

Architecture Studio: 2nd Year Spring '08

Spring 2008, CMU, Arch #48-205, M/W/F 1:30-4:20
Class Website: www.andrew.cmu.edu/course/48-205

Coordinator: Kai Gutschow
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Off. Hr: M/F 12:00-1:00pm & by appt. in MM202

(1/18/08)

PROJECT 2 - BLOCK SYSTEM

MINDSET: This project is intended to enrich the design process of the Proj.1 Fire Tower by engaging in architecture at the level of detail, by fabricating models of masonry building components at the scale of 1:1, and by seeking to understand the opportunities (and limitations) of working with a single, elemental building material. In addition, the project will introduce some of the thinking, software, and techniques of working with the new digital fabrication technology available to architects today and how they might begin to inform our design process.

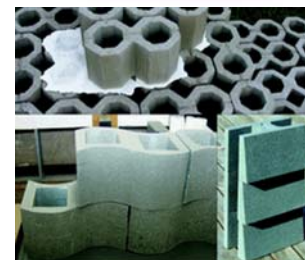
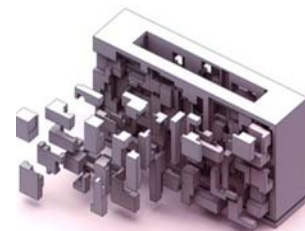
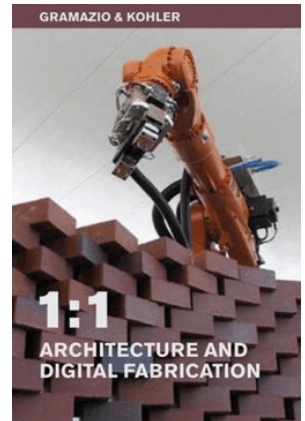
PROJECT: Your charge is to design and digitally fabricate a flexible “family” or “system” of masonry block components that can be dry-stacked, arranged to “turn the corner,” and begin to “frame an opening,” within the following constraints:

- All the components, including any kind of lintel or spanning member, must be milled out of a single block of 4'x8'x4" white foam using a large, flatbed CNC router, using only 2D tool path files (more on these technical limitations in a lecture by Jeremy Ficca)
- For efficiency reasons, we will be milling foam, as a substitute or model of a real building material. In order to integrate with the Fire Tower project, your design should model a high-end, custom concrete block of some kind (concrete can be formed in many shapes, colors, textures, etc.). Remember, however, to consider both the final design of the white foam model as an object in itself, as well as the “real” blocks you are representing and modeling.
- Your “system” may include as many different kinds of blocks as you wish.
- Your blocks may be any “size” you choose, and can be at any “scale” to a “real” building material (i.e it’s fine to create “miniature” versions of “real” blocks).
- No matter what the “size” or “scale” of your blocks, you should work at a 1:1 scale in your analog and digital drawings, and models. A recommended starting size is 5"x2"x2": blocks that are much smaller will not work well with the grain of the foam, the size of the router bit, and will be too light weight to assemble. Blocks that are much bigger will not yield enough blocks to assemble into a meaningful “system”
- You should work to maximize the overall number of blocks you can cut out of a single sheet of foam, while minimizing the “left over” material and waste.
- When cut out, the blocks should be assembled without glue to display the inherent design potential of your block system, including the variety of configurations that are possible. To stabilize the lightweight material, toothpicks may be used to keep small foam pieces in place during assembly and display, but should not form structural components of your system.

You will be evaluated on: 1) the formal design quality of the set of individual blocks and their relation to each other; 2) the experiential qualities of the overall system in aggregate, including the connections, texture, perforations, and their ability to turn the corner and create and opening; and 3) the efficiency with which you create the “2D nested milling drawing” and “tool path” files and use the foam. The results will be exhibited and reviewed during the same week as the Fire Tower reviews, and considered as part of an in-house competition sponsored by the National Concrete Masonry Association to promote student research.

