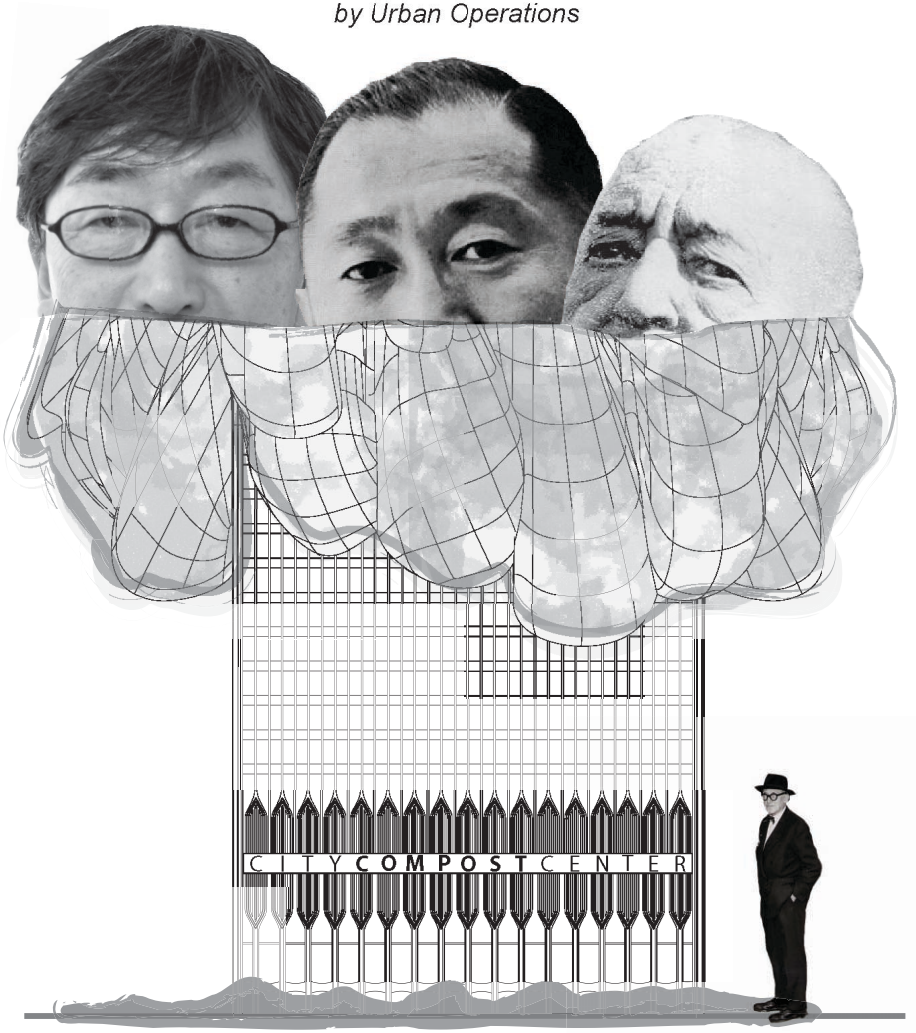
Slopscraper:

Sustainable Production in the Age of Flux

by Urban Operations



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It's a lot like life
And that's what's appealing
If you despise that throwaway feeling
From disposable fun

Then this is the one

Depeche Mode (Martin Gore, lyrics)

"Master and Servant"

Some Great Reward

Mute, 1984.

Project Team: Andrew Alcala & John Southern

The Freedom Tower site under construction. (New York, N.Y. 2010)

Preface:

Slopscraper: Sustainable Production in the Age of Flux

By John Southern

"*Dubai shows us that what we are now facing is a solvency issue, not a liquidity issue.*"
-Jonathan Tepper, Variant Perception Inc.

"*I am the power that lifts the world's head proudly skyward, surpassing limits and expectations.*"
– Emaar Properties, Arab Emirates, 2008.

If the economic melt-down of 2008 has taught us anything it is that the shimmering facades and ostentatious examples of formal expression produced over the boom period represent much more than the end of an architectural orgy. While much of the economic speculation that led to the collapse is tied to corrupt banking practices, a great deal of misplaced capital ended up in real estate as is evidenced by the numerous unfinished excavations and derelict construction sites dotting major cities everywhere. Even Dubai, that once shining beacon for egotistical starchitects everywhere, was crippled in 2009 by an estimated staggering 80 billion USD of outstanding debt, promptly putting an end to ten years of runaway development. What ended the party in the Arab Emirates was ultimately a speculative global space-making hubris and corporate greed that extended beyond Dubai and has resulted in millions, perhaps billions, of vacant condo and office space around the world. One of the most poignant examples of this economic tremor and its effects is the seemingly bottomless pit left by the cancelation of the Chicago Spire, a 2000 foot-tall speculative skyscraper project designed by Spanish architect, Santiago Calatrava. The World Trade Center site in New York also has slowed its re-development beyond the Freedom Towers construction, proving that even Manhattan, its verticality once the litmus of unfettered speculation, cannot afford continued upgrades for its skyline.

Rather than mourn the loss of vertical development in the post-bust city, we propose an alternative in the form of sustainable infrastructure.

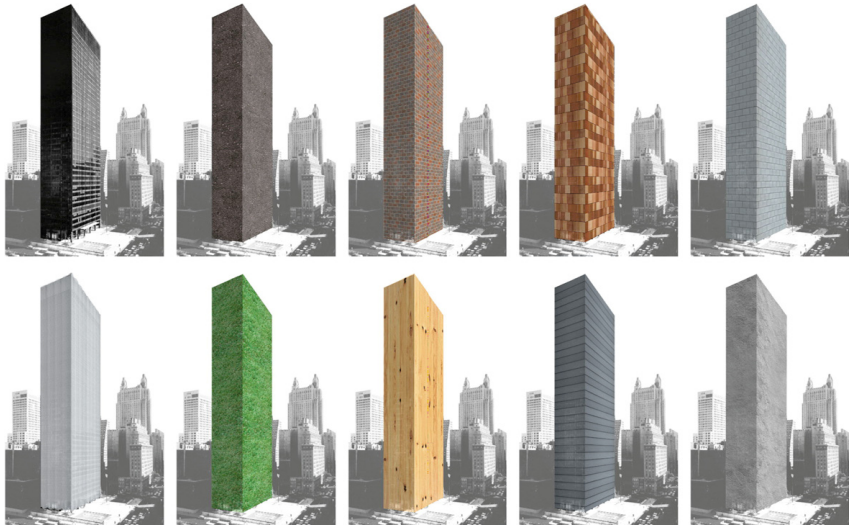
For in a world in flux, function has always trumped beauty.

