From Basic Design to Design-Build: Abstract Discourse and Construction

Author Albert Marichal
Texas Christian University

In his canonical work on architectural tectonics, Kenneth Frampton writes:

> *'The built is first and foremost a construction and only later and abstract discourse based on surface, volume, and plan, to cite the "Three Reminders to Architects" in Le Corbusier's Vers une architecture of 1923.' (2)*

Taking time to absorb and develop basic design concepts over the course of a four-year undergraduate design program, a senior-level design-build project, presented here, sets its foundation upon an earlier basic-design, abstract spatial exercise.

In defining literal and phenomenal transparency as a spatial abstraction, Colin Rowe and Robert Slutzky recount Gyorgy Kepes:

> *'If one sees two or more figures overlapping one another, and each of them claims for itself the common overlapped part, then one is confronted with a contradiction of spatial dimensions. To resolve this contradiction one must assume the presence of a new optical quality. The figures are endowed with transparency: that is, they are able to interpenetrate without an optical destruction of each other. Transparency however implies more than an optical characteristic, it implies a broader spatial order. Transparency means a simultaneous perception of different spatial locations. Space not only recedes but fluctuates in a continuous activity. The position of the transparent figures has equivocal meaning as one sees each figure now as the closer, now as the further one.' (45)*

The pedagogical objectives of this interior design, design-build project, aimed to demonstrate the importance of tectonics in developing design work, while at the same time, demonstrating the relevance of basic design principles in built work. A goal was to explore how a design idea, 'parti', or lessons learned in basic design, such as transparency, proportion or the golden section, could remain valid and informative while a project is developed, from schematic design through construction, with the realities of program and structure.

This project built upon lessons learned on two earlier design-build projects undertaken at the New Jersey Institute of Technology and at the University of Texas at Arlington. *Taking time* to reflect upon these two projects informed the third project at Texas Christian University.

