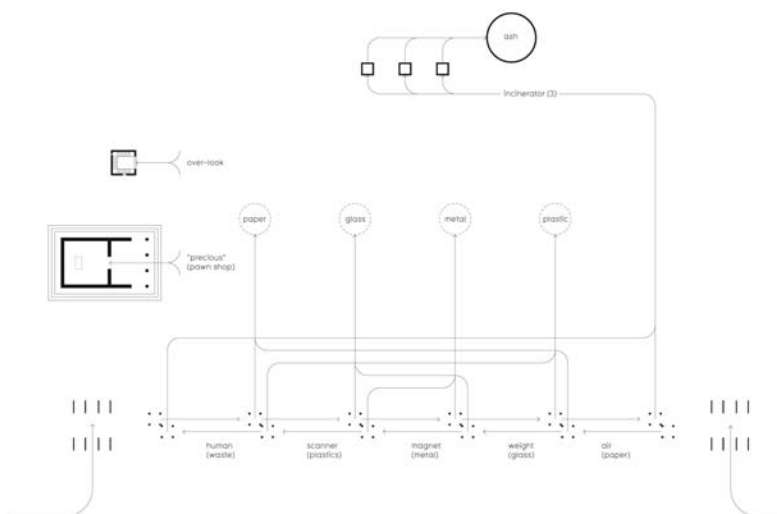
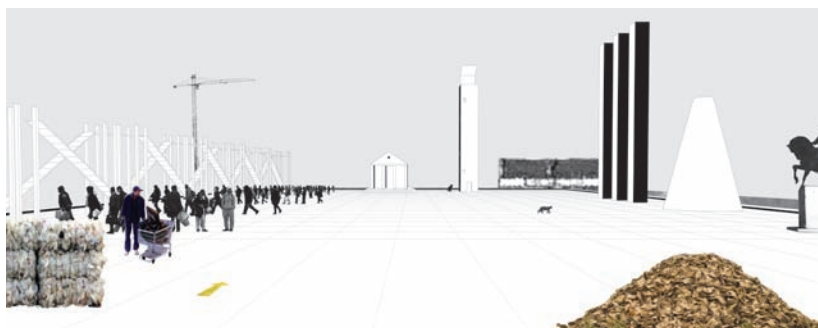
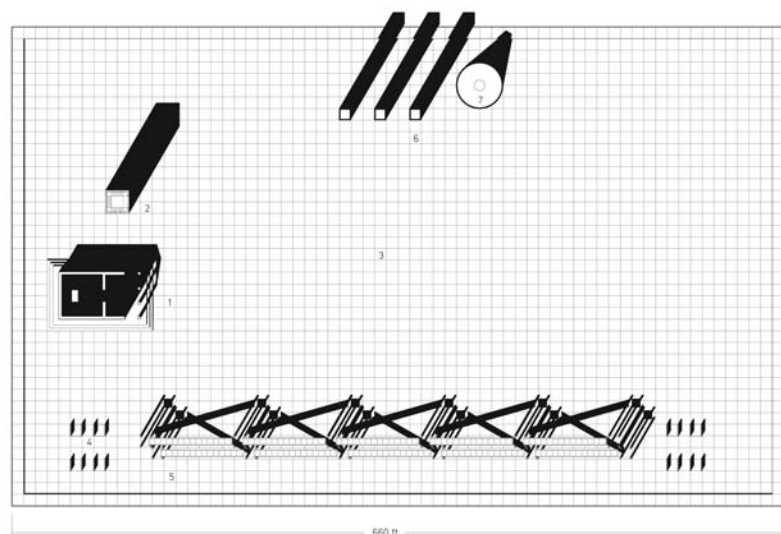


Figure 12. COLLECT Diagram. Waste sorting streams in neighborhood unit (top).

Figure 13. COLLECT Plan. Russell Woods collection grounds include an incinerator, watchtower, sorting bins, and ash container (middle).