And in times of crisis and collapse, beauty gets eaten.

Introduction:

Re-Surfacing

By David Freeland



Re-surfacing: Mies van der Rohe's Seagram Building, New York, N.Y. 1953.

When the Lever House opened in 1952 it became the first commercial building with an entirely glass façade. Constructed nearly contemporaneously with Mies van de Rohe's Seagram Building, the projects set a precedent for future skyscraper design with their innovative development of curtain wall technology. In what became the pervasive typology of corporate architecture, the buildings set precedent as single glazed, hermetically sealed boxes entirely dependent on internal mechanical systems, attributes which have contributed simultaneously to both their proliferation and are the ultimate cause of their deteriorization. In 1998, repairs were initiated that began to replace the corroded steel sub-frame of the curtain wall at the Lever House with concealed aluminum glazing channels. While this restoration consisted of a simple optimization of the previous design, the resurfacing of the mid-century skyscraper holds up a lens to the evolving status of surface in architecture and its resonant effects on discourse and practice today. Furthermore, this restoration suggests that new ways of theorizing surface need to be developed that account for the performative necessity of tall buildings and the transformative potential of *re-surfacing*.

While the technological concepts that drove curtain wall design were in place by the end of the 19th century, it was not until the middle of the following century that glass facades as we know them came into existence. It was in the 1940's, 50's and 60's that the majority of this development took place, much of it accomplished through the highly experimental use of materials. Construction consisted of steel, stainless steel, aluminum and bronze frames with either single or double insulated glazing and opaque sections of colored wire glass or sheet metal. Jointing materials were explored as newly developed sealants such as polysulphides, PVC, and neoprene gaskets became available. The result of this experimentation was the construction of a series of curtain walls, that depending on the success of the experiment, had drastically different life spans. While some systems failed soon after completion, others have lasted longer but required diligent maintenance.

Glass curtain walls are susceptible to degradation in a number of different ways, but causes can be traced back to either external forces or moisture infiltration. Structural loading from external forces can be caused by wind loading, substantial temperature change, or deflections of the building structure. Moisture infiltration through failed sealants or condensation can have serious effects on the substructure, as it did at Lever House. Early curtain walls are especially susceptible to damage from condensation inside the wall system due to insufficient insulation, lack of thermal breaks, and single glazing: all fairly common elements.

Given the likely and, in the case of some mid-century skyscrapers, inevitable deteriorization of curtain walls, it is surprising that a wider range of resurfacing solutions have not been explored. This is somewhat of a disciplinary issue: neither the exclusive problem of the architect, contractor or structural engineer, it is frequently unclear who would bear the responsibility in curtain wall failure and who is most qualified to fix the problem. Consideration of curtain wall replacement raises the question of performance- the ability of the surface to quantitatively and qualitatively respond to environmental, cultural, political, and economic vectors- a concept whose wide use and circulation within design discourse today deserves comment.

Performance has undoubted appeal in the disciplines surrounding design, resonating with recent development in building and computer technologies and increased interest in sustainability. It is, in many ways, about devising increasingly efficient solutions to largely practical problems. The use of computer technology to develop and integrate increasingly complex building systems has brought together engineer and architect in new and productive ways, shrinking the feedback loop and allowing for ever finer degrees of response, calibration, and optimization.

The objective of this kind of design process is often doing more with less, taking advantage of new building materials, technologies, and synergies between systems.

Yet the trend towards performance as a defining element of an architectural project may be characterized as a small part of a far larger paradigm shift from an understanding of culture as a static collection of artifacts with fixed meaning to a dynamic network of shifting relations without constant structure, value, or meaning. The shift has emerged in the arts and humanities over the past century constructing a worldview that suggests reality is not pre-given, "the world is enacted or actively performed anew."[1] Reality is constantly transforming, and continually constructed through our interactions.

The scale of this shift has implications on design and architecture far beyond the quantitative optimization of building systems with computing technology. It is unlikely that methods of measuring and predicting a building's structural and environmental behavior will reconstitute the practice and theory of architecture. Defining performance solely in terms of efficiency measures design against a constant maxim of functionalism with little ability to predict anything more than it delivers. To activate design and for the purposes of this discussion, surface, in response to the shift toward's performance in contemporary culture is to construct an architecture that is capable of negotiating, mediating, and responding to a multiplicity of systems and forces, environmental and cultural, which are constantly evolving.

It may be useful to pause here and consider why architecture has been such a late-comer with regards to a performance based approach to design. While there are notable exceptions to this assertion, namely Antonin Gaudi's and Frei Otto's use of material as a form finding agent, it is only in the past ten years that an understanding of performance beyond an equivalence between biology and technology (recently biomimetics) or functionalism has become evident. In 1955, J.L. Austen published How to do Things With Words that transformed the field of linguistics. In it he explains the effects of the special case utterance, the phrase that executes action, as in nominating, promising, declaring. These kinds of sentences (the officiate that says, "I pronounce you man and wife" are neither true nor false and are free of any representational meaning, they simply perform. Performance developed as a topical interest in cultural anthropology in the early 1970's as a way of understanding the multi-semiotic relationship between performers.

