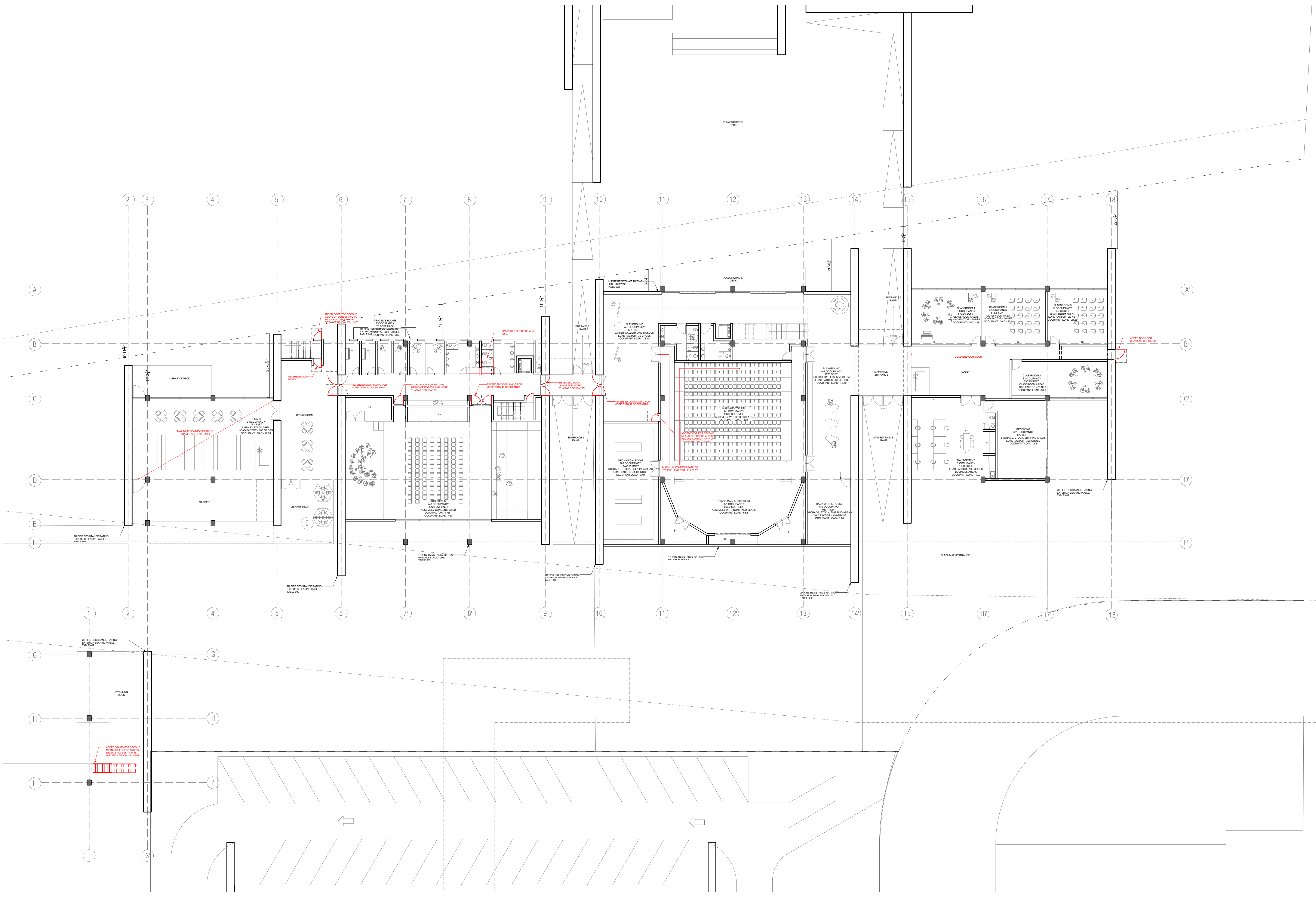
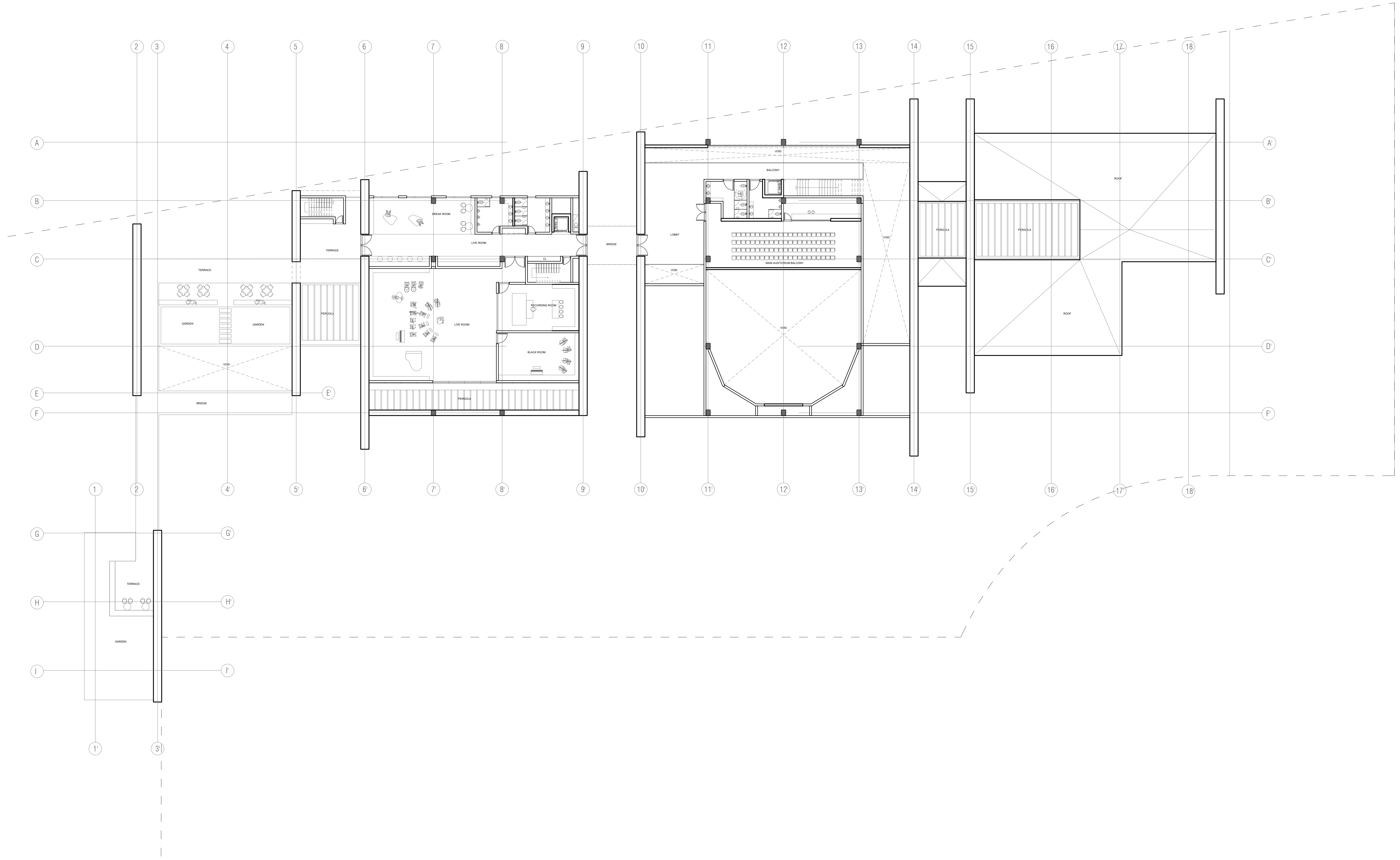


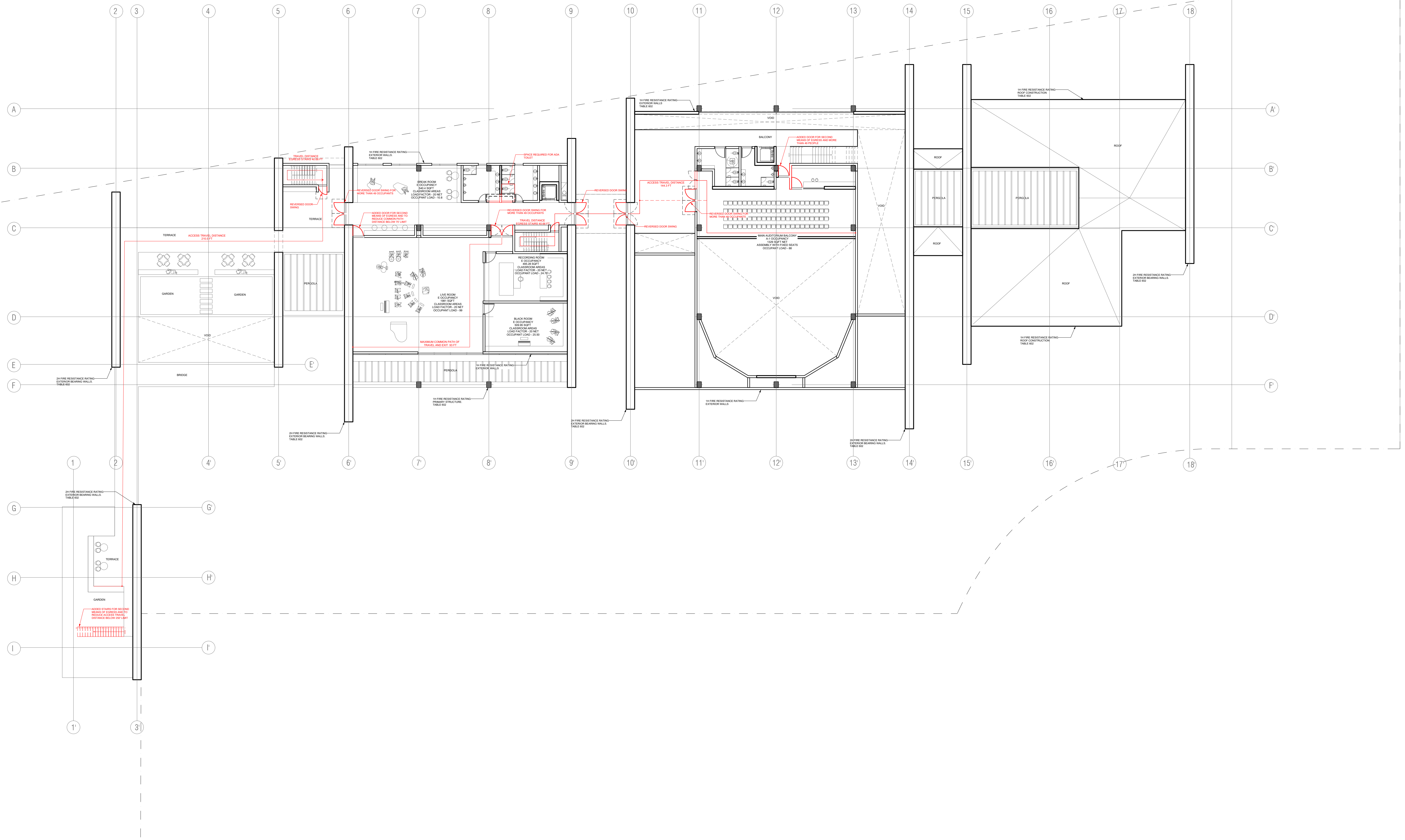
1 FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"



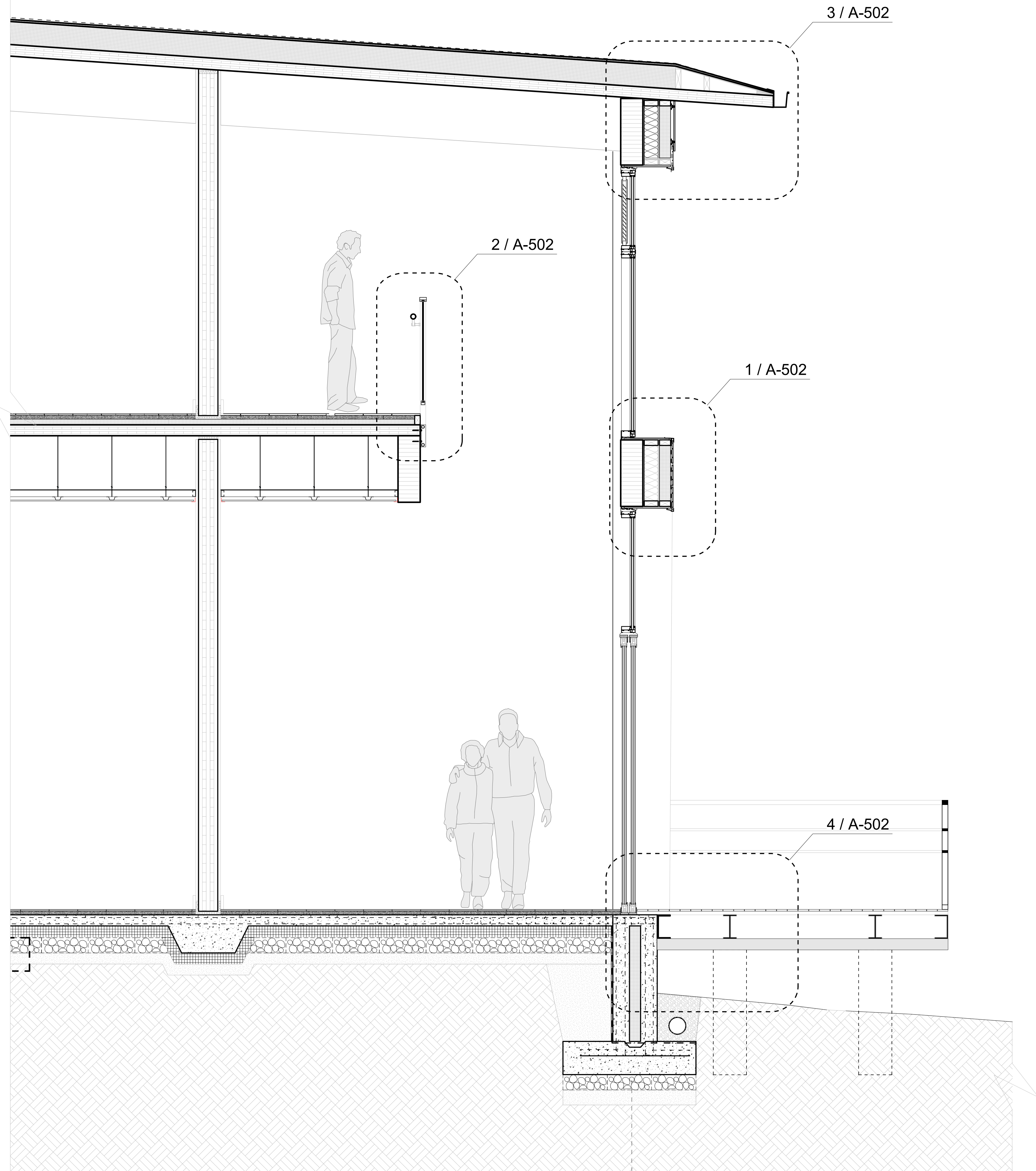
1 FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"



2 SECOND FLOOR PLAN
SCALE: 1/16" = 1'-0"



2 SECOND FLOOR PLAN
SCALE: 1/16" = 1'-0"



1 DETAIL WALL SECTION
SCALE: 1/8" = 1'-0"



Project Name: house of water

Rainfall Intensity (in/hr): 9.4
Based on rainfall averages in Indianapolis, INDIANA (100 years)

Roof Rainfall Design Area (ft²): 2,002.37
*Area of Largest Roof Serving a Single Gutter System
Design Area manually entered by user

Gutter in Lineal Ft: 96
*Length at Largest Roof Serving a Single Gutter System

Gutter Length Serving Single DS (ft.): 48
*Assumption: downspouts are equally spaced
**Maximum gutter length to be served by a downspout is 50ft per SMACNA ASMM

M (depth to width ratio): 1.00

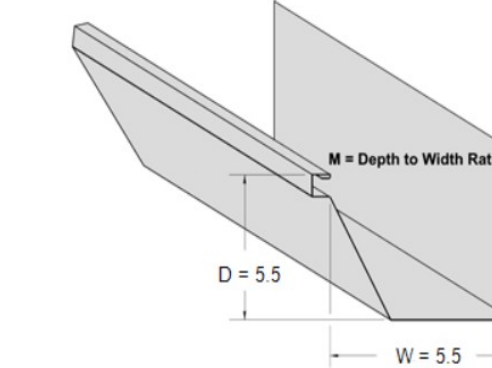
Min. Gutter Width (in.): 5.5 [Rectangular]

Min. Gutter Depth (in.): 5.5

of Downspouts: 2

Min. Area per DS (in²): 7.70

Min. DS Size (in): 2.37 x 3.25 [Rectangular Corrugated]
*Per Table 1-3 on page 1.4 of SMACNA ASMM



Calculations are derived using the 7th Edition of SMACNA's Architectural Sheet Metal Manual

