Pop Rocks: Soft Urban Boulder Field

Concrete, steel, aluminum, wood, and glass; the vast majority of building materials are hard. Despite the promise of early explorations in soft spatial environments, such as Ant Farm's inflatables or Hans Hollien's Mobile Office, even the most neo-naturalist and dynamic ambitions of contemporary design are typically realized through unitized increments of hard elements.

JOSEPH DAHMEN
University of British Columbia

MATTHEW SOULES
University of British Columbia

AMBER FRID-JIMENEZ
University of British Columbia

Zaha Hadid's sinuous curves are usually enabled through the solidity of formwork and the fixity of Portland cement. The isomorphic geometries of Preston Scott Cohen are made possible with the stiff certainty of rigid form. Conversely, it might be argued that instead of physical materiality, the primary domain of contemporary softness belongs to immaterial atmospheric performance, as evidenced in the work of designers like Philippe Rahm and Sean Lally. This latter mode of design inquiry elevates environmental softness as an avatar of prevalent sustainability and ecological concerns. However, the significance of immaterial softness notwithstanding, the polyvalent potentials of material softness continue to remain elusive.

One especially compelling domain of material softness is the way in which it can have direct implications for the ecological challenge of ever-accumulating material waste. Perhaps a refocus on material softness can assist the built-environment's strategic response to waste streams while at the same time achieving new social, political, and bodily experiences? Or put another way, what might trash offer up for rethinking the materiality of the built-environment? This paper presents a specific research-based design project, titled *Pop Rocks*, which explores these questions through a temporary public space installation in downtown Vancouver.

The topographies and processes of the landfill reveal a simple and basic fact of material waste: It is usually soft. This softness emerges in large part from the small increment of most waste components. Discarded packaging, plastic bags, off-cuts of wood, to name but a few; all scrambled together in the garbage landscapes of the world. Pushed, shaped, compacted, and capped, the physicality of waste is ironically defined by a suppleness akin to soil. While the increased prevalence of using relatively intact building components salvaged from obsolete structures in the construction of new buildings and spaces has merit, it is an

approach to recycling that overlooks immense categories of post-consumer and post-industrial waste. Of course, this type of low-grade waste is challenging to integrate into the built environment as it is currently understood, designed, and constructed. To build the world anew from the messy softness of garbage necessitates a migration from the solidity of top-down form generation to a bottom-up formlessness. In embarking on this migration with *Pop Rocks*, a new type of soft tactility and ambiguous and flexible forms is ought. Through this investigation the authors intended to demonstrate that up-cycling garbage can enhance sustainability while offering novel ambient pleasures that are artificially biotic and vegetal. The result is a spatial materialism that could be called the garbage organic.

1

Figure 1: Pop Rocks at night
(image credit: Krista Jahnke)

In the spring of 2012, the City of Vancouver commissioned a temporary summer-time public space installation over a full city block of downtown Vancouver that sees over 60,000 pedestrians pass through each day. The brief issued by the City solicited designs that created space for residents and visitors to sit and recline, sunbathe and eat, and interact and play. Temporary commissions of this sort often provide designers with valuable opportunities to adopt experimental approaches to materials and techniques, free from the constraints of longevity and durability. In this case, the temporary nature of the commission provided the conceptual basis for a design that sought to engage with the full life cycle of the materials. The design was inspired by two related questions: Could the materials for the installation simply be "borrowed" from waste streams, to which they would be returned at the end of the project? And could a design process transform these materials into an imaginative social space that might foster new interactions and perspectives on the city? As buildings stand for ever shorter durations due to the pressures of redevelopment, and construction and demolition debris accounts for 36% of all material in landfills in the Northeast

2

(NWMOA, 2009), the relevance of these contingent design processes might extend well beyond a temporary commission.

TEMPORAL PRECEDENTS

Recent architectural installations by Peter Zumthor and Interboro Partners have used temporary installations to engage in dialogues about the useful life of materials. The spaces of the *Swiss Sound Box*, the Swiss pavilion designed by Peter Zumthor for Expo 2000 in Hanover, Germany, were delineated by of 40,000 pieces of lumber stacked in a lattice pattern and held together with recyclable tension members. The individual pieces of lumber from Swiss forests dried slowly during the duration of the installation, accruing value as they seasoned (Davey, 2000). The pavilion was dismantled and sold for use in more permanent construction following the exhibition. More recently, Interboro Partners' 2011 project, *Holding Pattern*, used a temporary installation at PS1 as a tactical means to provide community centers and other civic institutions with needed amenities. After carefully cataloguing the shortcomings of fifty institutions in close proximity to PS1, the architects designed or acquired a diverse range of objects, which included climbing walls, furniture, and landscaping elements, and assembled them to create a compelling temporary installation. When the installation closed, the architects delivered objects and trees to organizations throughout Long Island City (Armborst et al, 2012). Like the *Swiss Sound Box*, *Holding Pattern* engages tactically with its own temporality to participate in a broader dialogue about the use of materials beyond the duration of the installation.

