

Between the End and the Beginning: Design-Build Teaching Through the Lens of the Solar Decathlon

Architecture, which has always involved drawing before building, can be split into prior and subsequent activities: design and construction. The building can be discarded as an unfortunate aftermath, and all the properties, values, and attributes that are worth keeping can be held in the drawing; perhaps a better way of putting it would be to say that they retract back into the drawing.¹

INTRODUCTION

Robin Evans' comments, offered as part of a broader review of Daniel Libeskind's *Chamber Works: Architectural Meditations on Themes from Heraclitus*, seem a strange point of departure to reflect on constructing architecture. Written in 1984, Evans' thoughts were a provocative reminder that architecture's meaning was not entirely defined by the act of construction, and that a critical uncoupling of design and construction could yield profound and powerful architectural potentials. In that era, architectural education favored experimentation through the reflective crafting of spatial ideas, probing issues of our discipline's interiority as situated within and amongst other forms of linguistic, artistic, cultural, and social production. Like many of today's educators, we came of age during precisely this moment. The educational experiences upon which our fundamental architectural beliefs were founded reinforced the potency of architectural meaning as being influenced by, but independent of, construction.

As we donned mortarboards and prepared to engage the material world of practice, the architectural academy was just beginning to recognize the emerging voices of design-build methodologies as a critical counterpoint to design pedagogy. In hindsight, this interest in hands-on building is not entirely surprising, as it helped offset the earlier retreat of architecture towards an exercise of images and words. But more importantly, it reminded the discipline that direct encounters with materials and construction provided a kind of learning experience that transcended theoretical trappings and offered the potential meanings found only through the making of "real" things.

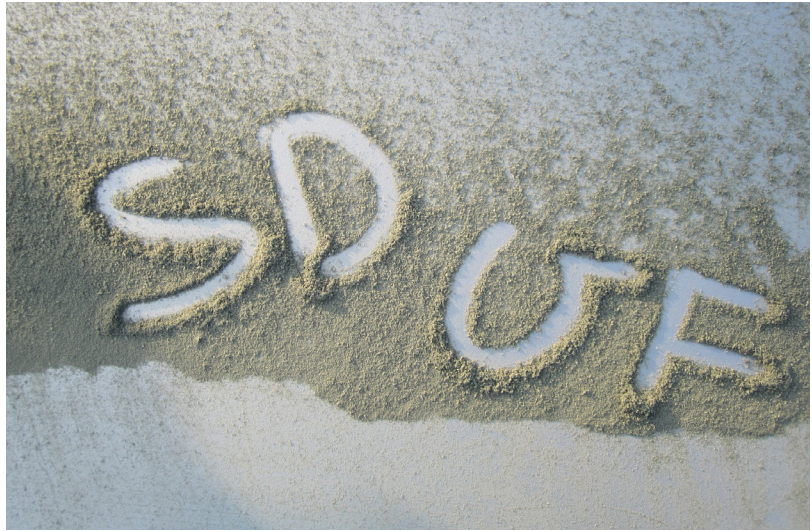
In retrospect, what stands out to us is not the apparent dispute between the primacy of either theoretical prowess or material mechanics in architectural education, nor do we wish to create a tempest where one does not exist. Rather, we are interested in exploring the distinctions, overlaps and syntheses between these two principles within design teaching, the potential ends that might be reached, and

