

Surface, Screen & Structure

ARCH A4781

Tech Elective Fall 2017 // Tuesday, 7-9 PM // Room 115

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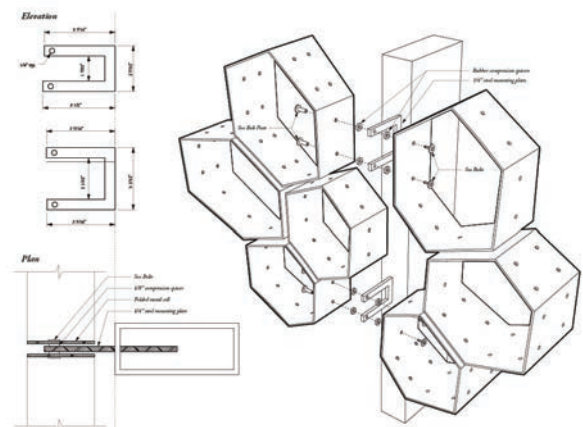
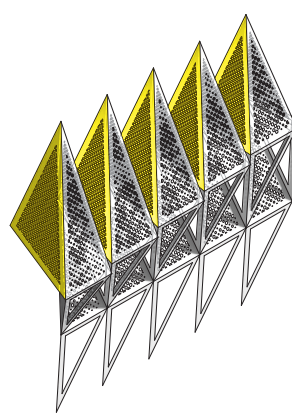
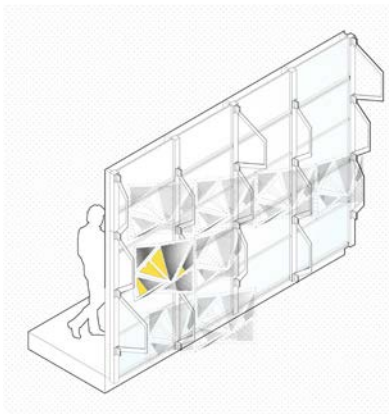
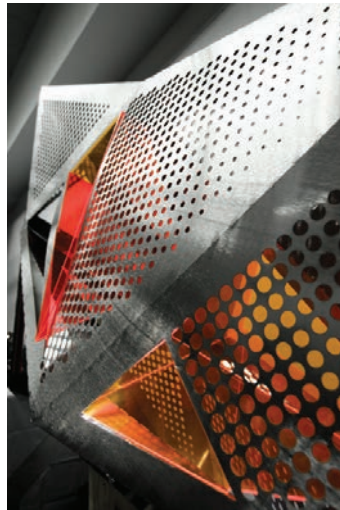
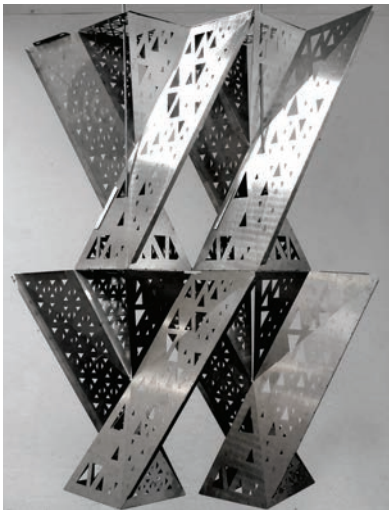
COURSE DESCRIPTION:

Surface, Screen & Structure focuses on the design and digital fabrication of stainless steel, panelized cladding systems. These systems will be designed for the New Inc building, a museum-led incubator and co-working space, located directly adjacent to the New Museum on the Bowery. Utilizing the simple masonry façade of the New Inc building as our canvas, this course challenges the students to develop a comprehensive cladding strategy in response to the diverse architectural fabric developing along the Bowery and the complex program within the incubator itself.

