

USGBC Competition: Holistic Embrace by Einfach Grun (Simply Green)

Sustainability: Where Modern Technology Meets Tradition

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Sustainability in buildings implies a regression to vernacular architecture. However, many contemporary projects, particularly large-scale projects, move toward technological advancements to solve environmental concerns. The primary focus of this USGBC submission is to combine a common sense approach to sustainability with technology in order to yield simple solutions that would be economically achievable and appropriate to the site in the outskirts of Portland, Oregon. A practical investigation of the ancient traditions of Feng Shui proved to be a valid starting point for the project which was further enhanced by Dutch and Germanic design influences. The mix of eastern and western perspectives as well as traditional versus modern concepts of sustainability laid the foundations for a mixed-use development that will lead the way in rethinking life on a rectangular city block.

Feng Shui, with its literal translation being “wind-water,” is a traditional Chinese practice that greatly influences planning and subsequent design decisions through the analysis of climate and natural features of the site. It is important to be informed about the climate of a place before designing in order to orient the building correctly so as to take advantage of prevailing winds in the summer months and to allow the entry of sunshine in the form of heat gain in the winter time. (Bramble, 2003).

Cross-ventilation is a common feature in dwellings of traditional cultures and served to be a primary design goal in this project where both one- and two-bedroom units were designed such that each room had glazed openings on two opposing walls, thus enabling cross-ventilation to occur. In Portland, Oregon, the prevailing winds in the summer months from April to September is NNW while winds come from the ESE in the winter. The one-bedroom units which are located in the low-rise building have triple-glazed operable windows on the east and west walls, allowing the air to move through the units in the summer months and shielding the wind during the winter. The north-south orientation of the two-bedroom units with floor to ceiling south-facing windows to facilitate passive solar heat gain in the winter months and north-facing operable clerestory windows to ventilate the unwanted heat during the summer is based on a similar strategy. Taking advantage of

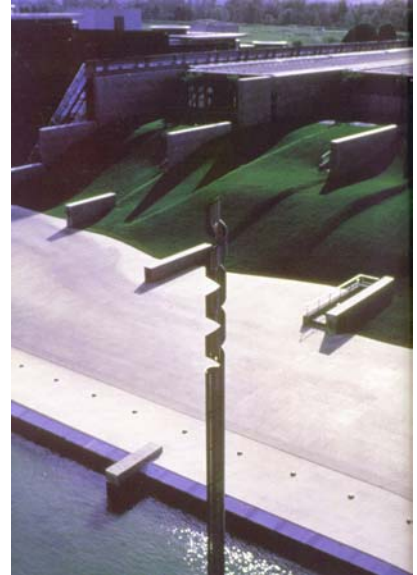
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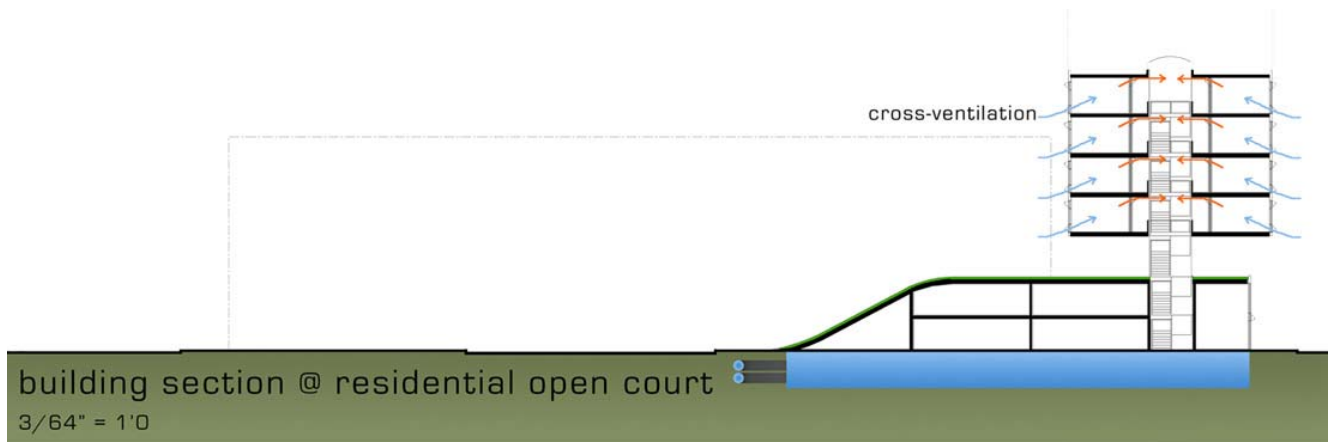
prevailing wind and solar heat gain can increase the interior comfort without the use of mechanical air conditioning thereby minimizing energy consumption. (Bramble, 2003).

