Edmond Multi-Modal Transport Hub

Natalie Haggard
ARCH 4216 Spring 2023

Schematic Design

The schematic design phase of our Integrative Studio consisted of research, preliminary design, and early coordination of structural and mechanical systems. Schematic Design lasted a total of 6 weeks of the total 16 weeks of the project. We worked as a team during this part of the project, two architects together with a structural engineer. This phase was the most similar to what we had done during our other previous design studios.

As it was a project for a multi-modal transport hub in Edmond, Oklahoma, I began my research by studying both the typology of similar transport hubs, and also the cultural and design context of Edmond Oklahoma. During our context study, my teammate and I became interested in the Rodkey Flour Mill that was located near to our site, we chose to use this as an inspiration for our design. This led to more research into historic Oklahoma agrarian structures, and incorporation of those forms into our design.

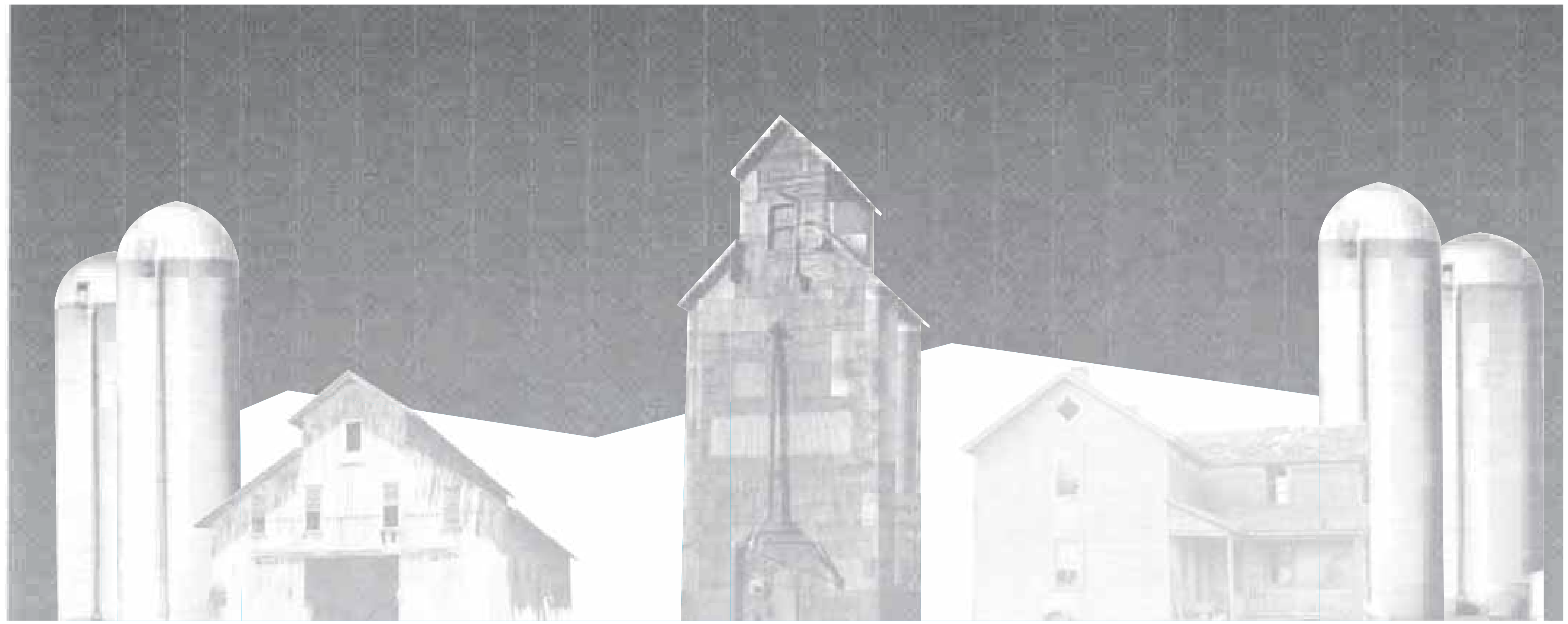
At this phase we also began the floor planning process. Something that was quite important to us in our overall floor plan was that the agrarian forms come through not just on the elevation, but also within the floor plan. We developed a scheme that had the agrarian forms shown as distinct buildings with a more contemporary infill connecting them as circulation space. This proved a fairly efficient way of organizing our building. We also began integrating our structural and mechanical systems with our preliminary building design at this stage. This is not something that we have ever had to focus on before, and doing it provided a lot of learning and context into not only how important those systems are, but also how important their integration with the design is so your whole building works seamlessly together.

collage

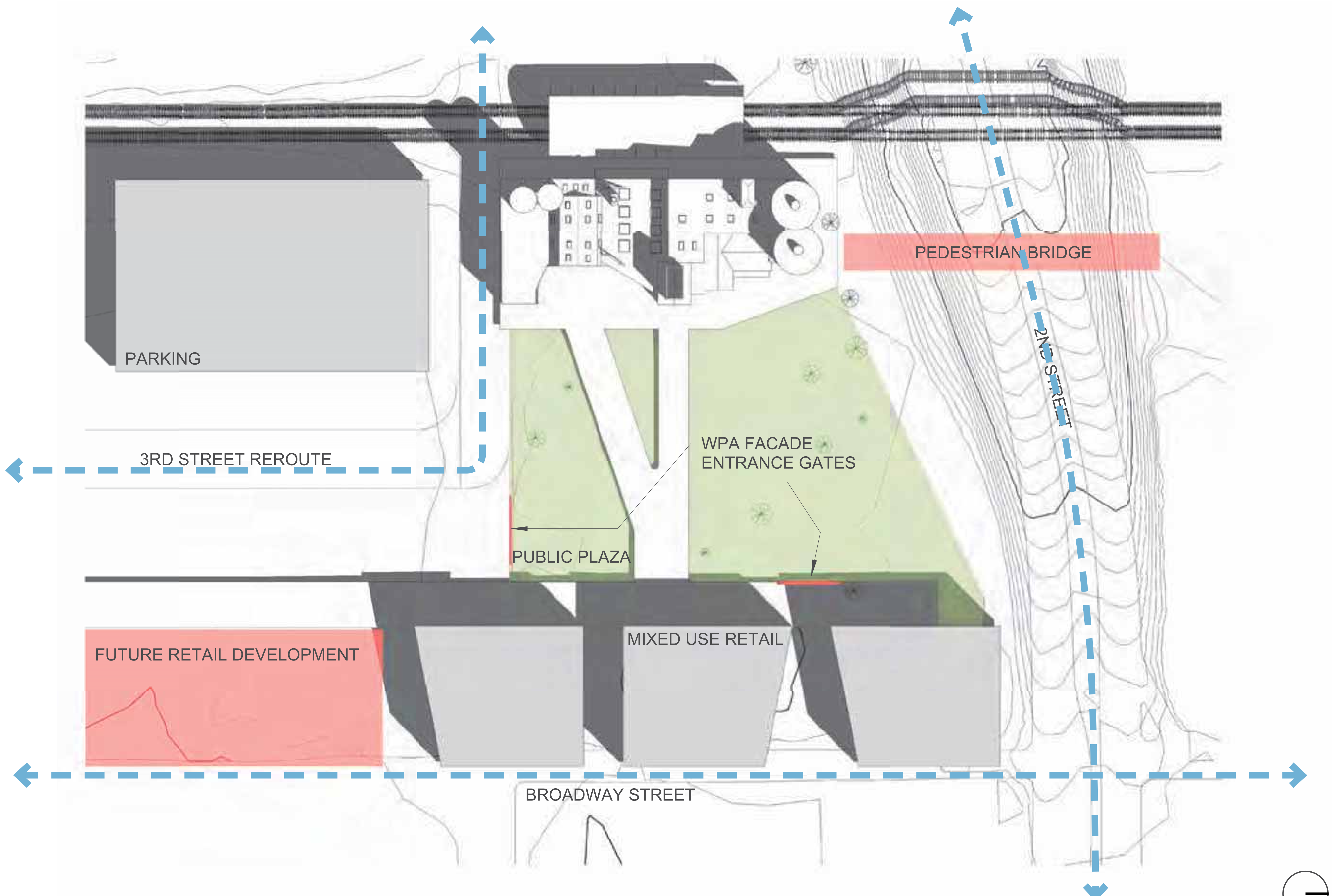
edmond multimodal transport hub
team 18

Design Premise

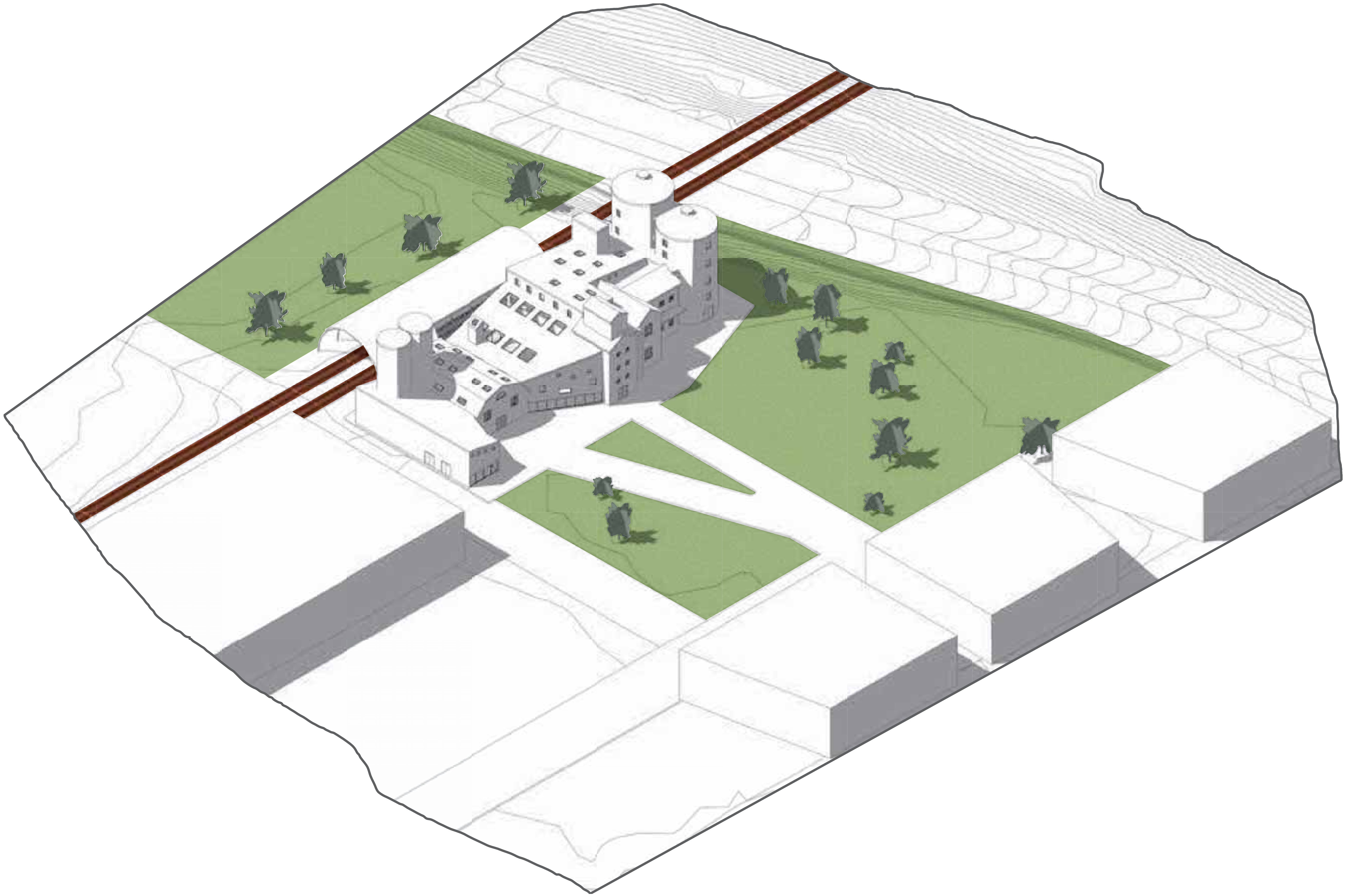
In our design proposal for the Edmond Multi-Modal Transport Hub, our primary focus was not on the development of a new monument for the city, but of a revival and recontextualization of the existing Rodkey Flour Mill as an icon for the city along with our project. Our proposal aims not to compete with the existing flour mill but complement it in formal expression. However, it is important that it stands out as a distinctly new object, in direct contrast with the surrounding historic downtown. Our goal is to redefine the public's association with these objects, and create a space where people are now allowed to interact with these historic forms in a way that allows them to build an appreciation for their towns past.



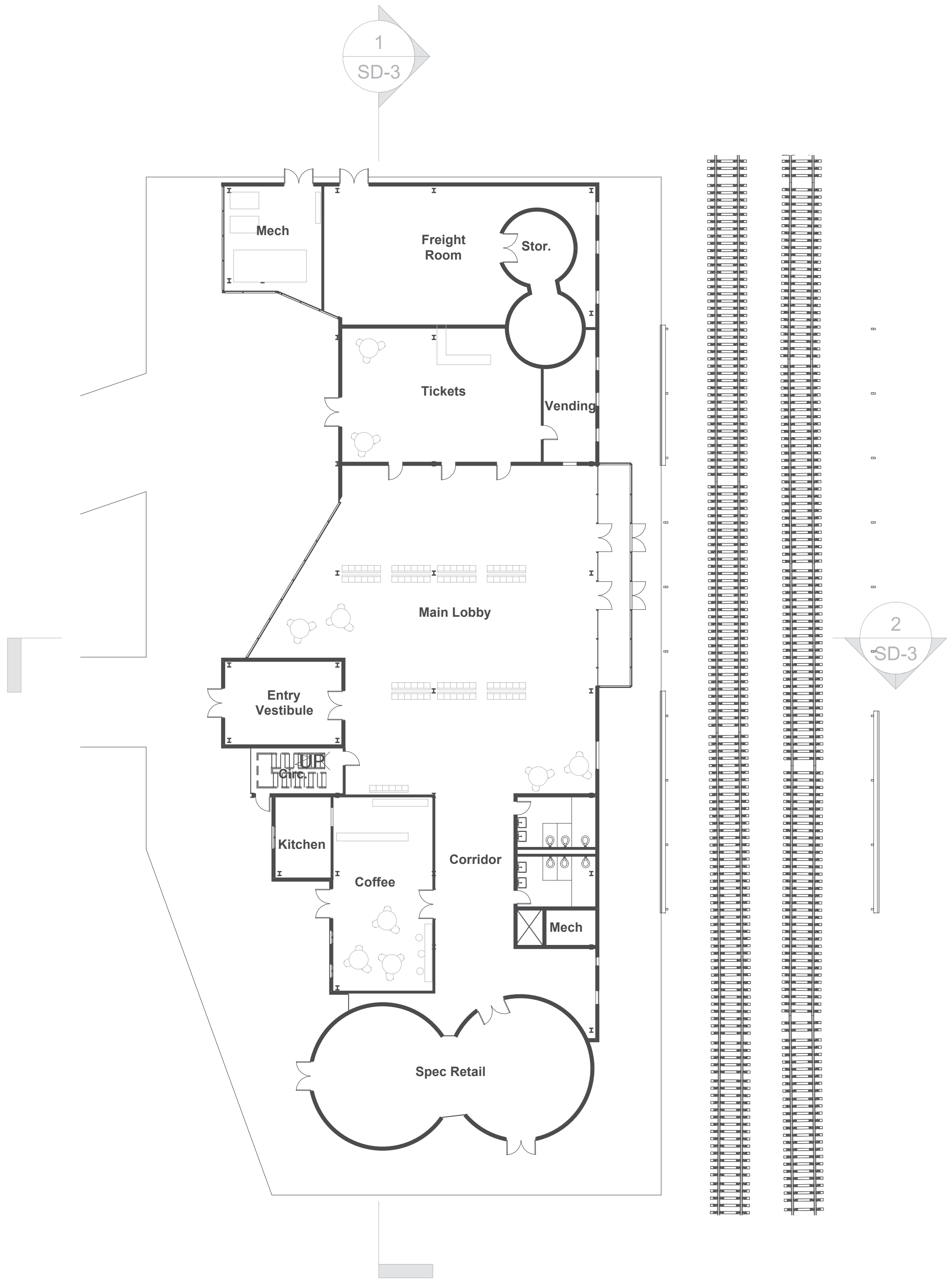
concept


PEDESTRIAN BRIDGE
PARKING
2ND STREET
3RD STREET REROUTE
WPA FACADE
ENTRANCE GATES
PUBLIC PLAZA
MIXED USE RETAIL
FUTURE RETAIL DEVELOPMENT
BROADWAY STREET

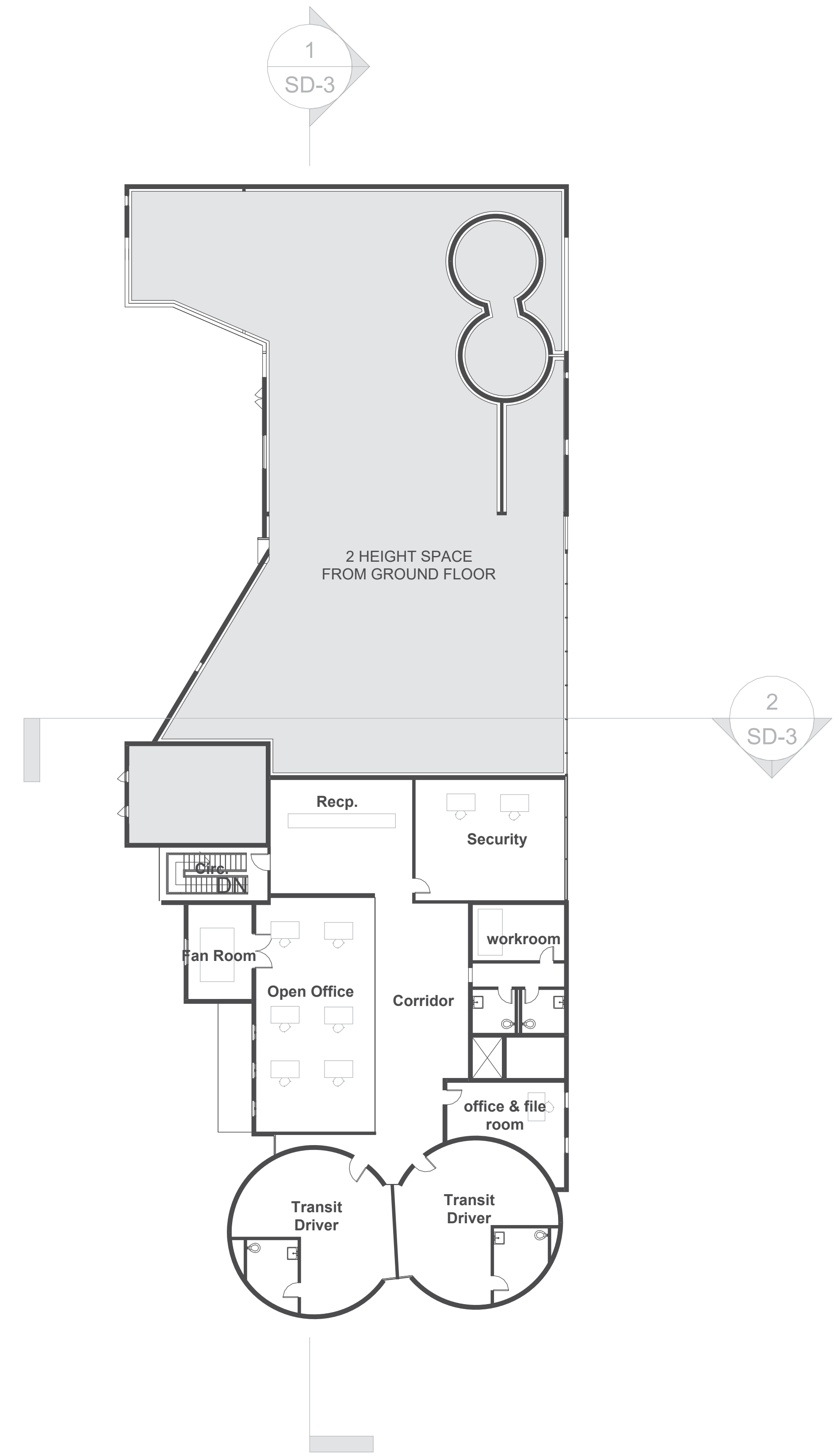
site plan



site aerial



1 Ground-SD
1" = 30'-0"

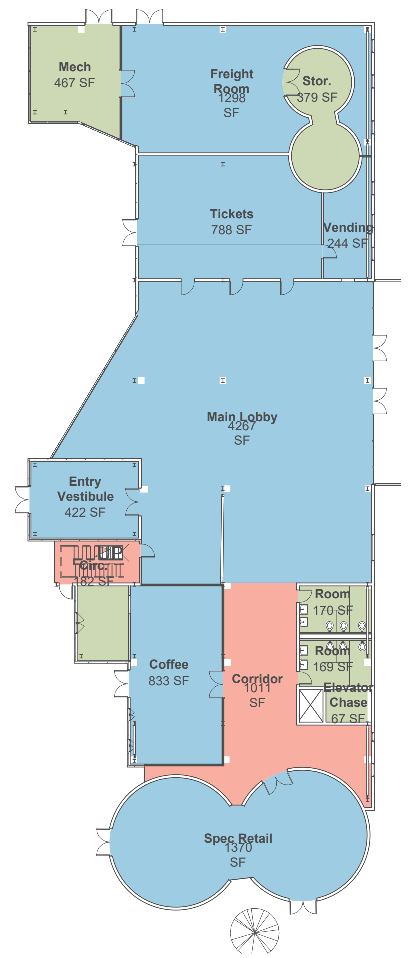


2 Level 2-SD
1" = 30'-0"

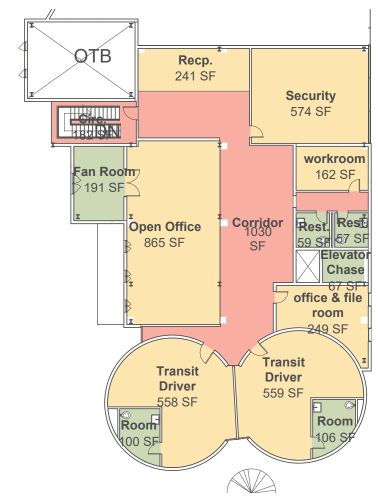
floor plans

DESIGN NARRATIVE - PLANNING EFFICIENCY

The design of our building focused on two main principles, the reproduction of historical elements and the addition of contempory infill. These elements drove not only the exterior form of our building, but also the way that we planned the program. Many of the key program elements are located in the historic elements, while the service and circulation are in the infil. This leads to a fairly efficent and interesting floor plan.



1 Ground-program diagram
1/32" = 1'-0"



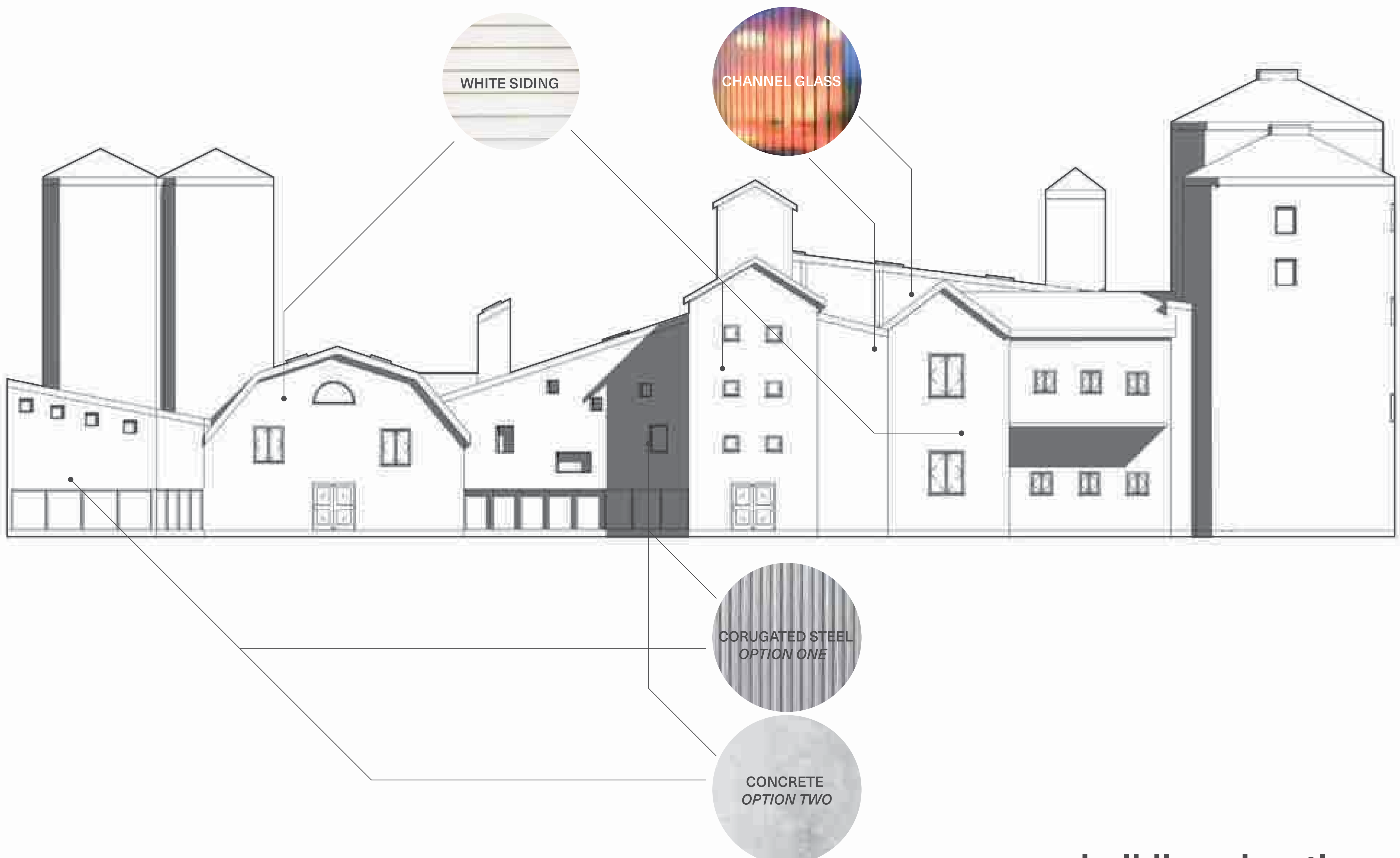
2 Level 2 -program diagram
1/32" = 1'-0"

Room Schedule				
Name	Number	Department	Area	Comments
Tickets	1	Public Space	788 SF	600 SF
Freight Room	5	Public Space	1298 SF	1000 SF
Mech	6	Service	467 SF	as code
Entry Vestibule	11	Public Space	422 SF	300 SF
Stor.	13	Service	379 SF	add. program
Recp.	14	Transit Services	241 SF	200 SF
Security	15	Transit Services	574 SF	600 SF
workroom	16	Transit Services	162 SF	200 SF
Open Office	17	Transit Services	865 SF	600 sf
Transit Driver	18	Transit Services	558 SF	600 SF
office & file room	21	Transit Services	249 SF	350 SF
Spec Retail	2	Public Space	1370 SF	2000 SF
Coffee	10	Public Space	833 SF	1000 SF
Main Lobby	22	Public Space	4267 SF	5000 SF
Vending	23	Public Space	244 SF	200 SF
Circ.	26	Circulation	182 SF	as code
Transit Driver	27	Transit Services	559 SF	600 SF
Elevator Chase	29	Service	67 SF	as code
Rest.	30	Service	59 SF	as code
Rest.	31	Service	57 SF	as code
Circ.	32	Circulation	182 SF	as code
Fan Room	33	Service	191 SF	as code
Corridor	3	Circulation	1011 SF	as code
Corridor	4	Circulation	1030 SF	as code
Elevator Chase	7	Service	67 SF	as code
Kitchen	8	Service	196 SF	incl. in coffee
Room	9	Service	170 SF	as code
Room	19	Service	169 SF	as code
Room	20	Service	106 SF	as code
Room	24	Service	100 SF	as code
Corridor	25	Circulation	69 SF	as code

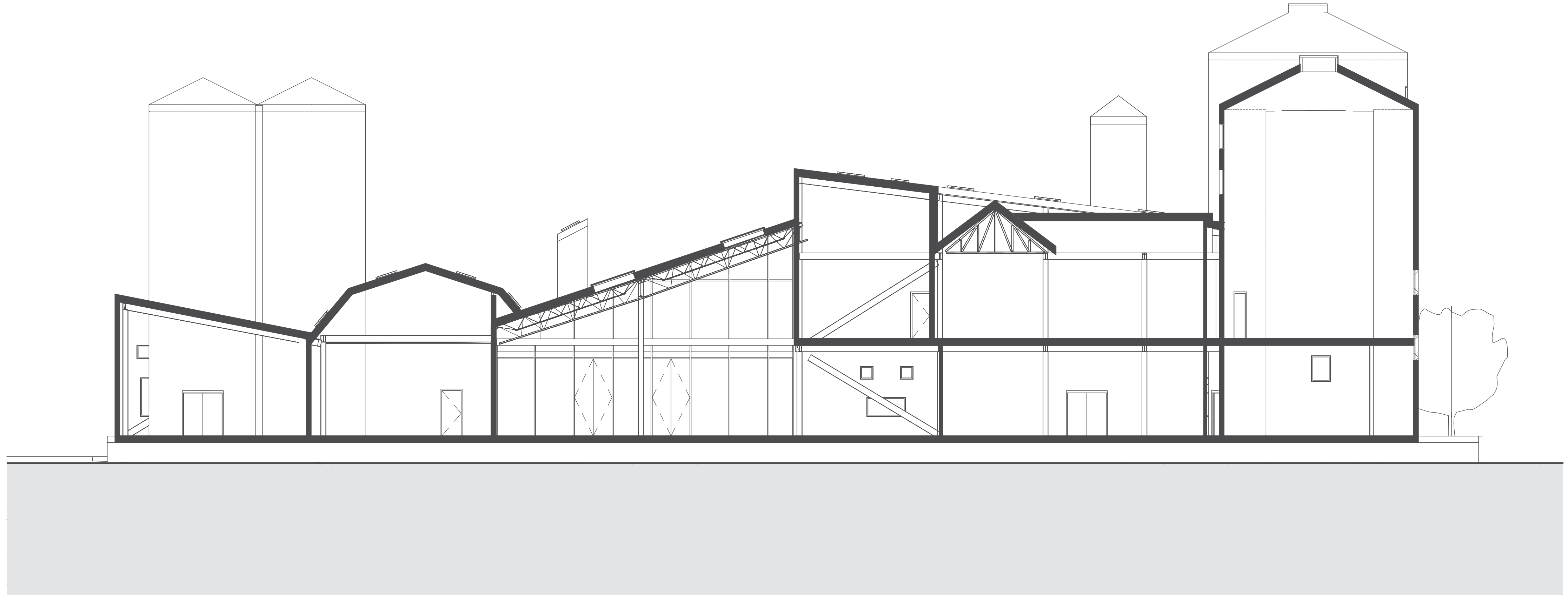
AIA Framework for Design Excellence

Design for economy

Good design adds value for owners, occupants, community, and planet, regardless of project size and budget.