SOFT MOTIVATION

Designing the temporary installation in Vancouver commenced with an intensive investigation of the resource flows of metropolitan Vancouver. This initial research into available materials led to a desire to fabricate the project entirely from the soft-landscapes of waste we witnessed at the edges of the region, using design to create value in these discarded materials that could extend beyond the immediate term of the installation. Our research into locally abundant waste that is resistant to re-use in architectural applications led us to two specific materials:

Figure 2: Pop Rocks Concept

3

Figure 3: Study models

polystyrene packaging material and Teflon-coated fiberglass fabric. We discovered a vast quantity of roughly six-by-six metre sheets of Teflon-coated fiberglass fabric that was discarded during the refurbishment of the tensile membrane roof of *Canada Place*, a convention centre in downtown Vancouver and a local architectural icon. At the same time we developed a working collaboration with a manufacturer that possessed acres of post-consumer polystyrene packaging in part produced by the retail activities in downtown Vancouver. The manufacturer had no reasonable means to make use of this immense quantity of constantly accruing waste material beyond grinding it up to produce beads measuring

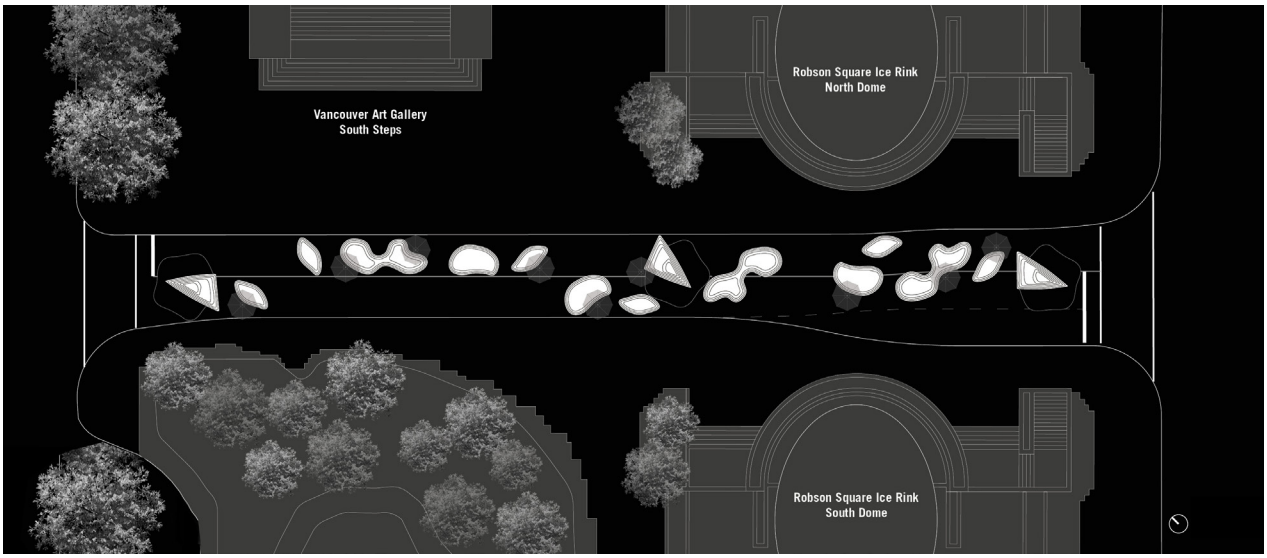
4

approximately twenty millimeters. Then began an iterative design process to synthesize material properties with the social and experiential ambitions of the project. Pop Rocks capitalizes upon the inherent attributes of these two materials by redeploying them into a strangely familiar yet otherworldly landscape.