Figure 14. COLLECT, Aerial View. Three incinerator towers mark the location of Russell Woods Park (bottom, left).

Figure 15. COLLECT, Ground View. A Day in the Park (bottom, right).



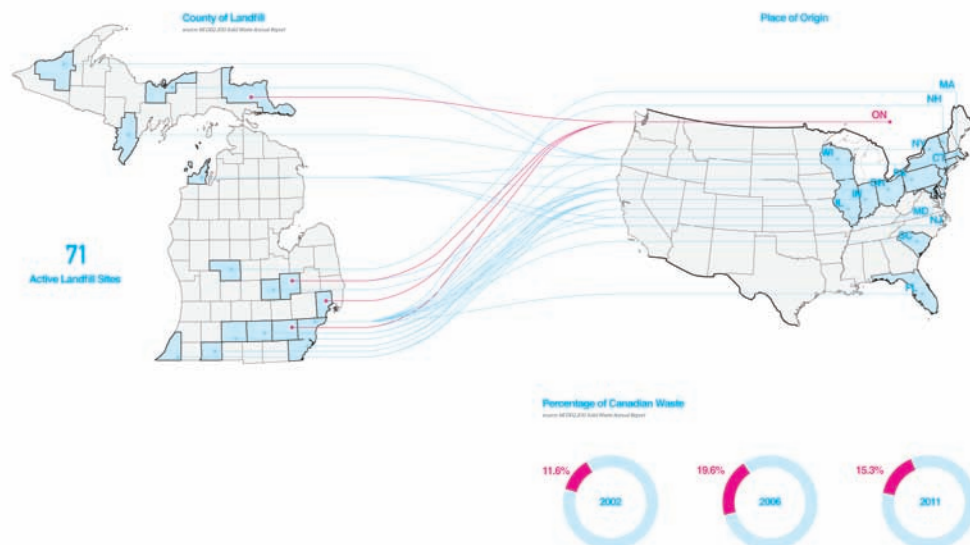


Figure 16. CONTAIN, Map. Waste Flows from Origin States into Michigan County of Landfill. Source: MI DEQ 2011 Solid Waste Annual Report.

“Clean ashes should be kept in cans separate from waste paper and other refuse, as the ashes are often used to mend mud streets and alleys.”¹⁴ Decades later, the rise of large-scale incineration brought Detroit to use waste in street widening and the construction of highways.

CONTAIN internalizes composting and burning within the courtyard of perimeter-building types. Despite Detroit’s shrinking population, numerous informal community organizations demark enclaves in space. The project deploys trash management as a redevelopment strategy in the Poletown East neighborhood, which in spite of its current low density, has historically been a location for grazing, orchards, and numerous immigrant communities. The enclave constructs itself from the waste it manages. Byproducts of low-tech composting constitute the soft surfaces of semi-public interior zones within the block (lawns, fields, gardens, etc.). The bottom ash of high-tech burning is used as aggregate in the construction of hard surfaces for the perimeter housing blocks (pavement, concrete, concrete stones, etc.). Eventually, the future city drops the distinction between waste and resources.



Figure 17. CONTAIN, Aerial View. A Redevelopment Strategy for Poletown East in Inner Detroit.

PRESERVE

The regulation of dumping does not place any liability on industrial and chemical producers displacing the costs to dumping sites, where the territorial plastic bag will indeterminate contain disposed waste. Since the 1980s, landfills are lined with low-density polyethylene, the material of the plastic trash bag, to keep them from leaching fetid liquids into lakes, streams and ground water, sealing the site forever. The polyethylene extends

well beyond the time period for which states are required to maintain and monitor landfills after closure, with Michigan’s 30 years being among the shortest timeframes in the nation. Such perpetual deferral of liabilities between the state and private corporations poses a legal hurdle to the ecological treatment of trash sites.

