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TEMPORAL PLAYSCAPE DESIGN WITHIN AN EXISTING LANDSCAPE DYNAMIC

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ABSTRACT

Designing within the landscape, architects are often challenged with the dilemma of what to build and to what extent if anything. The natural environment offers an architecture of its own parameters and rules. Building within those established parameters, architects must inform their design accordingly and responsibly. Taking cues from natural environmental processes, the design for a contemporary playscape within existing environmental conditions provides a refuge from city life for Boston area children. The design balances between the designed landscape and the natural landscape. Natural processes over time erode the playscape away so that the transformation is perceived by the children who return regularly to the site. Considerations of natural soil behavior, water drainage patterns, soil erosion, and plant invasion are instrumented into the final articulation of the playscape.

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CONTENTS:

07 Introduction
08 Site Selection
12 Landscape Parameters
   KARST TOPOGRAPHY
   GEOMORPHOLOGY
14 Landscape Berms
   SOIL AS BUILDING MATERIAL
16 Topographic System
   HILLS & RILLS
20 Child Interactions
22 Construction Methods
24 Phasing & Erosion
26 DESIGN: Back Bay Fens Playscape
36 Bibliography
INTRODUCTION:

Designing within the landscape, architects are often challenged with the dilemma of what to build and to what extent if anything. The natural environment offers an architecture of its own parameters and rules. Building within those established parameters, architects must inform their design accordingly and responsibly. Taking cues from natural environmental processes, the design for a contemporary playscape within existing environmental conditions provides a refuge from city life for Boston area children. The design balances between the designed landscape and the natural landscape. Natural processes over time erode the playscape away so that the transformation is perceived by the children who return regularly to the site. Considerations of natural soil behavior, water drainage patterns, soil erosion, and plant invasion are instrumented into the final articulation of the playscape. The final playscape design on a wetland site imagines a playful groundscape open for children to explore and susceptible to the natural erosive forces of nature.
SITE SELECTION:

The site selection for a series of environmentally responsive playscapes capitalizes on the range of existing environmental conditions in the Boston area. The series of sites chosen progresses from inland out to the Boston Harbor following the natural course of water. The series of sites highlight a range of ecosystems and environmental conditions. Site considerations included weather patterns, soil conditions, flora and fauna, and water conditions.
The sites considered include an upland forest in Franklin Park, a wetland area in the Back Bay Fens, a site along the Charles River, salt marsh and beach. Each site has a different relationship of land to water.
LANDSCAPE PARAMETERS: Geomorphology & Karst Topography

Geomorphology is the study of processes that shape landscape forms. Karst topography is a topographical condition where patterns are created in a landscape due to differences in the erosive timeline of different materials found adjacent to one another. In other words, softer soils more susceptible to erosion will dissolve away first, leaving naturally carved patternings in the landscape. These two concepts were studied as a way to inform the logic of the playscape and its transformations over time. Water drainage patterns illustrate the transmission of water from one area to another and the eroded forms that are created in the process. The patternings are fractal in nature implying their application at any scale. The logic of these patterns is then used to establish the logic at a regional scale of the playscape.
parallel

dendritic

water drainage patterns:

trellis

ridges

valleys
LANDSCAPE BERMS: Soil as Building Material

Natural landscape berms form specific shapes based on the properties of the soil. Angle of repose is the angle a certain type of soil will naturally settle when dropped in a pile. Different slopes of berms also support different types of plant life. A 7:1 ratio for example supports trees while a 3:1 ratio supports smaller plants. Beyond the 3:1 ratio the rate at which water will flow down the slope is too fast for the water to also partially be absorbed into the ground. It is therefore difficult for steeper slopes to support flora. Plantings can be used however as a way of strengthening the form of berms and preventing erosion. Roots can act as a form of infrastructure and also slow down the rate of water flow facilitating absorption of water instead.