5 GUTTER SIZE CALCULATION
SMACNA CALCULATION REPORT

CERTIFICATION

REVISIONS

UPDATED DETAILS

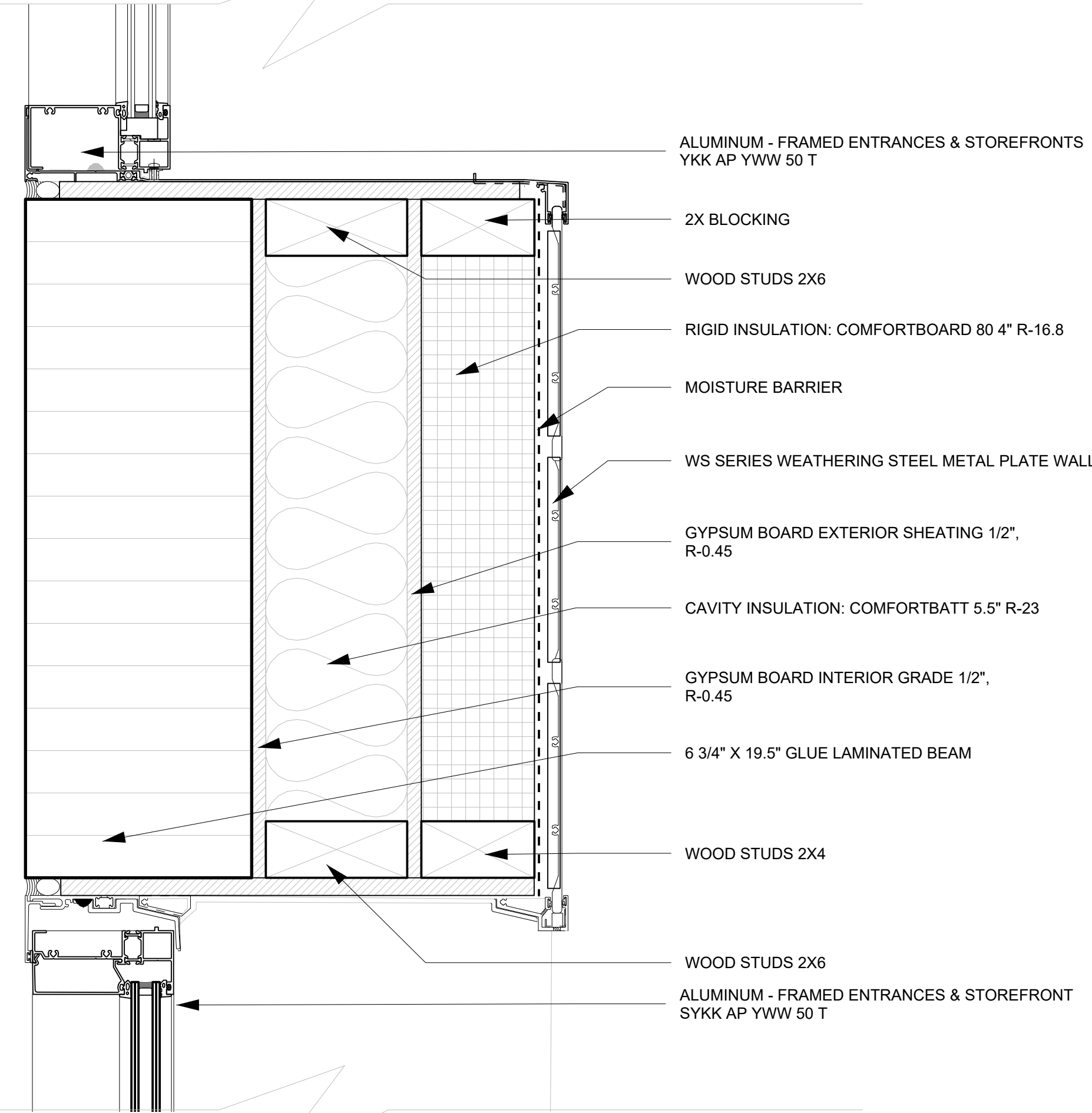
Detail Wall Section and
Custom Detail

4/27/2025

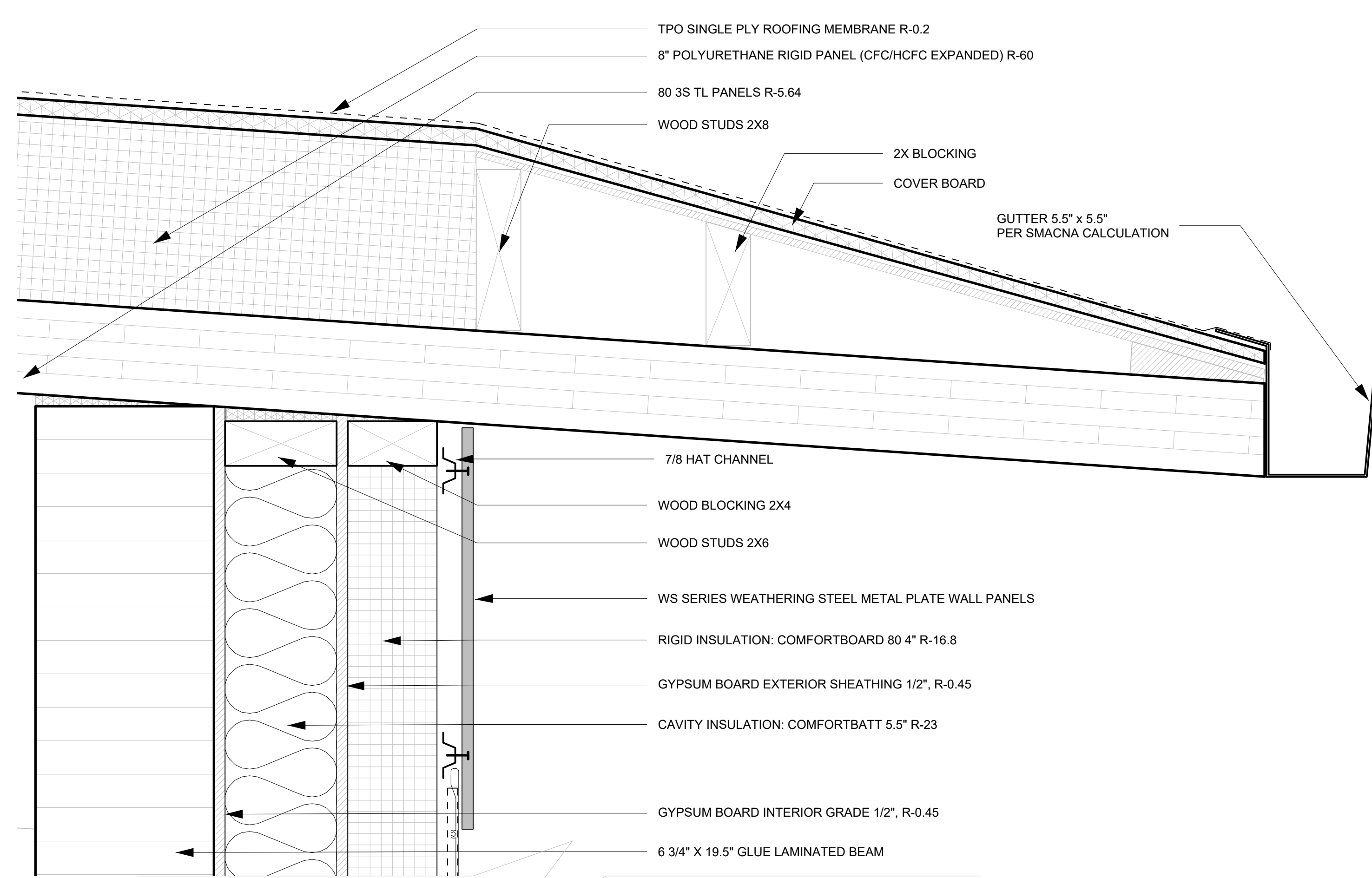
PRINT 24 X 36 FULL SIZE OR 12X18 HALF SIZE

SHEET NUMBER

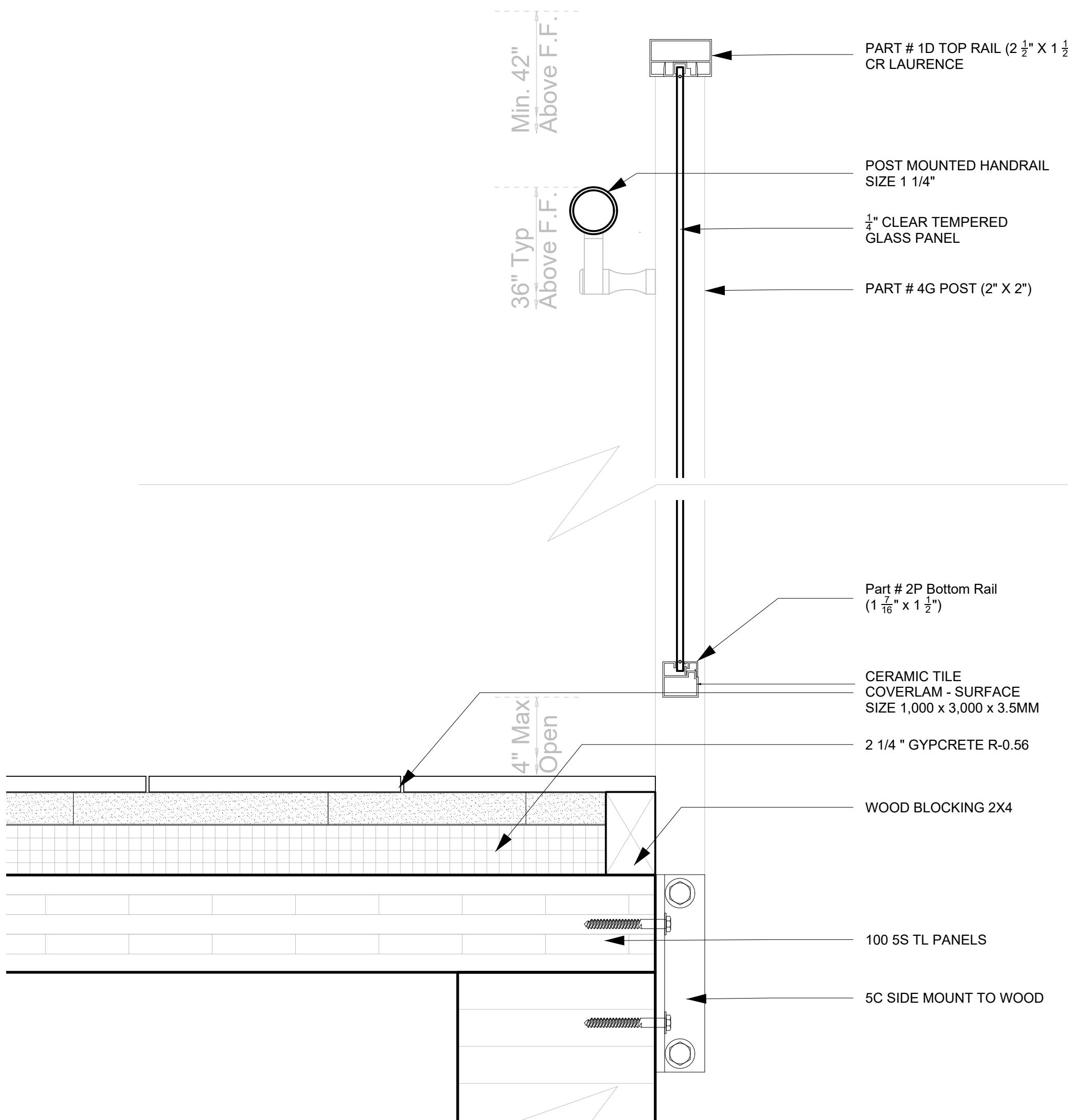
A-502



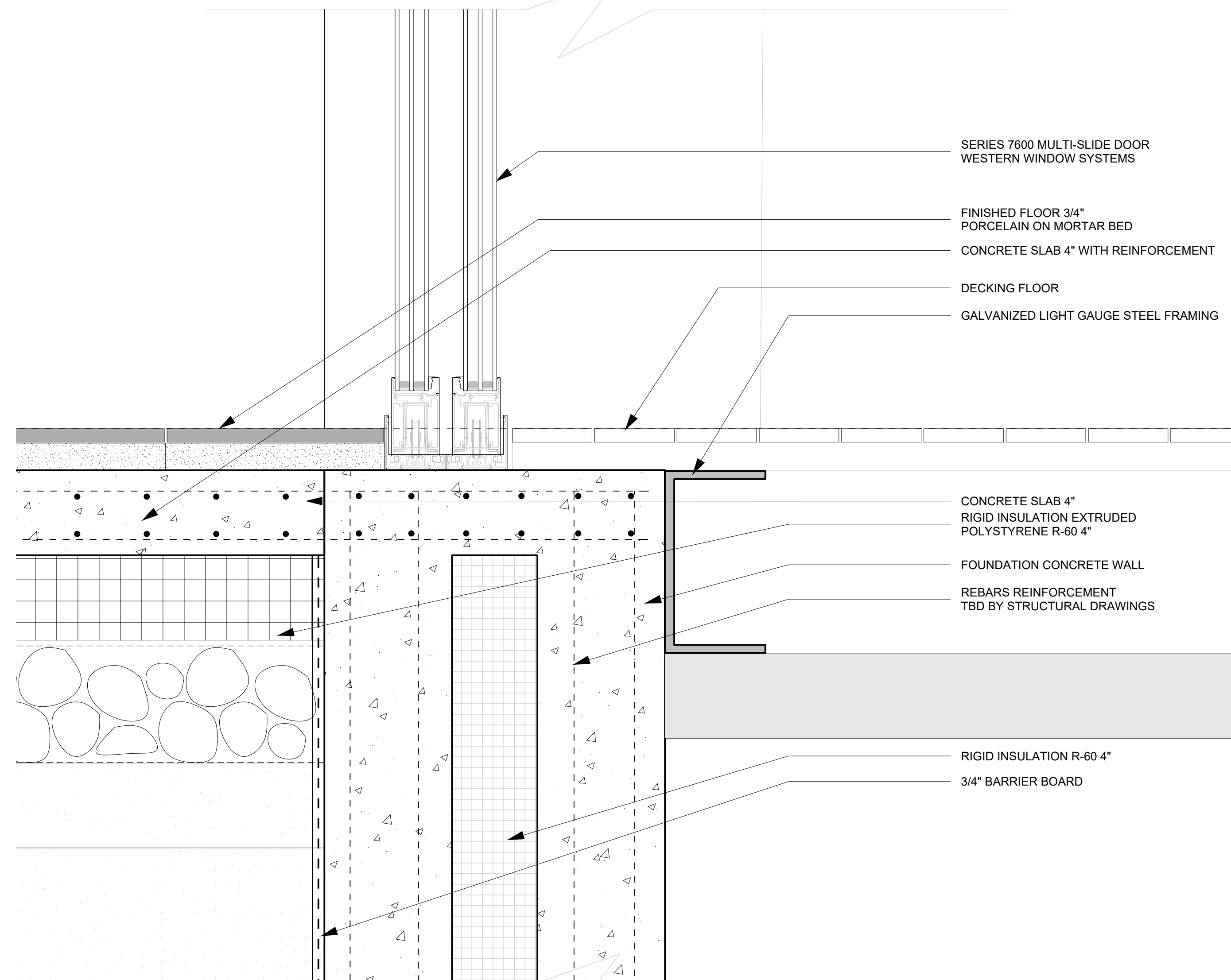
1 WINDOW HEAD DETAIL
SCALE: 3" = 1'-0"



3 ROOF-WALL DETAIL
SCALE: 3" = 1'-0"



2 HANDRAIL DETAIL
SCALE: 3" = 1'-0"



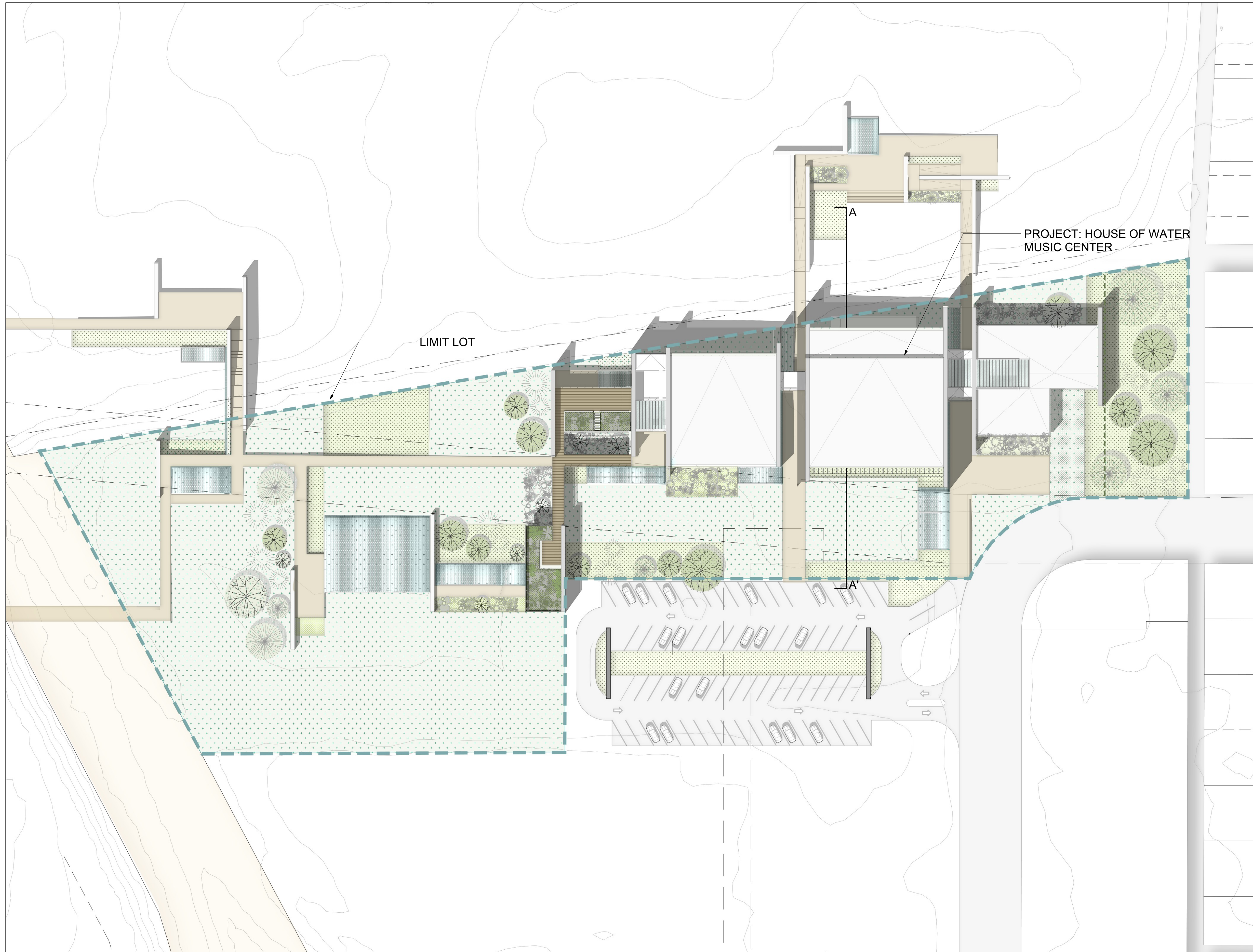
4 FLOOR-SLIDING GLASS DOOR DETAIL
SCALE: 3" = 1'-0"



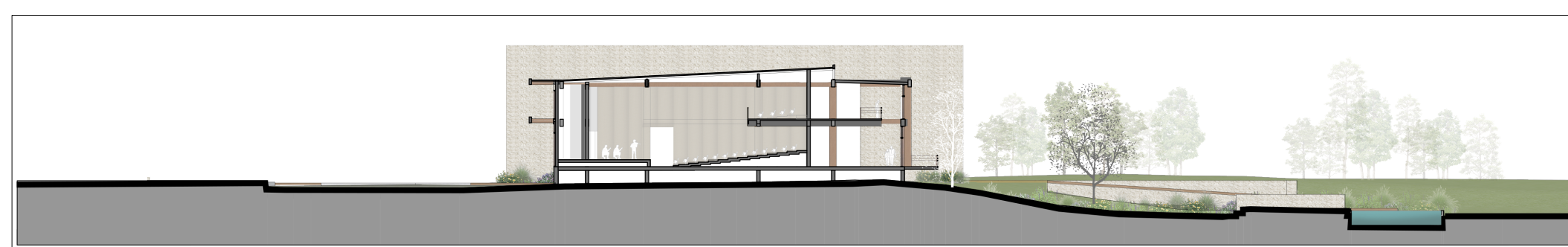
3 LOCATION MAP
SCALE: NTS

SHEET INDEX

SHEET NUMBER	SHEET NAME	CONTENT
G-001	COVER SHEET	LOCATION PLAN, SITE PLAN, BUILDING SECTION, SHEET INDEX
G-002	BUILDING INFOGRAPHIC	PRELIMINARY DESCRIPTION OF BUILDING DESIGN AND SUSTAINABILITY STRATEGIES
G-003	ENERGY ANALYSIS RESULTS	MEASURABLE OUTCOME OF BUILDING PERFORMANCE
G-004	ENERGY ANALYSIS INPUTS	MEASURABLE OUTCOME OF BUILDING PERFORMANCE
G-005	LIFE SAFETY	LIFE SAFETY SYSTEMS
A-101	ORIGINAL FIRST FLOOR PLAN	FLOOR PLANS PRIOR TO ENERGY AND LIFE SAFETY MODIFICATIONS
A-102	ORIGINAL SECOND FLOOR PLAN	FLOOR PLANS PRIOR TO ENERGY AND LIFE SAFETY MODIFICATIONS
A-101R	REVISED FIRST FLOOR PLAN	FLOOR PLANS WITH MODIFICATIONS BASED ON ENERGY ANALYSIS AND LIFE SAFETY REVIEW
A-102R	REVISED SECOND FLOOR PLAN	FLOOR PLANS WITH MODIFICATIONS BASED ON ENERGY ANALYSIS AND LIFE SAFETY REVIEW
A-501	DETAIL WALL SECTION AND DETAILS	INTEGRATION OF ENVELOPE SYSTEMS
A-502	DETAIL WALL SECTION AND DETAILS	INTEGRATION OF ENVELOPE SYSTEMS
S-101	STRUCTURAL PLANS	INTEGRATION OF STRUCTURAL SYSTEMS
S-102	STRUCTURAL PLANS	INTEGRATION OF STRUCTURAL SYSTEMS
S-301	STRUCTURAL SECTION	INTEGRATION OF STRUCTURAL SYSTEMS
M-101	THERMAL ZONING AND SIZING	INTEGRATION OF MECHANICAL SYSTEMS
M-102	MECHANICAL PLAN	INTEGRATION OF MECHANICAL SYSTEMS
M-103	MECHANICAL SECTION	INTEGRATION OF MECHANICAL SYSTEMS



1 SITE PLAN
SCALE: 1"=40'-0"



2 BUILDING SECTION
SCALE: 1"=40'-0"

STRUCTURAL SYSTEMS

CONSTRUCTION TYPE:

Assembly Group A-3 in the International Building Code (IBC), specific requirements for fire protection, means of egress, and interior finishes to ensure the safety of occupants.