Can we imagine alternative landfill ecologies that do not depend on the plastic wrapping of all material, but rather, favors an industrial ecology of

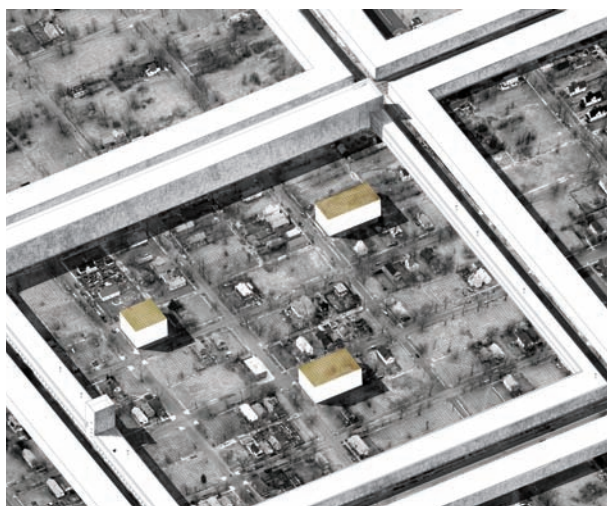
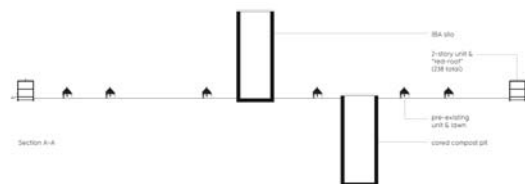
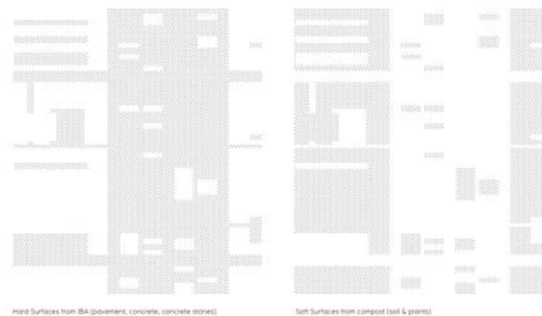
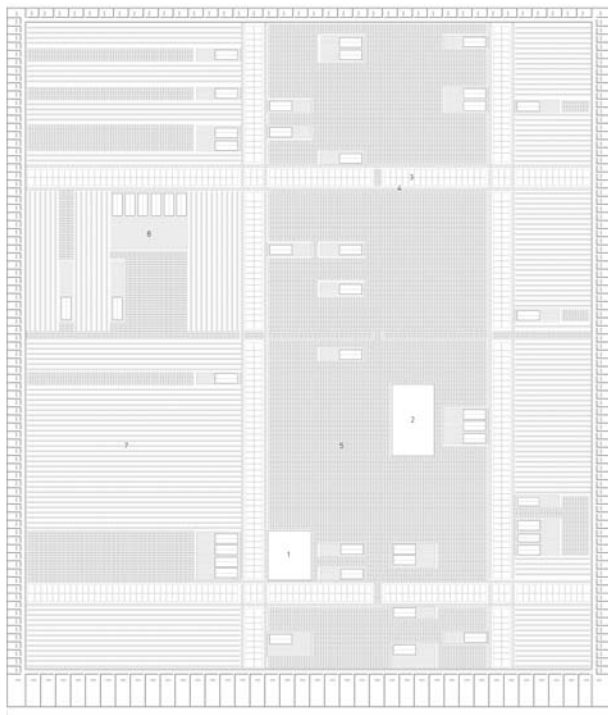


Figure 18. CONTAIN, Plan (top, left).

Figure 19. CONTAIN, Diagram. Hard and Soft Surfaces (top, right).

Figure 20. CONTAIN, Section (middle, right).

