BUILDING TYPOLOGY vs. SYSTEM TYPOLOGY

Parachute Pavilion Ideas Competition | Neeraj Bhatia | 99 076 873

"The typology argument today asserts that despite the diversity of our culture there are still roots of this kind which allow us to speak of the idea of a library, a museum, a city hall or a house"[1]

John E. Hancock

1. Toyo Ito's Serpentine Pavilion, 2002

2. Toyo Ito's Tods Store, 2005,draws its inspiration from the Serpentine Pavilion.

Pavilion has become an all-encompassing word in architectural terminology to signify a building with no definite programme. When looking at Mies' Barcelona pavilion, the Serpentine Gallery Pavilions, and Le Corbusier's Philips Pavilion, it is evident that there are more differences than similarities for projects all rooted within the same type.

What are the few similarities within the 'pavilion' typology? Firstly, pavilions usually deal with a simple idea, often experimental, that architects frequently use as a method of exploration for future projects. For instance, Toyo Ito's Serpentine Pavilion (2002) is said to have been a large stepping-stone in the design of the Tod's Omotesando store[2] *(see Fig 1/2)*. Another characteristic of the pavilion type is their temporal quality. This is sometimes a literal reality, for instance, in expos and biennales. In other cases, this is indicated through the use of light, ephemeral materials. Beyond these vague commonalities, it is difficult to categorize the typology of the pavilion.

Hancock's traditional understanding of typology is rooted in a building's use. He points to a few examples, namely, the library, museum, and city hall. The typological understanding of each of these buildings fosters an idea of other *systems* within architecture (structural, material, spatial planning, circulation, etc.) that are all related to the 'type' of building. This method of deduction is non-existent within the pavilion type, due to the diversity in building use. Furthermore, because of the inconsistent understanding and use of the term *pavilion*, it is difficult to draw solely upon the pavilion typology, when designing a submission for a Parachute Pavilion.

The proposed design for the Parachute Pavilion is not without precedent; these precedents, however, transcend building use and
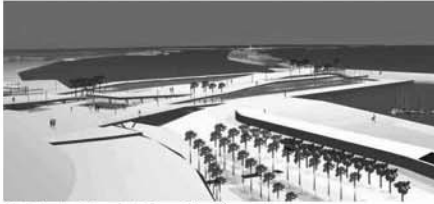
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[1] The Harvard Architectural Review. Volume 5. Precedent and Invention. Between History and Tradition: Notes Toward a Theory of Precedent. John E. Hancock.

[2] Architectural Record. No. 06. 2005. "Toyo Ito Fuses Structure and Wrapper in a Network of Concrete Trees at the new Tod's Omotesando Building in Tokyo". Pollock, Naomi. Page 82.

3. Santa Cruz de Tenerife Pier
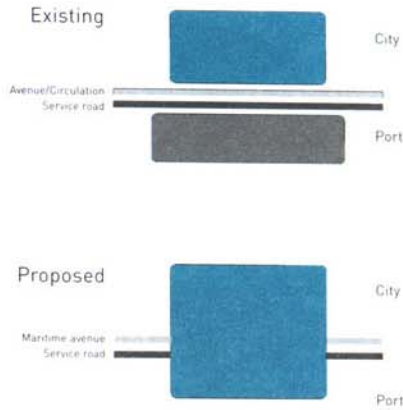Foreign Office Architects

4. Landform One
Zaha Hadid Architects

5. First Nations Pavilion
Saucier et Perrotte Architectes

operate within the *systems* of architecture discussed above. Key systems that were studied for the competition were masterplanning systems along a waterfront, spatial tectonics, circulatory systems, spatial organization and material systems. These systems were synthesized into an overall concept that responded to both the required programme and specific site. Three projects of diverse type, which were critical to the design of the Parachute Pavilion, were "The Masterplan for the Santa Cruz de Tenerife Pier" by Foreign Office Architects *(Fig. 3)*, "Landform One/ Landesgartenschau" by Zaha Hadid Architects *(Fig. 4)*, and "The First Nations Garden Pavilion" by Saucier et Perrotte Architectes *(Fig. 5)*. The *Masterplan for the Santa Cruz de Tenerife Pier* was researched because of its unique approach to masterplanning, its diversity in spatial tectonics, and its use of structural systems. *Landform One* was crucial to the proposal because of its understanding of path in both circulatory systems and landscape systems. The First Nations Garden Pavilion was a critical precedent for its use of material systems and spatial organization. The programme for the Parachute Pavilion allowed for an exploration not rooted solely in building type. The investigation of systems within different types ultimately fostered a rich proposal comprised of a complex set of systems interwoven together.

Existing

City

Avenue/Circulation
Service road

Port

Proposed

City

Maritime avenue
Service road

Port

6. Reorganization to bridge roadway, allows city and sea to interact.

7. The project emerges from a complex network of roadways, each at slightly different alignments

8. Sectional variation creates a diversity of spaces along the piers.

Masterplan: Santa Cruz de Tenerife Pier
Foreign Office Architects
1998, Spain

The masterplan for the Santa Cruz de Tenerife Pier by Foreign Office Architects implements an infrastructural approach to urban design. Informed by the existing roadways, and their associated infrastructure, the plan attempts to reconcile 3 variations in grids while producing a public space, as expressed, "There was a need to connect the port precinct with the urban structure, which involved resolution of the differences in alignment between at the city the lowest level and the pier platforms."[3] The proposed plan extends the urban grid out into the water, on a series of infrastructural 'fingers' that resolve these differences horizontally and vertically.

Two integrated approaches within the system of masterplanning were key to the design of the Parachute Pavilion. Firstly, the project runs perpendicular to the waterfront, bridging over the main roadway. This allows the urban city to connect to the port city, with the project standing as a threshold between the two *(Fig. 6)*. Secondly, due to the different alignment of the existing roads, the resolution of the project resides in 5 'fingers' that run through the city and port, while connecting to various infrastructure. These *fingers* originate at different levels (city and water) and axes, and then unite into a single pier – consolidating the activity and presence of the piers *(Fig. 7)*.

The topographical manipulation of the *fingers* not only enables a connection of points at different levels, it also generates variable spatial tectonics and a questioning of the true ground plane. Spaces are built under and over the 'fingers', dissolving the distinction between roof and floor. This variation allows for a smooth threshold between diverse spaces, namely - public vs. private, light vs. dark, and indoors vs. outdoors, as stated, "The sectional variations in the height of these bands also allows for ventilation and sentinel illumination of spaces situated below the structure, as well as permanent physical and visual connections between the new urban spaces and the programs set below

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[3] Zaera-Polo, Alejandro and Farshid Moussavi. "Phylogenesis: Foa's ark." London: Actar Publishing, 2004. page 124.

9. Structural system of Pier, separates and comes together

10. Connection to Existing Infrastructure and artifacts

11. Each finger is defined by its own one-way system. Columns densify and separate.

the surface".[4] It is this system of spatial tectonics that ultimately gives variety and continuity to a long walk through the pier *(Fig. 8)*.

Just as the individual fingers cross-pollinate spatially, the structural systems are both distinct and unified *(Fig. 9)*. Each finger is supported by concrete columns that are set at varying angles depending on the height of boardwalk. These are then tied together to brace the overall system. The variation in the column angles and the lack of vertical columns offers the sensation of lightness to the project. Rooted in the structural understanding of traditional piers, the project manipulates the system to offer both diversity and lightness.

The origin of the Parachute Pavilion is rooted in masterplanning decisions. Traditionally, boardwalks are an infrastructure of connection and disconnection. They connect artifacts that usually run parallel to the water, while disconnecting the water from the metropolis. In this light, they are a threshold space between the city and sea, animated by both diverse edge conditions. The site for the parachute jump is unique because it is situated north of the primary Coney Island boardwalk and south of the Brooklyn city grid (and baseball stadium). The design first connects the pier of the water to the city (stadium and parking areas), allowing both realms to interact. It is where these connections occur that the Parachute Pavilion is found. Secondly, just as the Santa Cruz de Tenerife Pier digests and resolves different axes, the Parachute Pavilion is made up of 4 fingers that originate in the existing infrastructure and resolve the variable axes through a flowing network of boardwalks *(Fig. 10)*. Sectionally, these planes rise and fall to connect the vertical variations along the site (the baseball path at +6m, the parking lot at –3m, the main boardwalk at –0.5m). Activity and presence is consolidated where the fingers are 'knotted'; it is here, that the pavilion emerges.
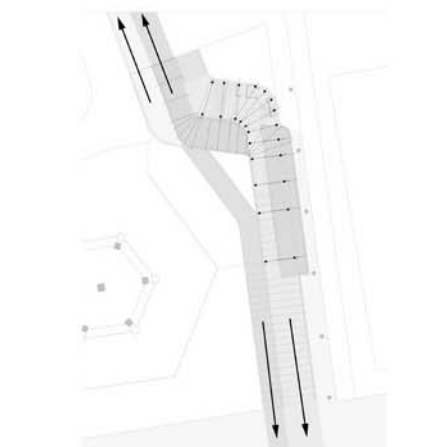
The topographical manipulation and shift in planar axes produces a great variation in spatial tectonics. Space is produced above, below and within the ambiguous ground plane. The swelling, or topographical manipulation, produces a soft transition between variable spatial systems, blurring the boundary between indoor/ outdoor spaces, light/ dark spaces,
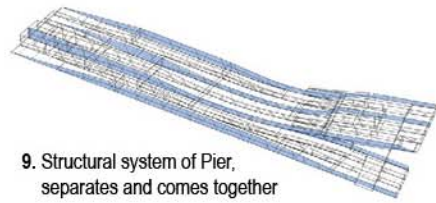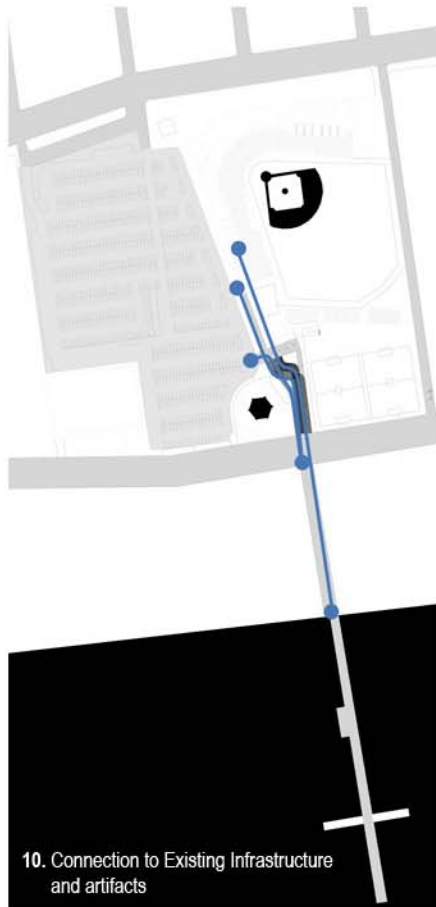
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[4] 2G International Architecture Review. Volume IV, No. 16. 2000. "Foreign Office Architects". Text by FOA. Page 59.
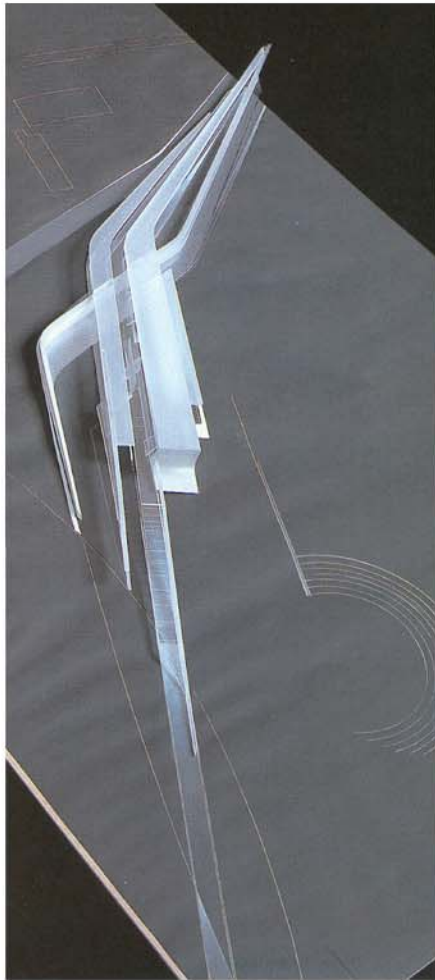
built/ unbuilt spaces, and fast (movement)/ slow (pause or reflection) spaces. Ultimately, this offers both continuity and diversity to the pavilion.

The structural system for the Parachute Pavilion originates from the boardwalk type. Wood columns set in a one-way system run perpendicular to the direction of the flowing fingers. Where fingers cross, columns are tied together and braced. Each finger retains its structural independence at its origin (at different infrastructural points), but loses this as they knot together to form a building. The thin columns are spaced according to the speed of the flowing finger; where the fingers connect out to the existing infrastructure, they are farther, where they get tangled and slowed, they are closer *(Fig. 11)*. Furthermore, they stand at slight angles to the direction of movement of each finger, to offer the feeling of both dynamism and lightness.

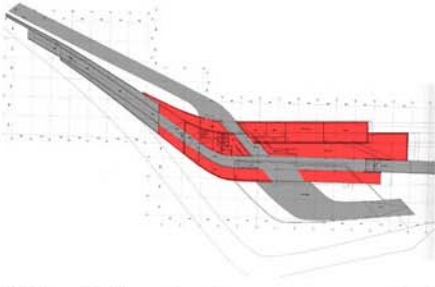**12.** Tangling and interweaving of paths produces a building tied to landscape.

13. Swelling of 'ground plane' defines the building. The paths recess down into the landscape to blur the edges of the project.

Landform One/ Landesgartenschau
Zaha Hadid Architects
1999, Germany

Landform One was a project designed by Zaha Hadid for the international gardening show, sponsored by the Space Bundle Group. Projects, or landscape spaces, chosen by the group had clear similarities, as expressed, "The most important general characteristic which is looked for in landscape spaces, in distinction to traditional urban and architectural spaces, are the multitude and subtleties of territorial definitions as well as the smoothness of transition between spaces"[5]. Zaha Hadid successfully adhered to this requirement by dissolving the distinction between building and landscape.

Landform One is born from the existing network of paths located within the park. The project was sited where these paths cross, tangle, and separate again *(Fig. 12)*. The project should be viewed as an assemblage of landscape paths rather than a constructed building, as stated, "The built spaces formed from the fluid geometry of the surrounding networks of paths, three of which entangle to form the building: one path snuggles up to the south side of the building, which another gently sloping rises over its back; the third describes a shallow S-curve and cuts diagonally through the interior."[6] The tension formed by the three dimensional interweaving causes some paths to swell upwards to create space below. This space is viewed as an extrusion of ground, rather than built over the ground, and accordingly, the understanding of ground plane becomes confused *(Fig. 13)*, as expressed, "The ground plane as stable reference is subverted through its multiplication. The public path that sweeps over the building and the terrace carving into the ground makes any definition of 'ground' ambiguous."[7] One new path (described earlier as the shallow S-curve) pushes through the building and marks the main entry. This is perhaps the most 'designed' element of the project, ironically defining itself in void (unbuilt) space that cuts through and connects the paths that produce the building. Thus, the

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[5] Landesgardenschau – Landscape Formation One. http://www.zaha-hadid.com

[6] Levene, Richard and Fernando Marquez Cecilia. "El Croquis: Zaha Hadid – Forms of Indetermination/ Landscape as a Plan." Madrid: El Croquis Publishing, 2004. page 290.
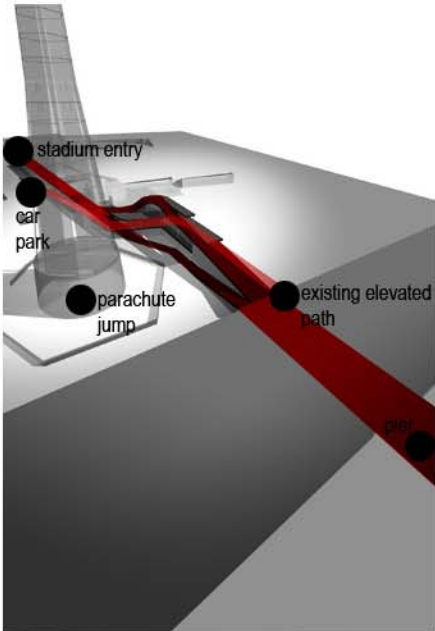
[7] Levene, Richard and Fernando Marquez Cecilia. "El Croquis: Zaha Hadid – Forms of Indetermination/ Landscape as a Plan." Madrid: El Croquis Publishing, 2004. page 290.

14. The paths (in grey) service programme spaces (red) to allow for a clear reading of the building. The S-Curve cuts through the project, and defines the entry bringing people into the project.

15. The Parachute Pavilion is comprised of a network of paths that emerge from the existing infrastructure. These build up to swell around the parachute jump.

landscape circulatory systems within the park swell and tangle to produce a building that dissolves and embeds itself back into the landscape.

There is very little space attributed to circulation within the building. The exterior paths that run around and through the project serve as circulation routes, allowing the interior spaces to be purely defined by the swelling of the ground plane *(Fig. 14)*. This once again dissolves the territorial distinction between landscape and building, as existing exterior paths are integrated into the 'building' for access. Furthermore, because many of the spaces are accessed by and bleed out to the exterior, the project begins to dissolve the distinction between interior and exterior spaces. The pure quality of the circulatory systems (building and landscape) allows the project to reintegrate itself into the landscape from which it was born, as described, "The figure of the building is not contained. It literally bleeds out and dissolves into the surrounding landscape. It emerges gradually from the tangle of paths, leaving it to the visitor to define and realize its beginning and its end".[8]
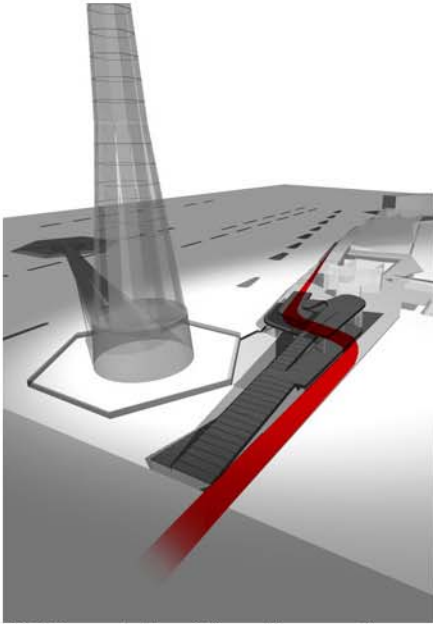
The proposal for the Parachute Pavilion is rooted in the existing network of boardwalks. The paths that surround the site are the main boardwalk to the south, a smaller raised boardwalk to the east, a path connecting to the baseball stadium to the north, and a path connecting to the parking lot to the north-west. The given site is situated in the middle of these disconnected paths. The project attempts to unite the points surrounding the site, producing a building out of connection *(Fig. 15)*. This, consequently, dissolves the territorial distinctions that occur within the site (between city and sea), allowing the conditions to the north and south to animate the project.

The tension of the 4 paths connecting and knotting within the site produces a swelling of space below. The building is not conceived as being 'built' as much as a manipulation to the plane of boardwalks. This topographical variance extinguishes the understanding of ground plane, allowing programme and visitors to gather on the different roof terraces. Furthermore, the building subtly embeds itself into the system of boardwalks, softening its edges at points of connection. The four fingers
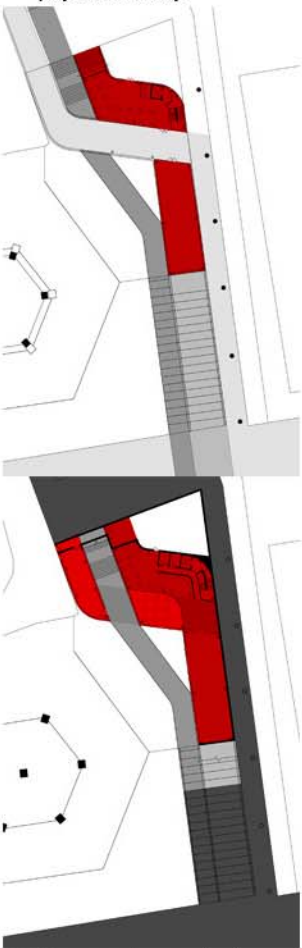
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[8] Landesgardenschau – Landscape Formation One. http://www.zaha-hadid.com

16. S-Curve cuts through the pavilion, connecting different fingers, and pulling people into the project/ main entry.

17. Programmed spaces (red) are accessed by the landscape of boardwalks. Ground and level one plan shown.

that originate within the site are accompanied by one introduced path that cuts through the pavilion and defines its main entry. This final path organizes the structure of the project, allowing one to move between paths instead of just along them *(Fig. 16)*.

The clear reading of the project extends to the building circulatory systems as well. Interior programme (shop, restaurant, and bar) are accessed by the exterior boardwalks, enabling a pure extrusion of the paths *(Fig. 17)*. Furthermore, these spaces bleed into the exterior environment as patios, informal theatres, and gathering spaces – further softening the distinction between interior and exterior. Consequently, the Parachute Pavilion emerges by connecting the otherwise disconnected network of existing paths. In doing so, the pavilion becomes a subtle threshold building between the city and sea, as well as interior and exterior environments.

18. Separation in the treatment of horizontal and vertical surfaces allows the project to be subtly pronounced within the landscape.

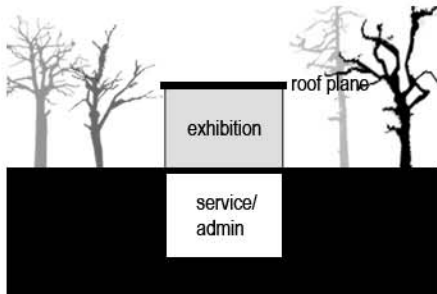**19.** Roof plane is both pronounced yet fluid and light. Glazed units below have a minimal impact on the surroundings.

20. Wood-formed concrete embeds the project into the surrounding site. The use of the wood forms makes the concrete appear heavy and light.

First Nations Pavilion
Saucier et Perrotte Architectes
2000, Montreal

The First Nations Pavilion is the only *pavilion* of the three chosen precedents. It was selected because of its system of materiality, sectional organization, and separation of horizontal and vertical surfaces, rather than building use.

Located within the Jardin Botanique, the First Nations Pavilion is closely tied to the surrounding landscape – physically and culturally. Culturally, it parallel's Hadid's Landform One, in that the pavilion is conceived as an extrusion of the ground, as stated, "Built along the garden's main pathway, the pavilion metaphorically raises the path to reveal the cultural memory of the place."[9]. Accordingly, horizontal surfaces were treated very differently than vertical surfaces (i.e. surface of extrusion vs. the surface produced by extrusion). Most vertical surfaces were glazed, to offer lightness to the project, as stated, "Vertical surfaces are minimized to limit the visual impact of the building on the environment"[10] *(Fig. 18)*. The horizontal surfaces required the dual quality of being subtle yet present within the landscape. This was achieved by making the roof plane from wood-formed concrete – offering a sense of fluidity and lightness, while still maintaining presence *(Fig. 19)*. The separate material understanding of the horizontal and vertical surfaces creates the illusion that the horizontal surfaces are floating in the landscape. Thus, in a physical sense, the characteristics of materials are used to give presence or absence to planes, while also hinting at weight and dynamism.

The materials employed in the project not only operate in a conceptual understanding of weight and presence, they physically are implanted in the surrounding landscape as well. The materials used were wood-formed concrete, wood, corten steel and glass. Surrounded by forest and earth, wood and concrete camouflage into the surrounding site *(Fig. 20)*, whereas the weathering steel enables the building to change like the natural systems that surround it. Ultimately, the choice of

[9] Carter, Brian. "Saucier + Perrotte Architectes 1995-2002." Halifax: Tuns Press, 2004. pages 83.

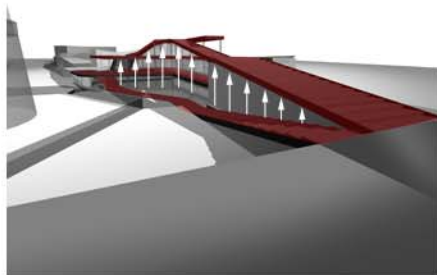[10] Carter, Brian. "Saucier + Perrotte Architectes 1995-2002." Halifax: Tuns Press, 2004. pages 83.

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21. Conceptual section showing the separation of service and public spaces to have a minimal reading on the surface.

22. Separation of horizontal and vertical planes allows the boardwalks to be pronounced and subtle. Vertical planes are glazed to not limit visual and spatial connections.

23. Services are built into the pre-existing excavated corner of the site. This optimizes daylight for public spaces and a clear reading of the pavilion.

materials embeds the project into the adjacent fabric, "helping to ground the pavilion in the landscape"[11].

The First Nations Pavilion appears to be formed from simple glazed units lying under a floating roof. To achieve this pure simplicity, there is a lower level which contains all administrative and service programme within the project, to, "further reduce the influence of the building on its setting"[12] *(Fig. 21)* . The separation of served and service spaces to create a minimal effect of the building on grade enables a clear understanding of the project.

The materiality of the Parachute Pavilion defined itself through both site and weight. The paths take their materiality from the existing wood boardwalks. This structure and surface is slightly manipulated, however, due to the fact that these paths now have enclosed spaces located within. The ground plane and roof plane are detailed and built in the same manner to further the ambiguity of the ground reference. These horizontal surfaces have a dual responsibility to both define the pavilion, yet subtly bleed into the surrounding boardwalks. Thus, they could be neither too light and lose their presence, nor too heavy and lose their subtly and dynamism. Accordingly, these planes were created from 2x8" vertical wood joists stacked horizontally. This allowed for the purest structural system, while also embedding a fluid solidity into the roof/ ground planes.
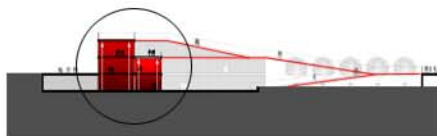
Conceptually, the horizontal planes are treated very differently from the vertical planes, distinguishing the surface being extruded from the products of the extrusion. Consequently, the vertical planes are detailed with lightness, to allow the horizontal surfaces to 'fly' through the project. These planes are produced out of glazed partitions that are slightly set in from the roof/ ground edge. This allows for visual and spatial connections within the project *(Fig. 22).* Furthermore, this enables the project to be both grounded in the surrounding materiality, while subtly pronouncing itself.
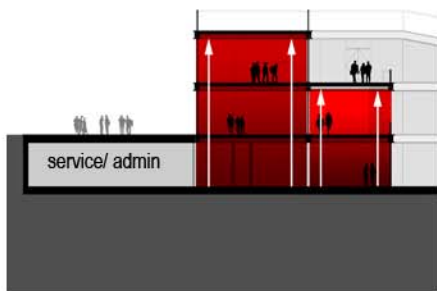
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[11] Jardin Botanique. http://www.saucierperrotte.com/

[12] Carter, Brian. "Saucier + Perrotte Architectes 1995-2002." Halifax: Tuns Press, 2004. pages 83.

The system of spatial organization to allow for a simple reading of the boardwalks required circulation to be served from the exterior paths (explained above), as well as service areas to be built below 'grade'. Service areas consisted of the kitchen, washrooms, loading, and office/ administration. Loading and offices were located adjacent to the parking lot for easy access, and minimal visual impact. The kitchen was built into the northeast edge of the site, below an existing platform, to allow the restaurant to read as a pure form produced by the extruded boardwalk *(Fig. 23)*. The separation of service and served zones offered conceptual coherence to the project, leaving all public programme above the 'ground' plane to read as a topographic manipulation of the boardwalks.

Conclusion

The term *pavilion* has many different conceptions in architecture, for it is used to describe a building without a consistent or specific programme. Because of this, it is difficult to use a typological analysis of existing buildings to understand the systems within the type. Accordingly, an approach of utilizing system precedents as opposed to building typology precedents was employed for the design of The Parachute Pavilion.

Systems that were analyzed as precedents involved infrastructural urban design, structure, spatial tectonics, circulation, materials and spatial stacking. These systems were uniquely utilized in projects of different typology: *The Masterplan for the Santa Cruz de Tenerife Pier* by Foreign Office Architects, *Landform One/ Landesgartenschau* by Zaha Hadid Architects, and *The First Nations Garden Pavilion* by Saucier et Perrotte Architectes. The Parachute Pavilion emerged from the systems in these projects, creating a building rooted in systems as opposed to typology.

Situated on a unique site to pay homage to an existing Parachute Jump, the proposal first tied together the existing infrastructural pathways that surrounded the site to allow for a dissolving of the threshold between city and sea. In the process, the project needed to reconcile the differences in vertical heights along the site, lending to a topographical manipulation that created spatial diversity within the project. Moreover, this confused the understanding of the ground plane, allowing spaces and patrons to flow throughout. Spaces are produced below, above, and within the boardwalks, creating a unique sectional diversity within the scheme. The pavilion originates from the existing boardwalks, producing a building of connection that swells to surround the existing parachute jump. Clad in materials native to the surrounding site, the pavilion distinguishes the horizontal and vertical surfaces while dissolving the distinction between indoor and outdoor environments. Ultimately, the synthesis of these systems creates a pavilion that emerges between the city and sea with a pronounced subtlety.
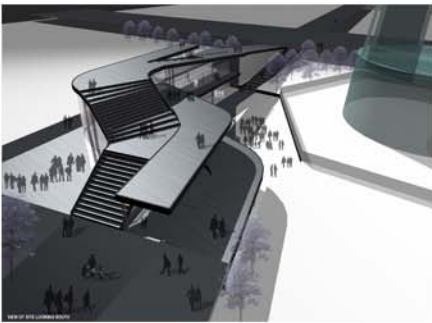
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Zaera-Polo, Alejandro and Farshid Moussavi. "Phylogenesis: Foa's ark." London: Actar Publishing, 2004. page 122-143.

Photo Credits

All photos used in the essay were found in the above sources. Many photos have been manipulated by Neeraj Bhatia to pull out important features relative to the argument. All diagrams relating to the Parachute Pavilion were done for the competition. Not all appear on the final board, as there was a limited amount of space, and required drawings that took precedence.