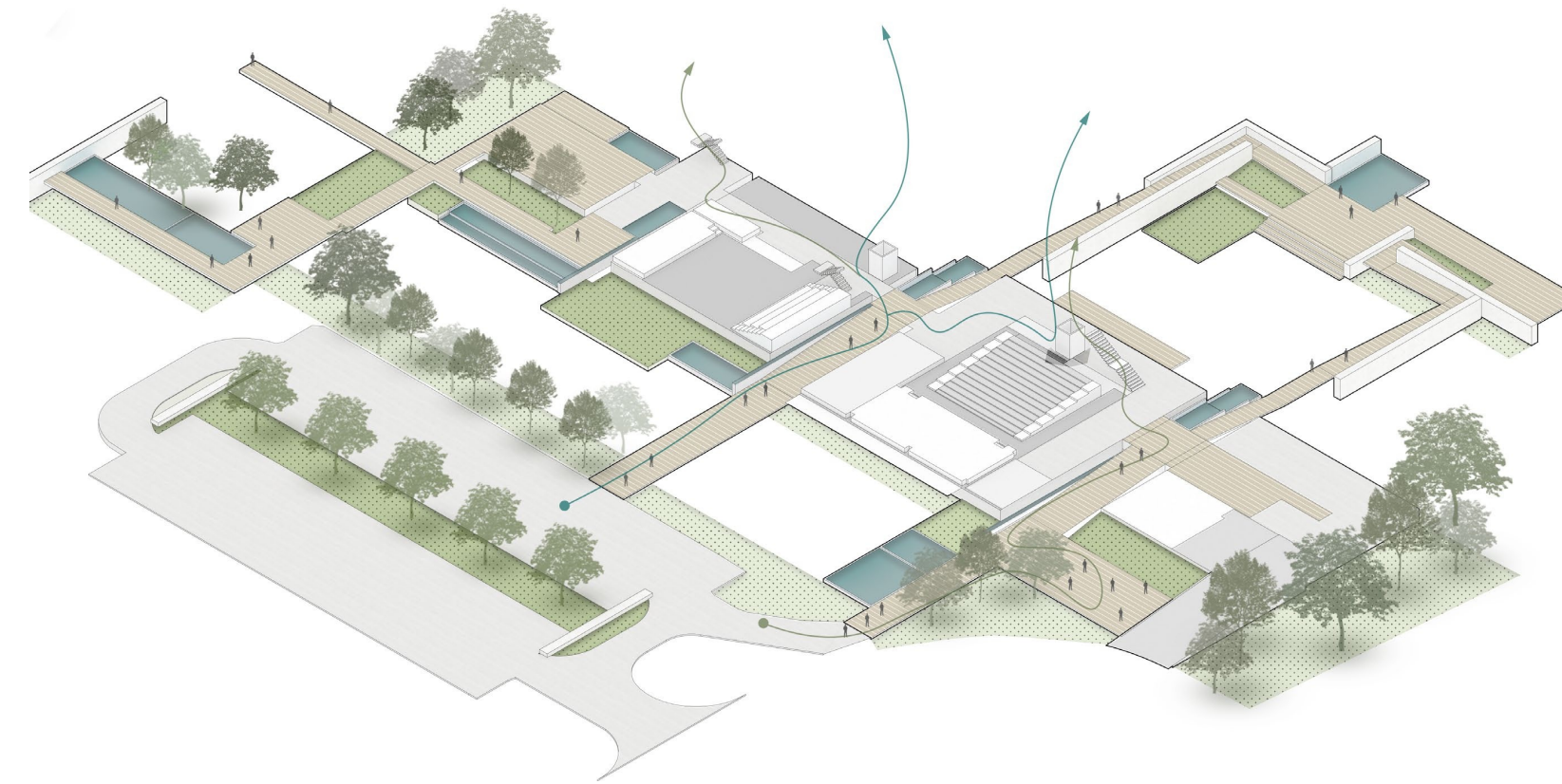
Typical construction uses non-combustible materials for exterior walls and any structural elements that are part of the exterior. However, the interior building elements (such as floors, ceilings, and partitions) can be constructed using any material allowed by code, including combustible materials.

Key Features

Exterior Walls: Non-combustible materials such as concrete, brick, block, or other approved materials. Exterior walls typically have a fire-resistance rating of 2 hours or more, depending on the building's height and occupancy type.

Interior Building Elements: Can be constructed with combustible materials like wood or other approved materials. The fire-resistance ratings for interior elements can vary based on specific building design and occupancy requirements.

Fire Safety Considerations: Type III construction offers a balance between fire resistance and flexibility in interior materials, making it a popular choice for many mid-rise buildings.

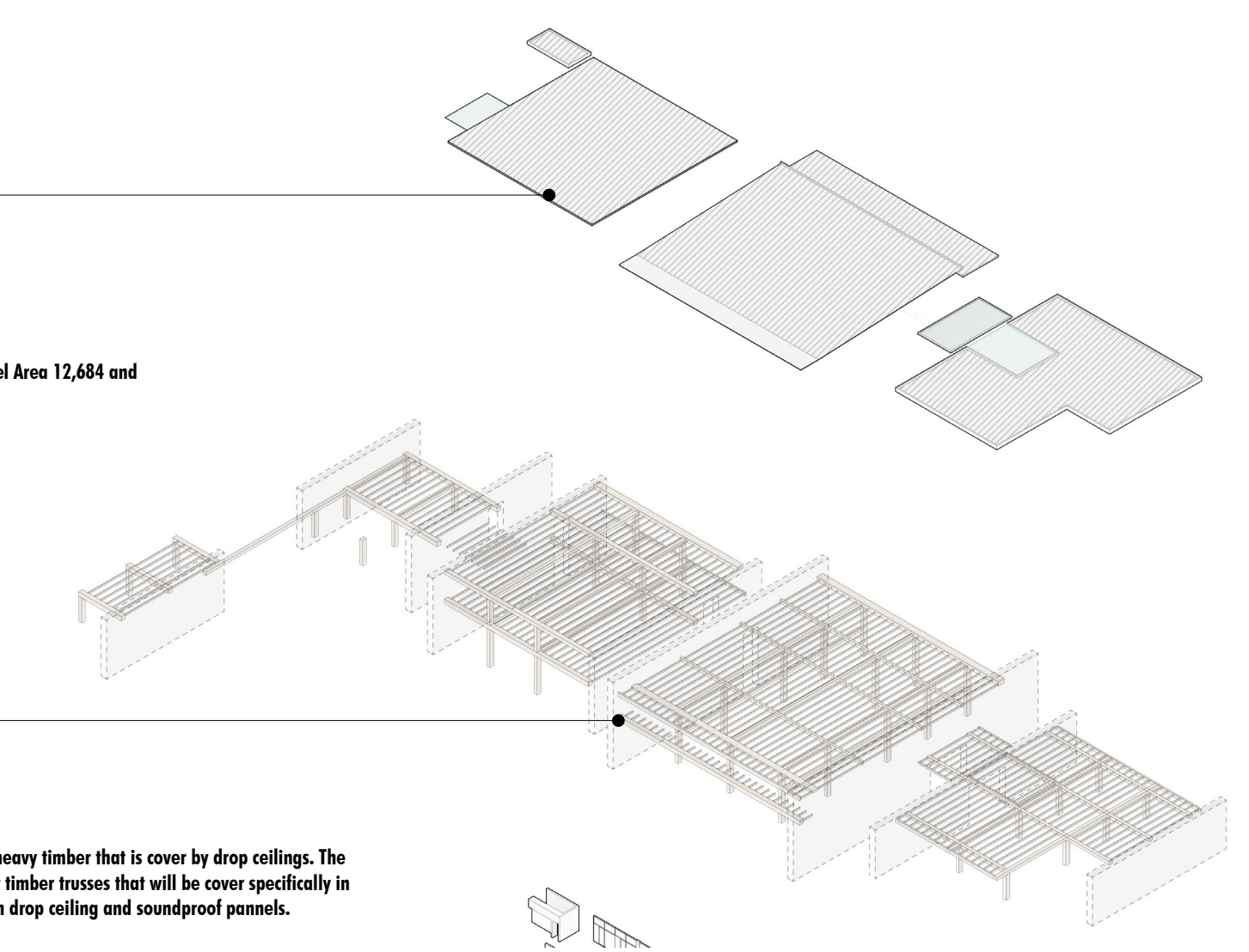
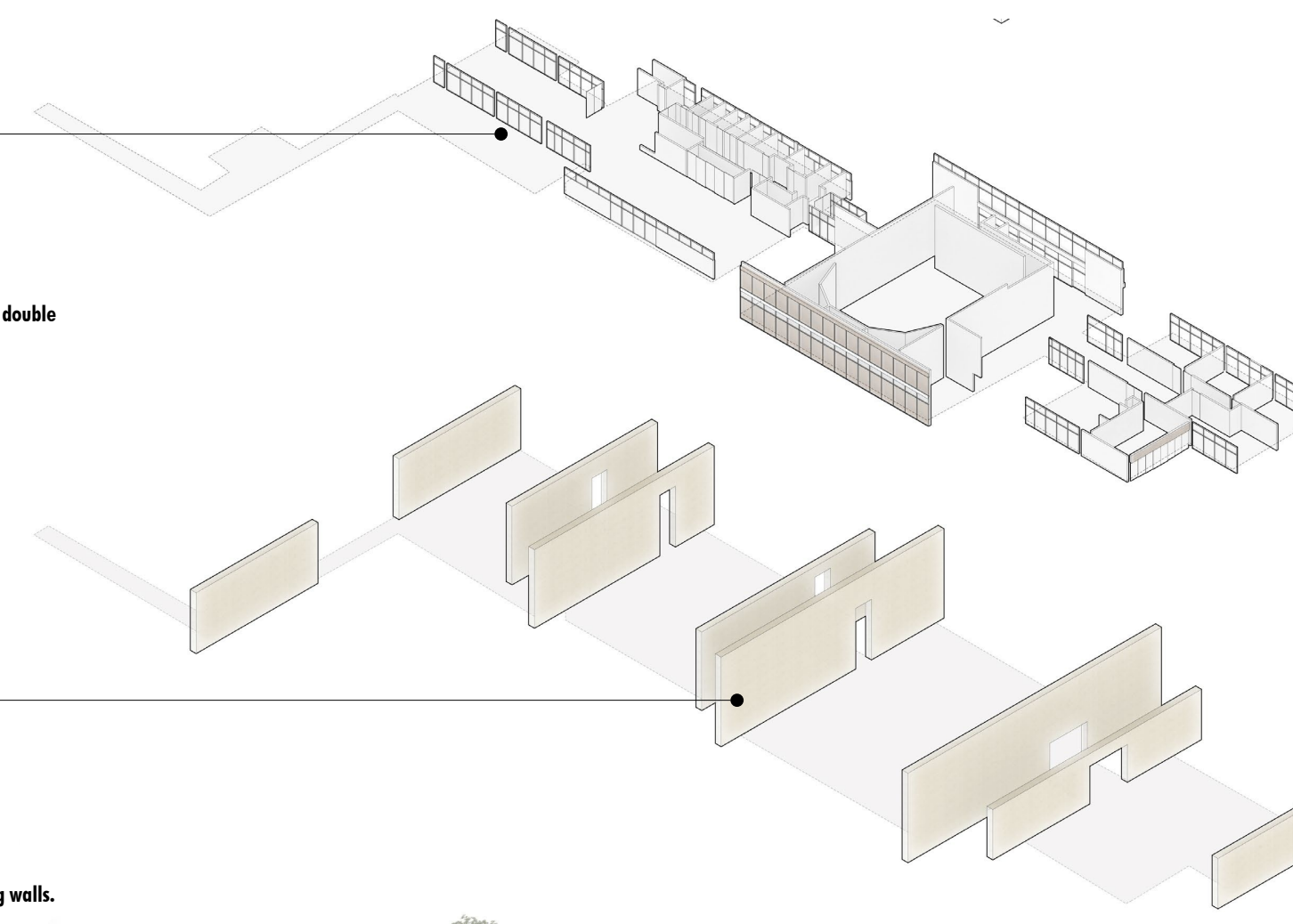


Cladding systems: Envelope design has metallic panels, windows by panels of double glazing. Interior drywall walls, painted and insulated.

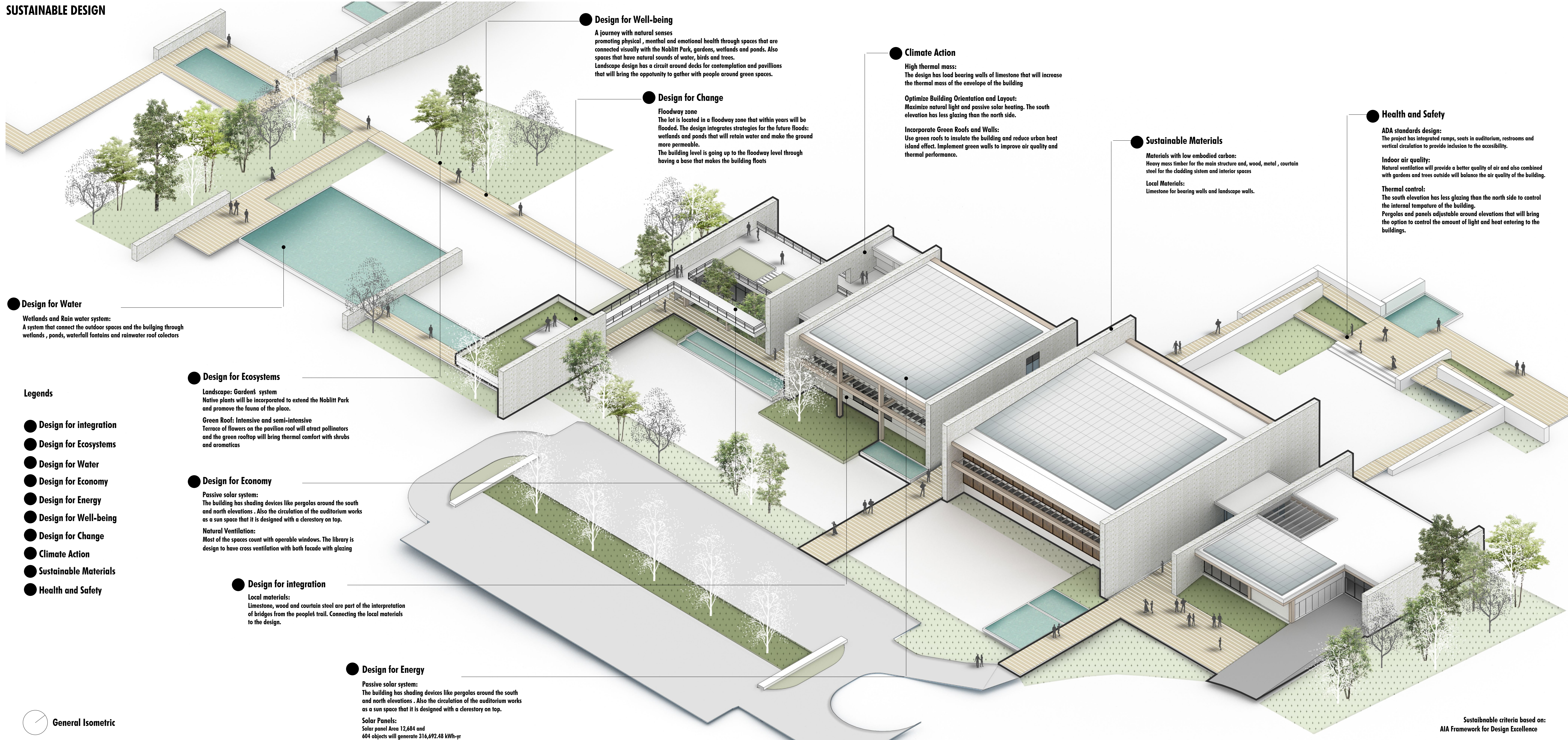
Structural systems: The Primary structure is design for two floors: Columns and beams in heavy timber combined with bearing walls.

Roof systems: Shingle tile roof and 604 objects of Solar panel Area 12,684 and

Structural systems: The main structure is in heavy timber that is cover by drop ceilings. The roof's structure has heavy timber trusses that will be cover specifically in the main auditorium with drop ceiling and soundproof panels.



SUSTAINABLE DESIGN



Design for Well-being

A journey with natural senses promoting physical, mental and emotional health through spaces that are connected visually with the Noblitt Park, gardens, wetlands and ponds. Also spaces that have natural sounds of water, birds and trees. Landscape design has a circuit around decks for contemplation and pavilions that will bring the opportunity to gather with people around green spaces.

Design for Change

Floodway zone
The lot is located in a floodway zone that within years will be flooded. The design integrates strategies for the future floods: wetlands and ponds that will retain water and make the ground more permeable. The building level is going up to the floodway level through having a base that makes the building floats

Climate Action

High thermal mass: The design has load bearing walls of limestone that will increase the thermal mass of the envelope of the building

Optimize Building Orientation and Layout: Maximize natural light and passive solar heating. The south elevation has less glazing than the north side.

Incorporate Green Roofs and Walls: Use green roofs to insulate the building and reduce urban heat island effect. Implement green walls to improve air quality and thermal performance.

Sustainable Materials

Materials with low embodied carbon: Heavy mass timber for the main structure and, wood, metal, curtain steel for the cladding system and interior spaces

Local Materials: Limestone for bearing walls and landscape walls.

Health and Safety

ADA standards design: The project has integrated ramps, seats in auditorium, restrooms and vertical circulation to provide inclusion to the accessibility.

Indoor air quality: Natural ventilation will provide a better quality of air and also combined with gardens and trees outside will balance the air quality of the building.

Thermal control: The south elevation has less glazing than the north side to control the internal temperature of the building. Pergolas and panels adjustable around elevations that will bring the option to control the amount of light and heat entering to the buildings.

Design for Water

Wetlands and Rain water system: A system that connect the outdoor spaces and the bulging through wetlands, ponds, waterfall fountains and rainwater roof collectors

Design for Ecosystems

Landscape: Gardens' system
Native plants will be incorporated to extend the Noblitt Park and promote the fauna of the place.

Green Roof: Intensive and semi-intensive
Terrace of flowers on the pavilion roof will attract pollinators and the green rooftop will bring thermal comfort with shrubs and aromatics

Design for Economy

Passive solar system: The building has shading devices like pergolas around the south and north elevations. Also the circulation of the auditorium works as a sun space that it is designed with a clerestory on top.

