Introduction

Thesis

Steven Holl’s work has similarities to modernism, such as open space and grids, however to “bring modernism out of its muteness,” he incorporates aspects of urbanism in his architectural designs, as in his Simmons Hall, which is motivated by a wish to achieve “porosity”, he relies on a “sponge” metaphor along with internal “lungs” and an emphasis on transparency.

Background

Steven Holl is an American architect and watercolorist, who was born December 9, 1947. With his embrace of computer technology, Holl transitioned into the digital design era of the 1900s and at the same time, he practices globally. He runs his office Steven Holl Architects in New York and Beijing.
Insisting that “the prime motivation of his architecture is anti-ideological,” Holl claims that the basis of his work is “neither sociological nor functionalist”, (Frampton & Holl, P7)

In Anchoring, (Holl, 1996) Holl states his basic principles as follows:
1. “All work is experienced phenomenologically in terms of material, light, climate and time.”
2. “Architecture is to be based on linear, planar, and volumetric elements, as these are found in either natural or cultural from, ranging from the micro-photography of crystal and plants to architectonic archetypes.”

In each project, Steven Holl explores new approaches to “integrate an organizing idea with the programmatic and functional essence of a building. Rather than imposing a style upon different sites or pursued irrespective of program, the unique character of a program and a site becomes the starting point for an architectural idea.” (Architect, 2013)
Overview of Simmons Hall

Simmons Hall
Massachusetts Institute of Technology
Cambridge, MA, United States, 1999-2002

The Simmons Hall is a part of the expansion project at the Massachusetts Institute of Technology (MIT). He integrates all the functions in one space and the hall becomes “one of the university’s art world”. It is called as a “vertical slice of city”, 10 stories tall and 382’ long, providing a 125 seat theater, a night café, and street level dining. (Holl, 2013)
“Sponge” Metaphor

The sponge concept enables interaction among students, functional design and aesthetics at the same time. Holl said that “a sponge can absorb several times its weight in liquid without changing its appearance.”

Large, dynamic openings are the “lungs”, bringing natural light down and moving air up. The urban concept provides necessary street-like amenities and corridors. “Housing dining is on street level, like a street front restaurant with a special awning and outdoor tables. The corridors connecting the rooms are like streets (11 feet wide).” (Holl, P118)

“Holes in the entry canopy play against the grid’s regular rhythm, providing a whimsical rendition of the porosity theme”. (Holl, 2013)
Transparency: Voids & Solids

“Five large openings corresponding to main entrances, view corridors, and outdoor activity terraces.” And each 9-small-windows room forms a porous “solid” surface. (Holl, 2013) Opposing architectural elements, such as “solids and voids and opaqueness and transparency” (Perez, 2010) are applied. Organic surfaces of the vertical cavities divides the space.

The wall is 18” deep, “shades out summer sun while allowing the low angled winter sun to help heat the building.” (Frampton & Holl, P212) There are more than 3,000 small openings on the solid surface.

“The abundance of windows creates a constant flicker of changing lights as the different rooms are occupied, resembling a city skyline at night. These windows also welcome plenty of sunlight and natural ventilation for each room.” (Perez, 2013)
Materials

Prefabricated reinforced concrete is arranged in a ruled surface system but “freely connected to sponge prints.” (Frampton & Holl, 2003)

“With its cast-concrete exoskeleton clad in sanded aluminum, the chameleon like building changes appearance according to light conditions.” (Sarah Amelar, 2003)

“Solar stack” glaze and curvilinear concrete stair and walls integrate with the façade of the building.

“Cast glass seems to trap light within its material. Its translucency or transparency maintains a glow of reflected light, refracted light or the light dispersed on adjacent surfaces. This intermeshing of material properties and optic phenomena opens a field for exploration.” Holl says. “The sponge concept for the new undergraduate residence hall transforms a porous building morphology via a series of programmatic and bio-technical functions.” (Holl, 2013)
“Tripartite Division Simmons’ climate system is designed to respond to conditions in each of the structure’s three sections, or “towers.” Horizontal distribution is limited by the architectural requirement for high-ceilinged corridors, so distribution occurs primarily through vertical risers. Each of the three tower roofs is fitted with an individual air-handling unit, or AHU.” (Holl, 2013)

The “PerfCon” structure is a unique design that allows “maximum flexibility and interaction.” (Frampton & Holl, P212) Separate vertical passageways divided the floor into three smaller and distinct communities.

“With bedrock too deep to reach and soil too unstable to support friction piles, the building was designed to ‘float’ like a boar in water. A volume of soil, equal to the weight of the building above is excavated”. Then “the pressure exerted by the building equals the pressure form the soil that had been removed.” (Garofalo, P212)

Computer was used to generate the structure model.
Summary & Conclusion

### Summary

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#### “Sponge” Metaphor

The sponge concept enables interaction among students, functional design and aesthetics at the same time.

Large, dynamic openings are the “lungs”, bringing natural light down and moving air up. The urban concept provides street-like necessary amenities and corridors. (Holl, 2007)

“Holes in the entry canopy play against the grid's regular rhythm, providing a whimsical rendition of the porosity theme”. (Holl, 2013)

#### Transparency: Voids & Solids

“Five large openings corresponding to main entrances, view corridors, and outdoor activity terraces.” And each 9-small-windows room forms a porous “solid” surface.

Opposing architectural elements, such as “solids and voids and opaqueness and transparency.”(Perez, 2010)

Organic surfaces of the vertical cavities divides the space.

The 18-foot depth of wall with 9 small open windows “naturally sheds out the summer sun while allowing the low angled winter sun in to help heat the building.” (Frampton& Holl, P212)

#### Material

“A porous structure enables light filter through and move air up.” (Garofalo, 2003)

Prefabricated reinforced concrete is arranged in a ruled grid but “freely connected to sponge prints.” (Frampton& Holl, 2003)

“Solar stack” glaze and curvilinear concrete stair and walls integrate with the façade of the building.

Colored window jambs are reinforced steel bars with different thickness according to the force being applied. The building changes appearance according to light because of the material used.

#### Structure

“The foundation was designed as floating like a boat in water.” (Garofalo, 2003)

“The pressure exerted by the building equals the pressure from the soil that had been removed.”

The “PerfCon” structure is a unique design that allows maximum flexibility and interaction. (Frampton& Holl, P212) Separate vertical passageways divided the floor into 3 smaller and distinct communities.

Computer generated the structure model and select windows are filled in to resolve overstressed condition.
Conclusion

Steven Holl’s work has similarities to modernism, such as open space and grids, however to “bring modernism out of its muteness,” he incorporates aspects of urbanism in his architectural designs, as in his Simmons Hall, which is motivated by a wish to achieve “porosity”, he relies on a “sponge” metaphor along with internal “lungs” and an emphasis on transparency.
References