Figure 21. CONTAIN, Aerial View. Incinerator ash and composting areas within the courtyard of each perimeter block (left).

waste? A nation-wide study from 1950 found that most cities in the Detroit Metropolitan region employed hogs for disposing of garbage either by contract to independent entrepreneurs, or by operating their own piggeries. Along the urban periphery, such urban and rural trash was combined with soil to produce a fertile duff.¹⁵

PRESERVE curates ecologies by engineering the operation and lifecycle of a landfill. In a twist on the image of Nature, the project

prescribes the geographic limits of a landfill into a golf course within the Indian Springs Nature Preserve at the boundary of Detroit's outer city. Against predominant landscape practices that deploy ecological consciousness in post-termination redevelopment strategies (think Fresh Kills), the proposal foregrounds the operating landfill as a political-ecological issue, and in doing so places liability on industrial and chemical operators.

Within the site, the liner is replaced by decomposition strategies and remediation processes that allow trash to become part of the preserve's ecology. Within its perimeter, PRESERVE attracts bears and a multitude of other ecologies, while producing fertile ground for urban agriculture in Detroit.

FORM

The North American Free Trade Agreement considers garbage a

Figure 22. PRESERVE, Plan. The site of a Golf-Course in the center of Indian Springs Nature is converted into an ecological dump site.



Figure 23. PRESERVE, Bird's Eye View.



Figure 24. PRESERVE, Ground View.



primary commodity and legitimizes its flows. Michigan capitalizes on its location at the geographic center of the Great Lakes Region, as well as its rock-bottom landfilling prices, low tipping fees, and environmental regulations far looser than those mandated in Canada. Although the practice of importing waste from Canada towards Michigan has recently stopped, over sixty percent of the landfills in southeastern Michigan continue to receive out of state waste; with only Pennsylvania importing more waste than Michigan. Over the next two decades, most of the landfills in Michigan's densest urban areas will have reached their maximum holding capacity, hinting at possible zones for thinking and action in the present.

How can we plan for an economy of waste that integrates the large number of landfills in the urbanized corridor between Detroit and Lake Michigan, while capitalizing on their post-termination developmental potentials? How can capped landfills project a new model of urbanism in which post-technological systems are incorporated at conception?

FORM re-surveys a continuous waste management system's two mile-wide area along the Michigan baseline, an urbanized corridor that begins in Detroit and extends westward along 8 Mile Road. Rather than perpetuating the landfill siting logics of the six-mile township boundaries, the project engages geographical features (such as topographical changes, waterways, motorways, forests, towns, etc.) to form an archipelago of platforms within a continuous landfill stretching from Detroit to Lake Michigan.

Conclusion

To underscore the geographic dimension of trash is to reassert the centrality of space in the containment of costs and the production of value in urban regimes. If the externalization of waste serves to depoliticize it as "matter-out-of-place" then to inquire into the geographic brings the space of trash management into the aesthetics of matters of concern.