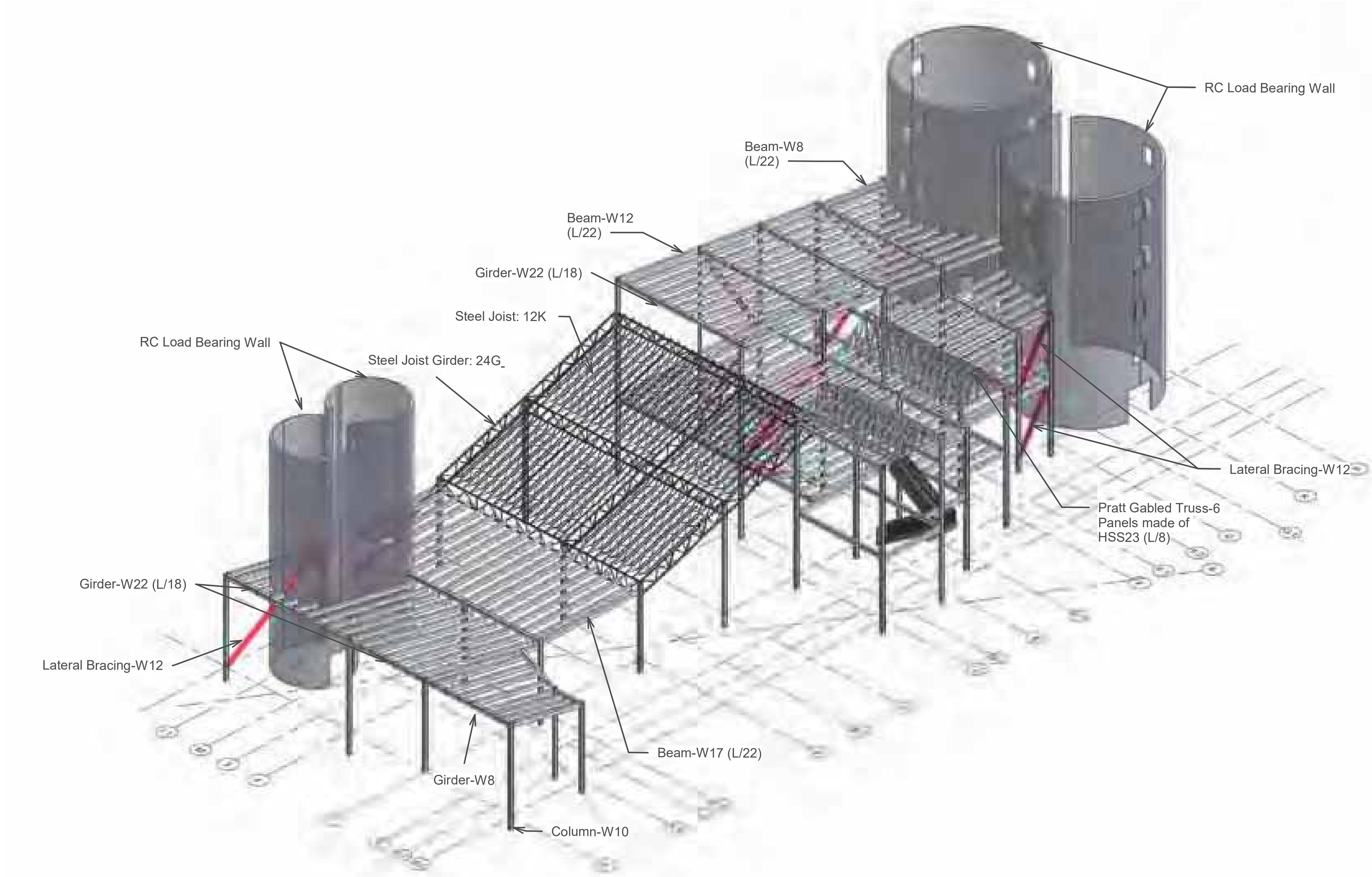
building elevation



1 Section 1-SD
1" = 20'-0"

2 Section 2-SD
1" = 20'-0"

sections

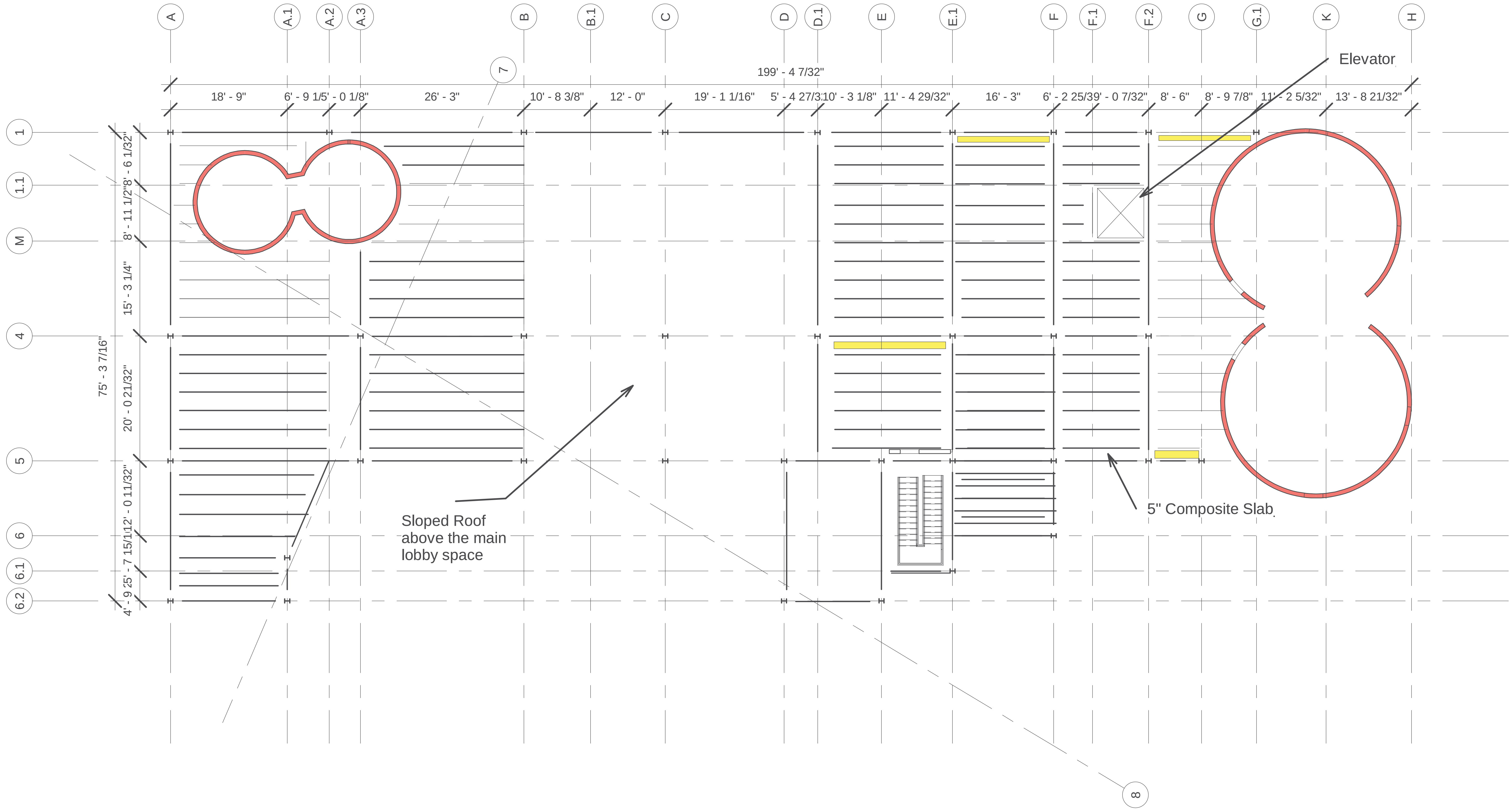


Steel framing is our selection for the building structure. The w-shapes steel member is the dominant member is used in this structure system. The steel framing supports both the 2nd floor & the roof. At the Floor using a 3VLI composite Deck of the 2nd floor. Columns are used in steel material (w-shape) as well. As a team, we decided to have an exposed structure, so part of the roof using steel joists that support the sloped roof above the big area located after the vestibule that would give a good look for this open space (as a public space) and a system to support for this wide and big roof. The metal Deck used in this system is (1.5B Metal Deck) at the roof. The joists girders span for a range of (30'-0" – 35'-0") and beam joists span in a different direction attached to the girders that span for a range of (23'-0" – 25'-0"). Lateral bracing is used in steel members (W-shape steel beam). To promote the lateral resistance for the structure. HSS steel members are used to support the gabled roof by using a truss system (Pratt Gabled - 6 Panels truss) that spans (25'-0" – 28'-0"). RC Load-bearing walls are used in two locations of the building in this structure system.

Pros:
- Durability
- Sustainable material
- Flexibility
- Lightweight

Foundation Information:
The depth of the foundation can be from the ground level to the lowest point of the foundation construction. The main key to picking the type of foundation is the ground type such as loam soil, clay, silt, gravel, or hard rock, so that can show the types of foundation which can be used in construction. This part can be done by the geotechnical engineers which can be clear for the structural engineer to choose the type of foundation. On our project the geotechnical engineer report shows that two types of foundations will work for the construction 1) Shallow Footings and 2) Drilled Pier Foundation. We as a team planned to use the shallow footing foundation for our project. The shallow foundations are wider than they are deep that making them a quicker & economize option to use. The type of shallow foundation to be used is spread footings, well designed in thickness to assist in spreading the loads from the structure over a large area. Also, the thickness of the footings lightens the pressure that the structure cause on a specific area on the foundation since it spreads the loads evenly across the footings. (Pratt Gabled - 6 Panels truss) that spans (25'-0" – 28'-0"). RC Load-bearing walls are used in two locations of the building in this structure system.

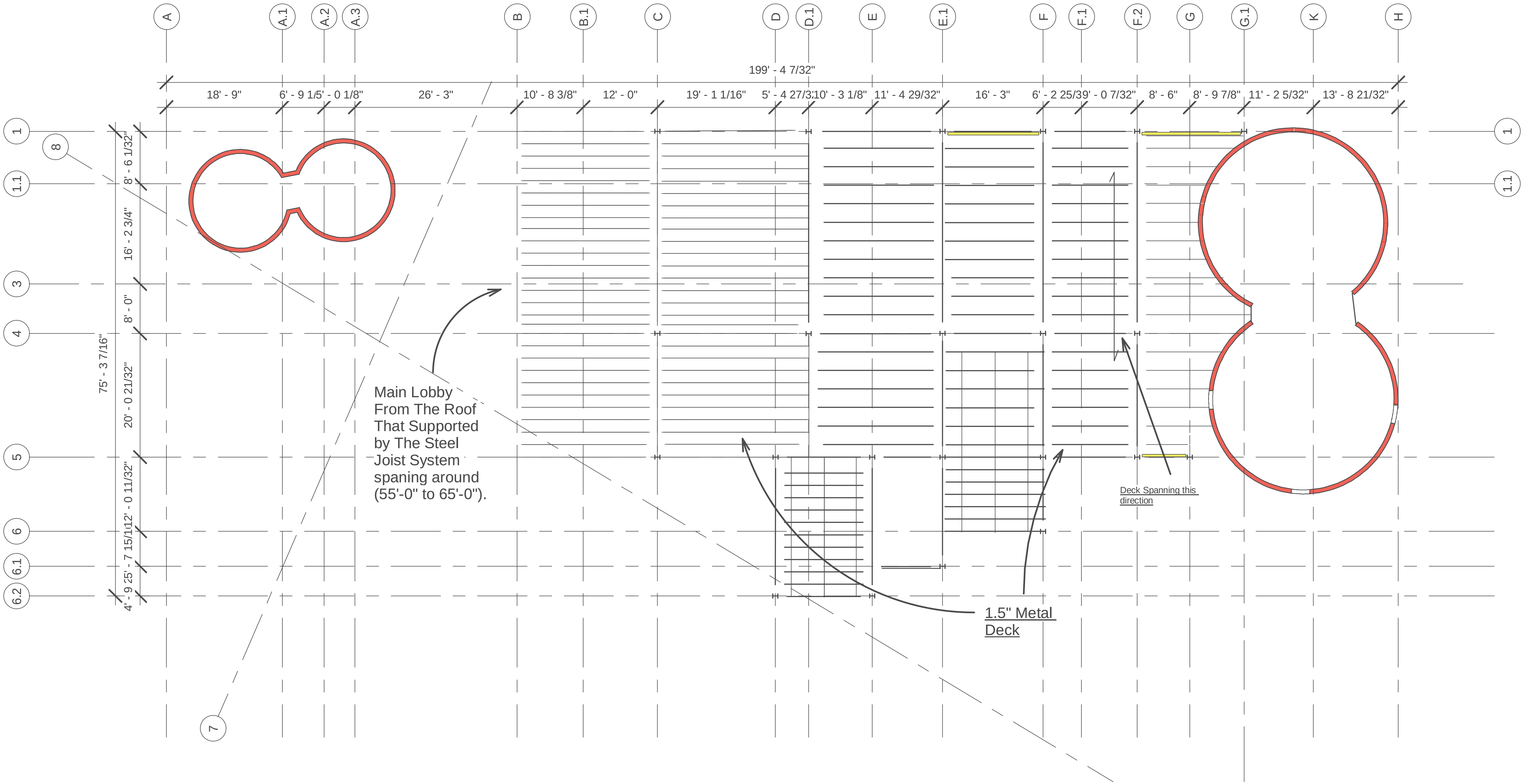
structural scheme 3 : steel (selected)



Framing Floor Plan

Reinforced Concrete Load Bearing Wall

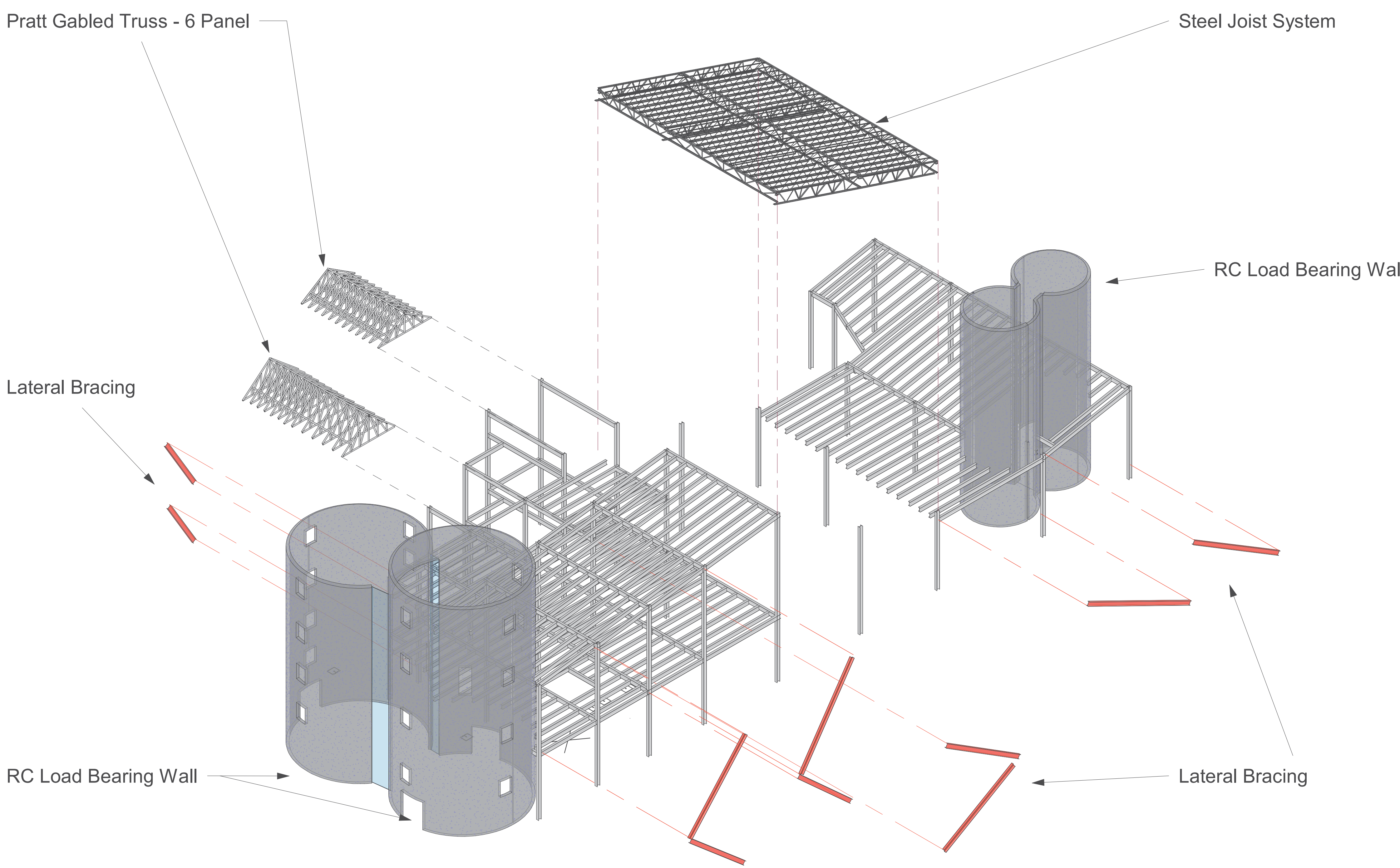
Lateral Bracing



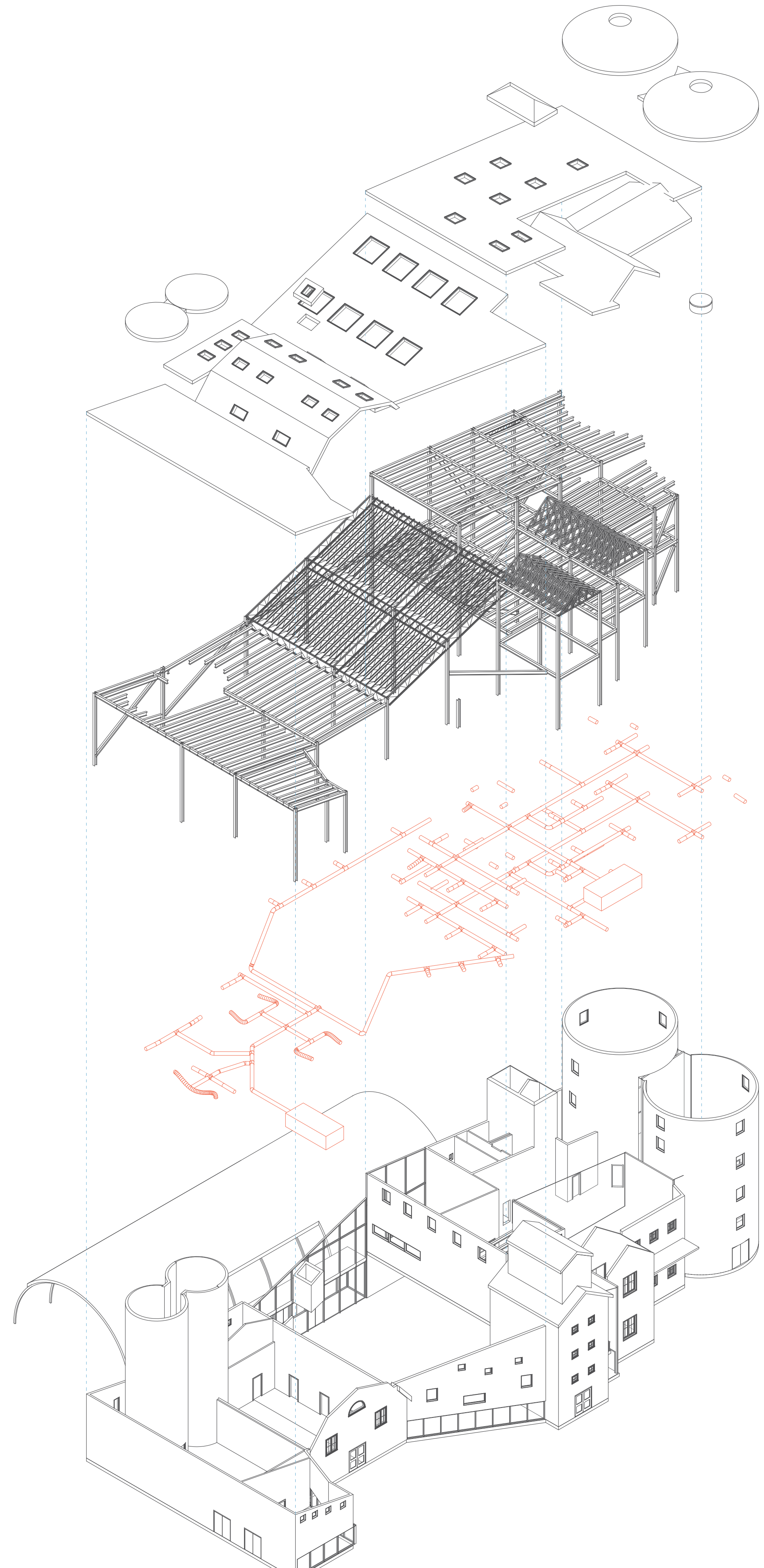
Framing Roof Plan

Reinforced Concrete Load Bearing Wall

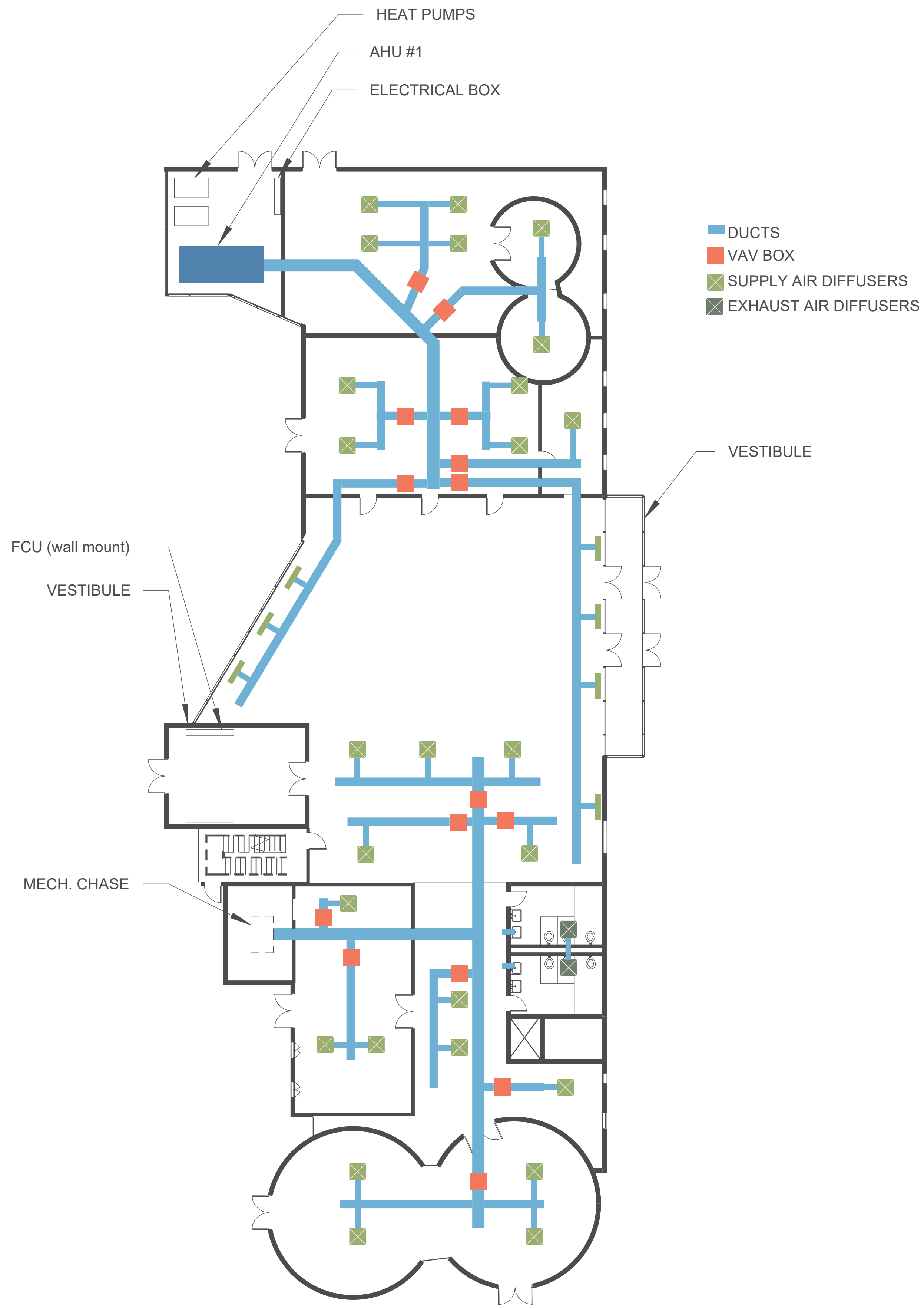
Lateral Bracing



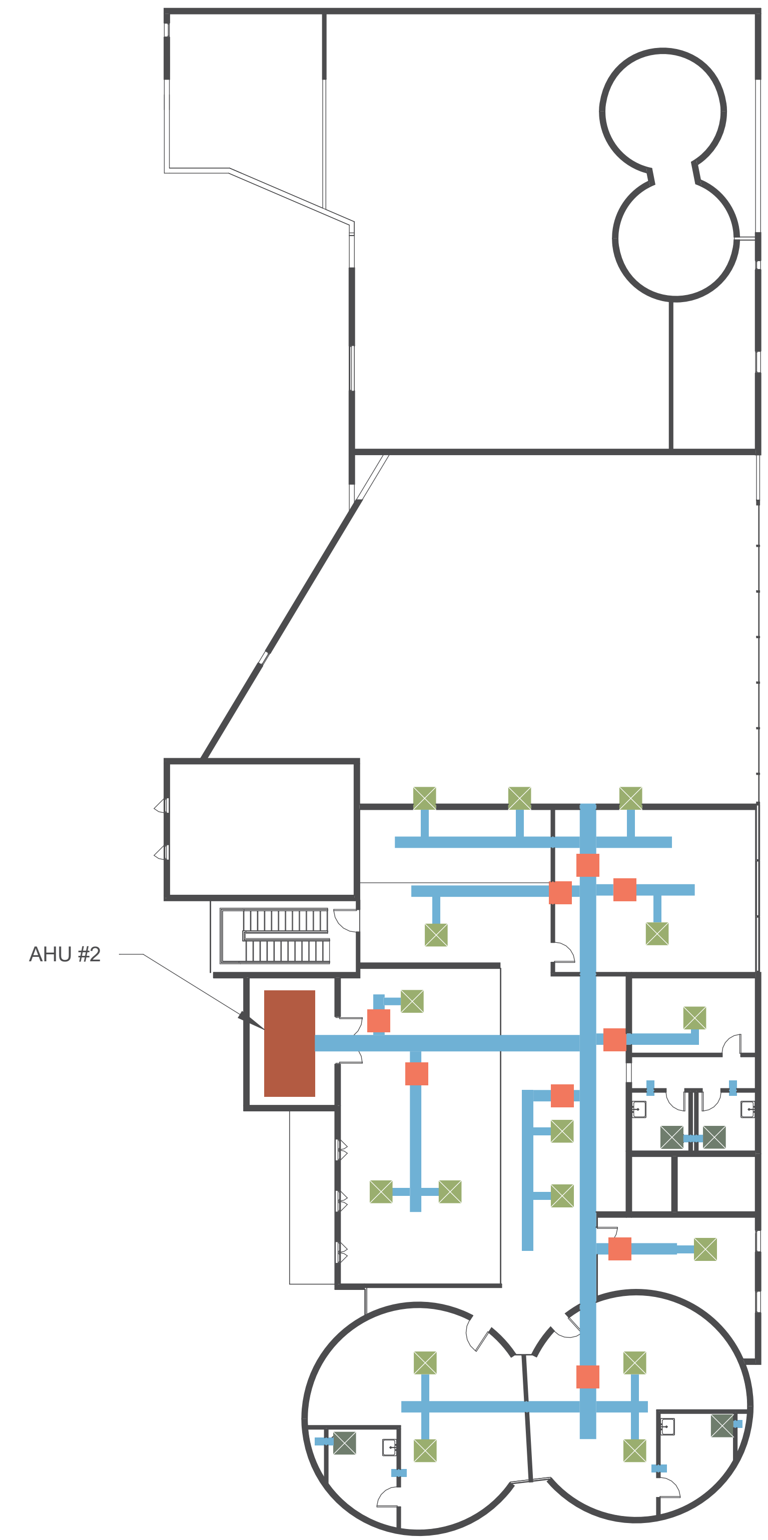
exploded steel system



systems axonometeric



1 Ground-HVAC
1" = 30'-0"

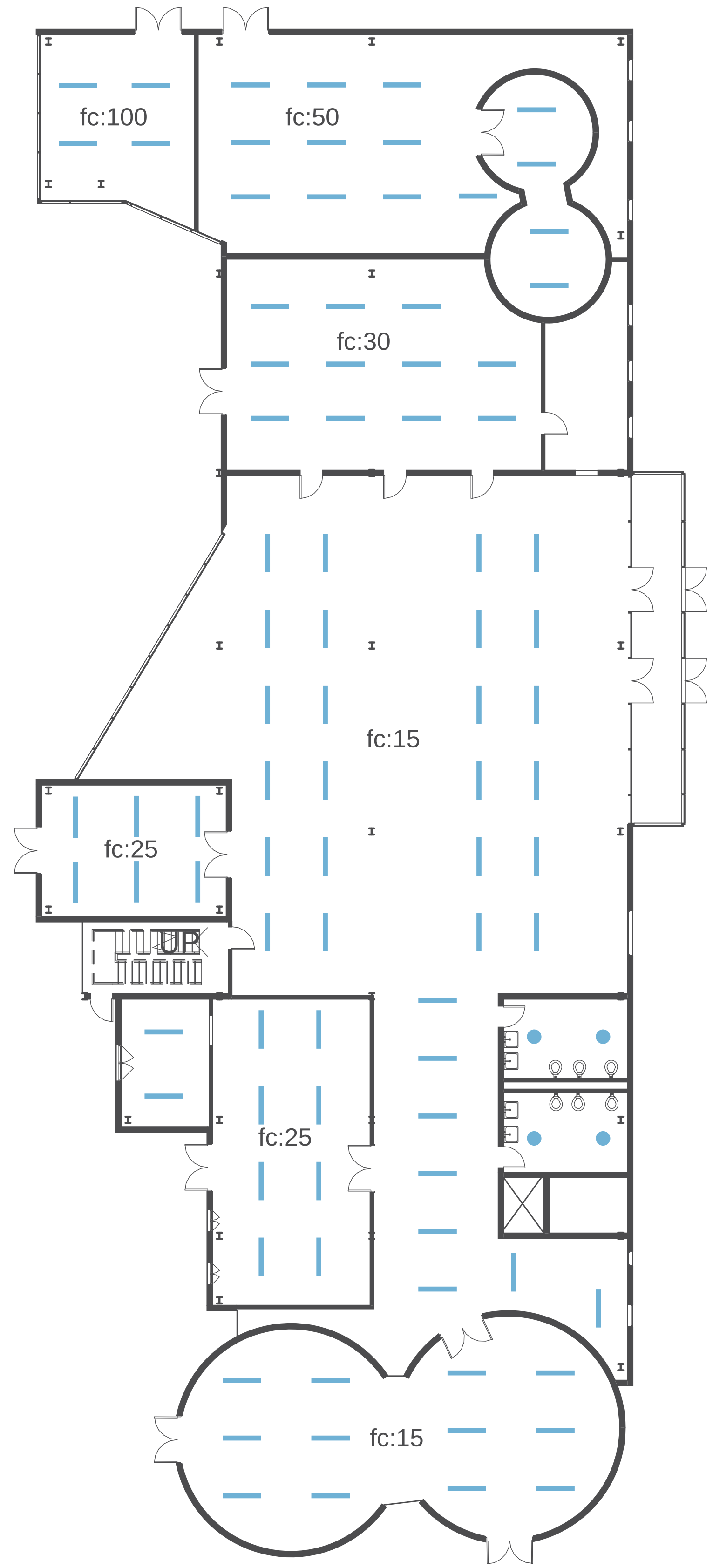


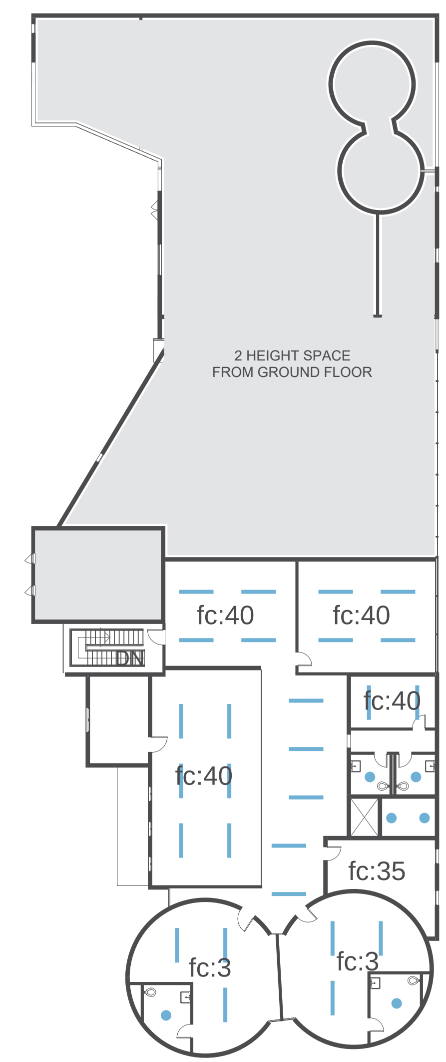
2 Level 2-HVAC
1" = 30'-0"