Natural features such as water and topography are also a basis for Feng Shui. Unfortunately, the planning of the site had already been done with property lines of the mixed-use building and its two adjacent future developments designated. The site is a flat field. A key aspect to the language of sustainable architecture seems to be buildings that emerge from the earth. Ultimately, this led to a study of projects that resembled the sculpting of landscape and an investigation of architecture as earthworks. One such project is the Shell Headquarters in Paris by Hatherly Gustafson. In Gustafson's manifesto entitled "The Conceptual Landscape," the goal of achieving *genius loci* is described as such:

A new landscape should be in a site not on it. A project should be born from its site, emerging from the land and the place. The site's ambience, climate, history and environmental structure are a backbone to creating a sense of place....I often work with the ground plane. It is the one area that people physically touch, see, hear, and smell....If you succeed in putting a project's essence in the ground plane, the site will hold its own over time. (Cook and Spiller ed, 1999).



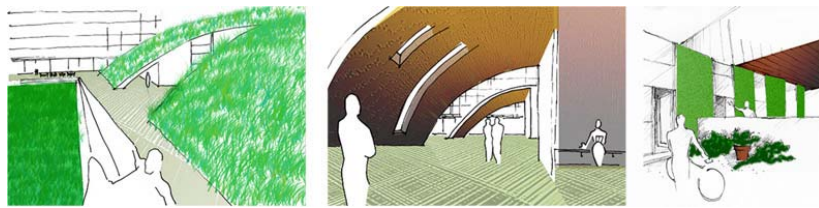
These words inspired a project that would be firmly rooted in the ground. The east-west site section shows a smooth transition from the park space to the park amenities to the two-storey two-bedroom units which support the mixed-use office tower as the grassy ground plane of the park slopes up to act as a green roof for the two-bedroom units which also serves as the terrace of the one-bedroom units.



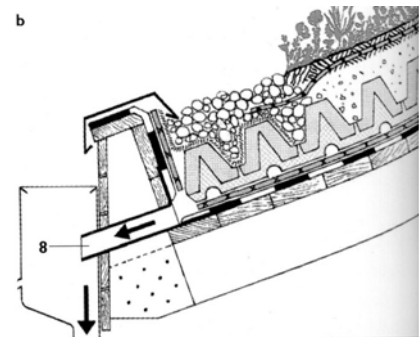
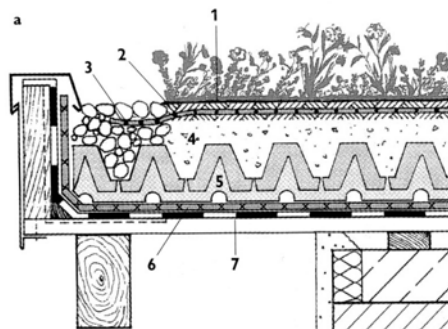
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This idea of topographically sculpting the roof was reinforced by an NL Architects project entitled “Hidden Delights.” Situated between the historic center and the recently redeveloped harbour area in the east of Amsterdam, “Hidden Delights” consists of ten houses that are part of a master plan of 500 units. The site was previously used as a parking lot which meant that the project emerged from a level plane much like the site in Portland, Oregon. The most influential idea of this project was that the swooping green roof was not only added a level of aesthetic complexity to the project but was completely pragmatic in achieving the goals of design such as creating a vista across one diagonal while maintaining a narrow access way across the other diagonal of the square complex. The roof was an undulating mesh that covered units ranging from two levels to 3.5 levels high with varying square footages to accommodate programmatic requirements. (NL Architects, 2002).



