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## 3D MODELLING | CAAD/CAM TECHNOLOGIES

by Alexandre Kapellos

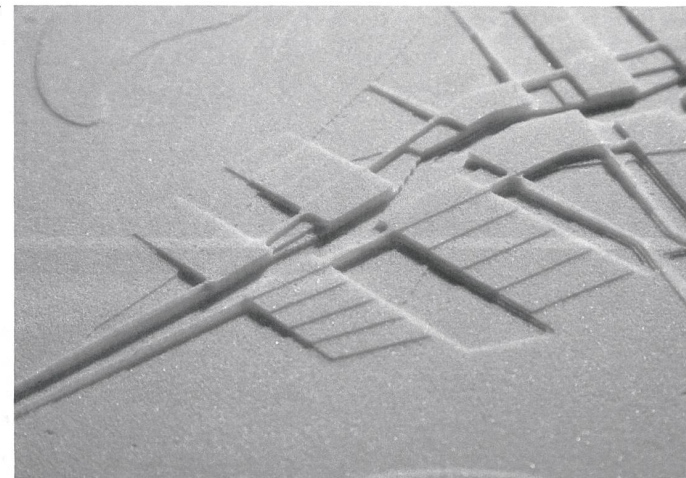
The MAS LA studio proposes to research synergies between teaching landscape architecture and using computer numerically controlled (CNC) machines as prototyping tools in the project development process. The focus of the course is not to turn students into proficient CAAD/CAM users but rather to familiarize them with landscape design and the problematic of large-scale topographical interventions and promote the use of these tools as verification instruments. Of all the prototyping tools available to the students at ETH (3-axis mill, laser cutter, flatbed cutter, 3D printer), the mill allows for the best translation between idea and model in landscape design. Of interest here is the more direct and fluid translation of an idea on paper into physical three-dimensional output, as well as the ability to continuously reshape and refine the model. The result is a series of models or evolutions, documenting the project idea as it evolves from the initial concept to the final project.

Throughout the semester the students were asked to produce a number of milled models. They elaborated an initial topographical concept developed in CAD software and milled it using foam blocks. This scale-less and abstract model showed the student's topographical concept, the project's lines of forces, edge conditions and so on. Throughout the semester, this prototype evolved in a constant exchange between scales and project iterations, gradually becoming more detailed and defined. In parallel, a more analogue approach was pursued, where students built a sand model of the complete site at a precise scale. Alterations could be made to these models more directly than on milled models, but these sand mock-ups had no 'memory': each project step was lost with each modification. It is of interest to note here that the

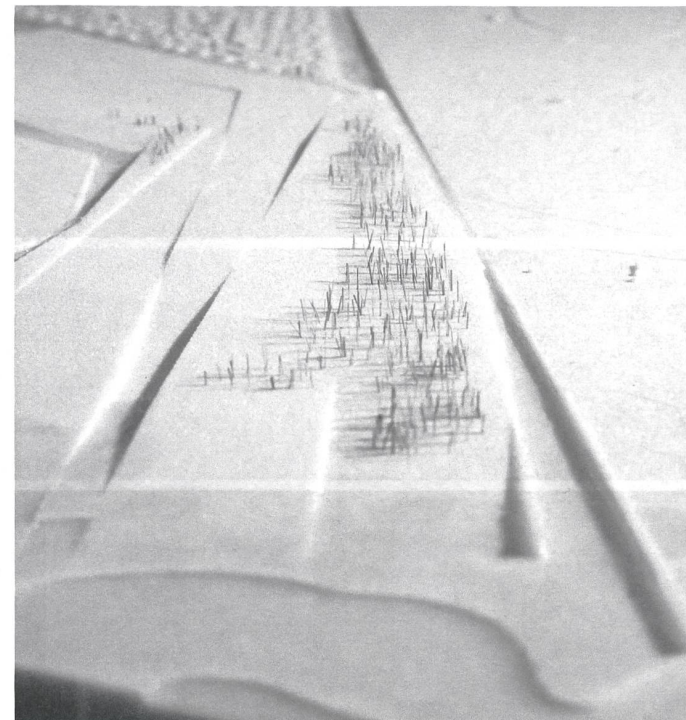
milled models often better represented the students' initial topographical idea than the drawings themselves. Formal concepts such as oscillation, folding, and compression were easier to represent three-dimensionally than graphically. Students were also pushed to experiment with different materials and modes of expression, working with plaster and wood both in section and in plan.

It is of interest to note that working with CNC technology offers an appropriate analogy to landscape design. Milling is a subtractive process in which material is taken away similar to the way landscape is modified and sculpted: earth is also subtracted (or displaced). The mill proceeds to transform a rough surface to a fine one in much the same way that a bulldozer does – by digging, terracing, levelling, and scraping.

Jin-Woo Lee & Melanie Stulz /  
CNC milled model in foam



Kirstyn Lindsay & Sibëlle Urben /  
CNC milled model in foam

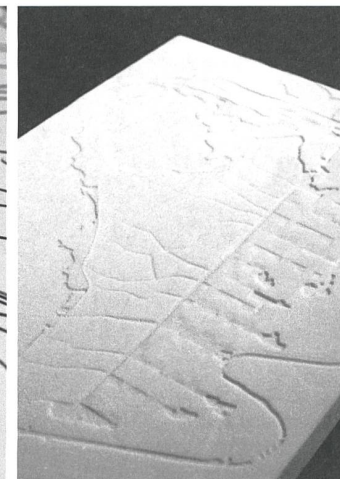




Ging Gal Metchanun / laser cut model in wood



Liesl Vanautgaerden & Matany Sack / laser cut cardboard model



Antonio Sassano & Philipp Urech /  
CNC milled model in foam



Jin-Woo Lee & Melanie Stulz /  
CNC milled model in foam

Carolyn Fickinger / laser cut cardboard model