HVAC layout

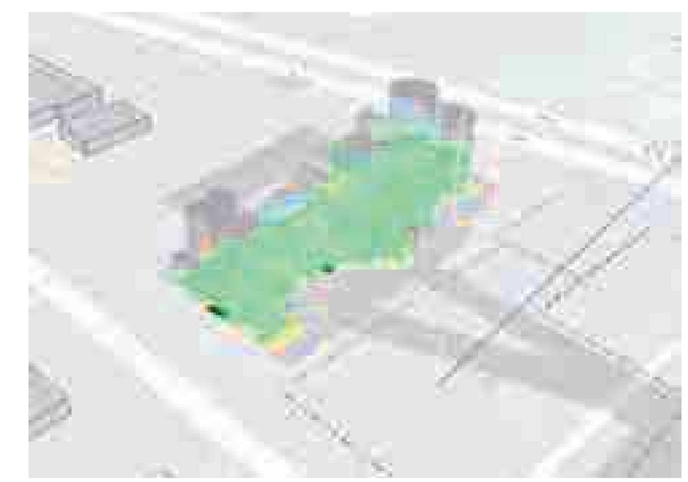
DESIGN NARRATIVE - LIGHTING & DAYLIGHTING

Large spaces like the lobby are supported by sizable windows and repetitive skylights filling the space with light. Smaller spaces are accented by smaller puncture windows. Any spaces restricted to natural daylight like the coffee shop, ticket office, retail spaces, and all interstitial circulation spaces are provided with ample artificial light to make up the voids of light visible in the covetool diagrams. Resizing and placing more skylights in some of these spaces also may help us to fill this space.





sDA from Cove tool: 23%



ASE from Cove tool: 8%

AIA Framework for Design Excellence

Design for well-being

Good design supports health and well-being for all people, considering physical, mental, and emotional effects on building occupants and the surrounding community.

DESIGN NARRATIVE - ACOUSTIC PERFORMANCE

Due to the additive approach of this design some of the noisier spaces will require better care to accommodate their proximity to other sensitive spaces. Taking care to increase sound absorption with higher stc walls and reduce sound transmission with sound batten insulation. As well as designing ways to reduce the sound at the source in spaces like mechanical rooms.

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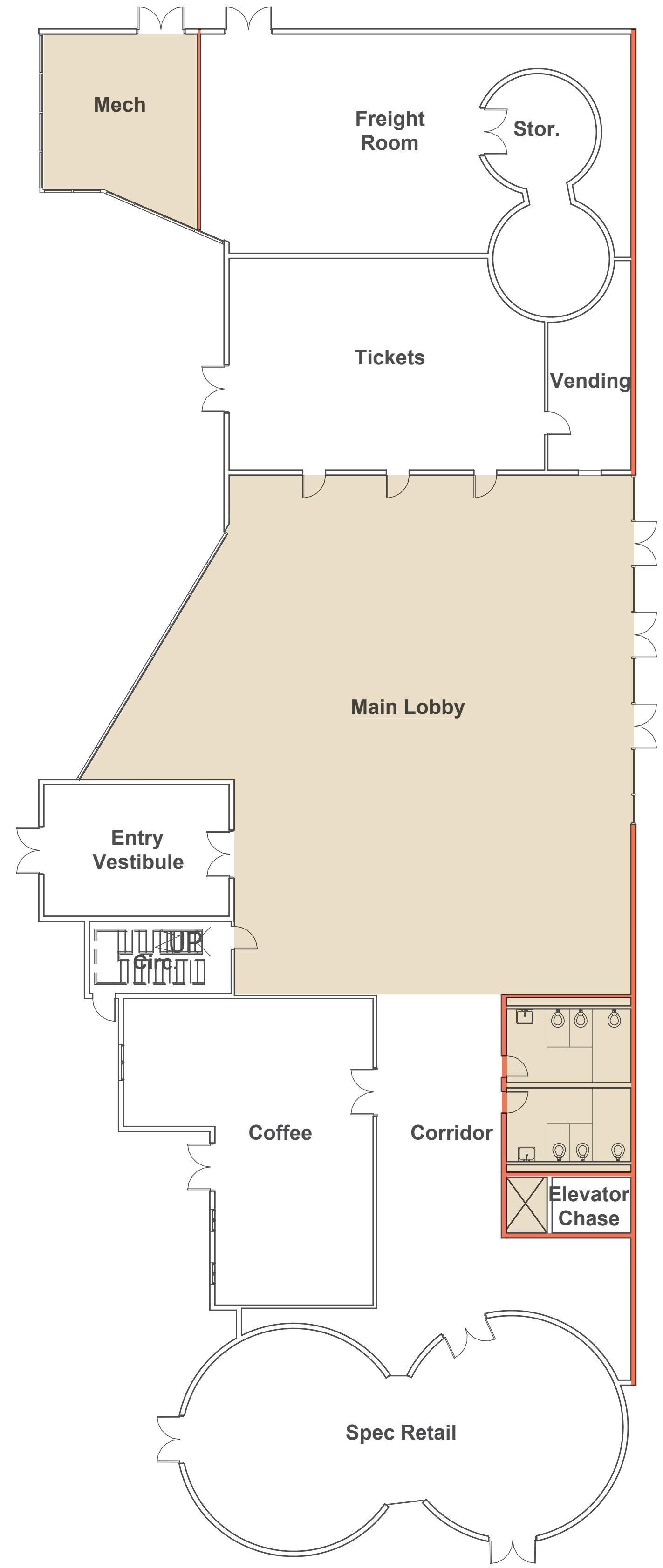
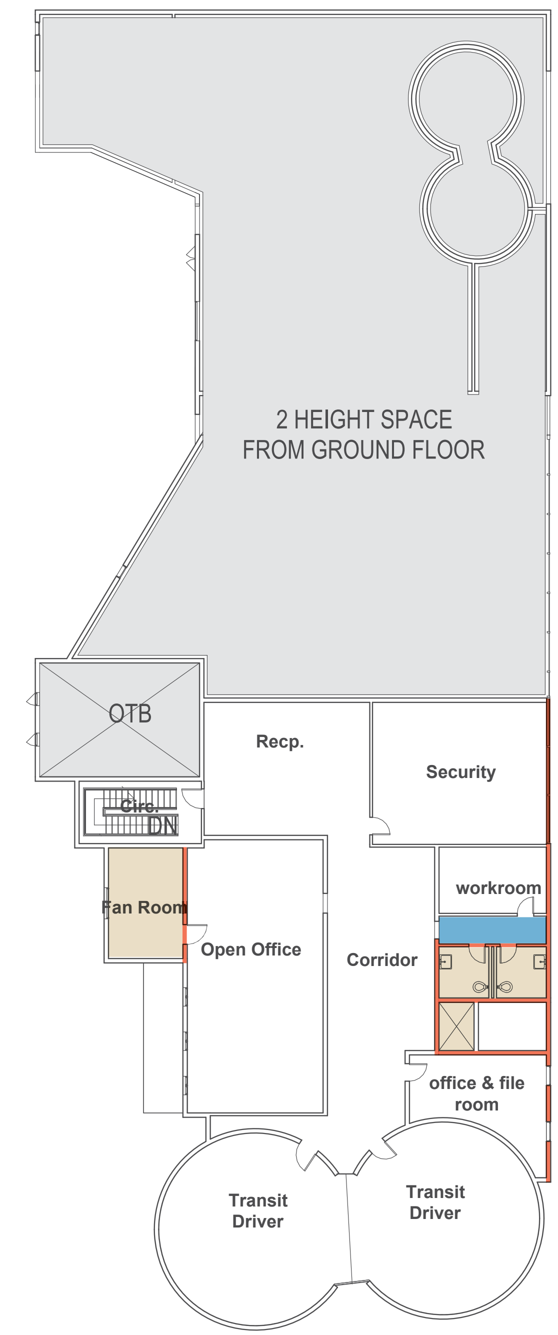


1 Ground-SD acoustic
1" = 30'-0"

Walls with higher STC
Noisy spaces
Buffer spaces

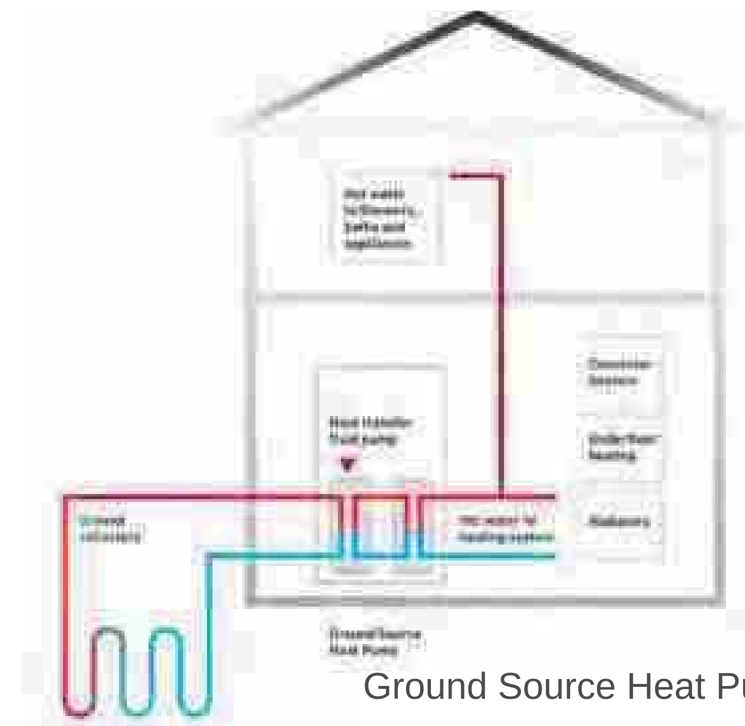


2 Level 2-SD acoustic
1" = 30'-0"

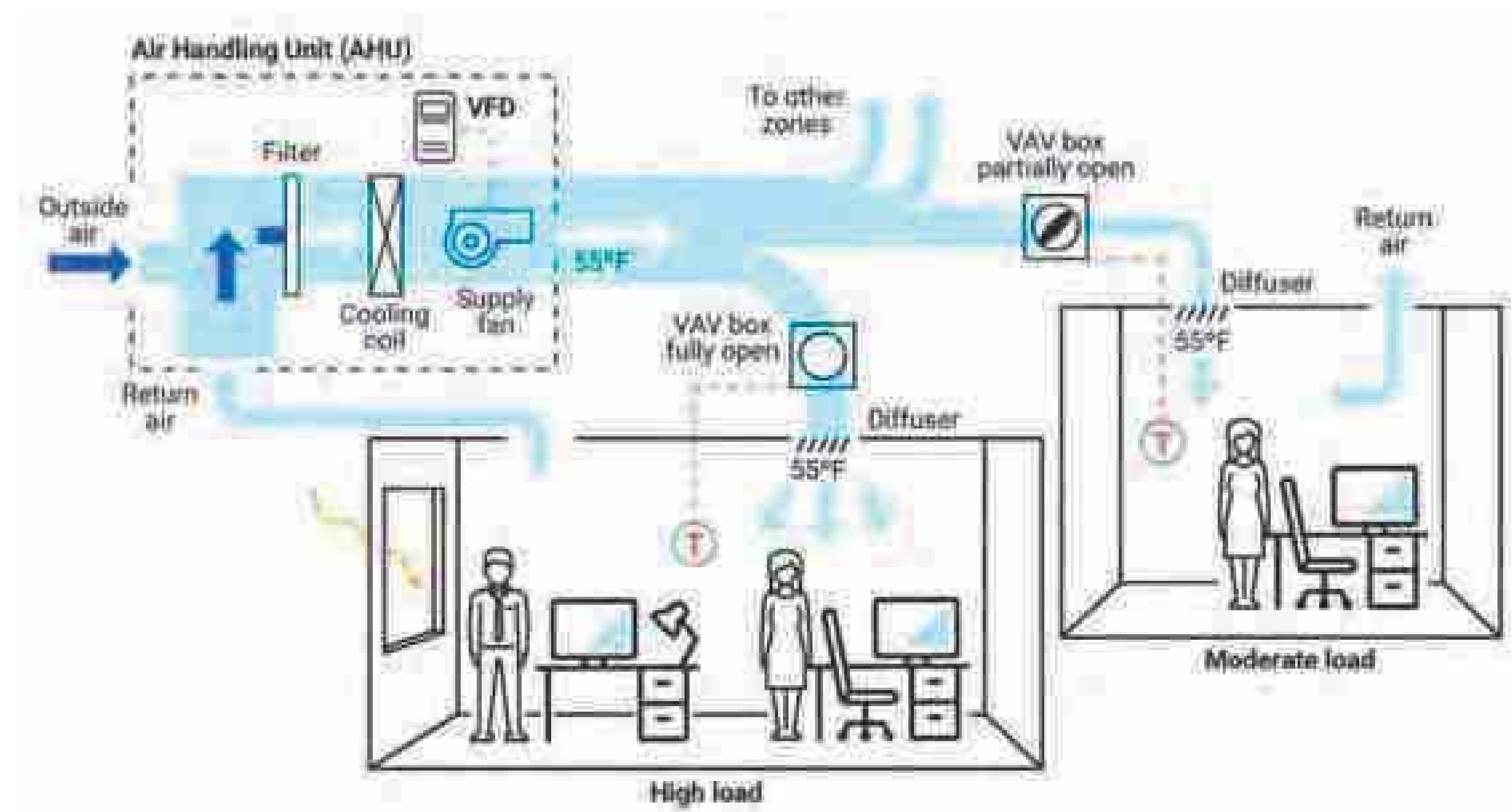
DESIGN NARRATIVE - THERMAL COMFORT

In order to save space in our building design we are utilizing a Ground Source Heat Pump with VAV system. Central Heating and cooling are located in two wings of our building. The South wing is only one story. The North wing is the two story part of our building, so the heating and cooling are chased from the 2nd floor down to the first floor.

HVAC System



Ground Source Heat Pump



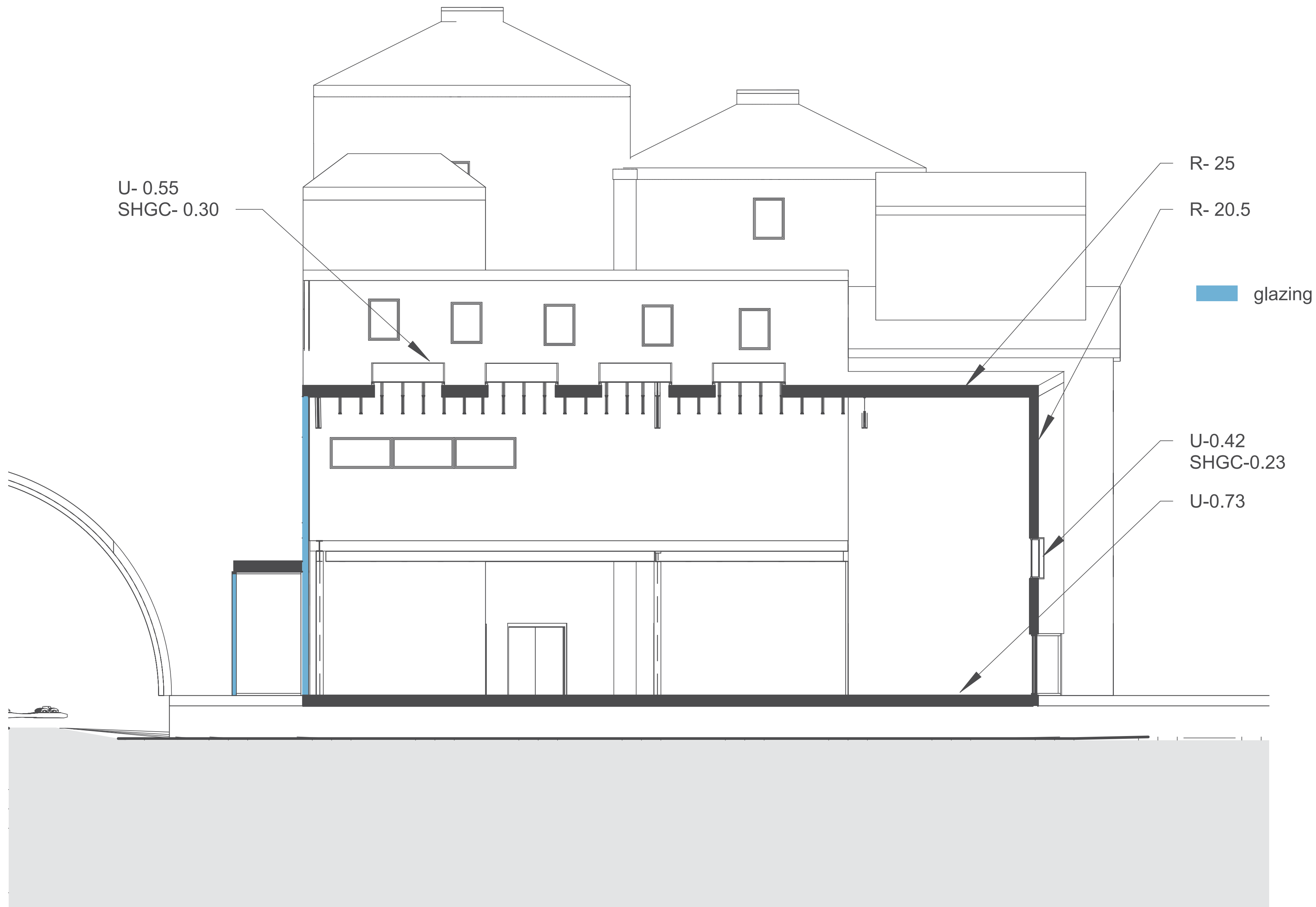
AIA Framework for Design Excellence

Design for energy

Good design reduces energy use and eliminates dependence on fossil fuels while improving building performance, function, comfort, and enjoyment.

DESIGN NARRATIVE - THERMAL RESISTANCE OF THE BUILDING ENVELOPE

Due to the existence of west facing glass on our project, we have selected a glass with a low solar heat gain coefficent (0.23) to reduce the cooling demand on our building. Some spots where there is potential for issues with insulation in the varied pitches of our roofline. We have a very complex roof form, and there could be potential issues in maintaining a thermal barrier.



AIA Framework for Design Excellence

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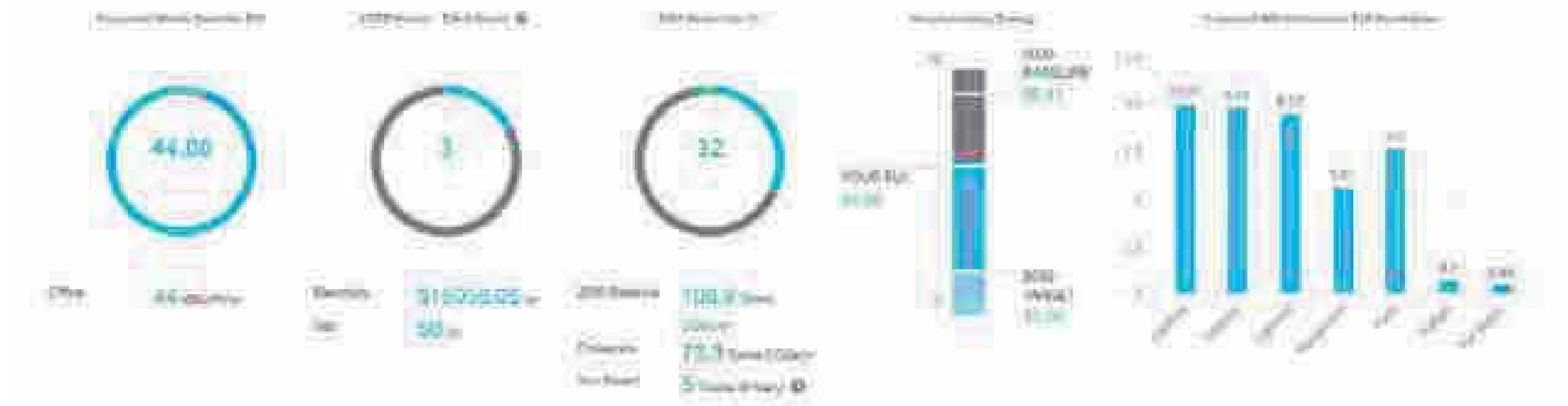
DESIGN NARRATIVE - CARBON FOOTPRINT

The majority of our energy usage is taken up by heating and cooling loads due to the use of a air cooled chillers with a VAV system. Switching this system in model C to ground source heat pumps with VAV allowed us to increase our coefficient of performance. As well as using heat pipes as a heat recovery system, an advanced energy management system which reduced our CO2 by 52%. Furthering our lighting design to better accommodate a wider verity of spaces without increasing our heating and cooling will allow us to reduce our artificial lighting and further reduce our total EUI.

Model A: 100% Code Compliant



Model B: Improved Design

Model C: Improved Design + Equipment

AIA Framework for Design Excellence

Design for energy

Good design reduces energy use and eliminates dependence on fossil fuels while improving building performance, function, comfort, and enjoyment.

exterior perspective

Design Development

The design development phase of our Integrative Studio consisted of exactly what the name would suggest, design development. This included material research, typical detailing, lighting design, final systems integration, and general refinement of our designs. This phase was 8 weeks of the total 16 weeks of the project. This is also where we split off from our teams and began to work individually.

Material and Elevation studies were something that I focused on heavily at the beginning of the design development phase, as I felt that it was crucial to my project. I performed material research, taking into account factors such as cost, maintenance, sustainability, and aesthetics. Following some elevation studies, I chose a natural wood panel for the historic agrarian structures and channel glass for the contemporary infill, supplementing with a light-colored metal panel in areas where it made more sense economically. With the decisions made, I began to focus on developing my typical wall section and roof details. While wall sections are something that we had attempted in the past, we had never gone quite this deep. I learned a lot about material and detailing from this exercise.

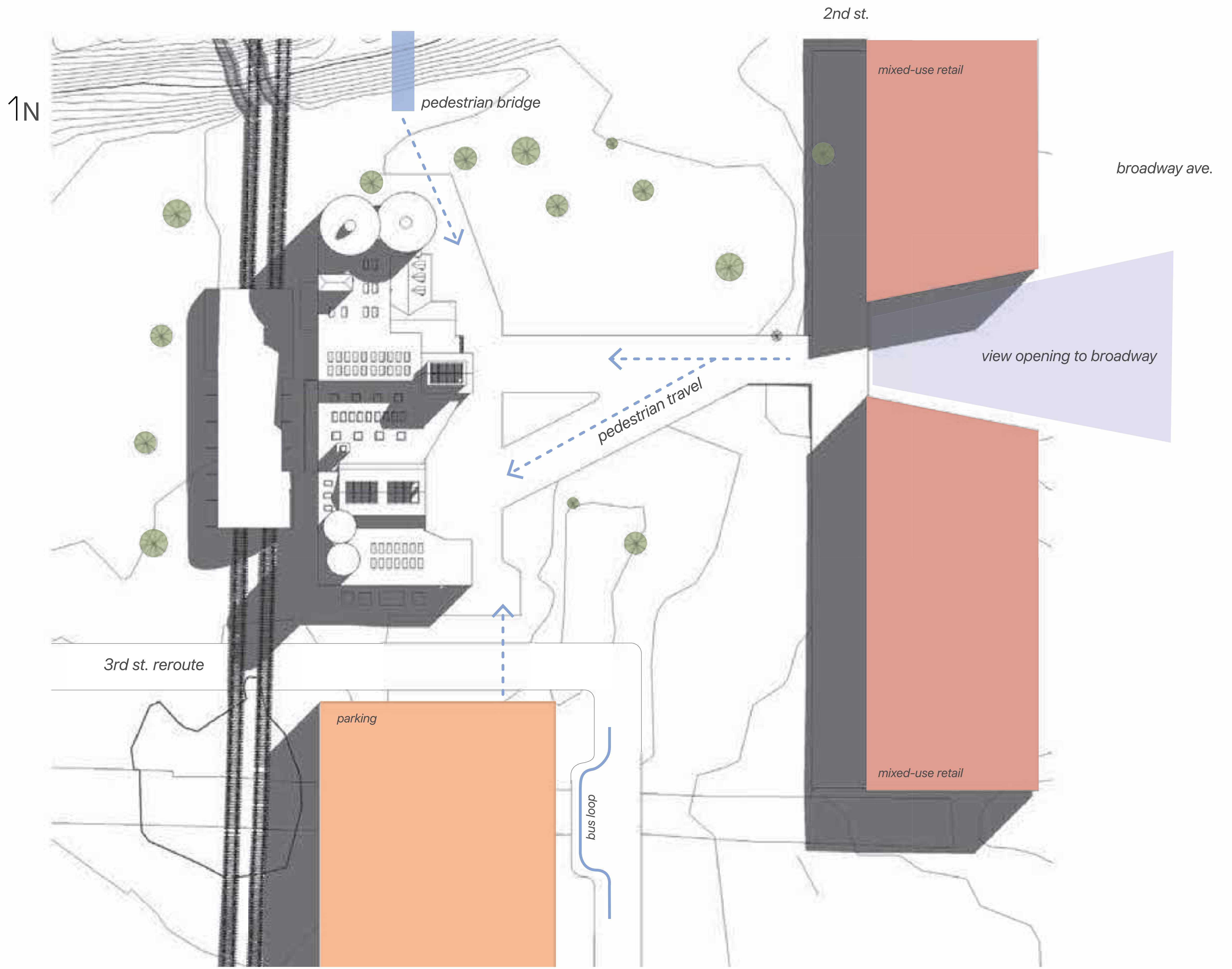
One focus of this phase was the environmental performance of our building. Through my daylighting and systems design, I was able to reduce my energy usage by 32.7% compared to the code compliant standards. I really enjoyed getting to see how small design changes can make a large impact on the environment performance and overall sustainability of your design.