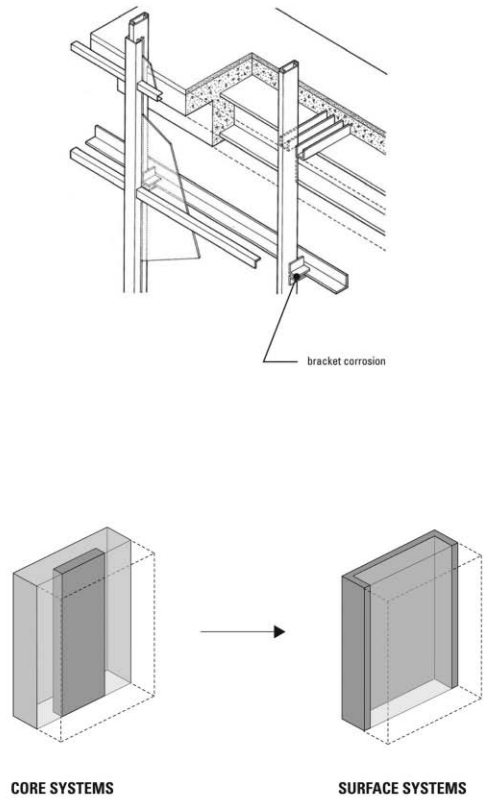
1) Salter, Chris. *Entangled: Technology and the Transformation of Performance*. Cambridge, MA: MIT, 2010.

Victor Turner attributed the new focus on performance to a shift from "structure to process and from competence to performance."[2]
In Richard Wagner's 1849 essay "Art and Revolution" he introduced the idea of the gesamtkunstwerk, a performance that combines all arts including the dramatic arts, literature, and visual arts. In these immersive works the individual arts are subordinated to a common purpose to involve and provoke the audience in new ways.

Perhaps one explanation has to do with an early aesthetization of performance in terms of the machine. As much as the unmediated forms of modernism were to remain uncompromised by ornamentation, they were also to evince an aesthetic of the new machine age. Le Corbusier's assertion, "The house is a machine for living," co-opted the spirit of technology to open up new typological possibilities, redefining the language of architecture in formal terms instead of representational ones. The operable glass façade at the Bauhaus, an important milestone in the development of the curtain wall, is one example of modernism's reach beyond the aesthetic of the machine to explore performative potential. The avant garde architectural practices of the 1960's and 70's explored utopian designs through images of futuristic machines and robotic metaphors. While visionary in projection of alternate futures that synthesized new relationships between technology and architecture, they frequently remained engaged in semiotic games and pop cultural references that pale in the face of reality's complexity. Whether due to machine-oriented aesthetics or the machine as vehicle to produce an urban ideal, performance has been dealt with obliquely as a vehicle for speculation on a critical polemic as opposed to a potential convergence between the dynamics of culture and the complexity of the envelope.

In contemporary architecture and discourse, it is no coincidence that a new engagement with performance has paralleled a flight from language and representation. Performance offers a new perspective to the mediation between architecture and audience, one that is responsive to the increasingly diverse and fragmented nature of contemporary culture. Understood as an index of changing economic, political, and environmental conditions, performative architecture has the capacity to continually reformat and adapt without losing coherence. It is better understood as a fluid web of complex relationships, driven by the dynamics of shifting cultural patterns to create adaptive provisional spatialities rather than a static spatial program and concrete forms. [3] As the notion of site in architecture becomes more global, more interconnected and the audience more diverse, performance is the most effective way to negotiate the cultural milieu.

2) Royce, Anya Peterson. Anthropology of the Performing Arts: Artistry, Virtuosity, and Interpretation in a Cross-cultural Perspective. Walnut Creek, CA: AltaMira, 2004
3) Le, Corbusier. *Towards a New Architecture*. New York: Payson & Clarke, 1927



Lever House curtain wall detail: Integrated re-surfacing systems.

As Alejandro Zaero-Polo has argued, “At a time when energy and security concerns have replaced an earlier focus on circulation and flow as the contents of architectural expression, the building envelope becomes a key political subject.”[4] Performance is integral to the envelope, the point of physical mediation between interior and exterior atmospheres as well as the less than tangible layer that articulates the identity of a building. Considering an approach to resurfacing in light of the new performance-driven imperative is an opportunity to remake the tall building. Further it may be a strategy to re-imagine an existing landscape of aging skyscrapers whose provisional positions as icons may be clad, both functionally and affective, in a new more performative surface.

[4] Zaero-Polo, Alejandro. “The Politics of the Envelope.” *Log 13/14* (Fall 2008): 196

Re-surfaced Lever House, 2007. (photograph by author)