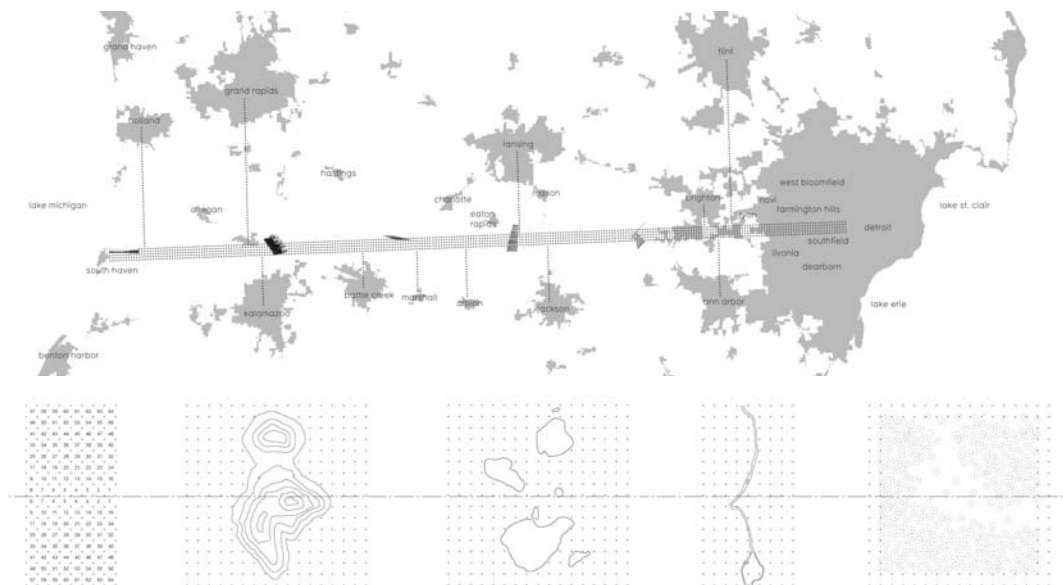


Figure 25. FORM, Plan and Elements of the Zone of Action.

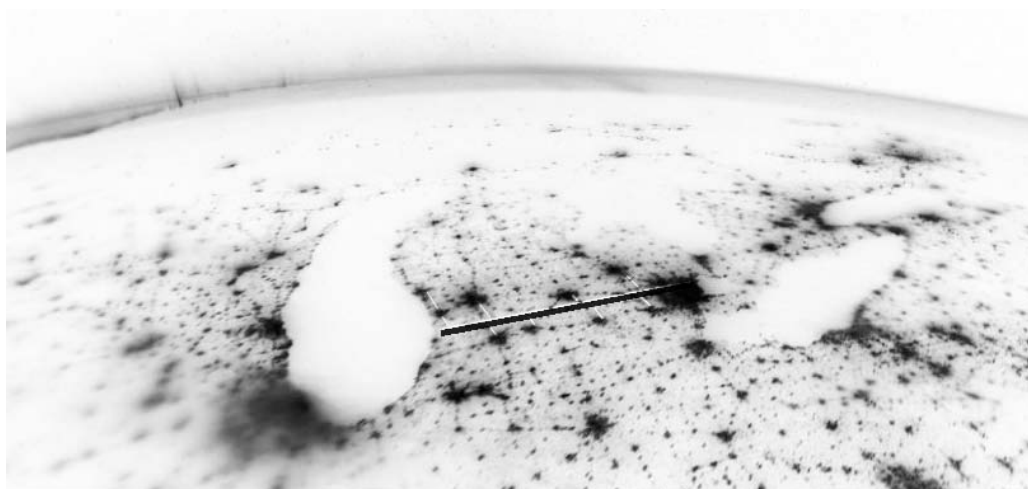


Figure 26. FORM, Aerial View.