INFLATABLE INSPIRATIONS

Designing forms from Teflon-coated fabric capable of containing vast volumes of lightweight postconsumer polystyrene beads presented unique formal challenges akin to those encountered by past designers of inflatable architectures. Architects and artists have long used inflatables to provide large, low-cost participatory environments designed for temporary inhabitation. Perhaps the most notable examples of this approach are the ephemeral interactive pneumatic structures by the collective Ant Farm, which used lightweight materials to enclose the maximum amount of space (Lewallen and Seid, 2004). Another early inflatable project is *Silver Clouds*, installed by Andy Warhol in the Leo Castelli Gallery in 1966. This project involved a collaboration between the artist and Bell Laboratories engineer Billy Kluver to make use of technologically advanced fabric of metallized plastic, called scotchpak, manufactured by 3M for weather balloons (Watson, 2003). The helium-filled material was shiny and extremely lightweight, enabling Warhol to radically alter the interior space of the gallery with a minimum of amount of material. More recently, artist Gediminas Urbonas and architect Nader Tehrani collaborated to produce *Liquid Archive* for the FAST Future Forum for the Arts in 2012. A lightweight inflatable form was positioned on a barge in Boston's Charles River, where it served as a screen for projections.

Figure 4: Installation in downtown Vancouver, BC (image credit: Krista Jahnke)



5

Figure 5: Pop Rocks site plan

The temporary installation produced an effect at the scale of the river and the city, legible against the skyline of Boston. Using air trapped in a fabric structure enables a maximum effect from a minimum amount of material, but the forms that result are more highly contingent on the forces involved than other, more rigid materials. The material limitations and challenges of inflatable structures were akin to those encountered when designing forms to be realized by containing lightwieght ground polystyrene beads in stiff teflon-coated fabric.

TECHNICAL CHALLENGES

Cutting, sewing, and filling, pattern-making tests to stitching experiments; the development of *Pop Rocks* employed an iterative modeling and prototyping process. This responsive material-based methodology and its results are indicative of design operations that are increasingly relevant in the context of decreasing resources. Radically recycled architectures, like *Pop Rocks*, mark a departure from traditional top-down, form-heavy design methods towards a contingent, emergent, and tactical design ethos. This might be described as a new form of pragmatism that is not only ethically enticing but promises new aesthetic, formal, social, and political frontiers. The soft suppleness of waste finds its avatar in built environments that challenge the dominance of the hardness in cities and its associated behavioral norms.

The softness of the materials presented challenges in equal parts technical and social. From the earliest prototypes, it was apparent that the soft forms required a departure from standard design methodologies. Unlike typical materials, working with soft forms requires a willingness to accept material tectonics as a fluid dialogue, in which the designers must embrace a range of states rather than one particular design.

While the early soft prototypes left much to be desired from a formal perspective, there was something alluring about the way that they registered the presence of users in their absence, dynamically attesting to former human occupation in stark contrast to the rest of a city comprised of hard forms and surfaces.

Obstacles in fabrication accompanied technical design challenges. Many of these stemmed, ironically, from to the inherent relative stiffness of the Teflon coated

fiberglass fabric, which is designed to withstand the tremendous tensile forces occurring in large-scale tensile membrane roofs. The very scale of these structures made the fabric more amenable to large radius curves and gentle slopes than the tight curves and tucks characteristic of furniture. Working with the stiff fabric in conjunction with the near-weightlessness of the polystyrene beads to achieve the large scale of the seating registered yet another design constraint, favoring shapes into which the material could flow smoothly.

MAKE IT SOFT, BUT NOT TOO SOFT

The technical challenges of designing in soft granular materials were accompanied by a different set of social challenges. The proposal to place soft forms in a high-profile public square at the center of the city led to concerns on the part of the civic agency sponsoring the project that the installation could be occupied by homeless residents of the city. As the design of the project moved forward, these concerns led to a useful dialogue about inclusive approaches to public space in the city. *Pop Rocks* seeks to use post-consumer waste to create a compelling dialogical space in which residents and visitors were able to simply enjoy the city and each other from a different perspective, literally and figuratively, free from the need to consume. This ambition was inspired by ideas developed in David Harvey's *Spaces of Hope* (2000); in contrast, Mike Davis (1992) has written about the strategic deployment of materials by urban designers to discourage behaviors that do not produce consumer exchanges. In the end, the scale of the project itself, which stretched for the length of an entire city block, provided for a kind of democracy of use, preventing any one group from monopolizing the installation, or crowding others out. Instead, the installation fostered a multiplicity of uses, and the unexpected softness at the center of the city engaged residents and visitors alike, offering new perspectives on the city.

