

**WAVES INC**

**ARCE 415 - W21  
STUDIO SALIKLIS**



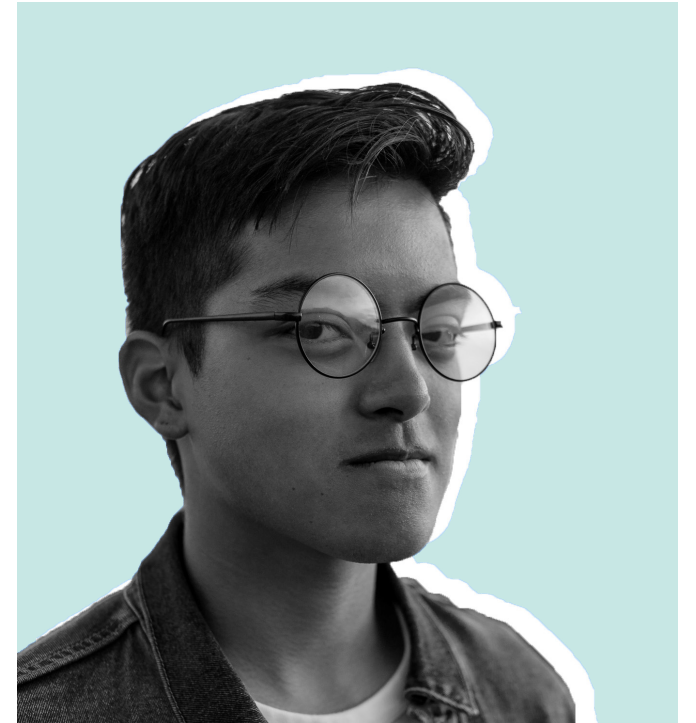
**EMMA  
PLACEK**



**JORGE  
RIOS**



**JACOB  
KELLER**



**RICARDO  
VILLANUEVA**

**FLOWING THROUGH THE CANALS**





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# TIMELINE

We began the quarter by creating a timeline highlighting key events of how glass played a significant role in history. We delve into how glass has been used and how glass was seen as a material.

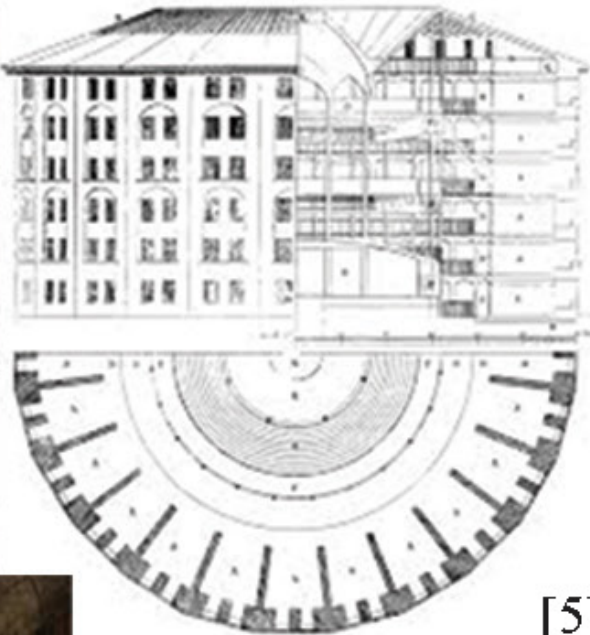
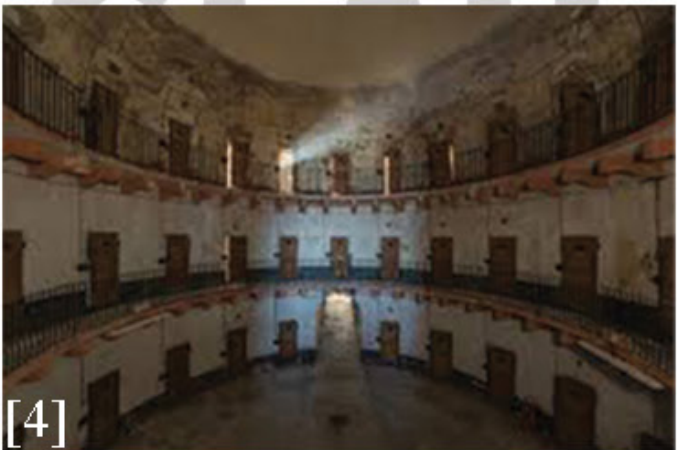


TIMELINE

*“By Blinds, and other contrivances, the Inspectors concealed from the observation of the Prisoners: hence the sentiment of a sort of invisible omnipresence.”*  
- Jeremy Bentham



(1345)



(1851)



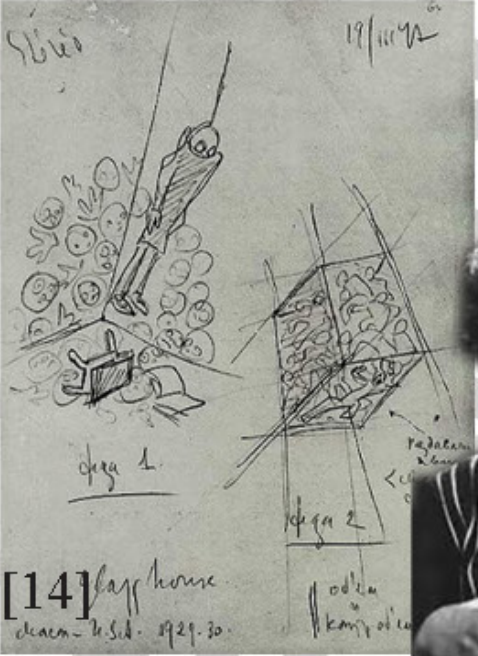
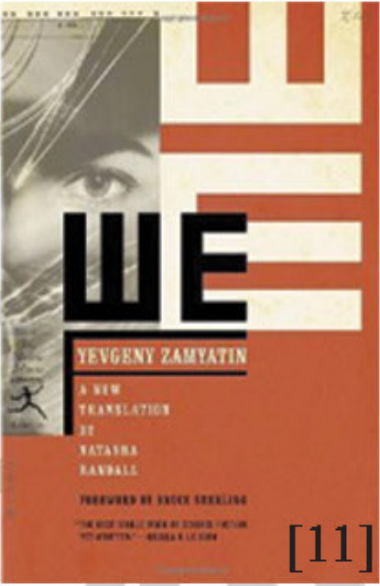
*“...a glass building would establish other relations between people and the universe...”*



TIMELINE



(1914)



'Modernity was fascinating transparency' - Sergei Ginzburg

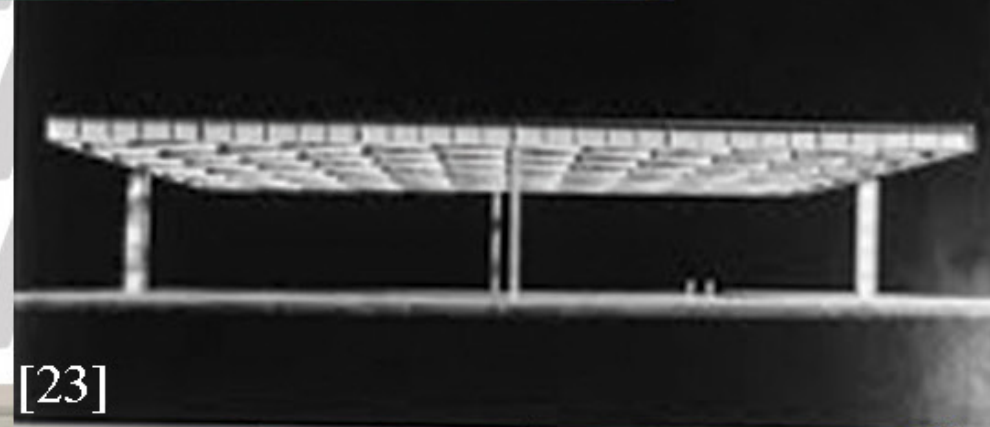


## TIMELINE

GLASS GLASS GLASS GLASS GLASS  
GLASS GLASS GLASS GLASS GLASS



(1951)



(200



ited with the idea of  
Eisenstein



TIMELINE



[1] 3,600 BC Theorized that the First Use of Glass was in Mesopotamia  
[2] 1345 *Notre-Dame de Paris* Stained Glass - Paris, France  
[3] 1760 Industrial Revolution Helped Increased the Production of Glass  
[4] 1791 Panopticon is a Design Theory by Jeremy Bentham About Control  
[5] 1791 Panopticon Prison Drawing  
[6] 1851 *Crystal Palace* - Joseph Paxton - London, United Kingdom  
[7] 1913 Constructivist Movement  
[8] Bruno Taut  
[9] 1914 *Glass Pavilion* - Bruno Taut - Cologne, Germany  
[10] 1921 *Glass Skyscraper* - Mies Van Der Rohe  
[11] 1924 *We* - Yevgeny Zamyatin  
[12] Yevgeny Zamyatin  
[13] George Orwell writes *1984* that was inspired by *We*  
[14] 1926 Storyboard for Sergei Eisenstein's *The Glass House*  
[15] Sergei Eisenstein  
[16] 1929 *The Villa Savoye* - Le Corbusier - Paris, France  
[17] 1941 Eisenstein Meets Disney  
[18] 1949 *Glass House* - Philip Johnson - Connecticut, USA  
[19] 1951 *50x50 House* - Mies van der Rohe  
[20] 1951 *Farnsworth House* - Ludwig Mies van der Rohe - Illinois, USA  
[21] Ludwig Mies van der Rohe  
[22] 1959 *The Stahl House, Case Study House #22* - Pierre Koenig -California, USA  
[23] 1964 *World Fair Model* - Meiji Watanabe  
[24] 1999 *Le Baiser* - Iñigo Manglano-Ovalle  
[25] 2006 *The Louvre* - I.M. Pei - Paris, France  
[26] 2006 *Toledo Museum of Art Glass Pavilion* - Kazuyo Sejima + Ryue Nishizawa - Ohio, USA  
[27] 2011 *Gravity is a Force to be Reckoned With* - Iñigo Manglano-Ovalle  
[28] 2011 *Are You Really Sure that a Floor Can't Also be a Ceiling?* - Bik Van Der Pol  
[29] 2016 *Martel Glass Pavilion* - Maurice Martel Architecte - Saint-Bruno-de-Montarville, Canada

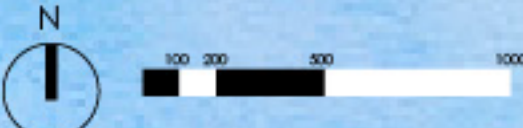
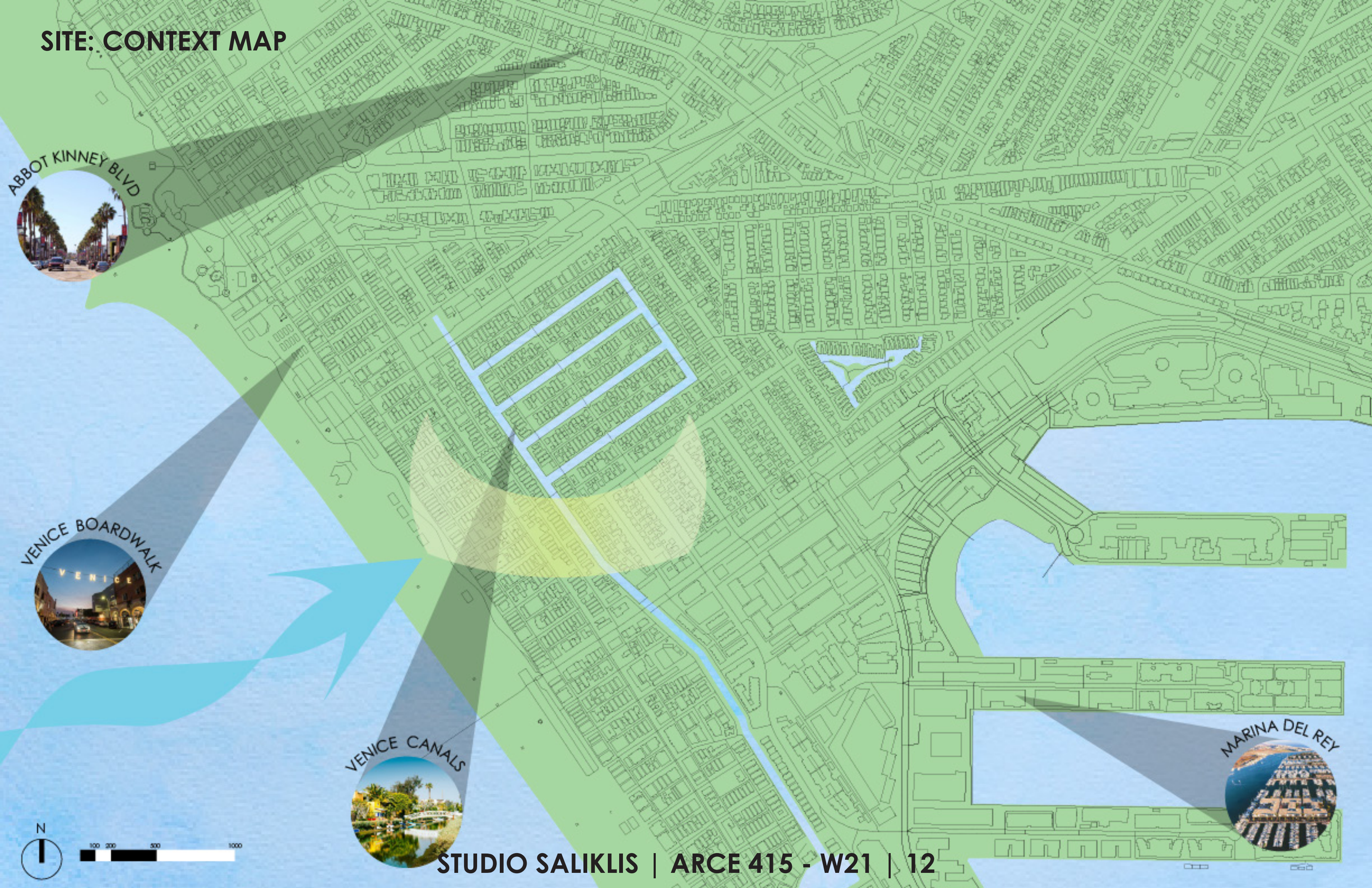


# SITE

**Overview of location of project and surrounding areas.**



SITE: CONTEXT MAP





SITE: ANALYSIS

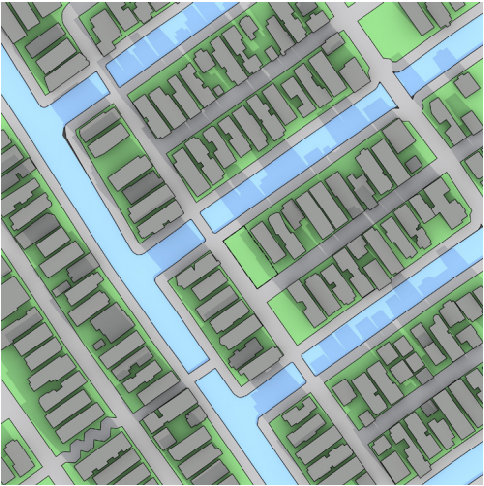
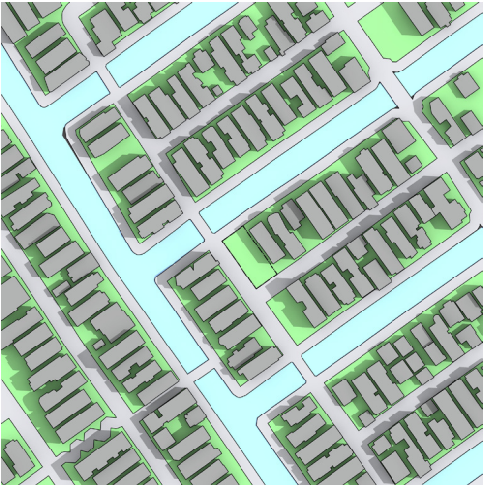


JUNE

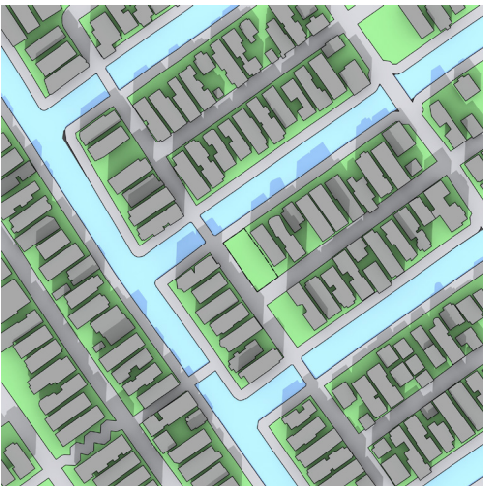
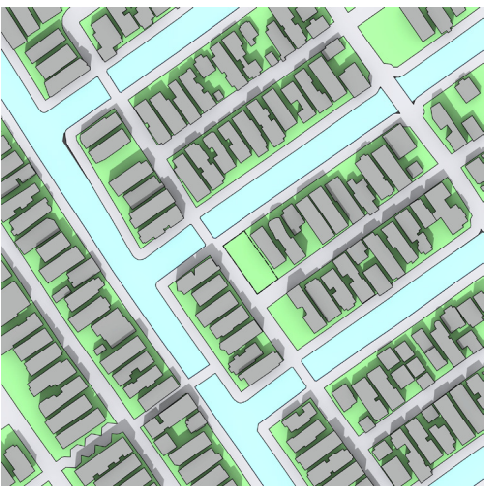
SEPTEMBER

DECEMBER

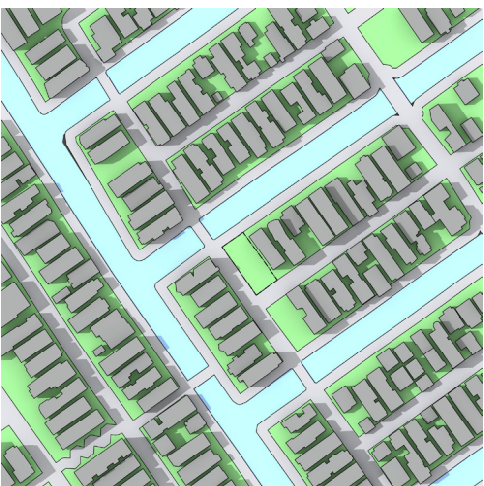
9 AM



12 PM



3 PM





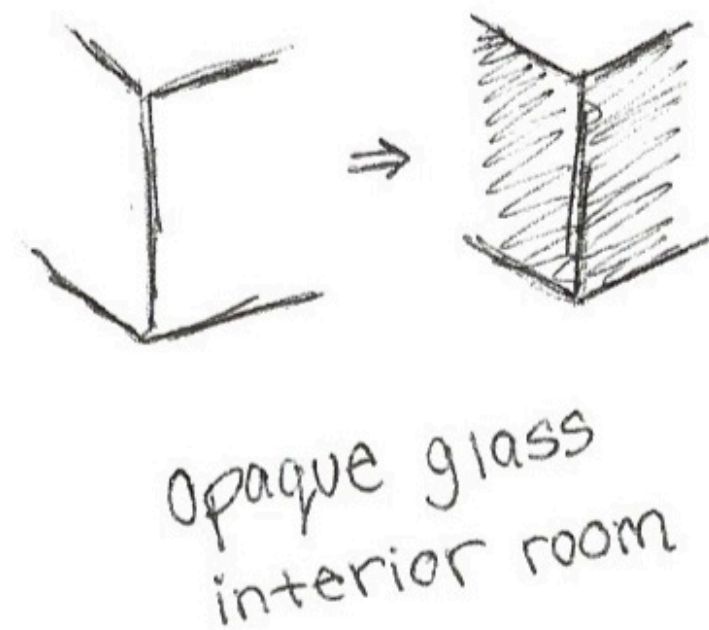
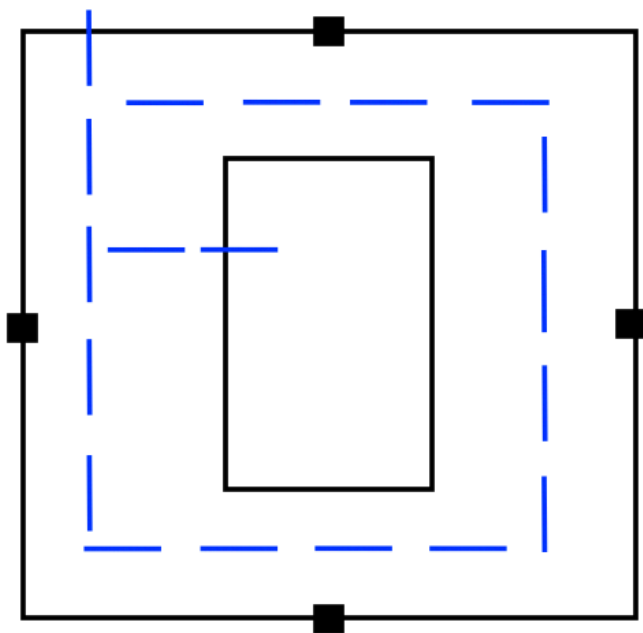
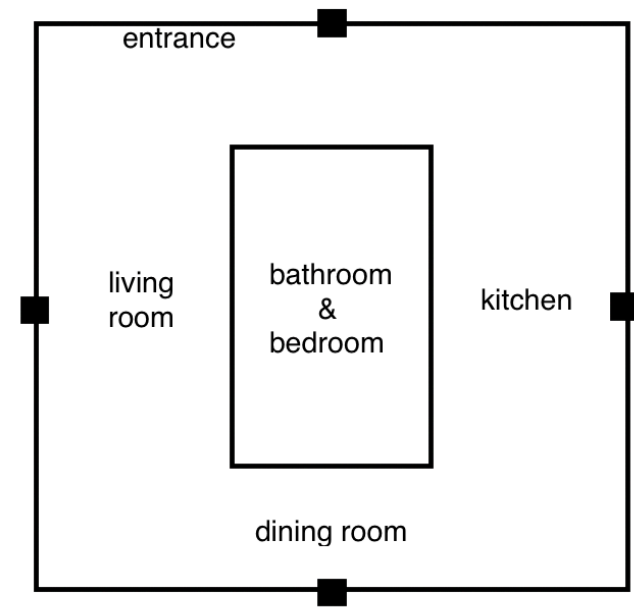
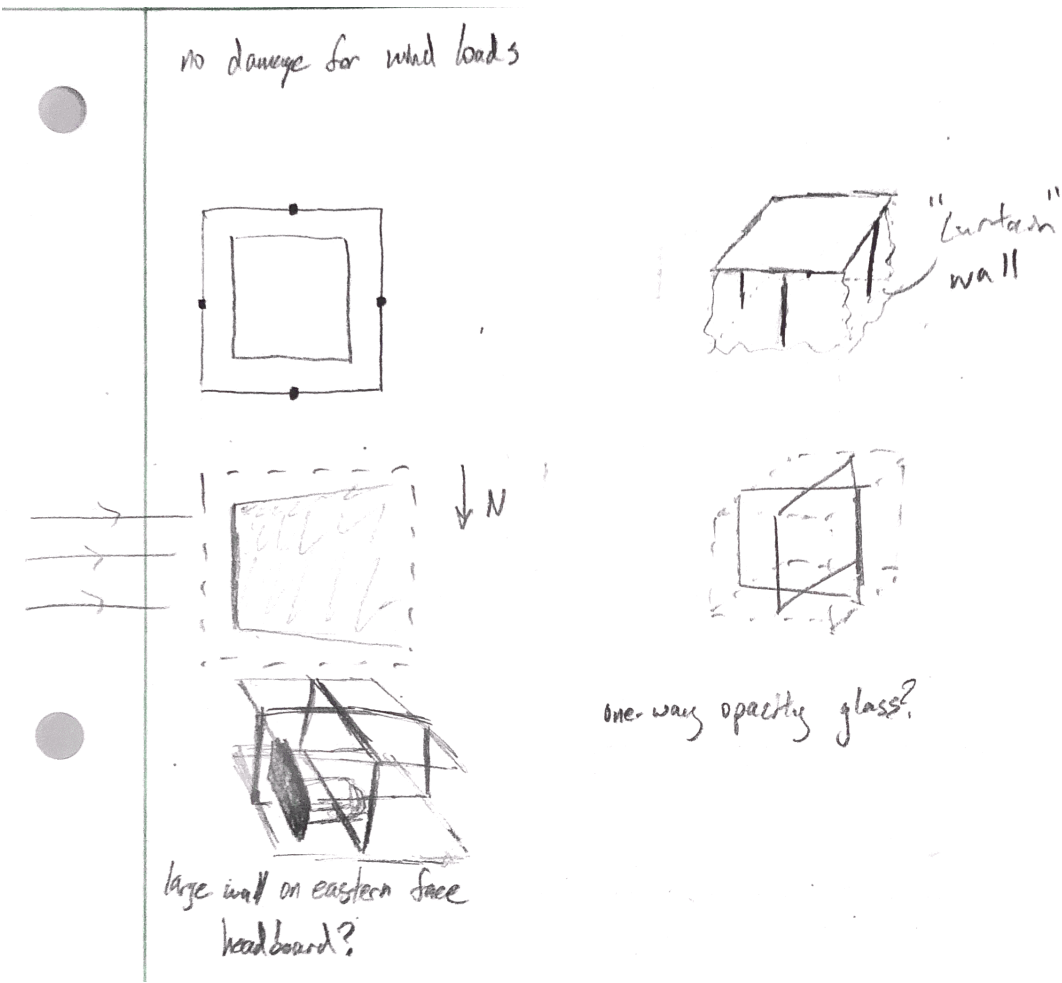
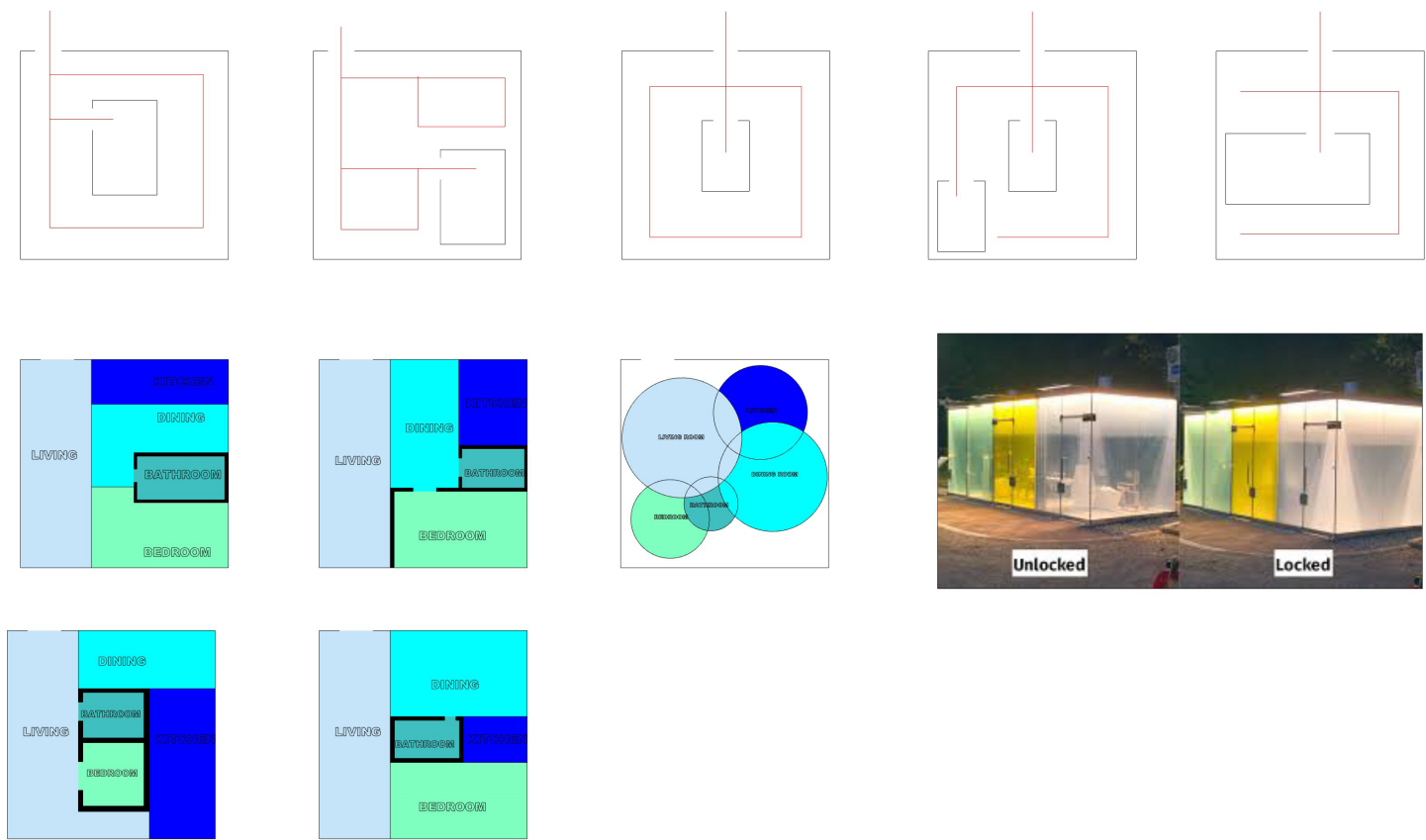


