

# **Dialectical Ecologies at Hulsey Yards**

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## ***ABSTRACT***

**Rural wooded lots, green pastures, desert landscapes, open plains, and mountain cliffs. These spaces appear to be the ideal setting for ecological design, according to recent publishing. At these “out-there” sites, solar orientation is registered. Surface treatments are hung. Fins are cantilevered. Water is recycled. Roof grass is planted. Geothermal technologies are buried. Low voc paints are brushed. Higher efficacy machines are specified. While the value of these ecological strategies and use of new green products is clear, not even one hundred million new solar houses could environmentally redeem the unforgiving amount of low-density greenfield development built during the last twenty-five years. This paper argues that decoupling the eco-tec project from the urban one is futile, and that the bottom line of sustainability is not the individual low-entropy building but urbanism.**

## **1. INTRODUCTION**

### **1.1 Eco-Social Dynamic**

In a review of a dozen books published between 1996-2002 on sustainable architecture, historian Richard Ingersoll reaches the conclusion that in order to “dismantle the burden of determinism” associated with the ecological design movement, the emergence of a “dialectical ecologist” seems more valuable to the ecology movement today than all its good intentions or innovations. (1) Ingersoll drives the point home that decoupling the innovative eco-tec project from the urban one is futile. He writes, “any theory of design and ecology must acknowledge that the bottom line of sustainability is not the individual [efficiently-designed] building but urbanism.” For Ingersoll and others, without urbanism, all of the right eco-tec building in the world will not add up to much.

And yet buildings worldwide, more than any other urban infrastructure, are responsible for about 40% of CO2 emissions, the US being the largest culprit by far. Despite a US governmental pledge at the 1992 Earth Summit in Rio to reduce emissions of green house gases, air pollution is increasing - over 60,000 Americans die each year from air pollution alone. In 2000, carbon dioxide emissions were 14% higher than they were in 1990. (2) By the year 2020, world population will have grown from six to eight billion. In effect, a reduction in energy consumption in buildings is a design imperative, especially from the world’s largest consumer.

It is in this tensional space between the urban project and the ecology one that prompted a “dialectical research method” for a graduate design studio located at Hulsey Yards in Atlanta, Georgia. Following environmental philosopher Allen Carlson’s call for “an appreciation of paradoxes and dialectical relationships,” a multi-phase eco-urban research agenda was developed where complexity and conflict could be nurtured. (3) Strategizing a critical approach to ecological design, the studio process set out to incorporate conflict and dissimilarity ~ conflating what James Corner calls “modernist dualities into fantastic worlds of

mutuality, paradox and difference.” (4) Rather than object architectures - too often associated with contemporary green building despite all the right intentions - this studio sought out “environmental architectures,” architectures associated with a new understanding of building as a *field of forces*, both natural and cultural. A 35-acre post-industrial, inner-city site became a space of reciprocity between collaborative and individual work for twelve graduate students in their final year of study. Students were encouraged to think in unconventional ways about making environmentally responsible buildings that contribute to vital, local place-making. The results of the research fed a range of issues including lifestyle, landscape, structures and materials. It also raised doubts and shed new light regarding many well-worn definitions of ecological architecture.

## 2. DIALECTICAL RESEARCH METHOD

### 2.1 Environmental Science and Ecocriticism

Environmental science, in one form or another, has formed the central part of ecological discourse. This is particularly evident in architecture. When addressing the subject of ecology, most architecture programs prescribe two required environmental [control] systems courses in their curriculum. The second law of thermodynamics serves as a starting place. Energy is plotted. Solar angles are graphed. Gravitational forces are registered. Thermal flows are demarcated. Comfort is mapped. These environmental science principles are fundamental to shaping new alternative energy systems, as well as, eventually, the plan and sections of our new buildings. The science behind the environment continues to prosper, generating new technologies, new construction systems and new green products. Evidence of such is well documented and marketed. Since the 1960's, environmental science has been a primary force behind the work of many of leaders in the ecological design community [Soleri, Fisk, McDonough, Addington, Dunster, Yeang].