Edmond Multi-Modal Transport Hub

Natalie Haggard

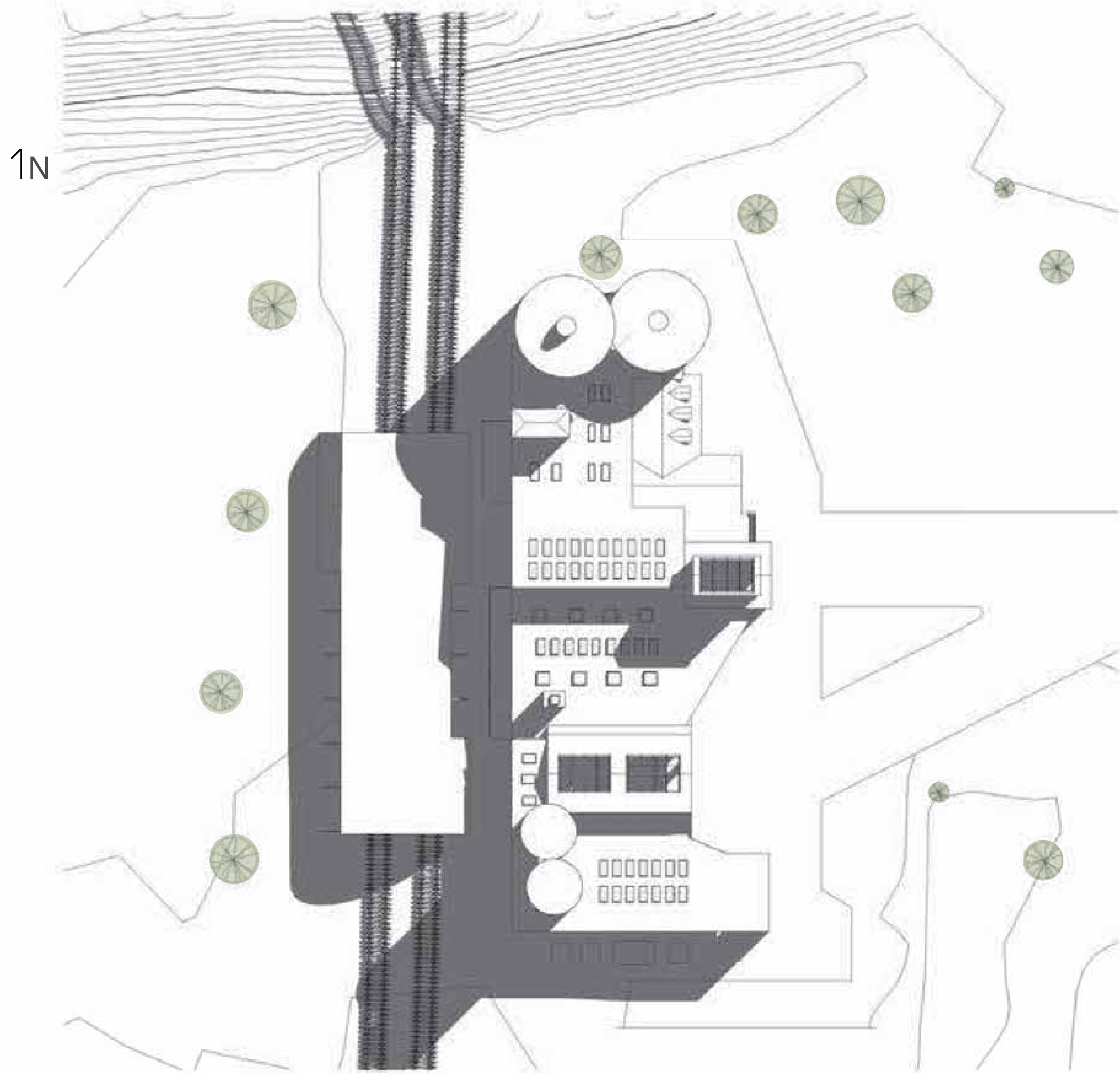
Master Plan

1:60 Scale

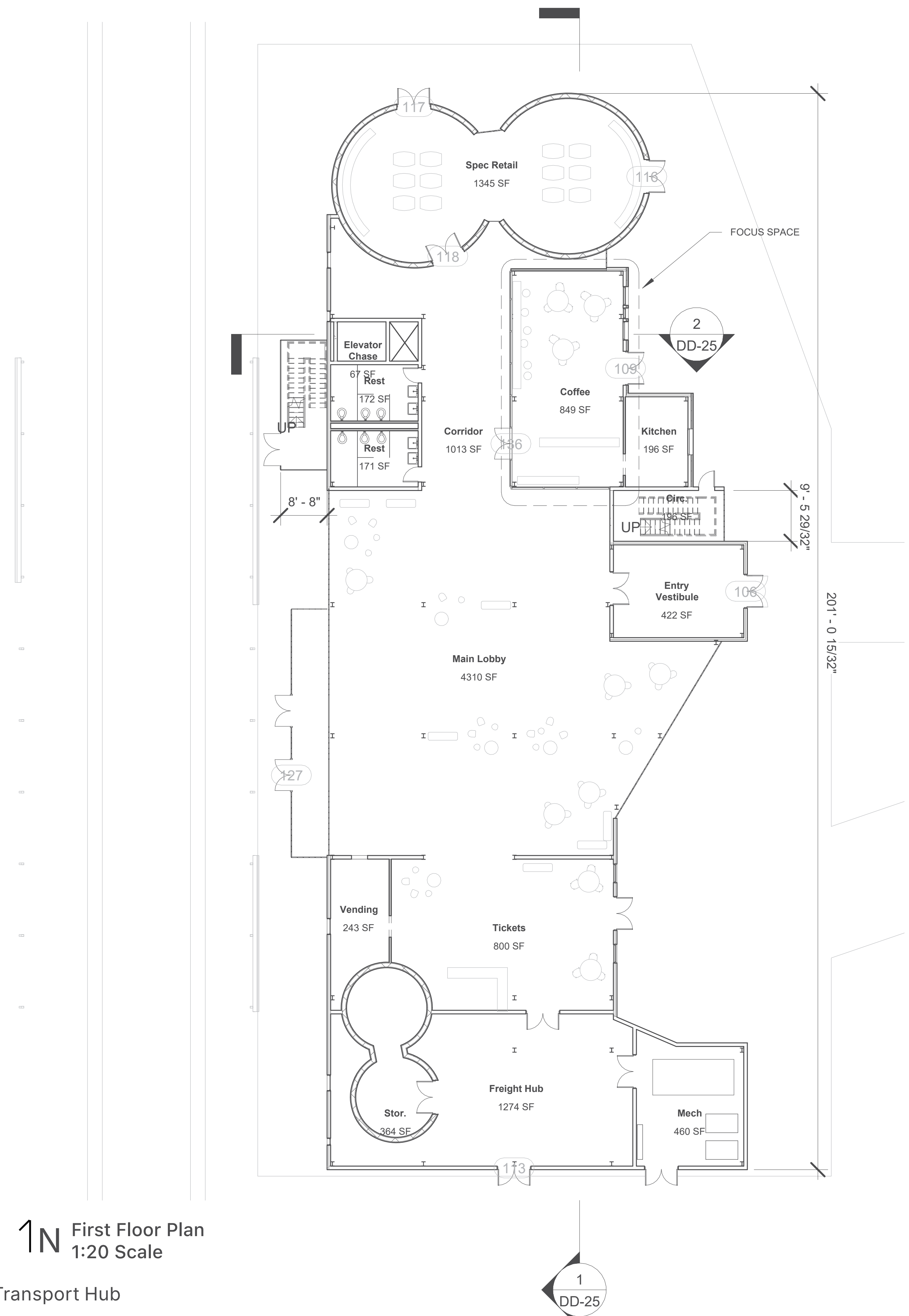


Site Plan

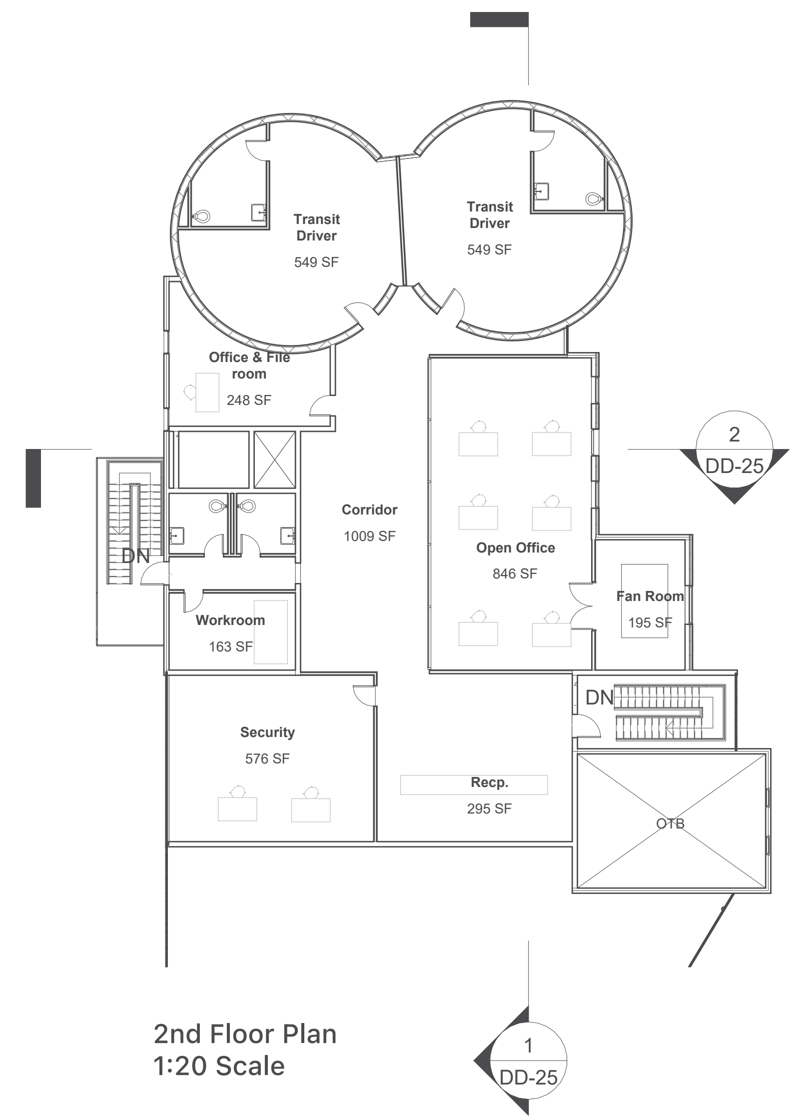
1:40 Scale



Floor Plans

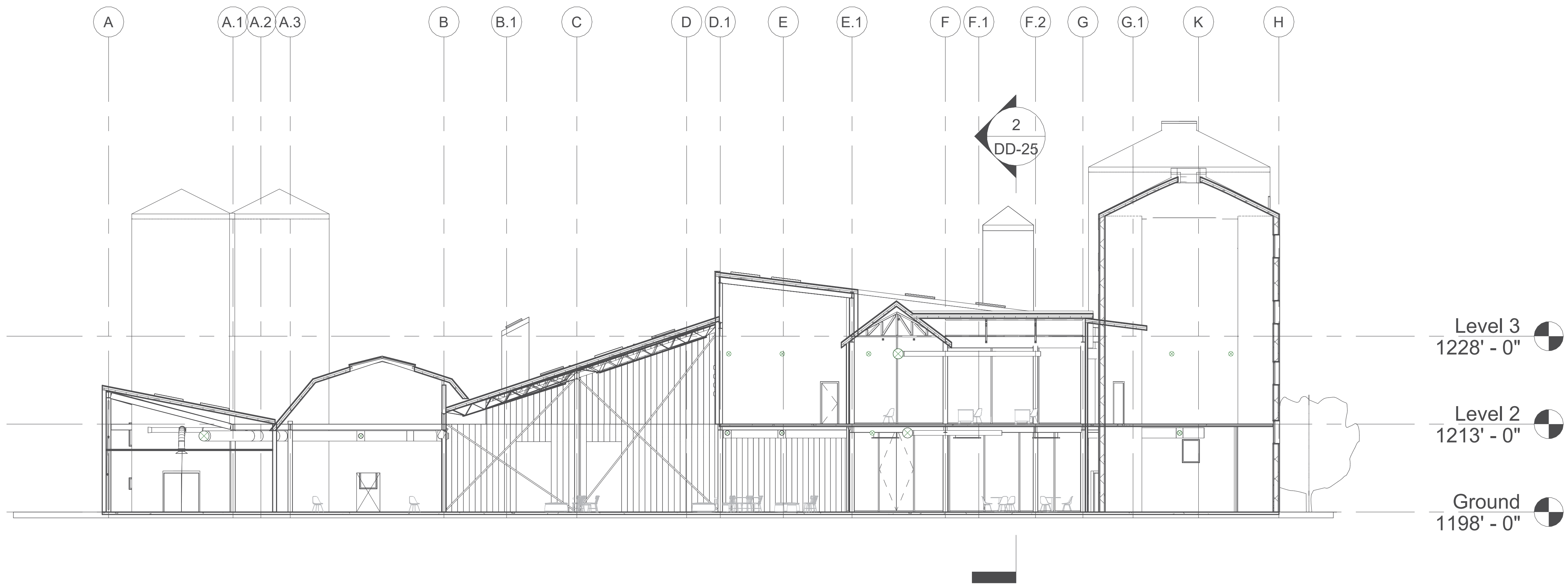


First Floor Plan
1:20 Scale

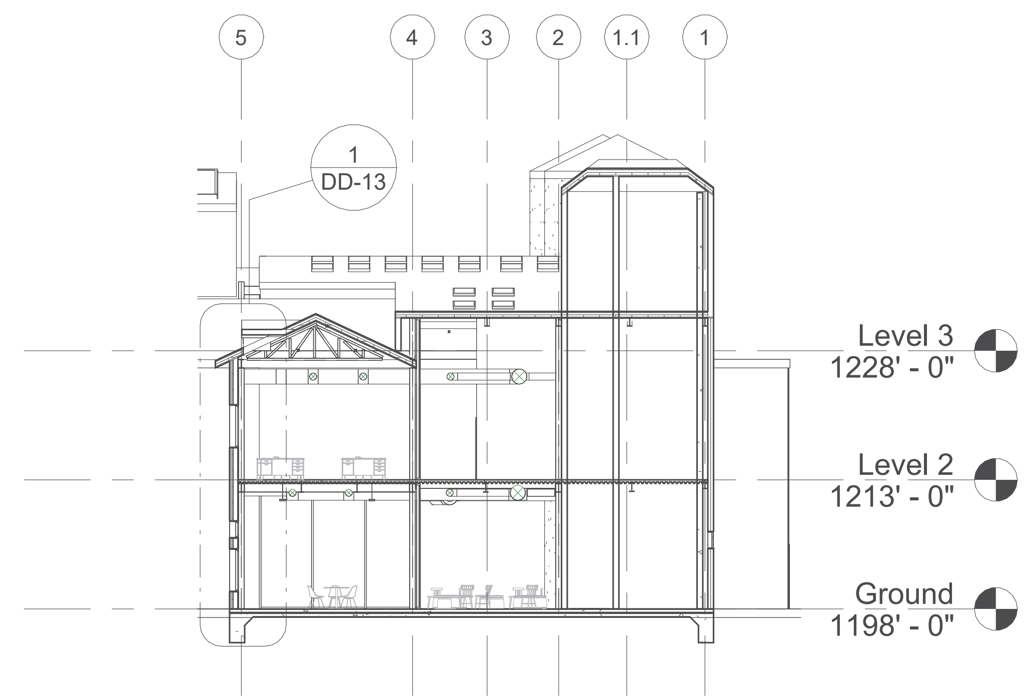


2nd Floor Plan
1:20 Scale

Building Sections



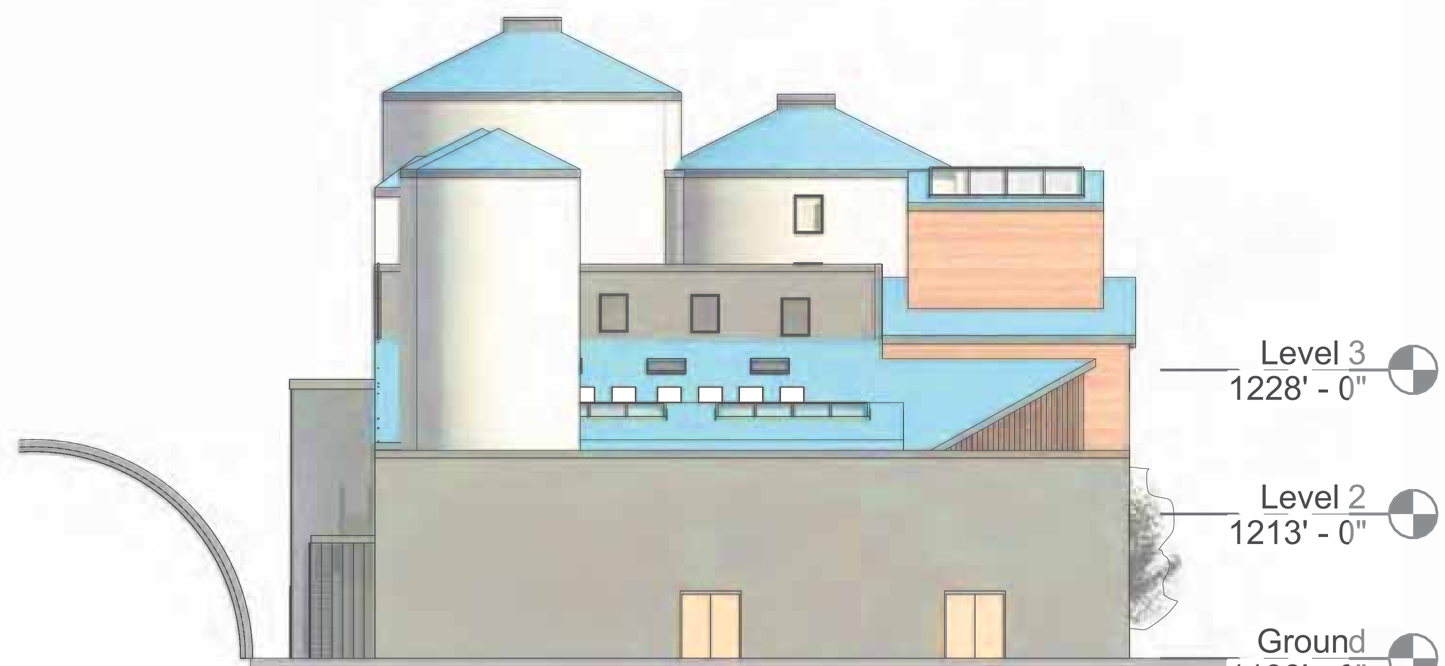
Longitudinal Section
1:20 Scale



Latitudinal Section
1:20 Scale

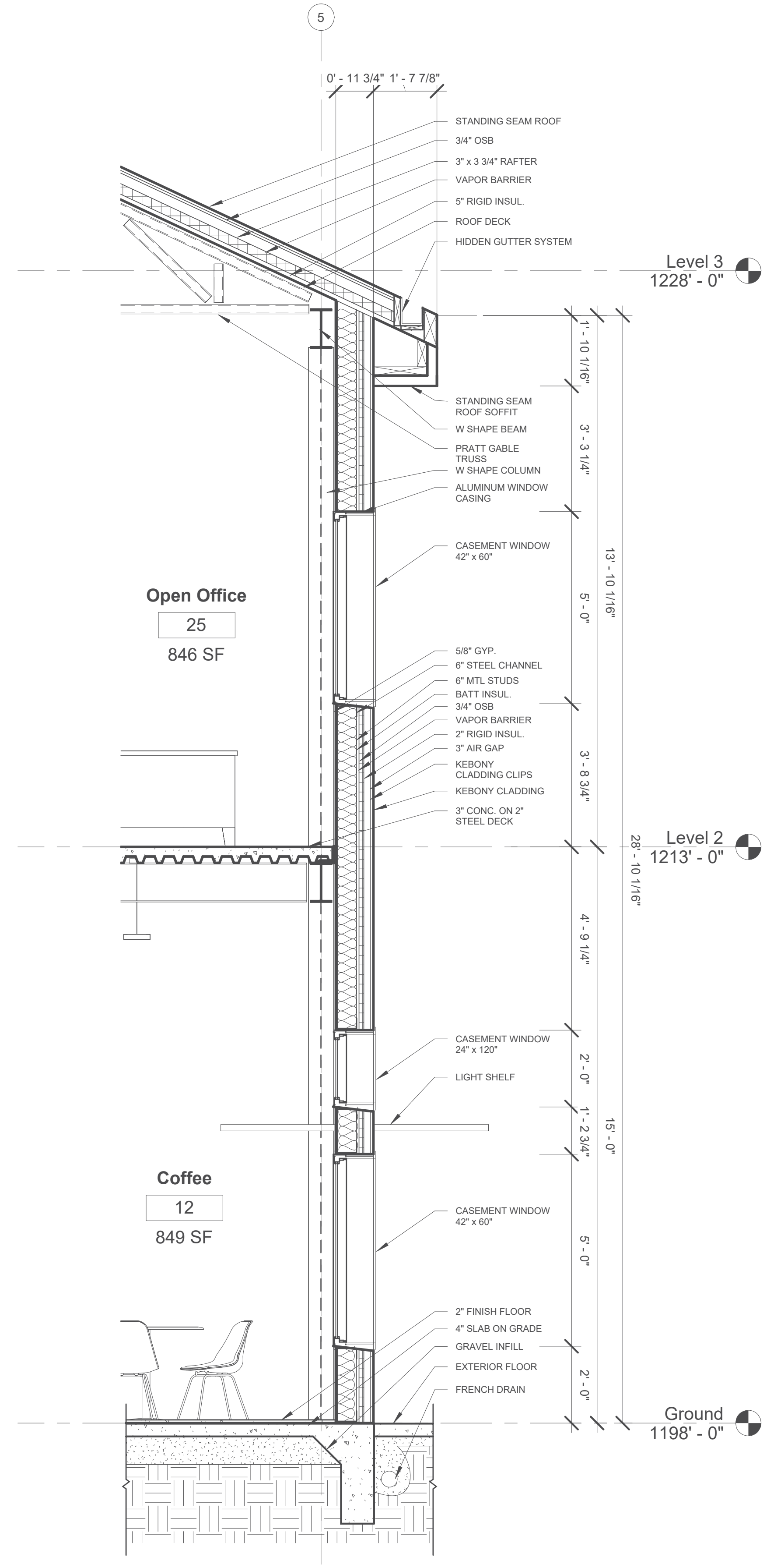
Exterior Elevations

West Elevation
1:20 Scale



South Elevation
1:20 Scale

Wall Section

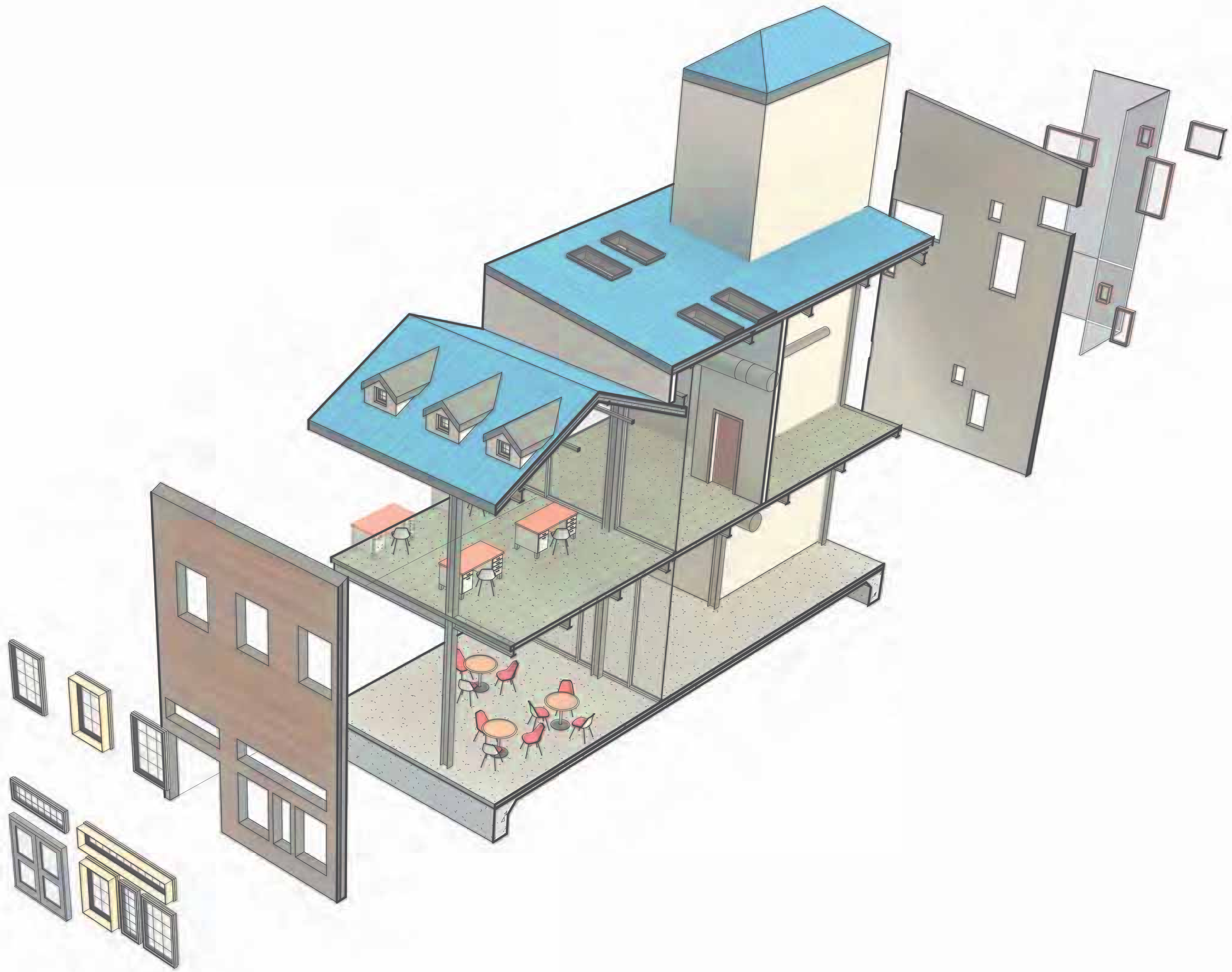


Exterior Perspective

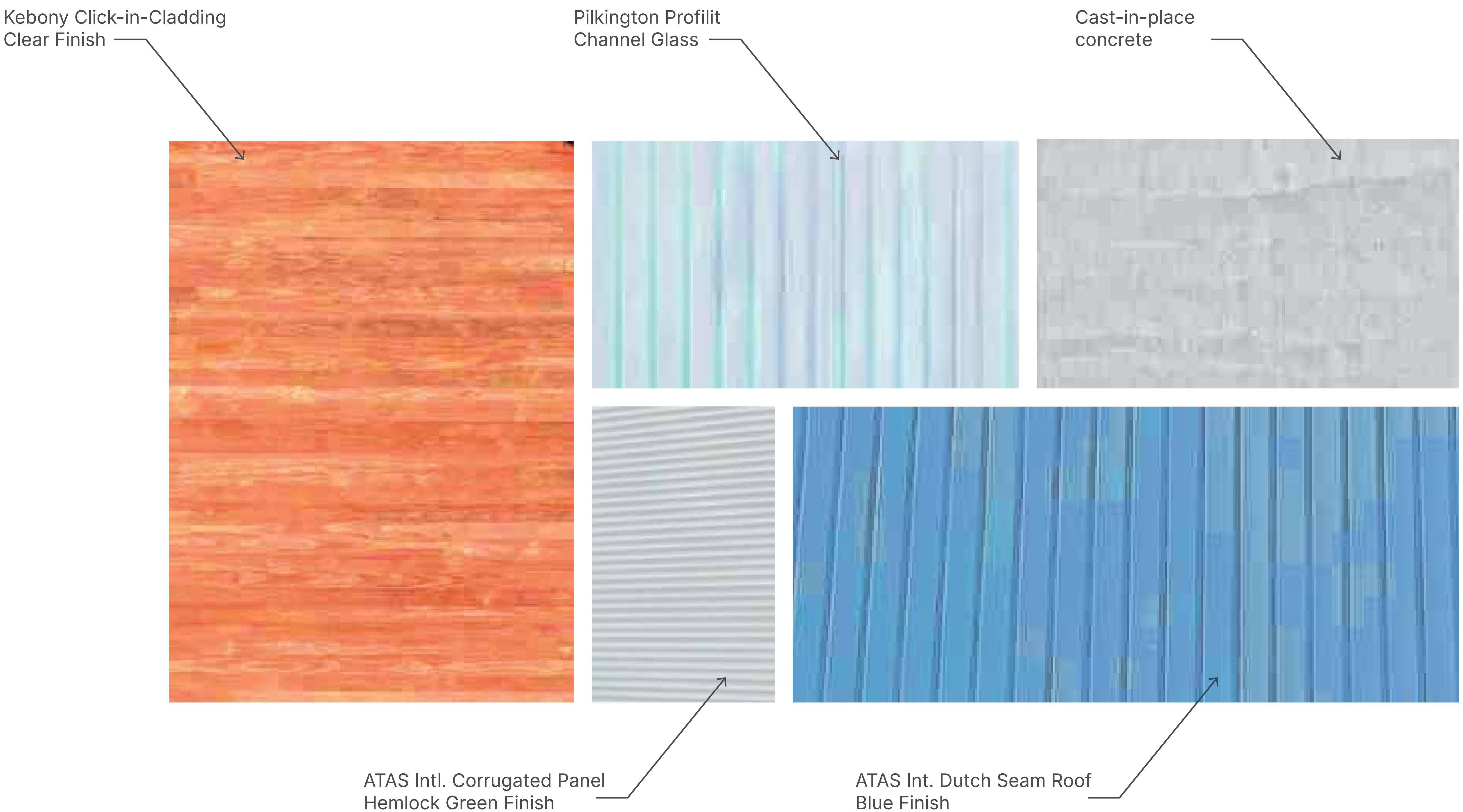
Interior Perspective

Bay Model

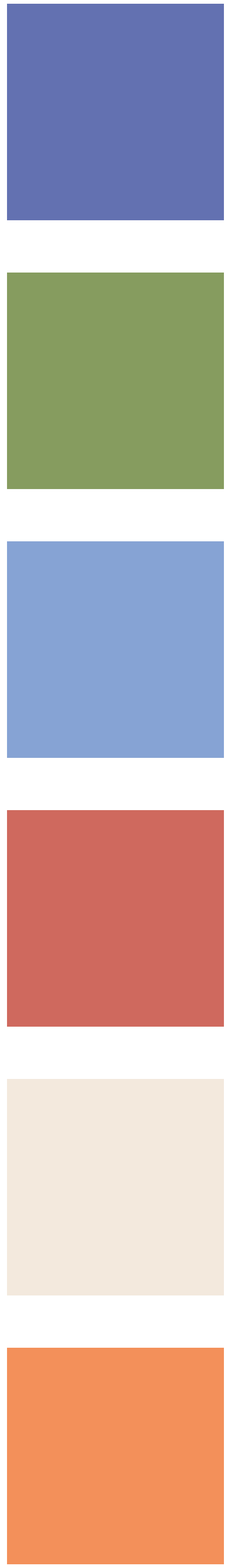
Skin Axon



Material Palette

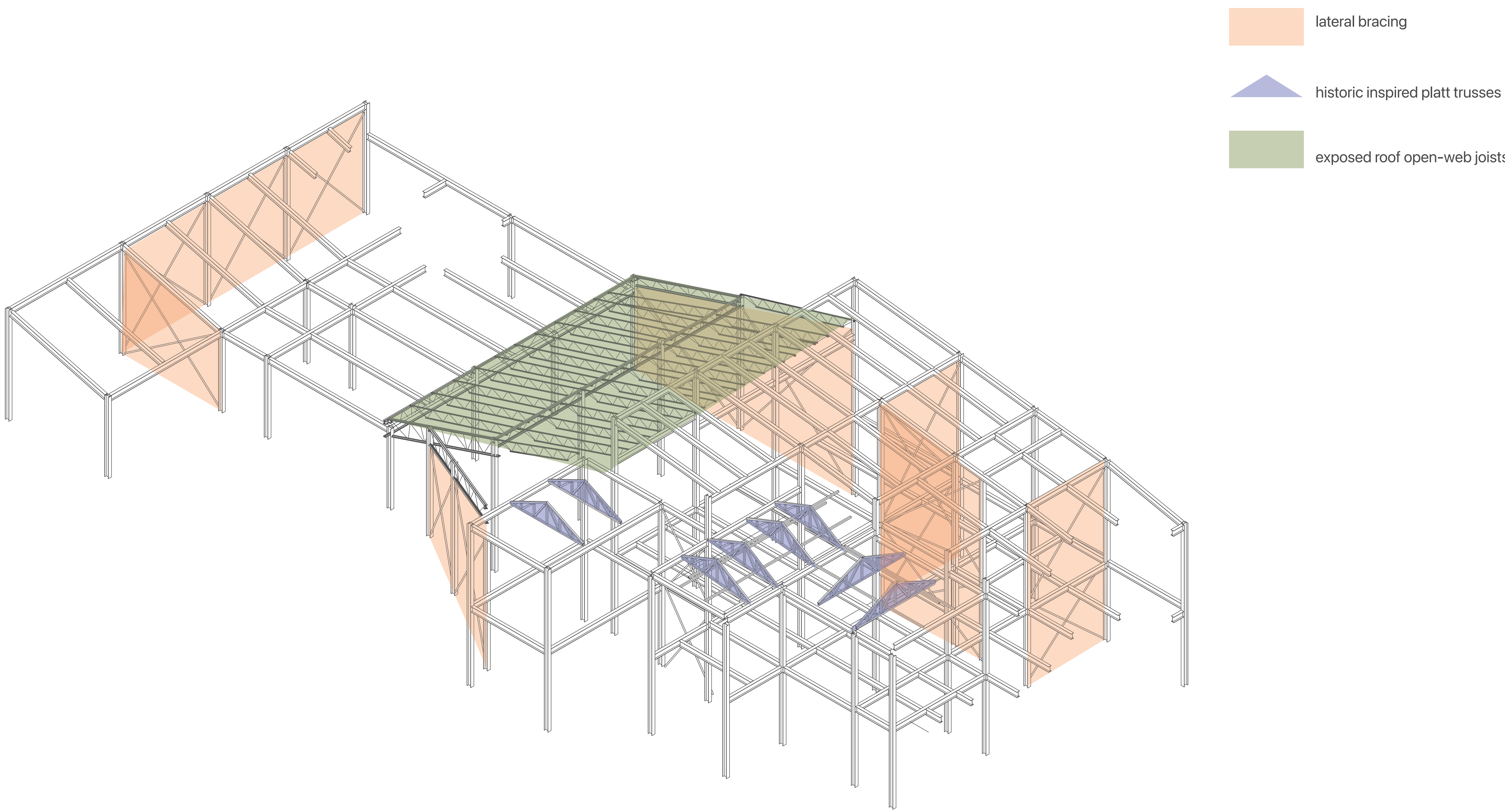


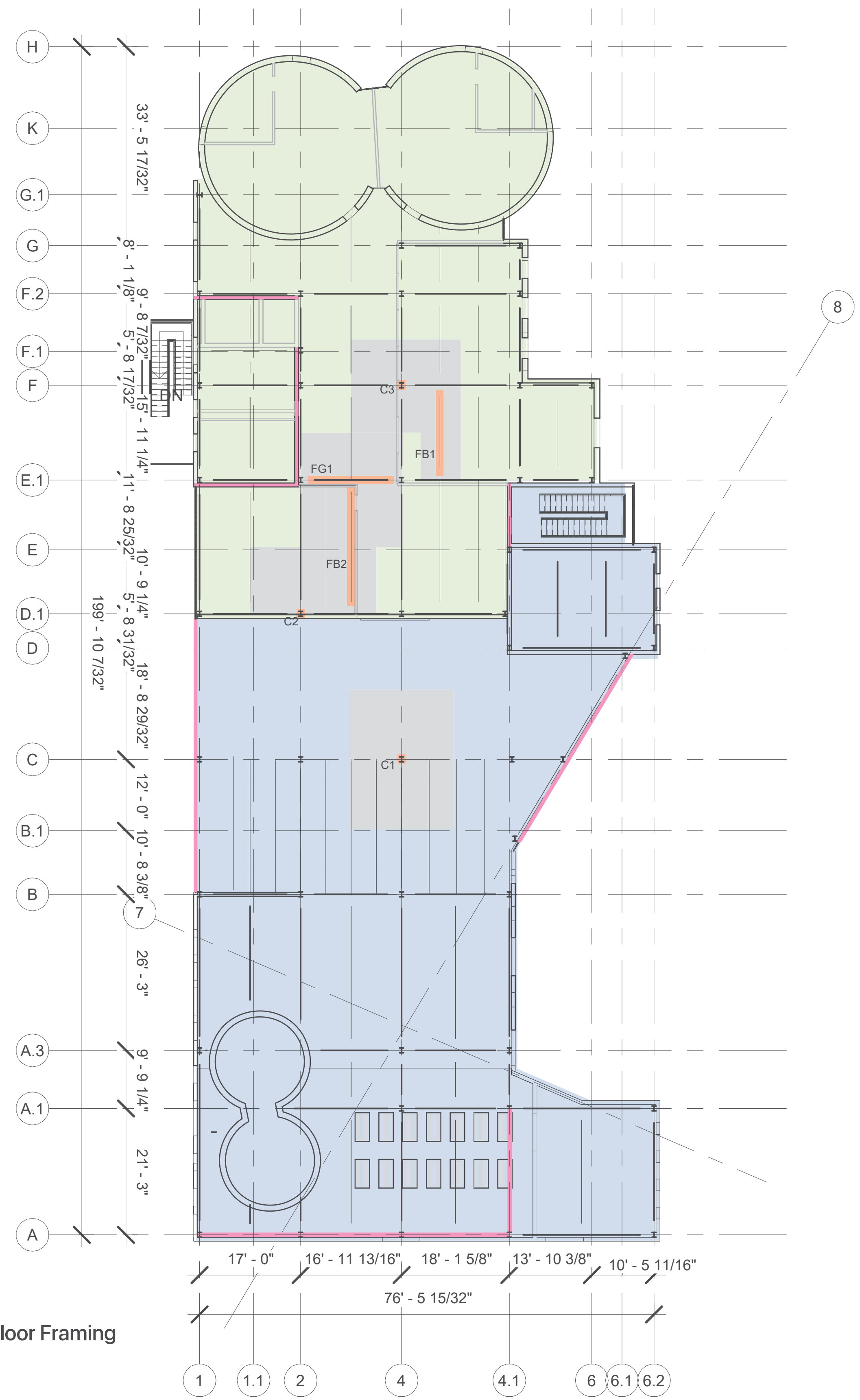
Color Inspiration for Materials



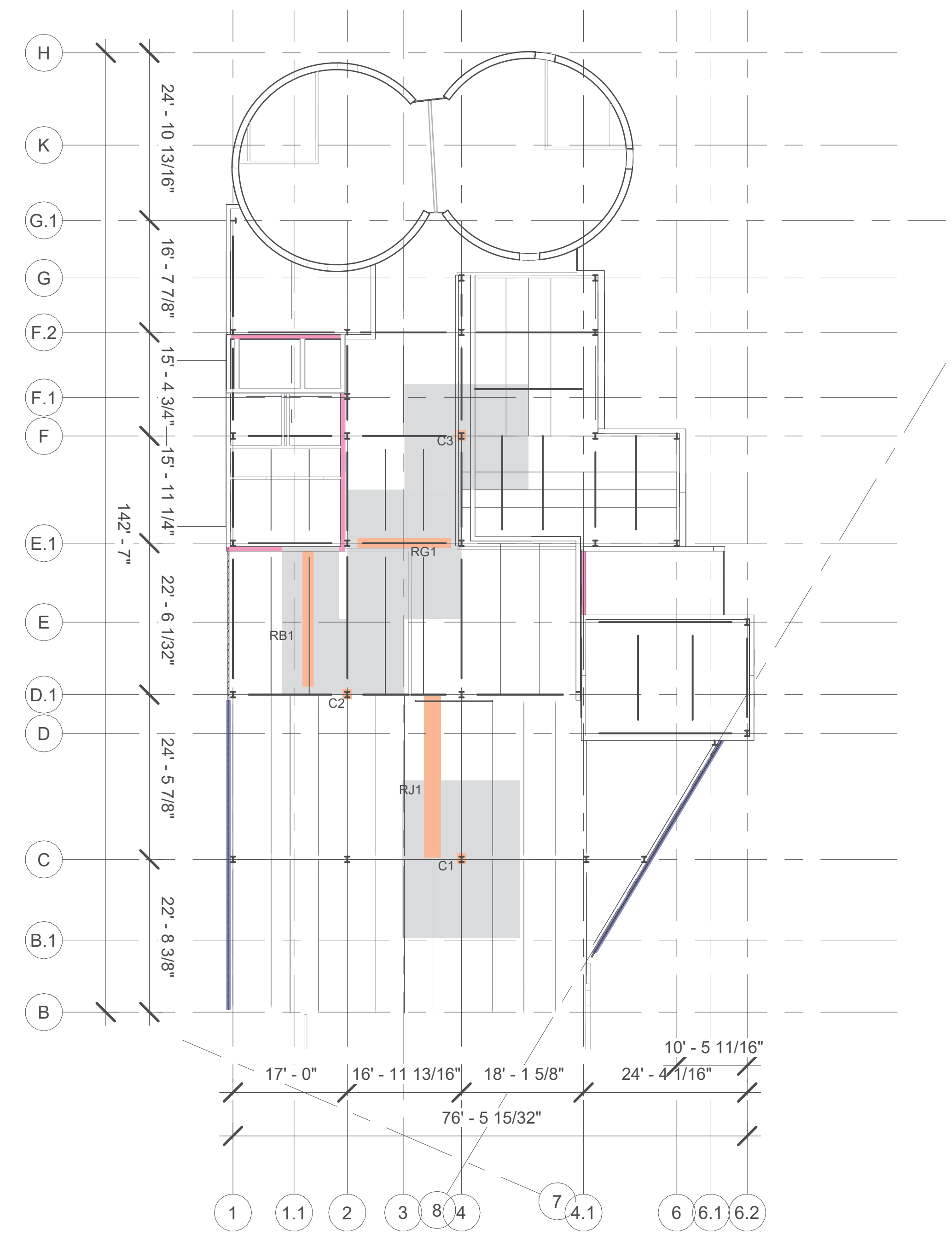
Oklahoma!
Rodgers & Hammerstein, 1943

Structural Drawings



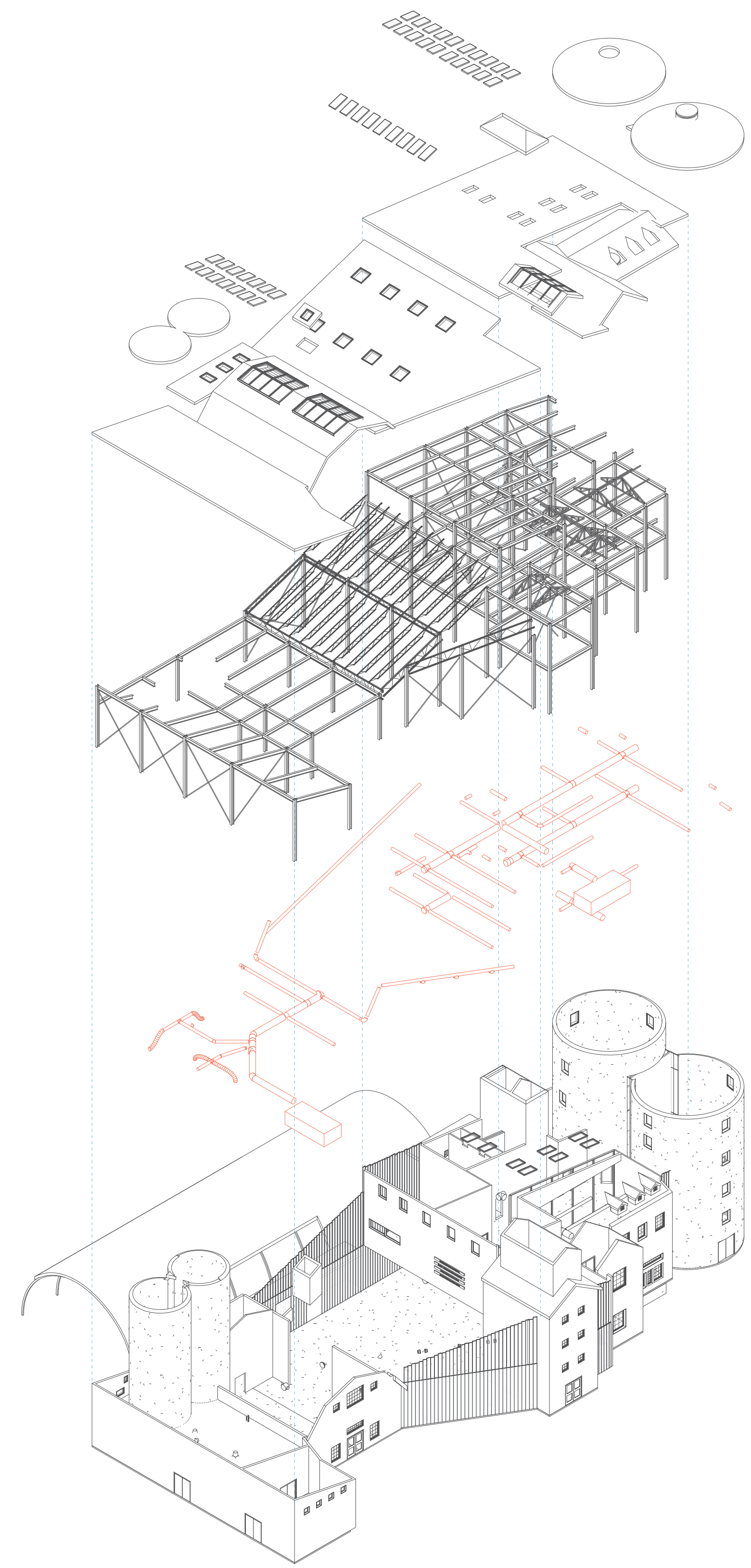


Floor Framing

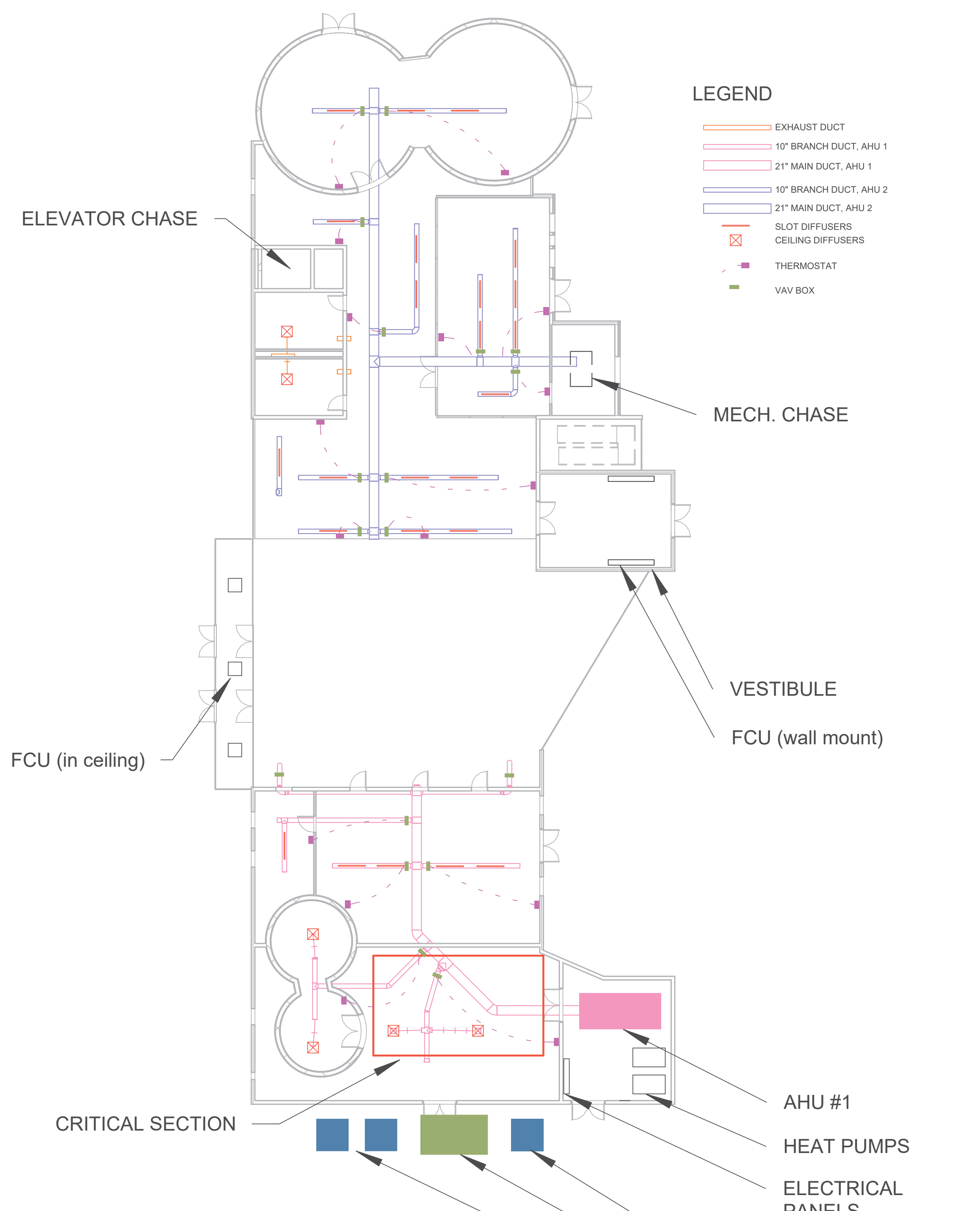


Roof Framing

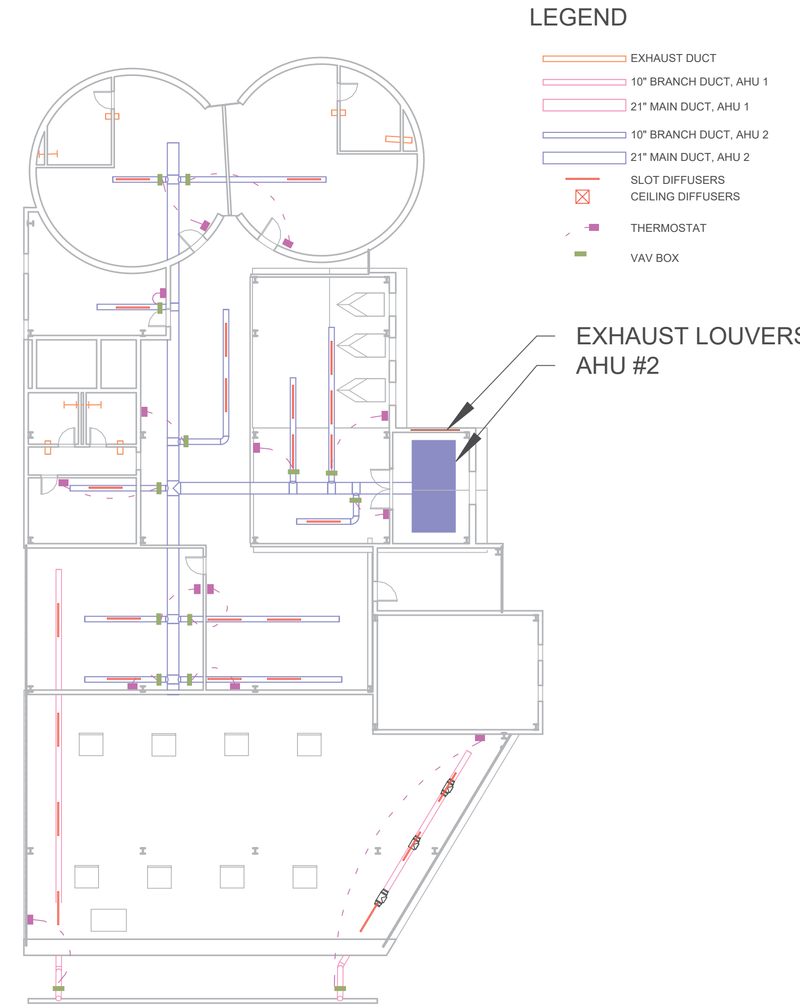
MEP Systems Integration



HVAC Plans

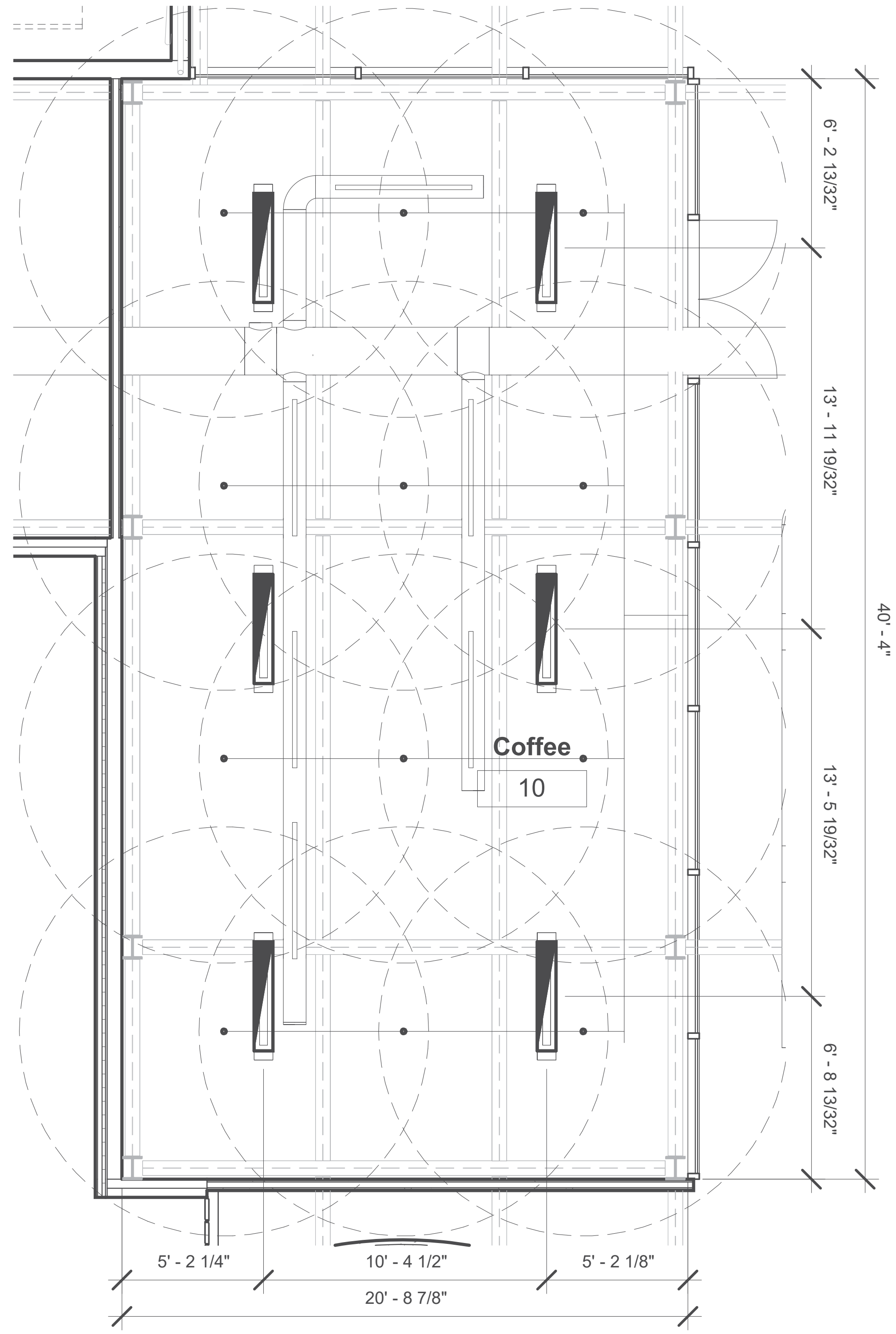


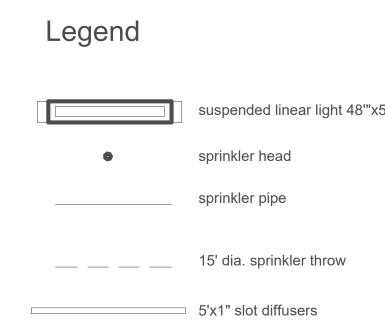
First Floor HVAC



Second Floor HVAC

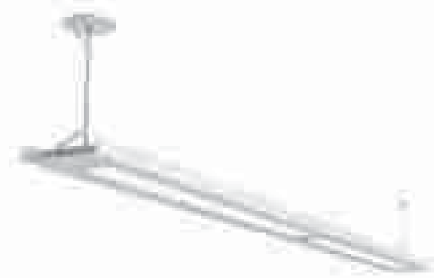
Reflected Ceiling Plan





Lighting Design

Test #:	ISF 31245P170
Test Lab:	SCALED PHOTOMETRY
Catalog:	BRM9L MSL4 80CRI TUWH PROR_30K ID140ILMF 70/30
Description:	BRM9L MSL4 80CRI TUWH PROR_30K ID140ILMF 70/30
Series:	BRM9L TUWH Linear
Lamp Output:	Total luminaire Lumens: 5843.9, absolute photometry *
Input Wattage:	47.2818
Luminous Opening:	Rectangle w/Luminous Sides (L: 48", W: 5.04", H: 0.96")
Cie Class:	Semi-Indirect
Max Cd:	1,274.0 at Horizontal: 90°, Vertical: 125°
Spacing Criterion:	@ 0 = 1.39 / @ 90 = 1.71



Selected Fixture
Peerless BRM91 TUWH Linear

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	431.2	7.4%
0-40	751.7	12.9%
0-60	1,450.7	24.8%
60-90	460.2	7.9%
70-100	311.7	5.3%
90-120	1,364.2	23.3%
0-90	1,910.8	32.7%
90-180	3,933.0	67.3%
0-180	5,843.9	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	47.1	0.8%	90-100	116.7	2%
10-20	143.8	2.5%	100-110	465.7	8%
20-30	240.2	4.1%	110-120	781.8	13.4%
30-40	320.1	5.5%	120-130	818.8	14%
40-50	358.6	6.1%	130-140	691.5	11.8%
50-60	341.4	5.8%	140-150	512.6	8.8%
60-70	265.2	4.5%	150-160	328.0	5.6%
70-80	152.5	2.6%	160-170	168.4	2.9%
80-90	42.6	0.7%	170-180	45.4	0.8%

