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Inhabiting Infrastructure

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Rail and subway lines, distribution grids, communications rights-of-way, on and off ramps, highways—these elements of our landscape are no less real or less cultural than the institutions that typically attract the attention of designers and the general public. Larger than life, but part of it, infrastructure has an immediate presence; it shapes our environment and urban life in vital, authentic, and often messy ways. The very nature of infrastructure suggests continuity: highway, subway, utility lines, and teledata networks have the capacity to sever or connect communities, define the static or fluid identity of an urban landscape, and unravel or restitch the increasingly fragmented fabric of our metropolitan world.

For us, the allure of this new public territory lies in the range of scales and hybrid opportunities it affords. We look at the physical elements of infrastructure, and the often marginalized sites they occupy, as potential contributions to a meaningful public realm. We focus our attention on the interstitial spaces that transform and reconnect disparate enclaves across the metropolis. During periods of rapid urbanization, particularly after World War II, both developed and developing countries built comprehensive networks of roadways and highways to expedite movement within and beyond the core of old cities. Politically fragile communities lacking the political strength to protest this signature of progress offered little resistance to these large-scale projects.



Ecologically fragile waterways and contested landscapes were equally at risk. Expanded highway networks, train lines, and aqueducts were quickly deployed across urban communities and regional landscapes with disastrous impact on local and regional ecologies. Examples include the Cross Bronx Expressway that divided and devastated the Bronx, in New York and the Los Angeles Aqueduct system that accelerated the desertification to the north and impoverished countless local ecosystems along its way. Infrastructure, once the greatest asset to serve the modern urban landscape, has created cities now in perpetual crisis.

Realizing the limitation of a monofunctional infrastructure, we advocate a more hybrid, resilient, “thick” infrastructure, where large-scale regional ambitions do not preclude programmatic variety, spatial richness, and specificity of detail, but rather suggest an infrastructural alchemy, which forges new reciprocities between innovative engineering, ecological imperatives, and compelling architecture.

Ironically, these very same qualities—programmatic variety and spatial richness—are part of the legacy of infrastructurally-scaled modernist utopian visions and are a reminder that the legacy of modernism is complex, and its social motivations often overlooked. Hugh Ferriss, in his *Metropolis* series, rendered a multileveled city of inhabitable bridges. Le Corbusier, in his

unrealized designs for Algiers and Rio de Janeiro, identified a continuous hybrid of highway and housing, and in the decades following World War II, the Metabolists, principally centered in Japan, rendered a vision of multilevel cities to sustain global urban centers. These utopian visions, further elaborated in the 1960s by such groups as Superstudio and Archigram, anticipate a thick section and a density that would support the demand of a more layered public realm and recognize the importance of more multifunctional, programmatically varied infrastructures.

It is time to reconsider these heroic infrastructural utopias through the lens of shifting societal patterns, pressing ecological imperatives, and more specifically, a renewed interest in the architectural implication of topography and territory. The late architectural historian, Detlef Mertins, suggested these utopian models offer relevant, hybrid, multivalent, and open-ended strategies to consider in contemporary terms. Against the backdrop of these early inspirational models, we are challenged to explore more productive relationships between infrastructure, ecology, and public life.

For example, the Seattle *Olympic Sculpture Park* is about inventing a new ground—one that incorporates building, path, bridge, and shoreline into a newly invented topography. The park unfolds as a continuous Z-shaped landscape that wanders from the city to the bay, alternately

revealing and concealing the train and roadways below. This hybrid landform caps a former brownfield site and creates a new pedestrian infrastructure layered over existing routes. The enhanced earthwork reestablishes the original topography of the site, as it crosses the highway and train tracks and descends to meet the water—a chameleon-like strategy that begins as a fully-emerged form (a hill-top pavilion) and concludes in a fully-submerged condition (tidal terraces that form a regenerative underwater habitat for fish).

