

“PRECEDENT”

by Anna Beznogova

Arch 384

Terri Meyer Boake

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“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.”

– The Harvard Architectural Review. Volume 5. Precedent and Invention. Between History and Tradition: Notes Toward a Theory of Precedent. John E. Hancock.

When I don't know where to start a project, I look to past experience. I look to the buildings I have personally experienced for examples of what to do and not to do, and combine this with theoretical knowledge of socio-economic, environmental, and experiential factors. It is valuable to work from primary (i.e. experiential) rather than merely secondary knowledge because it has the advantage of not being filtered by someone else. Thus, the precedents that I used to come up with the condominium design for the Student Hydrogen Competition are mostly personal ones. To structure an analysis of why some places seemed better than others, I started by pinpointing the reasons why I liked or did not like each place, and looking for patterns; that is to say, structuring an understanding of how the works of the past have influenced me. The analysis culminated in a solution which – surprisingly – I already knew of, but have not experienced firsthand.

The program for the Hydrogen Competition was very open: incorporate a hydrogen fuelling station into a residence of any scale. The University of Waterloo team decided to design an apartment-style multiple-resident dwelling for the scale of onsite renewable energy sources that could be used, and to foster a sense of a hydrogen community, which still left a lot of options in regard to building type. The first apartment-style type that I looked at was the low-rise courtyard development (Fig. 1, top). I found this type of development a lot when I was staying in Copenhagen for a few weeks, and had the opportunity to stay in two apartments of this type which shared similar qualities, reinforcing the idea of patterns found by studying types. The second type that I looked at was the mid-rise block (Fig. 1, middle). I lived in this kind of development when I was growing up in Russia and it did not leave a favourable impression. However, in the case of a block-type building, this impression speaks more to the individual building than to the success or failure of the type since there are so many possible variations on the block. The third type

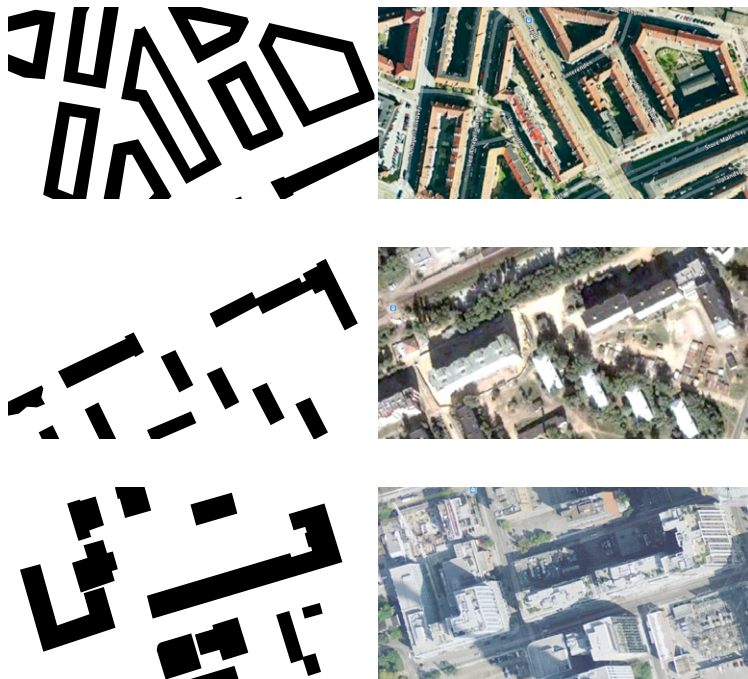


Fig. 1ⁱ (from top to bottom): Copenhagen, Vsevolozhsk, and Toronto aerial views and figure-ground maps

that I looked at was the contemporary high-rise, specifically looking at a condominium of one of my friends located in Toronto (Fig. 1, bottom). The contemporary high-rise type is most often defined by a high degree of repetition of units around a double-loaded corridor or core and a posh-looking all-glass envelope. I looked at these three different residential building typologies and combined their positive attributes to design an environmentally-responsible residential development while addressing the social stigma of hydrogen technology and mid-rise blocks. To analyze each type, I broke down the factors that affect the overall success or failure of a building – context, orientation, and environment.