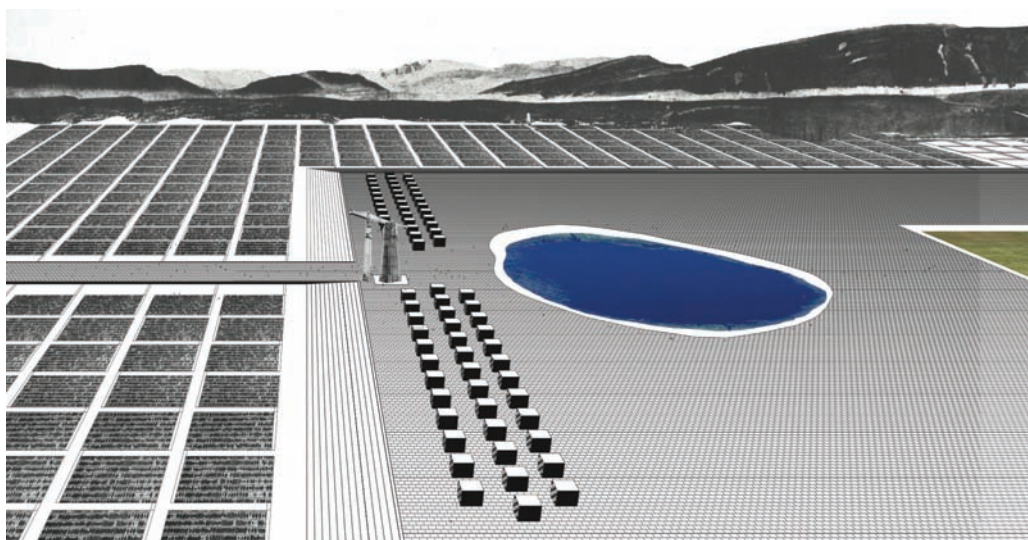


Figure 27. FORM, Bird's Eye View.

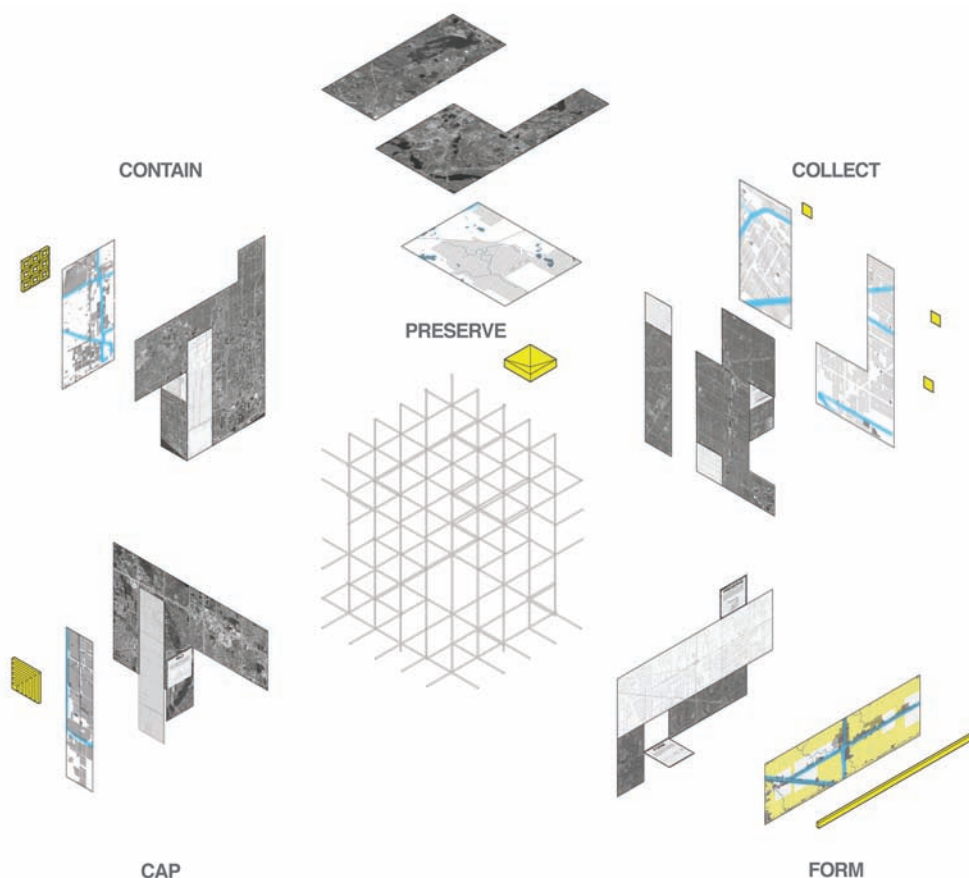


Figure 28. Geographies of Trash Exploded Axonometric View of Installation with the five projects.

By unfolding some instances of the system, this research makes visible how our waste-relations are organized and reproduced through space, and brings waste into matters of concern and public controversy.