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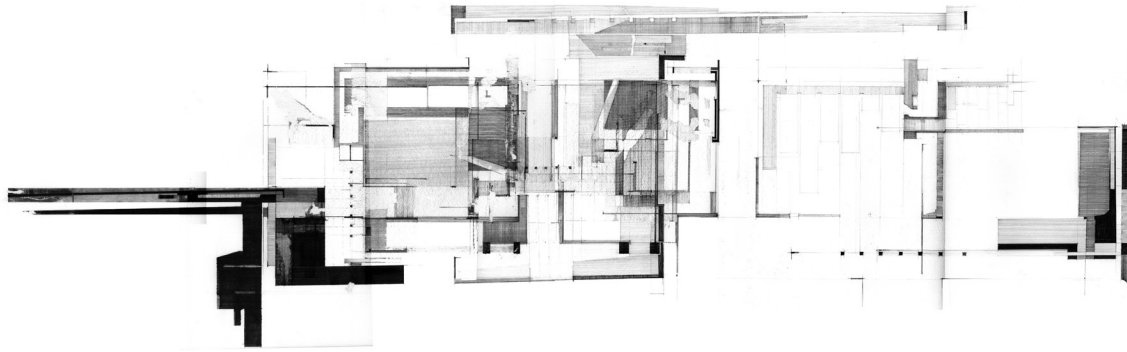
most importantly the knowledge they imbue, both explicit and tacit. We see the opportunity to probe issues of learning that cannot be taught and architectures that cannot be built. We sit at a curious moment, closing the chapter on one solar decathlon house and the initiating of a second. As we take a moment between these two projects, we find ourselves reflecting on both theoretical intents and material realities, and in doing so wishing to examine the broader role of design-build projects within the layered fabric of design pedagogy.

Before we go traipsing through the fields between the constructed and the imagined, we feel it important to offer two caveats to our escapade. First, we have employed two projects, namely the Solar Decathlon and Libeskind's *Chamberworks*, with the understanding that each of these projects serves as a proximal bookend to our arguments, the former indicative of the broader family of design-build projects and programs, and the latter anchoring the varied and layered world of theoretical constructs and architectural conceptions. Our choice of these two projects is not without cause. Both the Solar Decathlon and *Chamberworks* share the curious position of being exceptions within their genre of associated projects. Like an eccentric uncle who prefers the tease his more normative family members, each of the projects has stretched its familial ties to the tautness and resonance of violin strings.

Libeskind's *Chamberworks* has become iconic in its architectural footing and effect, though it is difficult, if not impossible to define it as being architecture in any conventional sense. Evan's goes to great lengths to unpack Libeskind's work and reorient it in more approachable terms, though precise alignments even evade Evan's insights, resulting in his depiction of the drawings as "tea-leaves in the cup, the split entrails of the eviscerated dove, distributions made in such a way that they cannot be fully understood even by their author."² In this light, *Chamberworks* becomes a distant relative even to other unbuilt work, uncoupled from the most fundamental graphic conventions and visual languages of architecture. That being said, what *Chamberworks* does provide is a glimpse into a project's making, those early critical steps that anticipate an idea only to be consumed during the slow migration from conception to construction.

Similarly, but in a radically different manner, the Solar Decathlon aligns with the broader aspects of design-build pedagogy insofar as it is both designed and built within an academic setting. Beyond this alignment, however, a decathlon house is an odd bedfellow to design-build thinking, and more so to the broader curricular

Figure 1: Student Notes drawn in the sawdust during construction. (Photo: Clay Anderson)



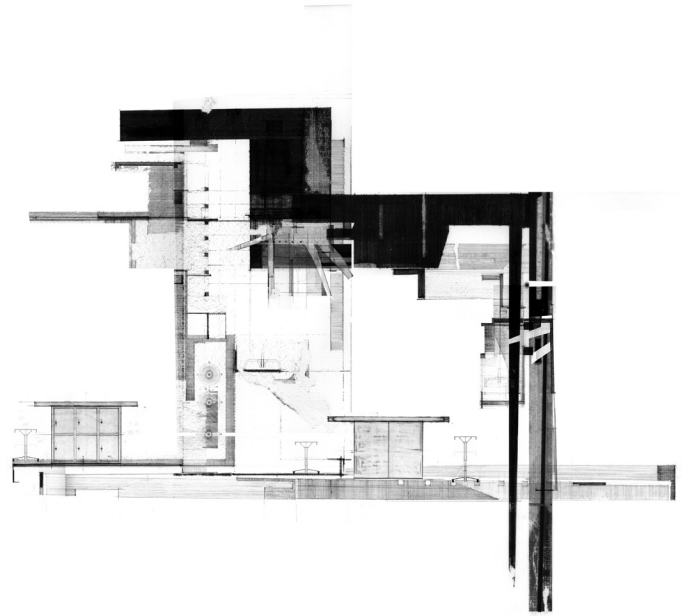
aspects of design pedagogy in general, wherein more orthodox expectations of program, site, material and occupant may be ill-fitted, displaced, or disregarded relative to the expectations of the competition. In this regard, the house may be considered as serving two opposing ends; that of a simple vessel for living at one moment, the second as a siteless nomad whose pilgrimage crests but for a moment within a sun-flooded spectacle, followed by a slow conclusion towards architectural anonymity.