One of the first considerations when designing a building is its built and social context. A successful building is one that affects its context positively by controlling the quality and location of the negative spaces on the site, assuming that every building leaves some. The negative space or lack thereof has potential to activate or deactivate the space around the building, either making it a social opportunity, or in fact creating a safety hazard for people. The courtyard type addresses the social context of its surrounding built fabric well by placing the negative space at its centre and extending to the sidewalk on surrounding streets (Fig. 1, top). This creates an outdoor space which is clearly communal but also clearly belongs to the residents of the development, which is important for ensuring that this negative – leftover – space is a safe one. People take ownership of the courtyard however they can: children play in it, ground-floor residents keep small gardens and create sitting areas. It also gives the residents a kind of “backyard” to look out on, so their dwellings have a formal and an informal face. On the street side of the building, a feeling of safety comes from a lack of hiding places since the building comes right to the sidewalk. The street face can also be made more or less social by filling the ground floor with public program such as shops and restaurants. On



Fig. 2 (from top to bottom): Copenhagen, Vsevolozhsk, and Toronto apartment plans



Fig. 3: Hydrogen Competition Site Plan 1:2000

the other hand, the mid-rise development where I lived in Russia did not address its context well or, arguably, at all (Fig. 1, middle). The building met the road at the front with a large and unused setback. This negative space around the building was unplanned, and since it did not obviously belong to anyone no one took ownership of it; it was littered and dangerous at night. This kind of failure comes from the “building in a park” approach – Le Corbusier’s concept of the Radiant City. The neighbourhood of Regent Park in Toronto is another development that follows Le Corbusier’s concept, and has gotten a lot of criticism in the press. The negative space left over by placing towers in an non-designed “park” space has resulted in high crime rates and the neighbourhood is now being redeveloped¹. The only saving factor for the building I grew up in is that it formed an L shape with another building, and the vacant lot in between became a makeshift playground, though only by chance. The high-rise development (Fig. 1, bottom), while similarly more or less block-shaped, is usually much more successful in addressing its context, although this relies on the fact that it is found in dense urban areas with a lot of existing social momentum. The building fits into its context by programming the first, and sometimes second, floor for public use such as retail, entertainment, and dining thereby keeping the street level occupied and safe, although not imparting anything to a sense of community between residents.

The chosen site for the Hydrogen Competition is within the Research and Technology Park at the University of Waterloo, close to Lake Columbia (Fig. 3). It was chosen because it is already a research hub of wealthy early adopters and academics that would be the primary market targets for the apartments. The ground floor of the building is designed to generate social momentum with a cafe and education lounge. The location allows it to cater to a wide demographic of University of Waterloo students, neighbouring families, and business park employees, which

is an opportunity to overcome the social stigma associated with hydrogen technologies by educating people about it – the hydrogen equipment room is placed on the ground floor adjacent to the lobby and cafe (Fig. 4), where people can look in on it through blast-proof windows. Through this arrangement, the space at the back of the building is activated by trail users and the cafe (with the patio and onlookers), while the space in front of the building is activated by people coming, going, and refuelling (Fig. 5). The space is designed to bring people together as a community and educate them, addressing the social context. The building has its prominent face on Columbia St. West, and its more diminutive face on the Lake, addressing the physical context and issues of safety.

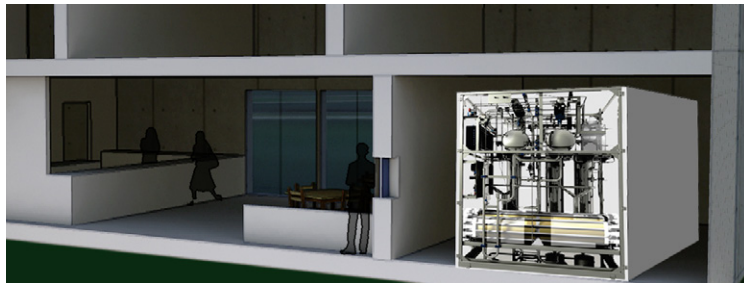


Fig. 4: Cafe and Equipment Room section, showing window

Another consideration when designing a building is its orientation, which affects how the building responds to the climate and site, and the quality of the interior spaces. In terms of climate, orientation is most important for solar access and control. In the courtyard development, the arrangement of the dwelling units is ruled by the need to establish the courtyard perimeter. There are a few units facing each street of the block, regardless of the position of the sun (Fig. 1, top). For this reason, the courtyard type does not give everyone equally good access to sunlight and some units get very little at all. In a cold climate, such as the one I am dealing with, this would create bleak and uninviting interior spaces as there is already not much sun for most of the year. It is important to make as much as possible of the available sun in this climate, but also limiting it during the summer to reduce cooling loads. For this reason, I knew I would not design a courtyard development. However, I did learn the social possibilities of well-placed public program at the ground level and of orienting each dwelling unit a public/formal and private/informal space; the former addresses the impact of the building on its surroundings, and the latter addresses qualities of interior space where it can