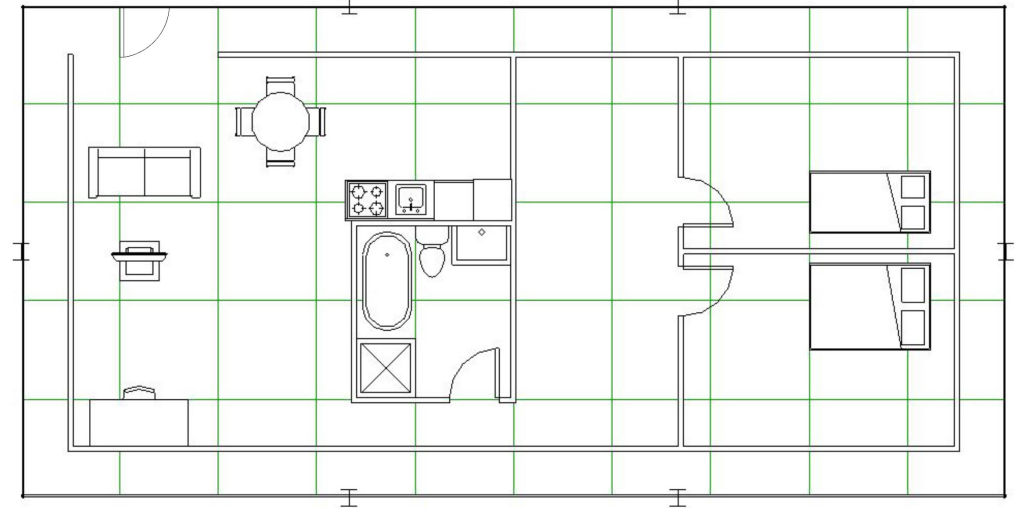
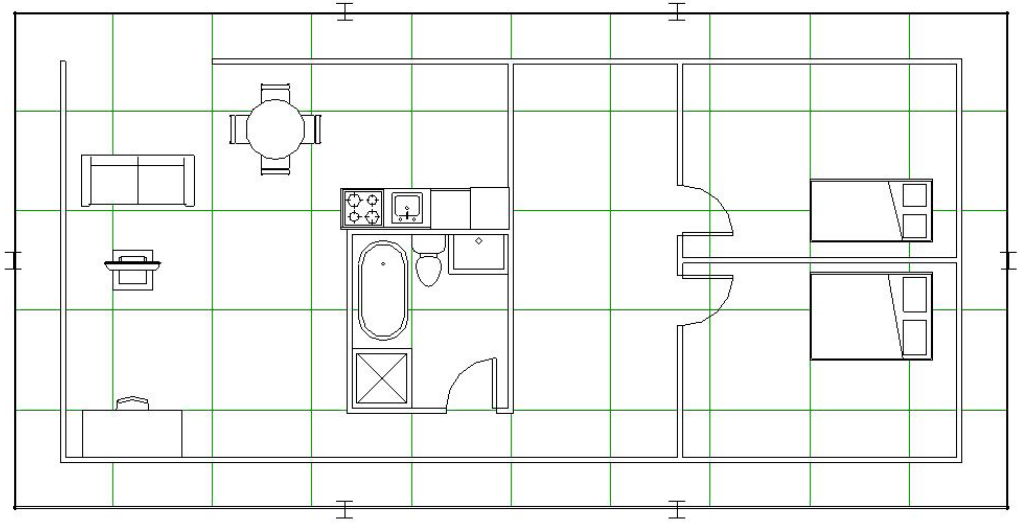
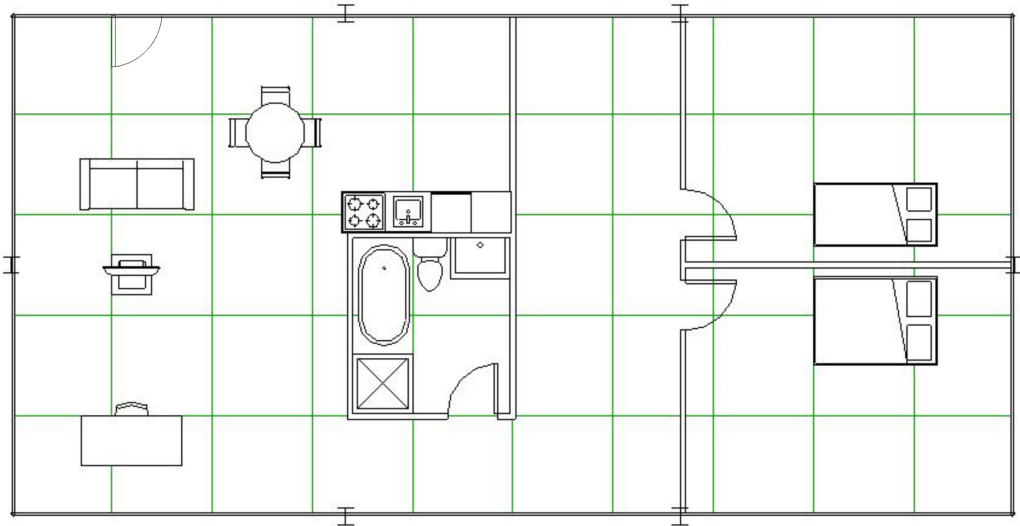
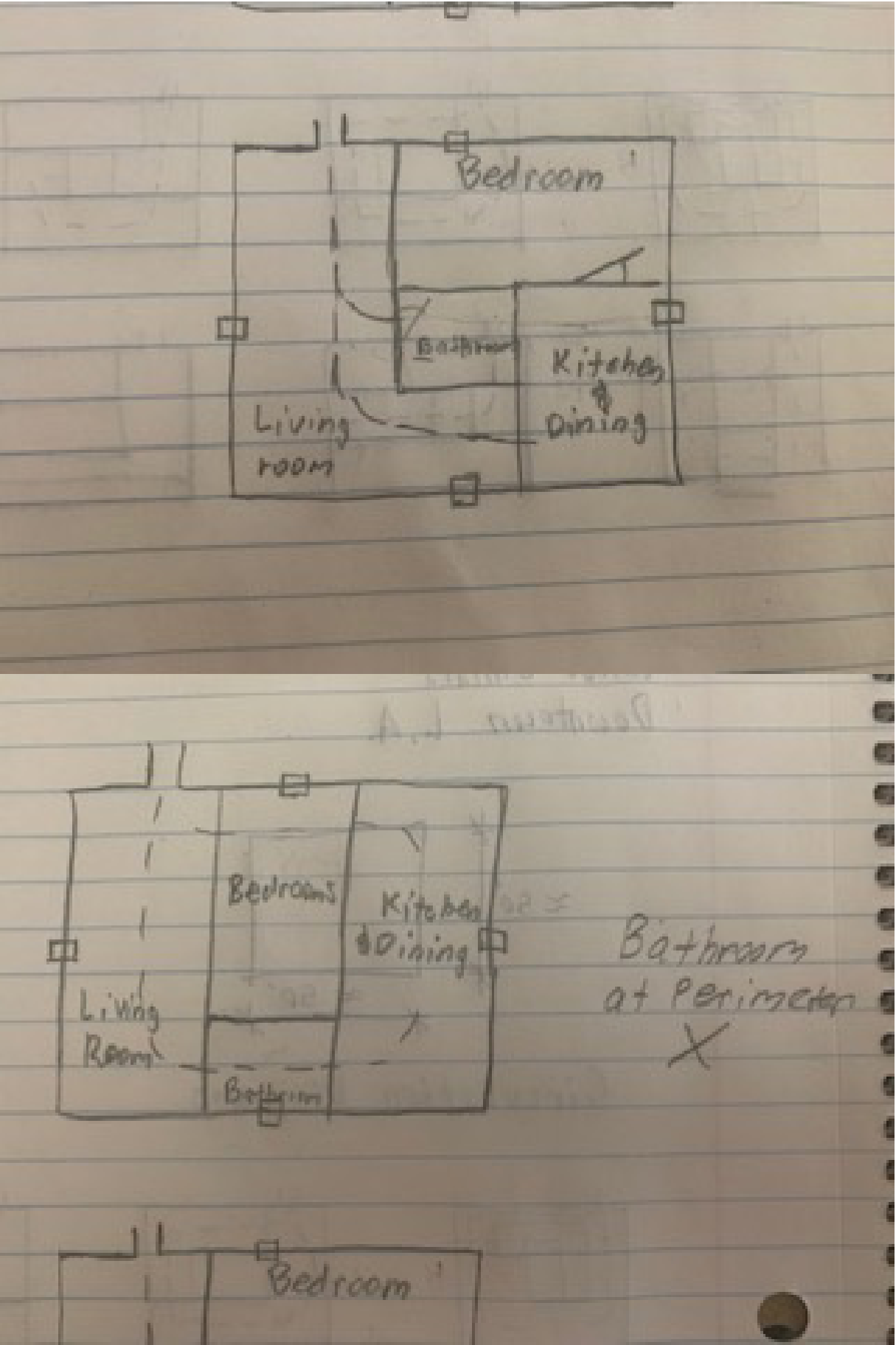


# PROCESS

**Reinterpretation of Mies van der Rohe's 50x50 glass house. Development of ideas that eventually culminated to the final structural and architectural project design. Main focuses of this process included creating a structural system with no columns at the corners of the building, and dealing with the issues that come along with living in a transparent structure, such as privacy.**

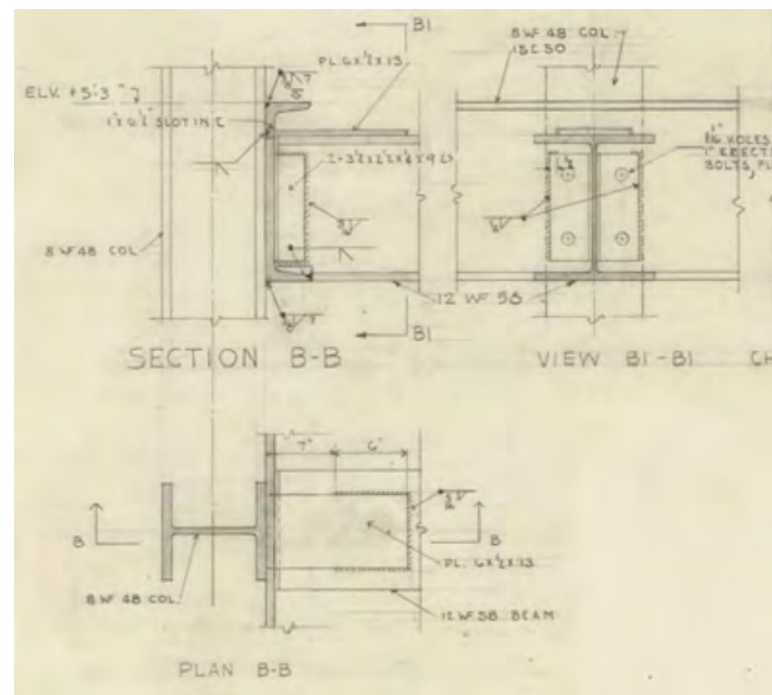
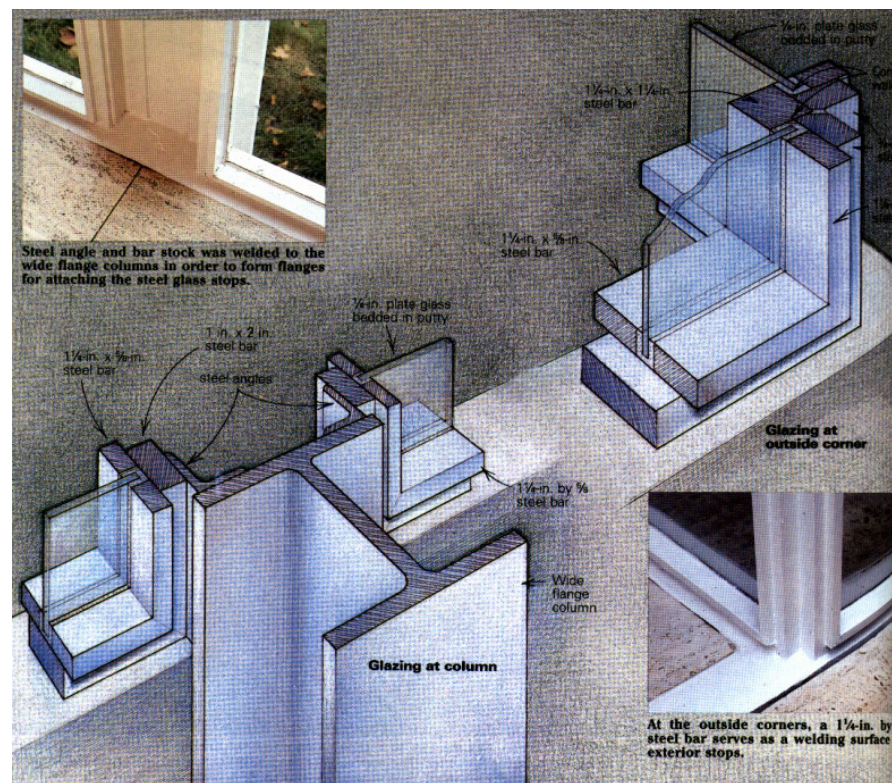
PROCESS: 1-6-21



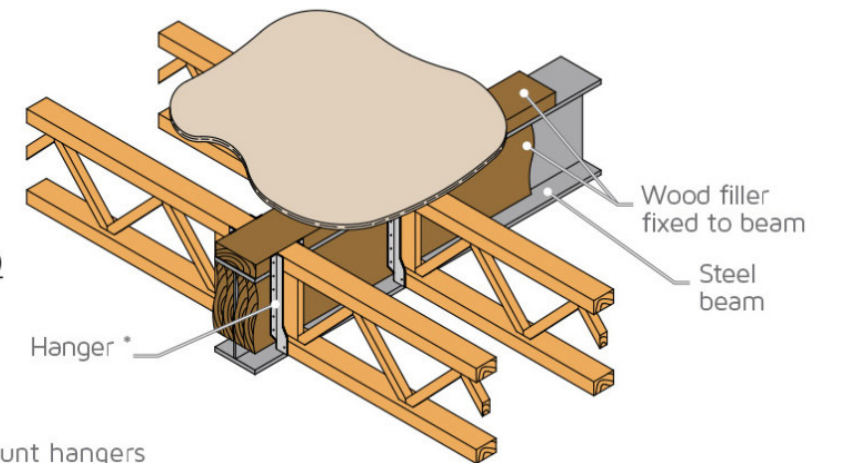




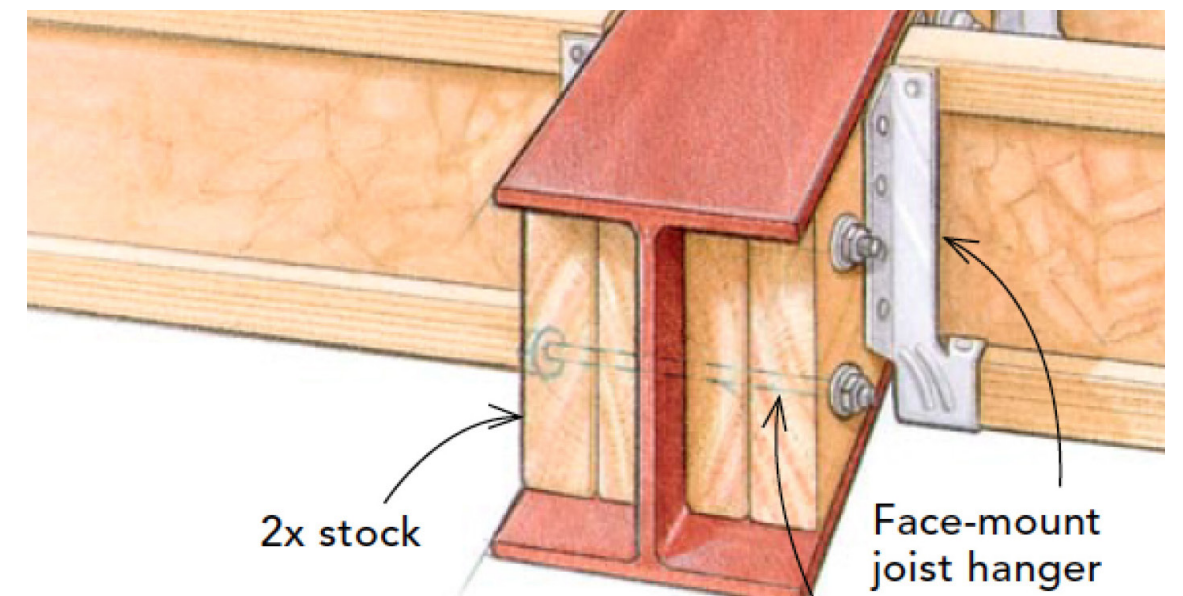
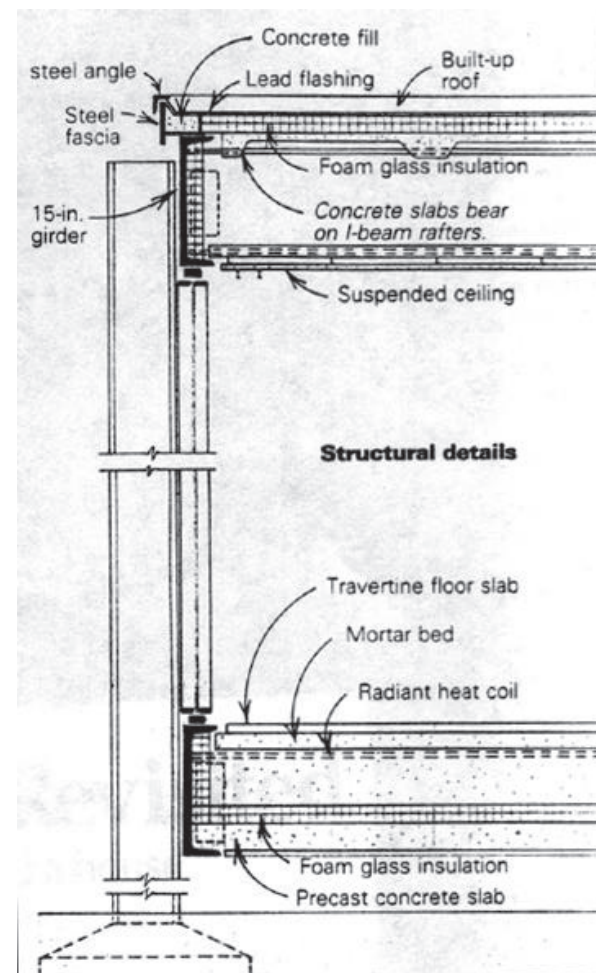
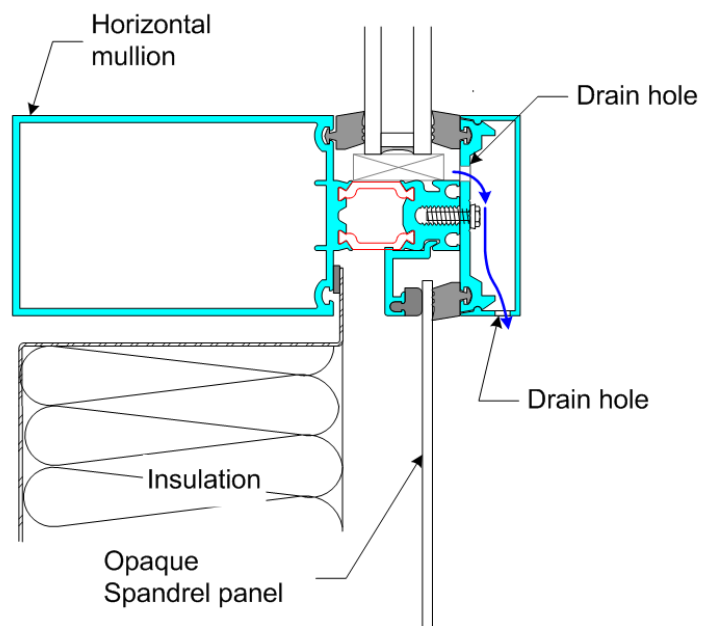
**PROCESS: 1-13-21**