In designing a playscape of soil berms, there are therefore transitions that need to occur in order to negotiate particular geometries. These transitions can include a change in soil type, a change in plantings, or in particularly exaggerated geometries, a change in materialization. Infrastructural changes can include meshings, stakes, and plantings and material changes can include a transition to boardwalk or to a geotextile.
change in flora condition
change in soil condition
change in materialization

angle of repose

7:1
5:1
4:1
3:1
different slopes support different plant life
A TOPOGRAPHIC SYSTEM: Hills and Rills

The topographic system used for the generation of the playscape is constructed from a base grid and intersecting conic surfaces. Locally the forms create a high density of peaks and valleys that easily trap water and seeds and facilitate natural flora growth. The system can also create regional differences and patterns. The system for example can vary from relative flat areas to areas with greater topographical expression. The flexibility of the system allows for a variety of different environments both as playscapes and as ecosystems.
grid underlay

contour mapping

drainage/irrigation pattern
MODEL STUDIES: variability and plant growth
CHILD INTERACTIONS

The scale of the berms is related to the scale of a child. The berms therefore can become occupiable elements within the landscape. From the perspective of the child, they are almost lost in the field of hills, immersed into the playscape, free to explore and play. Across a region the playscape can morph to create different conditions and environments that encourage different modes of interaction.
CONSTRUCTION METHODS

The construction of the playscape is a careful negotiation between geometry and material limits. As the geometries are exaggerated beyond the limits of soil, other elements come into play to negotiate the articulation of the geometries. Stone retaining walls for example can be used to hold the soil in place and can be cut to shape the particulars of the landscape forms. Mesh can also be used as a layer underneath the top layer of soil to help hold the larger mass of soil underneath in place.

In the greater extremes, a geotextile matting can be fabricated to be laid over a soil roughing of the groundscape. The matting can also be perforated to allow for plantings to grow and for the drainage of rainwater. Since the playscape is constructed of developable conic surfaces, the matting can be cut from a flat stock and then laid out on site to form the specific geometries of the established system.

Geotextiles are also a soft material so that when used to construct the playscape, they create a safe surface against children falling down.
plantings

geotextile matting

soil bars

retaining wall
PHASING & EROSION

The playscape as a system within a changing environmental setting is designed as a temporary condition. The natural processes of soil erosion and plant growth will transform the playscape over time. As water levels rise and recede with spring floods and snow melts the landscape berms will slowly dissolve and lose the specifics of their original geometry. Human use will also slowly erode away at the playscape. The nature of the berms is also to support flora growth so over time the site will be invaded by particular species of plants and organic material will slowly be added layer after layer on top of the playscape forms.

The temporality and phasing of the playscape system is embraced as a means to encourage children's awareness of the environmental processes taking place. Over the span of a few years children will be able to perceive the transformations of the playscape. These processes will also add dynamism to the playscape as some elements of the design erode at faster rates than others.
SOIL EROSION: rising and receding water levels contribute to the erosion of the groundscape

PLANT INVASION: invasion of native species phragmites naturally deteriorates the form of the playscape over time
BACK BAY FENS PLAYSCAPE

The system of generating a playscape of soil berms is used to create a playscape in the Back Bay Fens wetland area. The area is overgrown with a particularly invasive phragmite species and the site chosen is located at a bend in the river. The soil condition across the site makes a transformation from loam to saturated peat.

A network of paths establishing a drainage pattern for water across the site, also creates different isolated zones for creating different playscape conditions. In addition, the boardwalks negotiate the change in the natural soil condition. The site orientation is established from the land down to the water edge. The berms along this axis change from relatively flat to highly exaggerated, dissolving into the water's edge. The field of berms supports the invasive nature of the sites phragmites to create a dense secondary layer within the playscape.
global orientation

localized conditions

drainage paths create isolated regions

SITE ORGANIZATION: LAND TO WATER
MODEL STUDIES
SITE RENDERING: BOARDWALK NEAR WATER EDGE
BIBLIOGRAPHY:


