Machines for Architecture to Be Lived In
Advanced Studio VI Section 007
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Introduction

Architecture relies on a range of technologies to make the structures of our cities livable. In their absence, buildings would lack basic services like water and power. There would be no heating, cooling, lighting, fire safety, and elevators. Repairs and maintenance would be impossible; digital and communication technology also out of the question. The capacity to support life would be severely diminished. Architecture would be reduced to basic shelter.

Modern buildings aren't equipped to function without machines. Consider the issue of thermal comfort and fresh air: floors, ceilings, and envelopes are inadequate sources of insulation, and so buildings rely on climate control machinery to maintain reasonable temperatures indoors. Additionally, a structure of any significant size and level of occupancy requires an arrangement of respirators and tubes to be fit for human habitation. Even with the assistance of natural ventilation, outside air must be mechanically pumped in and drawn out to circulate enough fresh air to inhabit the space comfortably. Machines compensate for the building's deficiencies to control temperature and airflow. Machines allow architecture to be lived in.

Though essential in function, the mechanical system is typically cast in a supporting role that causes it to perform inefficiently. Often in the design and engineering process the building scheme is first established, then the mechanical infrastructure is fashioned to respond to the determined massing, uses, and organization of spaces. To offset thermal shortcomings, a system of heat exchangers, chillers, fans, trunks, ducts, dampeners, vents, and diffusers is inserted into allotted residual zones. The machinery tends to be oversized since the network of parts is extensive and sinuous – diverted as they are behind walls, floors, and ceilings to remain buried inside the architecture's physique. This sequence of professional services tends to diminish the system's effectiveness and reproduces a subservient relationship to a pre-set form.

Thinking about what machines can make possible, not just what they make up for, can inject oxygen into the design process. Devising buildings that are less dependent on their mechanical systems, where mass and machines work together to sustainably treat the interior, is just one aspect of improving upon this default relationship. Environmental control systems could be employed toward a more inspired aim. If current climate technology is adept enough to counteract the results of poor design, it's more than able to aid in the service of good design. Thermal controls could serve as a vehicle to explore and realize new building forms.

C-Lab's studio will consider the environmental and mechanical performance of a building as an active input of the design process. Machines are vital to the life of buildings and it would be undesirable to have architecture without them, but it would be better if architecture were itself conceived of as a machine whose forms, spaces, and technology collectively condition the interior. Certainly, this technological aspect doesn't have to be seen in the experience of the architecture, just as buildings today and for that matter building machinery, don't look like the

technologies housed within them. Instead, the form the technology takes on could be in the service of the architect's preoccupation, laying the groundwork for an inquiry about space, figuration, or urbanism. In other words, deepening the dialogue about climate technology can circulate novel strategies for how to integrate buildings and machines, and give architecture a breath of fresh air.

Program

The program will be a culture, meeting, and event space, located on the East River waterfront in Brooklyn. Similar to the role of the Manhattan's Park Avenue Armory, Paris' Grand Palais - and at a smaller scale – Milk Studios in NY and LA, the building will add to Brooklyn's cultural landscape by creating space for productions like large-scale art installations, theatrical performances, as well as parties, lectures and technology workshops.

The program is intended to question the value of neutral, 'flexible space' and to develop these areas by considering instead their form and air. Students are encouraged to approach the program as a series of specifically sized volumes, each with distinct formal qualities that differentiate it from other spaces within the building. Rather than being dedicated to a specific use, please consider each space as a set of physical parameters related to occupancy (a number of people, at a given level of physical activity, for a certain time). In thinking about the relationship between environmental control and design, the performance of the building should be conceived through a correspondence between its physical form, its environmental systems, and the activities it supports, making it desirable for an intended quality of experience rather than a conventional set of functions.

Exhibition / expo space	40,000
Lobby	2,000
Lecture halls	12,000
Blackbox Theater	8,000
Event room(s) / multifunction room(s)	18,000
Meeting rooms	6,000
Administrative rooms	3,000
Support areas (pre-function rooms, kitchen, security, restrooms, storage, AV, etc)	8,000
Bathrooms	3,000
Total	100,000
Parking	90,000
Outdoor	20,000

Site

The site is a piece of the East River Waterfront in the Vinegar Hill Neighborhood, currently the location of the Con Edison Farragut Substation. The studio imagines that the substation, which currently runs only part-time and has had several fires in the recent years, will be eventually decommissioned, freeing up a prime piece of land immediately between the Brooklyn Bridge Park and the redeveloped Brooklyn Navy Yards. The site affords many opportunities, including potential uses of the river for cooling and wind off the river for ventilation, as well as considering the relationship of the building to the energy networks of the city, in light of the site's current use as a substation.

Schedule
(A full schedule will be posted online)
Mid-review: week of 3 March
Kinne travel: week of 10 March
Final review: week of 28 April

Kinne Trip

The studio will travel to several cities in Japan. Japan is of interest as a building culture that has pursued advanced approaches to architectural technologies, as well as a nation that is currently searching for new models of energy application in the wake of the Fukushima disaster. New agendas for the relationship between buildings and energy are needed in every country, but in Japan the urgency is even greater for an ambitious rethinking. The studio will visit buildings that have incorporated inventive combinations of formal devices, construction methods and building systems.

Course policies

Students are encouraged to work in pairs so that a more ambitious scope of design can be explored and developed; students are also welcome to work individually.

Final Submission: Following the Final Review and prior to the grading deadline, the final submission will involve submitting the presentation materials, including photos of your physical model, in a digital format to an ftp site that will be provided to you.

Emphasis will be placed on a collaborative approach to formulating ideas. To promote this collective process of contributing and sharing concepts, please remember that any insight, observation, or comment made in the context of the course will be considered to be authored by the group rather than any one person, and available for use and interpretation by all.