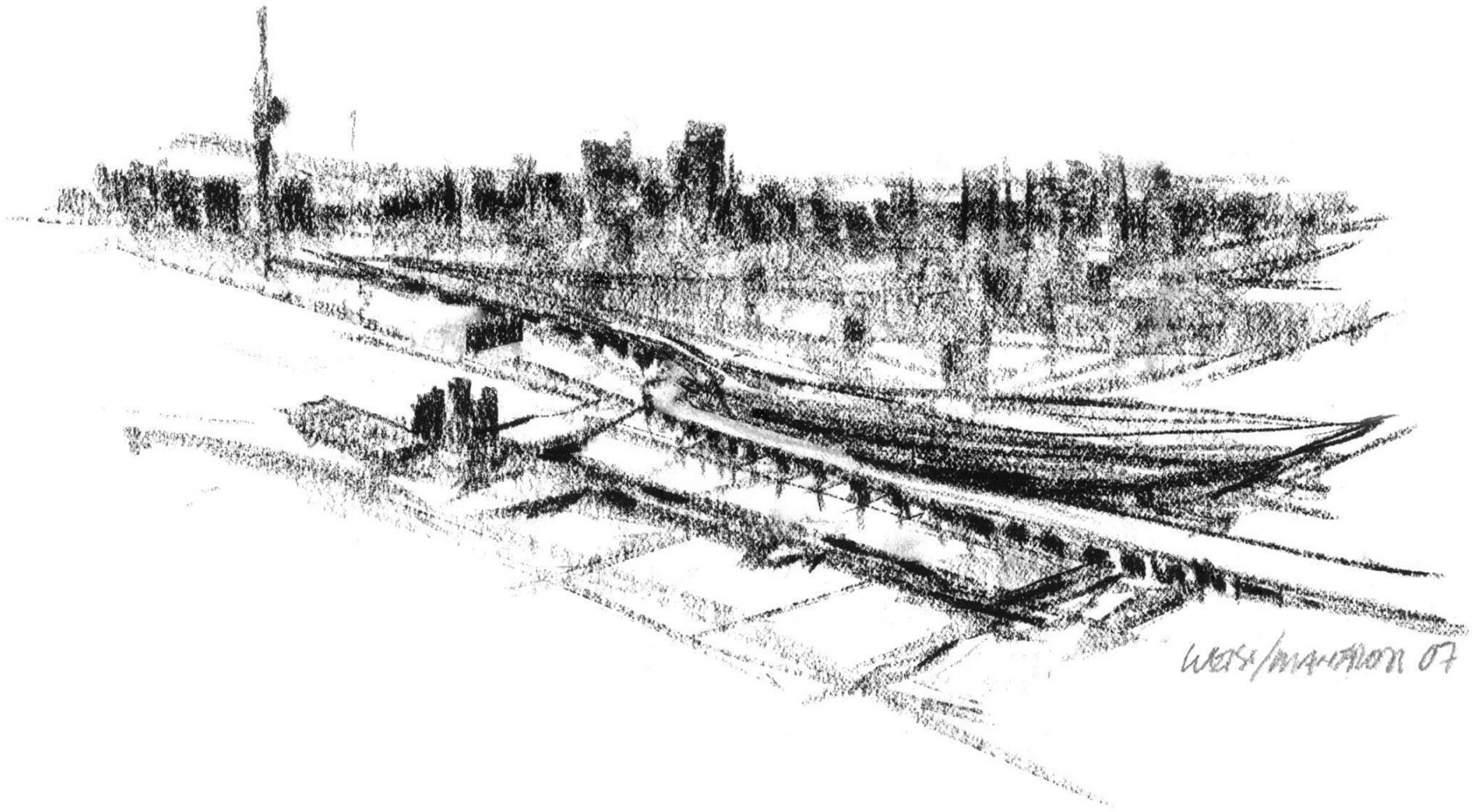
This pedestrian infrastructure allows free movement, long denied, between downtown Seattle and the newly created beach at the base of the site. The tilting planes of the Z-shaped landform and its plantings collaborate to direct, collect, and cleanse storm water as it travels down the site and is released into Elliott Bay. Beneath, a new subsurface infrastructure—approximately 2.5 miles of power, water, telephone, and data lines—allows artists to incorporate sophisticated technologies into their work.

Our project for the Lower Don River in Toronto reclaims a formerly industrial site into an ecologically-engineered setting for public life. As Toronto grew, industry transformed the mouth of the Don River into a concrete channel, terminating the free flow of water to make room for an industrial port, thereby accelerating the cycles of flooding. We proposed to recalibrate the angled

alignment of the river into a more hydrologically-sensitive geometry of arcs and curves. Hard armored edges give way to a series of wetlands and walkways, which are interwoven with the banks of the realigned river and lead to a boardwalk and cantilevered pier outlook that provides a new vantage to view the Toronto skyline. A place of lost nature is transformed into a place of multiple natures.

Similarly, in our proposal for Saint Louis, *Full Circle*, we identify strategies to creatively incorporate the inevitable and often destructive cycle of flooding that occurs on the banks of the Mississippi. We create an exaggerated topography that becomes a series of amphitheaters when the water level in the river is low. When the water level is high, interconnected islands provide settings to enjoy the river and to appreciate with renewed humility the cycles of flooding, destruction, and regeneration.

Because infrastructure is often incorrectly perceived as hard and inflexible, it is time to develop alternative strategies that structure a lateral, resilient, and pliable infrastructure capable of absorbing cycles of flooding, unpredictable uses, fluctuating traffic volumes, and multiple activities. By bending the loose ends of architecture, landscape, and engineering together, we imagine an alchemy that transcends the limitations of single-use infrastructures, generating a more bountiful, inhabitable interpretation of infrastructure’s potential.



**Toronto Lower Don Lands:
Wandering Ecologies**
Toronto, Ontario

Wandering Ecologies establishes a new identity for Toronto, in which recreational, living, and cultural activities are free to wander and overlap. Urban life and nature are reciprocal conditions that together can transform the city's Lower Don Lands into a new kind of cultural and ecological landscape. The area's potential for paradigmatic change resides in celebrating multiple ecologies: city and water; infrastructure and ecology, destination and retreat.

Before Toronto was a city, the Don Watershed released into Lake Ontario through Ashbridges Bay, the largest wetland in southeast Canada. As To-

ronto grew, industry transformed the mouth of the Don River into a concrete landscape, terminating the free flow of water to make room for an industrial port. Roadways, expressways, and overpasses spanned the Don, concealing a nature that had once sustained a vital ecosystem. Today, the Lower Don Lands represent a void in the city that disconnects the Don River Greenway from the emerging waterfront.

As a growing international city, Toronto has an opportunity to transform a place of lost nature into a place of multiple natures. Envisioned as an interwoven system of *Wandering Ecologies*, this iconic park creates a new model for sustainable waterfront expansion on the eastern edge of the city.

The primary design objective is to create a public waterfront park located directly on Lake Ontario, connecting city to water. Organized around the newly designed meandering Lower Don River, the urban park establishes new settings for recreation and civic life. The naturalized river creates new wetlands and habitats for avian and aquatic species and opportunities to engage the water through kayaking and fishing.

New public spaces are linked along the southern bank of the Don River Meander and lead to a boardwalk and a pier outlook that will become a focal point of the park, providing a year-round setting for festivals and events. The outlook also provides

a new vantage to view the Toronto skyline. The valley functions as both flood spillway for the Don River and, more importantly, as a setting for organized recreational activities and group sports.

Wandering Ecologies connects communities through a network of routes and paths that accommodates public transit, parkways, local roads, bicycle trails, and an extensive system of pedestrian paths. A new, bi-level bridge provides access and views of the city and river along the public waterfront.

The design strategy for the park and infrastructure is conceived as an international model for innovative waterfront development.