With our first exceptions noted, the second caveat may be readily apparent to the seasoned academic. Though our intent is not to be deliberately irreverent to all of the protocols of academic writing, we feel it appropriate to employ first-person writing, in part to help keep our thoughts tethered directly to the issues at hand, but more so to serve as a reminder that the creation of a project, particularly design-build exercises that depend on hands-on learning, can and should be understood from the first-person point of view. Though there is undeniable value in the detached and objective review that third-person writing affords, we cannot support nor are we interested in ceding our thoughts and observations to an academic catalog, captioned and filed away, as if they merely exist as inventoried specimens left “sprawling on a pin.”³

INTO THE BETWEEN

With this in mind, we will begin our journey as we have experienced it – at the beginning. As noted in the introduction, our initiation to the architectural academy was rooted in a time when design pedagogy had distanced itself from the strictures of practice in favor of greater experimentation in the design process, retreating as Evan’s quote suggests, to a world of drawing, uncompromised by the realities of construction. As students, we admired, perhaps idolized, the radical thoughts that these drawings suggested and our desks were consistently littered with the monographs of contemporary designers whose architectural acclaim was established through drawing first; Libeskind, Hadid, Mayne and Rotondi, Moss, Holl, Darden to name but a few. Much of our training in conceptual thinking was rooted here, wherein the spatial dimensions of the page were pushed to carry the fullest intellectual weight that we could bring to bear. Elaborate narratives often accompanied our work, replete with metaphors, symbols, and quotations desperately trying to weave together our poetic, lyrical, and prosaic thoughts. We were taught that the ideas of construction were inadequate to fully harness the power of our ideas, that

Figure 2: *Usufruct: Context of the Space of Exchange*. Student work by Will Zajac. This image is one of several theoretic propositions. Though this kind of work still persists in our school, the majority of students shift quickly towards conventions and lose the potentials that this kind of drawing might offer.



³ the architectural potentials were rooted in conceptual underpinnings and theoretical principles first, and that material thinking alone might lead to beautiful, but conceptually shallow work.

Peter Cook, in writing about the power of narrative in drawing, notes that; “We have been led to believe the unbelievable through drawing. Now we are tempted to set up in our minds a series of belief/disbelief/belief/disbelief. We are itching to know the story for it is both an architectural space and a scenographic construct.”⁴ This notion that narrative became a powerful tool in our work, infused in such a way as to simultaneously bear witness to both the highly personal act of drawing and the highly public act of viewing

In looking back to the close of our education, it is of little surprise that the shift away from drawing-centric thinking was emerging. As Cook notes of this time,

Then the 1990’s developed as a period in which many of the paper architects began to build and prove that their extensions of the vocabulary of architecture could be applied. Many of the drawings in this book are by those who were at one time influential as ‘unbuilt’ or ‘drawing’ architects before they started to build (I know, I was one of them). The effect on the galleries has been mixed, with drawings being published in newspapers for visualization purposes to reveal to a general public a proposal for a likely building. This has pulled back the contemplation of serious innovation into the coteries: the schools of architecture or the reviewers of competitions⁵

Figure 3: *Usufruct: The Space of Exchange*. Student work by Will Zajac.. A second part of the *Usufruct* proposal, in which a space for exchange between two people. This project was prefaced by an earlier query into the ideas of time and measure, as proposed in the project brief. .