The sloping green roofs in the USGBC project acted as connective tissue between the tower and the park. Their undersides sheltered the two-bedroom family units and sloped downward to top the park washrooms and resting spaces, and then became the structure of a covered walkway with a north-south access before meeting the ground. The top of the roof yields a different experience with an access that allows the inhabitants of the tower to move from east to west down to the community park. The roofs, sloped and planted, play a role in the sustainable aspects design. Because of Portland’s proximity to the west coast, rain is also an important element. Rainwater is first absorbed by the planted layer on the green roof. Next, the slope allows the roofs to drain excess rainwater into cisterns which are buried underground. This water would be used for functions such as site irrigation and toilet-flushing which do not require potable water. The follow diagrams show the two conditions of the green roof: flat and sloped.

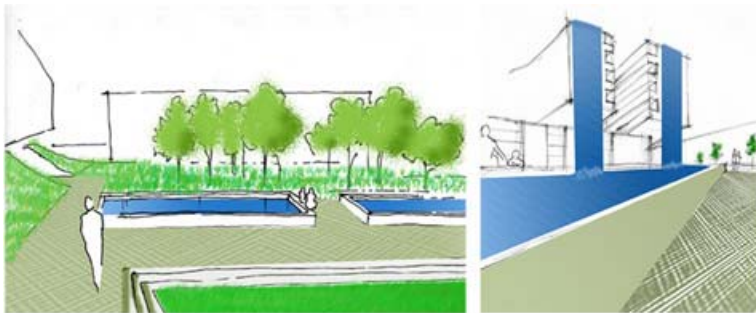


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Rainwater collection is not only a practical part of the project, but as a water feature, it contributes to the aesthetic value and physical comfort of the site. The DaimlerChrysler building on Potsdamer Platz in Berlin showcases a shallow pool of flowing water that is both sculptural and functional. This pool called the *Urbane Gewässer* (urban waters) includes a network of streams and ponds that cover an area of 12,050m² that represent a sense of serenity in the midst of a hectic business quarter. “The water is kept clean by bio-mechanical purification, with more high-tech equipment used only when necessary....” (Gauzin-Muller, 2002). A stormwater collection feature was incorporated into the project on the south side of the site. This rectangular pool borders the east-west pedestrian access and cools the large gathering space to the north of it during the summer months.