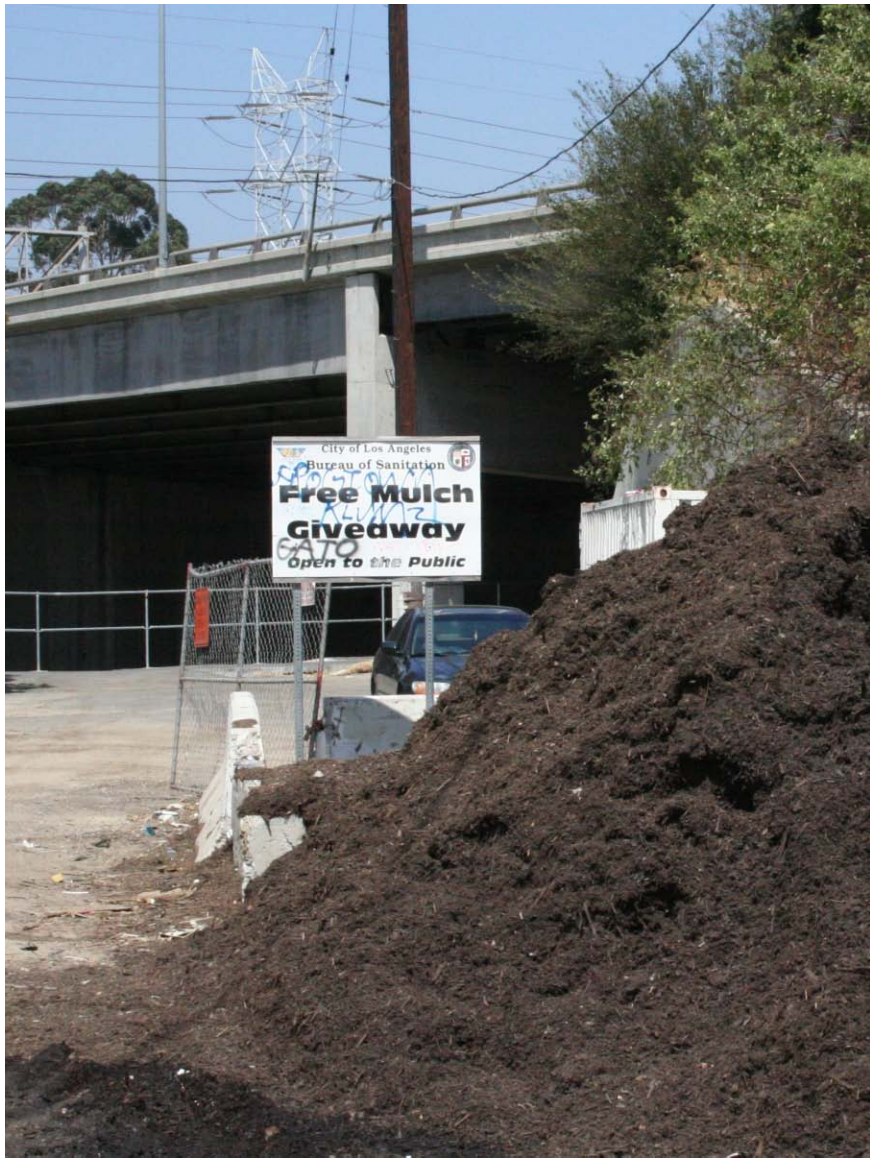


Photo: Urban Operations

Slopscraper: Production in the Age of Flux

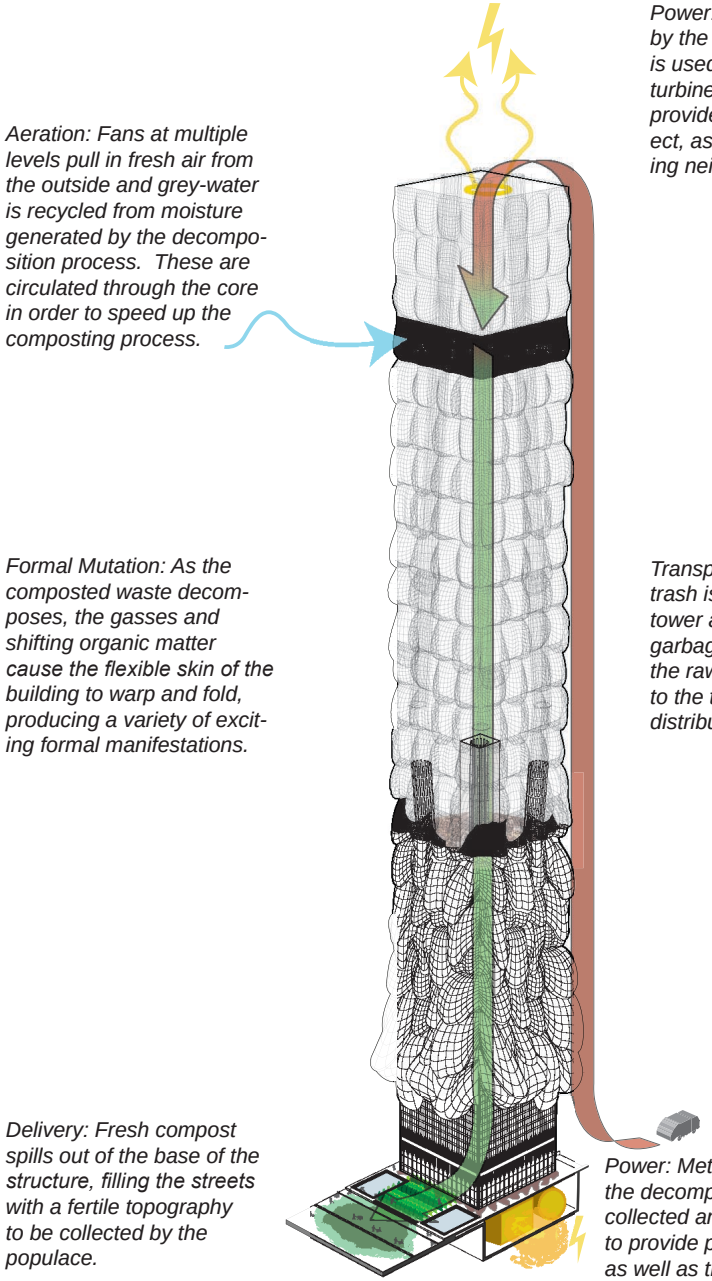
"*Consumptive space has overtaken productive space.*"
-Hans Ibelings, *"Supermodernism".*

The project is an in-bred compendium of the most successful, visually popular structural systems produced by modern engineering and the over-hyped offices of architecture's globe-trotting glitterati. Its exterior and interior members form a web of redundancy so as to cancel out the dynamic loads of solid, liquid, and gas, which all act on the structure simultaneously. One part gassometer and one part compost bin, our concept must satisfy both compressive and expansive forces at once, thereby producing an urban icon whose ballistic mesh and carbon-fiber skin heaves, pulses, and undulates, its formal transformations driven by the forces of decomposition.

We call it Slopscraper.

Slopscraper does not need to rely on pre-mediated formal arguments or parametric scripting to arrive at visual difference, for its ultimate shape is always in question and cannot be calculated.