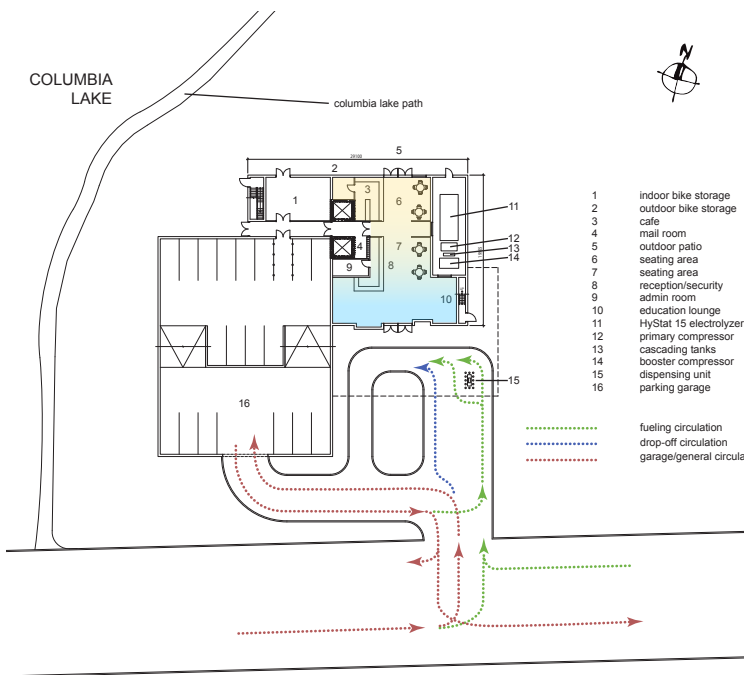


Fig. 5: Hydrogen Competition ground floor, highlighting lobby & cafe, and showing circulation

be used to organize programmatic elements according to the degree of publicness of each. The mid-rise building in Russia was not well-oriented to the sun, which – combined with small windows (Fig. 2, middle) – left the impression of a dark, gloomy space. Since the climate was similar to that of Waterloo, the experience confirmed the notion of providing each unit with solar access. Unlike the courtyard type, the block apartment does present the potential to give every unit access to South sun if it is oriented correctly. Similarly to a mid-rise block, the high-rise has the same potential. However, in orienting the building it is also important to look at the impact the orientation can have on the site context at the same time as looking at its positive climatic and interior qualities – the two priorities have to balance, and sometimes compromise. There is also potential to reconcile the two interests between a publicly-programmed ground floor and private dwelling units above.

The potential of the block to give all units South sun made me look at it as an appropriate response to the climate, where I could apply the lessons learned from the successes of the courtyard developments. Thus, the main residential block of the Hydrogen Competition building is oriented almost true South, the slight compromise being made to give residents views onto Columbia Lake from the back of their apartments (Fig. 6). In this way, each of the units has an informal and a formal face, which plays a role in the interior arrangement of program. The sun is easy to control with horizontal shading devices with this orientation, preventing solar gain in the summer and making it more environmentally-responsible by reducing cooling loads. On the ground floor, program is arranged to activate all parts of the building, with the lobby closer to the street and the cafe facing the lake (Fig. 5). As with the apartments, this lends the lobby more of a formal feel, while making the cafe more informal.

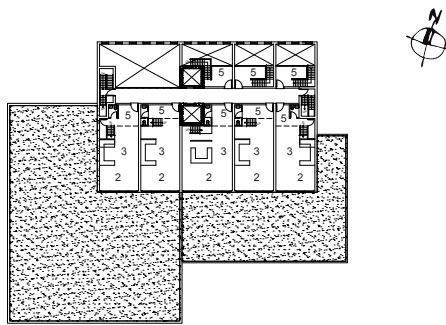


Fig. 6: Third floor, showing residential units

Having considered orientation for sun as well as social factors, another important environmental factor to consider is the wind and natural ventilation. This can reduce cooling loads in the building in the summer months and help create an environmentally-responsible building. The apartments of the courtyard developments I stayed in had natural cross ventilation reducing the need for air conditioning. In fact, the use of air conditioners did not seem prevalent in Copenhagen even in the hottest days of summer because it was not necessary. Since the units spanned from street to courtyard, a breeze could travel through them to cool off the occupants (Fig. 2, top). This arrangement is challenging in block-shaped buildings because circulation must be organized around or along an elevator core for the sake of efficiency; the double-loaded corridor runs perpendicular to the spaces which one would want to be continuous from front to back of building and a circular path around a core does not establish a common orientation for all units (Fig. 7).