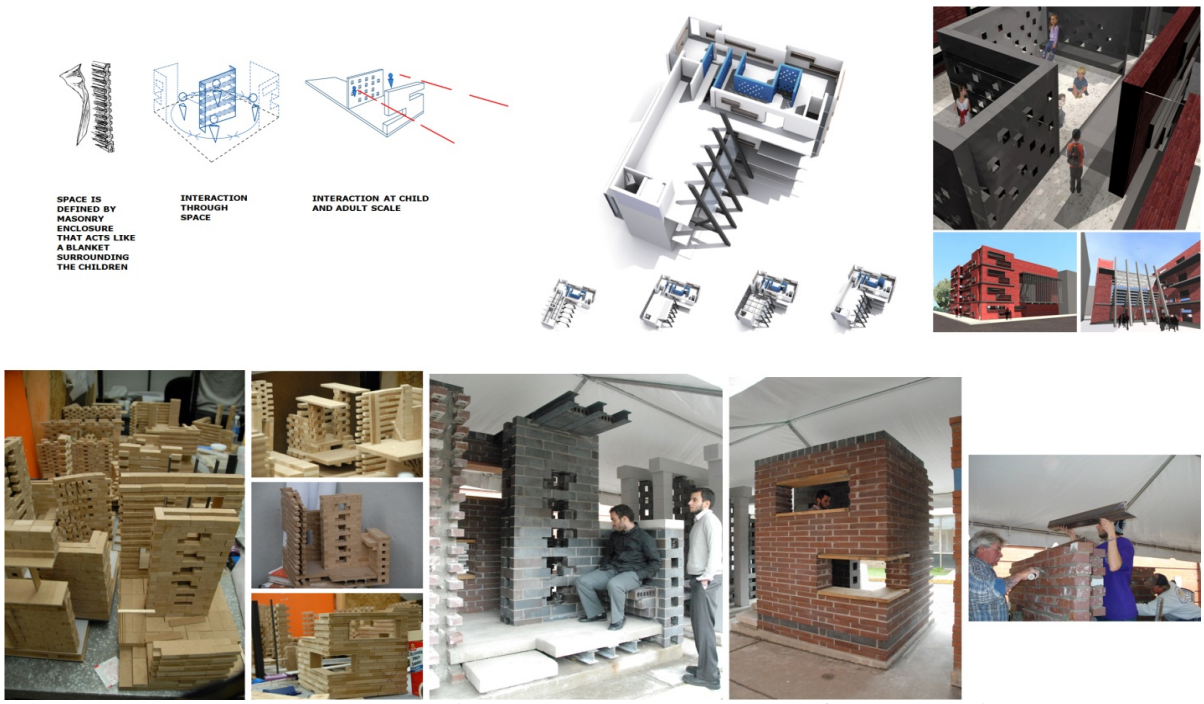

Figure 1. Montessori school concept sketches, building design, and tectonic fragment, Newark, New Jersey.

NJIT

The first design-build project was a full-scale, built fragment of a Montessori school with an emphasis on masonry construction (Figure 1). This second-year undergraduate architecture studio began with a reading of Frampton's chapter on the tectonic development of Mies van der Rohe's works in Studies in Tectonic Culture: The Poetics of Construction Nineteenth and Twentieth Century Architecture (159-207). Students made drawings and models of Mies's brick country houses, including the Wolf House, the Josef Ester's House, and the Hermann Lange House. Students were each assigned one of these houses to propose a design for a small detached structure to hold an architectural archives dedicated to Mies's work. This assignment was followed by the major project of the semester, a Montessori School in the historic downtown of Jersey City, once again with an emphasis on Masonry construction. Students each built, brick by brick, 1/2-inch scale models representing a tectonic condensation of their design. One design was selected by the studio to be realized as a full-scale, built fragment of the Montessori school in masonry construction. The pedagogical question asked was: can construction be used to inform design concepts, and can design concepts remain evident in the final realized construction?

Students desired to poetically express particular qualities of masonry construction in much of the detailing. However, one detail remained resolved maintaining the abstraction of form with a pragmatic, rather than poetically expressive, structural response: for the double-cantilever of a corner window with heavy masonry overhead, a hidden steel lintel was employed as the solution.

Ironically, this could be compared to some of Mies's own frustrations in developing large openings out of masonry walls in the brick country houses of his early career. Mies was frustrated with the heaviness that resulted from the masonry walls to achieve the lightness he desired in having large spans of

retractable glazed openings. The requirements of construction ultimately lead to massive walls about two feet thick and required unexpressive steel lintels for the structural demands of the masonry openings sought by Mies.

Figure 2. Gateway Park Pavilion, Arlington, Texas.

UTA

The next design-build project built upon included the design and subsequent construction of an community square and outdoor classroom for a low-income housing community (Figure 2). This work took place over several semesters, beginning as a graduate-level architecture and urban design studio that was later developed into two undergraduate and graduate courses on the poetics of construction; one with a focus on heavy earthwork stereotomics and the other with a focus on light skywork tectonics. The pedagogical emphasis of the design studio was on the intersection of tectonics, corporeal urban program, and environmental performance, including rainwater collection, shade, and ventilation. A double-cantilever reappears, this time in the form of a butterfly roof, that later became one large sheet roof, for rainwater collection, shade, and ventilation, with a central line of six double-columns holding down the gigantic, steel kite-form.

During the construction of the earthwork structure, a student asked about the perceived disappearance of foundational concepts in realized works, such as the Fibonacci sequence and the golden section, taught in foundation design studio. The Fibonacci sequence was expeditiously scored into the concrete floor of the honorific entrance ramp as a kind of as syncopation to go along with one's bodily movement as one ceremoniously processed up the ramp, but the question remained to be answered more assiduously in the following project.