Natural Ventilation: Most of the spaces count with operable windows. The library is design to have cross ventilation with both facade with glazing

Design for integration

Local materials: Limestone, wood and curtain steel are part of the interpretation of bridges from the peoples trail. Connecting the local materials to the design.

Design for Energy

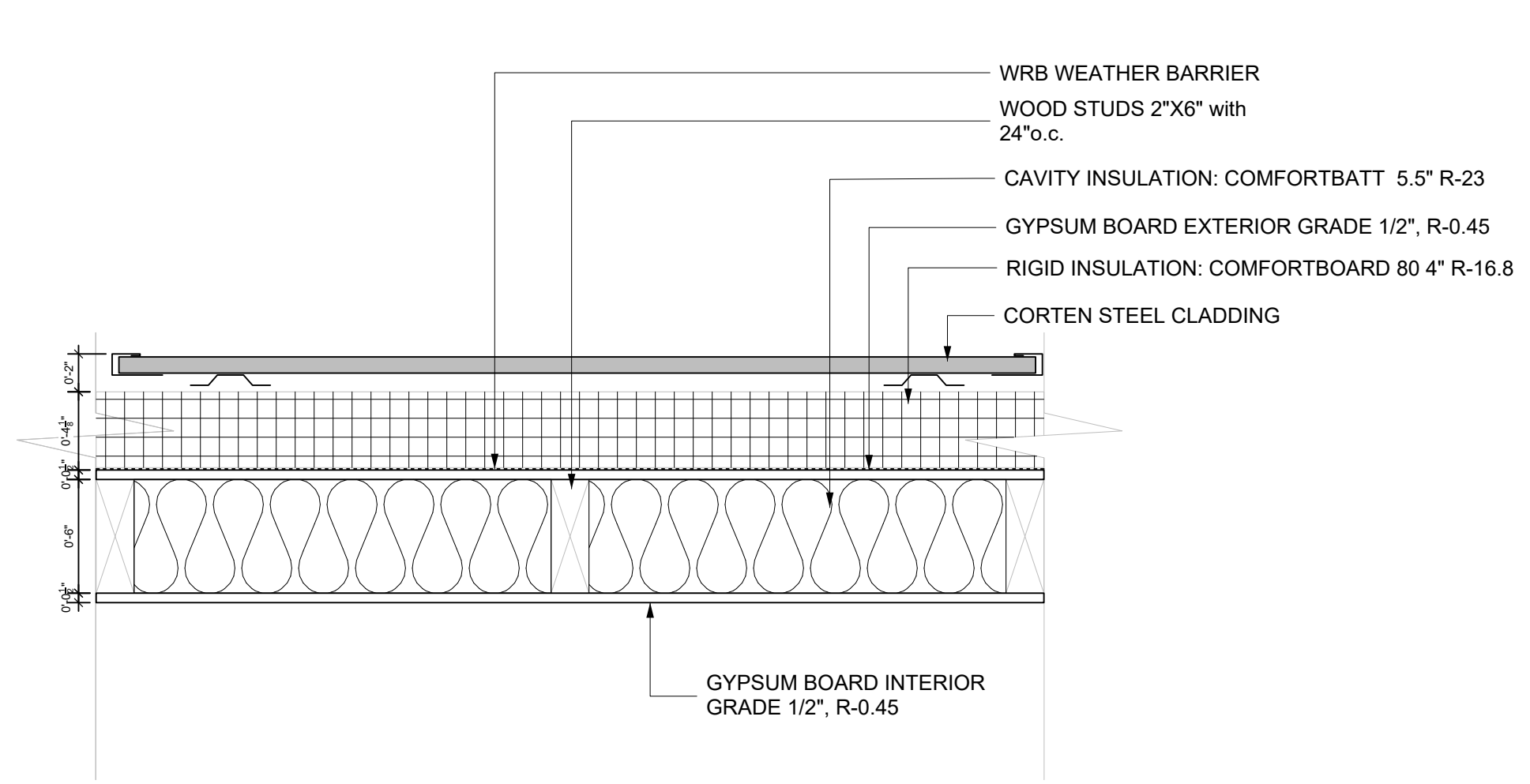
Passive solar system: The building has shading devices like pergolas around the south and north elevations. Also the circulation of the auditorium works as a sun space that it is designed with a clerestory on top.

Solar Panels: Solar panel Area 12,684 and 604 objects will generate 316,692.48 kWh-yr

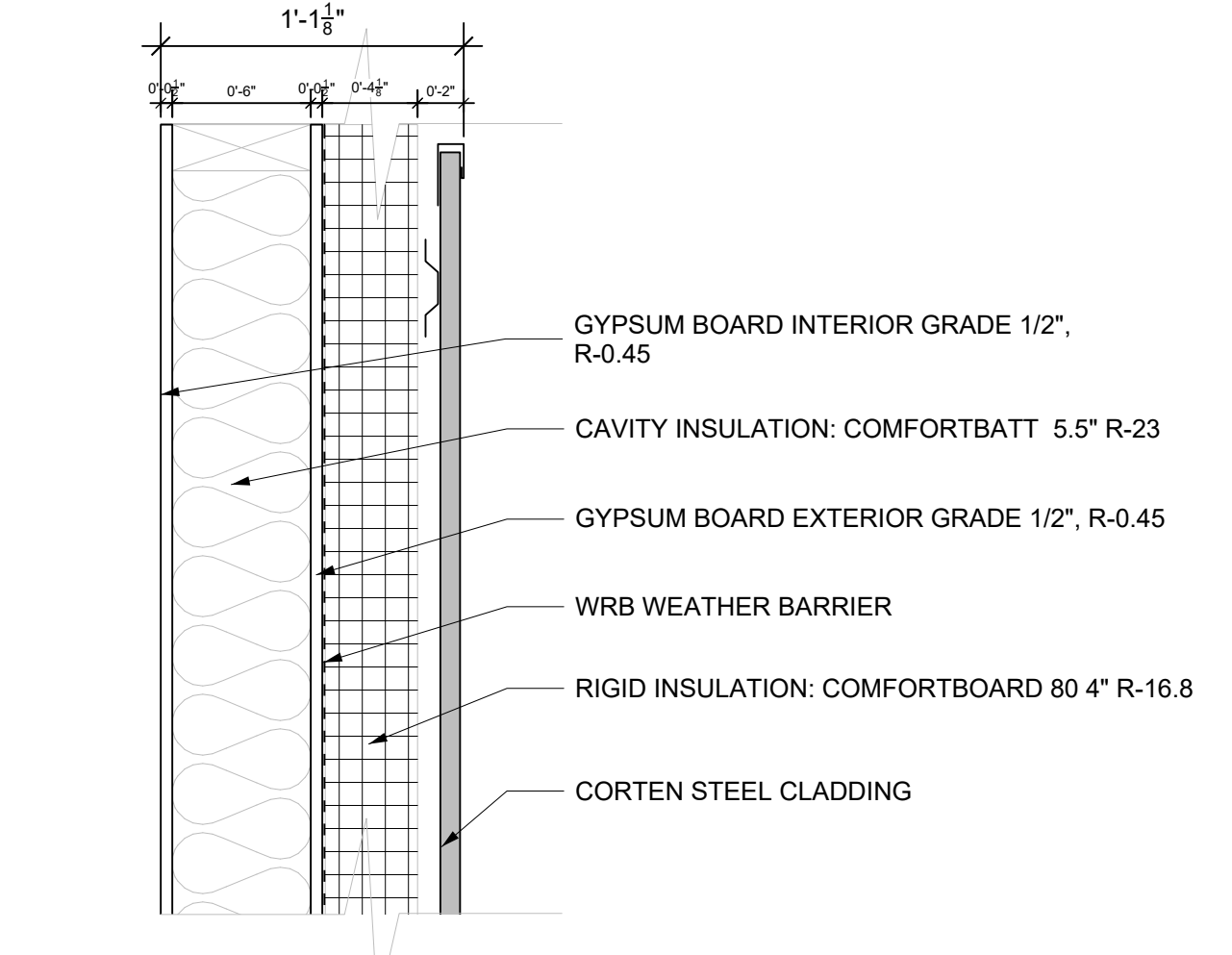
Legends

- Design for integration
- Design for Ecosystems
- Design for Water
- Design for Economy
- Design for Energy
- Design for Well-being
- Design for Change
- Climate Action
- Sustainable Materials
- Health and Safety

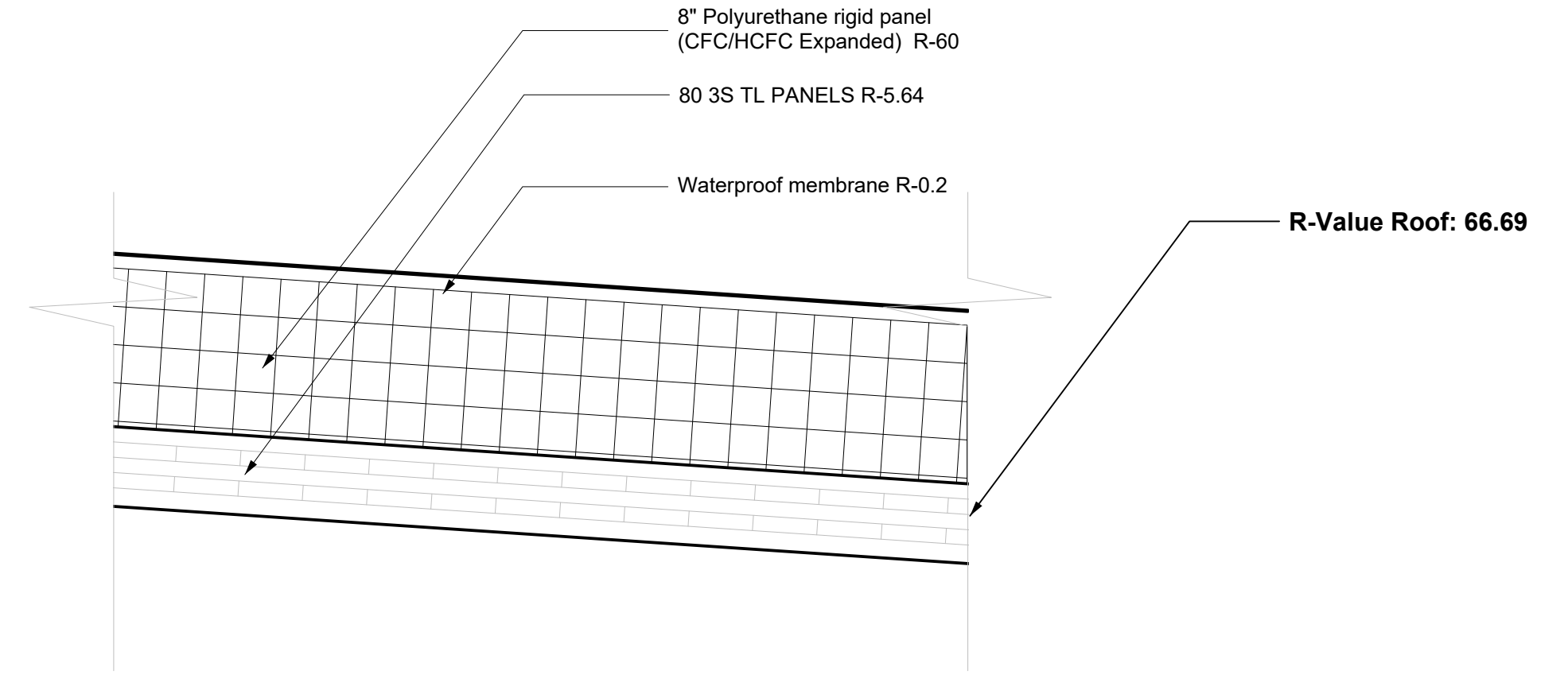
General Isometric



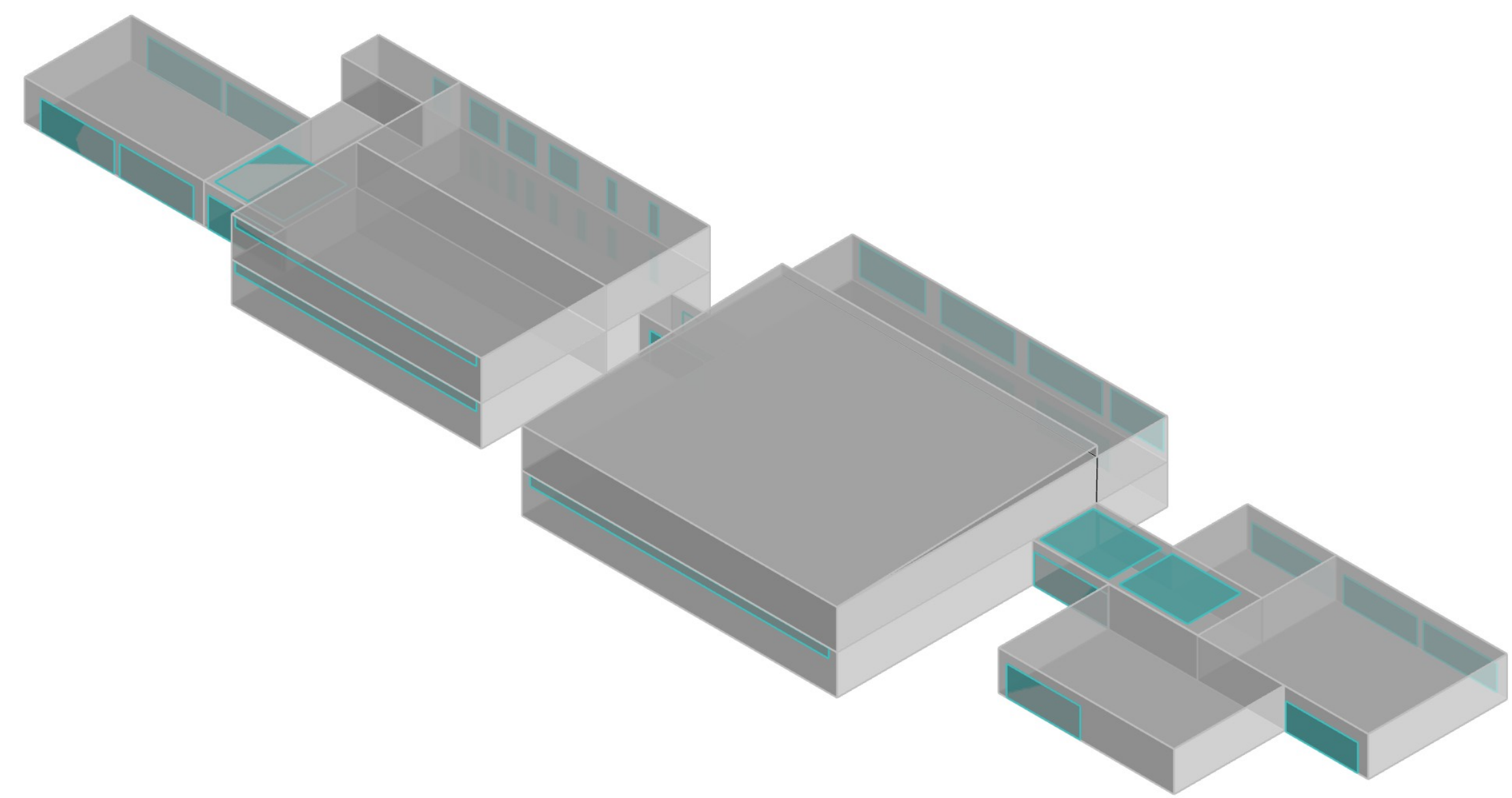
1 Plan Opaque wall detail
SCALE 1 1/2" = 1'-0"



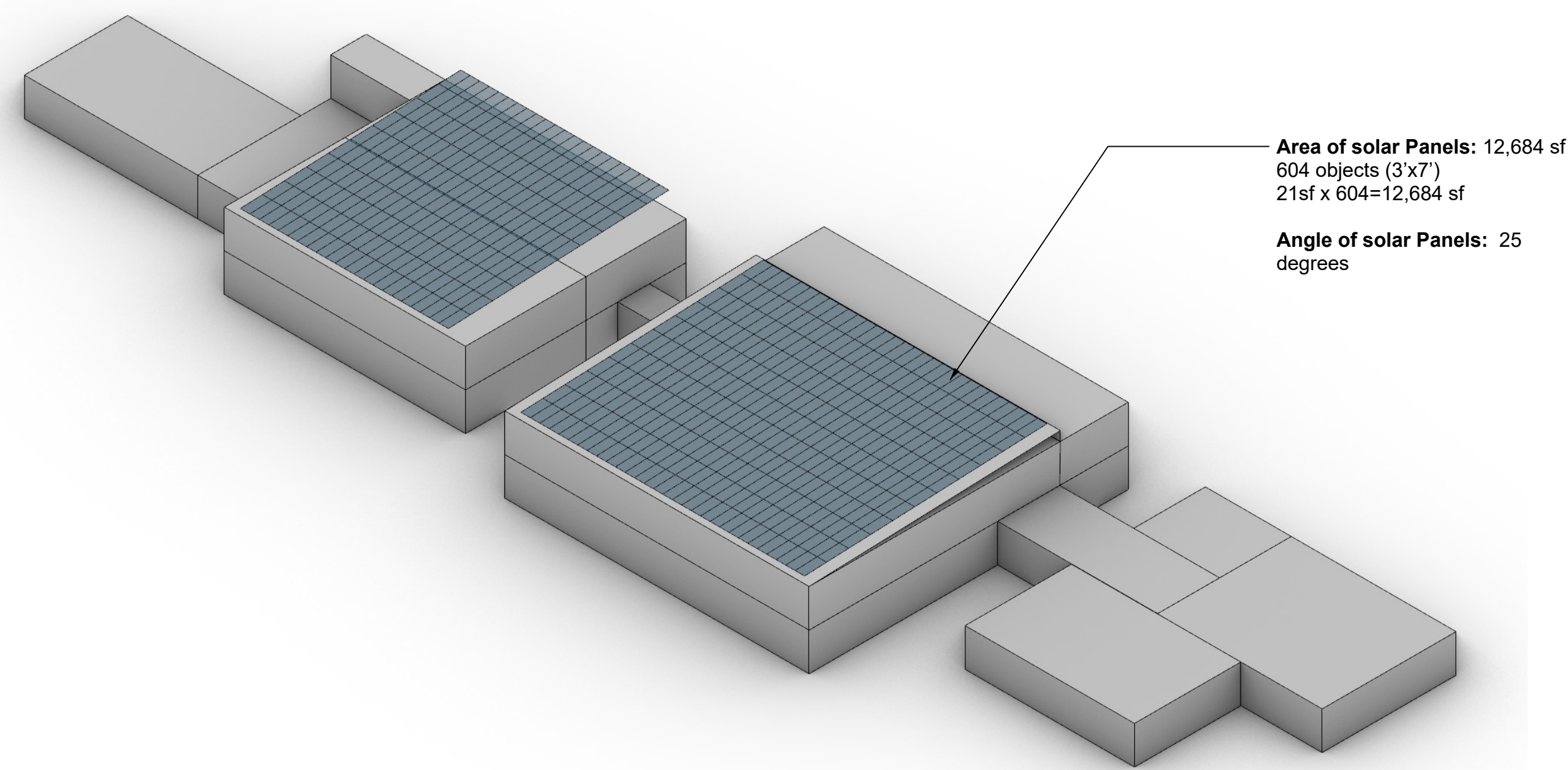
2 Section Opaque wall detail
SCALE 1 1/2" = 1'-0"



