

FABRICATING FERAL

TOWARD NEW CONCRETE AESTHETICS + TECTONICS

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Research funded by AU CADG 2018 SEED Grant

2019 AUBURN UNIVERSITY FACULTY RESEARCH SYMPOSIUM
 4 OCTOBER 2019

INTRODUCTION

Fabricating Feral interrogates regional ecologies of material extraction and use and considers redirecting these energy flows toward the creation of a new aesthetic in the practice of landscape architecture.

The work embeds entropy into small-scale fabrications to suggest alternative concrete constructions that interrupt common waste cycles, minimize carbon outputs, and embrace landscape processes of growth and change. This project asks two separate but related questions:

+ Can the medium of landscape help us also re-imagine and revalue the scale of processes that create the ubiquitous

materials of our built environment?

+ Can process-based materials be created and deployed outside of the industrial capitalist systems that often distribute resources and impacts unequally?

The resulting mock-ups are the start of prototypes for replacing traditional concrete systems that think big and act at human, community, and infrastructural scales to promote living landscapes in our built environments.

The project adds tangible physical dimension to wide-ranging contemporary discourse around uncertainty in the future of urban landscapes. Maintenance regimes in mostly

mineral landscapes "fix" a limited use or value while denying other uses. As climate extremes increase the impact of weathering, they also increase the potential for alternative aesthetics and hybrid conditions that value entropy over certainty – or feral over fixed.

By testing and representing material changes and interactions with biological processes, this project proposes a nuanced consideration of material "failure" that can be adapted to future design of cities, but also reach beyond the metropolitan areas to those under-served by existing systems.

CONTEXT

Concrete is ubiquitous in urban landscapes and appears in nearly every physical component of city-making.

It is the most consumed resource on the planet, behind water² and its primary binding agent. Portland cement, has an incredibly high carbon footprint, with about one ton of carbon dioxide (CO₂)³ released for each ton of cement produced.⁴

Using less concrete, and so less cement, may be the most effective way to reduce the carbon footprint of the material.

As climate extremes increase weathering, they also increase alternative aesthetics and hybrid conditions that value entropy over certainty – feral over fixed.

Sidewalks are a common application for concrete in the built environment, and so many cities across the US are experimenting

with different materials to replace their sidewalks. From heated sidewalks in Minneapolis MN to walkable solar panels in Ashburn VA,⁵ a suitable replacement that matches concrete in terms of cost- and installation-effectiveness has not emerged.

Landscape architects are central to some of these explorations, proposing ways to economize the use of concrete in the city. Designers typically take a high-tech approach to this question, however, using digital parametricism and bespoke fabrication technologies to change concrete form and performance.⁶

PROCESS

Fabricating Feral asks if there can be a low-tech approach to broaden the relevance and reach of these strategies. The project uses concrete as a point of departure and, inspired by the processes that produce the material itself, aims to build a new taxonomy of inputs and outcomes for the built environment.

This project conceives of two separate but related workflows that embrace flux and change, brought together as Reciprocal Tectonics for Nomads and Gardeners.

Against the apparent neutrality and permanence of concrete, the project imagines "Tectonics for Nomads" that destabilize the very constraints of concrete – aggregates and mass – by intervening in waste flows.

Plastic packaging is wasteful and negatively

impacts earth's ecosystems. Most plastic waste is sent to landfills or otherwise discarded into the landscape, where it reaches and harms important ecologies.

So this project uses leftover packaging materials – packing peanuts and bubble wrap – to give variable forms to test panels of 10"x10"x2" concrete pavers. (These could be tested for structural durability for use in sidewalks, or could be deployed where safety tolerances would allow the use of non-standard pavers.)

Waste and weathering are fuel and form, and so discards from commercial processes are used as alternative aggregates that create gaps, discontinuities, and fertile zones of production within an otherwise hardened form. In forming and casting, simple operations (addition, subtraction) promote

inevitable influences (warming, erosion) and add the potential for unexpected change. These fertile gaps become a new ground for "Tectonics of Gardeners," which projects that mineral weathering (of stone) and biological succession (within soil) might emphasize and articulate the time-based circumstances of the concrete, rather than its apparently rigid forms.

Using calcium chloride, a common rock salt used for deicing and maintaining sidewalks, and perlite, an inorganic material used to increase the pore space of soil, disrupts nutrient and pH balances but creates generative new ground as sediment accretes in the pockets that remain.

Coupled with the expected decay of concrete, unpredictable urban mini-meadows could emerge.

FUTURES

The project is in its infancy, and suggests two further directions for exploration and more refined study:

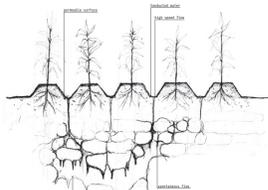
Hyper-local mixes

Concrete can be produced anywhere, and so changes in the aggregate material give site specificity to an otherwise generic process. Changing density and distribution of new aggregates based on specific parameters of design, material dimension and availability would further expand the understanding of possible, if not final, forms.

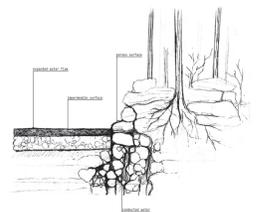
Entropic not extractive processes

As a critique of the concrete manufacturing process – an ecologically destructive process of extraction and heating – aggregate manipulation would remain confined to inevitable processes actualized by or inspired by landscape process (i.e. warming, erosion, decay) rather than mechanical extraction.

AGRICULTURE PRACTICES



MATERIAL REMOVAL AND INFRASTRUCTURE



TOP: Waste begins weathering.

Plastic discards give initial form to concrete casts, and create productive pockets. Future samples will subject casts to weathering to promote sedimentation and so test potential for spontaneous vegetation to root in the shallow soil banks.

BOTTOM + RIGHT: Disrupted surfaces.

Karst landforms of the southeast US are both geologic and anthropic conditions. Limestone is the raw material for Portland cement and most stone aggregates in concrete. Climate and weathering impacts are accelerated by unintentional human activity and land use changes.

After being extracted from quarries and crushed into aggregates, the raw materials to make concrete are typically hauled by truck to mixing plants, which are located quite densely. Mixer trucks can only drive limited distances before the wet concrete begins to harden and so become unworkable. Mixing plants are effectively trucking companies that happen to deliver concrete.

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 2. Rodgers, Lucy (17 December 2018). "The massive CO2 emitter you may not know about". BBC News. Retrieved 17 December 2018.
 3. CO₂ is released at two points during cement production: about 40% of the CO₂ is generated by burning fossil fuels in manufacturing and the remaining 60% by naturally occurring chemical reactions.
 4. Souto-Martinez, A, Arehart, J. and Srubar, W. (15 May 2018) "Cradle-to-gate CO₂ emissions vs. in situ CO₂ sequestration of structural concrete elements." Energy and Buildings, Vol 167, 301-311.
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a sponge." PBS News Hour. <https://www.pbs.org/newshour/show/cement-alternative-absorbs-carbon-dioxide-like-sponge>. Retrieved 9 November 2019.
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 7. Kieran Timberlake (12 November 2012). "Experiments in Concrete Casting." Accessed at <https://kierantimberlake.com/post/view/175>