The cladding systems will be designed to perform as functional shading, ornamental expression and graphic branding, while engaging with the city at multiple scales. Students are challenged to design thoughtful solutions that spatially and functionally resolve their concepts within a strict set of intrinsic and extrinsic constraints. These constraints include but are not limited to: light transmittance, structural loading, thermal expansion, CNC machine limitations, assembly logistics, material properties and building cost analysis.

DIGITAL FABRICATION + PROTOTYPE:

Throughout the semester students will meet with professionals in the fields of architectural cladding, structural engineering, lighting design, rain screen manufacturing and metal fabricators in order to further refine their designs. Students will build two iterative, full-scale prototypes from 20 gauge stainless steel sheet, allowing for an unparalleled opportunity to experiment, learn and modify. Each prototype will be tested for material, tectonic and design failures, combining hands-on learning with physical optimization. All fabrication will be done with Maloya Laser and their 4000 watt laser cutter in conjunction with GSAPP's digital fabrication lab. Students will have the opportunity to learn and work directly with Maloya Laser's President, Reto Hug, and their CAD/CAM fabrication experts.



COURSE STRUCTURE:

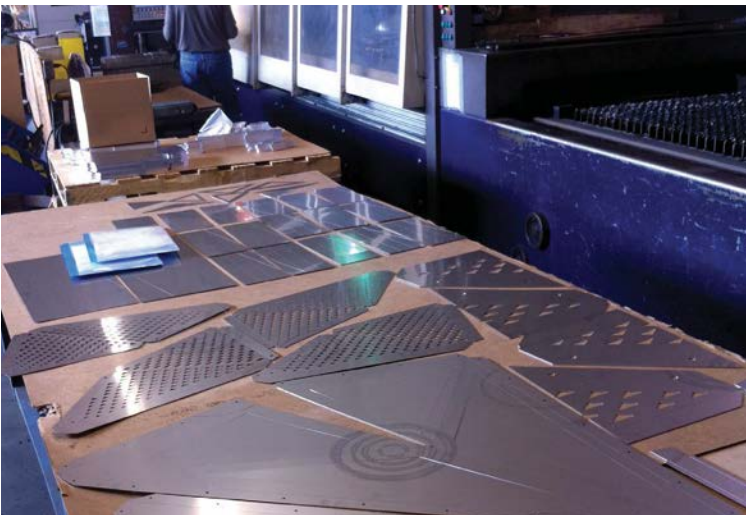
1. Utilize Rhino as generative modeling tools in order to design a screening system that is responsive to the material capabilities of metal, natural and artificial light transmittance and CNC machine techniques
2. Review design work with a structural engineer, to analyze the forces that will act globally upon your cladding system as well as locally at each joint or connection
3. Use Solidworks to create an accurate parametric model, materially and structurally, of a single connection detail.
4. Digitally fabricate two stainless steel prototypes using Maloya Laser and the CNC routers available at the GSAPP

COURSE DELIVERABLES: (per team)

1. Two full-scale digitally fabricated prototypes of your screening systems
2. A Technical Report at the end of the semester providing all the process, analysis, and technical data for your system

FIELD TRIPS: MALOYA LASER

- Maloya: Touring the advanced CNC machines and technologies with Reto Hug
- FACE Design + Build: Touring the structural metal working studio and design studio with Todd Fouser
- Possible site visits to see rain screen and sun screen systems in the process of installation



GUEST LECTURES:

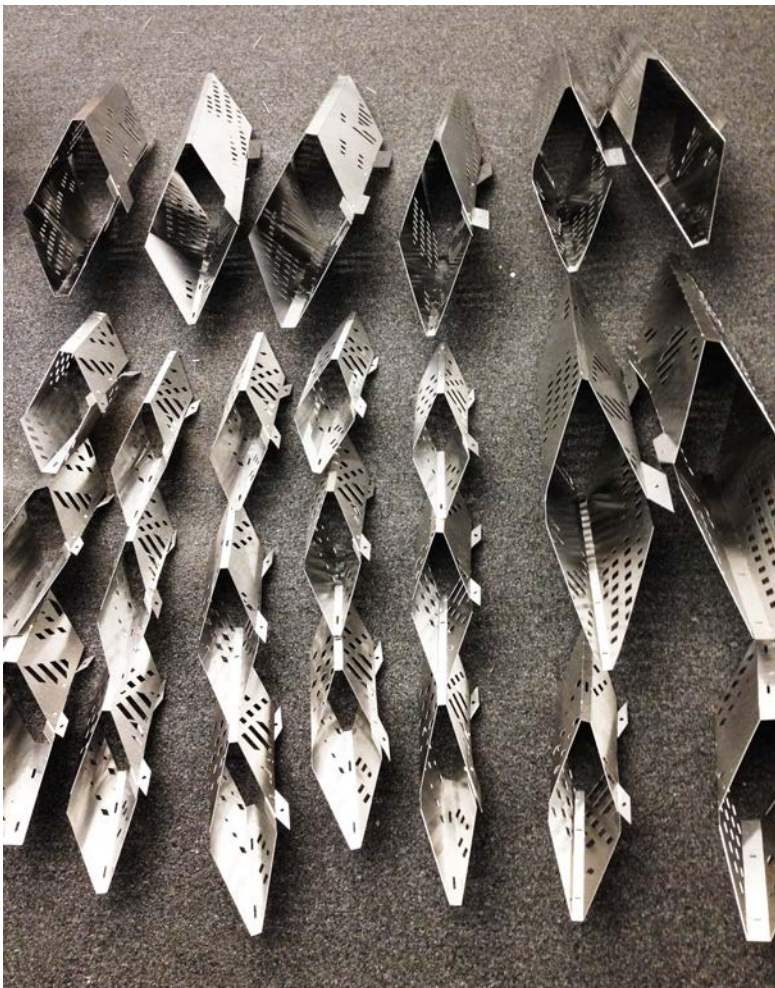
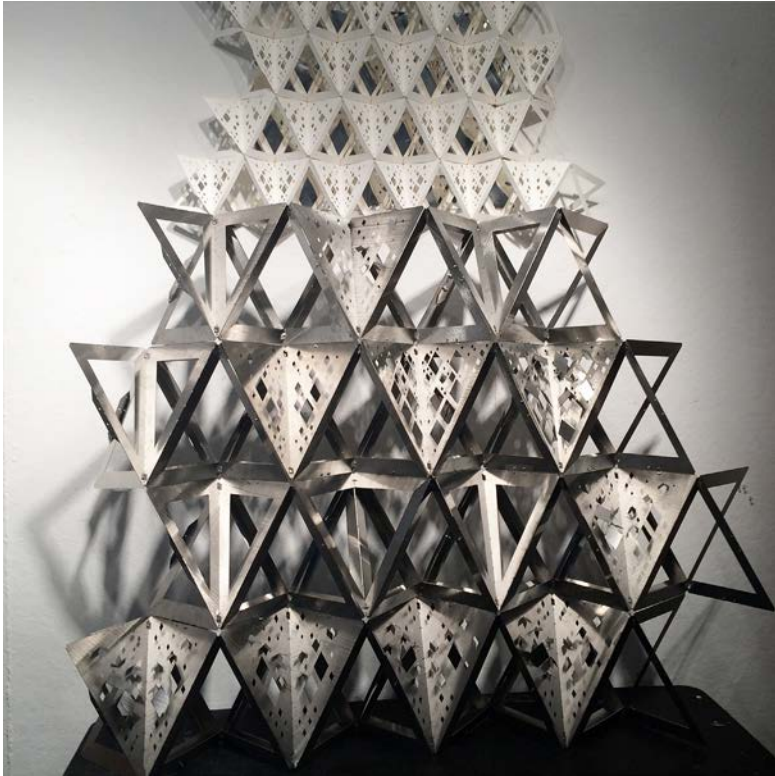
- Reto Hug: President Maloya Laser – relationships between the designer and fabricator. Optimizing for fabrication and analysis. Pricing structures and the reality of value engineering
- Structural engineer and curtain wall consultant – analysis and optimization of global and local systems (panels, armature and detail)
- Facade system manufacturer – Capabilities of the full-scale mock-up and built-up structural cladding details. Finishing techniques (black oxide patina, powder coating, galvanizing, anodizing, plating)

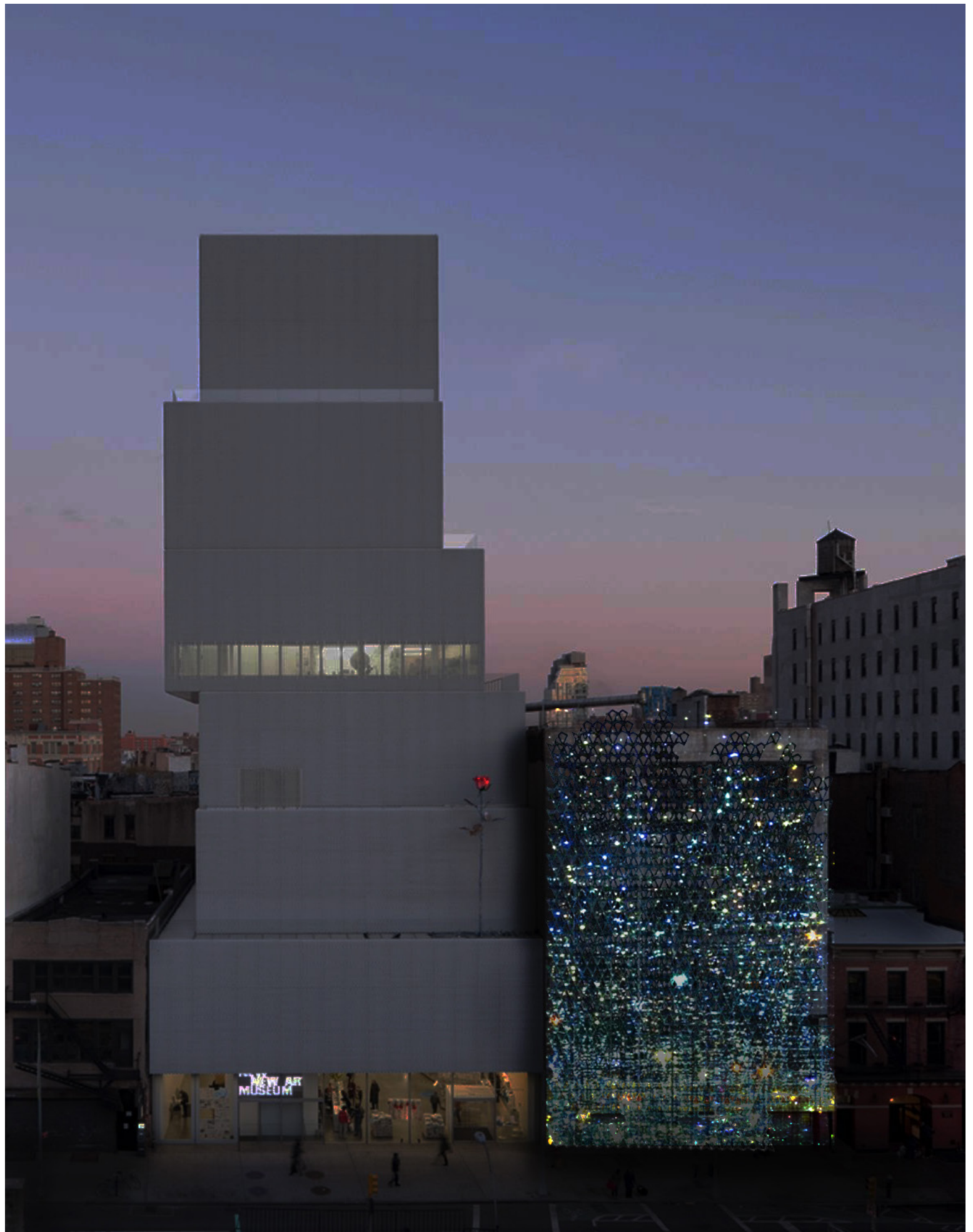
BIBLIOGRAPHY - OPTIONAL:

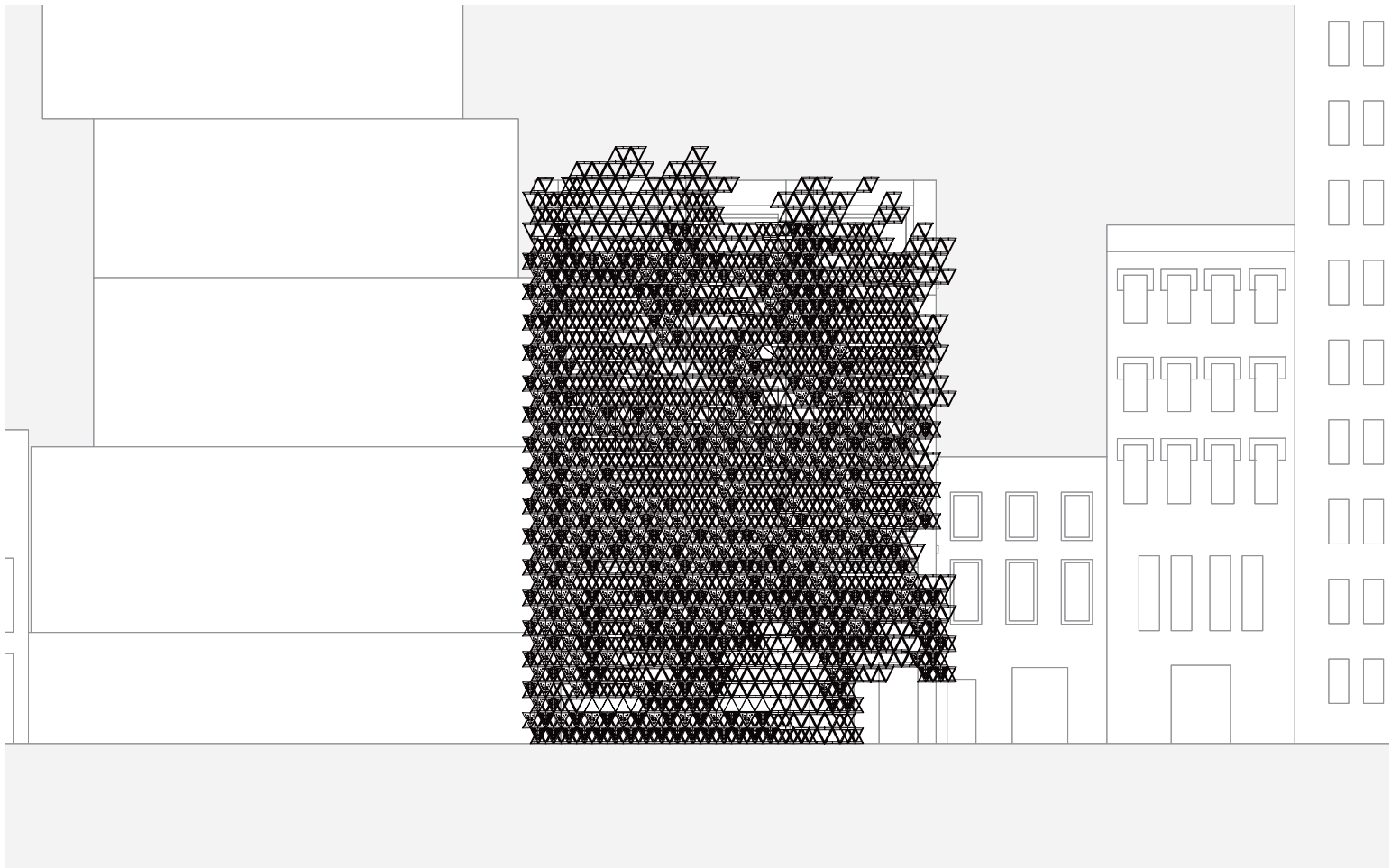
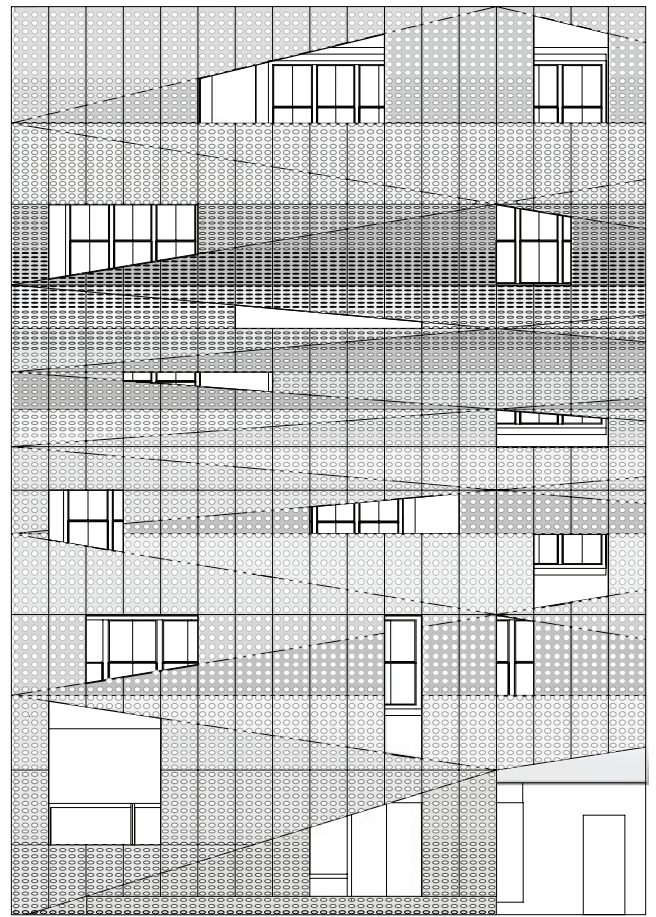
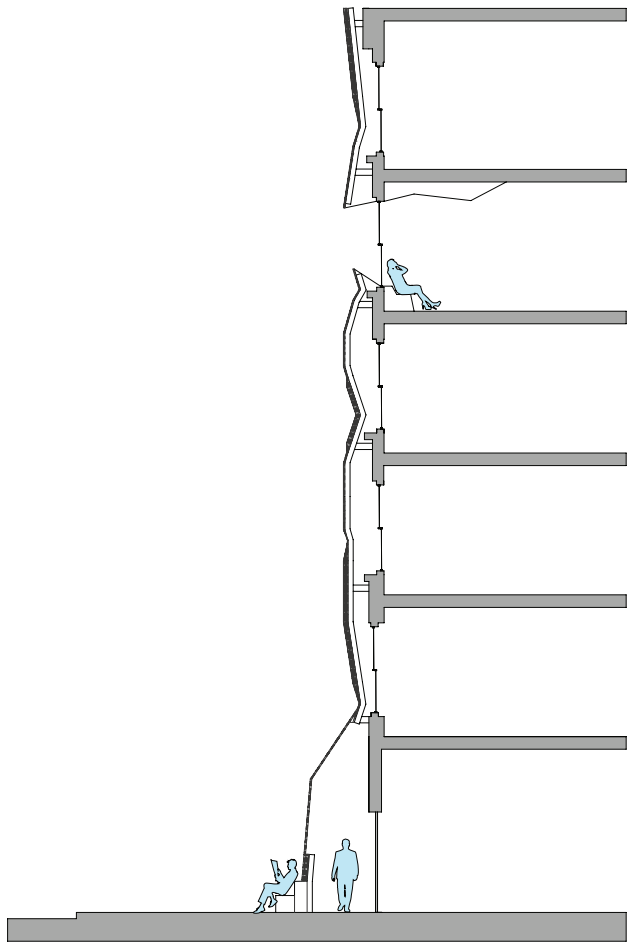
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