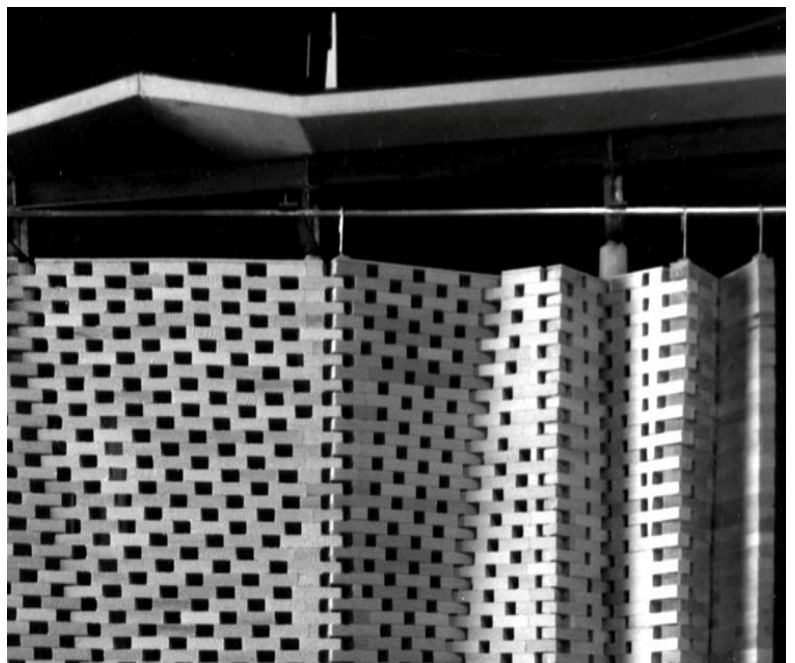
PROCESS: In order to make efficient use of time, and to maximize the learning potential for all, we have scripted the design constraints and fabrication process quite closely according the following schedule (subject to change):

- Fr. 1/18 - lecture by Jeremy Ficca on the technical constraints imposed, and the opportunities afforded, by the CNC router and the configuration in which we intend to use it, including issues of router-bit size, limiting cuts to 2D tool paths, efficient use of the material, creating the “nested milling drawing” and the “tool path files” from Rhino and other digital drawings.
- all students start individual Block System designs .
 - each studio divides into 3 groups, and each group begins “Masonry charette” to design a small installation in masonry, to be constructed 1/24 (see M&A)



- discussion by students and studio instructor about the inter-relationship of the “Block System” project, the “Masonry Charette” and the Fire Tower, including any unique focus in the studio, and the assignment over the long MLK weekend.
- Mo. 1/21 - NO STUDIO - MLK Holiday. Work independently on the Block System and Fire Tower, and in groups on the Masonry Charette (review Wed., construct Thu. On M&A field trip)
- Tu. 1/22 - Wats:ON Lecture by Kazuyo Sejima (SANAA), 7pm, McConomy
- We. 1/23 - Review “Masonry Charette” group projects
 - Crit progress on individual Block System project
 - Crit progress on Fire Tower
- Th. 1/24 - M&A Field trip to masonry apprentice center
- Fr. 1/25 - DUE: analog physical model of one block, 3D rendered model in Rhino or similar, “shaded elevation” drawing of wall
 - Review individual Block Systems.
 - Based on block designs, divide each studio into 3 fabrication groups
- Mo. 1/28 - DUE: Analog physical model, Rhino model, Shaded Elevation
 - Crit group Block Projects (P. Lewis guest ?).
 - Crit Fire Tower
 - Velux Lecture by Paul Lewis of LTL Architects, NYC (www.ltlwork.net), 6:30pm
- We. 1/30 - Crit group Block Project
 - Crit Fire Tower
- Fr. 2/1 - DUE: Analog Model, Rhino model, Shaded Elevation drawing, & Nested Milling Drawing.
 - Mid-review of group Block System.
 - Crit Fire Tower
- Sa. 2/2 & Su. 2/3 - Sign up for 1-hour slots in dfab lab all weekend. Begin creating “tool path files,” and begin routing 2x2 foam practice pieces in
- Mo. 2/4 - MID-REVIEW - Fire Tower (Lubetz + Wolff; O’Toole + Price)
 - Milling of 2x2 practice pieces (evening)
- Tu. 2/5 - Milling of 2x2 practice pieces
- We. 2/6 - DUE: Analog model, Rhino model, Shaded Elevation & Milling Drawing
 - Review final group Block Project
 - Revise & finalize Nested Milling Drawing. Then no work in dfab lab until Sat. 2/9
 - Crit Fire Tower
- Fr. 2/8 - Crit Fire Tower
 - Dfab Lab Grand Opening event, evening
- Sa. 2/9 - Sign up for slots in dfab lab to create final toolpath files for 4x8 foam and start routing. Continue all week in evenings (sign up for slots).
- Mo. 2/11, We. 2/13 - Crit Fire Tower
- Fr. 2/15 - Finish all milling and work on group Block System
- Su. 2/17 - Deadline for work on Fire Tower
- Mo. 2/18, We. 2/20 - FINAL REVIEW for Proj.1 Fire Tower & Proj.2 Block System
- Fr. 2/29 - DUE: Project Documentation for Proj.1 & for Proj.2
- TBA - possible NCMA competition jury