Set in dialectical relation to this exercise - following the dialogic framework of the studio - students were simultaneously introduced to ecocriticism, or green criticism - one of the most recent interdisciplinary fields to have emerged in literary and cultural studies. David Teague loosely defines ecocriticism as the study of the mutual constructing relationship between culture and the environment. (5) For Ursula Heise, it is defined as the role that the natural environment plays in the imagination of a cultural community. It examines how the concept of "nature" is defined, what values are assigned to it or denied it and why, and the way in which the relationship between humans and nature is envisioned. More specifically, it investigates how nature is used literally or metaphorically in certain literary or aesthetic genres and tropes. This analysis in turn allows ecocriticism to assess how certain historically conditioned concepts of nature and the natural, and particularly literary and artistic constructions of it have come to shape current perceptions of the environment. (6)

Andrew Ross' essay “The Social Claim on Ecology” introduced the students to ecocritical thinking. Ross does not deny the physics of the environment or the reality of environmental degradation. However, he is exceedingly skeptical of the role and weight that environmental science has to diminish global warming and alike. If scientific methodology is, after all, essentially relative, he argues, how does one ascertain claims of real scientific improvement. For Ross, environmental degradation is, in the end, not a scientific problem but a cultural or urban one. Before anything like sustainable development can be made effectual, according to Ross, economic, social, and cultural inequalities must be addressed. (7)

It is in this tensional space between environmental science and ecocriticism that students were asked to situate themselves and their work. In terms of environmental science, the studio was divided into three teams of four students. Each group was charged to investigate one of the four elements - air, water, sun, and earth - extending the lessons they learned in their required environmental systems courses. They collected technical data, sorted it, and organized it into five

categories: properties, principles, problems or issues, applications and design considerations. Each team also presented two case study projects that were driven in large part by the forces inherent to the element they studied – one at the urban scale and the other at the building scale. They were called upon to reveal both the conceptual ideas and specific strategies of the projects as they pertain to one of the elements. At the same time, students were introduced to a series of green topics drawn from a collection essays in “The Nature of Cities: Ecocriticism and Urban Environment.” Topics included urban wilderness, American pastoralism, urban nature, nature in suburbia, the urban park, working landscapes, urban ecofeminism, environmental justice, urban fauna, and simulacra of nature. As a group, these topics provided the parameters for an ecological component often missing from cultural analyses of the city and an urban or socio-cultural perspective often lacking in environmental approaches to contemporary culture.

## **2.2 Eco-Tectonics in an Ecology of Sprawl**

In her book “Building Suburbia,” urban theorist Dolores Hayden acknowledges “the contributions of architects who create green architecture. Citizens can see substantial demonstrations of better ways to plan and build.” But, she adds, “New designs alone cannot redeem a throwaway culture organized around the continual consumption of un-developed land.” As Bill Dunster writes, we are a culture currently consuming enough resources to need three planets to survive. (8) Even a program for one hundred million new solar houses could not make the United States sustainable. Hayden’s argument is if the United States is to become a more sustainable and more equitable place, existing under-developed territories have to be saved rather than abandoned on the way to making new projects.” (9) For Hayden, Dunster and others, there is little point to build energy efficient buildings if transport and food miles are not first addressed. The rate of suburban expansion must be slowed, and in turn, the rate of urban infill must be expanded.

Hayden’s point resonates in Atlanta. During the last twenty-five years, Atlanta has produced more than its share of unchecked suburban growth. While economically popular, this wasteful, placeless form of development has led to unforgiving amounts of low-density greenfield development, homogenous subdivisions, unparalleled long-distance travel routes, and reportedly some of the worst air and water pollution in any US city. The environmental impact is dramatic and unsustainable. Thermal glass, solar panels and green roofs are simply not up to the task of competing with this scale of earthly transformation.

So one might ask, why has ecology primarily produced mechanical or prescriptive methods in individual buildings in light of the possibilities for a vibrant exchange between ecology and urbanity? Why is there ambiguity over ecology’s content and relationship with urbanism? Why hasn’t the transformative phenomena of ecology had a greater effect on the production of urbanism? Why has ecological design been drawn more from objectionist and instrumental models of ecology, while design creativity has all too frequently been reduced to dimensions of environmental problem-solving? This lack of inventiveness is both surprising and difficult for many architects. This is especially true for those who entered the field believing that ecology and artistic creativity might together help develop new and alternative forms of architecture and urbanism.

## **2.3 Green Transit and Urban Redevelopment**

Arguably, much the same way as an infrastructure of highways led to suburban expansion and urban depopulation in the last twenty-five years, an expansion of mass transit infrastructure will lead to both the revitalization of neglected urban land and the protection of our natural ecology and resources. This urban repositioning led the studio to piggy-back the Belt Line Atlanta Project.

Begun as a Planning Thesis at Georgia Tech in 2000, The Belt Line Atlanta Project is a green transit and urban redevelopment project that is now the focus of a \$1 million study by the

Georgia Department of Transportation. (10) The proposal consists of a 22-mile light rail loop with 45 stations that would weave through the city on existing railroad rights-of-way. It would also intersect with five existing MARTA [Metropolitan Atlanta Rapid Transit Authority] stations. The Belt Line would consist of an hour and a half journey through over 4,000 acres of neglected urban sites. With over half of that land suitable for residential and mixed-use development, approximately 100,000 residents could be accommodated in new mixed-use, brownfield, transit-oriented districts.