JUNKSPACE AND THE FUTURE OF TRASH

The post-installation future of the trash took an unexpected turn. The original proposal was to up-cycle the Teflon-coated fiberglass fabric into bags sewn by homeless residents working with a local non-profit organization. This desire was partly inspired by the artist Krzysztof Wodiczko, who worked closely with homeless residents of New York City's Lower East Side to develop human-powered vehicles in the *Homeless Vehicle Project* during the late 1980's (Wodizcko, 1998). An agreement with the polystyrene manufacturer ensured that the polystyrene beads used for filling would be returned at project end for use in future industrial applications. By strategically intercepting resource flows to achieve a zero-waste footprint, *Pop Rocks* aimed to avoid the landfill fate that typically awaits temporary installations. However, as it turned out, a local university acquired the forms for use as informal seating on the campus at the end of the installation. The continued use of the forms to enrich the city embodies the highest ideals of the project, in which tactical design operations create lasting value from post-consumer detritus.

Pop Rocks poses more questions than it answers. While it proved to be a popular public space installation that consumed no new materials, designing a temporary public furniture installation requires a different sent of considerations than a permanent space for intended for inhabitation. Could the bottom up formlessness and soft-materialism of *Pop Rocks* scale up and become inhabitable? From a certain vantage point, this appears exceedingly difficult. But from a different perspective, it looks already emergent and not so far off. In this regard it might

be useful to reconsider Rem Koolhaas' 'junkspace' essay, which reminds readers of the degree to which the fabrication of contemporary space has already become remarkably soft. Precise construction details that fetishize the tectonic marriage of discrete materials have long given way to the predominance of bending, taping, and gluing. Indeed, the omnipresence of Koolhaasian junkspace is a perpetually remodelled interior geography in which the glue-gun and construction adhesive are the weapons of choice. Softness is fabrication and installation king in the service of space that is always temporary. It is from this position, that the logics of *Pop Rocks* may be more readily deployable than at first glance. If impermanence and softness are increasingly prevalent, for better and for worse, then what exactly are the impediments to incorporating a radical re-use of junk in a constant reconstitution of junkspace? Of course, one of the primary hurdles is regulatory. How can something approved for one type of use easily shift to another, and especially so, if its original form is significantly altered in the process? It is these questions that both the achievements and shortcomings of *Pop Rocks* most emphatically poses.

Implicit in this line of thinking are the interconnected issues of ethics, publicness, and technology's relation with nature. The problem of waste is most properly understood in terms of the commons and is therefore a public issue. The use of trash in the making of public space gives shape to an emergent form of the civic that offers an optimistically literal avatar of junk in the everyday. If Koolhaas' junkspace litters the planet through the omnivorous consumption and waste production embodied in its perpetually remodeled private interiors (Koolhaas, 2002), *Pop Rocks* belongs to another junkspace, one that envisions the softness of waste anew and outlines the novel resourcefulness and potentials of future publics and their territories. These territories can be thought of as a kind of third nature, in which the technological transformation of primary resources into construction materials and then into waste cycles back into the production of new spatial conditions that would not be possible without the first two iterative moments. This extended trajectory of material transformation and contingent design operations offers rich new territory with potentials that are at once post-technological and post-natural.

ENDNOTES

1. Davis, Mike. *City of Quartz*. New York: Vintage Books, 1992.
2. Davey, Peter. "Moral maze." The Architectural review (London) Vol: 208, Issue:1243. Sept., 2000, p. 50.
3. Harvey, David. *Spaces of Hope*. Berkeley, CA: University of California Press, 2000. '
4. Koolhaas, Rem. "Junk Space" October, Vol. 100, Obsolescence. Spring, 2002, pp. 175-190.
5. Wodiczko, Krzysztof. *Critical vehicles : writings, projects, interviews*. Cambridge, Mass.: MIT Press, 1998.
6. Lewallen, Constance and Steve Seid (ed.) *Ant Farm, 1968-1978*. University of California Press, 2004
7. Northeast Waste Management. "Construction & Demolition Waste Management in the Northeast in 2006" Boston, Ma: The Northeast Waste Management Officials' Association, 2009.
8. Watson, Steve. Factory Made: Warhol and the sixties. New York: Pantheon, 2003. pp 244,245.
9. Armborst, Tobias, Georgeen Theodore and Daniel D'Oca (2012, Sept. 18) Interboro Partners, "Holding Pattern" retrieved from http://www.interboropartners.net/2012/holding-pattern-at-moma-ps1/