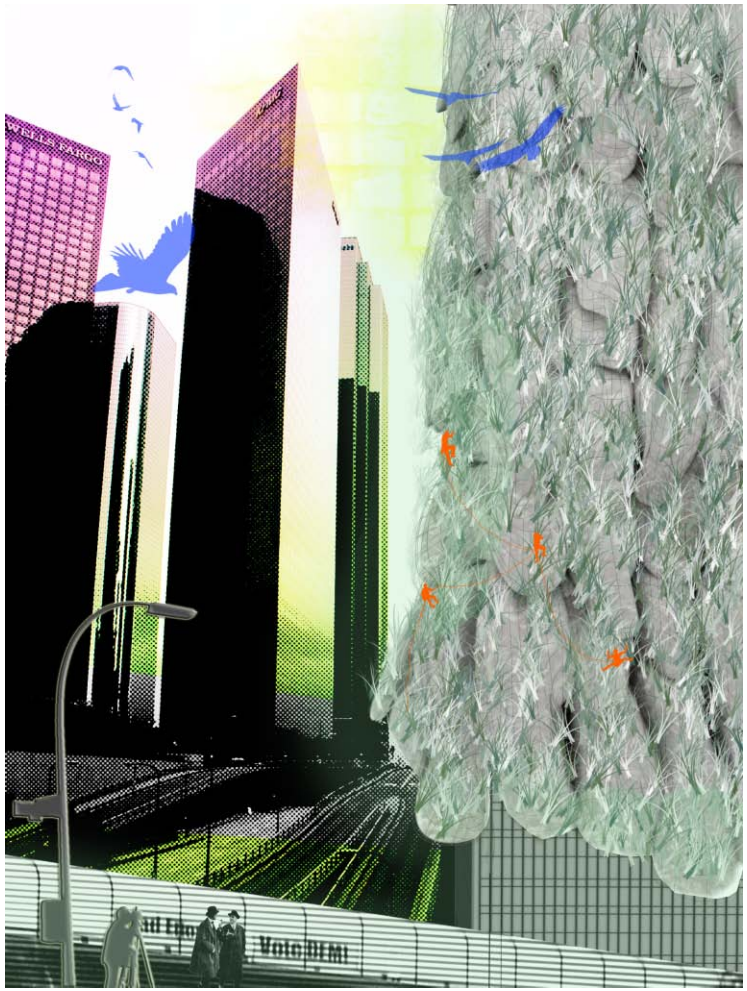
On “light-load” days it might be the Seagram Building, while on others the expansive gasses bloat Slopscraper into an unpturned mirage recalling Frank Gehry’s Guggenheim Museum in Bilbao. Its rippling folds mimic the agitated formal desires of the avant garde, while satiating the optimistic pinings of green urbanists everywhere. Slopscraper is the sustainable solution to the skyscraper problem that has faced modernity since 9-11. It facilitates the visual myth of postcard boosterism, while offsetting its carbon footprint with ecologically friendly output.



Systematic axonometric explaining the different stages the waste must go through to become compost.

Slopscraper does not aspire to be architecture, instead it cloaks itself in the gaudy trappings of “heavy tech” and functional formalism, supplanting itself into the vertical clutter of today’s bustling metropolis as both an object and as a machine.

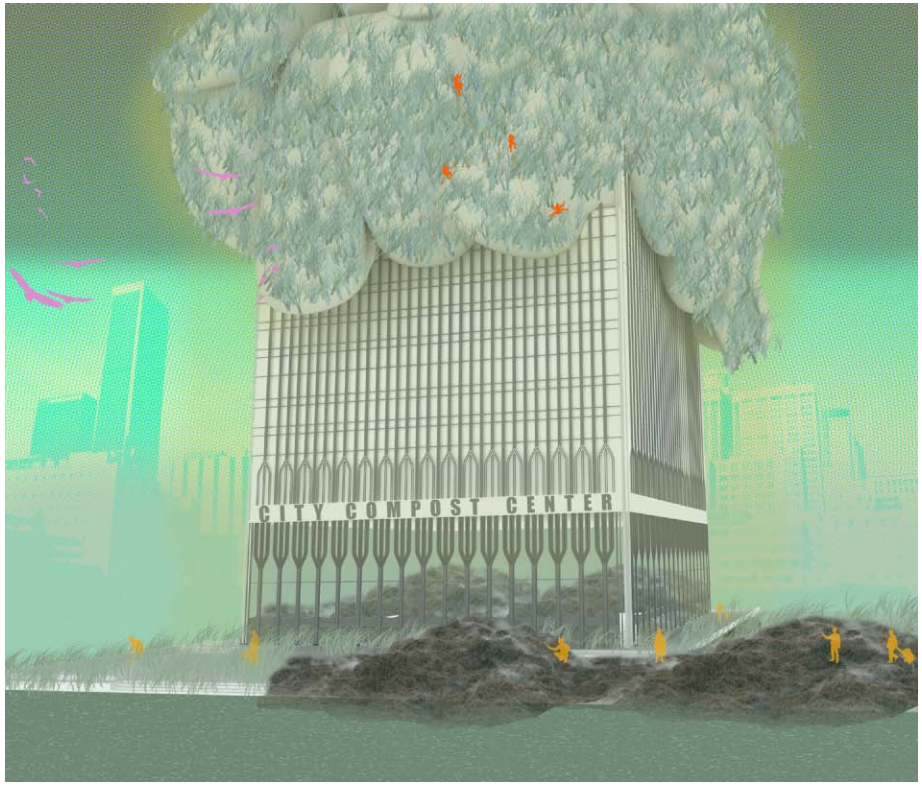
Technically advanced and formally efficient, Slopscraper composts billions of tons of organic waste per year and provides ample fertilizer for the communal gardens of the unemployed. As the global economic meltdown drags on and more citizens end up on the streets, mayors everywhere can sleep soundly knowing that this newest infrastructural solution not only makes their city skylines look more visually robust, belying the chaos below, but is eco-friendly as well. This is because Slopscraper takes on the real problem confronting contemporary societies everywhere- Waste.



Slopscraper’s facade billows with growths of vegetation through its carbon-fiber ballistic mesh, while the static remnants of post modernism reflect its dynamism to the city beyond.

Organic matter in trash represents a tremendous space problem to municipal landfills and one cannot expect consumers in dense urban areas to compost effectively at home.

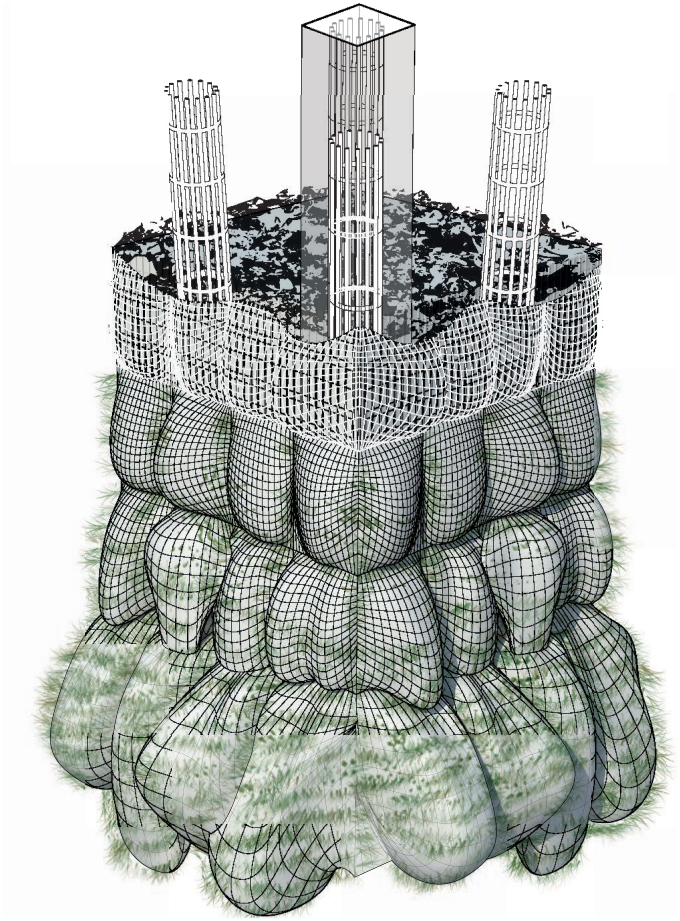
We remove refuse from our home and cities because the process of putrification reminds us of death and we fear the terminal implications that this represents with respect to our own lives. Rising fuel costs and Global Warming, however, are signaling that current methods of trucking trash out of urban centers is financially inefficient and morally insensitive to the environment. Slopscraper localizes the recycling of organic waste and provides a readily available supply of compost that will allow for the citizens of urban environments to create their own public parks and edible gardens on private building sites left vacant after the bust. In this way, Slopscraper demonstrates that putrification and rot are not a taboo to be hidden from view but rather a societal salvation to embrace and celebrate.



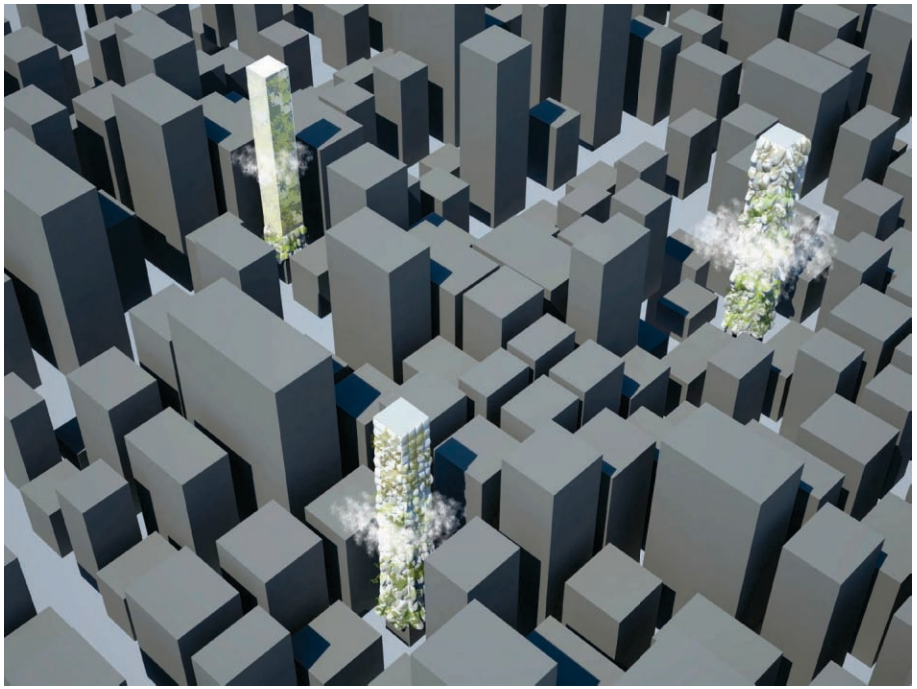
Urban farmers coming to harvest compost for the gardens of the unemployed.

Slopscraper transgresses the taboos behind decay by presenting the process of putrification in a visually pleasant and technologically performative wrapper.

