Arch 384: ACSA + AISC Student Design Competition, Winter 2005

Integrating and Enlivening the Student Union Building

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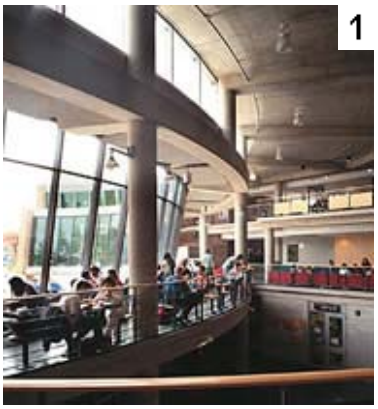
A university campus is, for all intents and purposes, a self-sustaining city in which the majority of student's activities take place – working, studying, eating, socializing, etc. Of course not all campuses are the same, and these instances require special attention. In designing a Student Union Building for the University Of Waterloo School Of Architecture's new campus in Galt, I found this to be extremely pertinent. For one thing, the school's population is a fraction of most institutions, and its location in a single building in the centre of small urban core demands that the design address these key issues. The close ties the school has with the surrounding community must be maintained and encouraged in the SUB, so that the building is not so much a destination only for students but also for the Cambridge community. Thus a porous building parti is necessary, and the design should welcome those around to enter. In order to articulate this idea of openness, transparency, and light, steel is an ideal choice due to its slenderness, light construction, and the myriad different forms in which it can be articulated. From personal experiences and learned research, the project is grounded in diverse techniques and established precedents.

For the base planning of the building, I found that the only SUB I had ever known in fact encompassed many useful elements and design strategies. The SLC at the main Waterloo campus is located directly on a well-used pedestrian path, and since I faced a similar site condition, I sought to discover how the building responded. A necessary condition is to encourage people to enter the building, and this is achieved through a sweeping glass wall punctured throughout with entrances to the main dining and study space. This works well not only because people can see who may already be inside, but also what food is being served, whether it is busy, quiet, or if a special event is taking place. In

this way the architecture and its interior are solidly and meaningfully tied to the passerby. Upon entering, the program is divided hierarchically in a vertical manner. Public facilities are located on the main and lower levels, while more private areas are upstairs. For the Cambridge SUB, this is important because student's need to have a private area in which they may relax or study away from the working bustle of the second floor and the chatter of the very public ground floor. The one thing I found the SLC did not maintain was a sense of openness and light throughout. Because the building has been added on to in different stages, it lacks cohesion and one notices this immediately moving from the main dining area into the student lounge. The overwhelming weight of concrete, low ceilings, and too few windows all negate the effect of the bright dining area. I have attempted to prevent this kind of disparity by using steel construction in the Cambridge SUB, so that the entire space may remain light, slender, and open. In order to heighten this experience, I believe that the construction and form should be something new and exciting – give the visitor a reason to come in, and moreover a reason to stay. In order to achieve this end, I have researched numerous projects which all use steel in an innovative and powerful way.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I have always found architecture to be especially interesting when the structure which comprises it is celebrated and detailed. When a building does something special, to be able to understand how it achieves this creates a connection between the user and the design. One of the precedents I found that achieves this is the new Clinton Presidential Library in Arkansas. Designed by Polshek Partnership, the building is located in an area of Little Rock in need of revitalization and fresh development. The main building is elevated above the ground plane, allowing the landscape to flow beneath and connect through to the river. Maintaining this connection, both visually and symbolically, is important in my site as well so that the user does not feel disconnected from the river, nor


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discouraged from using it. The great span required to preserve this relationship is achieved using structural steel. A giant truss, spanning the entire height and width of the façade, allows the library to soar above the landscape and realize a seemingly impossible span. The strength of the steel is on deliberate display, as it is located on the exterior of the façade in plain view for all to see. This celebration of structure I have attempted to integrate into the SUB design as well – most notably through a truss of my own. It spans the entire length of the Grand Ave. façade, and allows the second floor to pass over the road and create an urban square without any columns or obstructions, rather one that flows seamlessly from the road to the school to the river. Both building's bridge-like forms emphasize their connection to the bridges and rivers which form their respective contextual locations.

Some steel buildings are so outrageous and exciting in their presentation that they receive immediate attention from all over the world, regardless of how commonplace their program may be. One such building is the WoZoCo Apartments for the Elderly in Osdorp, The Netherlands, by Dutch firm MVRDV. Needing to accommodate 100 units into a restricted footprint and height where only 87 would fit, the architects cantilevered the remaining units onto the north


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façade, connecting them to the transparent gallery of the main block in a seemingly impossible manner. The steel structure of these floating boxes is buried behind the wood sheathing and within the main building mass, creating a sense of instability in their connection to the thin wall of the north façade[1]. Unlike the Polshek example, the structure here is not embraced, but concealed from view. While in this case the sense of excitement comes from not knowing what