(See attached calendar for overview)



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Spring 2008, CMU, Arch #48-205

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OVERVIEW of Proj.1 & Proj. 2 Assignment & Crit Schedule (Subject to Revision: see www.andrew.cmu.edu/course/48-205)

Week / End	Monday	Wednesday	Friday (Lec. MM103 1:30-2:50)
#1	Jan. 14 Lec.1 (MM A14): Intro. to Studio, Proj.1 & Proj.2	16 M&A Carpentry Hand-on →	18 Lec.2: Intro. Proj.2, dfab (Ficca) Discuss Block System design process Assign "Masonry Charette" to groups Divide each studio into 3 groups VELUX Jury (3-5pm, MM203) <i>Ice Cream, 4:30, CFA214</i>
#2	21 MLK Day - No Studio Work on group masonry charette Work on Fire Tower Work on indiv. Block System <i>Wats:ON Lec.: K. Sejima, 1/22, 7pm, McConomy →</i>	23 Review "Masonry Charette" group projs. Crit progress on indiv. Block Project Crit progress on Fire Tower M&A Masonry Field Trip, 1/24 →	25 Lec.3: New Materiality Review indiv. Block Systems (analog model, 3D renderings, + "shadedelevation" dwgs.) Divide block projects into 3 groups/studio
#3 Work on group Block System	28 Crit Fire Tower Review group Block Projects (P. Lewis guest ?) <i>Velux Lec.: P. Lewis, 6:30</i>	30 Crit group Block Project Crit Fire Tower	Feb. 1 Lec.4: TBA DUE: Design for group Block Project (Rhino, Shaded Elevation & Milling Dwg) Crit Fire Tower
#4 Start milling 2x2 trial foam	4 MID-REVIEW FIRE TOWER (Lubetz & Wolff; O'Toole & Price) Milling of 2x2 trial foam (evening)	6 Review final group Block Project (Rhino, Shaded Elevation & Milling Drawing) Crit Fire Tower No work in dfab lab until Sat. 2/9	8 Lec.5: TBA Crit Fire Tower <i>Digital Fab. Lab Grand Opening</i>
#5 Start milling of 4x8 sheets groups #1-3	11 Fire tower crits Milling 4x8 sheets #4-6 (evening)	13 Fire tower crits Milling 4x8 sheets groups #7-9 (evening) Structures Midterm Exam →	15 Fire tower crits Milling 4x8 sheets groups #10-12 (evening) <i>Ice Cream, 4:30, CFA214</i>
#6 DUE: Proj.1, 10pm	18, 20 PROJ.1&2 - FINAL REVIEWS (Lubetz & O'Toole; Wolff & Price)		22 Start Proj. 4 in studios
#7	25 Lec.6: Intro. Projs. 3 & 4 (MM A14)	27	29 Lec.7: TBA DUE: Proj.1&2 Documentation