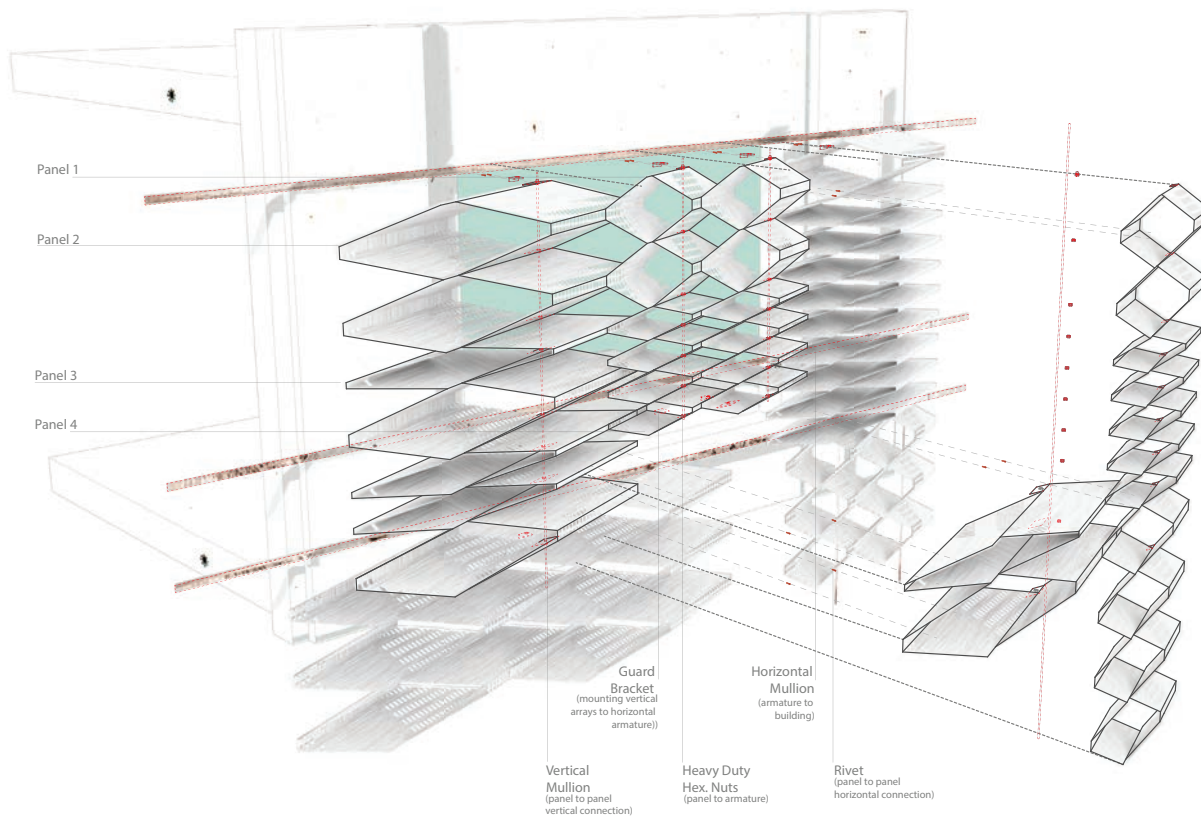