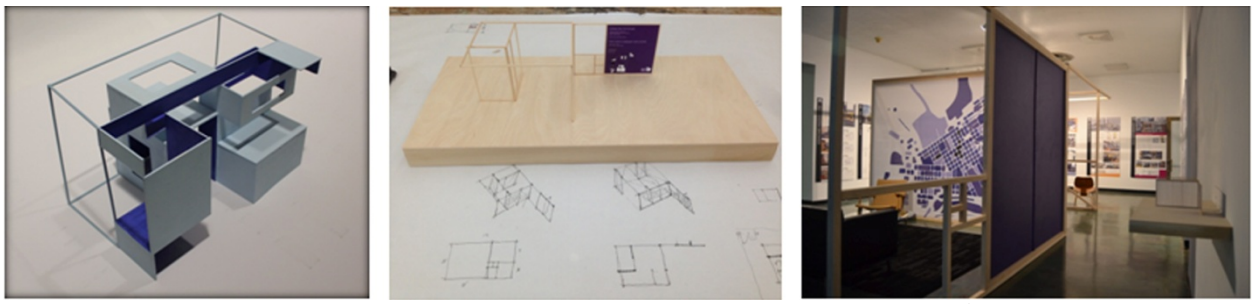

Figure 3. Spatial transparency project and interior design senior thesis exhibition design process work and installation, Fort Worth, Texas.

TCU

While assigned to teach both the sophomore-level foundational studio as well as the senior-level design-build course within a four-year undergraduate interior design curriculum, the pedagogical strategy here asked senior design-build students to recall their sophomore studio work to inform the design and construction of their senior thesis exhibition (Figure 3).

The pedagogical objectives aimed to reinforce foundation design teachings in this built work, emphasizing spatial transparency and proportion alongside tectonics, through a full-scale construction. Employing analog models, in tandem with other methods of design inquiry, ie: sketching, drafting, digital modeling, etc, thirteen students began working individually, and eventually as a single team to design, develop, fabricate, and install an interior design senior thesis exhibition. Looking back at a basic design exercise produced almost three years earlier, with an emphasis on spatial transparency and proportion, including the golden section and the Fibonacci sequence, work commenced with sketches as well as analog modeling and digital drafting. As the project progressed, students quickly resorted to digital modeling almost exclusively, which resulted in a project that simply would not stand up. The students' proposed solution was to jettison the abstract spatial qualities that made the initial design so desirable for a more pragmatic solution that fundamentally broke with the underlying virtues of the project. The design parameters mandated that the structure be lightweight and self-supporting, but difficulty arose in structuring a thirteen-foot cantilever that was a major space-defining element of the design and could not be held up by columns anchored into the floor, nor could it be suspended from the gallery's ceiling. This thirteen foot by thirteen foot element would be floating over a full house of students, professors, and parents at the opening reception of the thesis exhibition, on the evening before the university commencement ceremony. By returning to analog modeling experiments to empirically test the structural statics and dynamics of the design in conjunction with gravity, a solution was ultimately developed that included L-shaped wall elements with diagonal bracing, poetically emphasizing proportion, capable of producing a double-cantilever.

When it came to realizing this final project, constructed at full-scale, students relied heavily on analog modeling and were quick to discard abstract discourse for construction first and foremost. In the end, in this final design project of their undergraduate careers, and their first built work, students gained a fundamental first-hand understanding of the potential symbiotic, poetic relationship between abstract discourse and construction.

Conclusion

In the final analysis, architecture and interior design are material arts that involve the assembly of physical materials, with requisite detailing; but as arts, architecture and interior design must also stand up to discourse.

This last project serves as a curricular and pedagogical model, for studio professors whose design courses are 'bookended', teaching both first and final years, to allow symbiotic relationships between basic design and more comprehensive or integrated design, thereby extending the absorption period of a complex, multilayered education, and allowing students to TAKE TIME to RETURN to PAST EXPERIENCE.

References

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2. Kepes, G. (1944) Language of Vision. Chicago: Paul Theobald, p.77.

3. Rowe, C. and Slutzky, R. (1963). "Transparency: Literal and Phenomenal." Perspecta, 8, Cambridge: MIT Press, p.45.