Arch 384
Aquatic Center Competition
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May 29, 2006

> “The works of the past always influence us, whether or not we care to admit it, or to structure an understanding of how that influence occurs. The past is not just that which we know, it is that which we use, in a variety of ways, in the making of new work [...] 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. The continuity of these ideas of type, such as they are, and the esteemed examples which have established their identity and assured their continued cultural resonance, constitute an established line of inquiry in which new work may be effectively grounded.”
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> The Harvard Architectural Review. Volume 5. Precedent and Invention. Between History and Tradition: Notes Toward a Theory of Precedent. John E. Hancock.

The main intention of the design of the aquatic center was not as a typical pool, but rather as a beacon for the community, and maintaining a sensitivity to the unique urban situation of the neighbourhood. We considered the site to be primarily residential, but the generous size of the proposed site and its proximity to transit connections required a delicate resolution between urban and suburban space. Ultimately, our solution was to elevate the pool structure to create a ground-level plaza and landscaped park.

Finding a precedent for an elevated pool proved difficult, but we discovered a number of projects that had been elevated for reasons similar to ours: for transparency at grade and the creation of an urban-scale portico of sorts; visual impact by challenging traditional typologies; and drama, caused by the cantilevering but facilitated by elegant structural design. Though purely a feat of engineering, water bridges demonstrated to us how powerful perceiving a body of water above oneself feels. Another precedent was a competition entry for a church in La Defense, Paris, by Ibos & Vitart. Their design combined a departure from typology with sophisticated architectural and structural design by placing an amorphous church upon slender stilts[i]. Finally, two Will Alsop projects, the Peckham Library in London and the Sharp Centre in Toronto, were valuable influences; these will be discussed in further detail below.

Figure 1: Magdeburg Water Bridge, Germany

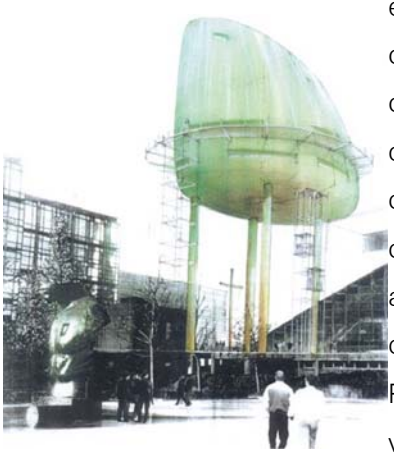

Figure 2: Notre Dame de la Pentecote

The advantages of raising the pool above grade are threefold. In addition to freeing up the space at street-level, the relationship formed with the surrounding townhouses becomes stronger as the street-level condition is not dominated by a large pool structure. Therefore, sightlines throughout the site are maintained for the residential units, and shading is minimized by the location of the building on the site. Furthermore, the building has a compelling, striking form that enhances its visual presence and visibility. A precedent for this siting was the Peckham Library (Figure 3, left) by Alsop

Figure 3: Peckham Library, London

Architects in London; here, Will Alsop does an admirable job of taking an institutional building and integrating it successfully into a residential neighbourhood consisting mostly of townhouses. The successful integration is a result of the building's sensitivity, flaunting its visibility while occupying a minimal physical footprint, and of its playfulness that makes it less institutional and more approachable. In our design for the aquatic center, these elements evolved into a clear separation of upper levels and entry pavilion, increasing the emphasis upon the pool levels, and a dynamic patterned facade that promoted the function of the building.

An obvious consequence of dramatically raising a pool above ground was structural complexity. We attempted to maintain an elegant transparency and the openness required for a pool space, while increasing the load drastically. Furthermore, the plaza space created by raising the pool had to be successful – well-lit, and feel as open as the site surrounding it. For example, we considered Zaha Hadid's Phaeno Science Centre in Wolfsburg, Germany, as a precedent; however, the plaza space that Hadid created was dark, cramped, and ultimately incompatible with our design ethos. The concrete pillars at the base were usable spaces, but they contributed somewhat to constricting the plaza space. Nevertheless, the gesture of including a large, open plaza and extending it below the building was similar to what our design intended[ii].

Figure 4: Phaeno Science Center, Wolfsburg

Ultimately, we wanted to marry this urban plaza with a more daring aesthetic, such as that of another Alsop project, the Sharp Centre for Design in Toronto. However, where the Sharp Center is soaring over an existing building, our aquatic center design is intended to provide an uninterrupted view from one end of the site to the other; the Sharp Centre makes an attempt to, but is largely unsuccessful at, realizing its potential relationship with Grange Park directly to the west of the building. In addition, the function of the building is institutional, and thus its accessibility is not at a level appropriate for a civic or public building[iii]. Our intention was to adapt this typology to enhance the relationship of the building to open public space below and around it.

Figure 5: Sharp Centre for Design, Toronto

Designing a structure to satisfy our design proved to be challenging. The pool had to be raised above-ground, but remain a column-free space so that the pool area could remain visually and physically unobstructed. We revisited the water bridge design, realizing that the Vierendeel truss was


Figure 6: Magdeburg Water Bridge, Germany

commonly employed in bridging wide rivers for their ability to provide large uninterrupted spans, even with the immense load of a canal (Figure 6, left). The Vierendeel truss allowed for the interior of the building to remain column-free by concentrating the load-bearing structure at the perimeter and in the mechanical levels of the building, and facilitated the dramatic floating effect that we desired. This became evident through our research of precedents, though the scope of the cantilever and scope of load borne by the Vierendeel trusses varied considerably, ranging from Vierendeel truss roof systems (such as the University of Saitama by Riken Yamamoto/Field Shop[iv]) to the Bang & Olufsen Headquarters in Struer, Denmark, by KHR Arkitekter, which is cantilevered to create a sense of transparency "between people, production, architecture, and surroundings".[v] In addition to transparency, however, the separation created by the cantilever in the Aquatic Centre creates a visceral threshold between the visitor and the cantilevered building above. The threshold, however, is not intimidating, but rather, inviting; it draws the visitor across it by contrasting the mass of the building with the openness of the threshold, as in Massimilano Fuksas' Ferrari Headquarters in Maranello, Italy (Figure 7, above right).


Figure 7: Ferrari SpA Headquarters, Maranello, Italy

Another precedent was Neeraj Bhatia's 4B studio project (Figure 8, right). Though an unbuilt student work, the clarity of the presentation and its Vierendeel truss system proved to be useful resources; furthermore, the project created an urban plaza condition underneath a large cantilever that was similar to the condition we desired underneath the Aquatic Center (Figure 9, below).


Figure 8: Hip Hop Cultural Centre, Montreal

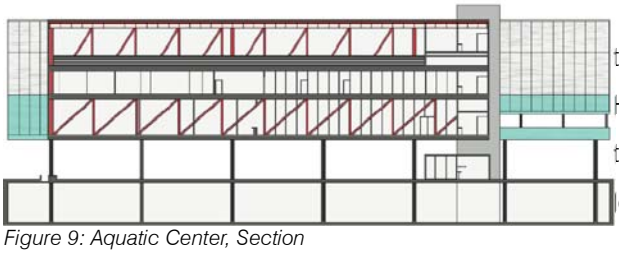
Figure 9: Aquatic Center, Section

The longitudinal section at left demonstrates the incorporation of the plaza at grade, like the Hip Hop Cultural Centre, while establishing a threshold between entry pavilion and pool levels, like Fuksas' Ferrari building. On a purely

structural basis, the section, as well as the axonometric (Figure 10, below), illustrates a similarity between the structural design of the Magdeburg bridge, Ferrari headquarters, and the Aquatic Center, as well as the evolution from the structural simplicity of the bridge to the complexity of the Aquatic Center.

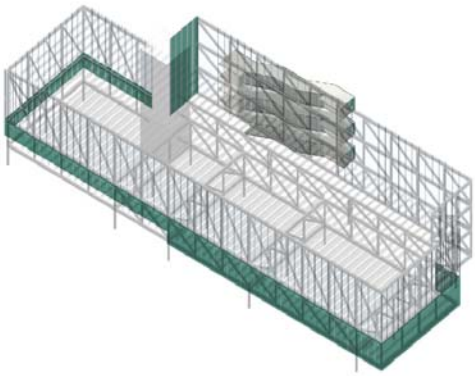

Figure 10: Aquatic Center, Structural Axonometric

Therefore, two important conditions emerged in the design for the aquatic center: the pool level itself, cantilevered over the second condition, a landscaped park with a plaza and outdoor activity and recreational spaces. Consequently, the connection between the two levels emerged as an important component of the design, for they remained inherently separated through the cantilever. The circulation had to complement the threshold and create the impression that one was being crossed as one ascended. Thus, unlike the aforementioned Sharp Centre, the Aquatic Center needed an entry and connection that was clear and accessible, while deferential to the pool level above. To achieve this, the Aquatic Center has a minimized entry pavilion, as its function is solely to support and organize the main arteries of

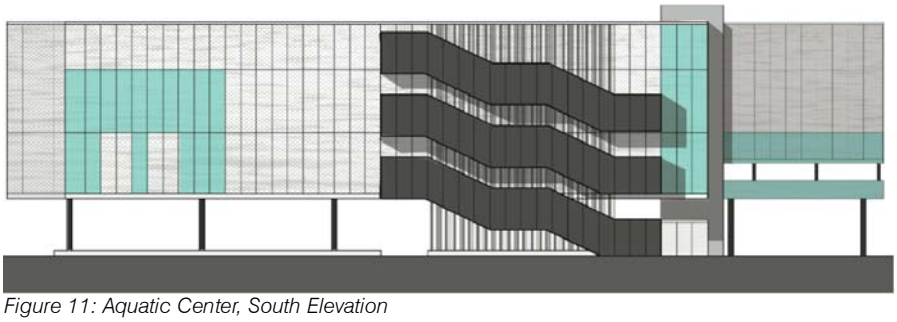

Figure 11: Aquatic Center, South Elevation

Figure 12: Expo 2000

circulation, while the circulation routes themselves were strongly emphasized (Figure 11, above left). It should be noted that the influence of Dutch firm MVRDV is apparent in the circulation of the Aquatic Center; consider the clear articulation of the circulation in their Dutch Pavilion at Expo 2000 in Hanover, Germany (Figure 12, above right), and our adaptation of it in the Aquatic Center.