Hulsey Yards has been designated as the location of one of the 45 stations. It has historically been associated with Atlanta's rail system since the mid 19<sup>th</sup> c. In 1979, MARTA opened several new transit stations, including both the Inman Park/Reynoldstown station and the King Memorial station, located at the east and west ends of the site respectively. The King Memorial station is the highest station in the Atlanta system, the tracks being 51 feet above ground. Since 1985, Hulsey Yards has been owned and operated by CSX, a major U.S. freight carrier.

Hulsey Yards is also located at the nexus of four historic neighborhoods. Each has a unique history of its own. Inman Park is Atlanta's first garden suburb. Located northeast of Hulsey Yards, it was conceived and developed by Joel Hurt, an Atlanta entrepreneur in the 1880s. It included large lots, curving streets, lakes and open park areas throughout the neighborhood. In 1973, Inman Park was officially listed on the National Register of Historic Places. Reynoldstown, located southeast of Hulsey Yards, was founded after the Civil War, when freed slaves came to settle and find work rebuilding the railroads. The community's residents became carpenters, mechanics, maids and teachers. In 1952, the Reynoldstown Civic Improvement League (RCIL) was organized during a time when the city was segregated and voting rights were denied to its predominantly African-American residents. The RCIL is still very active, with missions that include preserving the character of the neighborhood, improving quality of life for residents, encouraging diversity and participation in community. Cabbagetown is Atlanta's oldest industrial settlement, located southwest of Hulsey Yards. Founded in 1885, the community supported labor at the Fulton Bag & Cotton Mill. Many of the laborers were recruited from the North Georgia Appalachians. The workers brought their rich heritage with them, including religion, crafts, folklore, music, and their land ethic. Artists, musicians, and students discovered Cabbagetown's eccentric character and affordable homes, and were among the first new residents. Today, Cabbagetown has an eclectic population of young families, artists, musicians, students, and professionals. Many of the shotgun cottages have quaint gardens and large porches. The Old Fourth Ward neighborhood is located northwest of Hulsey Yards, near the Sweet Auburn district, where Martin Luther King, Jr. was born and raised, and where he preached. Recently, residents and the City government have taken steps recently to restore the neighborhood. An example fitting to this project, Dynamic Metals Lofts opened in 2004 on the site of an abandoned scrap metal yard. The site was an environmental challenge. Demolition revealed the residue of the site's history in remaining petroleum hydrocarbons, chlorinated solvents and heavy metals. The project represented the first voluntary clean up under the Georgia Brownfields Clean Up Act and received the US EPA Regional Brownfield Award in March, 2004. (11)

Students were charged to unearth the urban histories of these neighborhoods, sorting through their findings and organizing it into four categories: history, culture, demographics, and ecology.

#### **2.4 Mapping Relationships and the Subdivision of Blocks, Lots, and Rooms**

A mapping method was used to solicit relationships between the two prior phases. Students were asked to brainstorm a list of connective measures, sort their conclusions into categories that made sense to them, and rate each item regarding how important they were to the place at hand. A questionnaire was given to the studio-wide group who developed a list of physical variables plausibly related to innovative outcomes. They rated the importance of those items,

developed hypotheses and each selected one that became the basis of their individual design studio project.

Various subdivision strategies of HulseY Yards - into streets and blocks - were developed. Each strategy weighed the role and relevance of the urban and ecological forces of the site. Differences in weight shaped alternative organizational strategies of the site. Each group of students was asked to propose a subdivision scheme [street and block configurations] on a 30-acre site adjacent between MLK Jr and Inman Park/Reynoldstown MARTA Stations. At HulseY Yards, it was not immediately clear where the actual Beltline right-of-way would be located at HulseY Yards. The subdivision schemes incorporated different positions of the Beltline. After a couple of weeks, studio members reached consensus around a combination of two of the four schemes, but eventually incorporated attributes of all four schemes. Each of the twelve students selected an individual block to design within the overall subdivision scheme. Blocks ranged in size from 100'x400' [smallest] to 200'x700' [largest].

Following, each student subdivided their block into lots. A set of rules were established. Each block had to be divided into privately-owned lots. Minimum area of the block was to be dedicated to common space. The maximum lot size was thirty feet by one hundred and twenty feet. The maximum lot coverage was seventy-five percent. The minimum car/unit ratio was one car for studios and one bedroom's and one and a half for anything larger. These car/unit ratios are less than code. Finally, and perhaps most oddly, there could be no elevators at HulseY Yards.