The retreat of drawing into the academy provided insulation from the pressures of practice, and more so preserved the invention that drawing provided while avoiding the pesky intrusions of materials and construction. This isolated position, however, also encouraged a self-referential kind of process, wherein reality was limited to the page only, and merit judged only by those literate in reading the work. In simple

terms, architectural thinking had become in service of primarily itself, enrobed with theoretical rhetoric and conceptual aplomb, unconcerned with the larger issues of the built environment or the people who lived and worked within it.

The counter movement that emerged at this time challenged the intellectual heft of its predecessor with the brilliance of simple thinking, immediate impact, and positive outcomes- all realized through the toils of hand-labor and the lessons of bruised knuckles, splinters and the plain language of the construction site. Though the roots of design-build pedagogy extend further back than the 1990's, it is fair to say that the emergence of the Rural Studio in 1993 raised the stakes on this kind of hands-on learning, laying bare the theoretical obstructions as inconsequential and misguided, while reinforcing the ethical and moral foundations of architecture as a part of the building arts, and more so that this transformation would need to come from the academy, not the profession. His pithy words expose this position with folksy clarity;

“Screw the theory; choose the more beautiful.”⁶

The relevance of this moment is not merely anecdotal. The principles of design-build pedagogy had begun to surface years before the Rural Studio opened shop, and while the Rural Studio may still garner much of the attention nation-wide, the realities of learning through construction have entrenched themselves into most, if not all, architectural programs in some way. It is through this kind of thinking that the Solar Decathlon found its footing in the academy.

Since its initiation in 2002, the Solar Decathlon has matured into one of the most vibrant and visible student-based design and construction projects. Catering to an international audience, the decathlon “challenges collegiate teams to design, build, and operate solar-powered houses that are cost-effective, energy-efficient, and attractive.”⁷ The alignment of this challenge with the broader aspects of design-build programs is fairly clear, though this initial statement tends to mask complexities and curiosities of a decathlon house in comparison to more conventional design-build exercises. In all fairness, the comparisons of a decathlon house to other design-build projects tends to work only in the broadest definitions of *design* and *build* in design pedagogy. Most design-build project are bounded by, and perhaps benefit from, the academic constraints of schedule and resources, as well as the constants of a fixed site, client, and often budget. More so, most issues can be studied and resolved with minimal conflicts between the principles of design and the process of construction. The decathlon experience, in contrast, asks students to reconsider the design problem on multiple and often competing fronts. As we noted previously, the house can be envisioned as simply a domestic vessel, but this simplistic view is quickly trumped by the demands of the competition, whether those be the demands of multiple site conditions, the logistical complexities of shipping a house, the overt limits of available resources (and there are rarely, if ever enough), or the uncertainties of the house's demise once the competition closes.

It is from this point that we offer both a set of reflections, observations and speculations on the decathlon's current residence within the broad and varied world of design-build pedagogy.

IS IT REAL/IT IT TRUE?

Cook, in his wisdom, notes of drawings that,

“In certain respects, this intensity directs us more clearly than the built building: it holds onto the vision while only occurring on a piece of white paper, whereas the house, though finely executed, is subject to its surroundings, the



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Figure 4: *Project Re:Focus*. The north, bi-folding screen system as constructed in Madrid by the University of Florida Project Re:Focus team for the 2010 Solar Decathlon Europe Competition ¹²

time of day, the state of the materials in wet or dry weather and the like. So we have another paradox: that the drawn building is more pure, more concentrated than the built building. Is the latter the real thing but the former the true thing? A tricky question.”⁸

Tricky indeed. The struggle to preserve conceptual clarity as a project moves from the seeds of an idea towards the realities of construction is a challenge for even the most mature of practitioners, let alone the naïve enthusiasm of students eager to dispose of complicated words in favor of swinging a hammer. We have found that even the perceived reality of construction can quickly hobble the conceptual side of a project, as if those early, uncertain generative marks carry no weight whatsoever in the realities of materials and construction. Our first decathlon house demonstrated this sensibility in our students in an immediate and persistent manner. While their initial thoughts about the project could never be mistaken as probing the deepest recesses of architectural theory, they did have a conceptual grounding in the ideas of the vernacular, the role of place-making in the project, and the broad aspects of modular theories and precedents. What was surprising, however, was the speed with which these early, conceptual seeds were thrown to the wind, displaced by issues of material and construction. More surprising to us was the discovery that once gone, these ideas were difficult to resurrect in the project beyond rhetoric. Our students struggled to find traction when the realities of the construction process appeared, the students could only confront the project through fragmented thinking, as if each problem addressed in isolation would yield a cohesive whole. In hindsight, we could have exerted greater influence at these points and attempted to recall the broad, conceptual goals of the project, but it is unlikely that our students would have been willing or able to look to the forest when they were so deeply obscured by the trees before them.