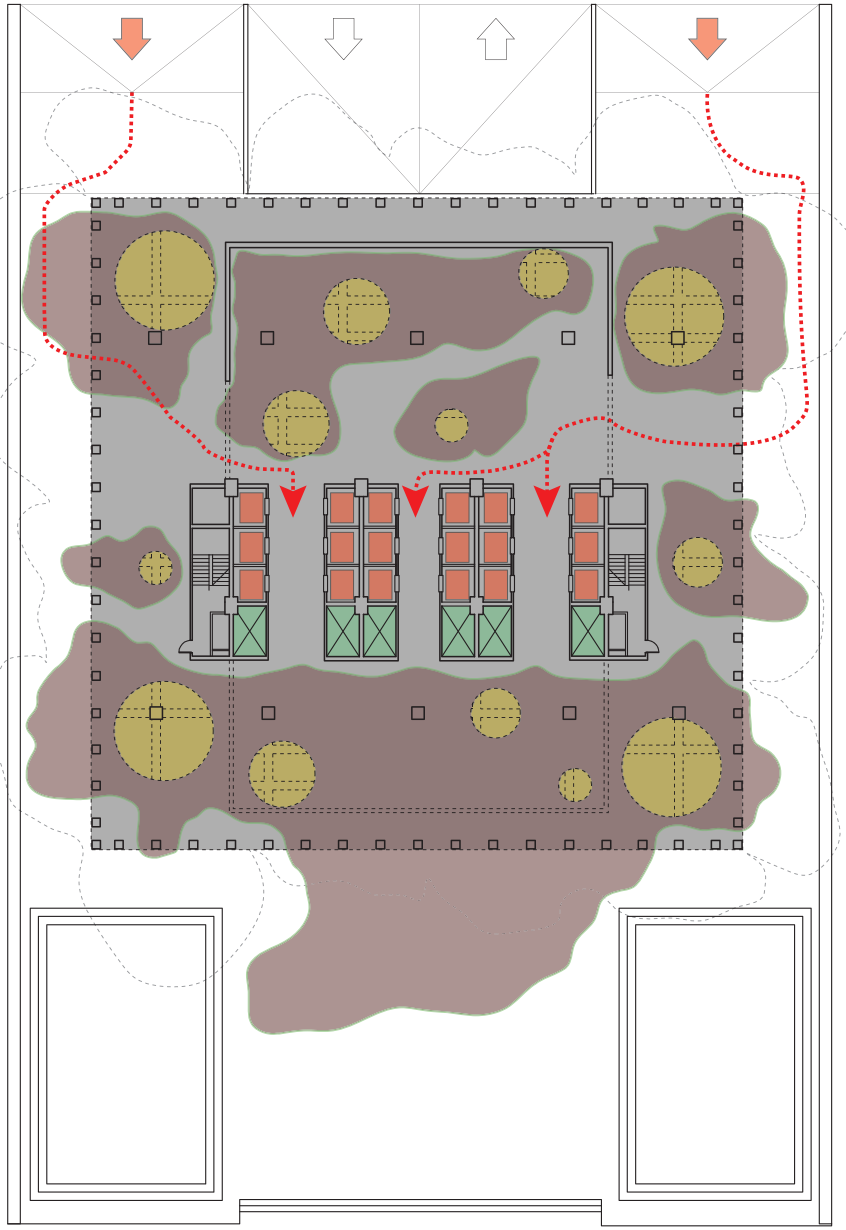
Its flexible skin expands as the composting process renders trash into “gardener’s gold,” keeping the building’s shape in constant formal fluctuation as pockets of gas and moisture migrate around the rotting matter, slowly composting down and through the structure. Eventually, as the shear organic fertility of Slopscraper pollinates surrounding neighborhoods, the entire city will become a bountiful garden, ready for life in the Age of Flux.



Natural Decay = Dynamic Form: Facade detail explaining the transformation of waste into compost and flattness into a constantly changing dynamic visual composition.



Pulsating with the natural processes of rot and decay, Slopscraper quickly eclipses the diversity of the surrounding metropolitan fabric by replacing the visually static with the optically unpredictable.

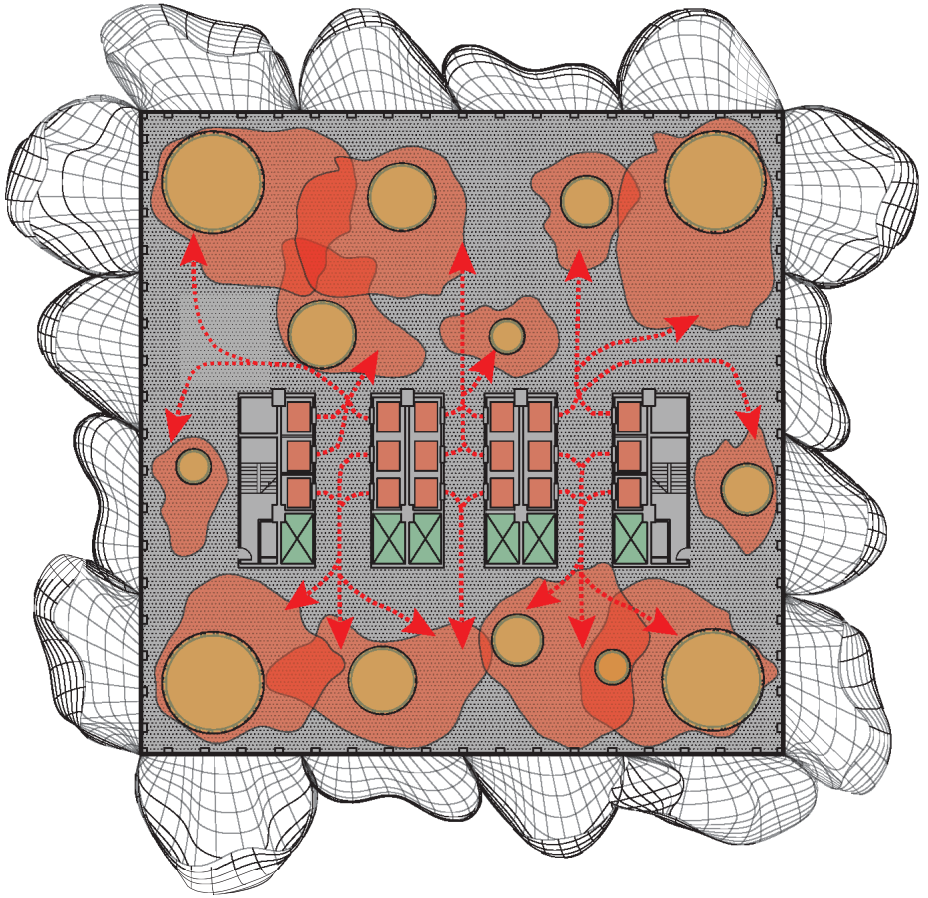


Ground Floor Plan: Finished garbage compost is deposited here via the structural tubing/over-flow troughs above for distribution to the swarms of urban farmers at the street level.