STEEL BEAM  
WITH SOLID  
WOOD FILLER  
HANGER REQUIRED

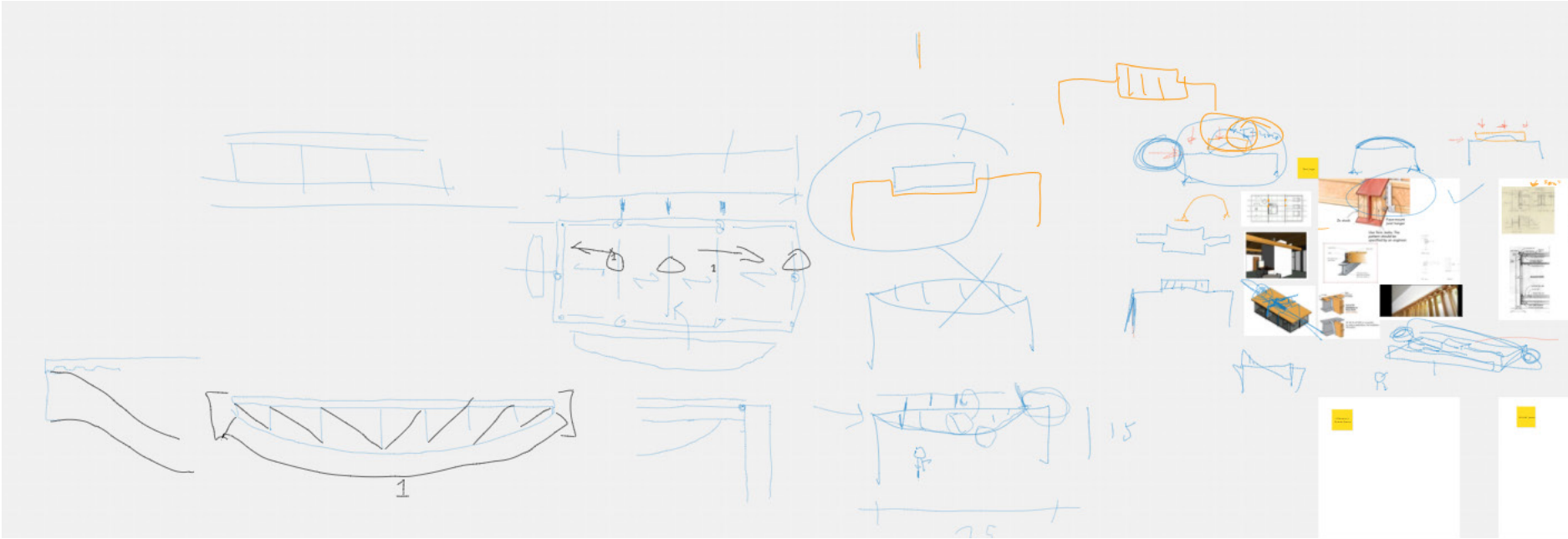


\* top mount or face mount hangers

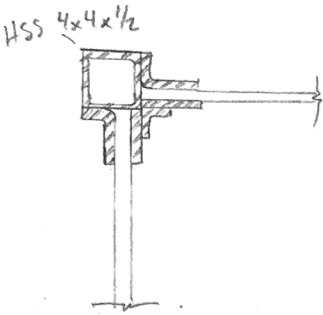


Use  $\frac{3}{8}$ -in. bolts. The pattern should be specified by an engineer.

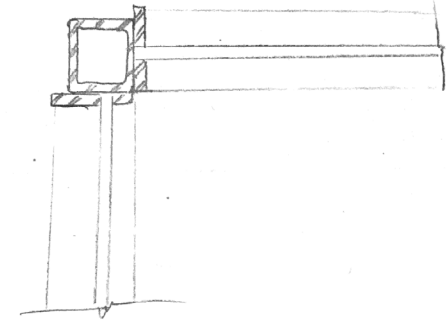




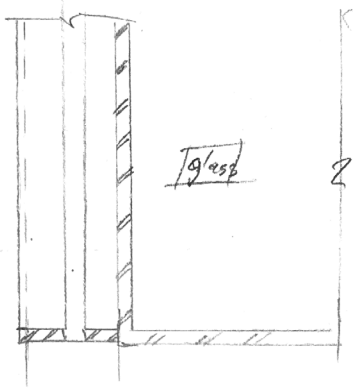
Corner Detail



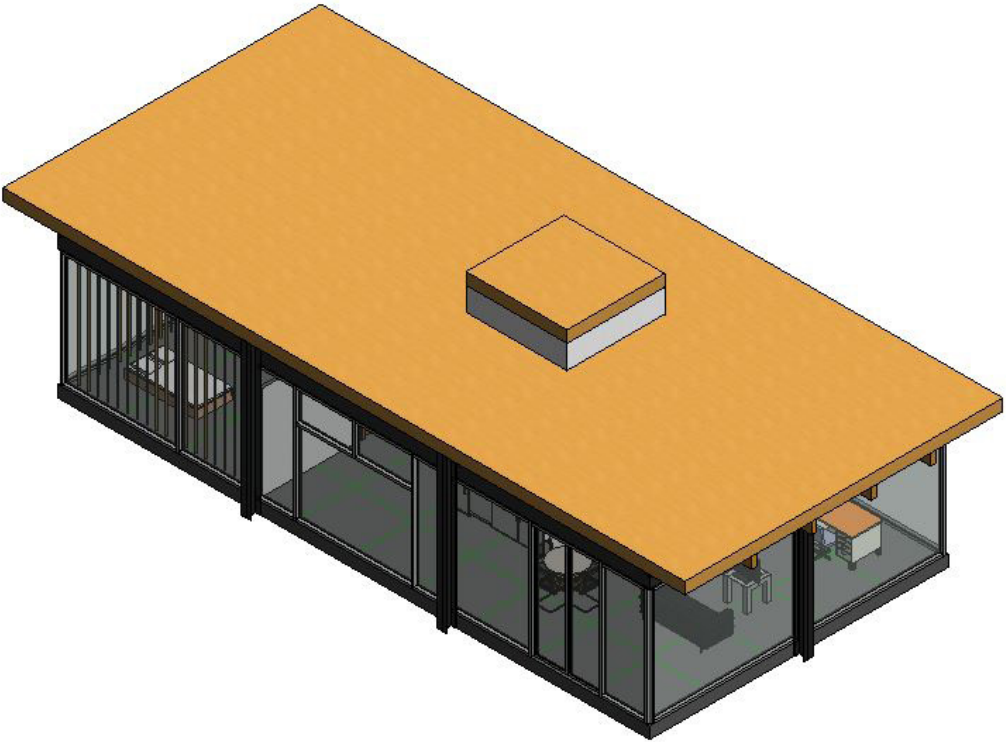
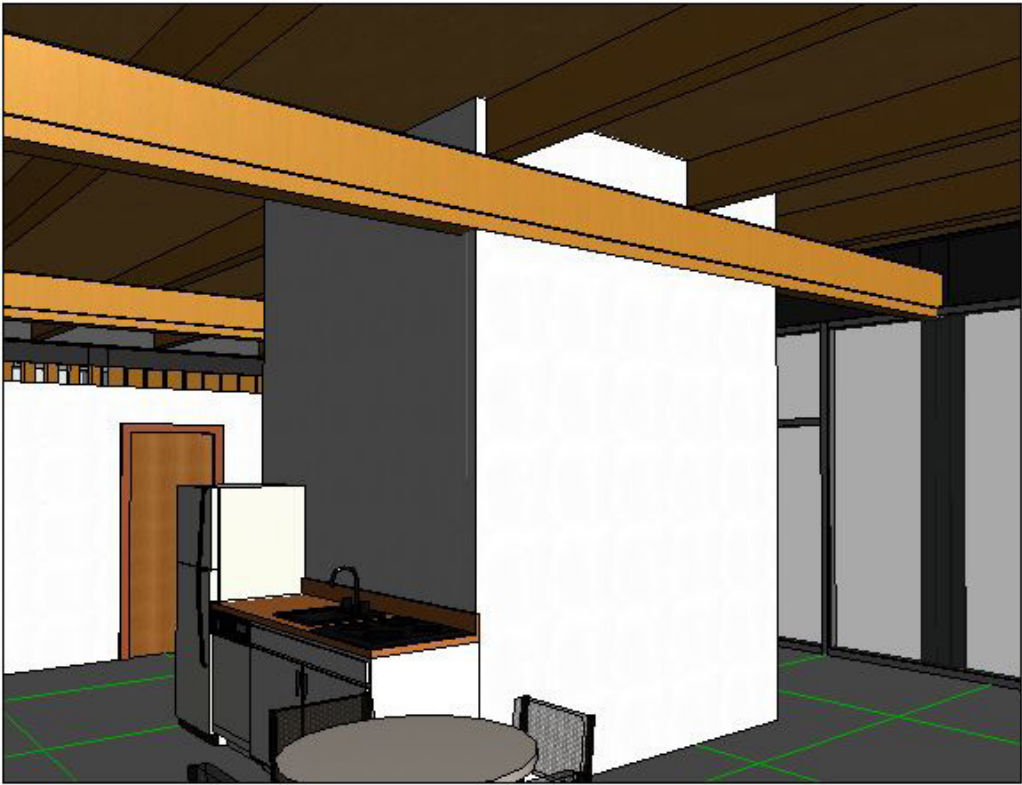
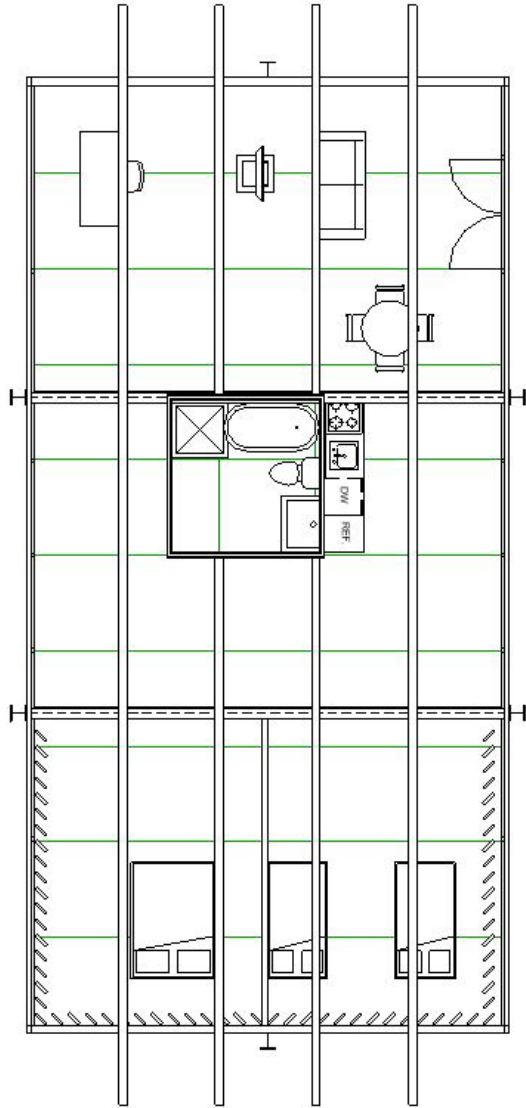
Plan View



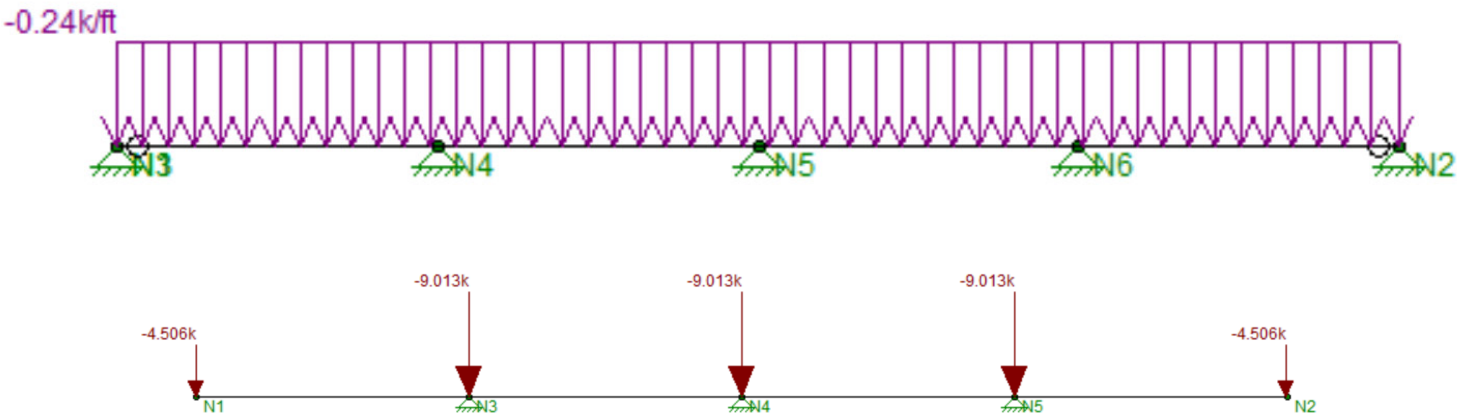
Plan View



Elevation



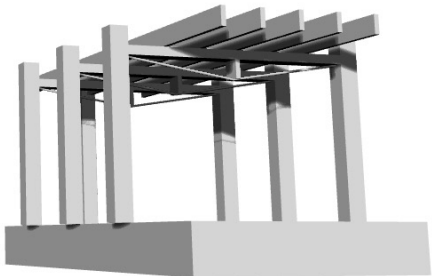
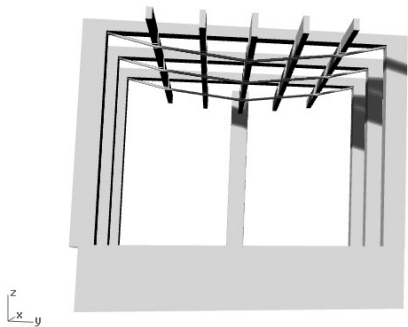
PROCESS: 1-19-21



2D Joint Reactions (By Combination)					
	L...	Joint Label	X [k]	Y [k]	MZ [k-ft]
1	1	N3	0	20.196	0
2	1	N4	0	-4.339	0
3	1	N5	0	20.196	0
4	1	Totals:	0	36.052	
5	1	COG (ft):	X: 25	Y: 14	

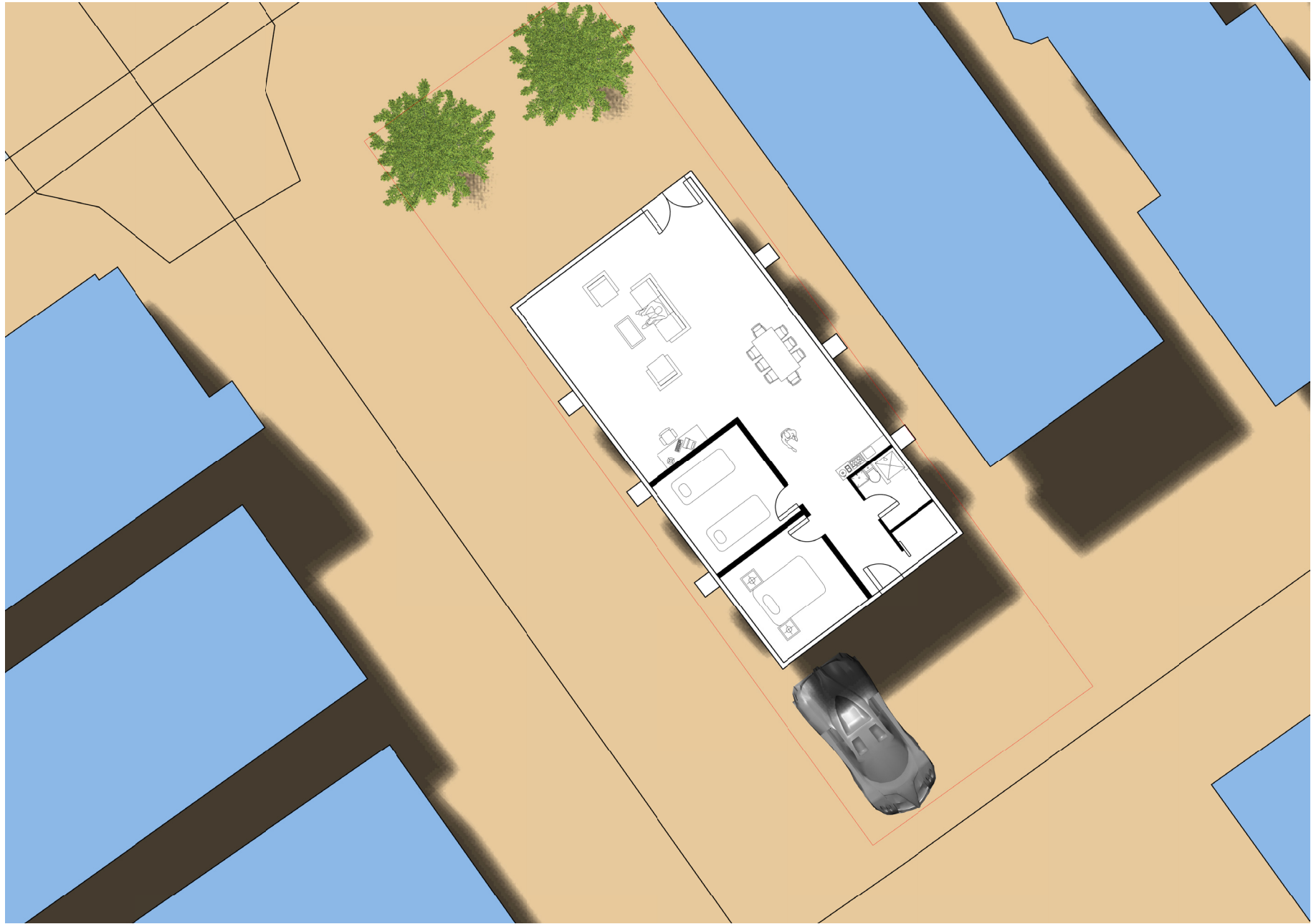
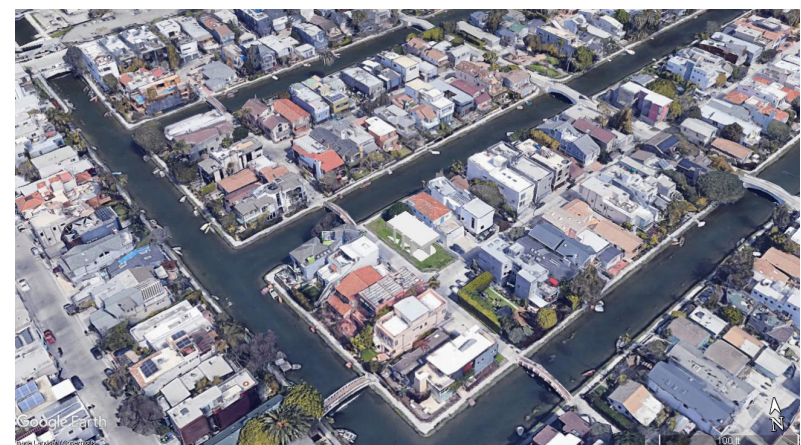
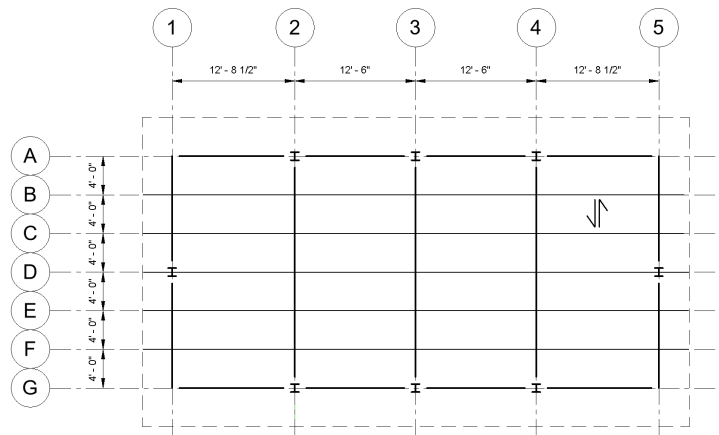
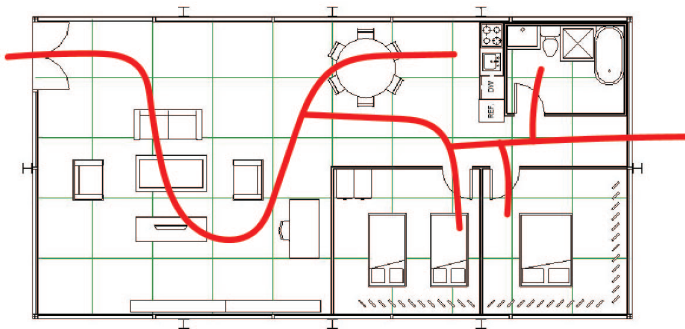
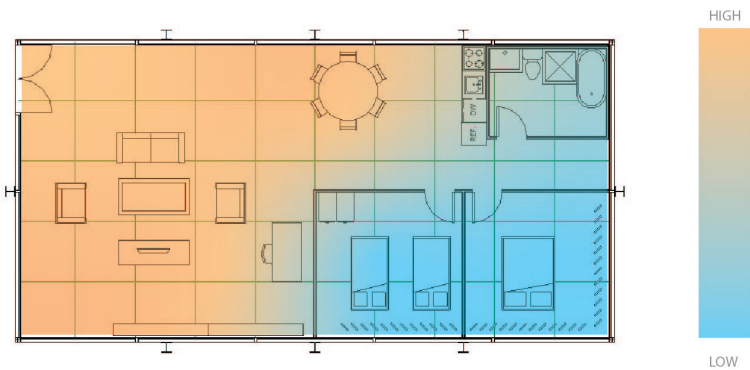
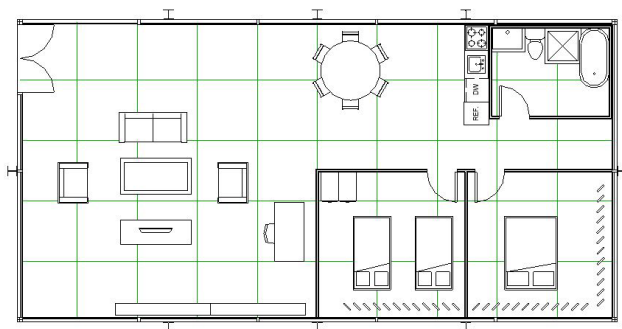
2D Joint Deflections (By Combination)					
	L...	Joint Label	X [in]	Y [in]	Rotatio...
1	1	N1	0	-0.968	8.214e-03
2	1	N2	0	-0.968	-8.214e-03
3	1	N3	0	0	2.805e-03
4	1	N4	0	0	0
5	1	N5	0	0	-2.805e-03