3 Section roof detail
SCALE 1 1/2" = 1'-0"



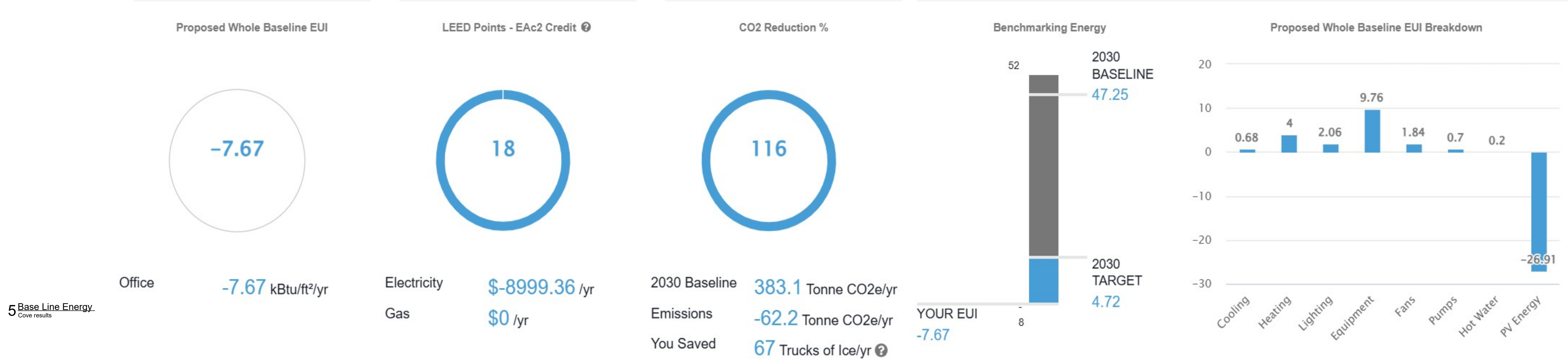
4 Rhino model used for Cove
Screen snip of a 3d model



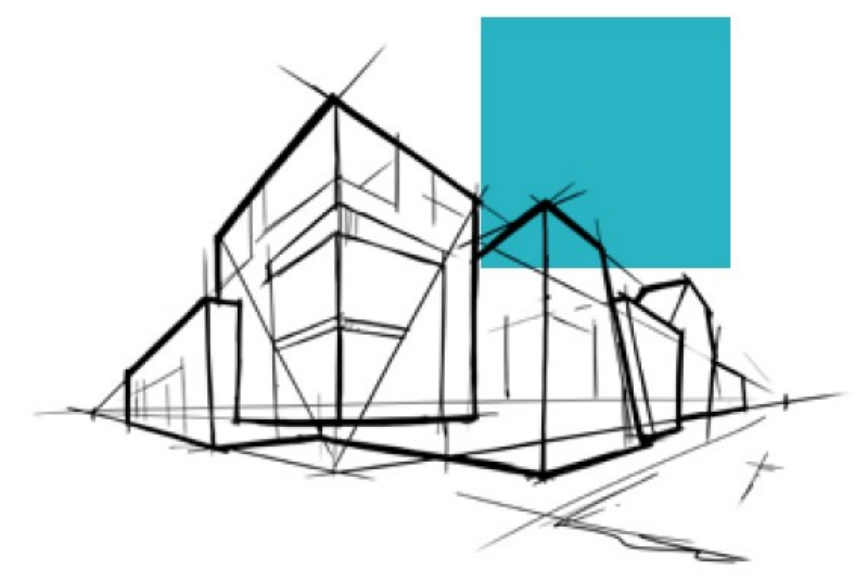
6 Solar Panel area
Screen snip of a 3d model

Baseline Energy ?

Create Report OpenStudio Export



ROCKWOOL Stone Wool: Meeting the Demands for Higher R-Values of Tomorrow



Building Envelope Performance Matrix

		Thermal Batt Insulation							
		Comfortbatt®		Comfortbatt®		Comfortbatt®		Comfortbatt®	
		16" On Center		24" On Center		16" On Center		24" On Center	
Continuous Insulation		3.5"		3.5"		5.5"		5.5"	
		Canada	U.S.	Canada	U.S.	Canada	U.S.	Canada	U.S.
		R14	R15	R14	R15	R22	R23	R22	R23
A	Comfortboard® 80 1.25" R 5.2	19.2	20.2	19.2	20.2	27.2	28.2	27.2	28.2
B	Comfortboard® 80 1.5" R 6.3	16.16	16.86	16.56	17.26	21.34	22.04	21.97	22.62
C	Comfortboard® 80 2.0" R 8.4	20.3	21.3	20.3	21.3	28.3	29.3	28.3	29.3
D	Comfortboard® 80 3.0" R 12.6	17.26	17.96	17.66	18.36	22.44	23.14	23.07	23.72
E	Comfortboard® 80 4.0" R 16.8	22.4	23.4	22.4	23.4	30.4	31.4	30.4	31.4
F	Comfortboard® 80 5.0" R 21	19.36	20.06	19.76	20.46	24.54	25.24	25.17	25.82
G	NONE	26.6	27.6	26.6	27.6	34.6	35.6	34.6	35.6
		23.56	24.26	23.96	24.66	28.74	29.44	29.37	30.02
		30.8	31.8	30.8	31.8	38.8	39.8	38.8	39.8
		27.76	28.46	28.16	28.86	32.94	33.64	33.57	34.22
		35	36	35	36	43	44	43	44
		31.96	32.66	32.36	33.06	37.14	37.84	37.77	38.42
		14	15	14.00	15.00	22.00	23.00	22.00	23.00
		10.96	11.66	11.36	12.06	16.14	16.84	16.77	17.42

1 Product sheets
wall cavity and continuous insulation

Insulation R-Value Chart (Per 1, 2, 4, 8 Inches Thickness)

Insulation Material:	R-Value Per Inch:	2 Inch R-Value:	4 Inch R-Value:	8 Inch R-Value:
Vacuum Insulated Panel (VIP)	R-25 Per Inch	R-50	R-100	R-200
Silica Aerosol	R-10.3 Per Inch	R-20.6	R-41.2	R-82.4
Polyurethane Rigid Panel (CFC/HCFC Expanded) New	R-7.5 Per Inch	R-15	R-30	R-60
Polyurethane Rigid Panel (CFC/HCFC Expanded) After 5-10 Years	R-6.25 Per Inch	R-12.5	R-25	R-50
Polyurethane Rigid Panel (Pentane Expanded) New	R-6.8 Per Inch	R-13.6	R-27.2	R-54.4
Polyurethane Rigid Panel (Pentane Expanded) After 5-10 Years	R-5.5 Per Inch	R-11	R-22	R-44
Foil-Faced Polyisocyanurate Rigid Panel (Pentane Expanded) New	R-6.8 Per Inch	R-13.6	R-27.2	R-54.4
Foil-Faced Polyisocyanurate Rigid Panel (Pentane Expanded) After 5-10 Years	R-5.5 Per Inch	R-11	R-22	R-44
Closed-Cell Polyurethane Spray Foam	R-6 Per Inch	R-12	R-24	R-48
Urea Foam	R-5.25 Per Inch	R-10.5	R-21	R-42
Urea-Formaldehyde Panels	R-5.5 Per Inch	R-11	R-22	R-44
High-Density XPS	R-5.2 Per Inch	R-10.4	R-20.8	R-41.6
Low-Density XPS	R-4.15 Per Inch	R-8.3	R-16.6	R-33.2

1 Product sheets
Roof rigid insulation

Assembly U-Factor - Cut through Insulation		
Component Name	Total Component R-Value	Source for Material R-Value
Inside Air Film	0.68	MEEB: Table E.3
Gypsum board (0.5 in.)	0.45	MEEB: Table E.1
Cavity insulation (5.5 in.)	23	ROCKWOOL Stone Wool: Table
Plywood Sheathing (0.5 in.)	0.62	MEEB: Table E.1
Rigid insulation (4 in.)	16.8	ROCKWOOL Stone Wool: Table
Corten steel cladding	0.04	Appendix Heating cooling and Lighting
Outside Air Film	0.17	MEEB: Table E.3
Total Assembly R-value	41.76	
Assembly U-Factor (1/Total R)	0.024	<i>cut through insulation</i>

Assembly U-Factor - Cut through Framing		
Component Name	Total Component R-Value	Source for Material R-Value
Inside Air Film	0.68	MEEB: Table E.3
Gypsum board (0.5 in.)	0.45	MEEB: Table E.1
Wood studs 2x6	6.105	MEEB: Table E.6:
Plywood Sheathing (0.5 in.)	0.62	MEEB: Table E.1
Rigid insulation (4 in.)	16.8	ROCKWOOL Stone Wool: Table
Corten steel cladding	0.04	Appendix Heating cooling and Lighting
Outside Air Film	0.17	MEEB: Table E.3
Total Assembly R-value	24.87	
Total Assembly U-Factor (1/Total R)	0.040	<i>cut through framing</i>

Framing factor for 16" o.c. spacing is 25% = 0.25

Framing factor for 24" o.c. spacing is 22% = 0.22

Above framing factors are from ASHRAE Book of Fundamentals

Area-weighted Envelope Values	
Framing Factor	0.22
Area-weighted U-Factor	0.028
Area-weighted R-value	36.33

2 Area-weighted wall assembly R-value
Screen snip

Envelope Usage and Schedules Building System Energy Generation General

Inputs

Daylight Sensors (%) 0

Occupancy Sensors (%) 100%

Lighting (W/ft²) 0.4

Exterior Lighting Power (Watts) 0

Appliance Use (W/ft²) 0.75

Metabolic Rate (MET Value) Standing: 70

Heating Set-Point (F) 70

Cooling Set-Point (F) 74

Cooling Set back (F) 84

Total Occupants 144



USAGE AND SCHEDULES

Envelope Usage and Schedules Building System Energy Generation General

Solar Panel Surface Area (ft²) 12684

Solar Panel Angle 12

Solar Panel Module Location Moderately Ventilated

Solar Panel Module Type (Efficiency) Mono Crystalline Silicon: 0.244

SHW Collector Surface Area (ft²) 0

SHW Collector Angle 0

SHW Collector Efficiency 0.5

ENERGY GENERATION

Cooling Heating Lighting Equipment Hot Water Fans Pumps PV Energy

Your cooling load is not dominating your energy use. This is because your HDD are higher than your CDD days are higher than your CDD, the Equipment load is dominating the calculation. Look under the Usage and Schedules tab in the Engineering inputs.

Your heating load is not dominating your energy use. This makes sense - although your HDD days are higher than your CDD, the Equipment load is dominating the calculation. Look under the Usage and Schedules tab in the Engineering inputs.

Your lighting load contributes to 10.75% of the total EUI. You can reduce your lighting load by reducing your lighting power density and having daylight and occupancy sensors in the Engineering inputs.

Your equipment load is dominating your energy use. You can reduce your equipment load by reducing your appliance power density.

Your hot water load contributes to 1.04% of the total EUI. You can reduce your hot water load by reducing your domestic hot water demand and using a more efficient hot water generation system in Engineering inputs.

Your fan load contributes to 9.55% of the total EUI. You can reduce your fan energy by switching your fan flow control accordingly in the Engineering inputs. Total Outdoor Air for the project is 3872.31 CFM.

Your pump load contributes to 3.65% of the total EUI. You can reduce your pump energy by adjusting pump control for cooling/heating in the Engineering inputs.

The current Photovoltaic panels offset -26.91 EUI off the building.

3 Base Line Energy
Cove results information

Envelope Usage and Schedules Building System Energy Generation General

Roof R-Value (h ft² F / BTU) 66.69

Wall R-Value (h ft² F / BTU) 36.33

Spandrel U-Value (BTU/h ft² F) 0.25

Glazing U-Value (BTU/h ft² F) 0.29

Glazing SHGC 0.39

Skylight U-Value (BTU/h ft² F) 1.17

Skylight SHGC

Envelope Heat Capacity Medium: 165,000

Blinds/Curtains/Shades (Exterior) Blinds

Wall Emissivity 0.9

Roof Emissivity 0.9

Ground Floor Area (ft²) 24161.89

Ground Floor U-Value (BTU/h ft² F) 0.063

Below Grade Area (ft²) 0

Below Grade Depth (ft) 0

Below Grade U-Value (BTU/h ft² F) 0.58

Door Area (ft²) 0

Door U-Value (BTU/h ft² F) 0.37

ENVELOPE

Envelope Usage and Schedules Building System Energy Generation General

System Type VAV w/ Reheat, with GSHP

Integrated Part Load Value Constant Speed Screw Chiller

Heating System COP 3.7

Cooling System COP 5.2

Heat Recovery System Enthalpy Wheel

Fan Flow Control Factor Variable Speed

Specific Fan Power Central Mechanical Ventilation With Heating

Ventilation Type Mechanical

People Outdoor Air Rate (CFM/Person) 5.3

Area Outdoor Air Rate (CFM/ft²) 0.06

Ventilation Calculation Type Ventilation Rate Procedure

Infiltration (CFM/ft²) 0.09

Building Energy Management System Advanced

Ventilation Control Demand Control

Exhaust Recirc. % Exhaust Recirc. 60%

DHW Gen. Electric Heat Pump, high efficiency

Hot Water Distribution System Taps Within 3 Meters Of Heat Generation

Domestic Hot Water Demand (gall/yr) 52841.85

Pump Control for Cooling All Other Cases

Pump Control for Heating All Other Cases

BUILDING SYSTEM



HOUSE OF WATER:
MUSIC CENTER

170 15th St, Columbus, IN 47201

CERTIFICATION

REVISIONS

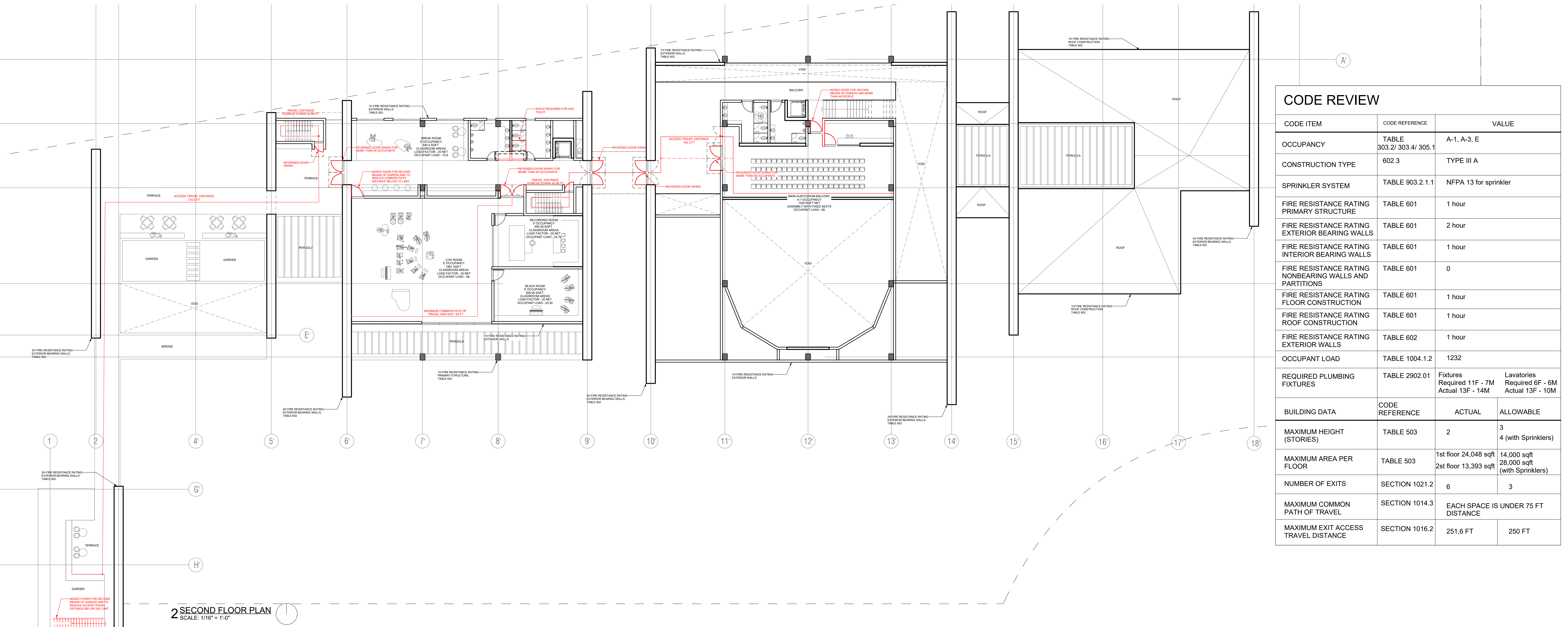
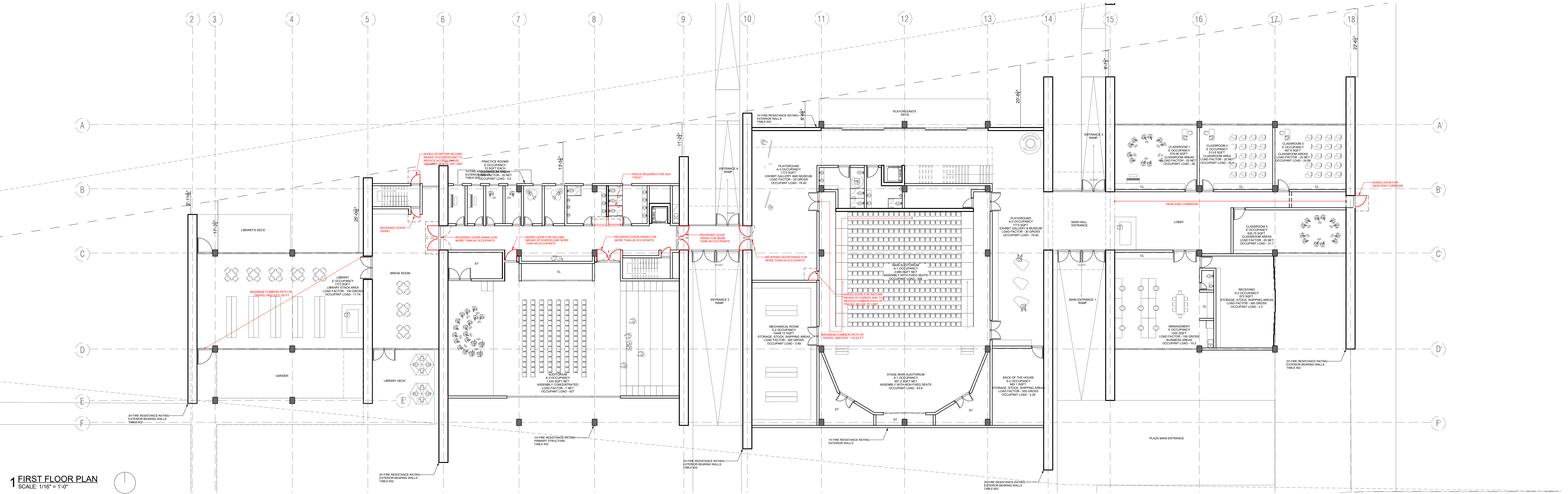
Energy Analysis Inputs