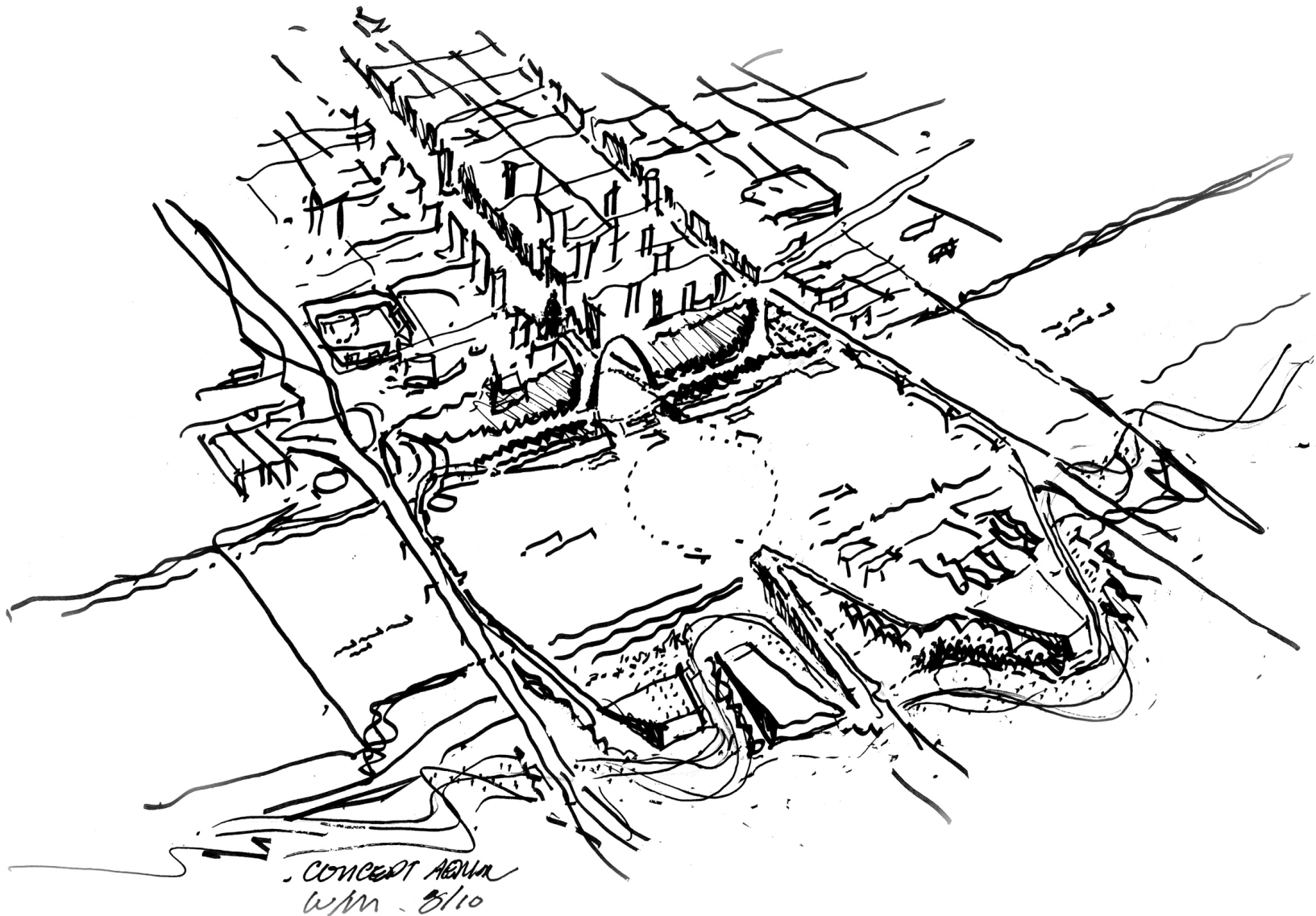
Saint Louis: Full Circle
Saint Louis, Missouri

Visible for miles, the Gateway Arch is recognized and celebrated around the world for its engineering and sculptural elegance. Designed by Eero Saarinen in 1947 and located in the riverfront park designed by Dan Kiley, the Arch remains timeless and compelling. Today, however, the Gateway Arch and grounds form an island, separated from the city by highways and rail lines, and distanced from the Mississippi River by unpredictable flooding.

Prior to the creation of the Arch, the city's strategic location on the river facilitated a robust flow of commerce and industry, but the limestone bluffs of the river's edge were destroyed to create a vast levy that could facilitate trade and form a protective boundary between the river and citizens of Saint Louis. On the opposite side of the river in East Saint Louis, railroad builders destroyed the Native American earthen mounds of "Mound City" to create fill for the construction of rail beds. This East Saint Louis territory is currently separated from the water by rail lines and its land remains contaminated with pollutants left by industry. The legacy of this evolution of commerce, industry, and infrastructure has damaged the region's forests and wetlands, and with the addition of roadways and highways, has eliminated connections between the city, river, and park.



Full Circle reconnects the two sides of the river and creates a new armature of pathways and a restored ecology, shifting the central focus of the site to the river. The design capitalizes on the existing dynamic movement and infrastructure to recover ecologies and historical narratives no longer evident on the site. Existing barriers are trans-



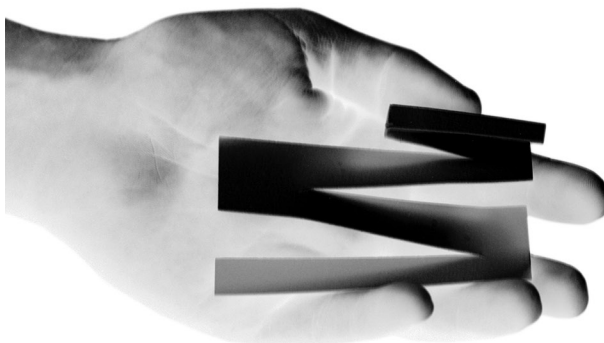
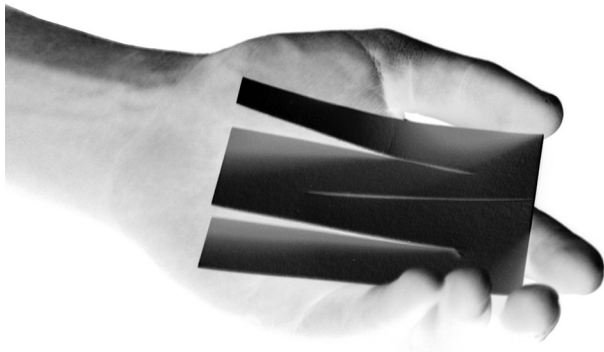
formed into a set of welcoming gateways that forge connections to residential, recreational, commercial, and civic activities in Saint Louis and East Saint Louis. On the east bank of the river, new earthen mounds and an oxbow lake embrace the natural cycles of flooding. A new ecological center extends high above the landscape to offer dramatic views of the Arch and river and connects with the wandering paths of this new ecologically vibrant destination.

On the Saint Louis side of the river, a bold land bridge crosses the highway to link the city's civic center to the Museum of Westward Expansion located below the Arch. A series of ascending stairs and a luminous cultural canopy transform the existing garage structure into a northern gateway that connects the park to the city and establishes a new cultural infrastructure for the park.

The design introduces two new urban bluffs that can withstand the

inevitable and often destructive flooding cycles of the Mississippi River. Even during flood conditions, these bluffs connect the park to the water with an elevated land bridge. By creating an exaggerated topography that becomes a series of amphitheatres when the water level is low, and interconnected islands when the water level is high, the design provides settings to enjoy the river and appreciate the cycles of flooding, destruction, and regeneration.

Full Circle establishes a renewed identity for the Arch, the cities of Saint Louis and East Saint Louis, and most importantly, the Mississippi River, where cultural, recreational, ecological, and artistic activities are free to overlap and find new intersections. Landmark and landscape, city and water, infrastructure and ecology, destination and retreat together transform this extraordinary setting into a new paradigm for urban rejuvenation.



Olympic Sculpture Park Seattle, Washington

Emblematic of many postindustrial cities, Seattle is disconnected from its waterfront by transportation infrastructure. The site of the Seattle Art Museum's *Olympic Sculpture Park*—an 8.5-acre, former-industrial area sliced into three separate parcels by train tracks and a four-lane arterial road—overlooks Elliott Bay in the Puget Sound. The design, a continuous constructed landscape for art, transforms the city's connection to the water by rising over the existing infrastructure to reconnect the urban core to a revitalized waterfront.

The park, which holds site-specific and iconic modern works, unfolds as a continuous Z-shaped landscape that wanders from the city to the bay, alternately revealing and concealing the train and roadways below. This hybrid landform provides a new pedestrian infrastructure layered over the existing site with a system of mechanically-stabilized earth capitalizing on the forty-foot grade change from the top of the hill to the water's edge. The enhanced earthwork reestablishes the original topography of the site, as it crosses the highway and train tracks and descends to meet the water. It is a chameleon-like strategy that begins as a fully emerged form—a hilltop pavilion—and concludes in a fully submerged condition—a shoreline garden.

The 2,200-foot-long pedestrian route begins at the 12,000-square-foot multi-use pavilion from which visitors traverse the site on a pathway that establishes topographic variations and opens up radically different prospects. The first leg crosses the highway, offering vistas of Elliott Bay and the Olympic Mountains; the second, on axis with Mount Rainier, spans the train tracks, providing visual connections to the city, port, and mountain; and the third descends to the water, offering views of the new beach. This pedestrian infrastructure allows free movement, long denied, between downtown Seattle and the newly created beach at the base of the site.

The tilting planes of the Z-shaped landform define a series of micro-settings, each a diverse ecological environment of native plantings. As the crushed-stone path descends from the pavilion to the water, it links three landscapes indigenous to the Northwest: a dense and temperate evergreen forest lined with ferns, a deciduous forest of quaking aspens with seasonally changing characteristics, and a shoreline garden with tidal terraces for salmon habitat and saltwater vegetation. The landform and plantings collaborate to direct, collect, and cleanse storm water as it

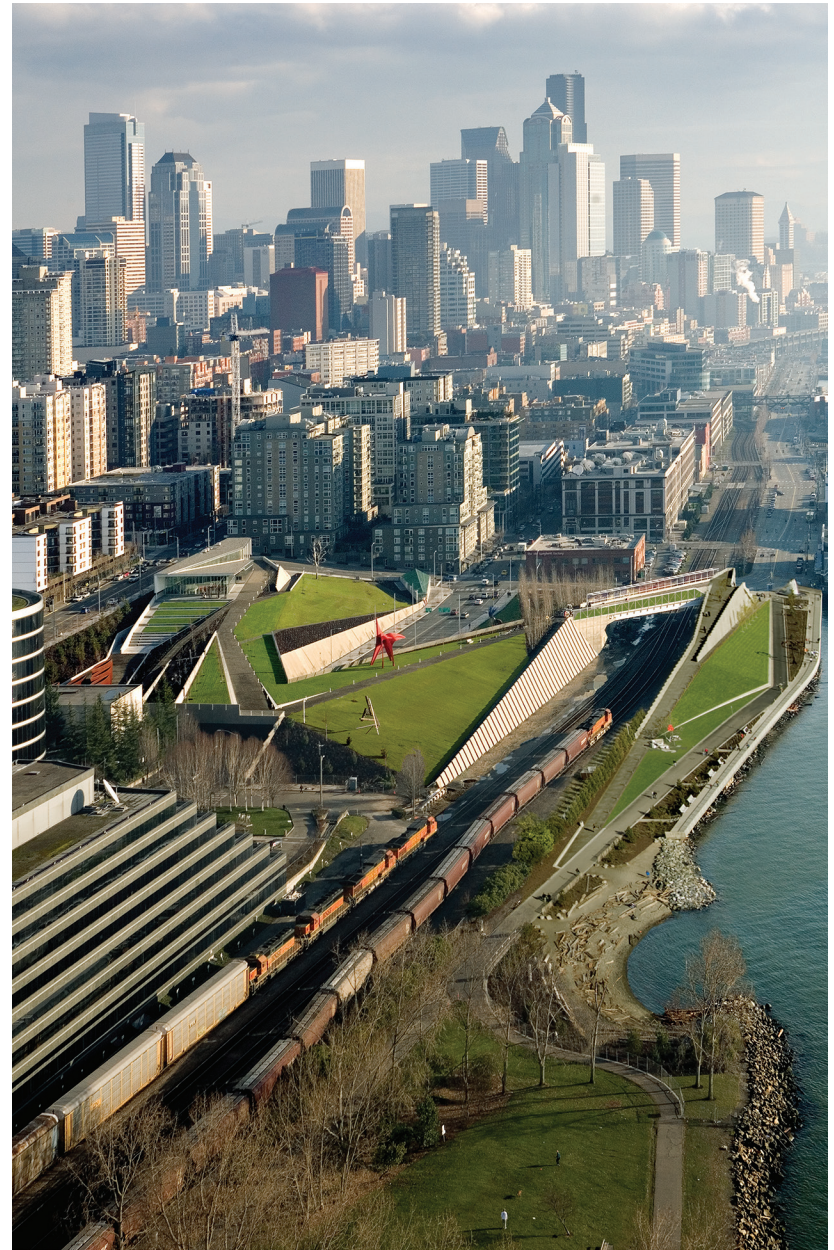


travels down the site and is released into Elliott Bay.

Throughout the site, seemingly parallel lines converge, accentuating the laws of perspective to suggest infinite distances within the confines of the park. The primary diagonals link the city and bay along the Z-shaped landform. Secondary diagonals mediate the vertical section of the site, emerging from the surrounding city and ascending to cross the highway and train lines

and reach the new elevated terrain. The rhythm of overlapping concrete retaining walls provides a metering device that links architecture, earthwork, landscape, and art.

At the top of the park, the pavilion accommodates art installations, performances, and educational programming beneath its cantilevered roof. Designed as an extension of the landscape, the pavilion unfolds to offer views of the waterfront. The pavilion's split section



extends the diagonal movement of the Z-path to an elevated mezzanine that overlooks the park, Elliott Bay, and the Olympic Mountains. The concrete walls and diagonal steel roof structure continue the scale and meter of the park's bridges and retaining walls into the pavilion. Glass and stainless-steel façades reflect the urban surroundings and appear ephemeral at sunset, when the building absorbs the gold and pink colors of dusk. At night, the pavilion becomes a

luminous presence within the park and the city.

As a landscape for art, the *Olympic Sculpture Park* extends the experience of viewing modern and contemporary works beyond the museum walls. Illuminating the power of an invented landscape to create connections between art and ecology, city and waterfront, the deliberately open-ended design invites new interpretations of art, ecology, and urban engagement.