Given these rules, each student was asked to calculate a) the highest possible density on their block; and b) the maximum number of lots on their block. Searching for the maximum was in fact an arduous task, as it required, unbeknownst to the students, a firm knowledge of housing. They had to quickly move from looking at the problem from the outside. The classic "inside-outside" lesson became central in this exercise ~ that is, an understanding that the organizational structure of the house, with its conventional dimensions of bedrooms and bathrooms and hallways and doors and door-swings, eventually has everything to do with the organization of the building on the lot, the lot on the block and the block layout at HulseY Yards.

### **3. THREE STUDENT PROJECT EXAMPLES**

#### **3.1 Light House**

This vertical, metallic, tower-like project recalls the cultural history that industry and the arts have played at and around HulseY Yards. The scheme was designed for smaller families, artists and artisans and students. Given the narrow dimension of the block and slope of the site, the "double-front" condition was one of the unique aspects of this scheme. The primary site strategy was modernist in approach, elevating buildings off the ground. Bearing lightly on the earth, 80% of site remained pervious surface, applying a combination of surface textures including grass, gravel, grasscrete, and water retention areas. Parking surface areas were sloped and located partially below grade. This provided environmental protection for the cars and screened them from the housing above. The water that naturally flows into these partially sunken parking areas is led to a horizontal retention trough for grey water use. Staggered arrangement of the dwellings on the block generated complex views. Various degrees of natural ventilation could be accessed through multiple sliding perforated metal screens with double-glazing behind. Screens could be opened for views to the neighborhood or for direct sunlight and fresh air. The metallic surfaces afford low maintenance and recall the industrial nature of the site. No exterior paint or other similar finish on-site treatments were necessary. The double-skin roof system incorporated photovoltaic panels and solar hot-water heating.

### **3.2 Co(ol) Habitation**

Two primary agendas directed the design of Co(ol) Habitation, the project with one of the highest densities in the studio. The first is cooling. The second is cooperative housing. The courtyard as a type was used to address both ecological and urban agendas. Referring to selected research on cooling associated with courtyard design [Reynolds] and on courtyard housing more generally [Sherwood], ecological and social agendas were conflated in plan and in section. The courtyard provided opportunities for adjacent units to meet if so desired. Integral screening mechanisms using recycled honeycomb plastic panels allowed for privacy when needed. Taking advantage of the mild slope from south to north, a parking deck was sunk five feet below the high point of the site, with integrated rainwater cisterns. The first floor was raised five feet above grade and surfaced with reused railroad ties. Applying stack effect principles, cool air from the parking deck was drawn up through the section of the building.

### **3.3 P.O. Box**

This project explored the idea of a “porous open box.” The porous open strategy was a response to a formal investigation of cross-ventilation and daylighting, and operates at both urban and building scales. At the urban scale, porosity drives the urban order of the block. Serving primarily larger families, this occurs by separating the townhouse-like buildings from one another enabling air circulation between the buildings. Akin to the shotgun house type, the 1x10x5 ratio of the outdoor space between buildings increased air pressure and thus air movement through the block. The level at grade was also perforated. This allowed for openings into the parking structure below, for daylighting and air exhaust and greywater storage. Programmatically, the spaces between the buildings serve as gardens with native landscaping. Some included open riser staircases to provide access to units above. At the scale of the building, the “ventilated plan” and “ventilated section” optimized air flow in both the x and y axes or horizontal and vertical spaces. Interior openings varied in dimension. Some were as small as one foot by two feet and as large ten feet by ten feet. The openings occurred not only between floors within the same unit but also between floors of different units. In these cases, the openings became air shafts, either to the garden space or garage level below. The porous strategy also included pixelated skins for solar protection. At the ground level, facing the Belt Line, music and religious shops, as well as a corner market, were interspersed with open porches the size of living rooms, enabling interaction across public/private boundaries.

## **4. CONCLUSION**

Final density across Hulseley Yards was 30 units/acre. The lowest unit/acre on a single block was 20 and the highest 40. Density variation from block to block was perceived positively. Total added residential population on site was approximately 1,400 persons. In the end, maximum densities were trumped by seeking higher quality living conditions, defined in large part by creatively employing passive ecological strategies. Overlaying urban agendas with ecological ones were demanding. Surprisingly the program type most familiar to students, namely housing, became the most difficult to grasp. This may be a by-product of where most students grow up these days, the very problematic that this studio aimed to address.

If the United States is to become a more sustainable and more equitable place, existing under-developed urban territories have to be saved rather than abandoned on the way to making new projects. There is little point to build energy efficient buildings if transport and food miles are not first addressed. The bottom line of sustainability is not the individual low-entropy building but urbanism.

## 5. ENDNOTES

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