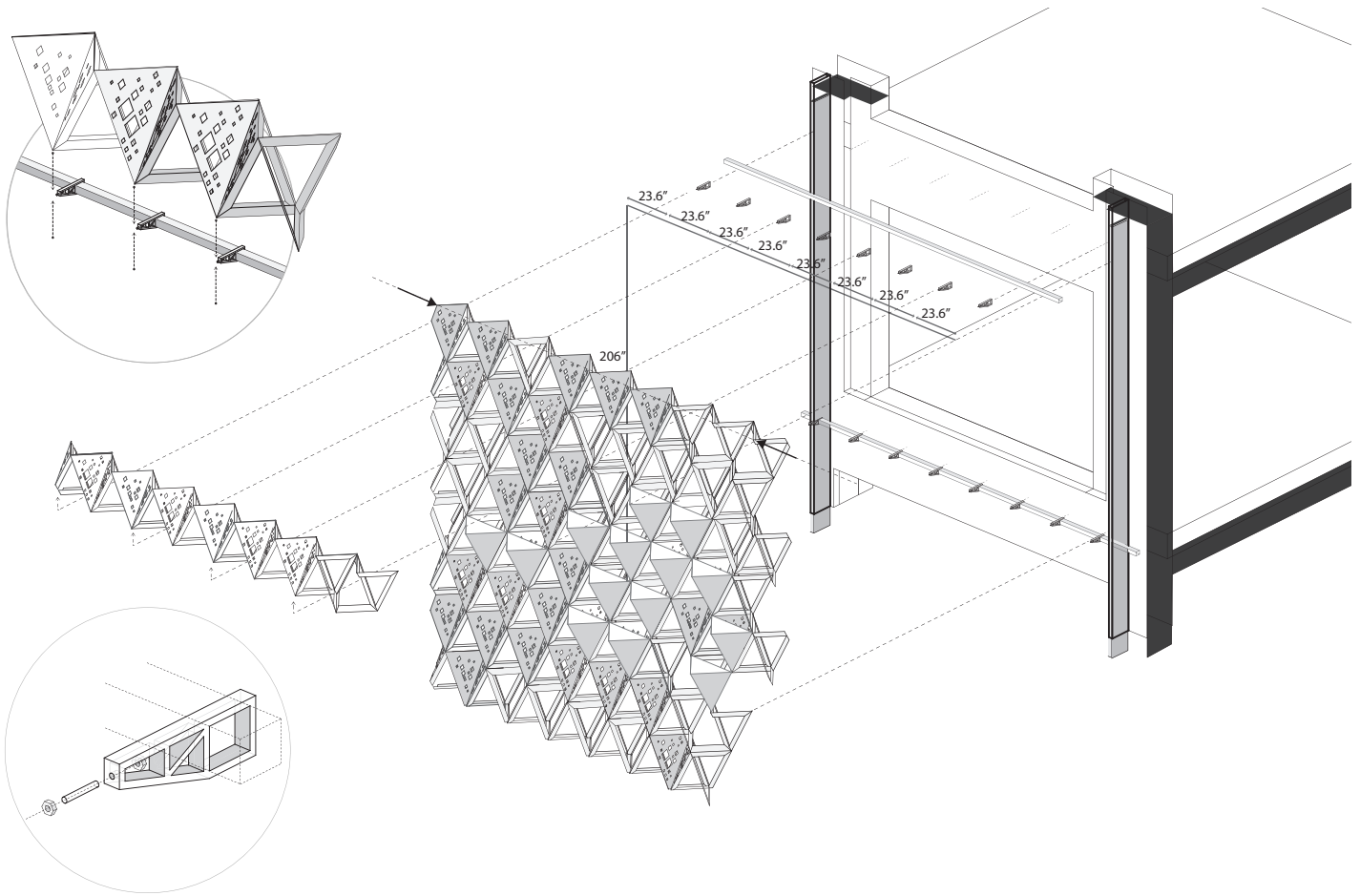
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