Candela Tabulation

	0	45	90	135	180	225	270	315	360
0	3133	3133	3133	3133	3133	3133	3133	3133	3133
45	3482	3691	3971	3652	3429	3746	4118	3794	3482
55	3475	3519	3671	3473	3410	3602	3914	3667	3475
65	3314	3057	3028	2977	3127	3195	3380	2275	3314
75	2972	2244	2069	2164	2764	2455	2490	2546	2972
85	2094	925	626	789	1795	1089	1064	2225	2094

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance: 20%

RCC %:	80				70				50			30			10			0
RW %:	70	50	30	0	70	50	30	0	50	30	10	50	30	10	50	30	10	0
RCR: 0	1.03	1.03	1.03	1.03	.93	.93	.93	.93	.74	.74	.74	.56	.56	.56	.40	.40	.40	.33
1	.94	.89	.85	.80	.84	.80	.77	.72	.64	.62	.60	.49	.47	.46	.35	.34	.33	.27
2	.85	.78	.71	.66	.76	.70	.65	.60	.56	.52	.49	.43	.40	.38	.30	.29	.28	.22
3	.77	.68	.60	.55	.69	.61	.55	.19	.49	.44	.41	.37	.34	.32	.27	.25	.23	.18
4	.70	.60	.52	.46	.63	.54	.47	.16	.43	.38	.34	.33	.30	.27	.24	.21	.19	.15
5	.64	.55	.45	.39	.58	.48	.41	.14	.38	.33	.29	.29	.26	.23	.21	.19	.17	.13
6	.59	.47	.39	.33	.53	.43	.36	.12	.34	.29	.25	.26	.23	.20	.19	.16	.14	.11
7	.54	.42	.34	.29	.49	.38	.31	.10	.31	.26	.22	.24	.20	.17	.17	.15	.13	.10
8	.50	.38	.31	.25	.45	.35	.28	.09	.28	.23	.19	.22	.18	.15	.16	.13	.11	.09
9	.47	.35	.27	.22	.42	.31	.25	.08	.25	.20	.17	.20	.16	.13	.14	.12	.10	.08
10	.44	.32	.24	.20	.39	.29	.22	.07	.23	.18	.15	.18	.15	.12	.13	.11	.09	.07

Electric lighting design *focus space only*

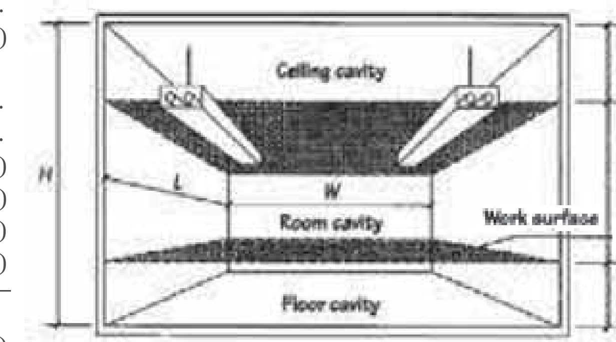
A copy of the 'Simplified Lumen Method' is provided below.

AVERAGE ILLUMINANCE WORKSHEET-ELECTRIC LIGHTING [LUMEN METHOD-SIMPLIFIED]

Designer: Natalie Haggard Space type: Cafe/Coffee Shop

PHOTOMETRIC DATA

IESNA Illuminance category: P
IESNA Recommended illuminance (average): 20 (fc)
[Refer to IESNA tables]
Lamp type: BRM9L TUWH Linear LED
Recommended spacing ratio 1.39 ∥ 1.17⊥
Lumen output from one lamp (initial): 5843.9 (lumens)
Number of lamps per luminaire: 1 (lamps)
Fixture efficiency: 100 (%)
Lumen output from one luminaire: 5843.9 (lumens)



ROOM DESIGN

L = 40'-4" (ft)
W = 20'-9" (ft)
H = 15'-0" (ft)
Ceiling cavity reflectance = CCR = 80 (%)
Room cavity reflectance (walls) = RCR = 50 (%)
Assumed floor cavity reflectance = FCR = 20 (%)

h_{CC} = 3' (ft)
h_{RC} = 9.5' (ft)
h_{FC} = 2.5' (ft)

SIZING OF THE SYSTEM

a. Effect of room geometry: Determine equivalent-square room length (W_{sq}), and the Room Cavity Ratio (RCR).

W_{sq} = W + [(L-W) / 3] = 20.75+[(40.33-20.75)/3] = 27.28
RCR = (10 x h_{RC}) / W_{sq} = (10x9.5)/27.28 = 3.48

From manufacturer's data, obtain the Coefficient of Utilization (CU) of this luminaire in this space.