2D Member Section Forces (By Combination)						
Sections   Maximums   End Reactions						
	L...	Member Label	S...	Axial[k]	Shear[k]	Mome...
1	1	M1	1	0	-4.506	0
2			2	0	6.676	56.331
3			3	0	6.676	-27.121
4			4	0	-6.676	56.331
5			5	0	4.506	0



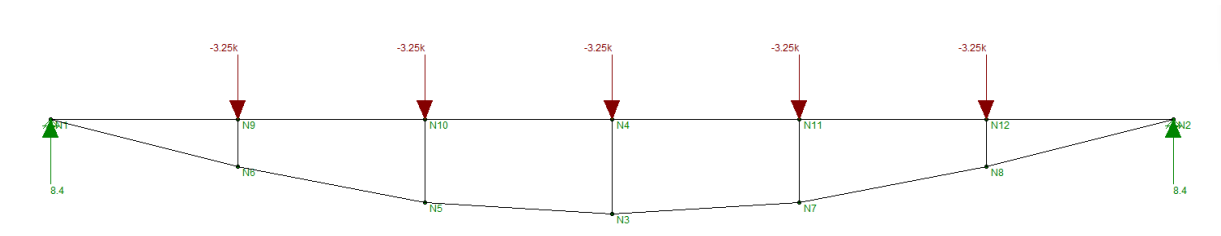


PROCESS: 1-19-21

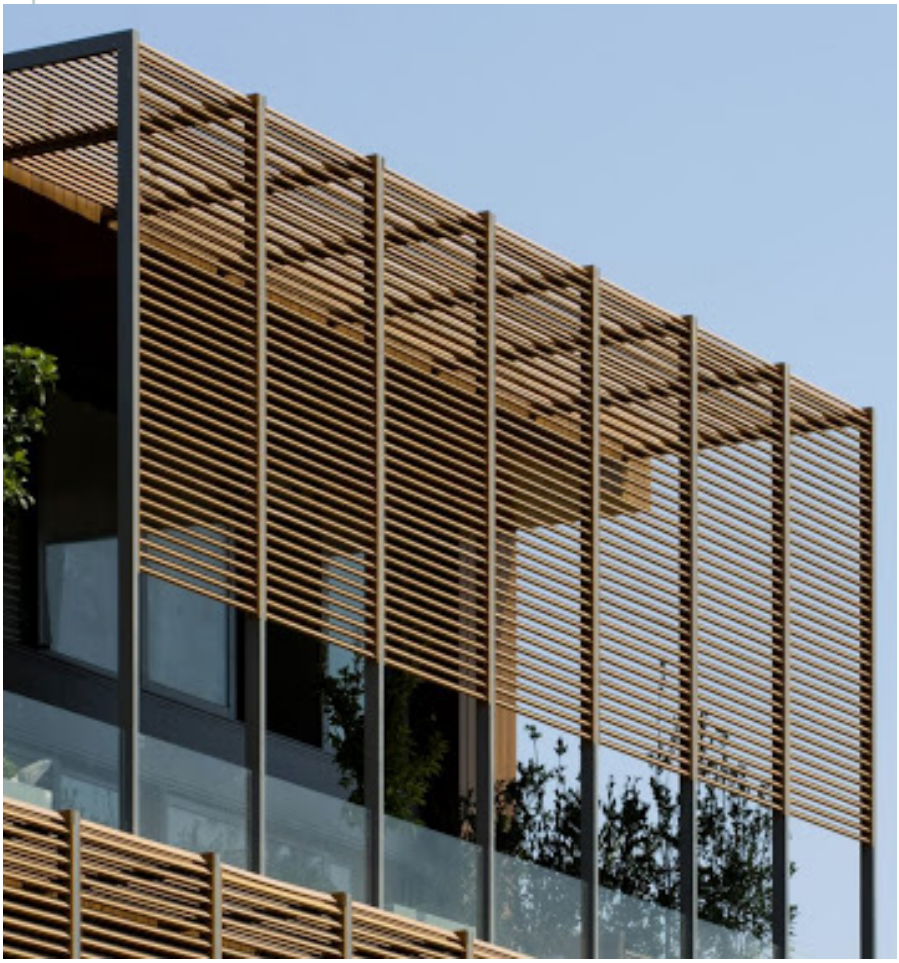
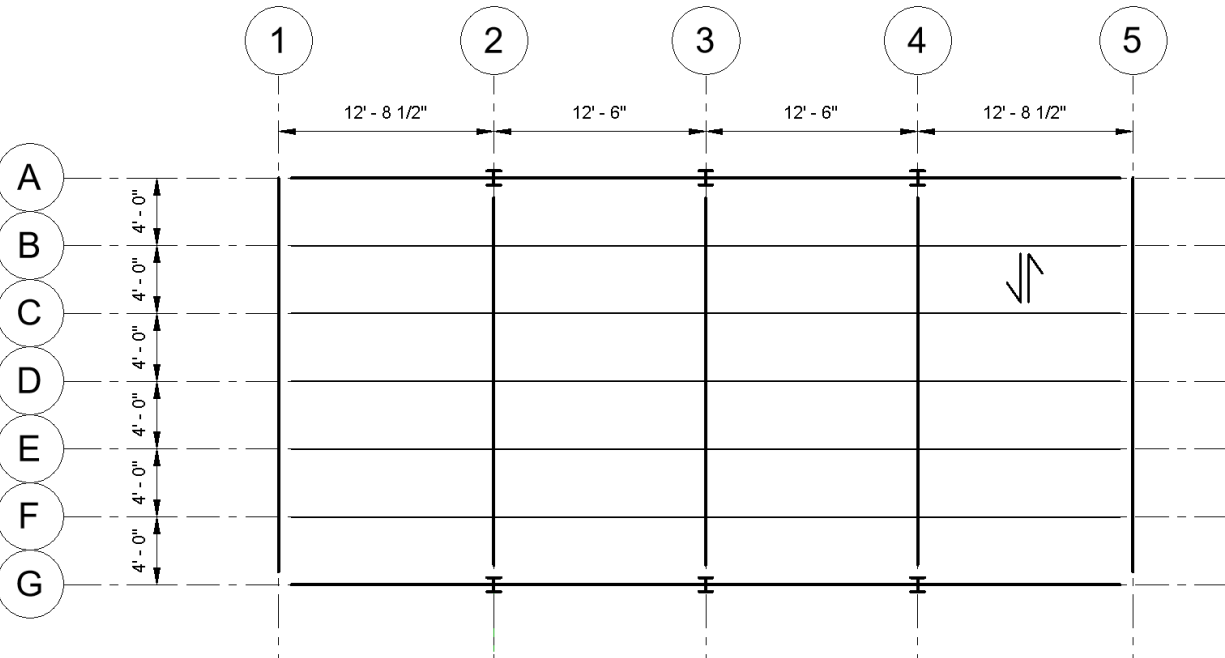
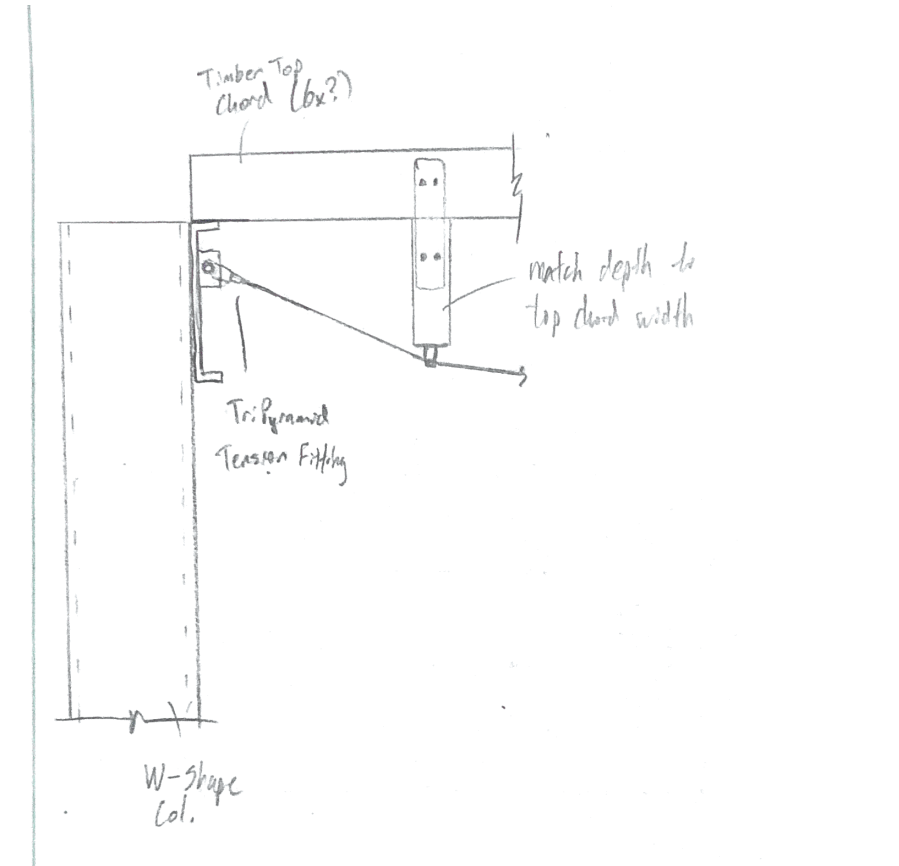


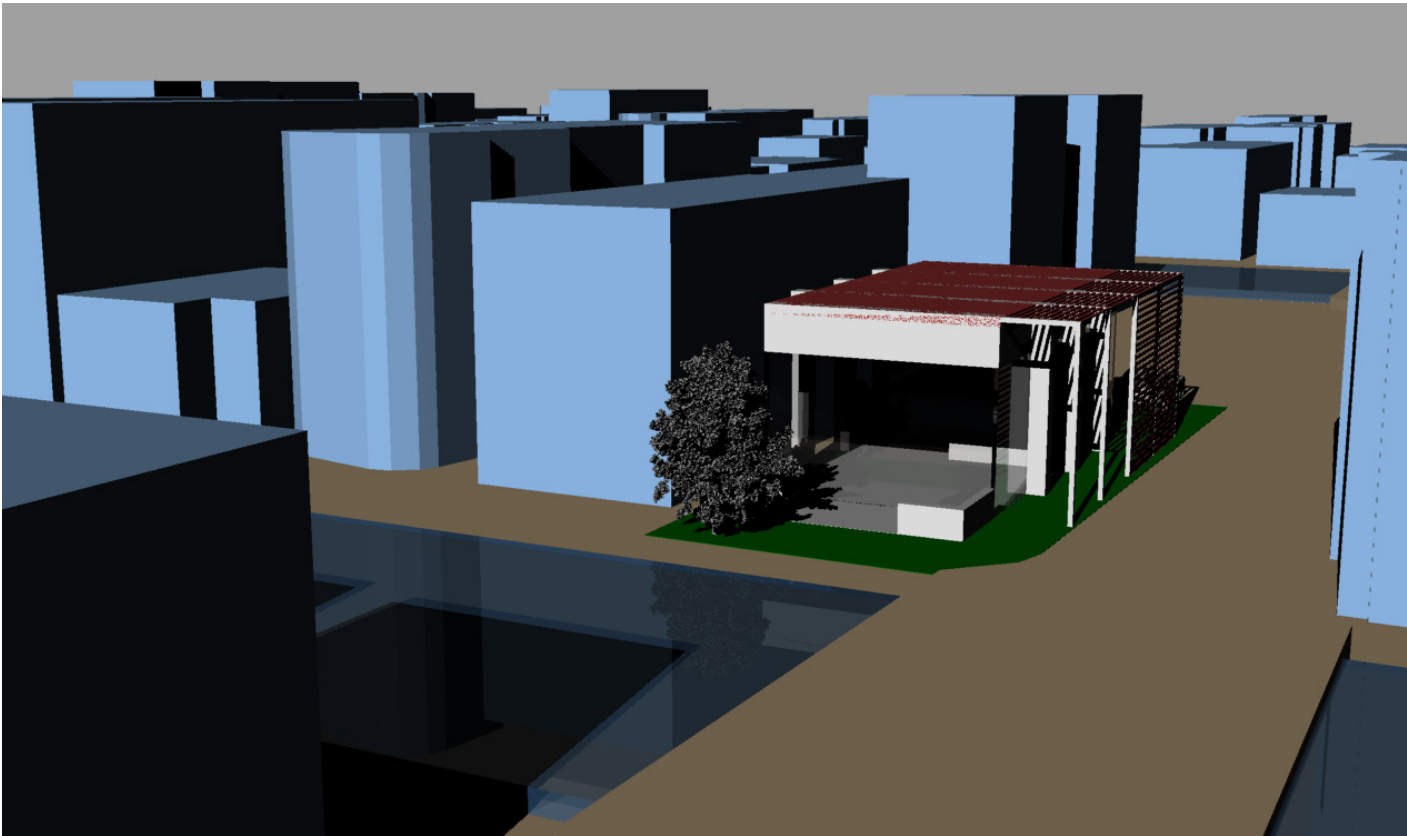


PROCESS: 1-25-21



Description	LW conc on decking	DF-L No.2 6x12 @ 4' o.c.	Trusses @ 12' o.c.	Girders (Channels)	Column W-Beam	Lateral
TBD	5	5	5	5	5	5
LW conc on decking	30	30	30	30	30	30
DF-L No.2 6x12 @ 4' o.c.		4	4	4	4	4
Insulation R38		0.5	0.5	0.5	0.5	0.5
5/8" Gyp		0	0	0	0	0
MEP		1.5	1.5	1.5	1.5	1.5
Trusses @ 12' o.c.			3	3	3	3
Girders (Channels)				6	6	6
Column (W-Beams)					7	7
Partition Walls						10
Misc	2	2	2	2	2	2
Total	37	43	46	52	59	69
Use	37	43	46	52	59	69
Live		20 psf Live load reduction allowed				





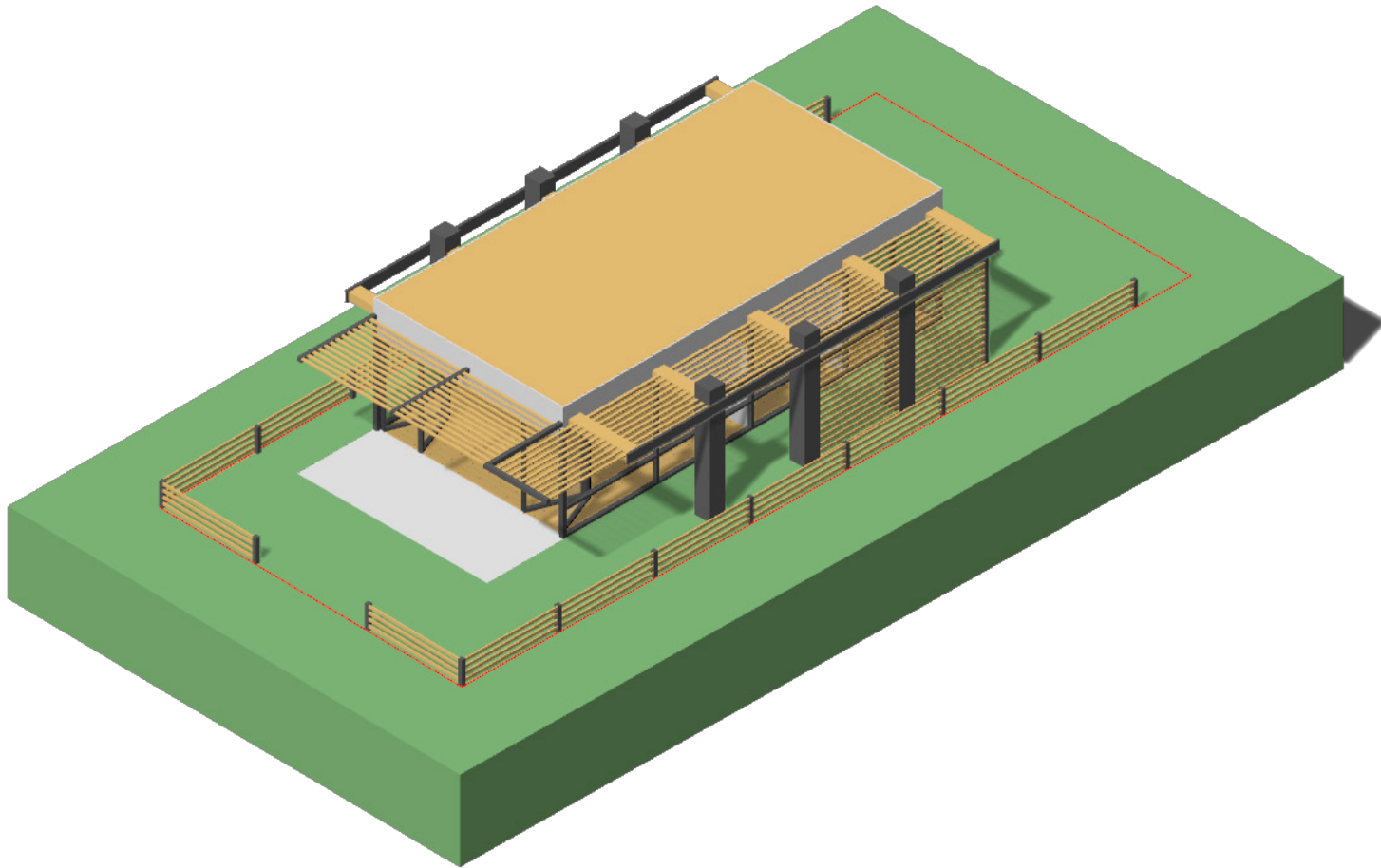
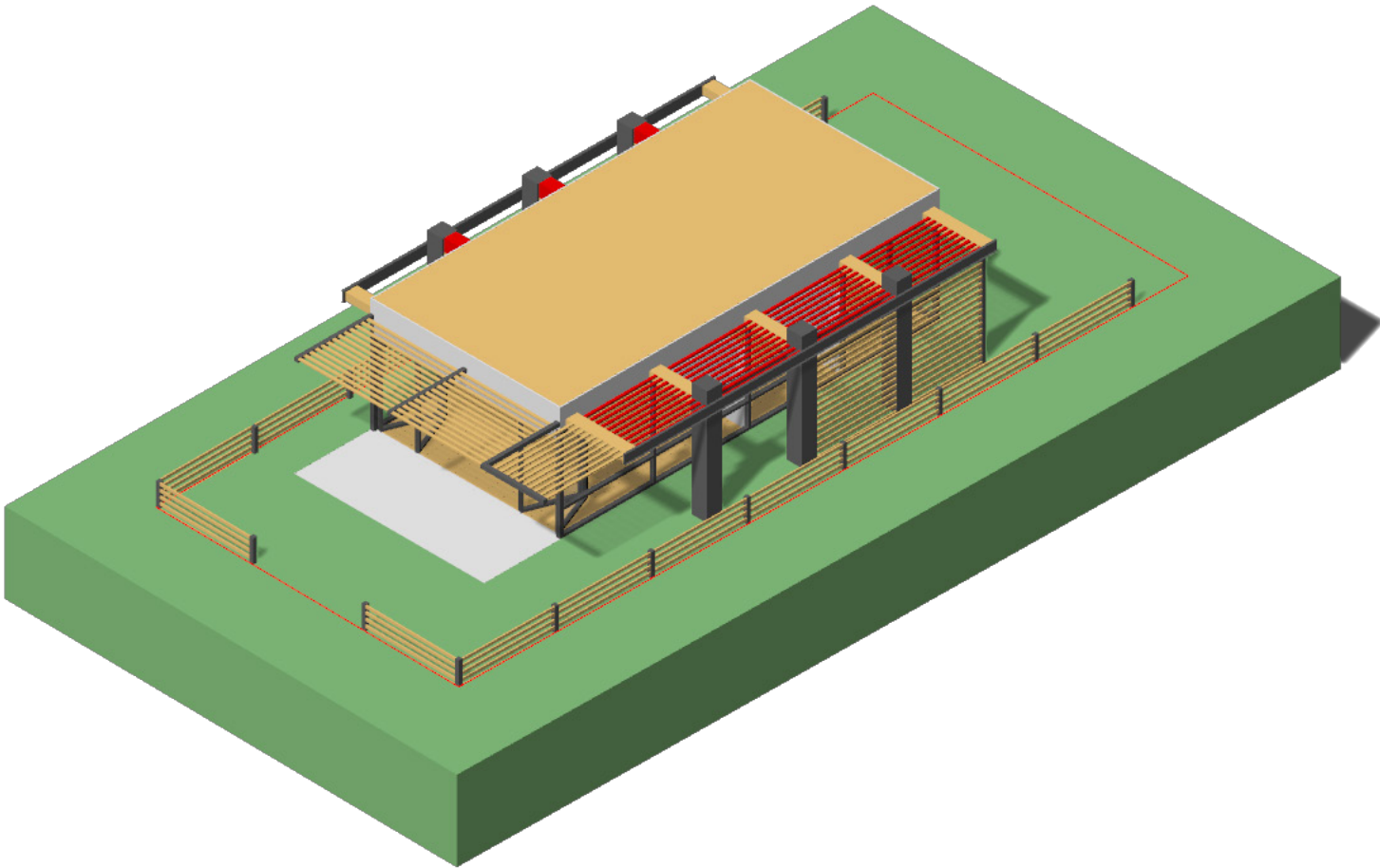




# MIDREVIEW

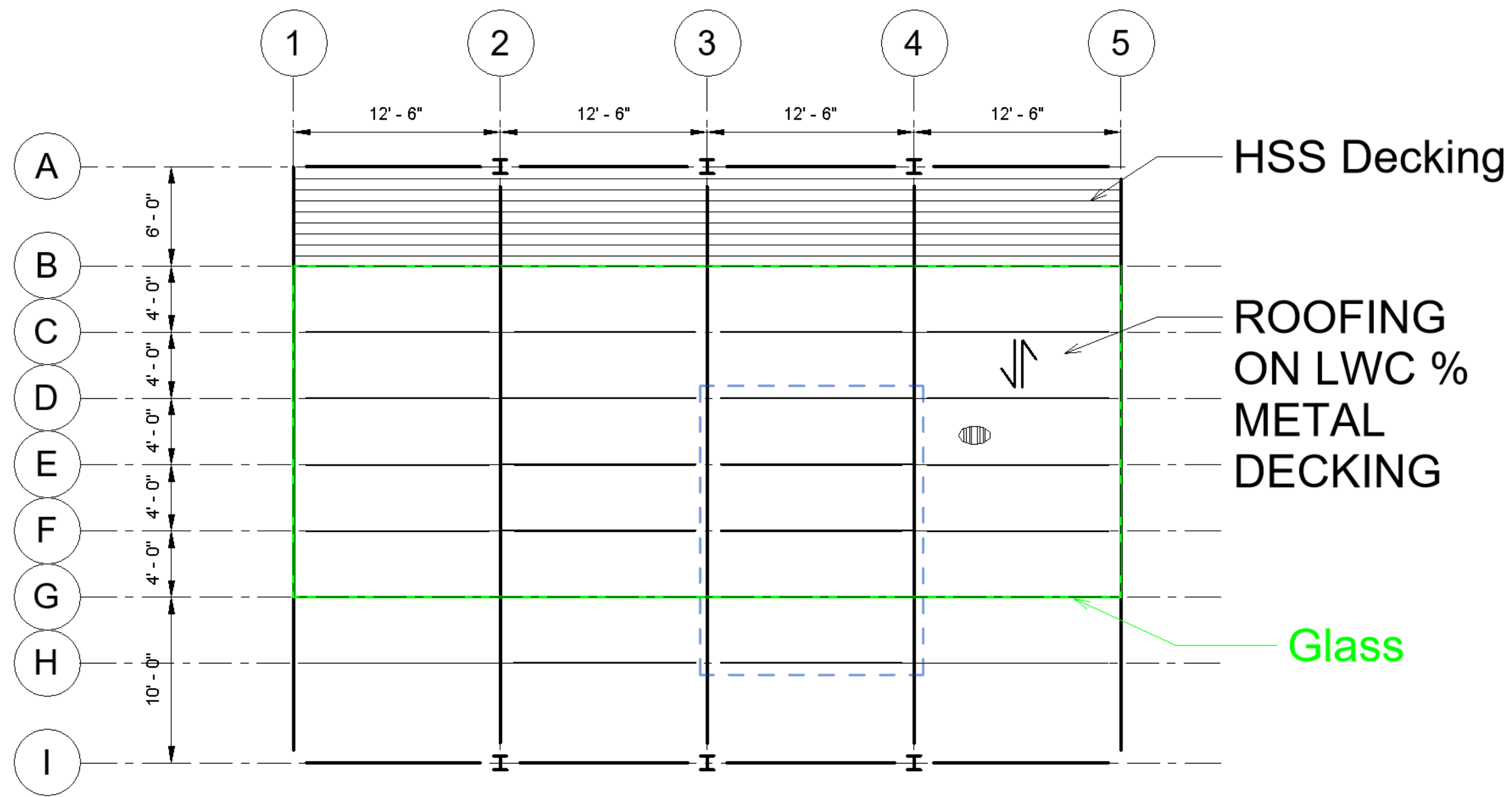
We presented our glass house and what consisted of it half way into the quarter. Architectural and Structural professionals were present to critique our project based on structural integrity and Miesian application.