Project Issue Date: 4/10/2025

PRINT 24 X 36 FULL SIZE OR 12X18 HALF SIZE

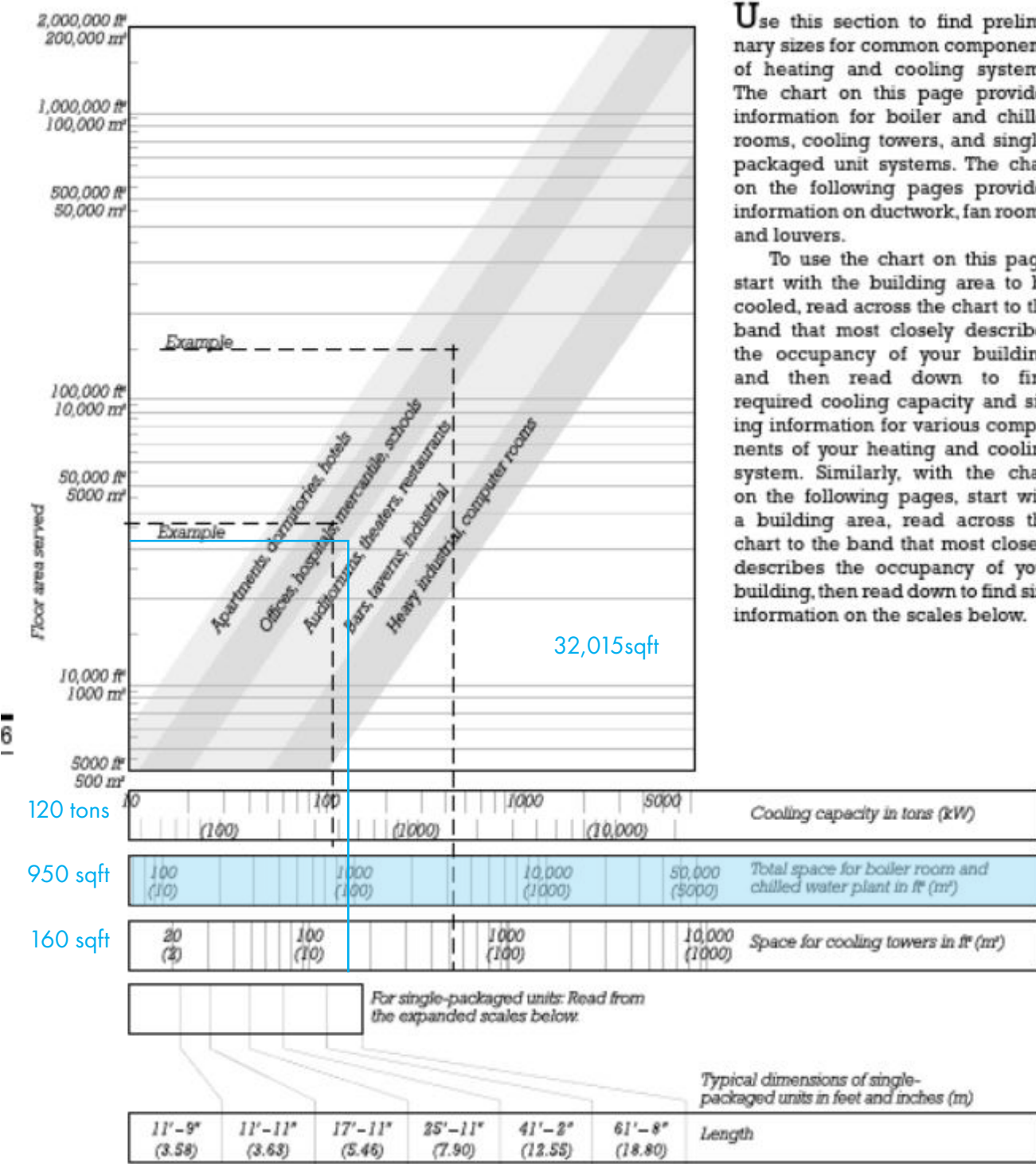
SHEET NUMBER

G-004

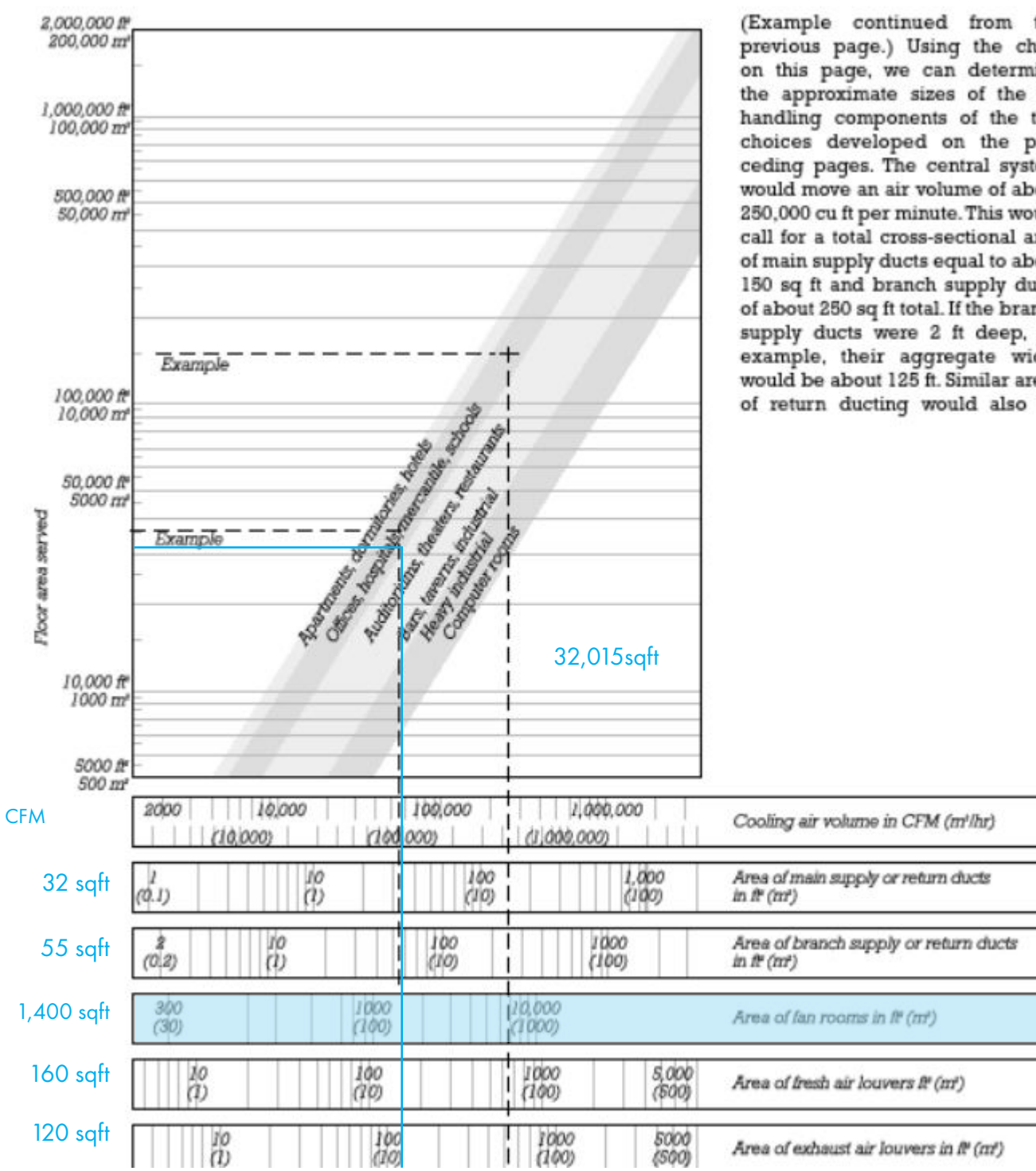


CODE REVIEW			
CODE ITEM	CODE REFERENCE	VALUE	
OCCUPANCY	TABLE 303.2/ 303.4/ 305.1	A-1, A-3, E	
CONSTRUCTION TYPE	602.3	TYPE III A	
SPRINKLER SYSTEM	TABLE 903.2.1.1	NFPA 13 for sprinkler	
FIRE RESISTANCE RATING PRIMARY STRUCTURE	TABLE 601	1 hour	
FIRE RESISTANCE RATING EXTERIOR BEARING WALLS	TABLE 601	2 hour	
FIRE RESISTANCE RATING INTERIOR BEARING WALLS	TABLE 601	1 hour	
FIRE RESISTANCE RATING NONBEARING WALLS AND PARTITIONS	TABLE 601	0	
FIRE RESISTANCE RATING FLOOR CONSTRUCTION	TABLE 601	1 hour	
FIRE RESISTANCE RATING ROOF CONSTRUCTION	TABLE 601	1 hour	
FIRE RESISTANCE RATING EXTERIOR WALLS	TABLE 602	1 hour	
OCCUPANT LOAD	TABLE 1004.1.2	1232	
REQUIRED PLUMBING FIXTURES	TABLE 2902.01	Fixtures Required 11F - 7M Actual 13F - 14M	Lavatories Required 6F - 6M Actual 13F - 10M
BUILDING DATA	CODE REFERENCE	ACTUAL	ALLOWABLE
MAXIMUM HEIGHT (STORIES)	TABLE 503	2	3 4 (with Sprinklers)
MAXIMUM AREA PER FLOOR	TABLE 503	1st floor 24,048 sqft 2st floor 13,393 sqft	14,000 sqft 28,000 sqft (with Sprinklers)
NUMBER OF EXITS	SECTION 1021.2	6	3
MAXIMUM COMMON PATH OF TRAVEL	SECTION 1014.3	EACH SPACE IS UNDER 75 FT DISTANCE	
MAXIMUM EXIT ACCESS TRAVEL DISTANCE	SECTION 1016.2	251.6 FT	250 FT

1.Horizontal: Distribution of services for large buildings



2.Sizing spaces for major heating and cooling equipment

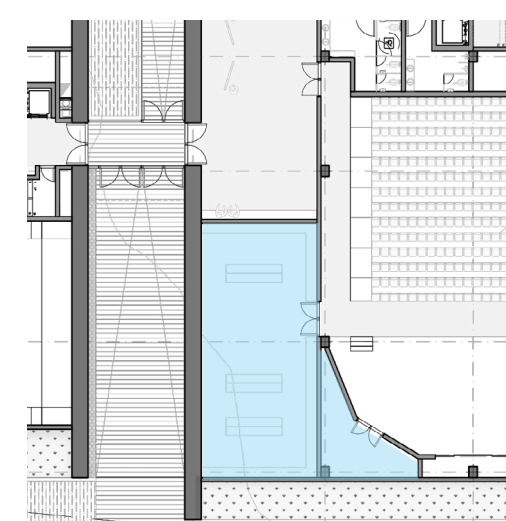


Areas description and Conclusion

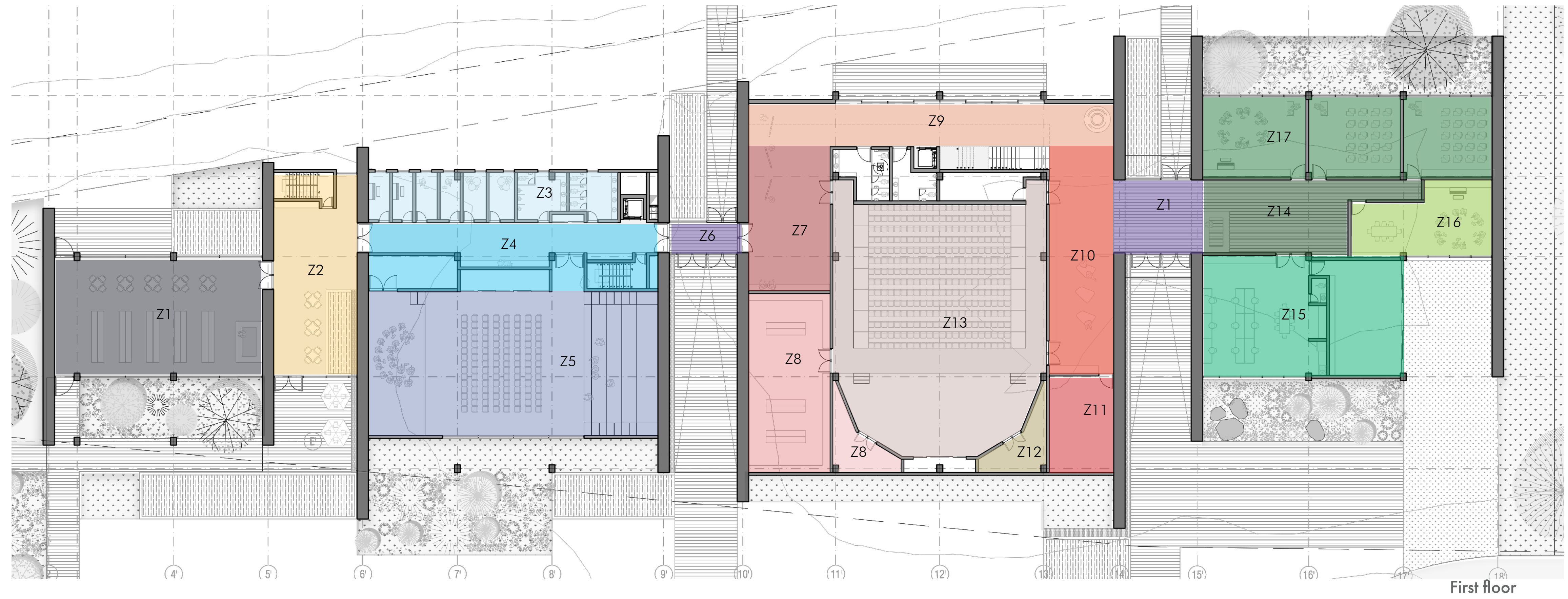
First floor area served= 23,970 sqft
 Second floor area served= 8,045 sqft
 Total footprint=32,015 sqft

Mechanical Room in groundfloor= 1,230 sqft

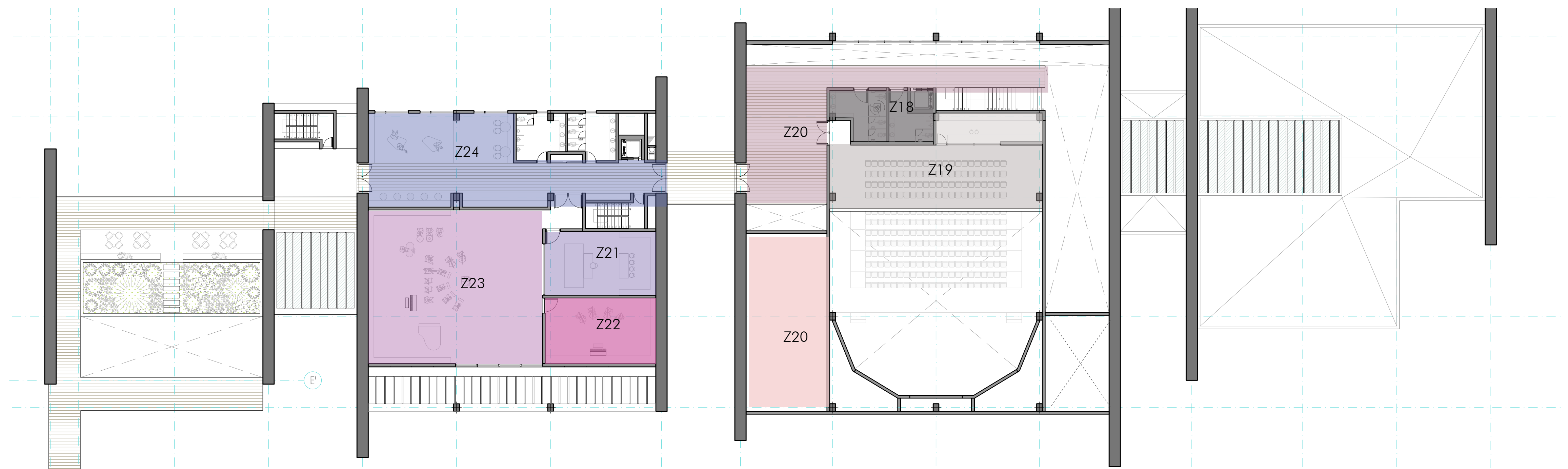
- Total space for boiler room and chilled water plant = 950 sqft
 - Total space for fan rooms = 1,400 sqft
- Total area Mechanical room= 2,350 sqft



The space for the the Mechanical room need to increase because the current one with 1,230 sqft is not enough. To follow the requirements is necessary to add 1,120 sqft to meet the total of the Mechanical room area of 2,100 sqft . This are will be on the second floor where is named by the legend Z25 that is shown in the second floor that has 1200sq.



- Z1 West Library
- Z2 Library corridor
- Z3 North classrooms
- Z4 Central corridor
- Z5 Secondary Auditorium
- Z6 Secondary corridor
- Z7 West playground
- Z8 Mechanical room
- Z9 Lobby's corridor
- Z10 Main Lobby/Playground
- Z11 Back of the house/ storage
- Z12 Back of the house
- Z13 Main Auditorium
- Z14 Secondary Lobby
- Z15 Management and Receiving
- Z16 East classroom
- Z17 North classrooms



- Z18 Restrooms
- Z19 balcony Main Auditorium
- Z20 Corridor
- Z21 Recording room
- Z22 Black room
- Z23 Live room
- Z24 North break room
- Z25 Mechanical room 2 : 1200sq