As we look to a student team at the early stages of our new decathlon house, we are optimistic that they are better prepared to address the transition from the conceptual to the concrete, and that we can better advise their thinking to ensure that the conceptual is always helping to steer the project. That being said, we are concerned that some of the same myopic views are starting to emerge, and more so that our students seems either complacent with this, or unconscious to it. To ask why this pattern happens is to delve into Cook’s tricky question, but we suspect that the theoretical propositions that were so instrumental in our architectural education have become diluted to the point that the students simply don’t grasp their importance.

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Figure 5: *Project Re:Focus*. Professors McGlothlin and Walters in a brief moment of pause during the deconstruction process of the SDE 2010.

In fairness to them, we, as pedagogues, are complicit in this dilution, as we often veer away from the difficulty of developing concepts in studio, as there is potentially too much risk and too little reward. As Cook notes of this kind of endeavor, “the more cerebral approach is more demanding – and often less successful,”⁹ and given the contemporary pressure for success over failure, however essential that failure may be to learning, we opt for the security of an ensured, but hollow, success.

IN FRONT AND BEHIND

This kind of conceptual loss may be symptomatic of not just a thinning of conceptual thinking in design curricula, but also of a struggle with how it can be introduced and maintained. Our recollections of our studio experiences, though tinged with a degree of nostalgic longing, remain critical, particularly in terms of how conceptual underpinnings were suggested, integrated and reviewed. More often than not, the ideas of a larger theoretical posture were expected to be within the work, etched in such a way as to be beneath each mark on the page, born of metaphorical origins to reveal these to a critic willing to dig. Evan’s suggests that this kind of digging is both common and expected, setting “the critic in search of origins, essences, intentions, motives, causes, for these are the things that lie behind appearances.”¹⁰ This kind of reading in our own work, and perhaps by extension our students’ work, is equally common, as if the meaning and importance remains buried by intention, and that we, as critics, enjoy the excavation. What is curious in Evan’s review of Libeskind’s *Chamberworks* is not his suggestion that a similar kind of mining could be done with these obscure lines and strokes, but rather that it would be an exercise of futility to do so, as the *Chamberworks* drawings do not carry such buried origins and meaning, but rather speculate on architectures yet to come.

“But then if we cannot look behind them, we must look in front for the things that the drawing might yet suggest, might lead to, might provoke; in short, for what is *potent* in them rather than what is *latent*.”¹¹

To bind Evan’s observation to the world of the decathlon is a stretch, but one worth making. In our students race to comprehend the project and define its boundaries, the world of uncertain, speculative drawings has been largely overlooked. In our first house, we had initially thought that the design process was struggling to find meaning because we could not unpack the project and find the encoded meanings and metaphors. Simply put, they were not there. This wasn’t a failure of thinking on the part of the students so much as the result of a quickly packaged set of issues that displaced, overlooked and neglected those early, uncertain, pregnant, and potent lines.

What is more present to us is the degree to which these generative marks are absent in many design studios, not merely those geared towards constructional ends. Though our foundation studios spend a great deal of time, effort and resources in the development of process, and particularly a process that insists on speculations that encourage inchoate architectural thinking, it is clear to us now that the pressures for architecture as a built system, whether realized materially or through imagery alone, has largely discounted any sensibility about conceptual importance or influence. In this regard, though we are champions of the decathlon experience, we can also express a sense of regret that the houses exhibited in the competition, our house among them, seem to have sidestepped their conceptual origins in order to be built.