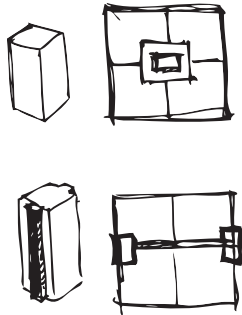


Fig. 7: Typical core and circulation arrangements in block-shaped buildings

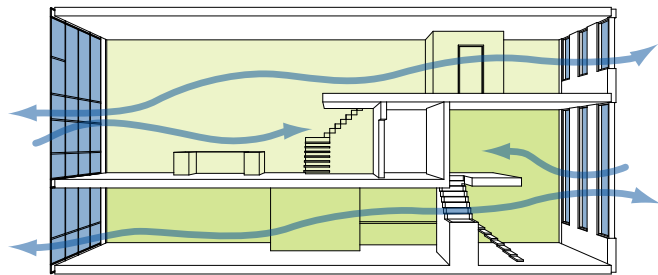


Fig. 8: Cross ventilation solution

Considering the social and environmental benefits of an apartment which stretches from one side of the building to the other, I wanted to see how or if such an arrangement could be possible with a block-shaped building. I realized that the units would need to have two levels and that if hallways were to remain straight, they would have to skip every two levels. Once I came to the solution (Fig. 8), I also immediately realized that it has been implemented before, by Le Corbusier in the Unité d’Habitation (Fig. 9). The conception of the units as “free volumes” instead of “free plans” opens them to natural cross ventilation². As well, Le Corbusier protected the balconies and interior spaces from excessive exposure to sun with brise-soleils. He also incorporated plenty of public program throughout the building – at the ground level, the roof level, and two levels in the middle of the building. Another benefit of the arrangement around “streets in the air” is the efficiency with

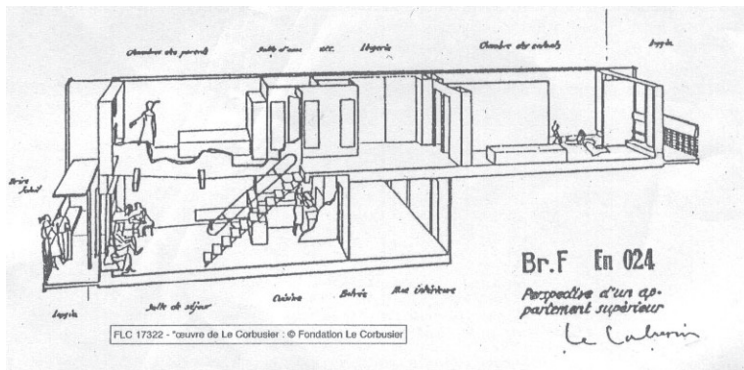


Fig. 9ⁱⁱ: Le Corbusier’s Unité d’Habitation



Fig. 10: Le Corbusier's Unité d'Habitation – overallⁱⁱⁱ, interior^{iv}, and corridor^v.

which it uses the space allotted to public corridors since there is only one needed every three levels³. For all these reasons, I adopted Le Corbusier's Unité as the model for my residential units.

Thus, through the study of primary experience and secondary knowledge I combined the positive attributes of three building typologies to design an environmentally-responsible residential development which addresses the social stigma of hydrogen technology and mid-rise blocks. I used what I learned from courtyard arrangements to create safe and social spaces on the building site, employ the benefits of an apartment having a front and back face, and provide natural cross ventilation. I also used the potential of a block-shaped building to provide each unit with access to South sun, a necessary feature in this climate for comfort and human well-being. I took cue from urban high-rises for their success in addressing their context and maintaining social momentum. Finally, I came to a solution which I recognized already existed and studied its benefits before using it – I was able to derive the necessity of the solution from personal experience, and used secondary sources to back up my hypothesis. Present, primary and secondary, is a powerful tool in making new work.

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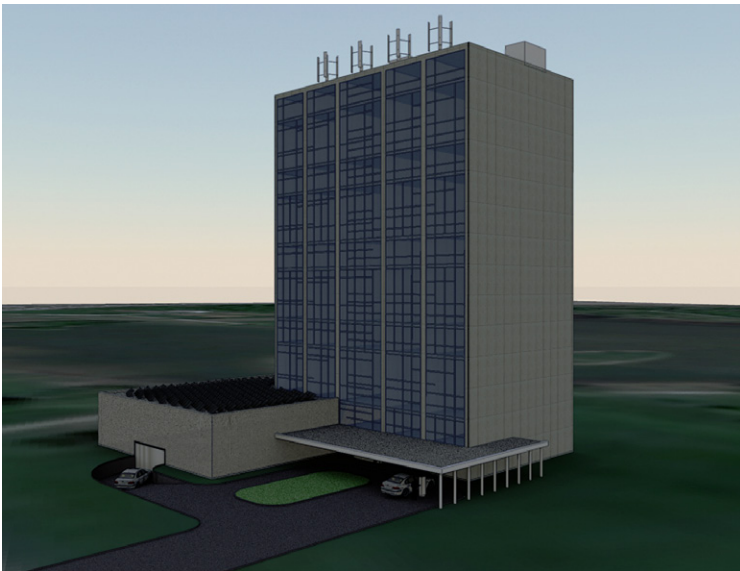


Fig. 11: Overall view of the Hydrogen Competition building