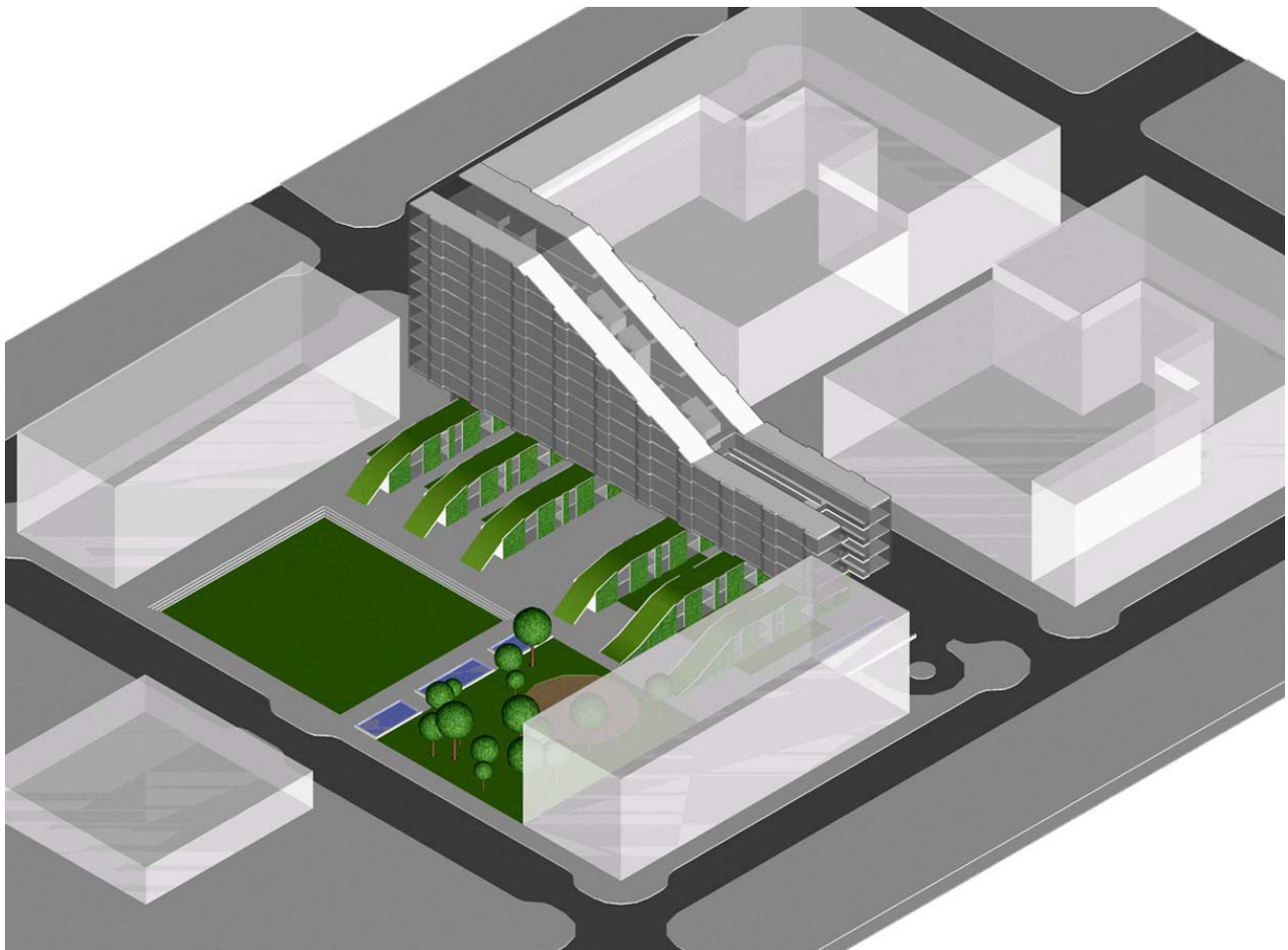
The form of the mixed-use tower stemmed from function. Terraced houses in the solar capital of the world Freiburg, Germany by Rolf Disch successfully incorporated solar paneling on the south-facing side of the building without sacrificing the aesthetics of the project. With the south-facing roof angled at 45 degrees as shown in the rendering below, it is an inspiration especially since most sustainable projects seem to have their angled solar panels tagged on, sitting atop flat roofs, a sign that the technology is outside the scope of design and not the basis for it. (Gauzin-Muller, 2002). The mixed-use office tower is higher on the north side to meet with programmatic requirements of office space with a 20 degree transitional slope to the south end of the building which houses 24 one-bedroom units. The angle of the slope is ideal for obtaining the optimal amount of solar energy in Portland, Oregon. Solar energy is to be used as a primary power source in the summer months when precipitation is limited. In the winter, the slope acts as a drainage system for stormwater which will be diverted to fall through water turbine down the south side of the building. The energy harvested will generate electricity for the site.



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Stepping toward a sustainable future could easily mean a break from the traditional language of architecture as modern architecture had been a leap from the past. However, designers must always keep in mind that traditional methods are often based on logical precedence and work with environmental forces. Vernacular architecture has survived the ages through its adaptability to regional climatic factors. While technology could greatly improve the standard of living, it should be used in moderation. This project is governed by a combination of traditional passive methods of air conditioning and rain water collection, and a sensible yet inventive use of technology including solar panels and water turbines. This union of tradition and innovation not only stresses the importance of precedence in contemporary architecture, it would also ensure an efficient evolution into a sustainable future.



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