MIDREVIEW: DIAPHRAGM

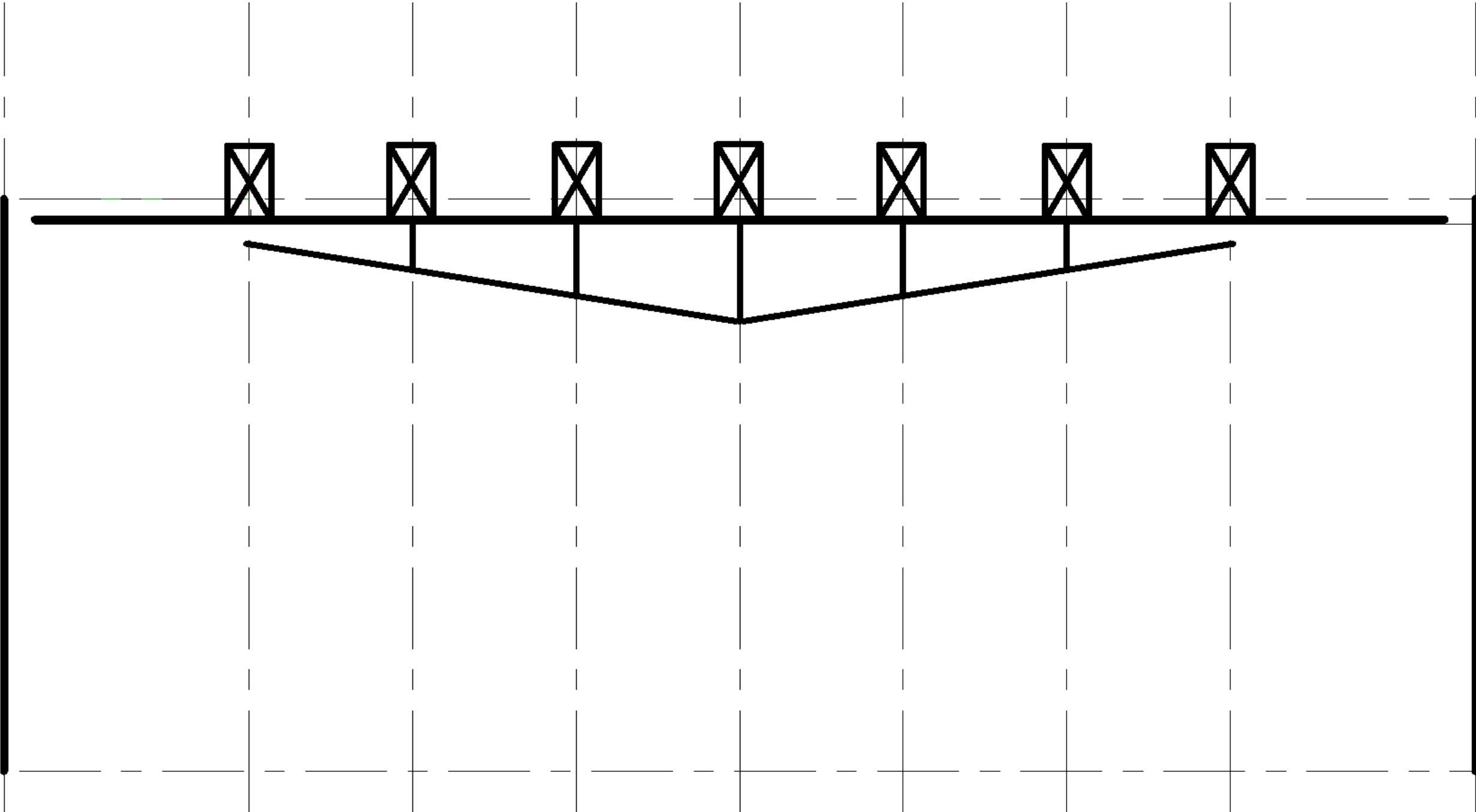




MIDREVIEW: FRAMING PLAN



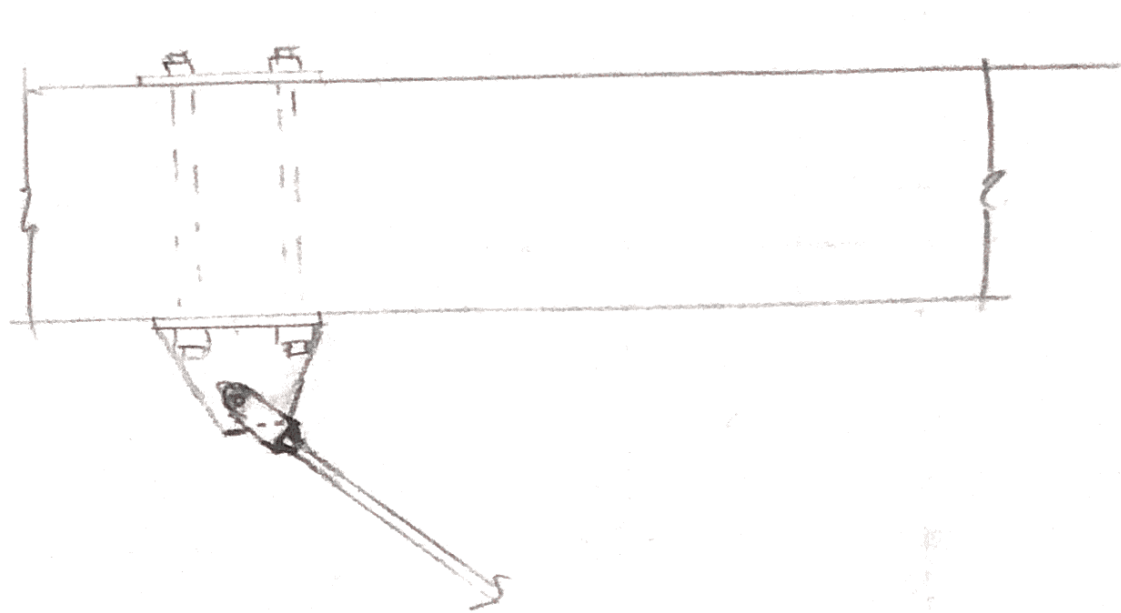
MIDREVIEW: TRUSS ELEVATION



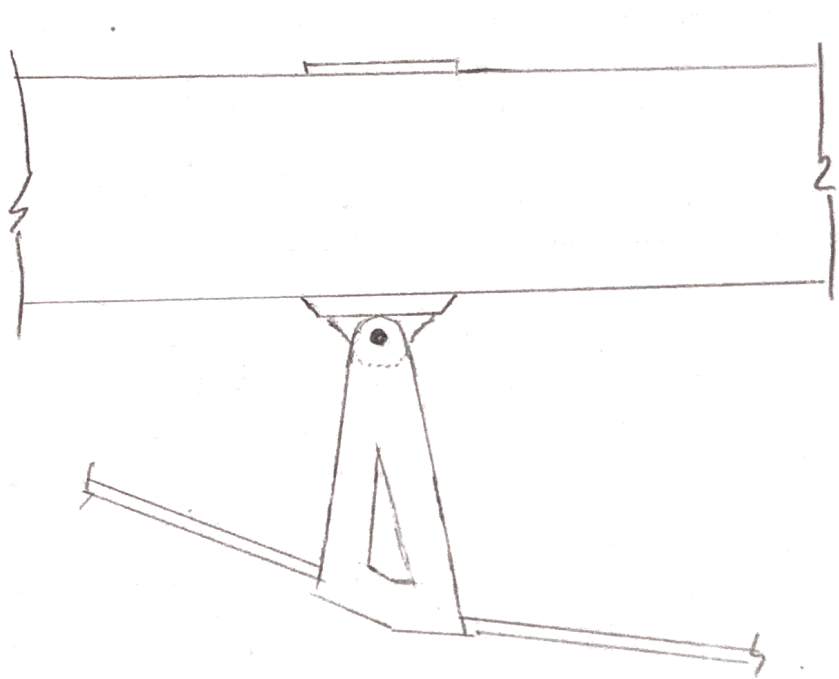


MIDREVIEW: TRUSS DETAIL

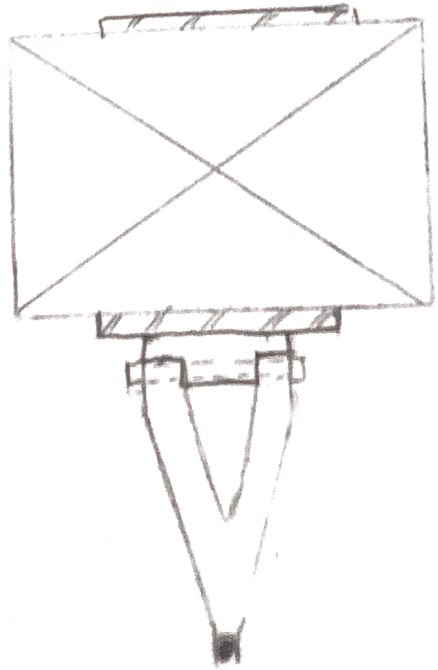
END ELEVATION DETAIL



MIDDLE ELEVATION DETAIL



MIDDLE SECTION DETAIL









MIDREVIEW: FLOOR PLAN



1' = 1/8"

MIDREVIEW: LONGITUDINAL SECTION



1'=1/8"



MIDREVIEW: SECTION



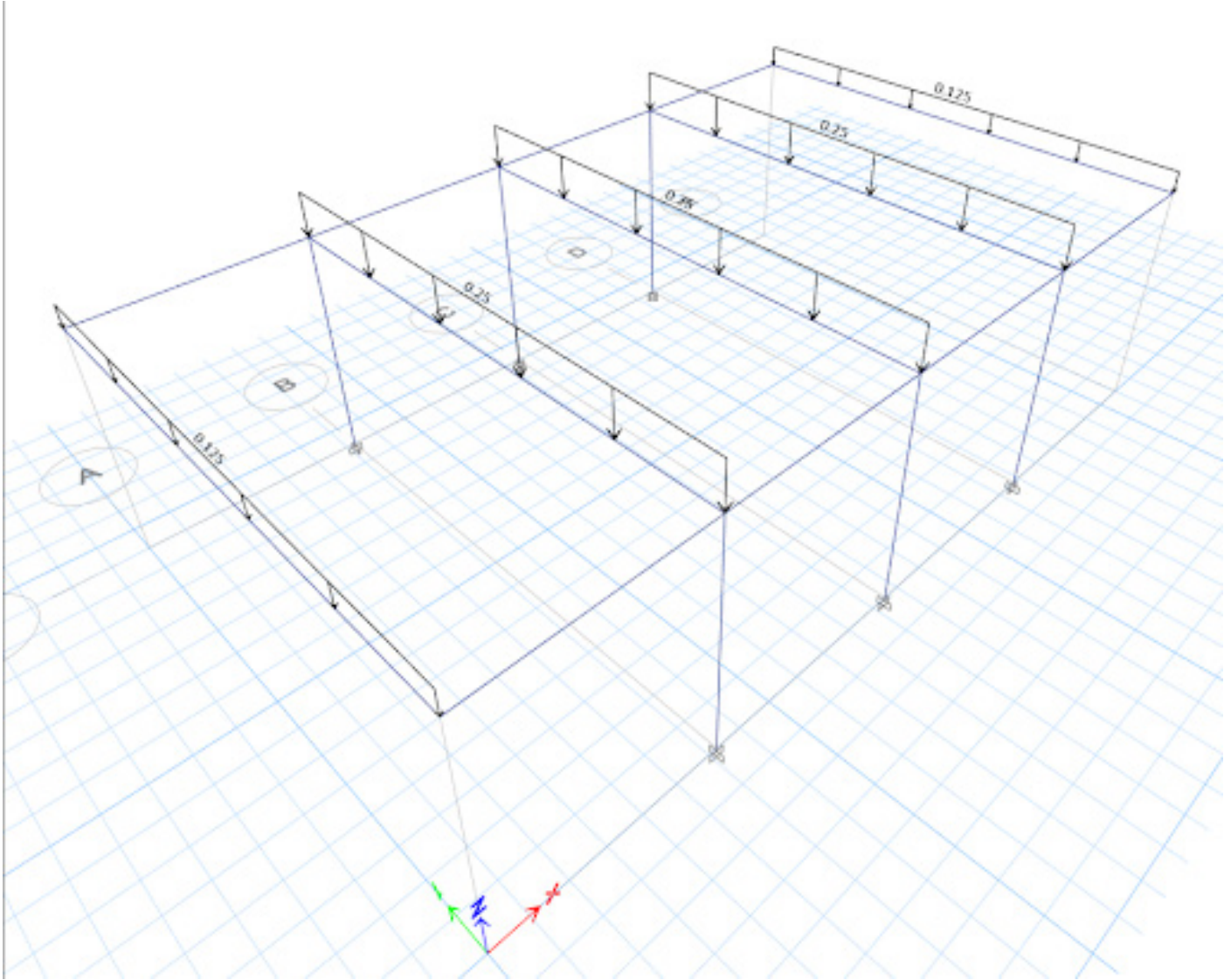
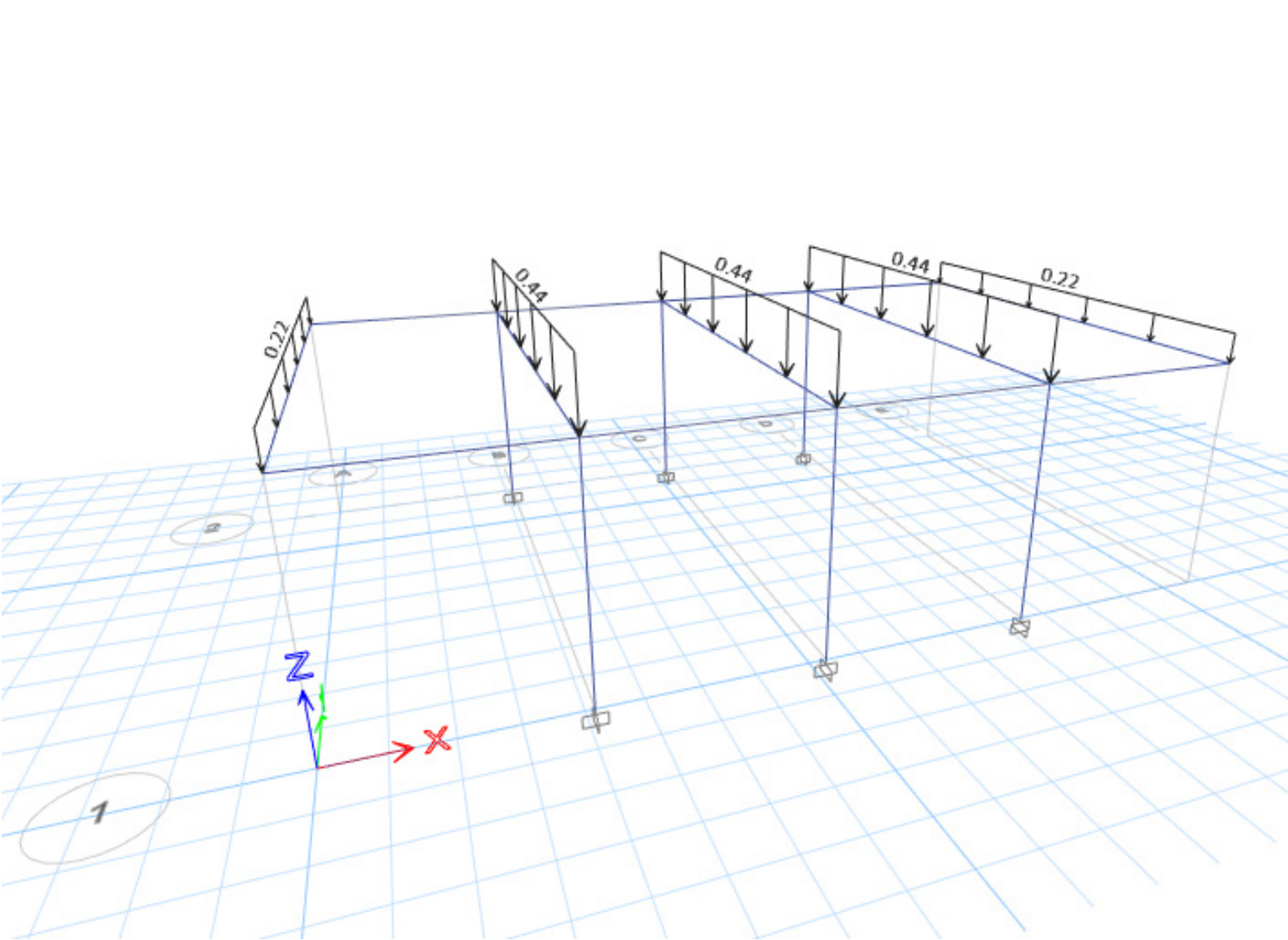




# FINAL REVIEW

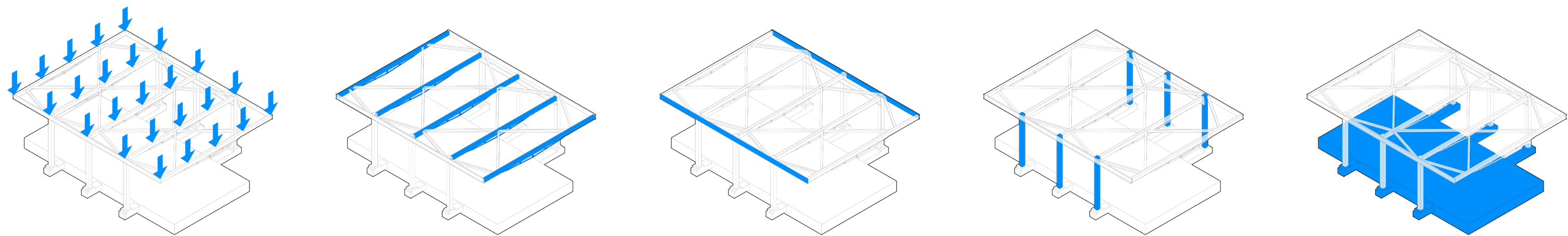
The Final Review was our final presentation of the glass house. Beginning with the model that we left from the Midterm review, we presented the changes we made since then. Most were changes to the structural layout of the model, followed by the corresponding architectural changes to keep the Miesian aesthetic of the building.