Garbage scows

Compost ready for use

With its agitated shape and pungent aromas, Slopscraper becomes a dynamic example of the urban dweller's desire for constant visual and sensory stimulation.



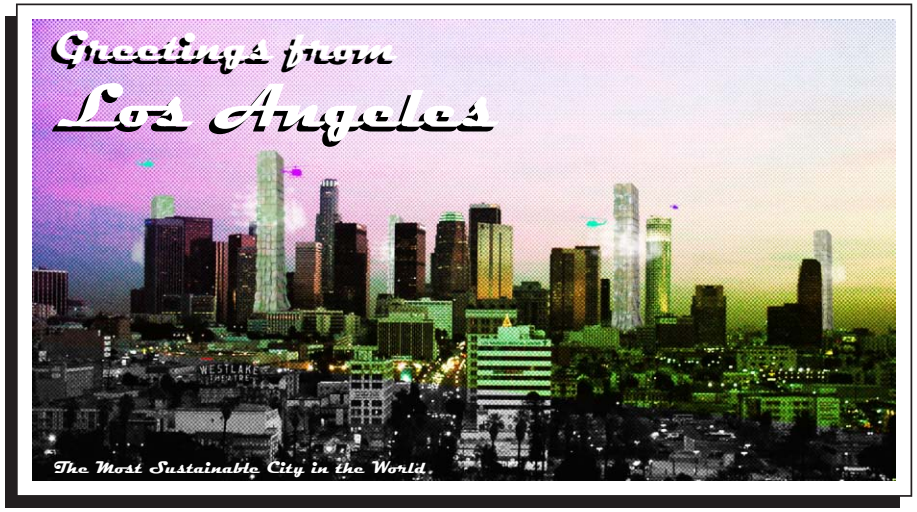
Top Floor Plan: Shows the distribution of trash from the garbage scows into the structural column matracies, whose open design allows the fresh organic waste to trickle down into the lower levels, which leads to the expansion of Slopscraper's facade.

Garbage scows

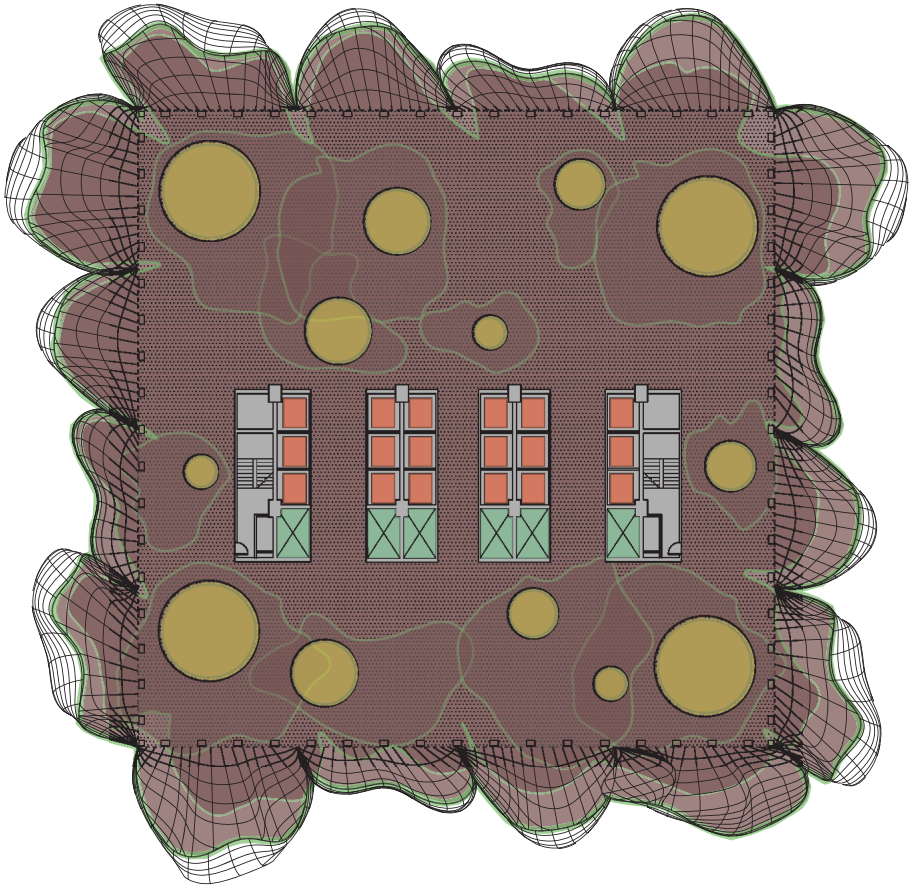
Structural tubing/transfer chutes

Methane transfer stacks

Organic trash delivery



Los Angeles: The Most Sustainable City in the World.



Typical floor plan showing how the flexible carbon-fiber facade allows for the expansion of the structure's envelope based on the build-up of compost and methane gas.

Garbage scows

Structural tubing/transfer chutes

Methane transfer stacks

Compost in process

Afterword:

"*The skyline becomes a diagram of the natural accumulation of capital itself. So the bourgeois metropolis remains a mainly visual place, and its experience remains tied to that type of communication.*"
—Andrea Branzi, "The Fluid Metropolis," 1971.

The crisis facing the 21st Century city brought about by late-capital will not be solved by new material technologies, formal difference, or architectural "green washing." Rather it will occur through the re-surfacing of outmoded structures and programmatic typologies into more useful programmatic armatures and social receptors. Material affect and visual sensation will always be in the service of capital and thus are intrinsically linked to the exploitative social hierarchies of capitalist space. Yet they still have the potential to be harnessed towards productive ends where technical performance is concerned. When the performative aspects of surface exceed the aesthetic quantities contained within that surface, architecture's position in the contemporary city achieves an infrastructural status, thereby allowing it to predict the unstable social desires of the future metropolis and maintain its relevancy in contemporary culture.