CU = 0.642 = 64.2%

b. Effect of maintenance conditions of the space and the system (includes ballast factor): Estimate LLF.

Light Loss Factor = **LLF** = Good conditions = 0.85 (Circle one)
Average conditions = 0.55
Poor conditions = 0.45

c. Calculate useful lumens from one luminaire (on the workplane):
Useful lumens from one luminaire = Lumen output from one luminaire x CU x LLF
= 5843.9x(0.642)x(0.85) = 3189.02 lumens

d. Determine total lumens needed on the workplane:
Total lumens needed on the workplane = Recommended illuminance x area
= 20(40.33x20.75) = 16736.95 lumens

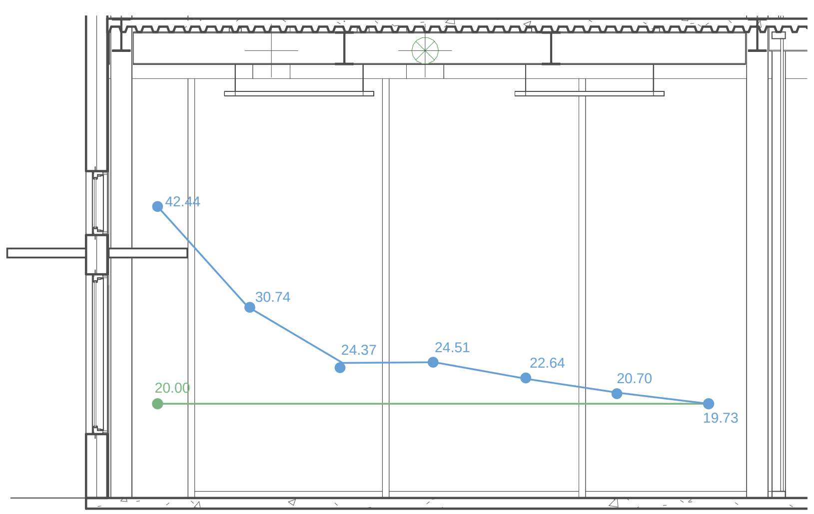
e. Determine needed number of luminaires:
Number of luminaires = Total lumens needed on the workplane/useful lumens from one luminaire

Number of luminaires = 16736.95/3189.02= 5.24 → use 6 for equal distribution

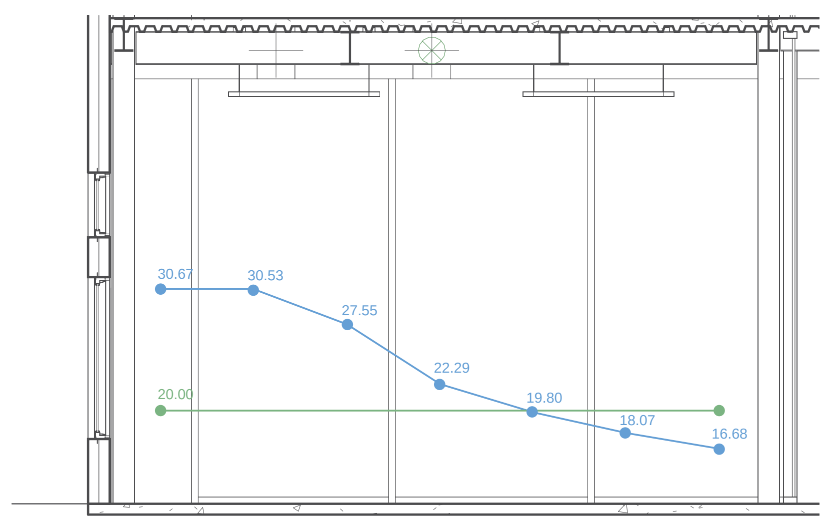
Actual illumination level provided = 20(6/5.24) = 22.9 fc
Light load = (6x47.28)/(40.33x20.75) = 0.34 w/sf < 0.43 maximum for dining from IECC
Light load index = (0.34)/22.9 = 0.0148 w/sf*fc
Covered area per luminaire = (40.33x20.75)/6 = 139.47 sf/luminaire
System's overall efficiency = 1.00x0.642x0.85 = 53%

Daylighting Design

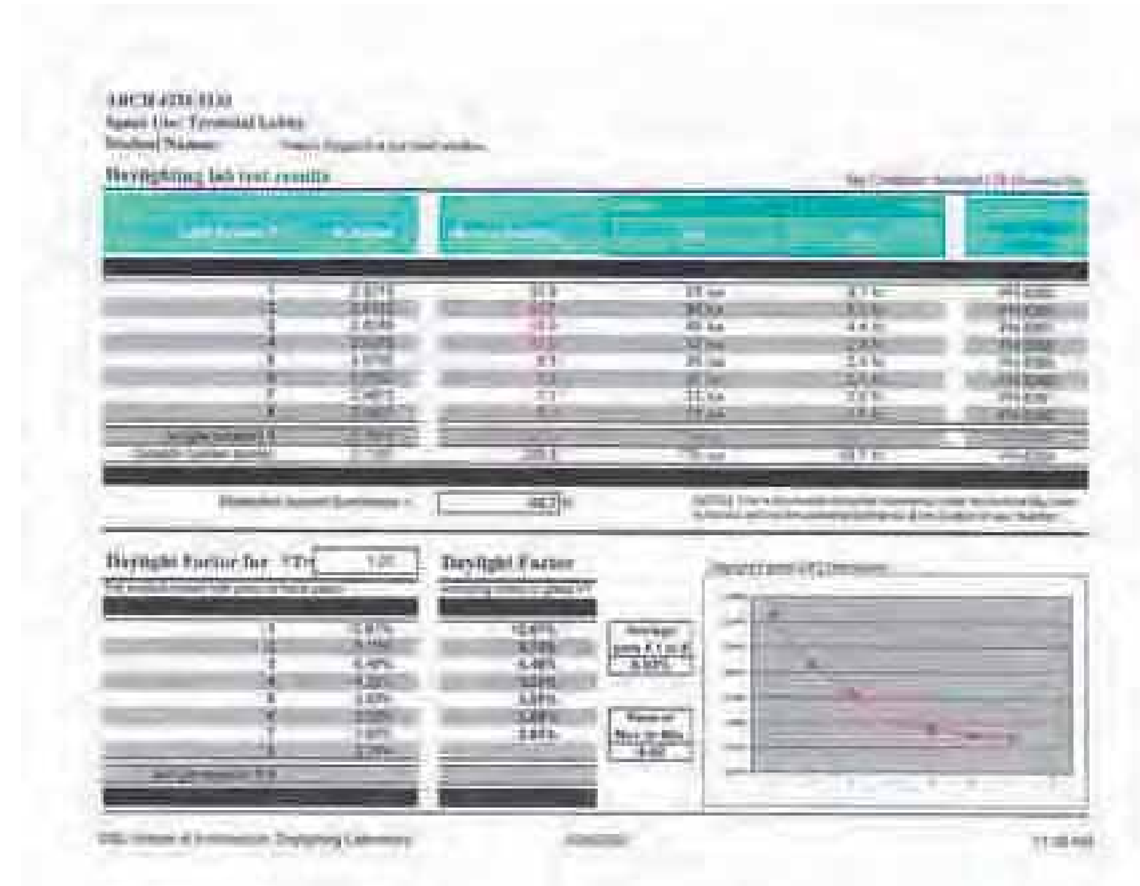
Architectural Glass Vitro Solarban 90

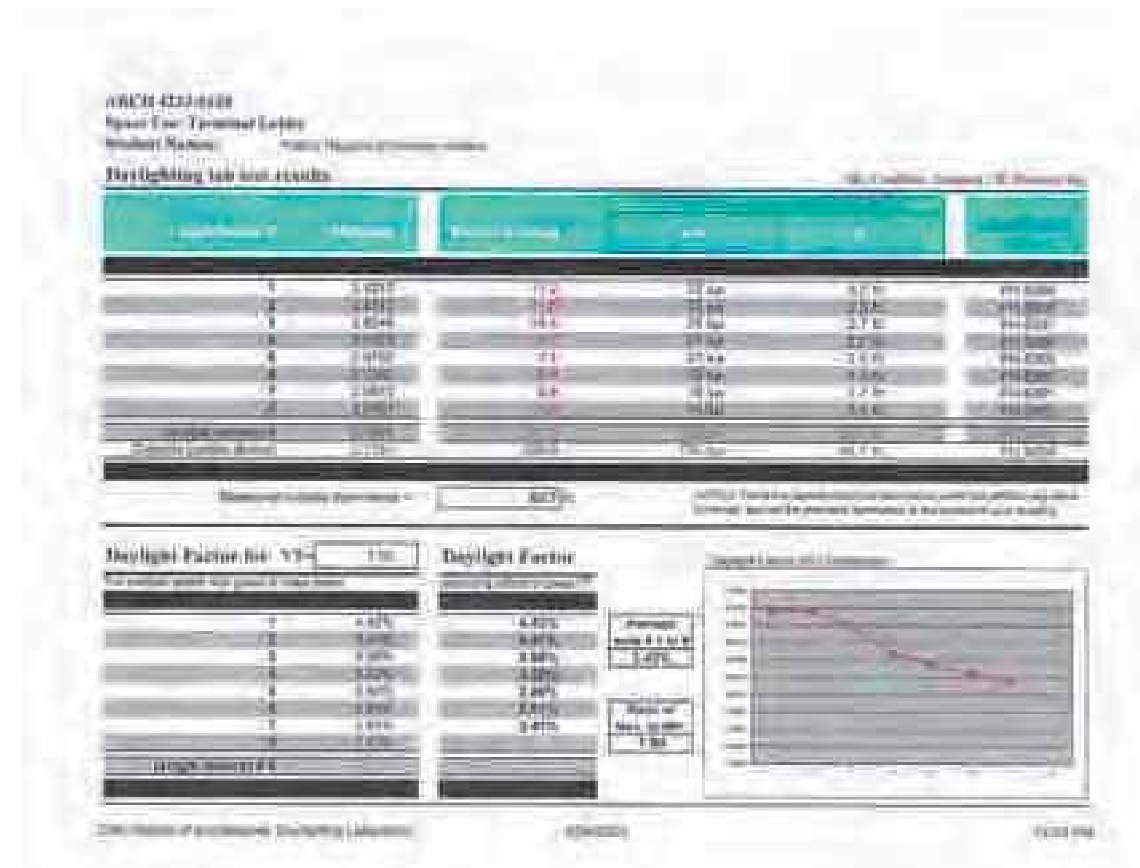


Daylighting Section @ eye-level window



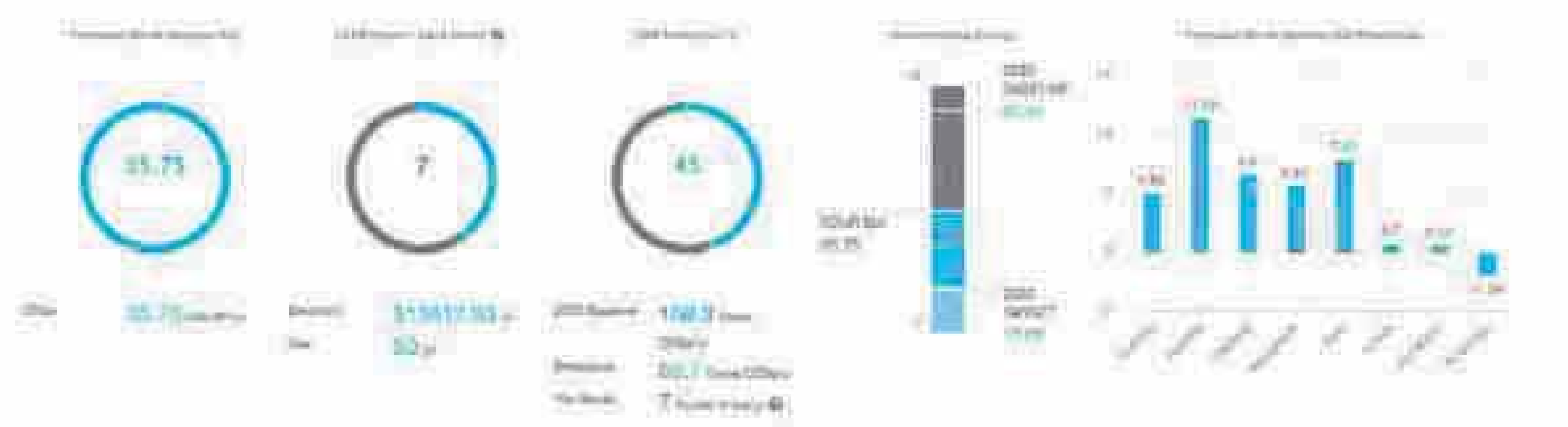
Daylighting Section @ clerestory window

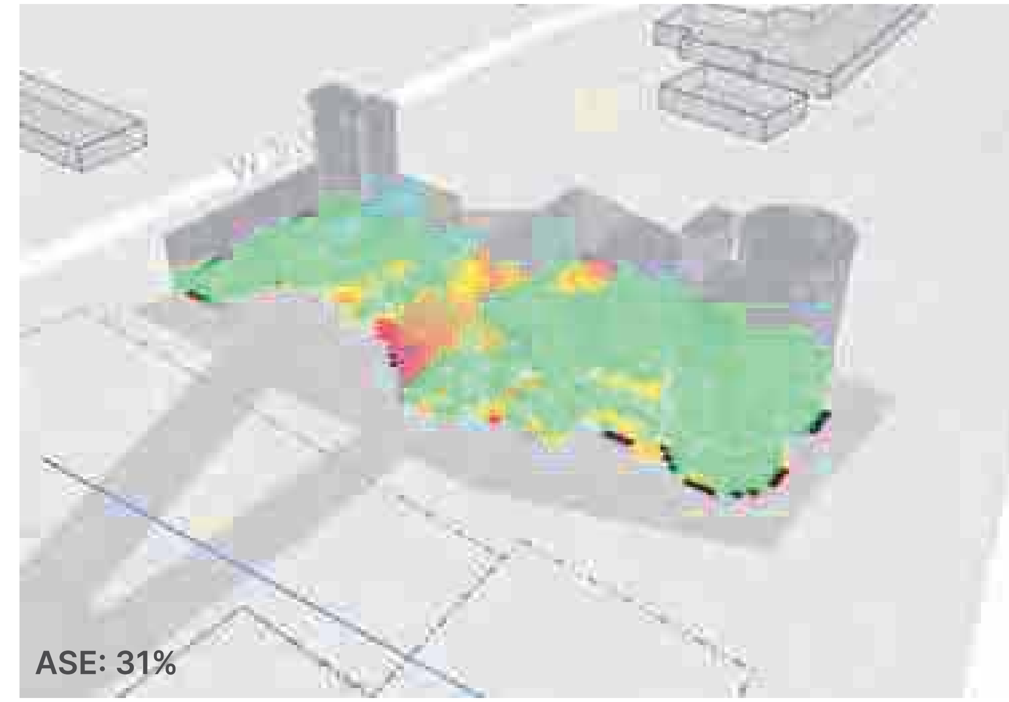




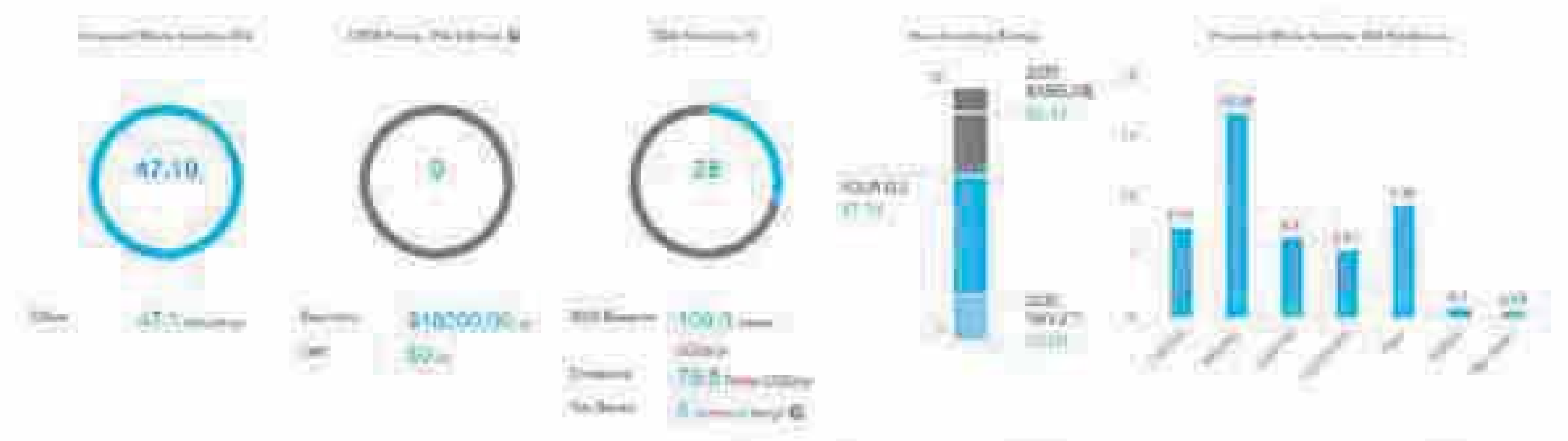
Building Energy Perfomance Drawings

Model C (improved design & system)

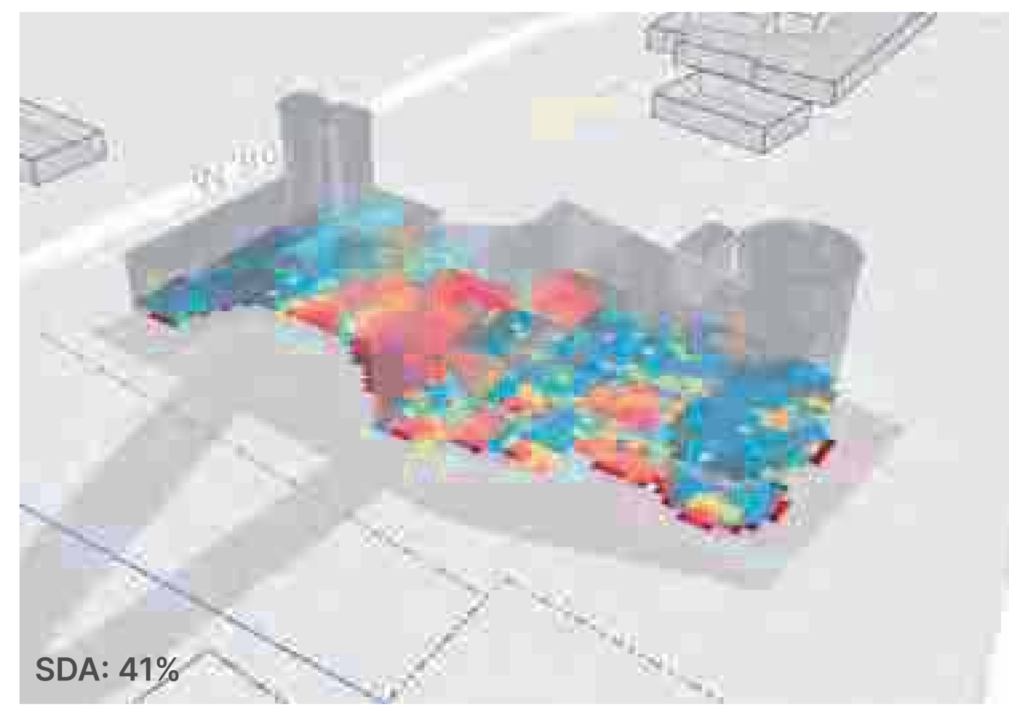




Model B (improved design)



Model A (code compliant)



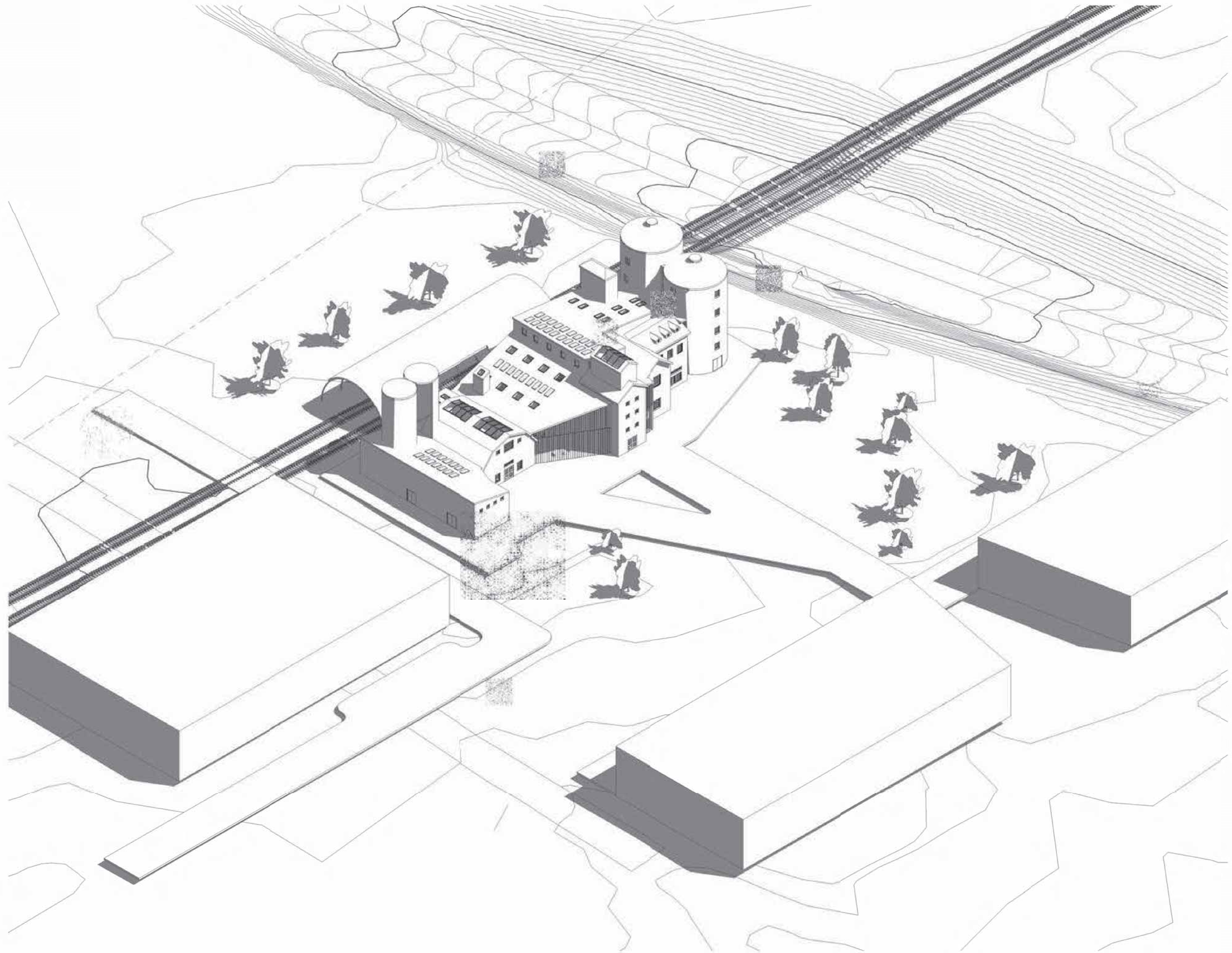
Construction Documents

The Construction Documents phase of our Integrative Studio consisted of the creation of final drawings to document our building as it would be built during construction. This was the shortest of the phases of this studio, lasting only 2 weeks and was also the most unfamiliar to me. Construction Documentation is not something that is taught in studio before now, so I felt like I learned a lot in a short amount of time.

One of the biggest things I had to learn was the standard drawing conditions for construction documents. These graphic standards are quite interesting and exist so that all drawings can be read by contractors, regardless of the architect. Obviously, communicating through drawing is something that I have been doing my whole career at architecture school, but this glimpse into the real world was very enlightening and exciting.

Another portion of this phase that I really enjoyed was the development of custom details for my project. I chose to detail the connection between the wood panel wall with the channel glass curtain wall at the corner. Channel glass is a very unique material and one that I enjoyed having the opportunity to really get into the weeds on and detail. My professor helped me through this detail extensively, and I believe I now have a better understanding of material connection because of it.

Sheet List		
Sheet Name	Sheet Number	Sheet Issue Date
TITLE SHEET	A.000	05/01/23
SITE/CONTEXT PLAN	A.001	04/20/23
FLOOR PLAN 1	A.101	04/21/23
FLOOR PLAN 2	A.102	04/21/23
EXTERIOR ELEVATIONS	A.201	04/21/23
EXTERIOR ELEVATIONS	A.202	04/24/23
BUILDING SECTIONS	A.301	04/24/23
WALL SECTIONS	A.351	04/24/23
DETAIL	A.401	04/24/23
FOCUS SPACE	A.701	04/24/23



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NOTES

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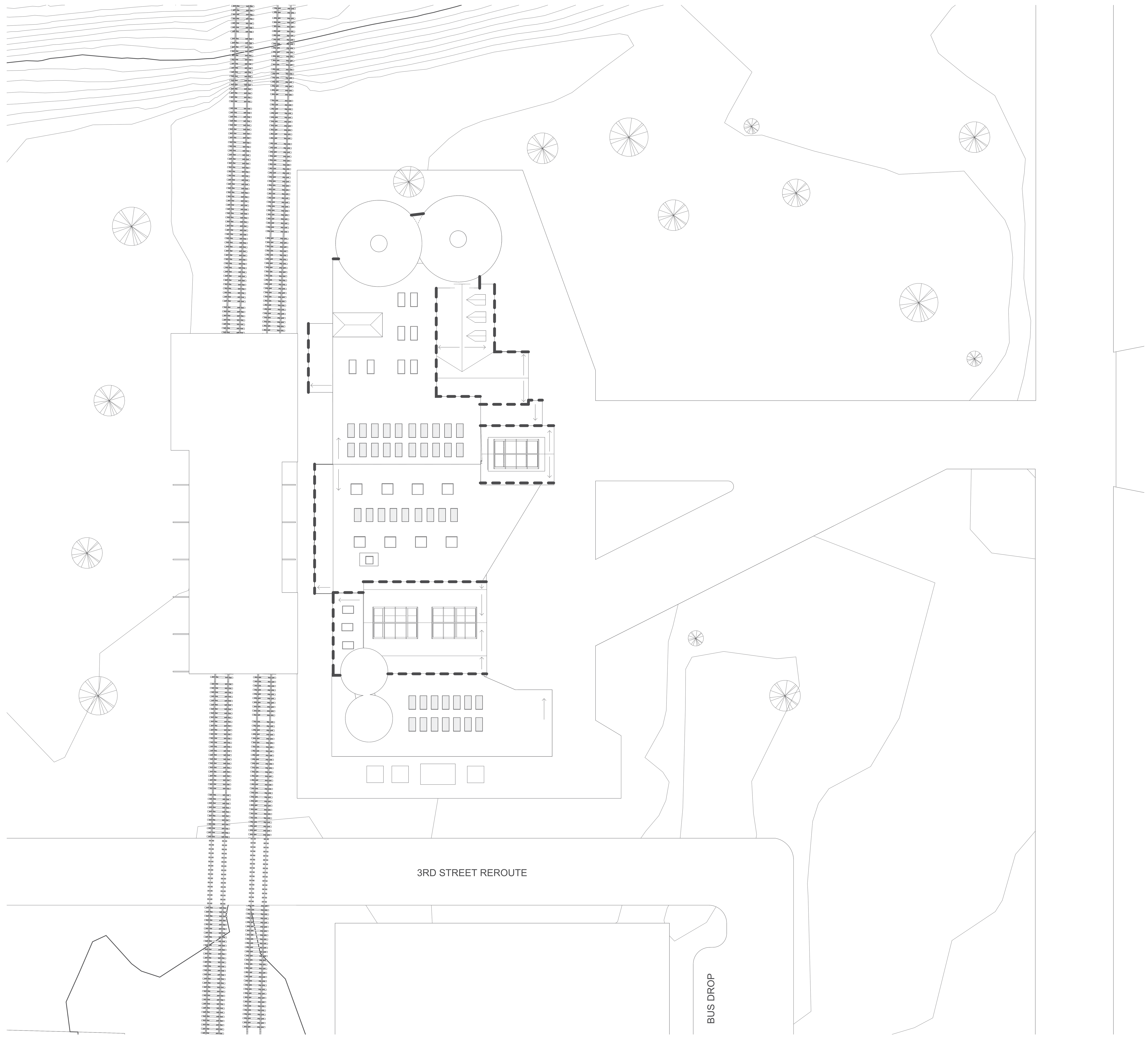
A.000

TITLE SHEET



1 SITE/DRAINAGE
1" = 20'-0"

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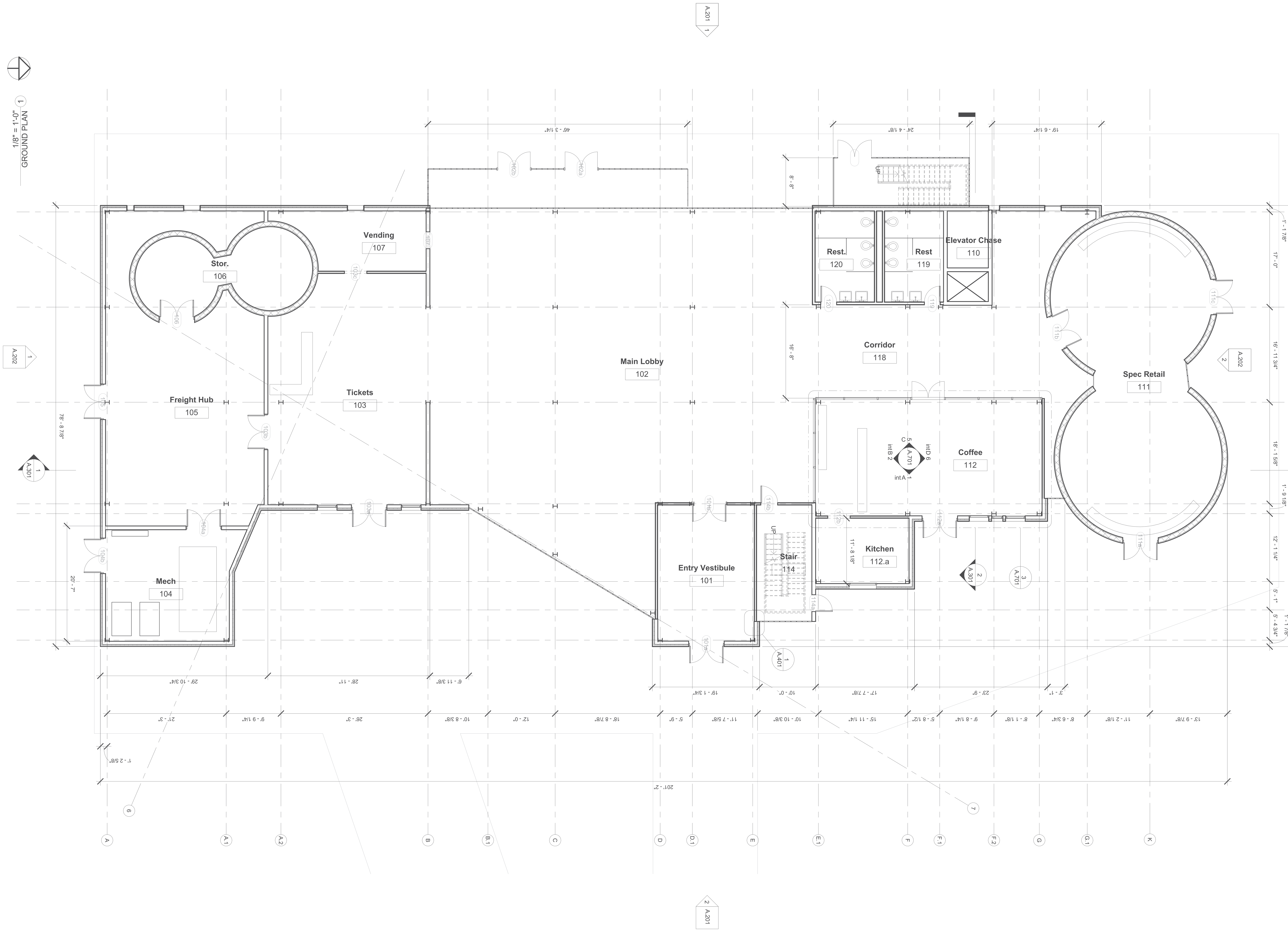
A.001