FINAL REVIEW: CALCULATIONS

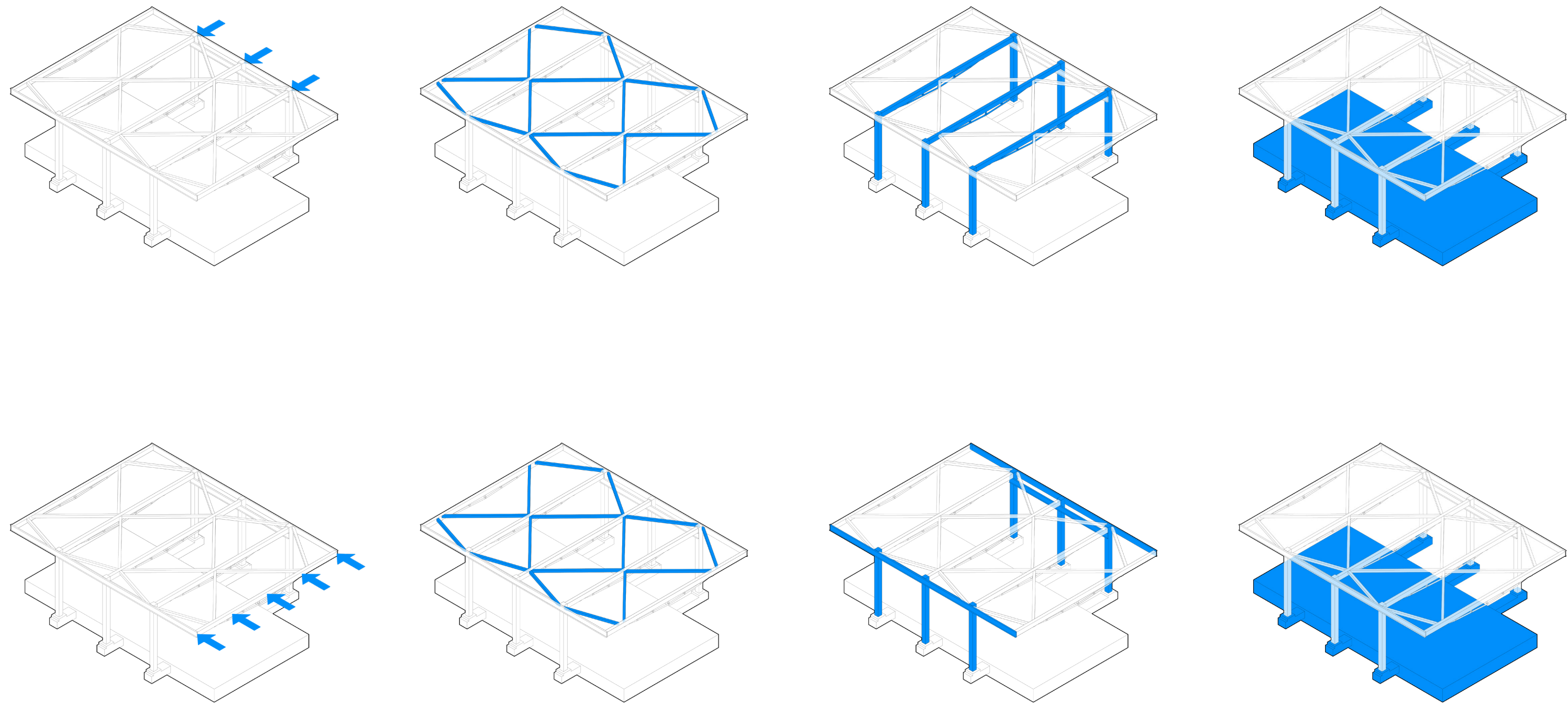




FINAL REVIEW: GRAVITY LOAD

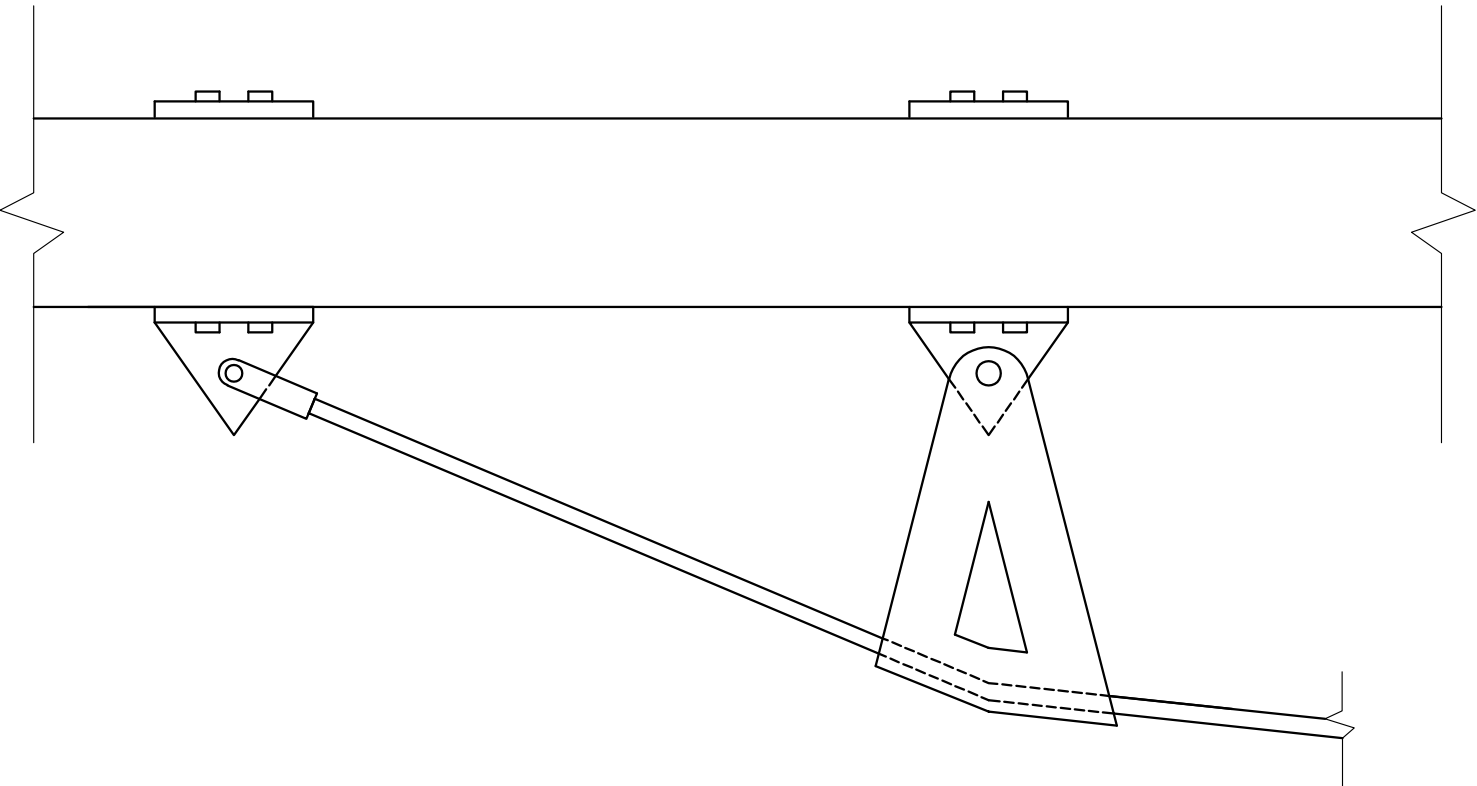
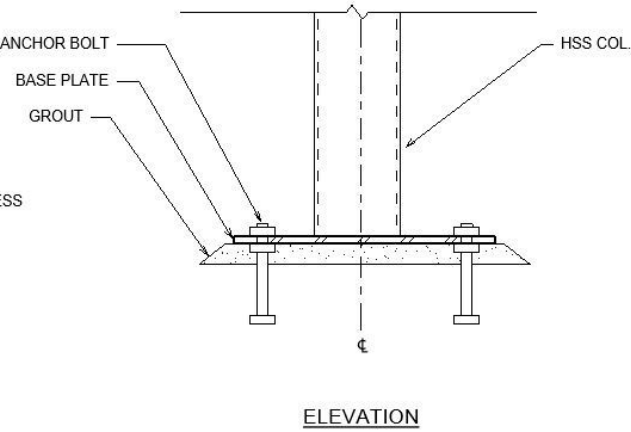
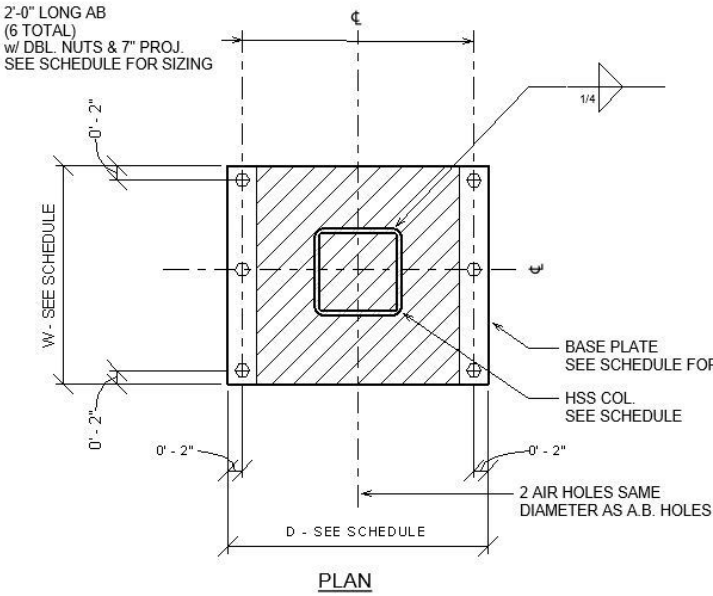


FINAL REVIEW: LATERAL LOADS

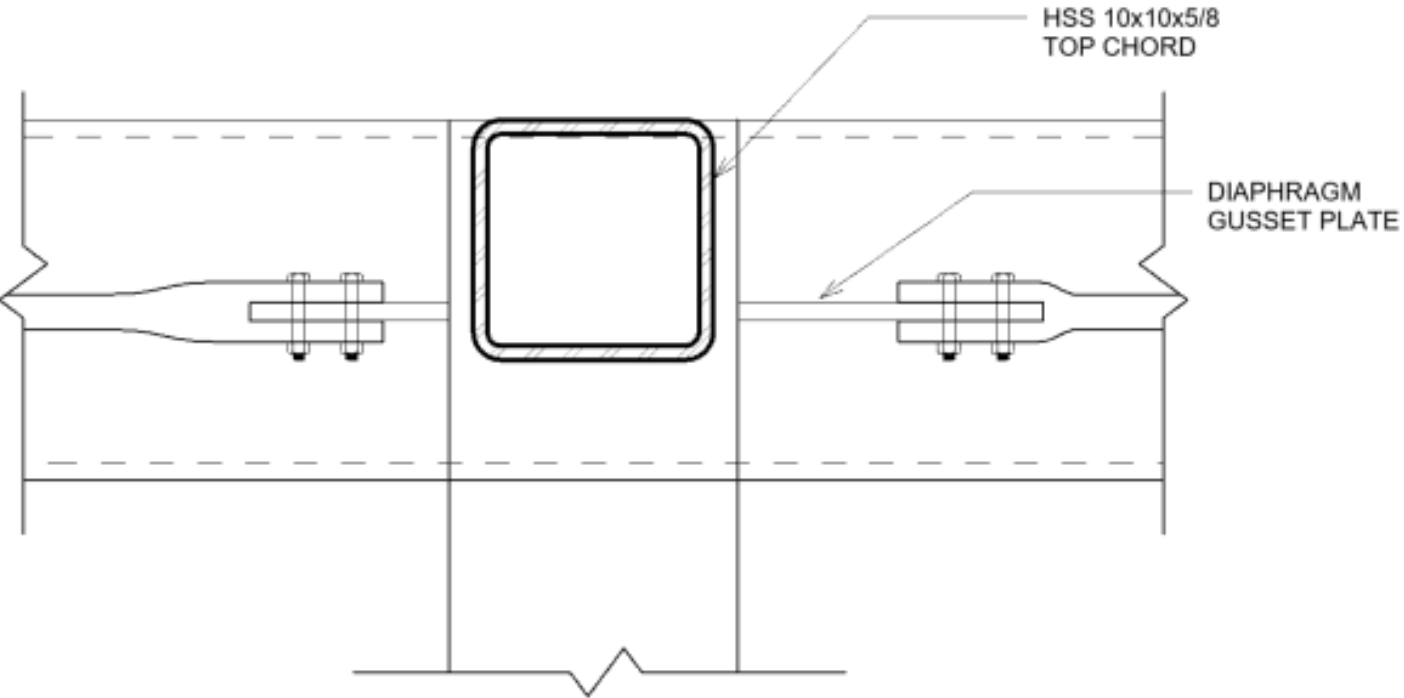
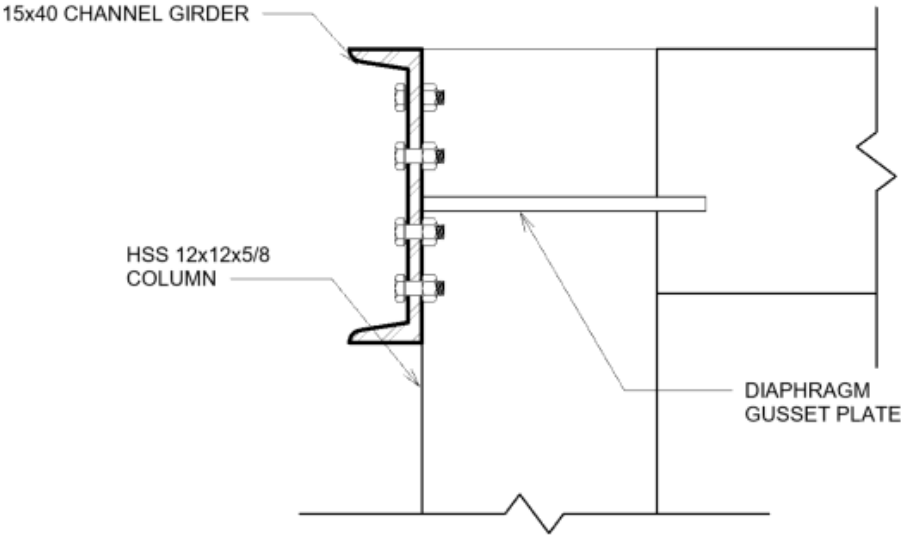
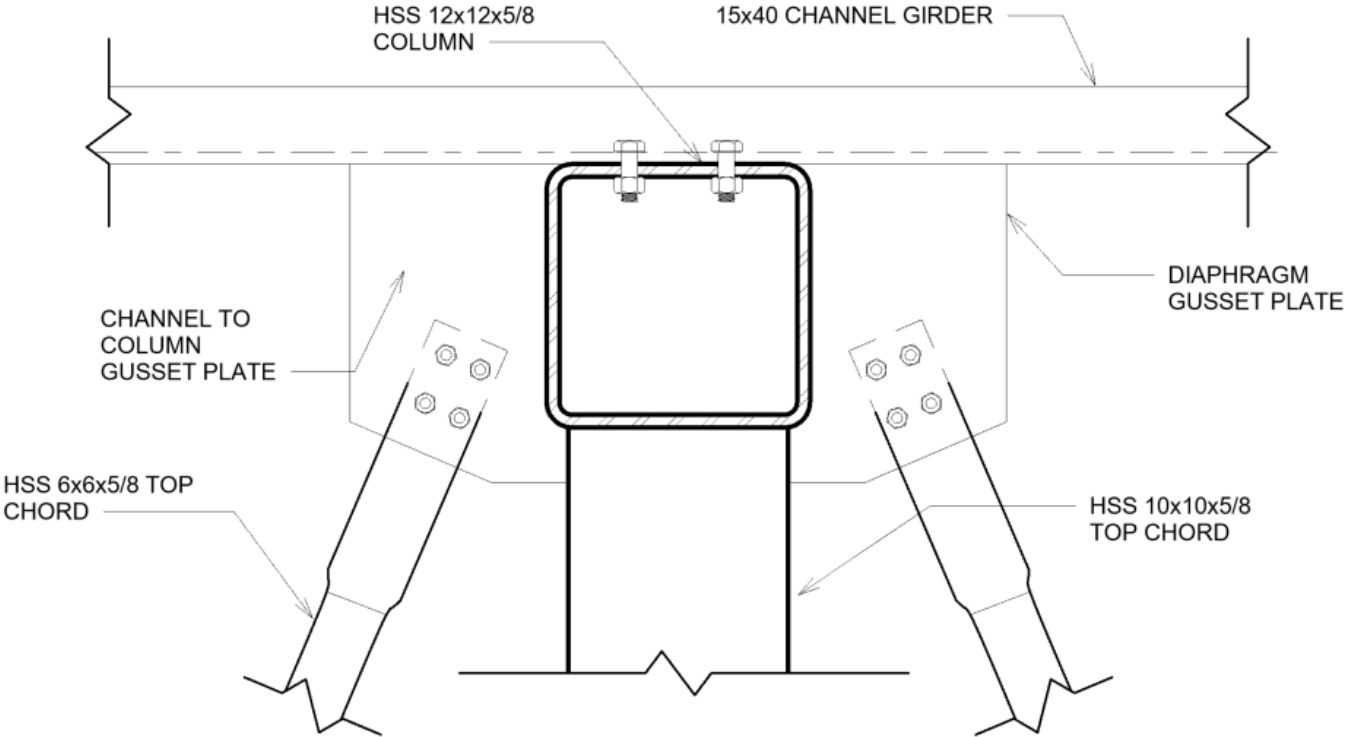
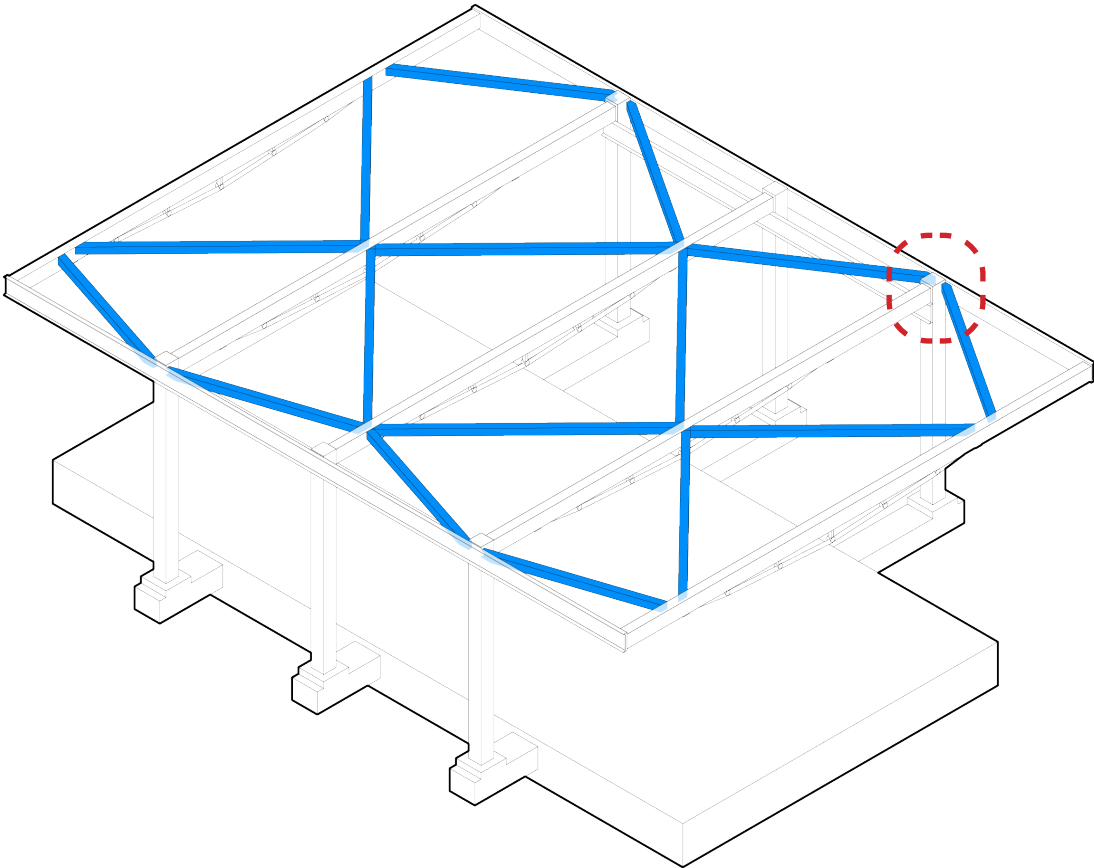




FINAL REVIEW: DETAIL

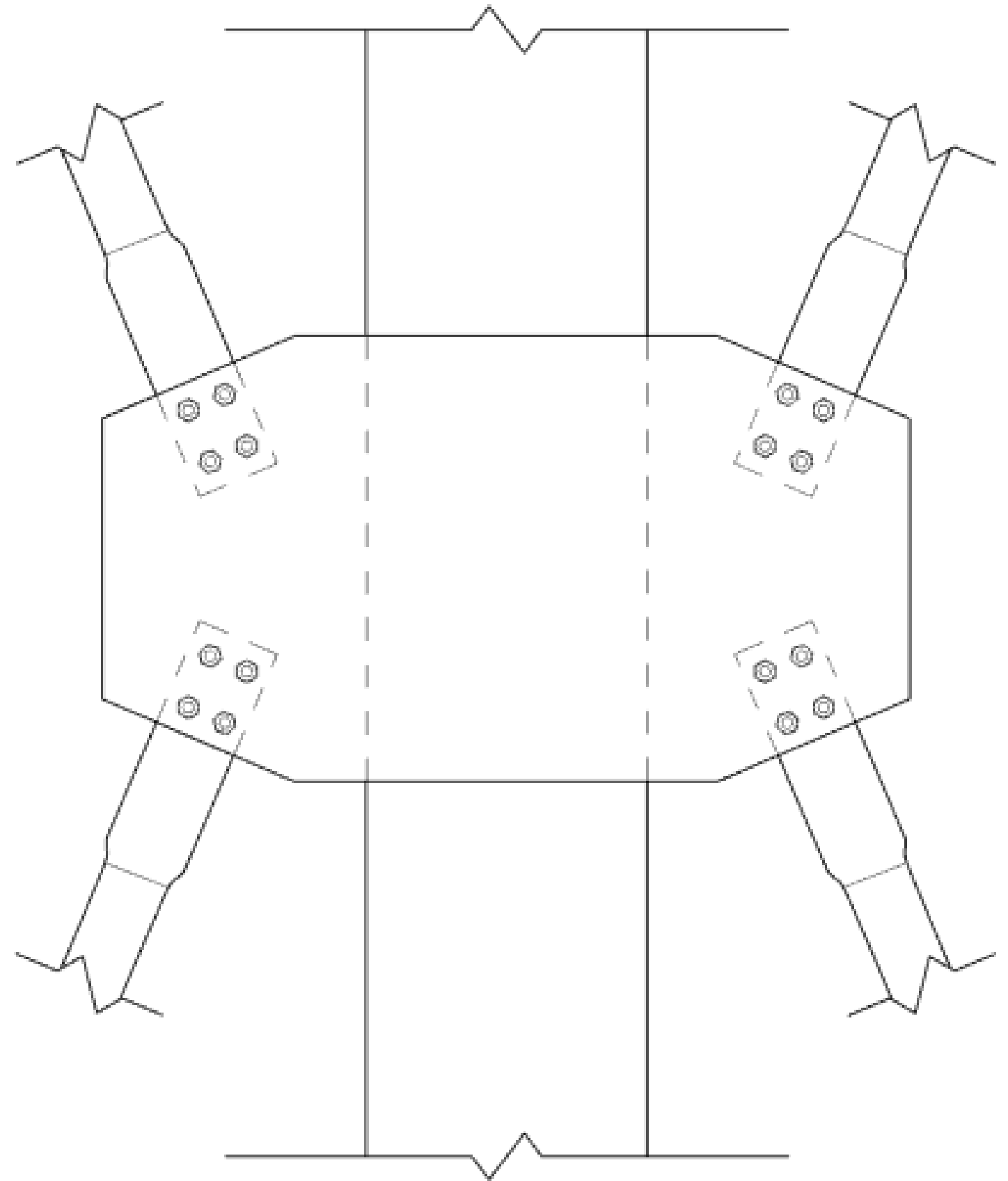
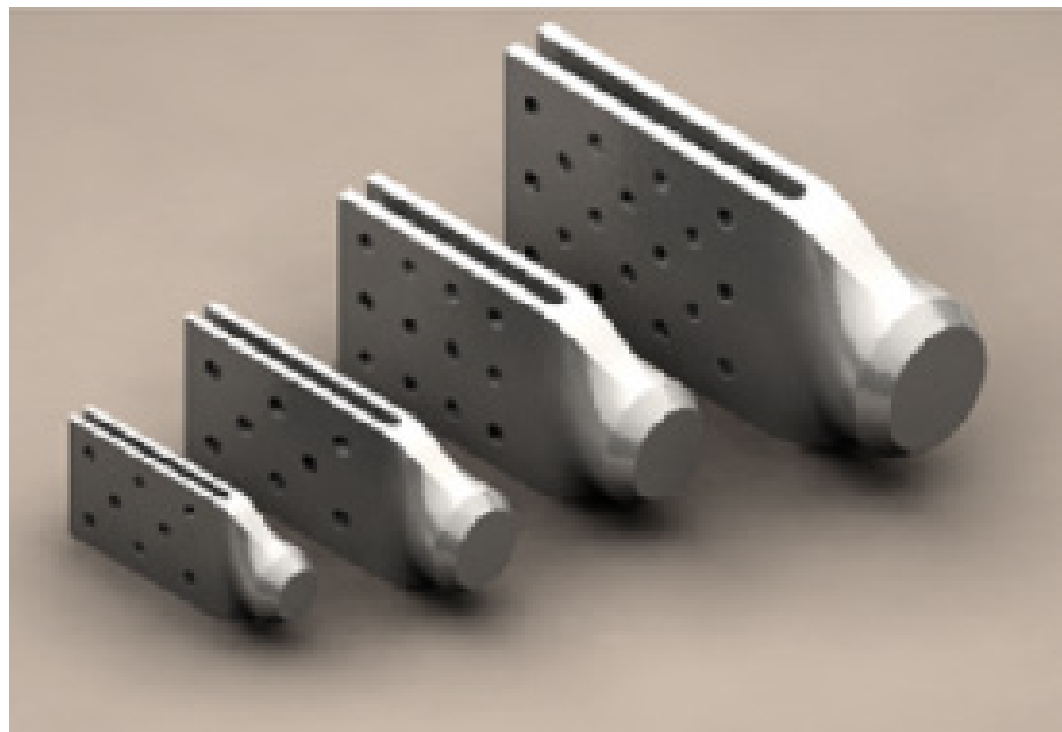


