Plywood Panels

GJC Panels
Jeremy Hiza, 2004

Plywood is an affordable, widely available building material, utilized by the construction and furniture industries alike. This off-the-shelf product presented the potential for investigating digital fabrication techniques, specifically two-and-a-half axis CNC routing, for which two-dimensional vector (2DV) drawings determined the toolpaths. This preorder investigation produced a surface that could respond to the changing programming or environmental requirements of a given space either through material variability or built-in flexibility.

The general premise was to allow for the product to evolve through specific testing iterations, the limits of which were largely defined by the material itself. Seven-ply Baltic birch was chosen for its strength and finish quality. Initial routing was primarily two-dimensional, producing both edges that allowed bending in response to push and pull, effectively transforming a rigid sheet into a pliable surface. A subtle change in the depth of spacing of bolts dramatically affected the ease of bending and general stability. Milling two-deep resulted in picturesque slits that were not only functional. Milling to shallow depth left the sheet slightly a little less constrained. As these investigations progressed, the milling process moved to both lines of the previous edge registration and intentional interpenetration between cuts on both faces produced a less stable condition. At the scale of a room, the series of panels encourage a manipulation of view and light.
[PUBLICATIONS]

PETER ROSE: HOUSES
William Morgan
Vineyard House

IMMATERIAL | ULTRAMATERIAL
Toshiko Mori
Surface Research
fossers. "School projects rarely go much further than 'design development,' and although most of us had had internships in which we had participated in making construction documents, being the ones solely responsible for the entire process simply does not compare."

This year’s group of students has started proposals of their own Design Build project, for the community of Homewood-Breaker. When asked about how constraints of constructability might modify the conceptual design process fourth year architecture student Katrina Mcaus- nay responded that “constraints for constructability are a source for innovation — there are many parameters to take into account from feasibility to time restrictions to community impact to code restrictions and more.”

The relationship between thinking and making is one critically engaged at Carnegie Mellon throughout the five years of the school’s B.Arch. program. Materials and Assembly, a second year course taught by assistant professor Dale Clifford, specifically spotlights the mind-to-hand and hand-to-mind communication. Students are encouraged to explore and experiment through model making, combining this tactile experience with their rational understanding of structure to produce a series of iterations responding to this rigorous process.

Clifford, emphasize about the importance of working models to contribute to the development of a design, explains, “For us, working models are a vehicle to discovery, innovation, and practical application. [...] A working model differentiated from a presentation model gives us an orientation on how to proceed with a design prospect. A working model helps us to gain new knowledge about the project from multiple and varied viewpoints; it is literally a creative, pragmatic, and experimental window into the possible contribution of our work.”

The ‘real world’ as students have heard whispers of throughout our academic lives sometimes seems like a threatening storm cloud of anxiety ready to pour down on us as we graduate. But gradual introductions to this untested ground have proven sturdy enough to carry our heavy academic baggage while establishing a new comfort zone in this place you call ‘reality.’

ARCHITECTURE AND TECHNOLOGY: WE HAVE ROBOTS — ARE WE AS COOL AS GREG LYNN?
BY MATTHEW HUBER
We live in a world where five-year-olds navigate YouTube with the same mundane ease that their parents assume while perusing the morning paper. New software, sustainable gadgetry, and automated manufacturing daily appear with the revolutionary vigor of the latest iPhone app. The relationship between technological fascination and respect for tradition is becoming ever more important. The School of Architecture at Carnegie Mellon University is exploring how the analog and the digital, the real and the virtual, can grow together.

For Carnegie Mellon, however, this bend of forward thinking is nothing new. Littering its
archives are as many photos of students working lathes as drafting details or filling the books. Founded in 1909 as the Carnegie Technical Schools, the institution owes its origins to training the sons and daughters of mill workers through a hands-on approach to the latest technologies. The recent trend of bolstering novel digital processes with physical correlaries is just the latest manifestation of the school’s legacy.

The most obvious and perhaps compelling advancement on this front is buried five floors below the first-year studios in Margaret Morrison Carnegie Hall. The recently established Digital Fabrication Lab or dFab is a megagrette fit for a technophile’s dreams. The facility grants access to students to a range of equipment, including two 3-D printers, a laser cutter, a vacuum former, a CNC milling machine, an additive robot, and a massive, versatile, 7 axis industrial robot rigged for milling or other operations.

The best of a recent symposium entitled Robotic Textonics, Jeremy Ficca, AIA, assistant professor and director of the lab, invited leading innovators from similar institutions to discuss and demonstrate the possibilities of robotic fabrication in architecture. As the title of the symposium and much of the work presented indicates, Ficca believes that dFab tools are re-introducing materiality and tectonics to the discourse of architecture.

He sees the seamless integration of the lab into studio coursework as a crucial strength of Carnegie Mellon’s curriculum. Not only does the lab offer a direct bridge between digital modeling and the real world, but experience there also provides students with crucial insight into the reality of otherwise abstract drawings and images on screens. Ficca explains, “as students quickly learn, materials and processes present resistance and limitations and as a result inform design. This is not a linear process, but rather a continuous feedback loop.”

The dialogue begins as early as students’ first semester. As part of the required curriculum, Lathan and Rita Caste Professor of Archi-

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