SITE/CONTEXT PLAN



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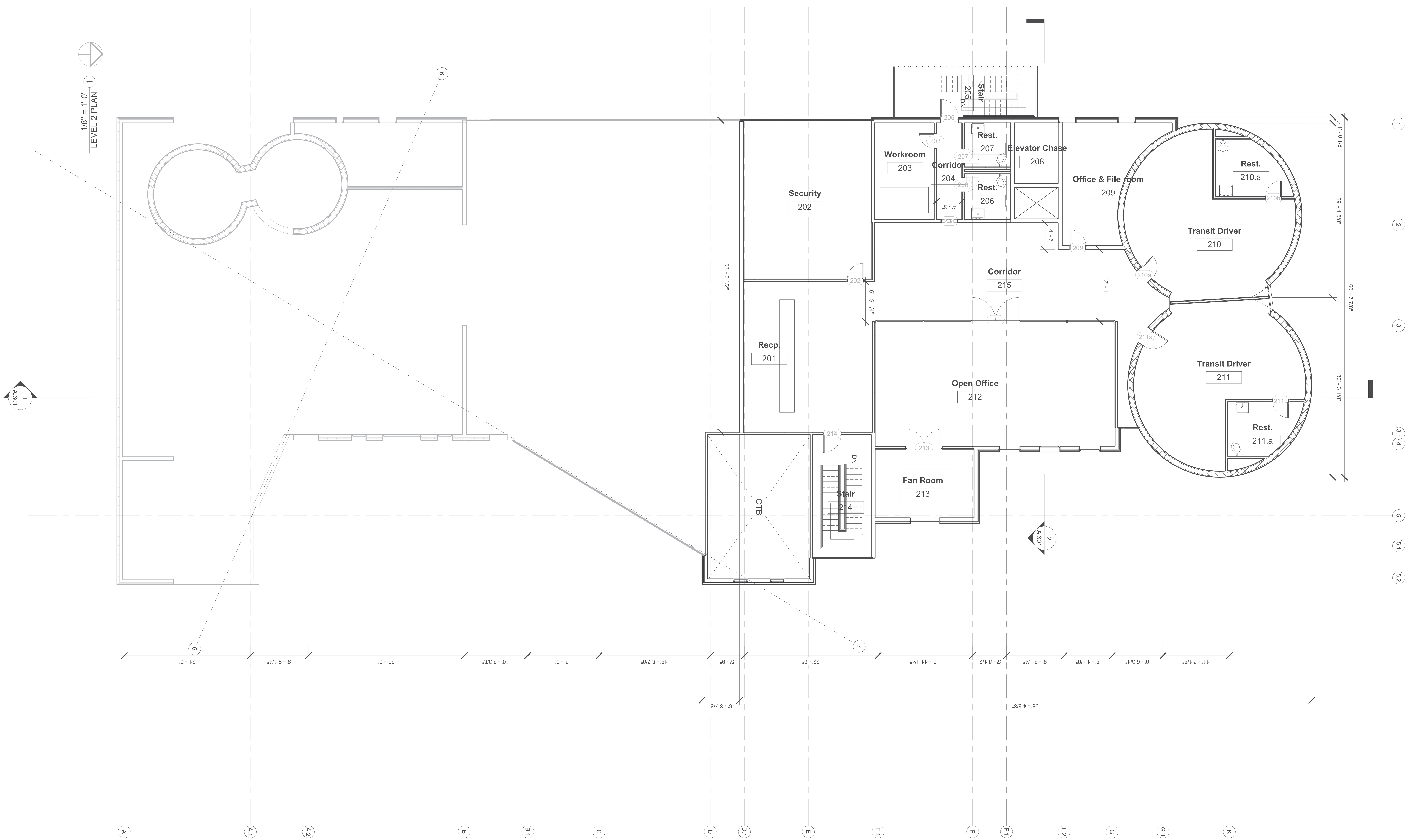
A.101
FLOOR PLAN 1



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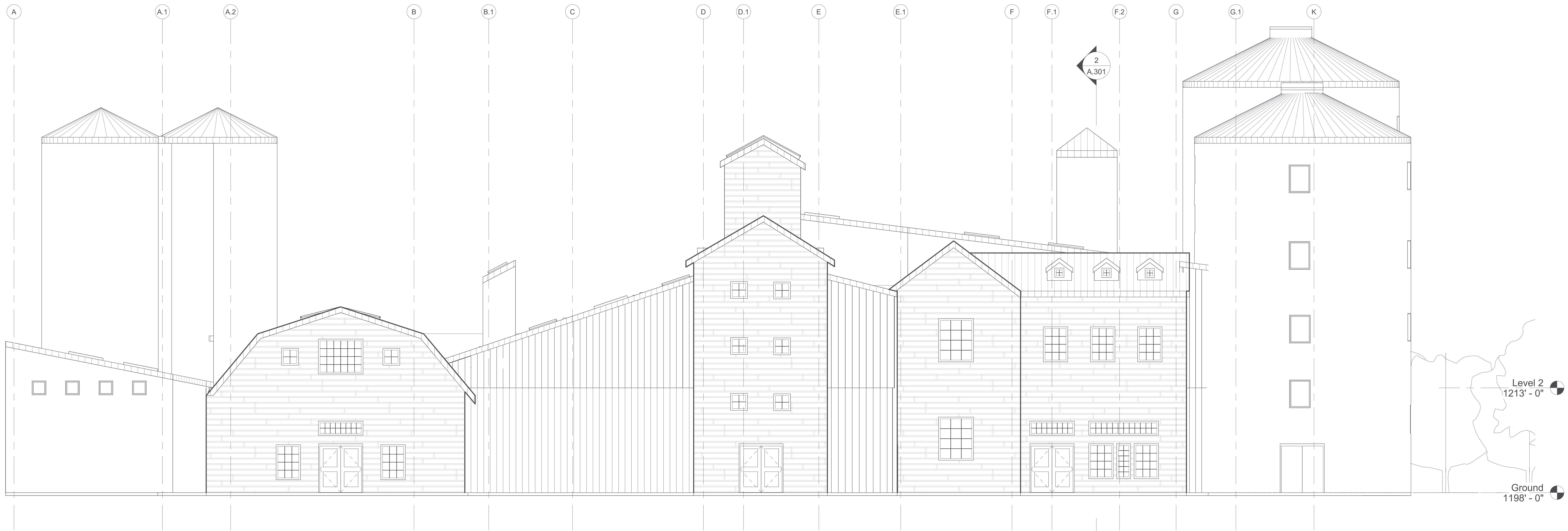
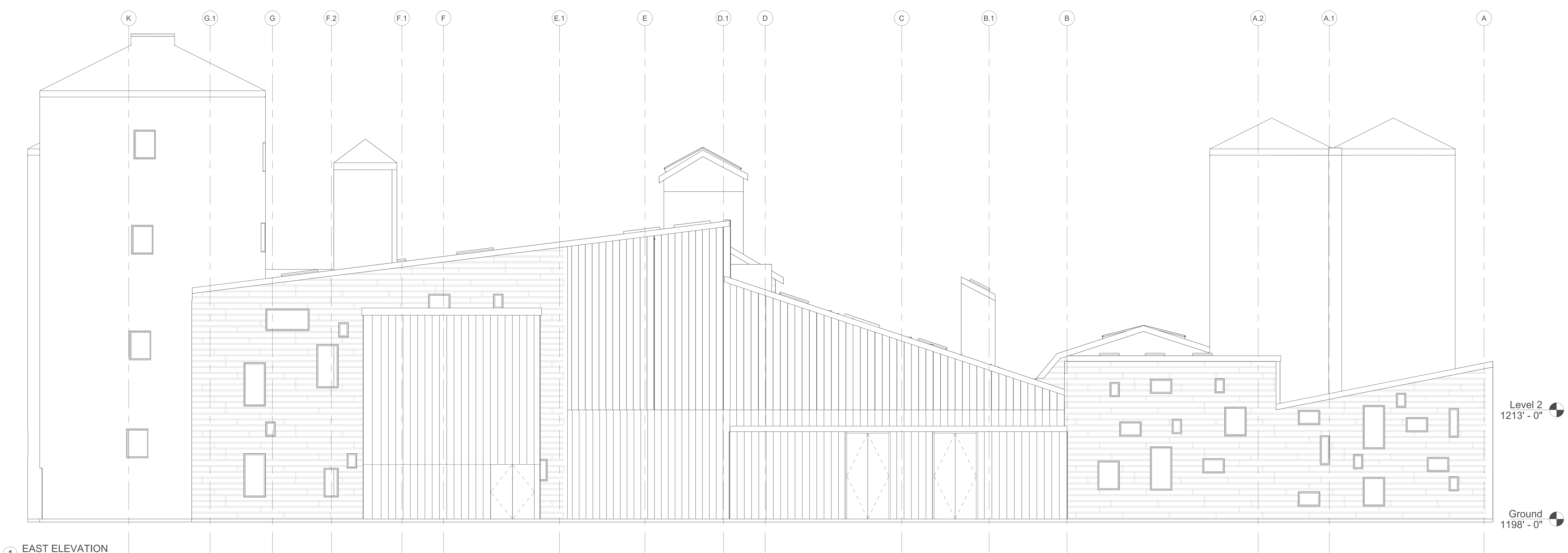
A.102
FLOOR PLAN 2



2 WEST ELEVATION
1/8" = 1'-0"



1 EAST ELEVATION
1/8" = 1'-0"

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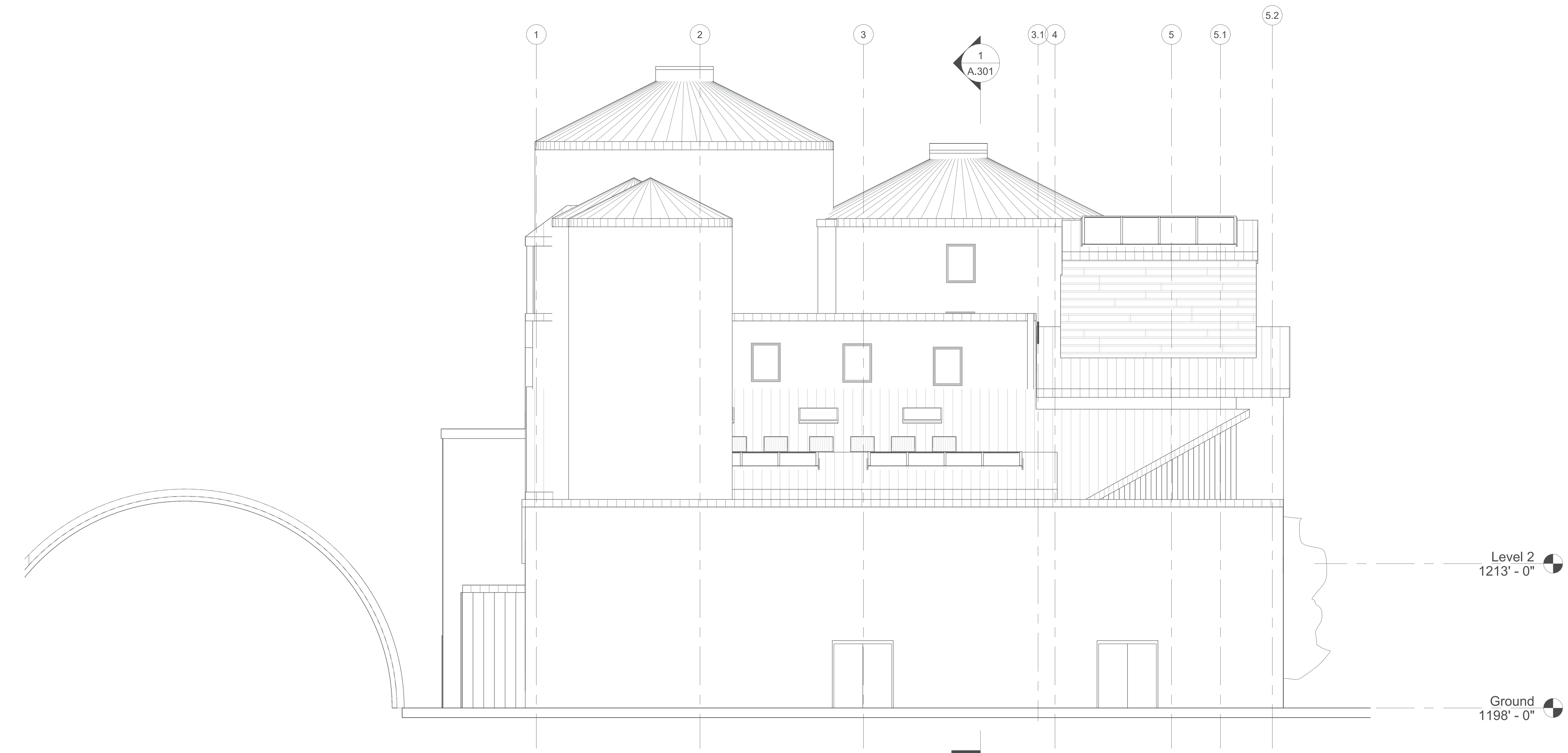
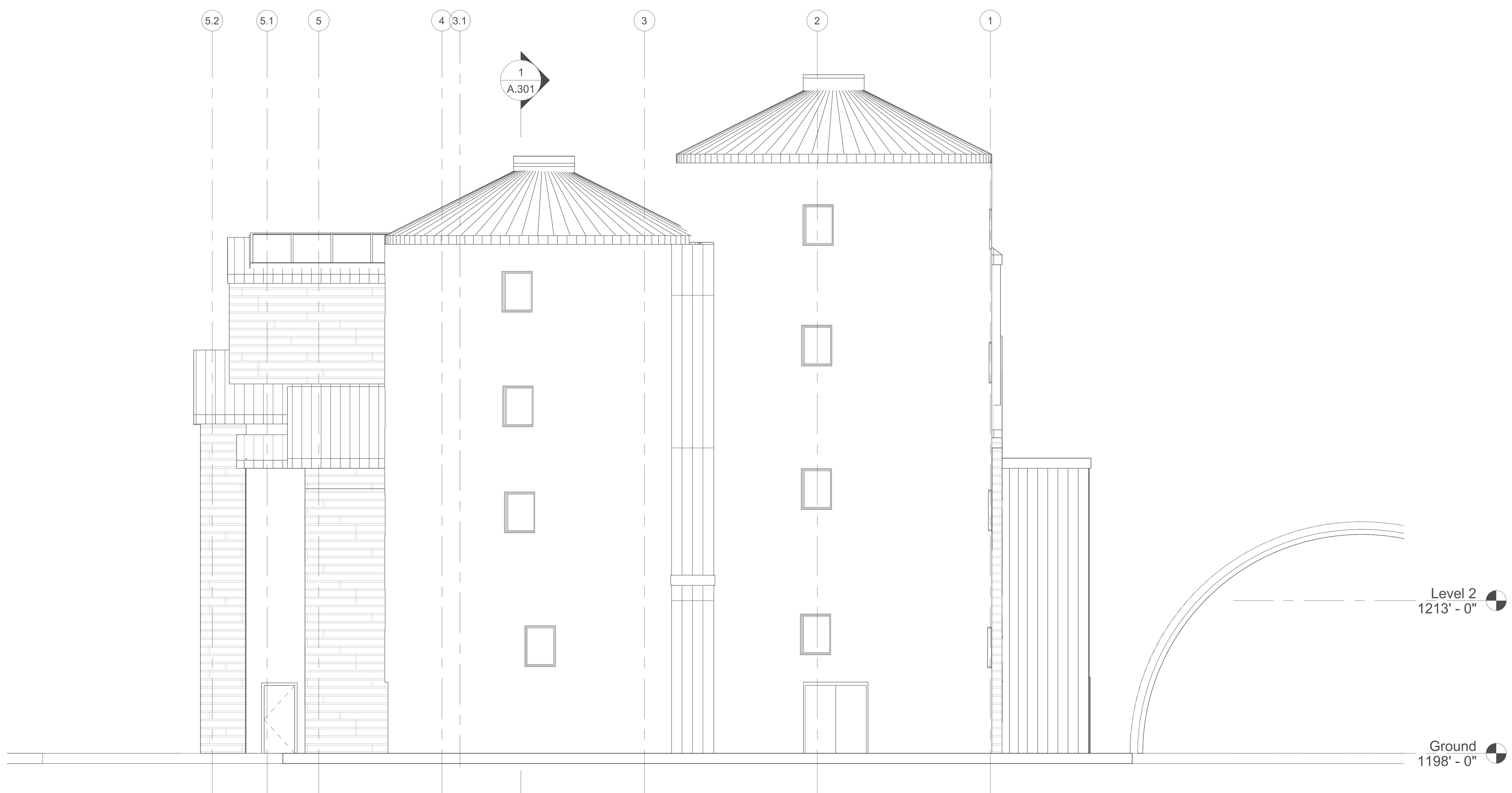
A.201
EXTERIOR ELEVATIONS



1 NORTH ELEVATION
1/8" = 1'-0"



2 SOUTH ELEVATION
1/8" = 1'-0"

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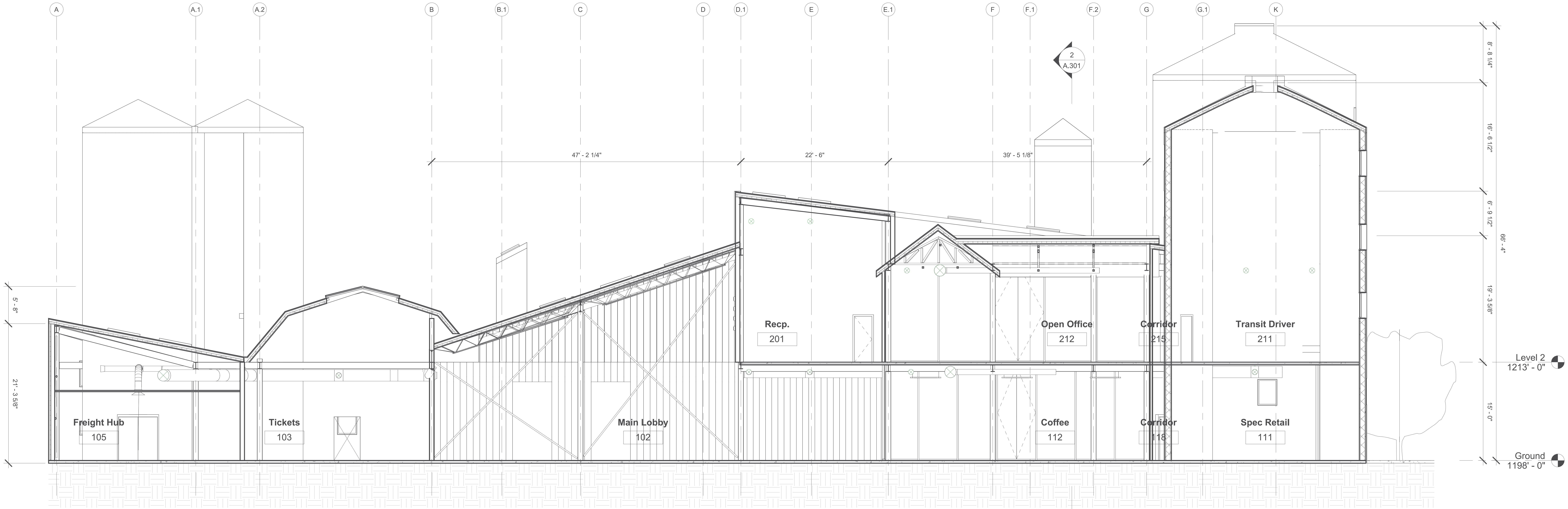
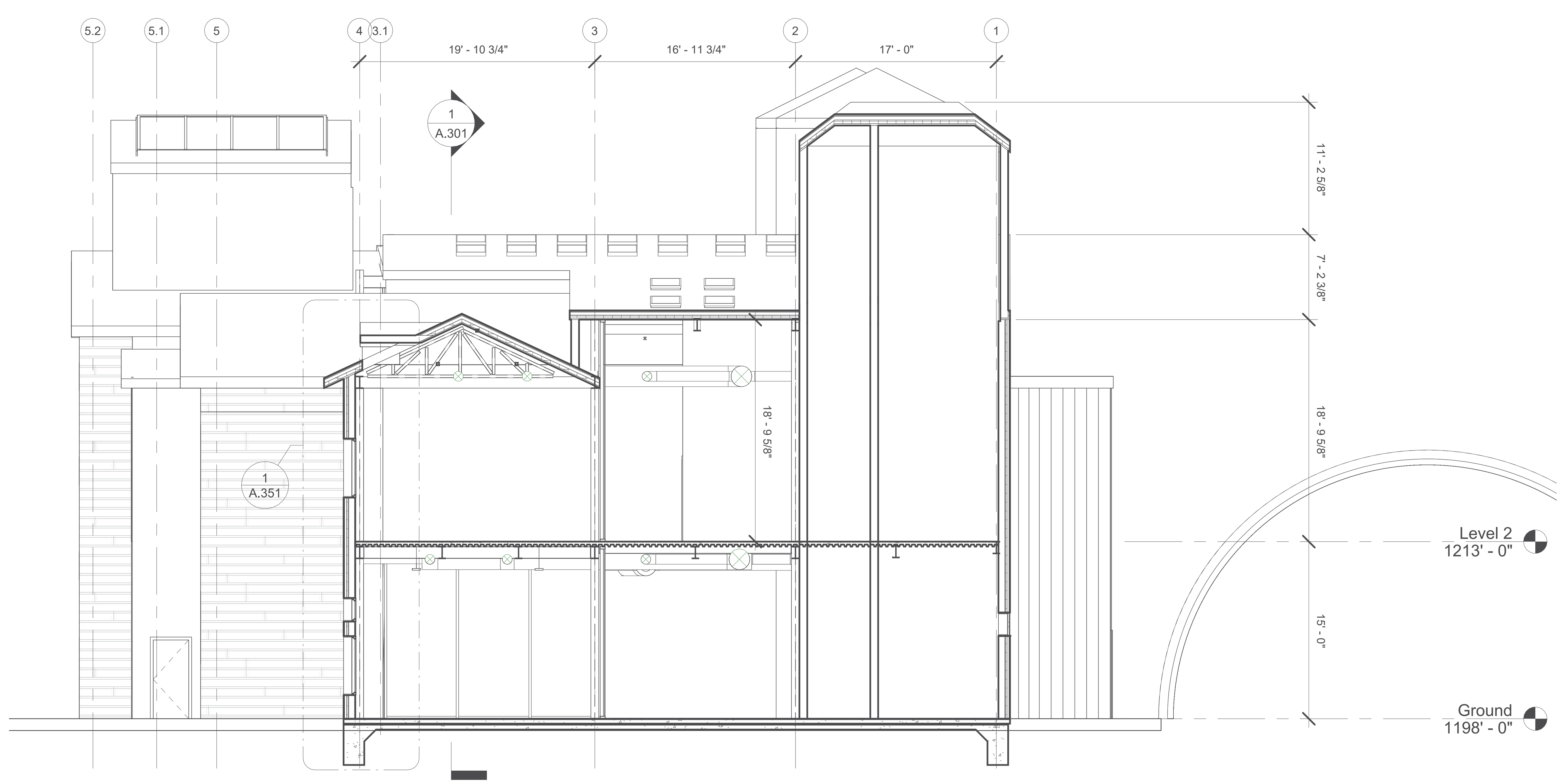
A.202

EXTERIOR ELEVATIONS



1 LONGITUDINAL SECTION
1/8" = 1'-0"



2 LATITUDINAL SECTION
1/8" = 1'-0"

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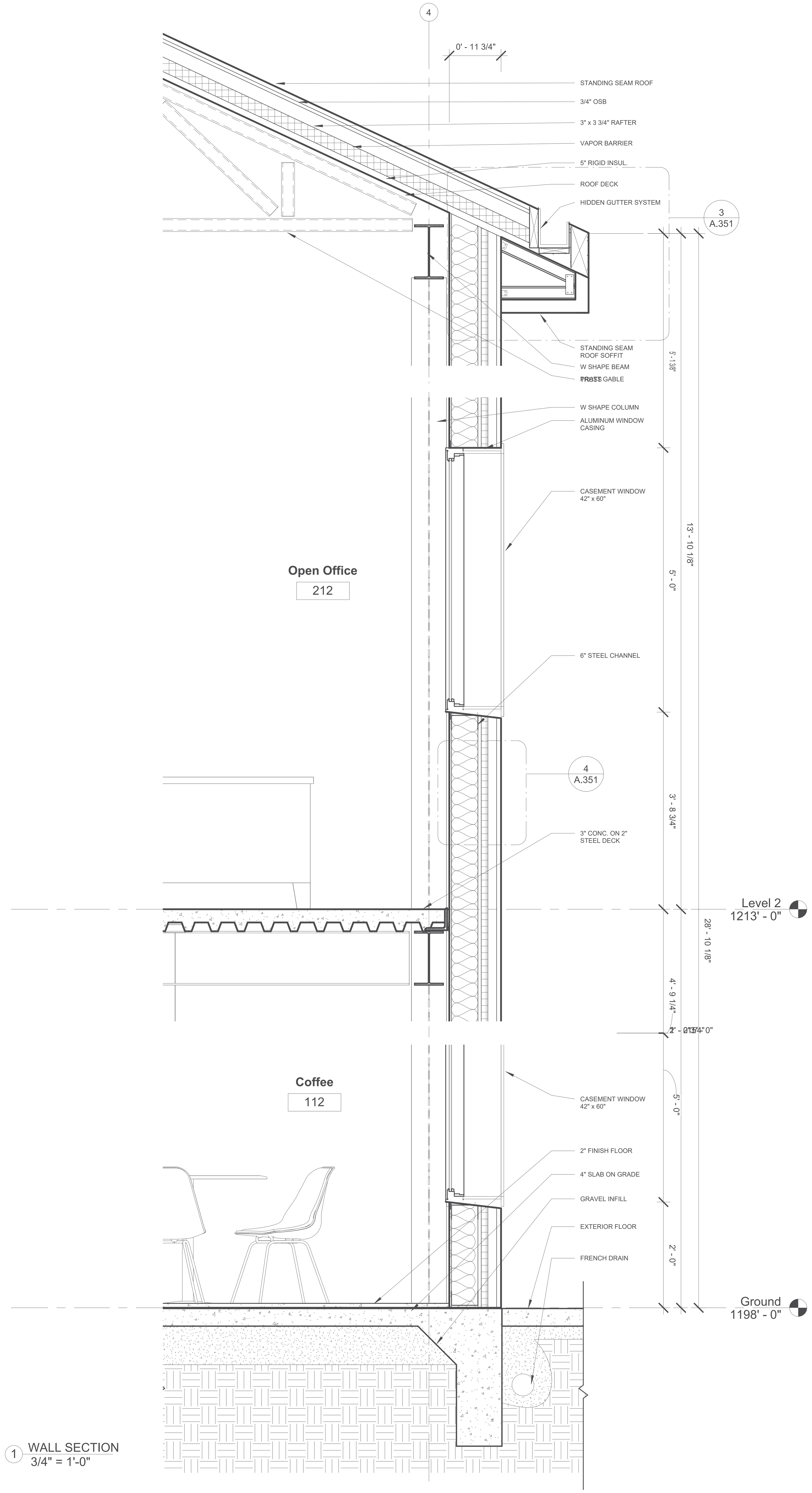
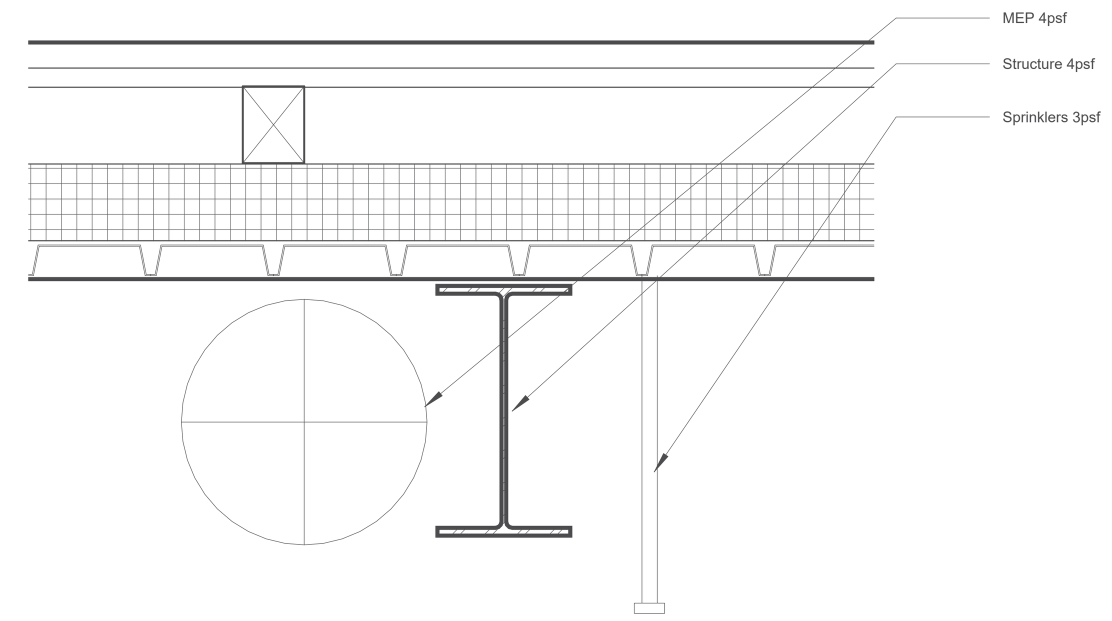
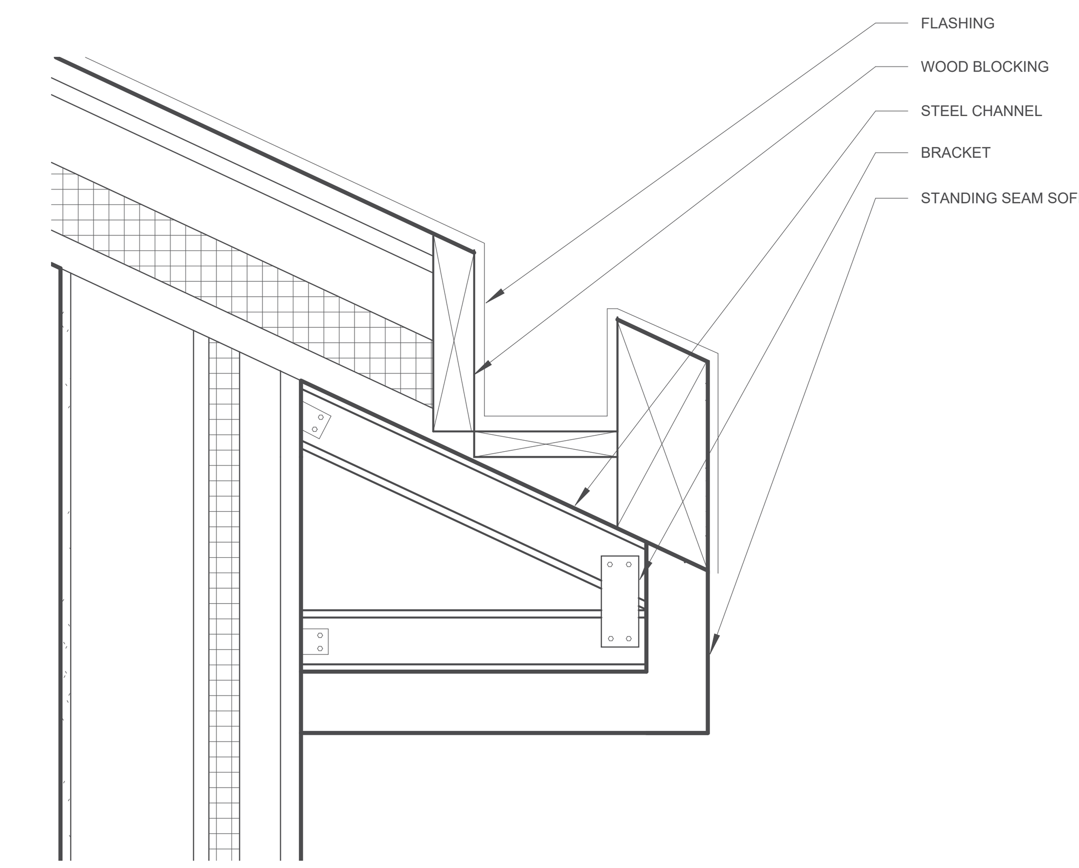
A.301
BUILDING SECTIONS