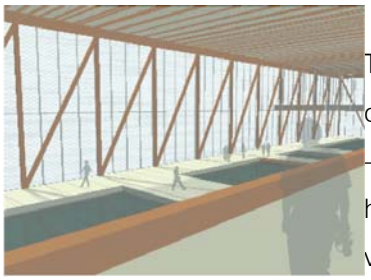

Figure 13: Aquatic Center, Pool Area

The defined mass of the cantilevered pool is contrasted with the openness of the plaza; however, from the interior, the opposite is true – despite the unconcealed structure, an openness is maintained by having no columns, being mostly glazed, and its uniquely elevated views of its surroundings (Figure 13, left). This is characteristic of

many Vierendeel truss projects, for the larger-scale steel sections appear heftier from the exterior, but contribute to a lightness and airiness on the interior. To emphasize this relationship, and to facilitate larger spans and taller ceiling heights, the trusses in the pool area are taller (12 metres) than those of our precedents (Figure 14, right). Furthermore, secondary structure, or bracing, is usually concealed in the floor or between pools to minimize its visual affect on the primary structural elements.

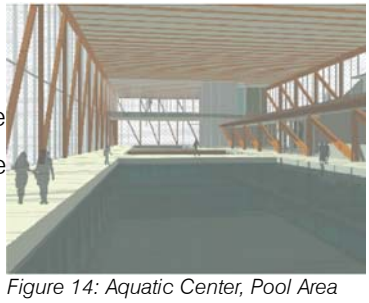

Figure 14: Aquatic Center, Pool Area

As visual impact is a key component of the design for the Aquatic Center, its facade was an important element, as it is the building's most obvious aspect. Therefore, a white halftone frit pattern of waves is printed on the glass, subtly revealing the building's function while reducing the solar heat gain through the vast glazed walls. This pattern is embossed or perforated, depending on their location, onto the oxidized copper panels where the facade is opaque. The pattern's density is dependent on the function it is required to serve – if more privacy or shading is required, the frit pattern is denser on the glass, or the perforations are lesser on the copper panels (Figure 11, previous page). An excellent precedent was the recently-completed De Young Museum in San Francisco, by Herzog & de Meuron (Figure 15, left). Though the facade on the De Young was intended to evolve and blend with the environment[vi], which differs from the functional subtle signage of the Aquatic Centre facade, Herzog & de Meuron did a brilliant job with the patterning of their facade and conveying a sense of dynamism and movement. Our design for the Aquatic Center attempted to capture a similar dynamism and movement to reflect the purpose of the building.

Figure 15: De Young Memorial Museum, San Francisco

The Aquatic Center, therefore, identifies more strongly with the public space typology, through the creation of a grade-level plaza and park (Figure 16, right) and by soaring above the surrounding buildings, not insensitively, but to maintain the scale of the neighbourhood and establish itself as the center of the community. A building of such scale will, clearly, be an important public space in the area and the design

Figure 16: Aquatic Center, Garden View

understands this responsibility. This, however, is a reversal from the traditional swimming pool typology, where the atmosphere is too often sterile, chemical, even dreary. The typical pool typology described by Dawes in *Design and Planning of Swimming Pools* is simply uninteresting and inflexible. Instead, our Aquatic Center attempts to realize the potential of water and swimming as inspirations, and incorporate their dynamism throughout the design. This aquatic center provides a different experience: from the approach, where the massive pool volume is perched precariously over the glass entry pavilion; to the stairs that connect the two, while concentrating the experience to crossing the threshold between them; to walking through the water feature to reach the cantilevered pool level; to the brightness of the pool level, which is almost entirely glazed; and even until diving into the pool, where a window allows visitors on the lower level to watch. There is an excitement and celebration of aquatic culture inherent in the design; indeed, a striking aspect of the Magdeburg Water Bridge as a precedent was the number of people simply watching ships float by on the elevated canal (Figure 1, second page). A body of water raised above ground is powerful because it is atypical; it is this challenging of tradition that makes the Aquatic Center what it is.

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iii Galinsky. “Sharp Centre For Design, Toronto.” <http://www.galinsky.com/buildings/sharpcentre/index.htm>

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vi Architectural Record. November 2005. “de Young Museum.” Sarah Amelar. p. 105.