FINAL REVIEW: DETAIL

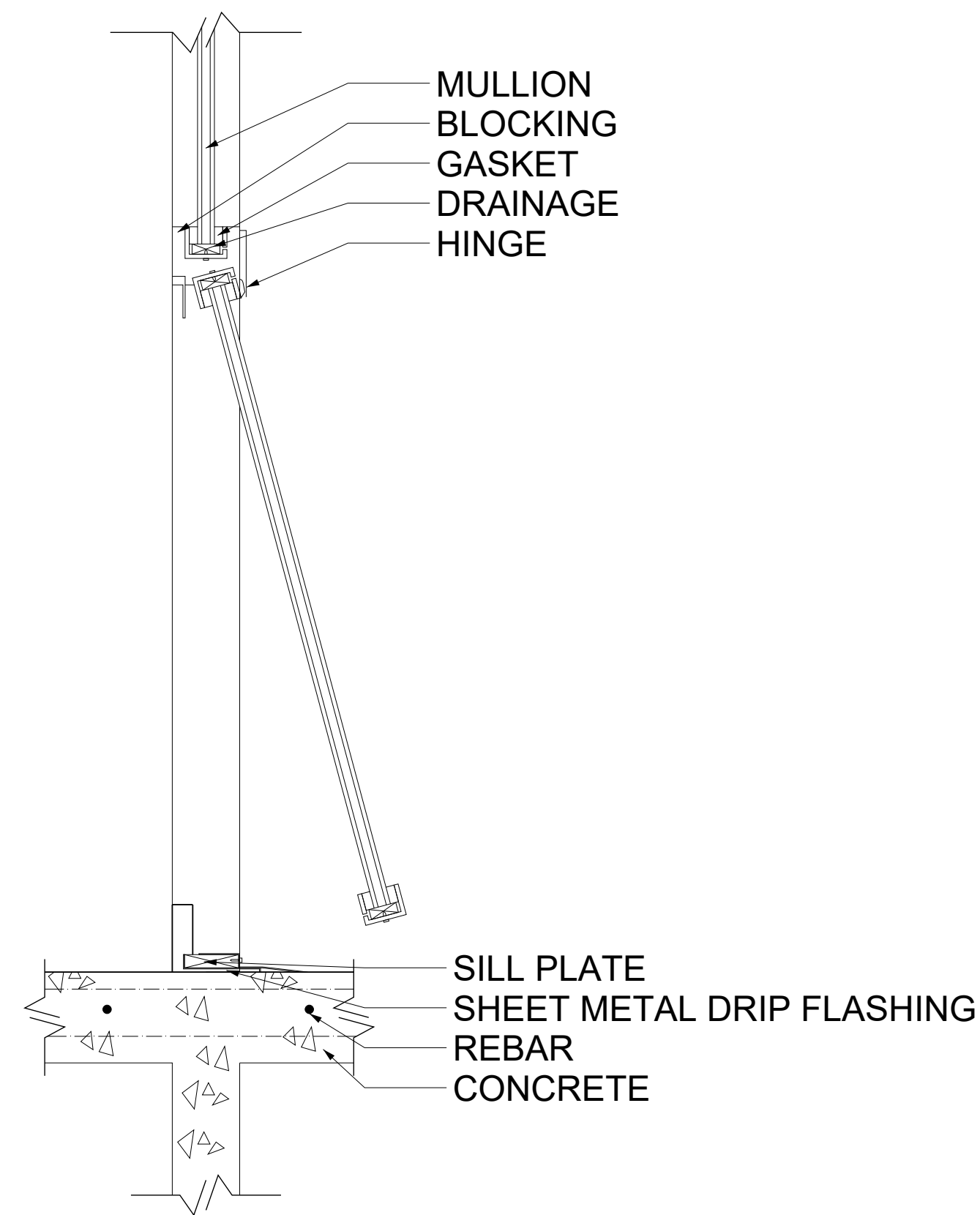
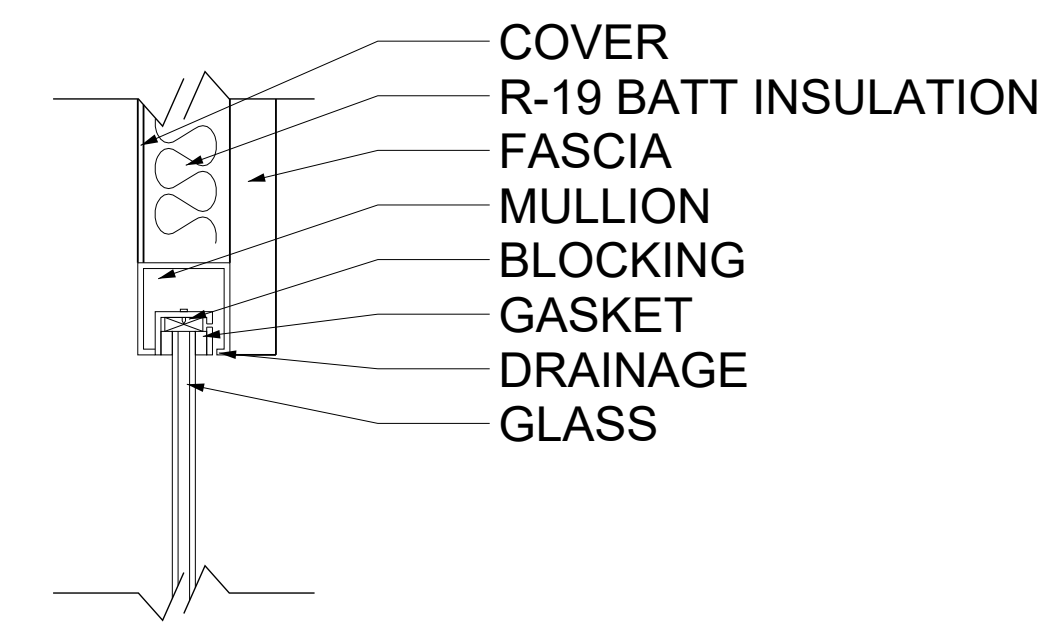
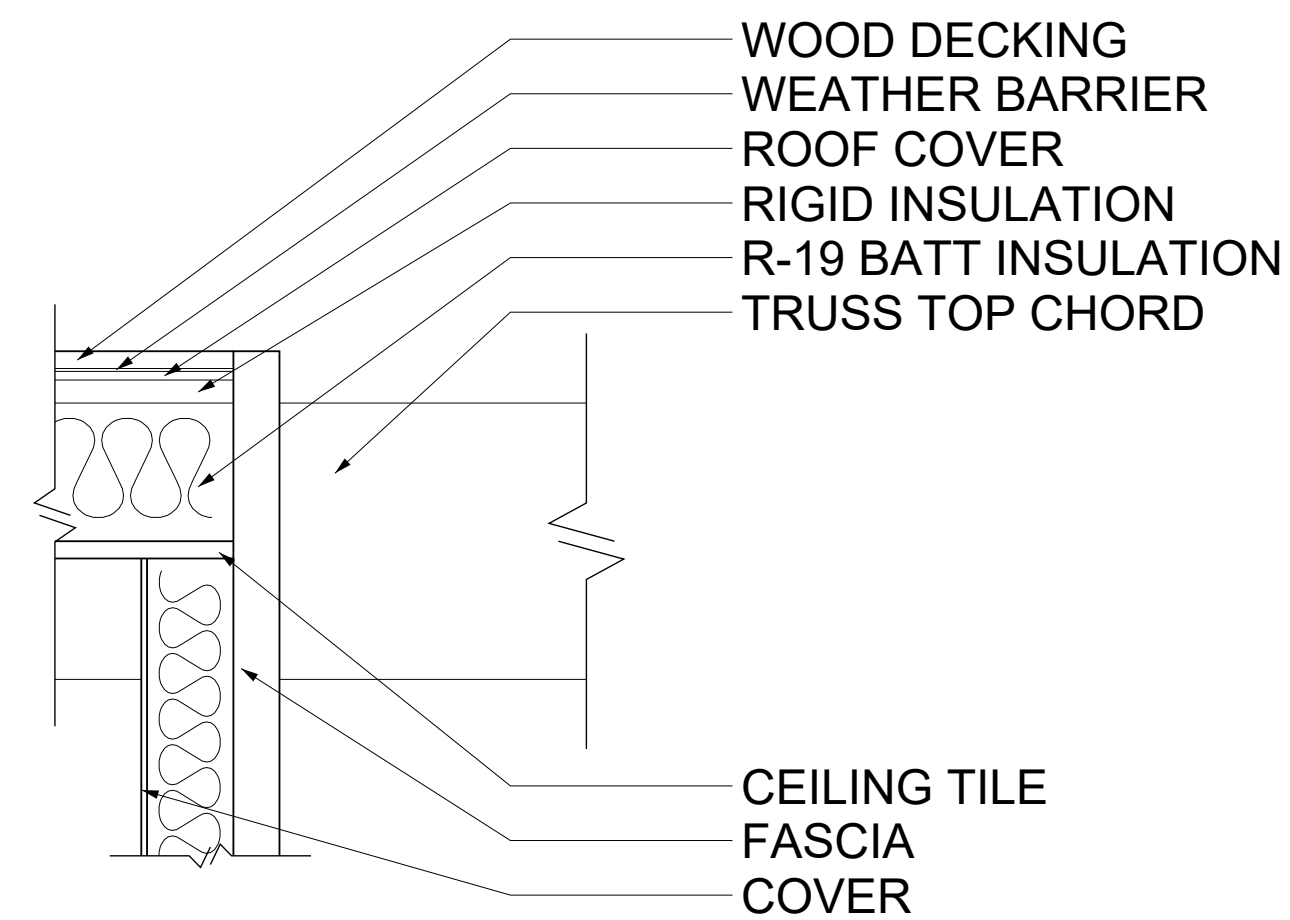




## FINAL REVIEW: DETAIL

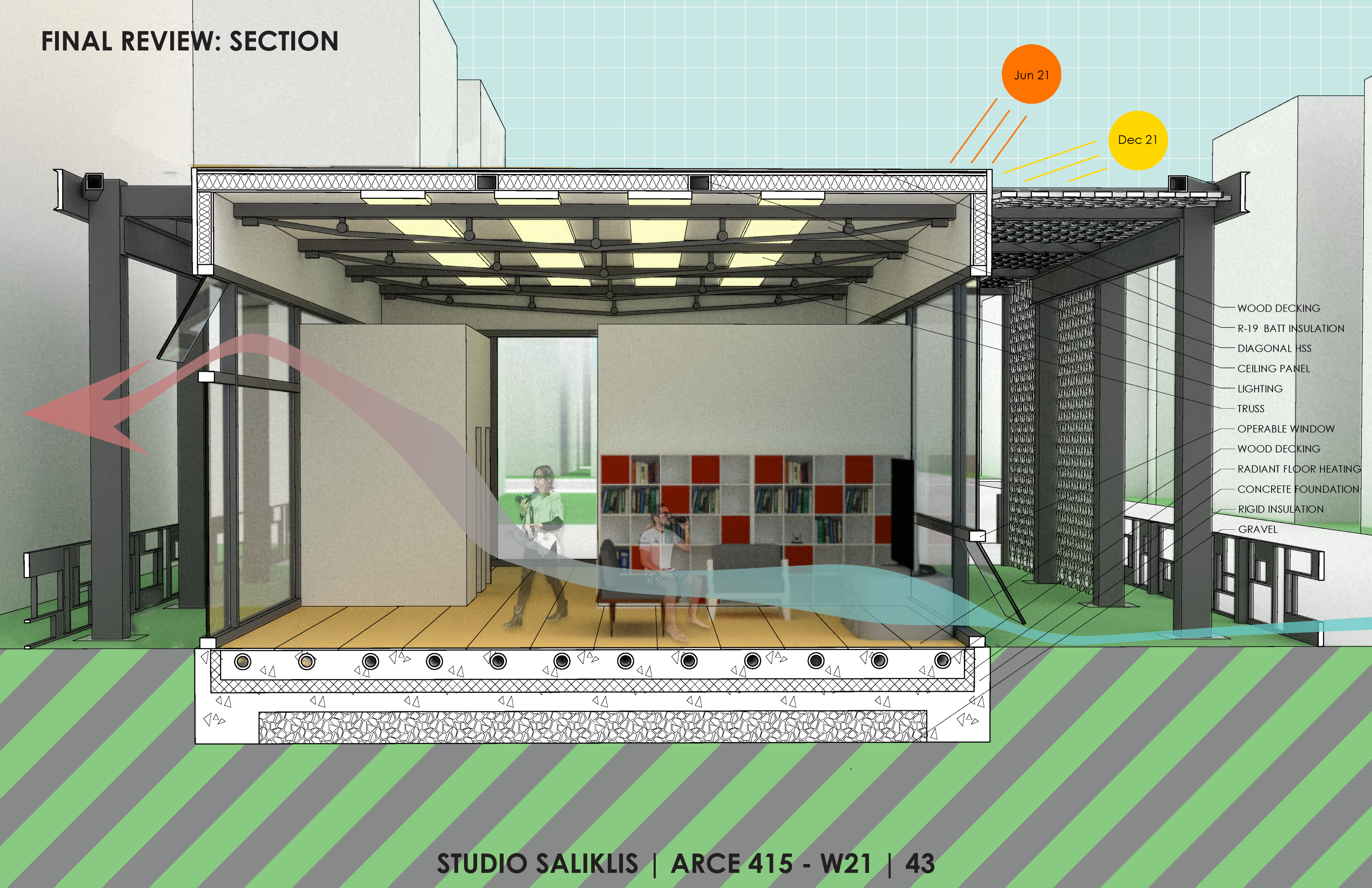


FINAL REVIEW: DETAIL





FINAL REVIEW: SECTION



- WOOD DECKING
- R-19 BATT INSULATION
- DIAGONAL HSS
- CEILING PANEL
- LIGHTING
- TRUSS
- OPERABLE WINDOW
- WOOD DECKING
- RADIANT FLOOR HEATING
- CONCRETE FOUNDATION
- RIGID INSULATION
- GRAVEL

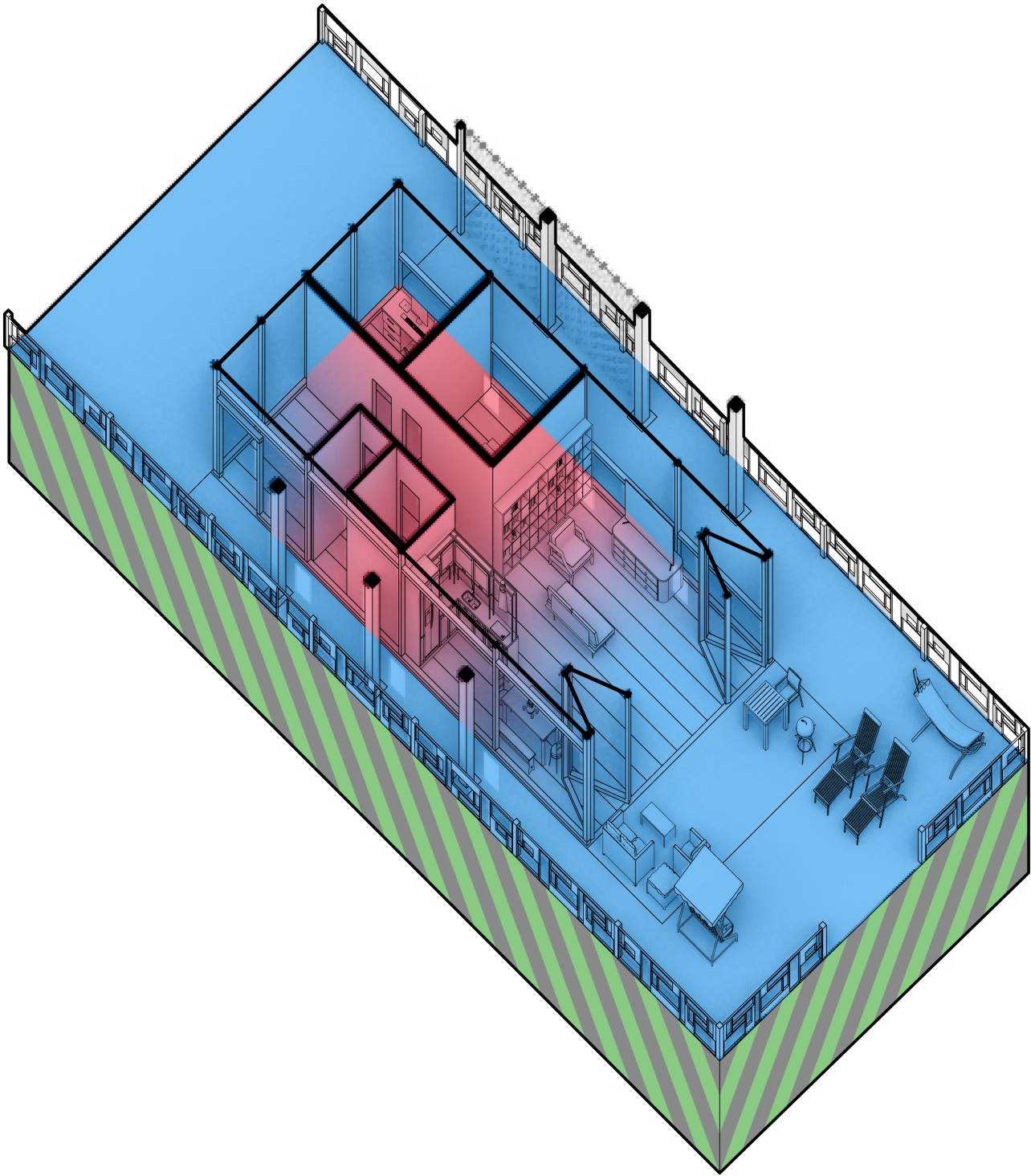
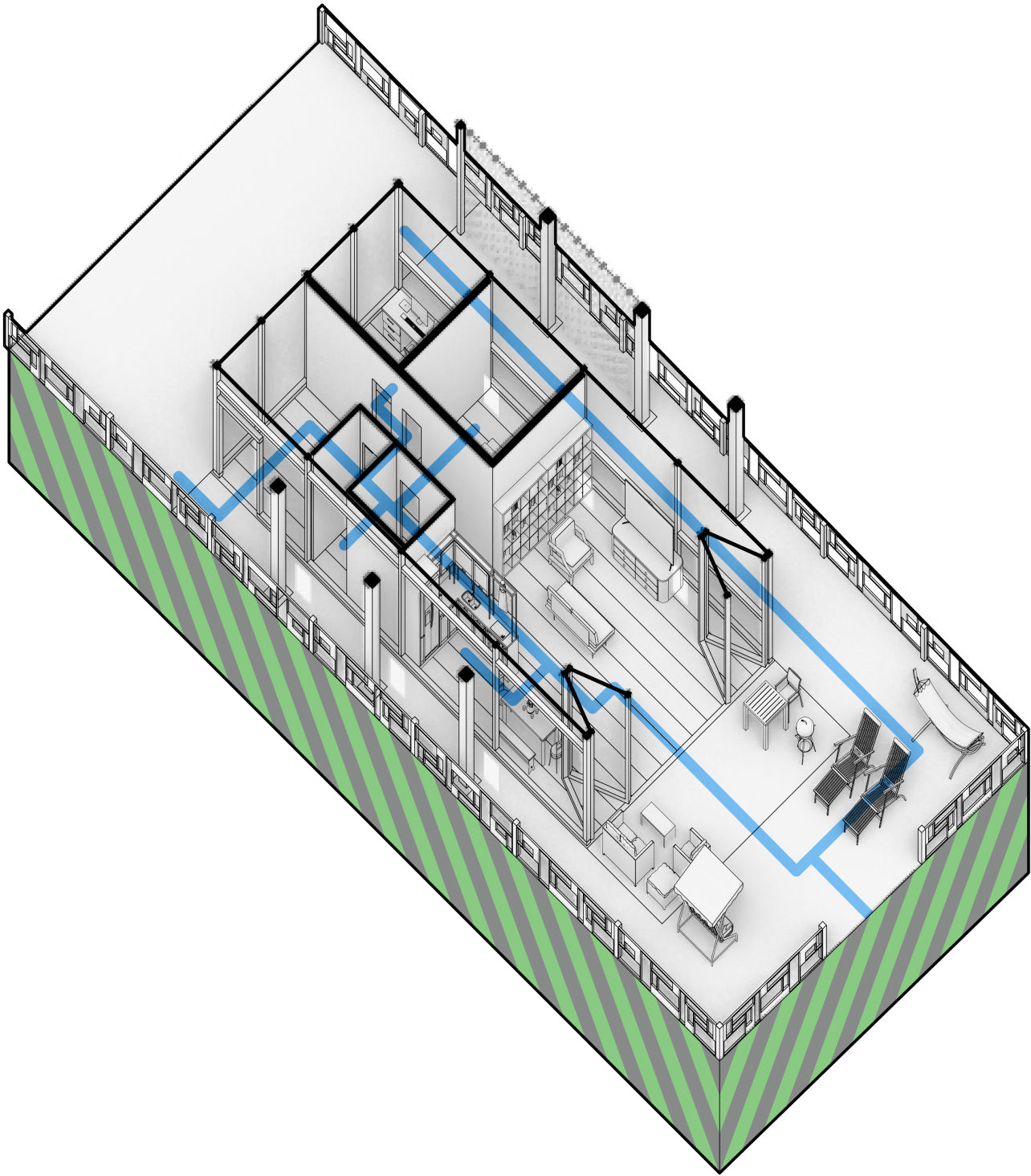


FINAL REVIEW: FLOOR PLAN

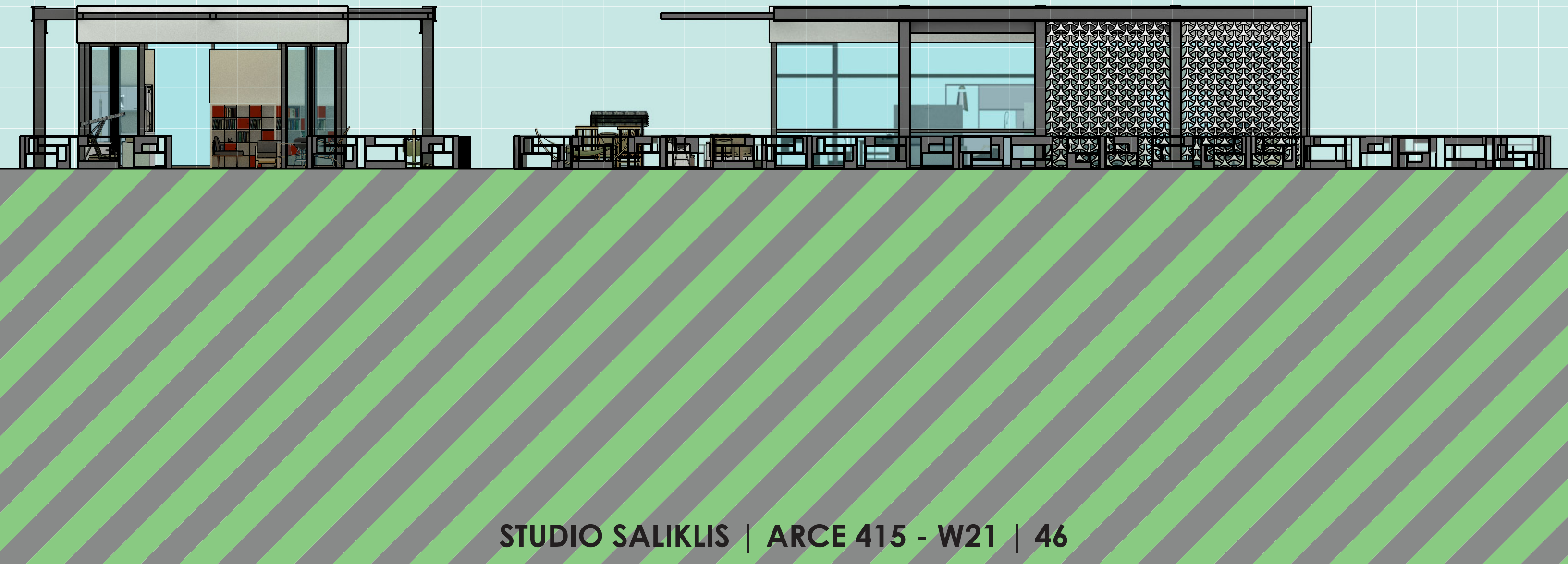




FINAL REVIEW: DIAGRAM



FINAL REVIEW: ELEVATION





FINAL REVIEW: LONGITUDINAL SECTION















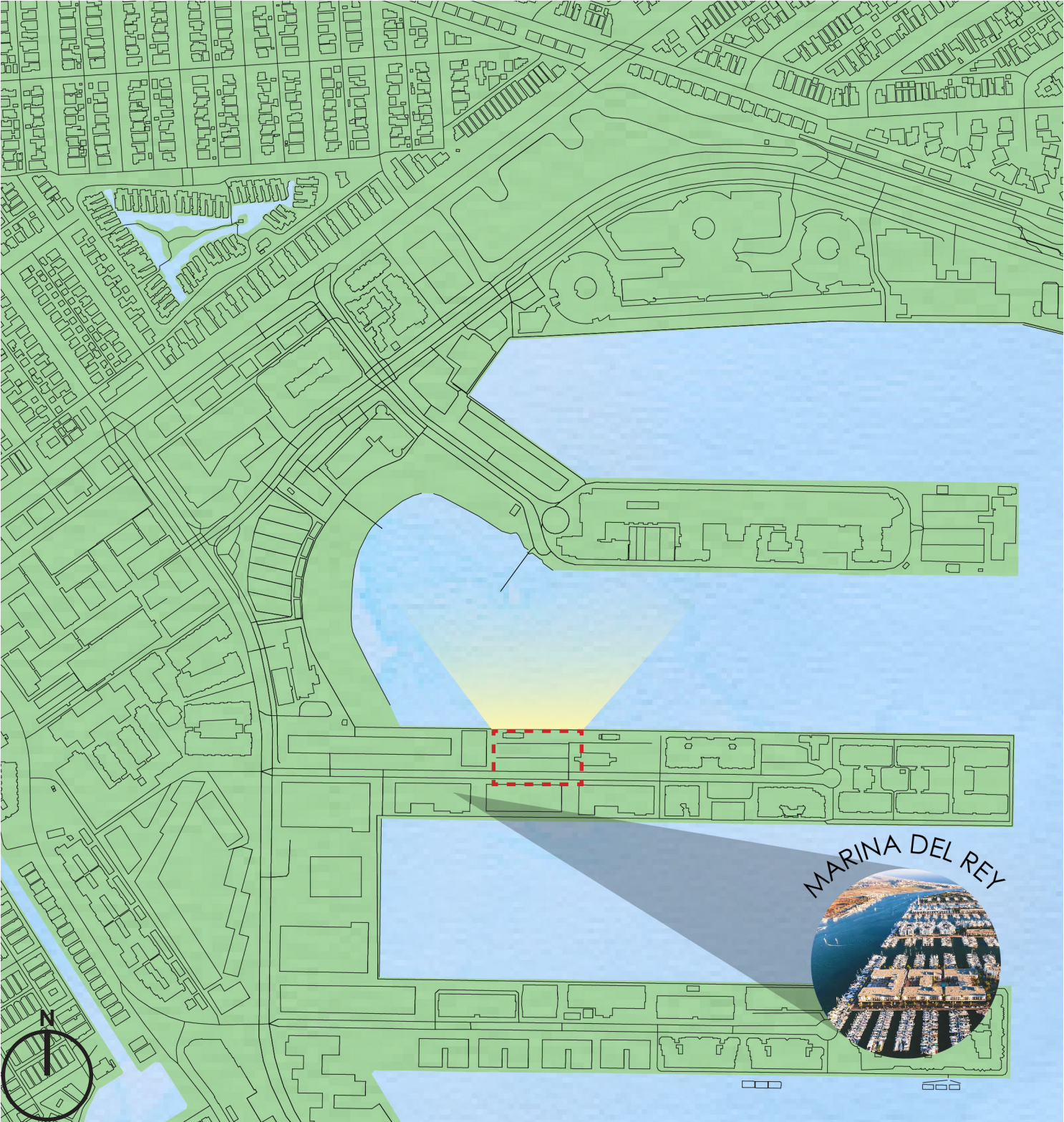


# FINAL FANTASY

Final Fantasy is a look into how our building can be used as a module system. We wanted to develop a market-rate apartment complex along with the Marina Del Rey. Throughout the quarter there was a lot of discussion of what it's like living in glass house and how that made the residence feel. With our Final Fantasy, we wanted to explore how a glass house made the neighbors and bystanders feel. If the resident was fine being exposed how would the general public react?