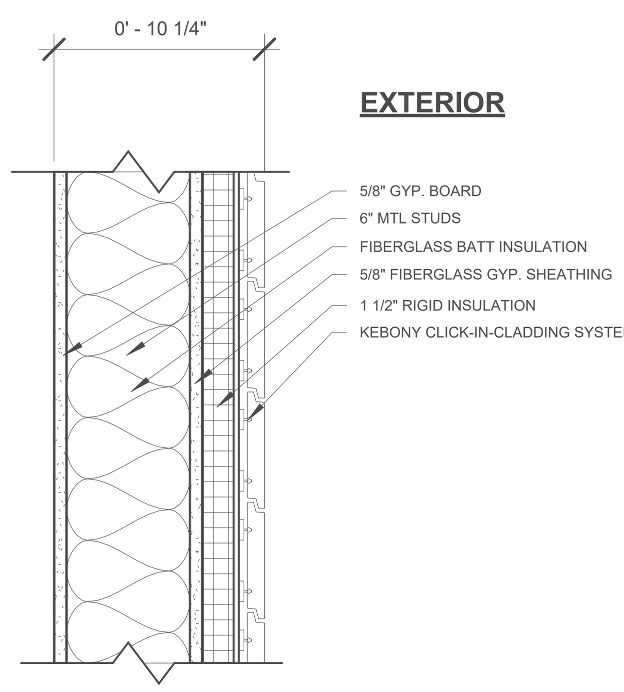
1 WALL SECTION
3/4" = 1'-0"



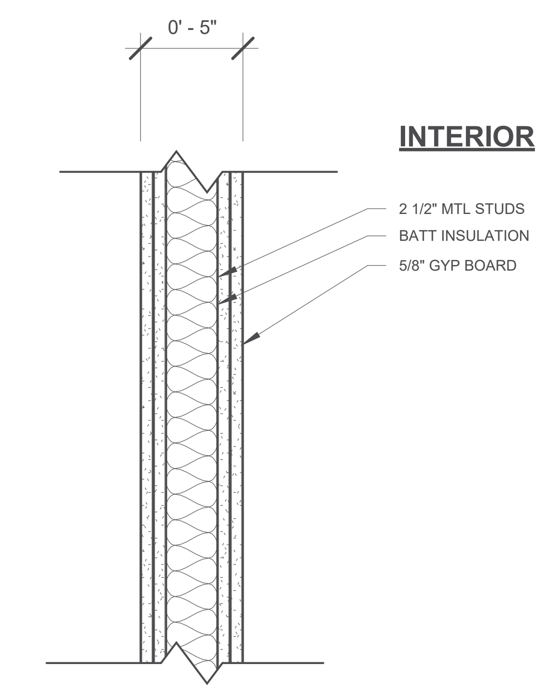
2 Roof Materials Copy 1
1 1/2" = 1'-0"



3 GUTTER DETAIL
1 1/2" = 1'-0"



4 EXT WALL TYPE 1
1 1/2" = 1'-0"



5 INT WALL TYPE 1
1 1/2" = 1'-0"

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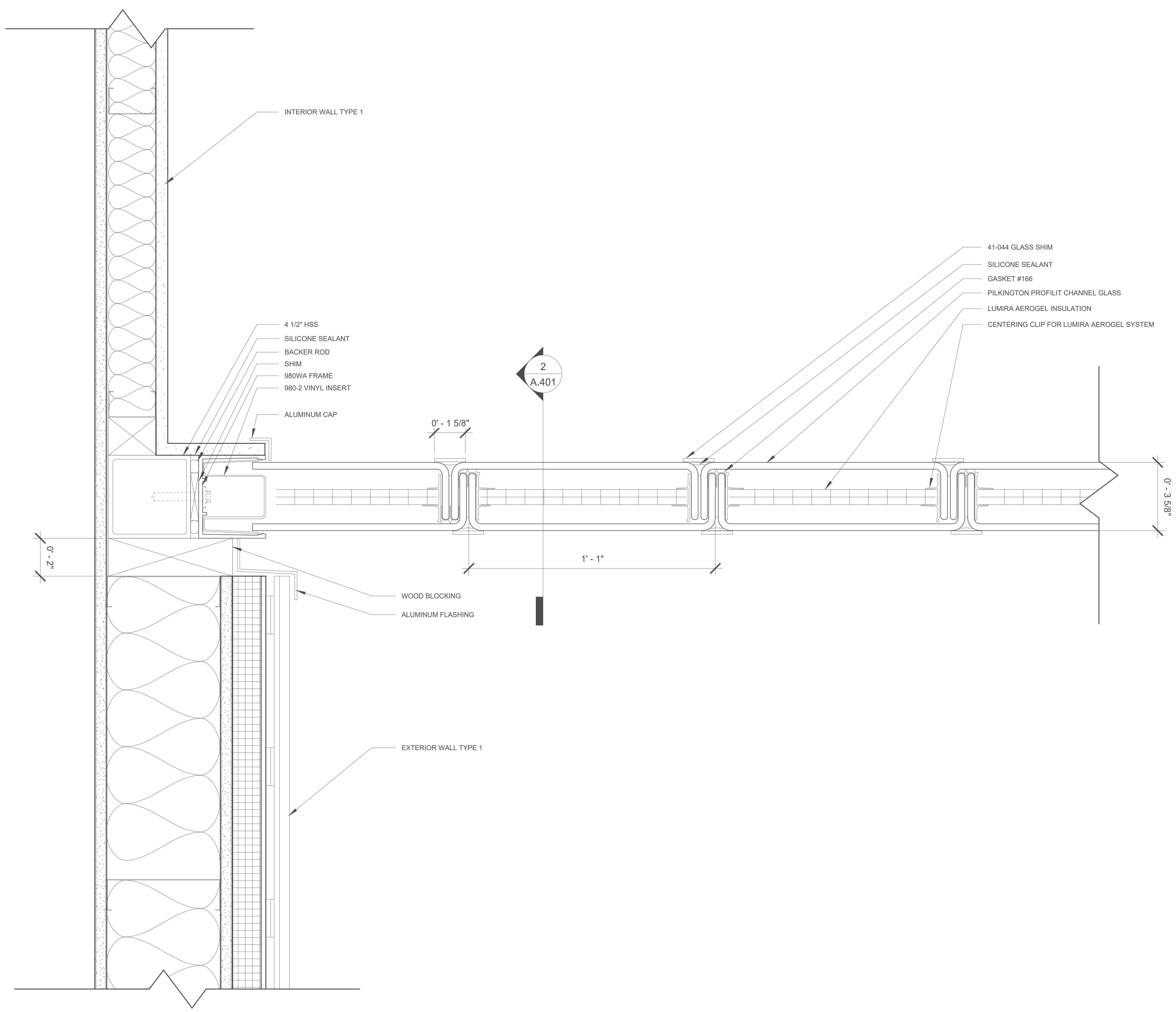
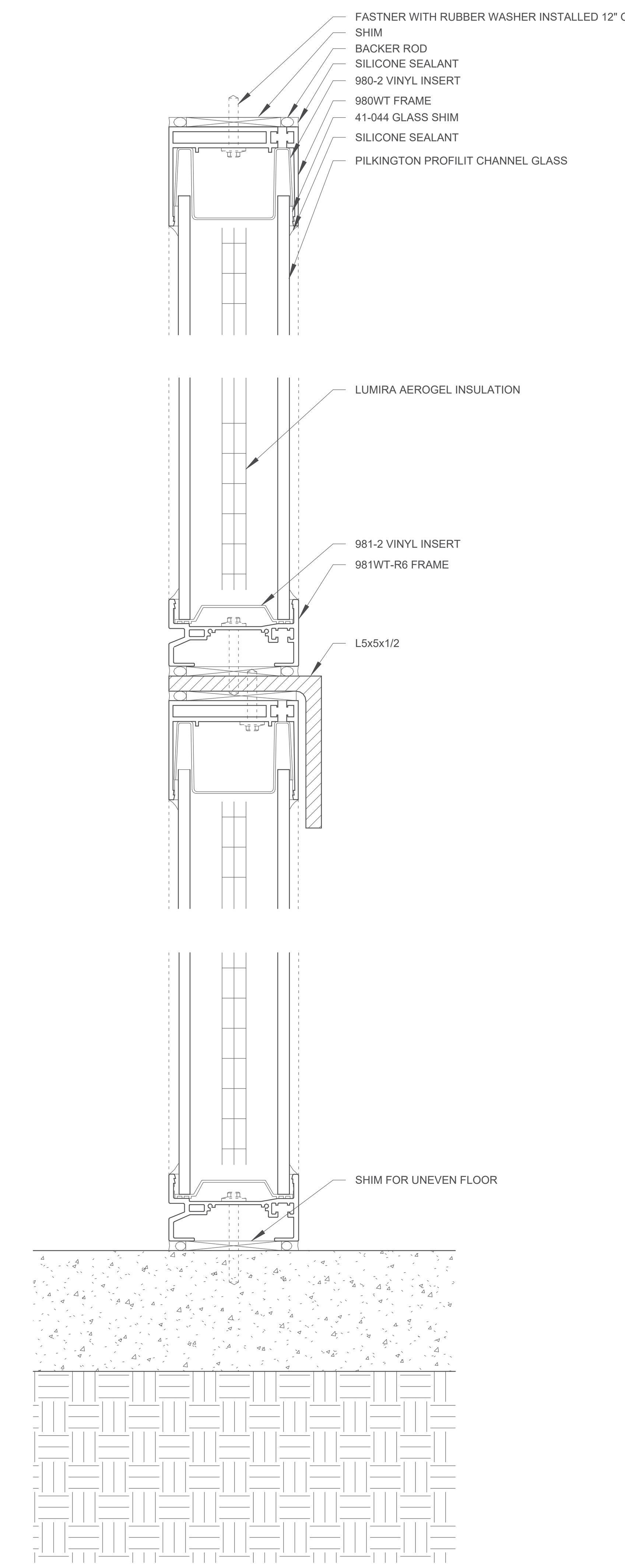
A.351

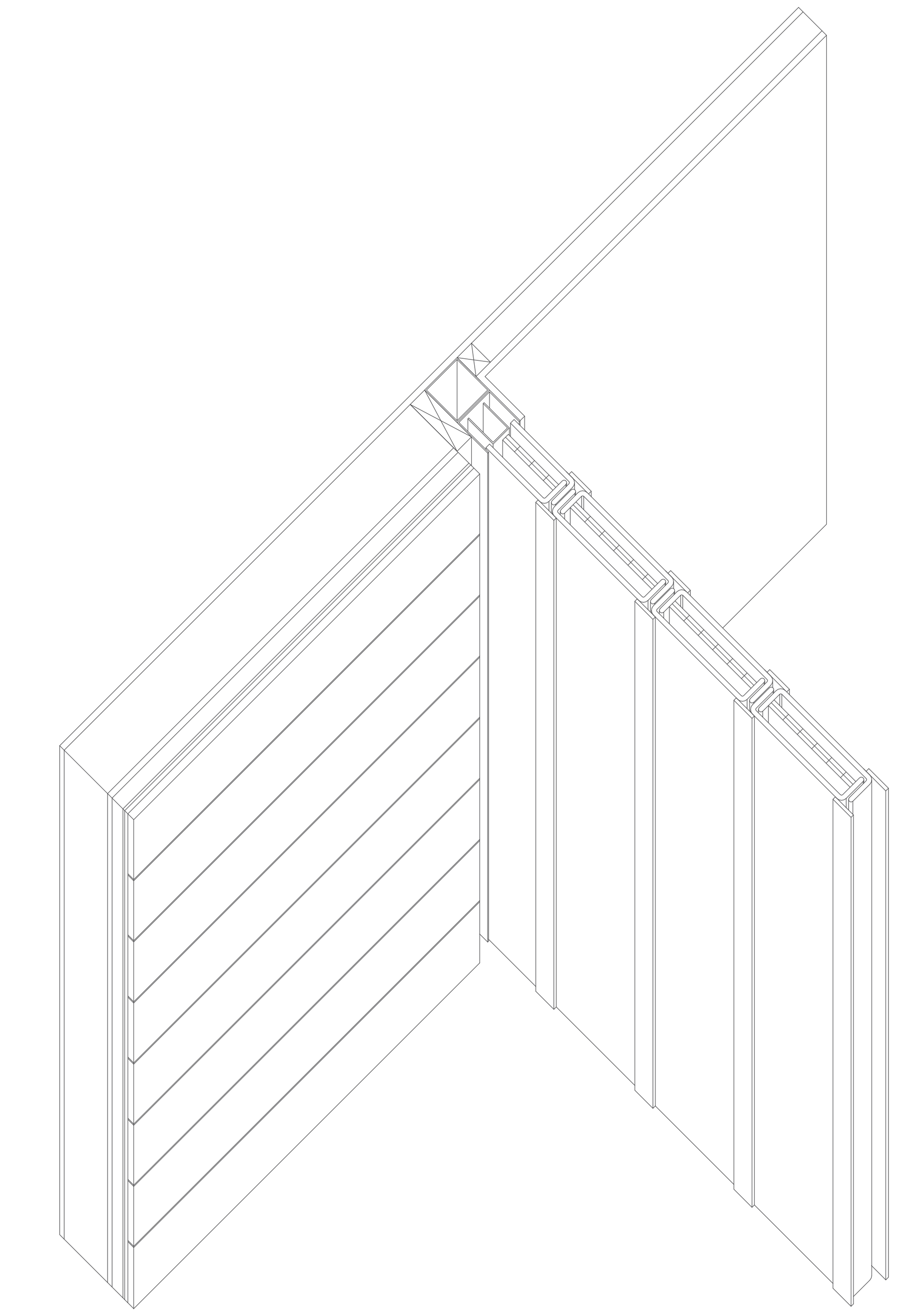
WALL SECTIONS



1 PLAN DETAIL-CHANNEL GLASS
3" = 1'-0"



2 SECTION DETAIL-CHANNEL GLASS
3" = 1'-0"



3 AXON
3/4" = 1'-0"

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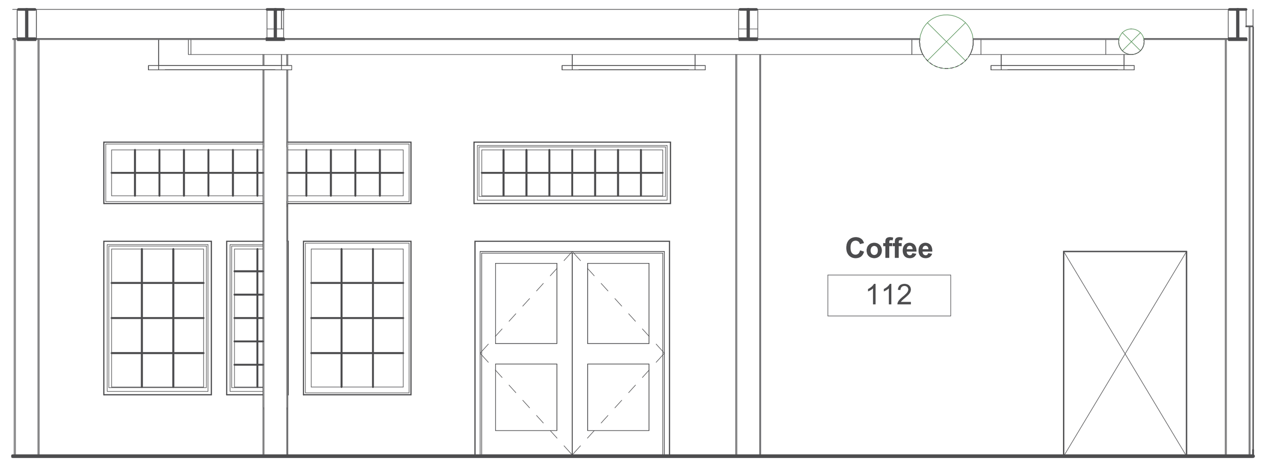
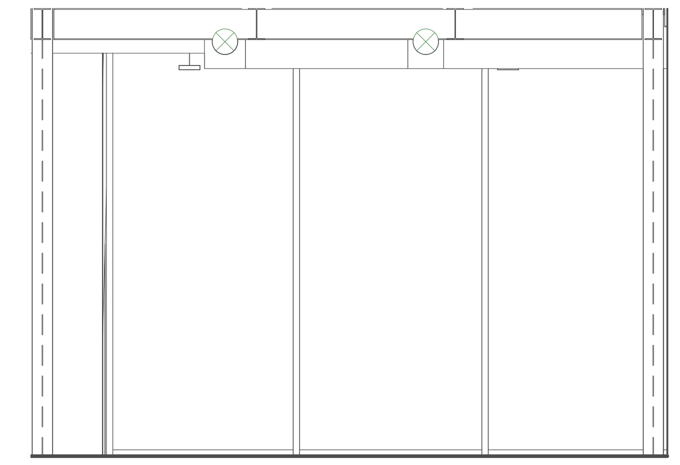
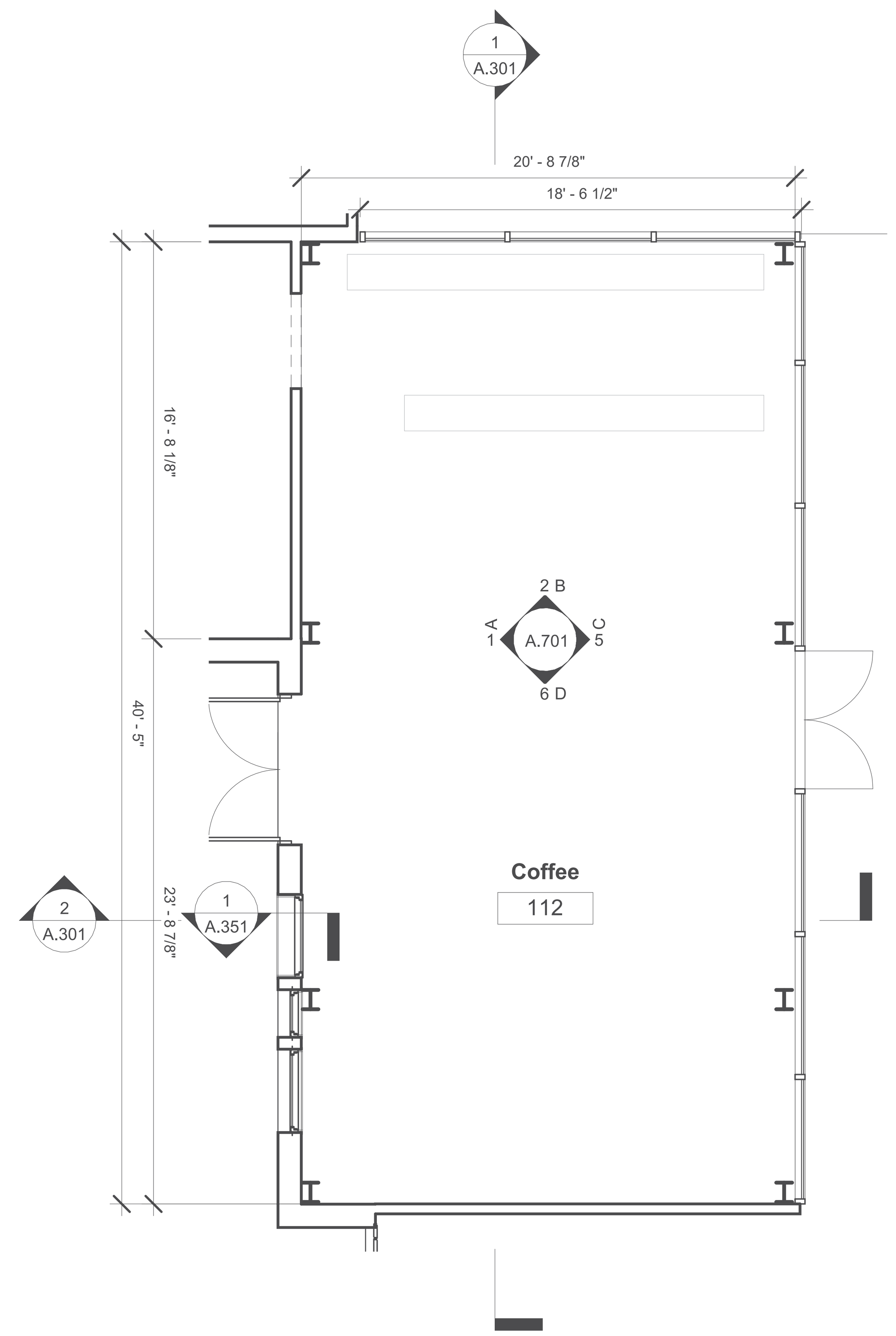
A.401
DETAIL



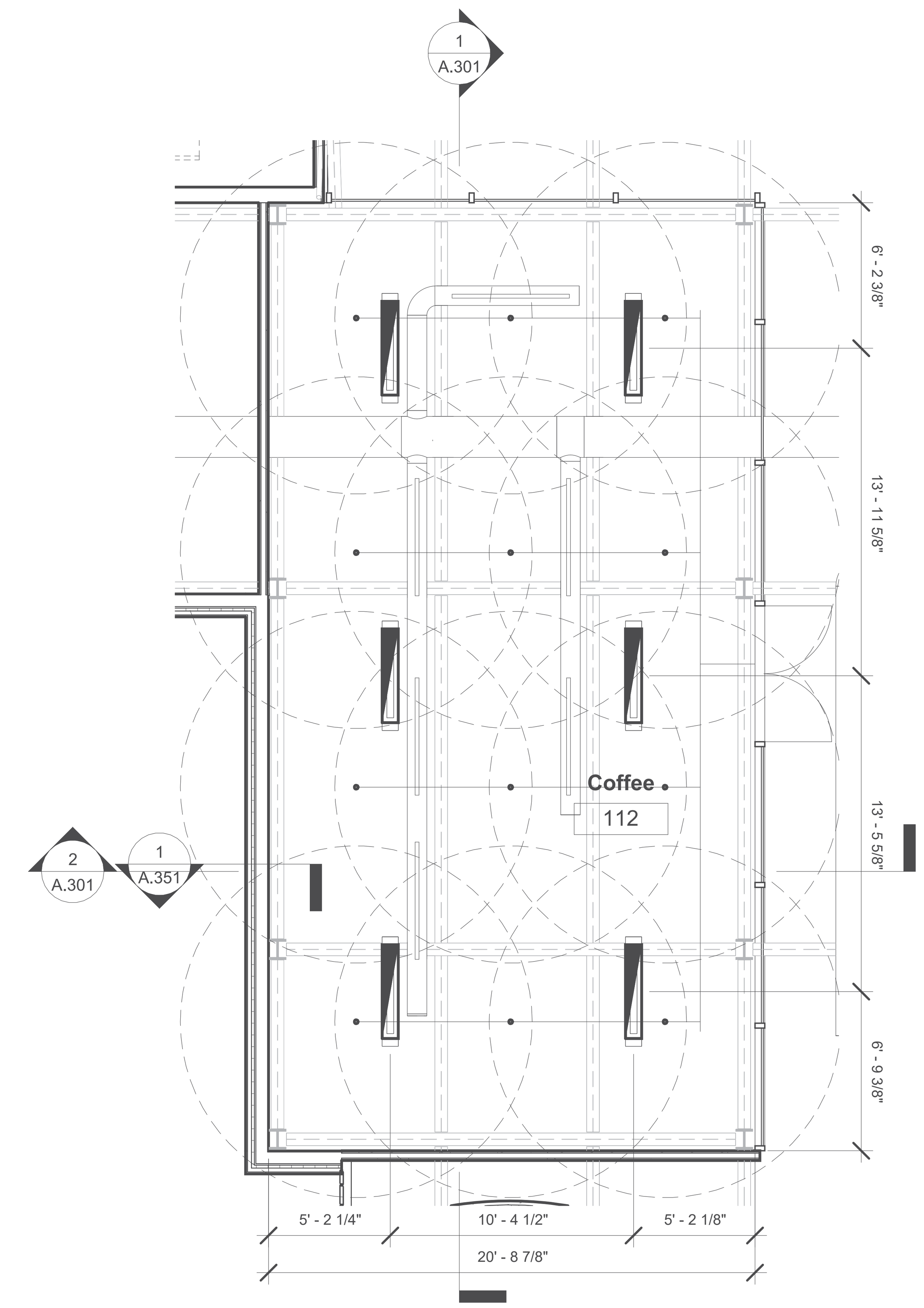
1 A
3/16" = 1'-0"



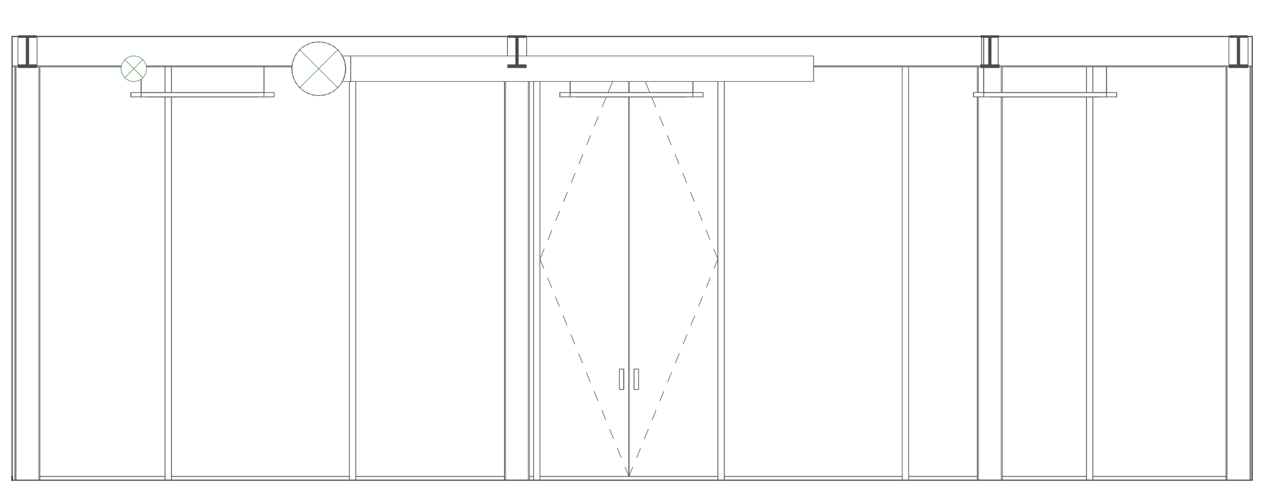
2 B
3/16" = 1'-0"



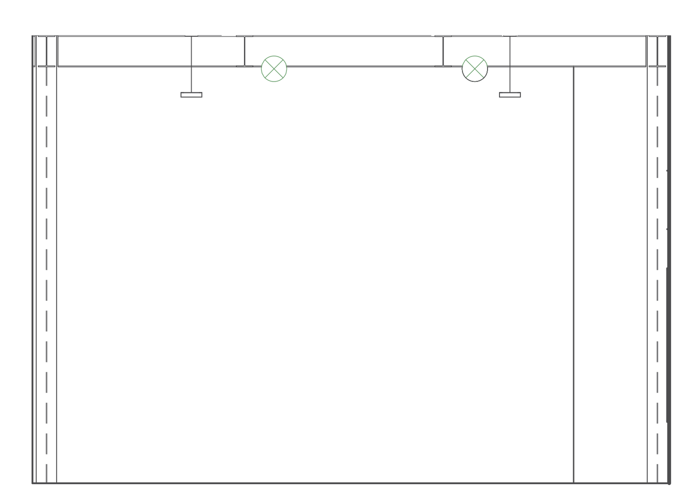
3 ENLARGED PLAN
3/16" = 1'-0"



4 REFLECTED CEILING PLAN
3/16" = 1'-0"



5 C
3/16" = 1'-0"



6 D
3/16" = 1'-0"

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A.701
FOCUS SPACE