The design research does not merely render visible the inequality between a distribution of spaces and time and a distribution of capacities and power.¹⁶ Above all, a geo-graphic design, literally the writing of the surface of the earth, elicits consequential interventions within power and its representations. *Geographies of Trash* contests the politics of containment by reconfiguring the aesthetic assumptions upon which boundaries and invisibilities rest and reclaiming matter and materiality into objects of design. It maintains as such the position that aesthetic reforms represent some agency for political thought. Along with the

research publication, the 6×6×6 feet cube installation collects the five projects onto an object in space. Representing the scale of the township, each side of the cube hosts a satellite image of context printed on acrylic, an aluminum etching of the site of concern, and a yellow resin cast model of the proposed project. By making trash visible and formal, the project aspires to engage both disciplinary and public debates on waste systems, in which form-making becomes a political tool that disturbs the aesthetics of consensus upon which trash boundaries rest.

Acknowledgments

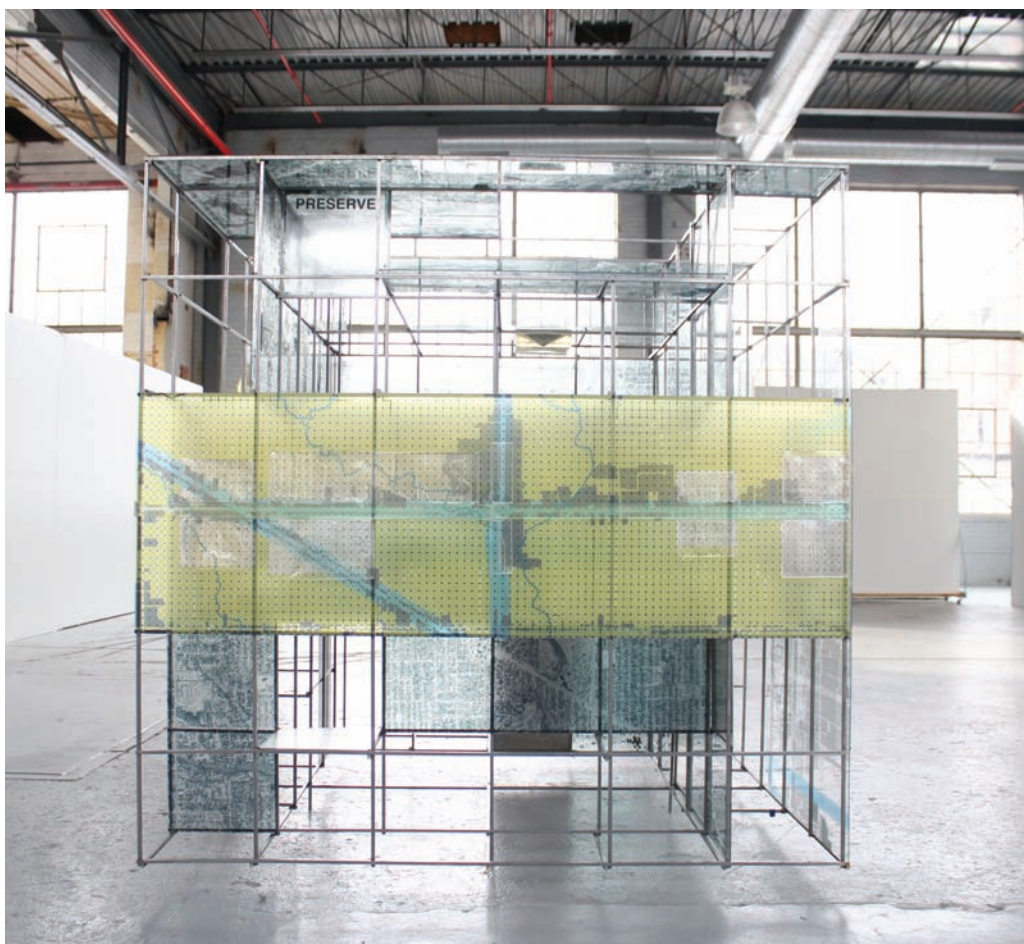
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Figure 29. Geographies of Trash Installation.



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