ENDNOTES

1. Robin Evans, "In Front of Lines That Leave Nothing Behind," in *Architectural Theory Since 1968*, ed. Michael K. Hays, K. Michael. (Cambridge, Mass: The MIT Press, 1998), 488. Print.
2. Evans, 484.
3. Eliot, T.S. and Frank Kermode, "The Love Song of J. Alfred Prufrock," in *The Wasteland and Other Poems*. (New York, NY: Penguin Books, 1998), 3-7. Print.
4. Cook, Peter. *Drawing, The Motive Force of Architecture*. (West Sussex, England: John Wiley & Sons Inc., 2010), 132. Print.
5. Cook, 81-83.
6. Oppenheimer Dean, Andrea and Timothy Hursley. *Proceed and Be Bold. The Rural Studio After Samuel Mockbee*. (New York, NY: Princeton Architectural Press., 2005), 7. Print.
7. "About Solar Decathlon." DOE Solar Decathlon.: Web. 6 Oct. 2014. <<http://www.solardecathlon.gov/about.html>>.
8. Cook, 60.
9. Cook, 64.
10. Evans, 482.
11. Evans, 488.
12. The composition of the UF Solar Decathlon Europe 2010 team was developed from four academic units of UF's College of Design, Construction and Planning (DCP), the College of Engineering, the College of Business Administration and the College of Journalism. The primary faculty advisor was Dr. Robert Ries, faculty in the Rinker School of Building Construction. Additional faculty advisors included, Mark McGlothlin and Bradley Walters (Architecture), Dr. Maruja Torres-Antonini (Interior Design), Dr. James Sullivan and Russell Walters (Building Construction), and Diana Pelfrey (Public Relations). The bulk of the student team was drawn from the DCP, with other units contributing in smaller numbers of students: architecture (11 students); building construction (15 students); Interior Design (3 students); Landscape Architecture (1 student); College of Engineering (3 students); the College of Business Administration (1 student), and the College of Journalism (3 students). It is important to note that a complete listing of student contributions would be nearly impossible, though the number would easily exceed 150 including the student team.

A PART APART

Our musings thus far suggest that much has been lost in this effort, and while we could lament this loss as irretrievable, such a dark dismissal is not to our liking. Rather, we think it more valuable to reconsider what and how we introduce building in design pedagogy, and how we can elevate these efforts to assure that what we propose is worth building. In this regard, we would suggest that Mockbee's encouragement to disregard theory was perhaps timely, but not eternal. Theoretical constructs and propositions are still necessary if we, as a discipline, are to retain our critical, intellectual edge. What is important in this call is a reminder that such endeavors, whether they remain limited to the page or are able to find their way into our built environment, cannot depart from the larger aspects of our discipline. Our architectural education occurred during a time when architecture thinking seemed determined to discount the role of simple ideas, of material concerns, of constructional logics, and, perhaps most importantly, of the idea that architecture should serve more than just the intellectual elite. In comparison, design-build pedagogy, and the Solar Decathlon included as part of it, has perhaps turned too far away from the intellect to remain vibrant and engaging.

As we spend a great deal of time working with students, particularly those in their most formative, foundational years, we suggest that conceptual thinking and make become essential, and that this kind of thinking address fundamental issues of space-making as both an act of the eye and of the mind. This has presented itself to be a challenging problem, particularly as our own internal debates with fellow faculty often erupt into dogmatic struggles pitting tradition, fashion, technology, practice, professionalism, construction and invention against one another. It is perhaps of little surprise that these arguments tend to conflate the fundamental issues at hand, and often lead to a moment where any attempt to reduce the complexities of the debate is rejected as oversimplifying the issues, leading in turn to an architecturally spherical cow. Yet this kind of distillation is exactly what is necessary, a return to fundamentals of thinking and making. In fairness, the decathlon experience is not the best agent for this kind of thinking. The problems are simply too complex and the pressure too extreme. That being said, our decathlon experiences do serve as a canary of sorts, signalling that the conceptual air has grown very thin.