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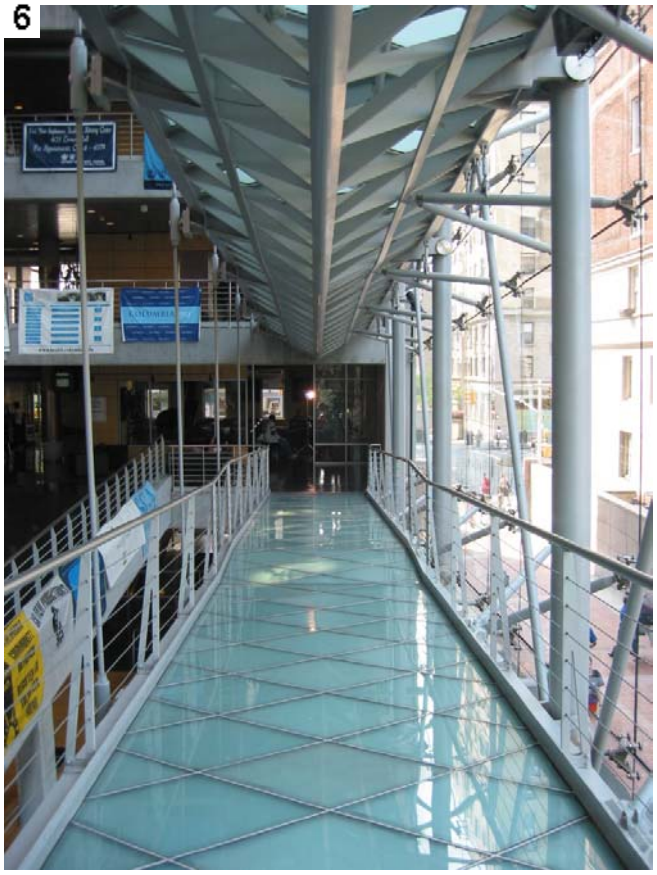
could possibly be supporting these extreme cantilevers, I chose to take the opposite side and display the steel that makes all this possible. Finding there was not enough space for all the necessary offices the competition called for, I devised a system that hangs the remaining 12 from the ceiling of the main dining space and secures them laterally to a ramp. Thus when one is in the main dining and study space, a series of glass cubes suspended by steel tension cables spirals up and around the perimeter of the room, and upon closer inspection it is possible to decipher how all of this is possible. To hide all of the technical detailing would be to waste an entire dimension of appreciation for the space.

To understand more about ramp systems, I relied on personal experience. One such scheme I encountered last summer on the 2b trip to New York - Alfred Lerner Hall at Columbia University, designed by Bernard Tschumi. The heart of Tschumi's design is the Glass Court, with an entirely glass façade and a network of steel ramps that connect the two wings of the building. This area serves as the main social and circulatory space of the entire building, and becomes the primary place where both students' and community members' paths cross.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During the day, light filters through the ramps and at night, as light flows from the inside, the silhouettes of students on the ramps will be seen from the outside "like a giant shadow theatre," Tschumi says[2]. The ramp is conceived as a series of triangulated plates, which when tied together with top and bottom chords, forms a three-dimensional truss. Tschumi's design secures the ramp system to an inclined façade truss (IFT), divided into tension and compression components. The truss is suspended between the two masses of Lerner hall in order to free the ground plane from columns. This system then also involves a roof transfer truss (RTT) to brace the IFT[3], and here the structure begins to get even more complex. I felt I should try and rationalize and simplify the whole scheme, and therefore settled on a design of open-web wall and roof joists that would be braced with corrugated steel decking. In this manner the entire space is structurally integrated. I was then able to secure the ramp system (as well as the glazing system) to each wall joist, meaning the overall bulk of the ramp proposal was

decreased since the intermittent span was also decreased. Tschumi's use of steel as a focal point, like in the Polshek example, furthers my enjoyment of design that integrates structure as something more than a means to an end. I appreciate his endeavour to enliven the Glass Court, infusing it with light and activity, and have striven to do the same.

I found this competition to be useful in helping me understand the inter-relationship between structure and design, and how one can heighten the experience of the other. Structure need not merely be a means to an architectural end, but can prove to be a stirring end in itself. Looking at methods and experiences which share this resolve has, I believe, resulted in a strong proposal grounded in successful precedent.

End notes:

[1] Shibata, Naomi. *MVRDV Files*. Tokyo: A+U Publishing, 2002. pg 26.
[2] Tschumi, Bernard. *Glass Ramps/Glass Wall; Deviations from the Normative*. London: Architectural Association, 2001. pg 89.
[3] Ibid.

Image credits:

1 http://www.grad.uwaterloo.ca/inside_pages/images/slc_small.jpg

2 http://www.nbm.org/Spotlight/website/images/photo_large/polshek.jpg

3 http://www.polshek.com/images/clinton-06x.jpg

4 http://www.cse.polyu.edu.hk/~cecspoon/lwbt/Case_Studies/Wozoco/wm_mvrdv07.JPG

5 http://www.cse.polyu.edu.hk/~cecspoon/lwbt/Case_Studies/Wozoco/wm_mvrdv01.JPG

6 personal photograph.

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