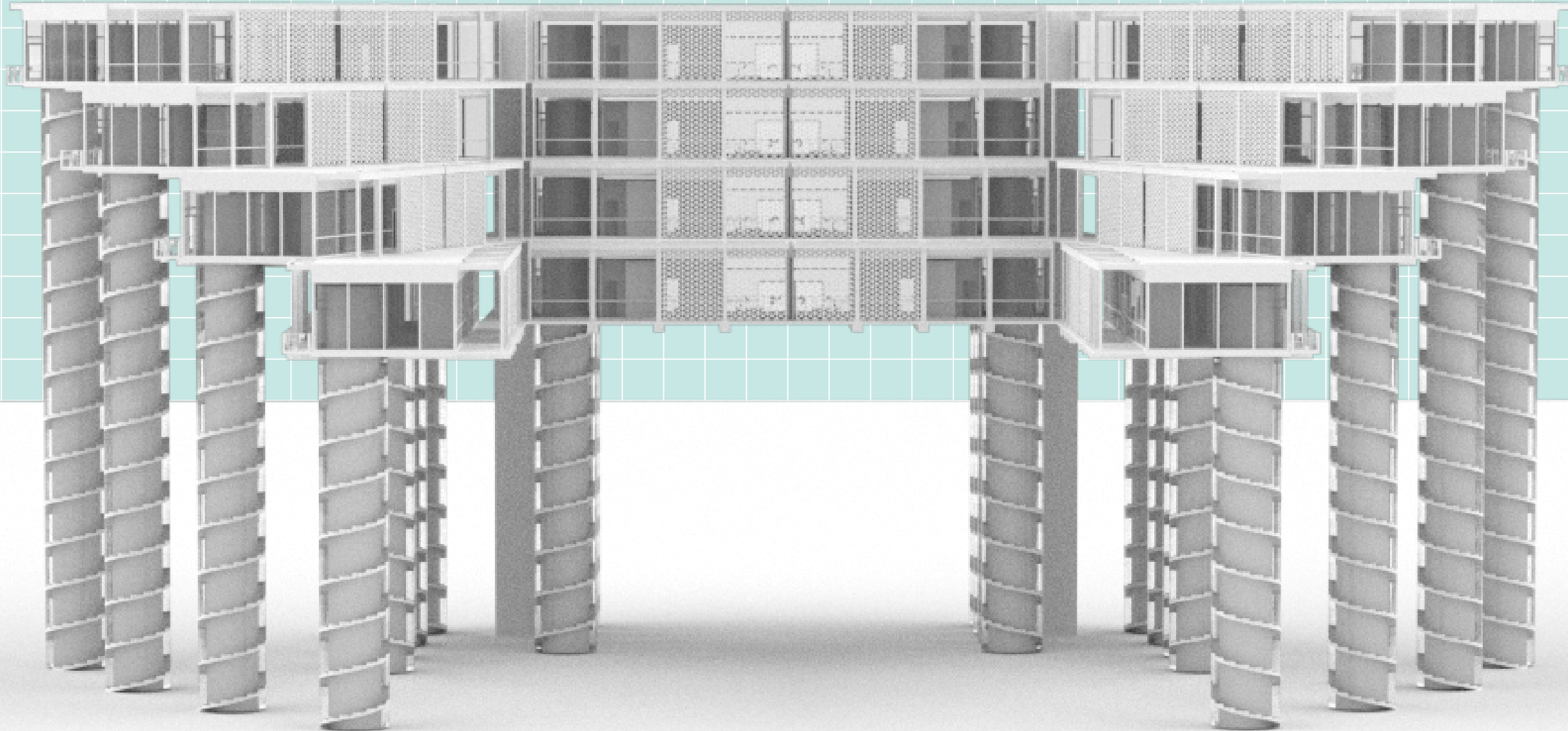
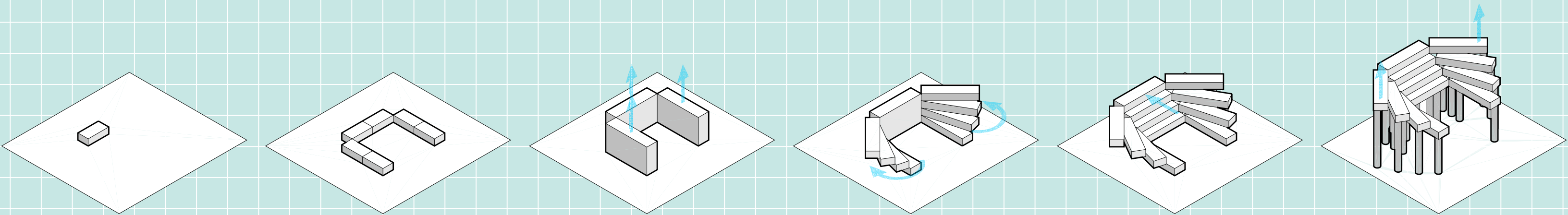


FINAL FANTASY: SITE





FINAL FANTASY: BUILDING

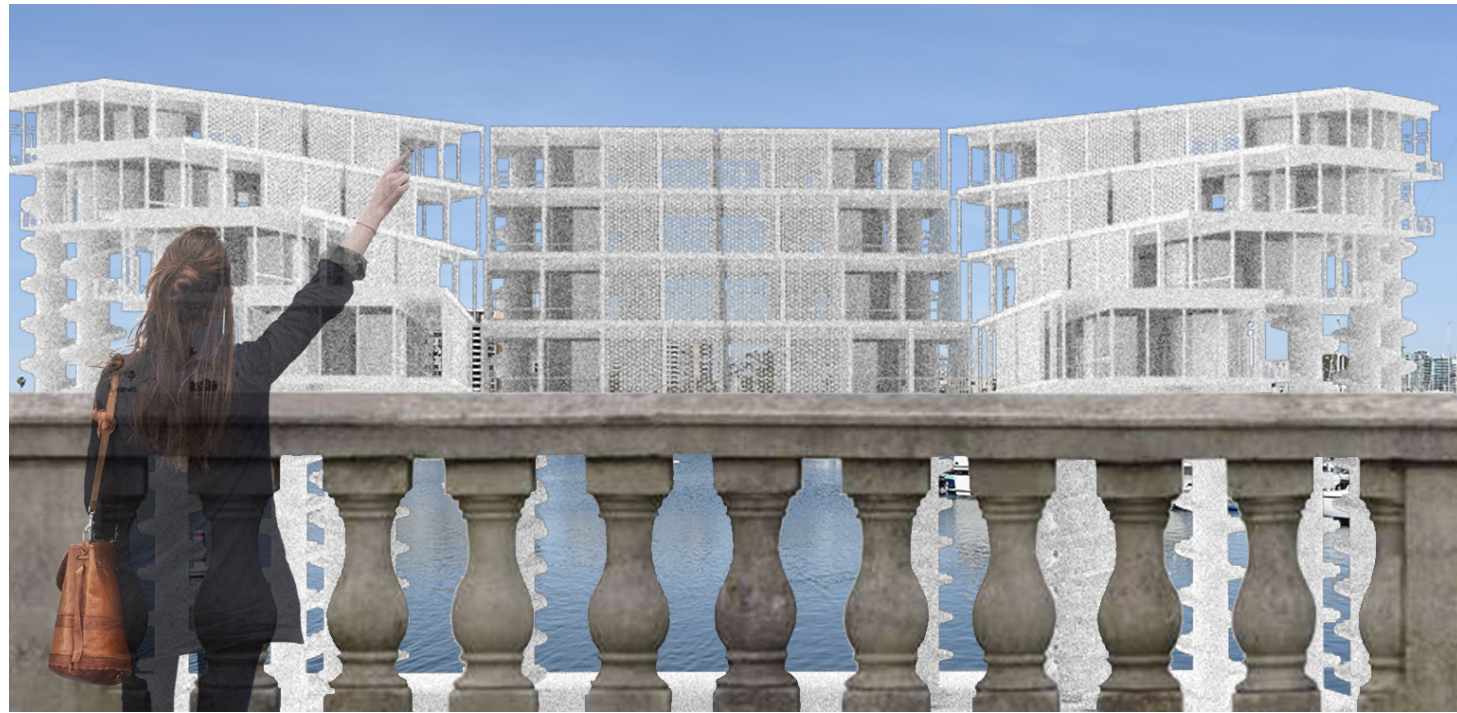


**FINAL FANTASY: RESPONSE**





## FINAL FANTASY: RESPONSE



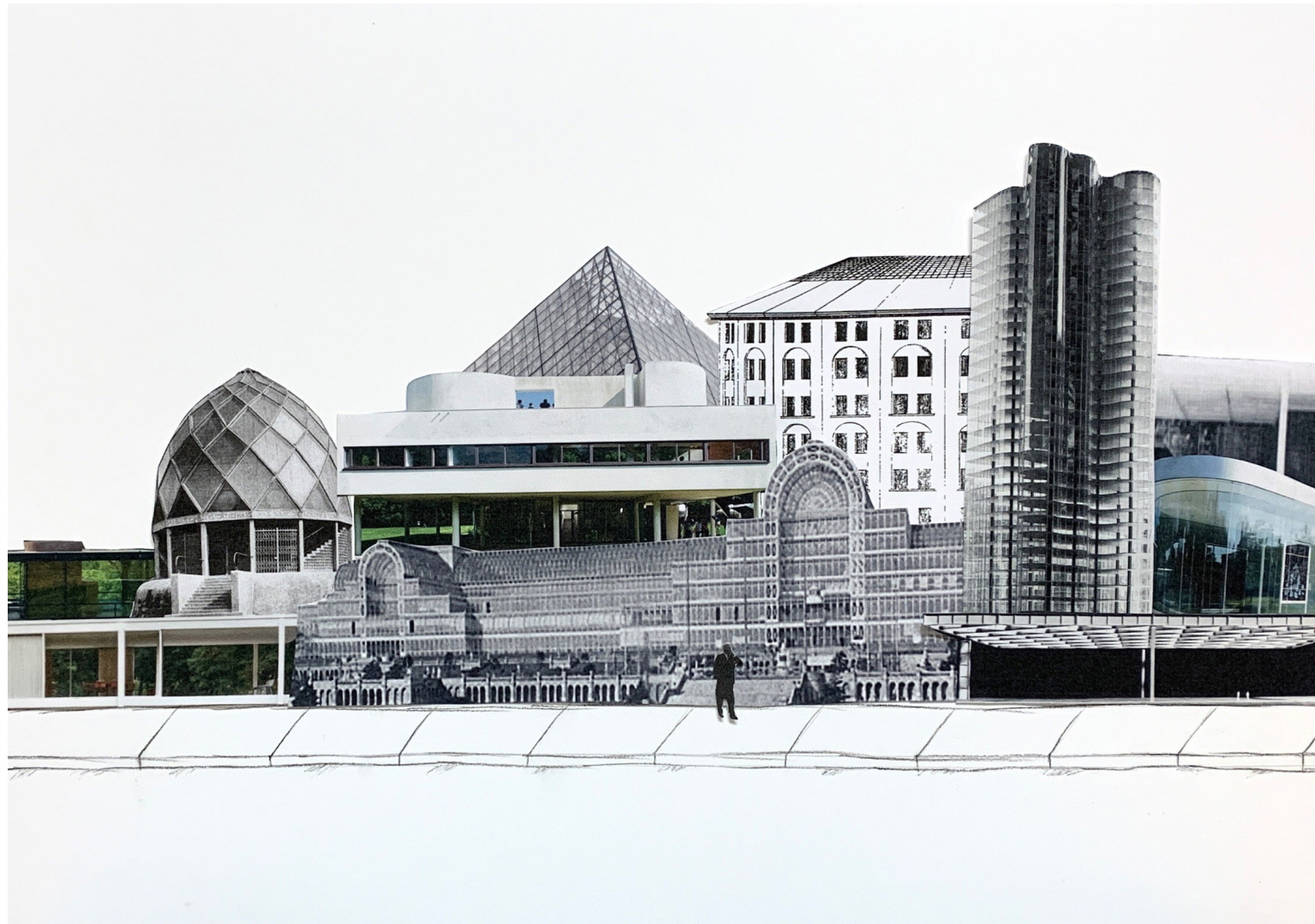




# ARTIFACT

Part of our final included each member creating an artifact related to our project. These works were created as commentary on the continuation of glass architecture.

## ARTIFACT: EMMA



At the beginning of this project we studied a lot of examples of glass architecture. This included some of the pieces of works that inspired the 50x50 house, and then later on other buildings that were inspired by the original 50x50 house. I created a collage of some of the specific buildings that we studied that collectively influenced the design of our own project.



## ARTIFACT: JORGE



**My artifact was a display of our building as an orthogonal shape, cubical, and applying two things: the question of how deep is too deep for truss depths, and what happens to the other faces of the building when a torsion is applied to it.**

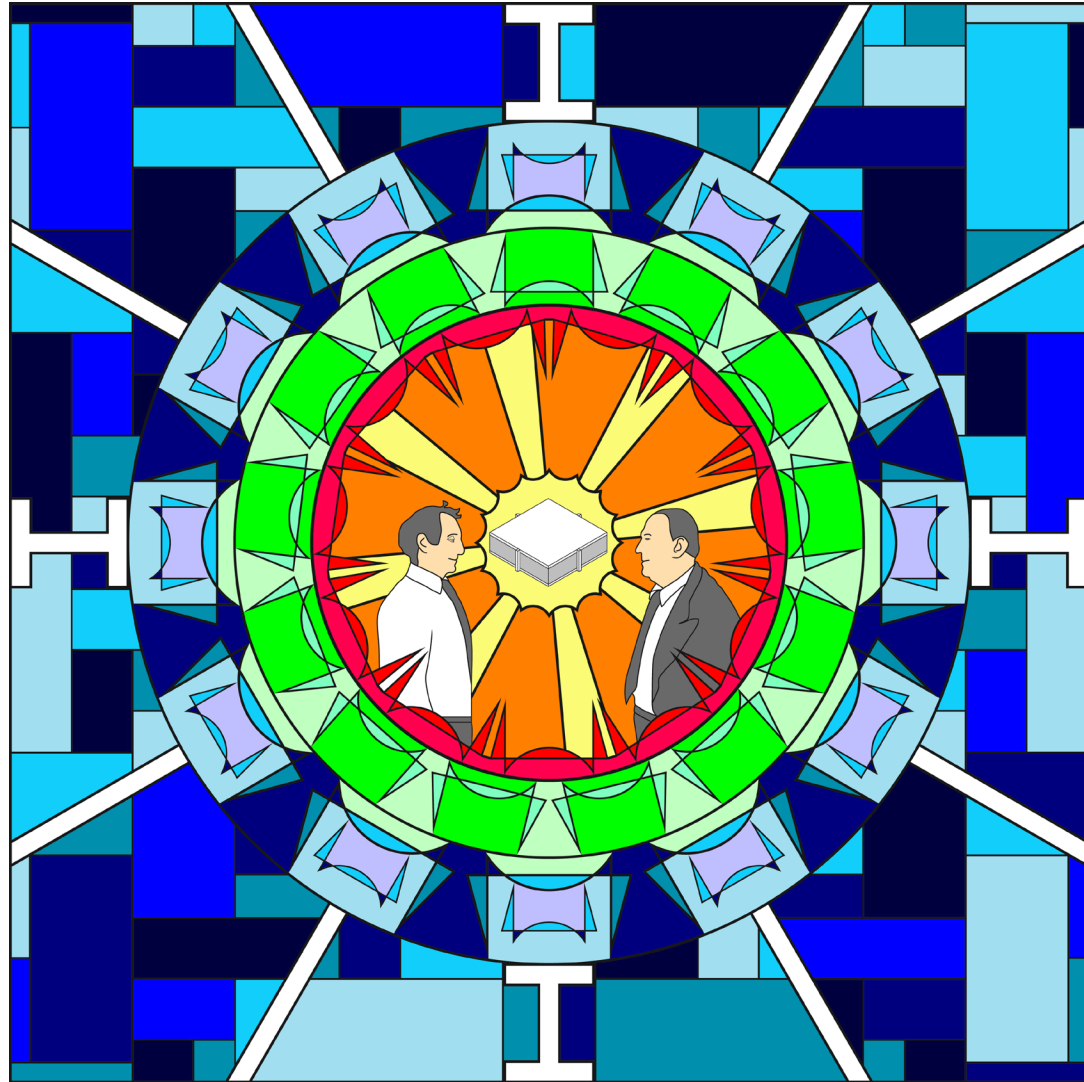
## ARTIFACT: JACOB



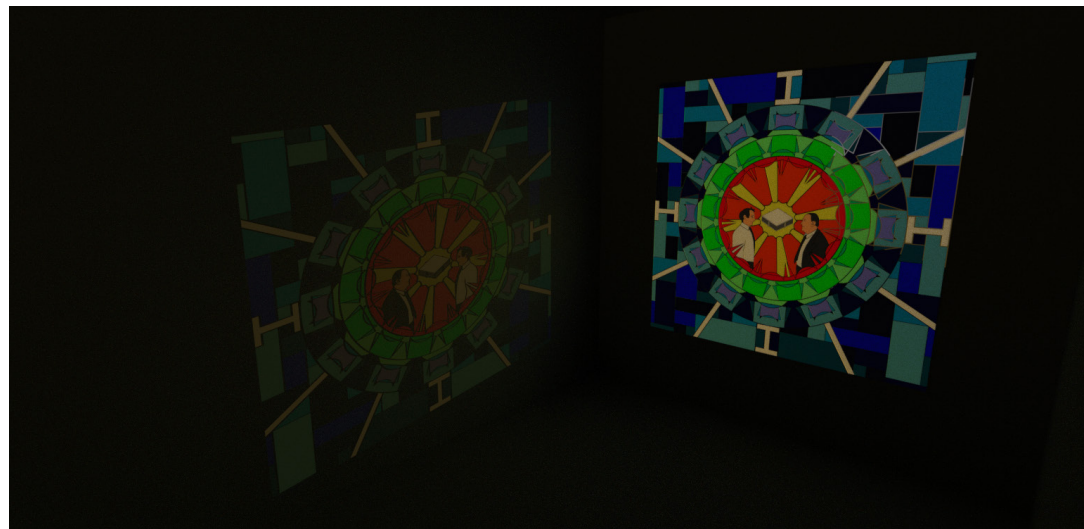
This artifact depicts a pair of dancers inside a mock 50x50 aquarium. It plays with the idea of being constantly exposed without knowing whether you are being watched or not.



## ARTIFACT: RICARDO



Since there was a heavy emphasis on glass this quarter, I wanted my artifact to incorporate that element. I designed a stained glass piece that showcases the event when Mies and Myron conceptualized the 50x50 House. Around them are moment diagrams and along the midspan are wide flange beams. The blue squares along the corners are ratios from our studio project. The bottom image is a rendering of the glass and how it would reflect color in a room.







# CONCLUSION

Concluding thoughts we each had about our experience and project.







## EMMA PLACEK

Overall, I thoroughly enjoyed this project and learned a lot from it. I think the challenges we were faced with in designing this building were very unique to other projects I have gotten to work on in the architectural engineering program. This project pushed me to think more creatively, and gave me the opportunity to consider aspects of a project that as engineers we typically think are solely the responsibility of the architect. I think that getting to collaborate on this project alongside both fellow engineers and an architect was a very beneficial experience that can be carried into my future career.



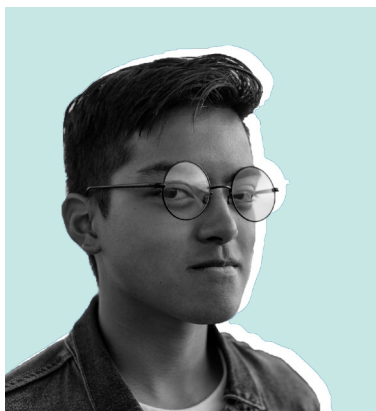
## JORGE RIOS

Learning about the Glass House and its century-old history was an amazing experience for the Senior Project. As an Architectural Engineering major, working with Architects is something I will be doing for a long time in my career. This project was the first step to introducing me to what it is like to coordinate with other engineers and with an architect. Additionally, designing houses such as the Glass House can demand more than simply structural application, but the history of it was well.



## JACOB KELLER

Through the conceptual 50x50 house by Mies and Myron, as well as the dystopic lens of Zamyatin, we explored the possibilities of glass and the way it relates to the structure on a social, symbolic, and scientific level. This studio blends the structural and architectural design processes allowing for interdisciplinary solutions.



## RICARDO VILLANUEVA

This studio experience is one that I enjoyed a lot. The design process was very different than what I often go through in a studio. Often there is more of an emphasis on form, site, and experience that is considered early in the design phase while structures are more of an afterthought. By incorporating structures in the early phases of the design, we were able to create something that can somewhat be built rather than it be a conceptual idea. I enjoyed working with ARCEs as it gave me a better understanding of what they do and it gave me a glimpse of what it's like working in the field.