HOUSE OF WATER

170 15th St, Columbus, IN 47201

CERTIFICATION

REVISIONS

RESUBMIT REVISION	4/22/2025

MECHANICAL EQ. SPACE FLOORPLAN

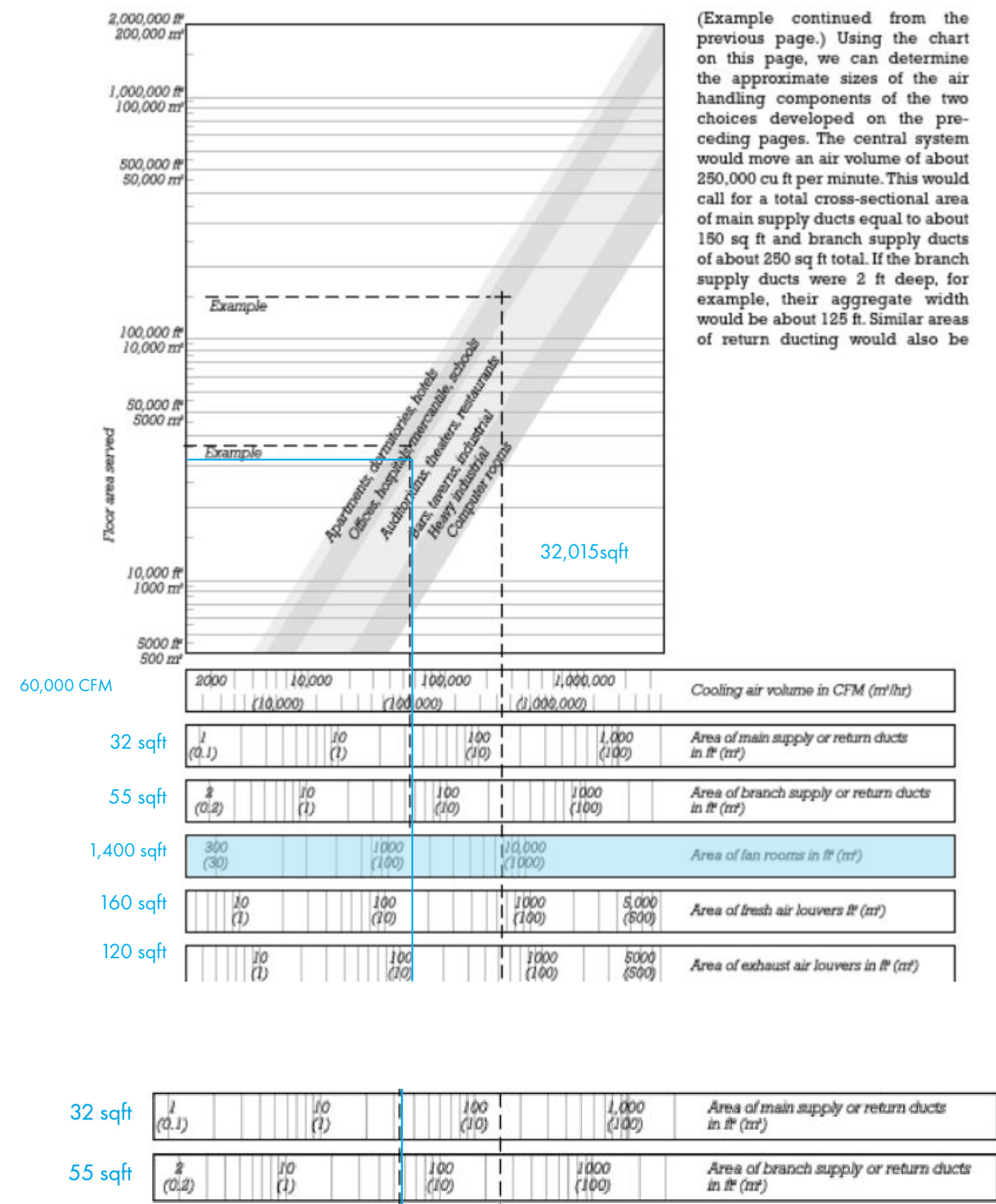
DD THERMAL ZONING

04/25/25

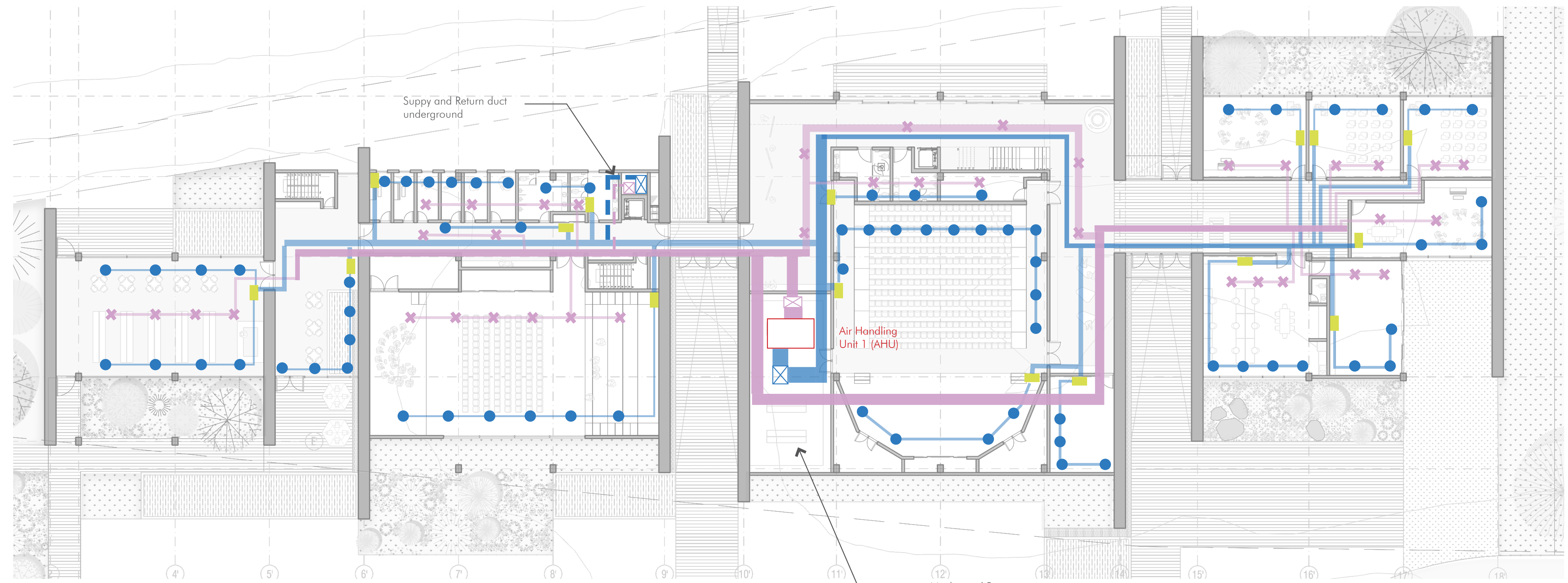
SHEET NUMBER

M-01

Main and Branch supply / Return duct sizing



*Sizing Information Referenced From Student Companion

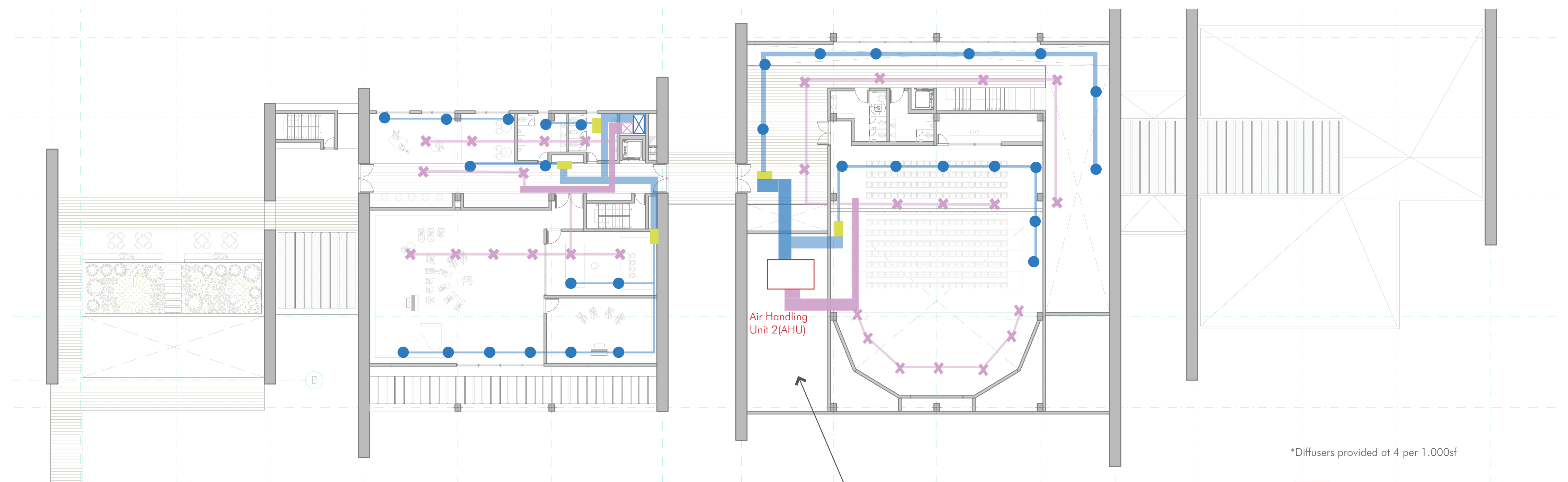
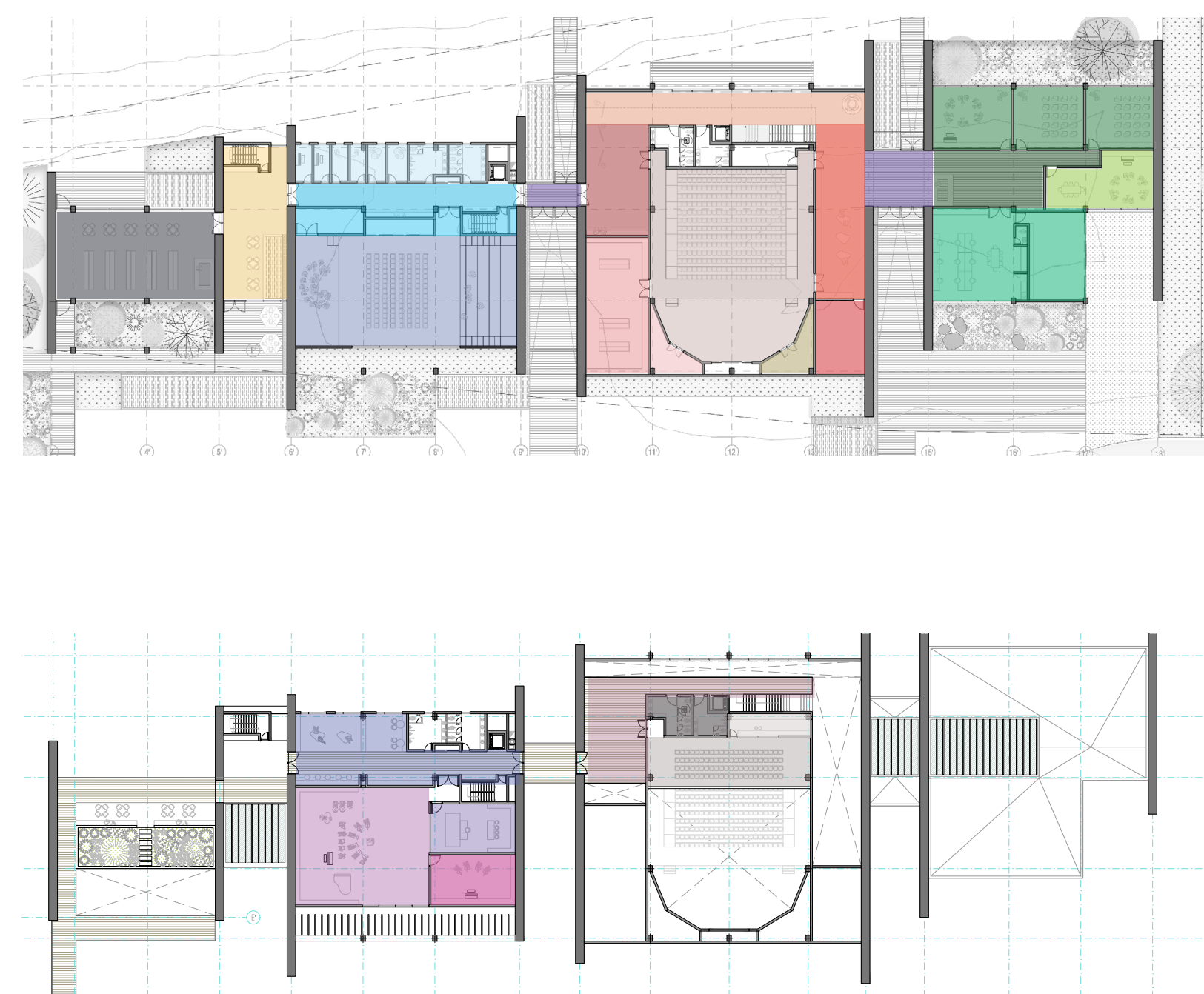


First floor

*Diffusers provided at 4 per 1,000sf

- Air Handling Unit (AHU)
- VAV control boxes
- Branch Supply Duct
- Main Supply Duct
- Diffusers: 24" x 24" Ceiling Supply Diffuser
- Branch Return Duct
- Branch Return Duct
- Return Grille

Thermal Zoning diagram



Second floor

*Diffusers provided at 4 per 1,000sf

- Air Handling Unit (AHU)
- VAV control boxes
- Branch Supply Duct
- Main Supply Duct
- Diffusers: 24" x 24" Ceiling Supply Diffuser
- Branch Return Duct
- Branch Return Duct
- Return Grille

HOUSE OF WATER

170 15th St, Columbus, IN 47201

CERTIFICATION

REVISIONS

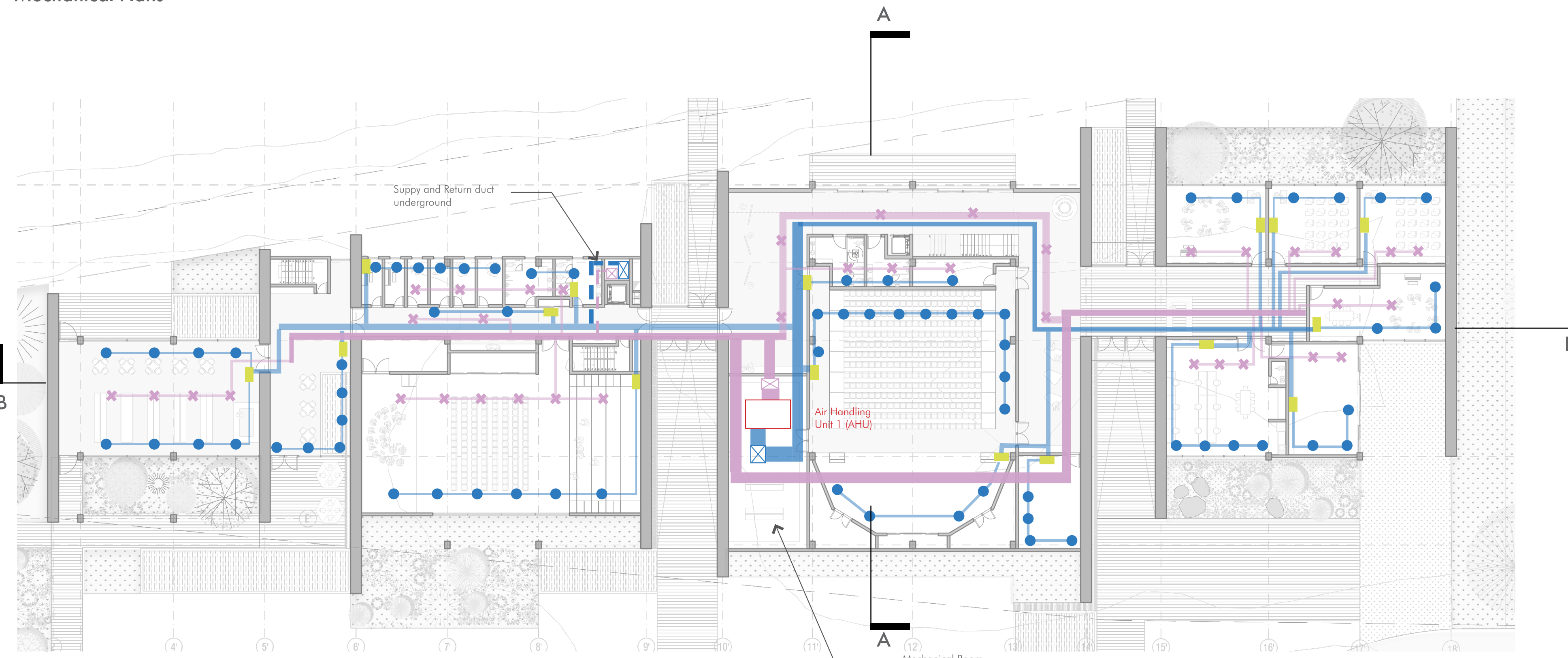
RESUBMIT SUBMISSION 4/28/25

MECHANICAL FLOORPLAN

04/25/25

SHEET NUMBER

M-02



Ductwork calculation size

32 sqft	7 (0.1)	10 (1)	100 (10)	1,000 (100)	Area of main supply or return ducts in # (sq)
55 sqft	8 (0.2)	10 (1)	100 (10)	1,000 (100)	Area of branch supply or return ducts in # (sq)

*Sizing Information Referenced From Student Companion

Total footprint=32,015 sqft

AHU 1 =74.9%

First floor area served= 23,970 sqft

- Area of main supply or return duct:

(74.9% of 32)= 23.9

= 3x8 Main supply duct

- Area of branch supply or return duct: 16ft2

(74.9% of 55)= 41.1

AHU 2 =25.1%

Second floor area served= 8,045 sqft

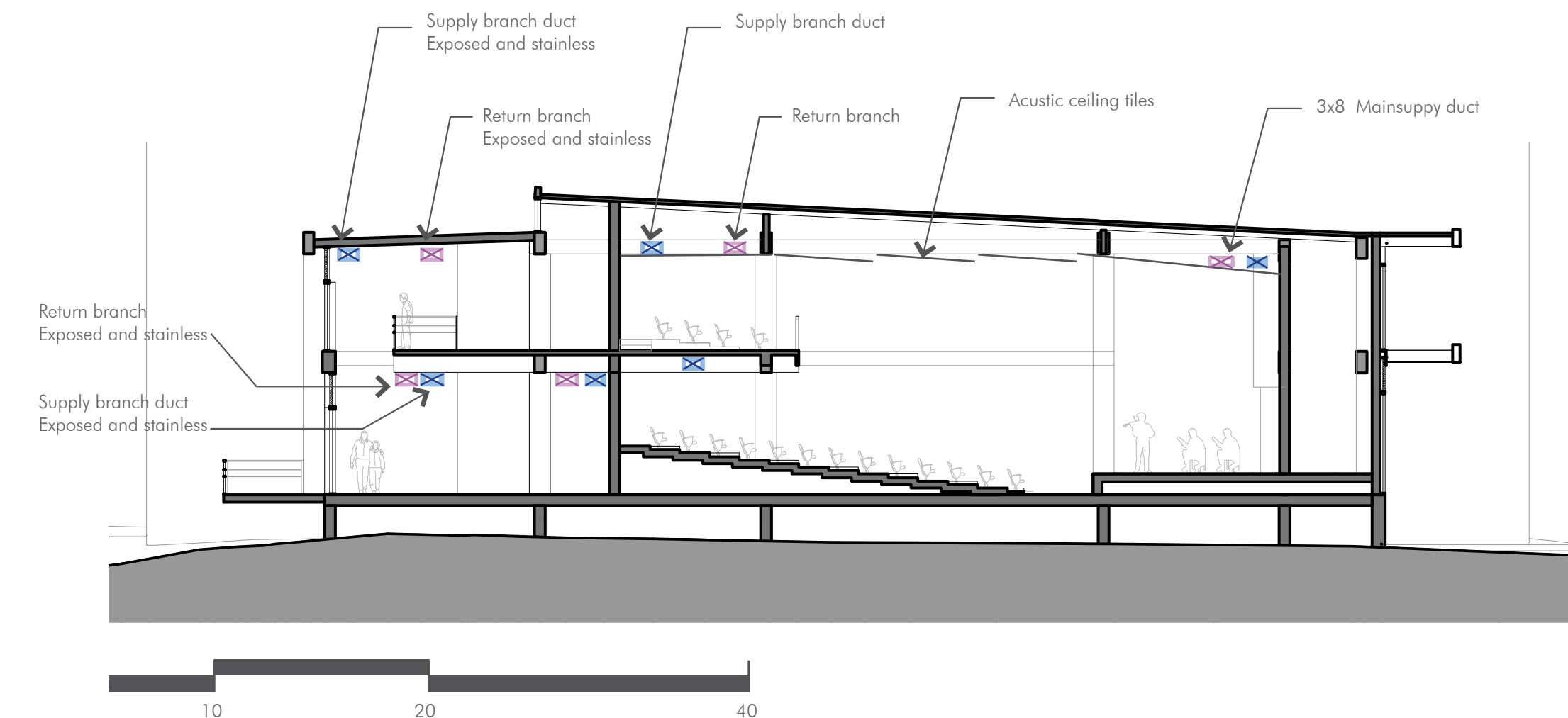
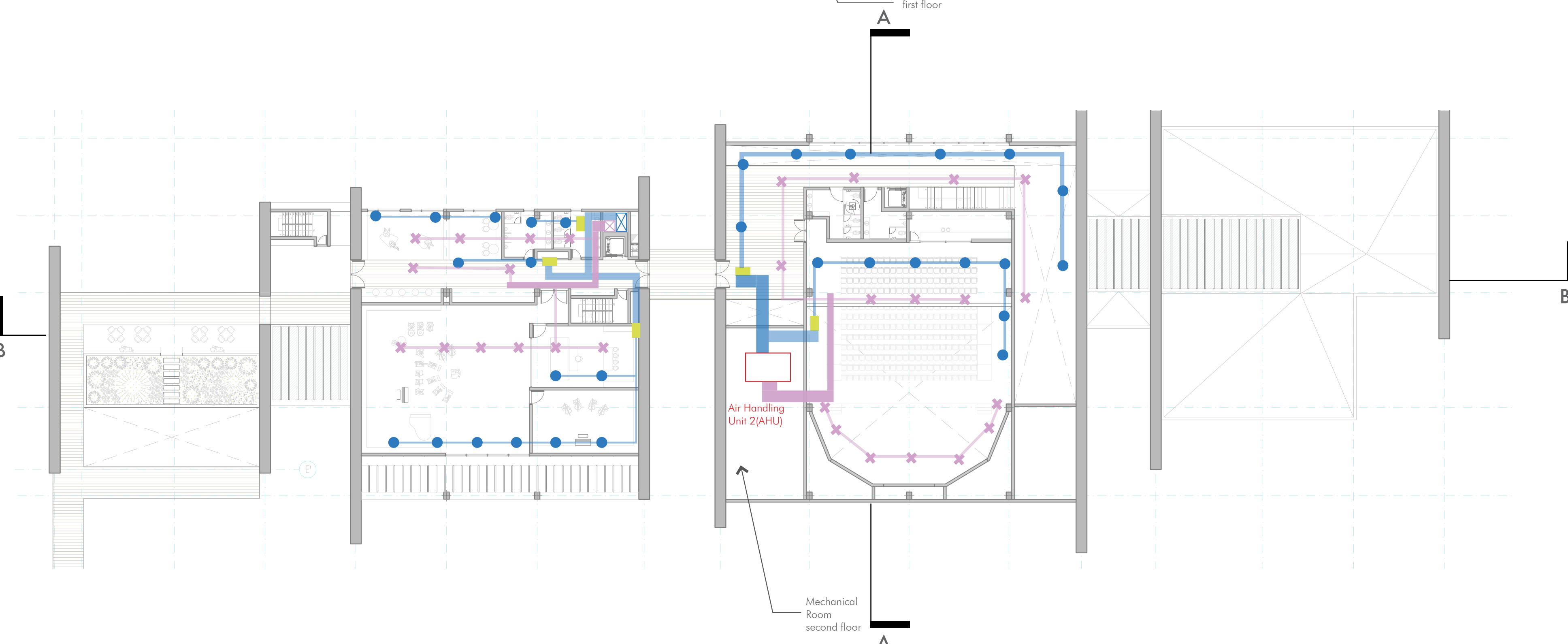
- Area of main supply or return duct:

(25.1% of 32)= 8

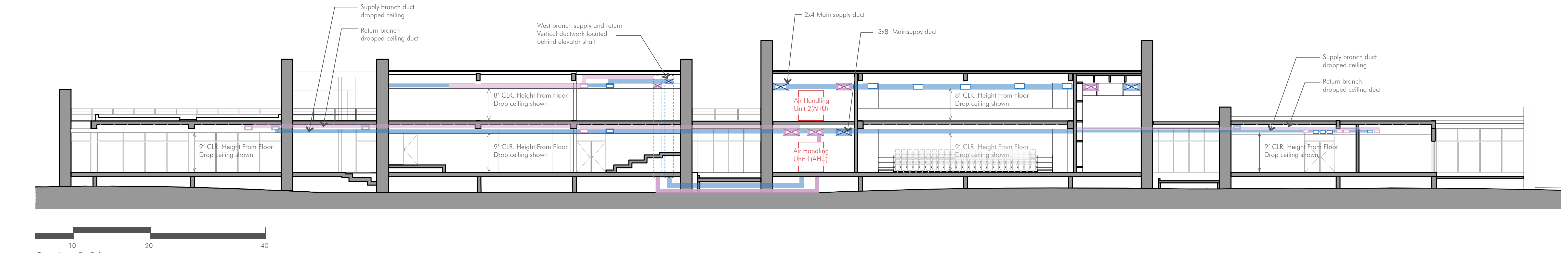
= 2x4 Main supply duct

- Area of branch supply or return duct: 54ft2

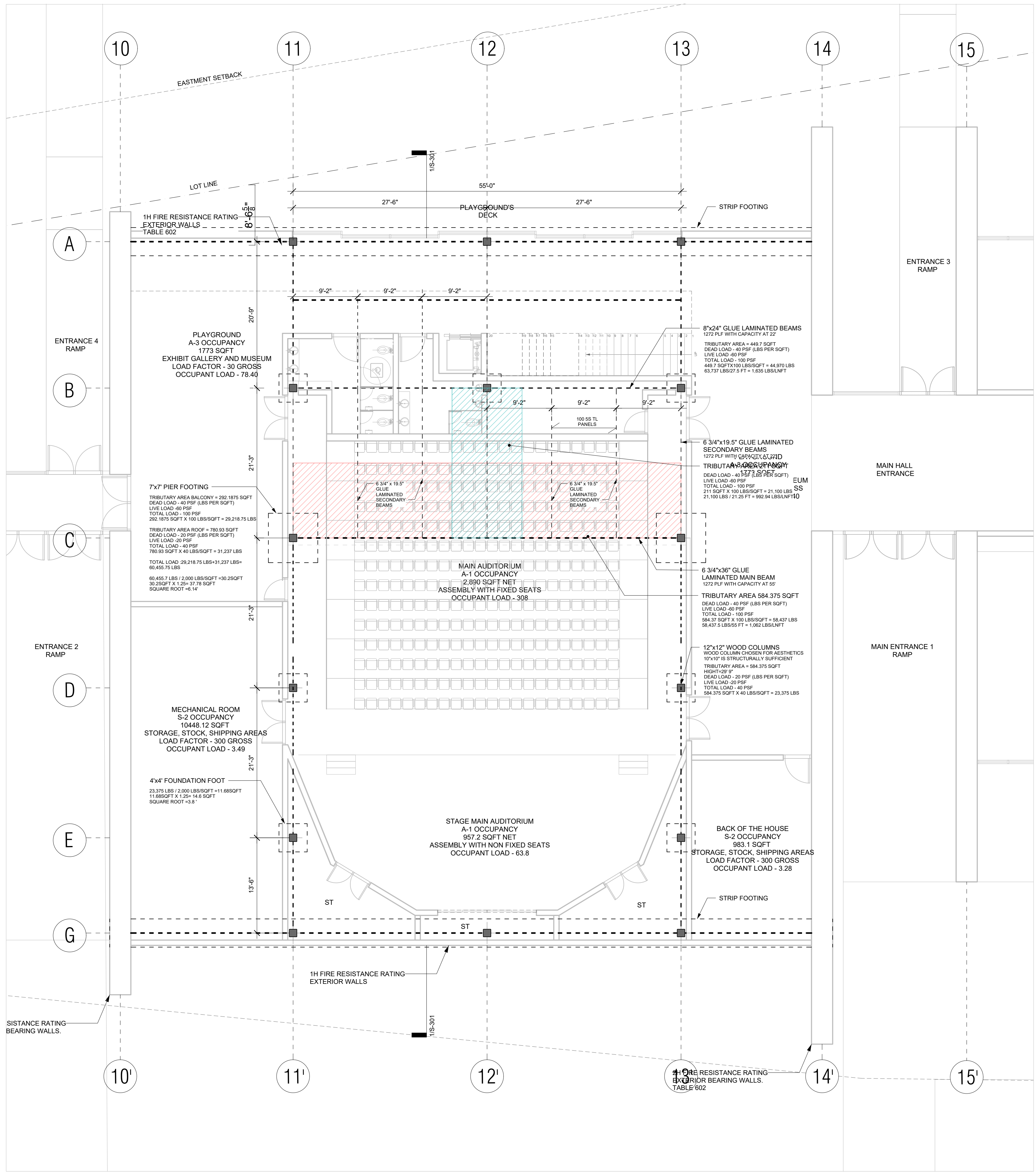
(25.1% of 55)= 13.8



Section A-A'



Section B-B'



1 FIRST FLOOR AUDITORIUM STRUCTURAL PLAN SCALE: 1/8" = 1'-0"

Architectural Appearance Beams 6 3/4" Floor Load Tables - 100%

24F-V4 Grade - 100% Load Duration In pounds per lineal foot (PLF)

Span [ft]	Span Type	24F-V4 Grade - 100% Load Duration In pounds per lineal foot (PLF)											
		7.5"	9"	10.5"	12"	13.5"	15"	16.5"	18"	19.5"	21"	22.5"	24"
6	Simple	2800	4035	5495	7135	8564	10197	12081	14280	16880			
	Multiple	2156	3107	4232	5184	6111	7130	8258	9510	10911			
	Min. Bearing	1.9 / 3.7	2.8 / 5.3	3.8 / 7.3	4.9 / 8.9	5.9 / 10.5	7 / 12.2	8.3 / 14.2	9.8 / 16.3	11.6 / 18.7			
8	Simple	1533	2263	3084	4030	5104	6304	7699	9256	11096	12590		
	Multiple	1207	1741	2373	3102	3929	4745	5401	6103	6858	7671	8549	
	Min. Bearing	1.5 / 3	2.1 / 4	2.8 / 5.4	3.7 / 7.1	4.7 / 9	5.8 / 10.9	6.8 / 12.4	7.8 / 14	8.9 / 15.7	10.1 / 17.6	11.5 / 19.6	
10	Simple	779	1352	1967	2572	3258	4025	4873	5802	6800	7671	8549	
	Multiple	768	1109	1512	1978	2507	3097	3750	4466	4996	5531	6096	
	Min. Bearing	1.5 / 3	1.6 / 3.2	2.3 / 4.4	3 / 5.7	3.7 / 7.2	4.6 / 8.9	5.6 / 10.8	6.6 / 12.8	7.8 / 14.3	8.8 / 15.9	9.8 / 17.5	
12	Simple	445	776	1239	1780	2256	2788	3364	3972	4626	5328	6077	
	Multiple	530	766	1045	1368	1734	2143	2587	3055	3559	4099	4676	
	Min. Bearing	1.5 / 3	1.5 / 3	1.7 / 3.6	2.5 / 4.7	3.1 / 6	3.8 / 7.4	4.6 / 8.9	5.5 / 10.5	6.4 / 12.3	7.3 / 14.1	8.4 / 16.1	
14	Simple	276	483	774	1161	1652	2023	2427	2865	3338	3845	4361	
	Multiple	367	559	763	1000	1268	1553	1864	2202	2566	2956	3373	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3.1	1.9 / 4.1	2.7 / 5.1	3.3 / 6.3	3.9 / 7.5	4.6 / 8.9	5.4 / 10.4	6.2 / 11.9	7.1 / 13.6	
16	Simple	181	319	513	771	1104	1520	1827	2157	2514	2897	3305	
	Multiple	242	424	580	761	954	1168	1402	1656	1931	2225	2539	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2.1 / 4.4	2.8 / 5.4	3.4 / 6.5	4 / 7.7	4.6 / 8.9	5.3 / 10.3	6.1 / 11.7	
18	Simple	123	220	355	536	769	1060	1417	1678	1956	2254	2572	
	Multiple	166	293	455	590	740	906	1089	1287	1501	1730	1974	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.1	1.6 / 3.9	2.2 / 4.8	3 / 5.7	3.5 / 6.8	4.1 / 7.9	4.7 / 9	5.4 / 10.3	
20	Simple	87	156	254	385	555	766	1026	1337	1662	1800	2054	
	Multiple	118	210	340	469	589	722	867	1026	1196	1380	1575	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.5	1.8 / 4.3	2.4 / 5.1	3.1 / 6	3.6 / 7	4.2 / 8.1	4.8 / 9.2	
22	Simple	62	114	187	285	411	570	764	997	1272	1467	1675	
	Multiple	85	154	251	380	478	586	705	834	974	1123	1283	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.1	1.5 / 3.8	2 / 4.6	2.6 / 5.4	3.3 / 6.3	3.8 / 7.3	4.3 / 8.3	

1. BEAMS TABLES

4.2 FLOORS WITH 2 IN. N.W. CONCRETE, L = 40 PSF

according to NDS 2015 and CLT Handbook, US ed.

Preliminary Sizing of CLT Floor Panels with 2" n.w. concrete

D = 40 psf + panel self weight

L = 40 psf, C₀ = 1.0

Allowable spans for KLH@CLT in major strength direction

Single span = L and two equal spans each = L

Governing span in bold font

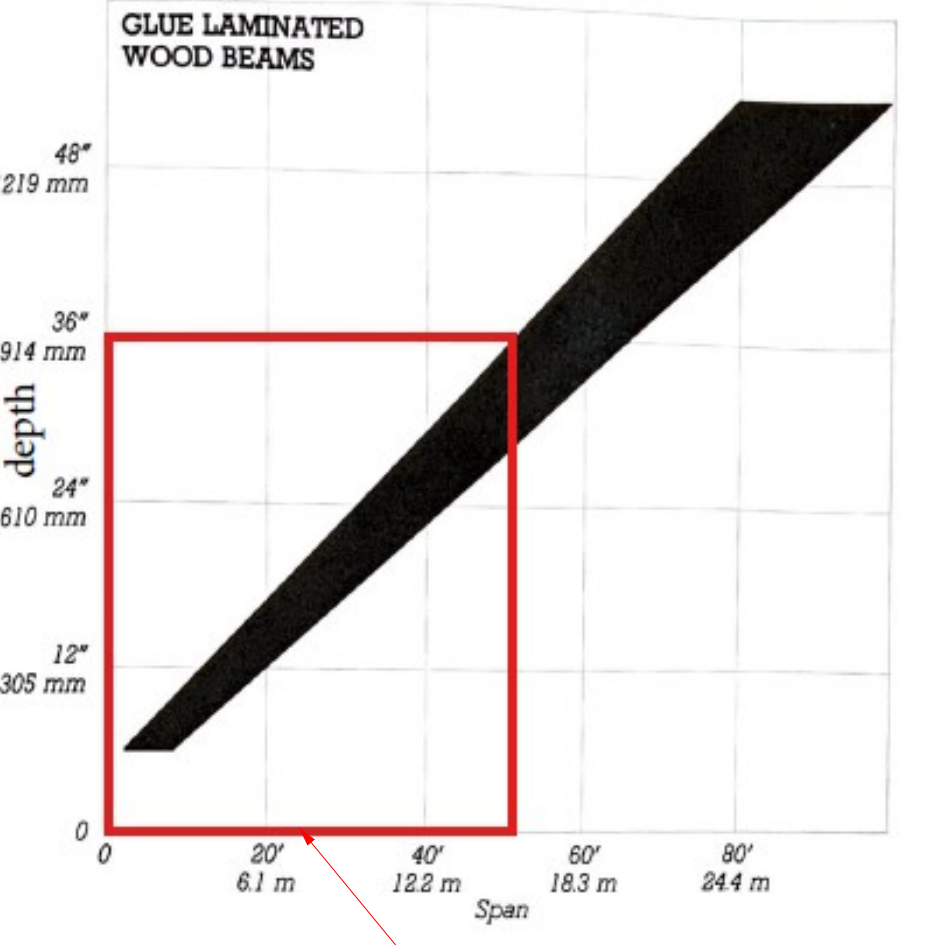
Panel Type	Thickness (in)	Both span conditions		Single span		Two equal spans	
		Vibration Control	Allowable Moment	Long term Δ _r = L/240	Live load Δ _i @ Allowable Moment span	Long term Δ _r = L/240	Live load Δ _i @ Allowable Moment span
60 3s TL	2.36	8.20	8.29	6.70	L/438	9.12	(6)
70 3s TL	2.76	9.13	9.40	7.69	L/463	10.48	(6)
80 3s TL	3.15	10.29	11.00	8.96	L/462	12.17	(6)
90 3s TL	3.54	11.17	12.19	9.95	L/474	13.54	(6)
100 3s TL	3.94	12.23	13.64	11.15	(5)	15.14	(6)
105 3s TL	4.13	12.51	14.07	11.49	(5)	15.63	(6)
120 3s TL	4.72	13.83	15.92	13.03	(5)	17.74	(6)
100 5s TL	3.94	11.49	12.23	10.38	(5)	14.09	(6)
120 5s TL	4.72	13.55	15.25	12.73	(5)	17.28	(6)



SECONDARY BEAMS LOAD 992.94 LBS/IN FT SPAN 21.5'

2. FLOOR PANELS TABLES

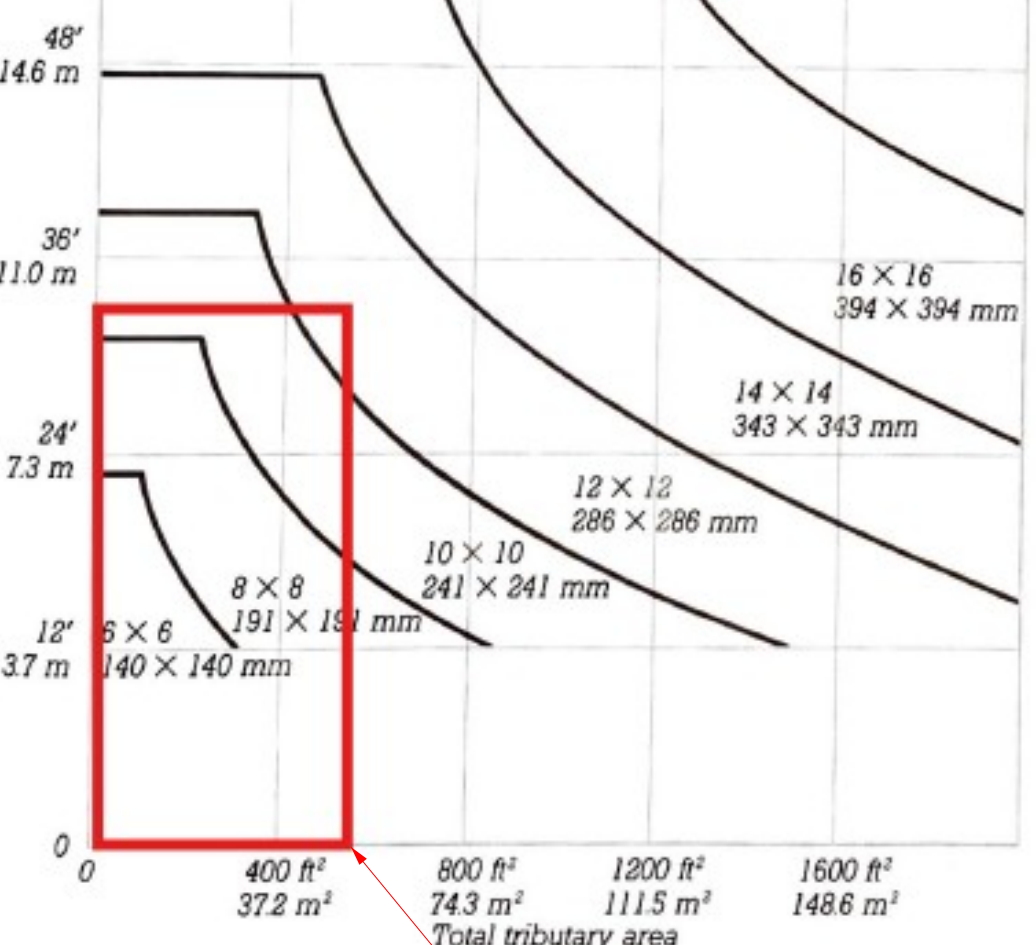
GLUE LAMINATED WOOD BEAMS



3. GLUELAM BEAMS CHART

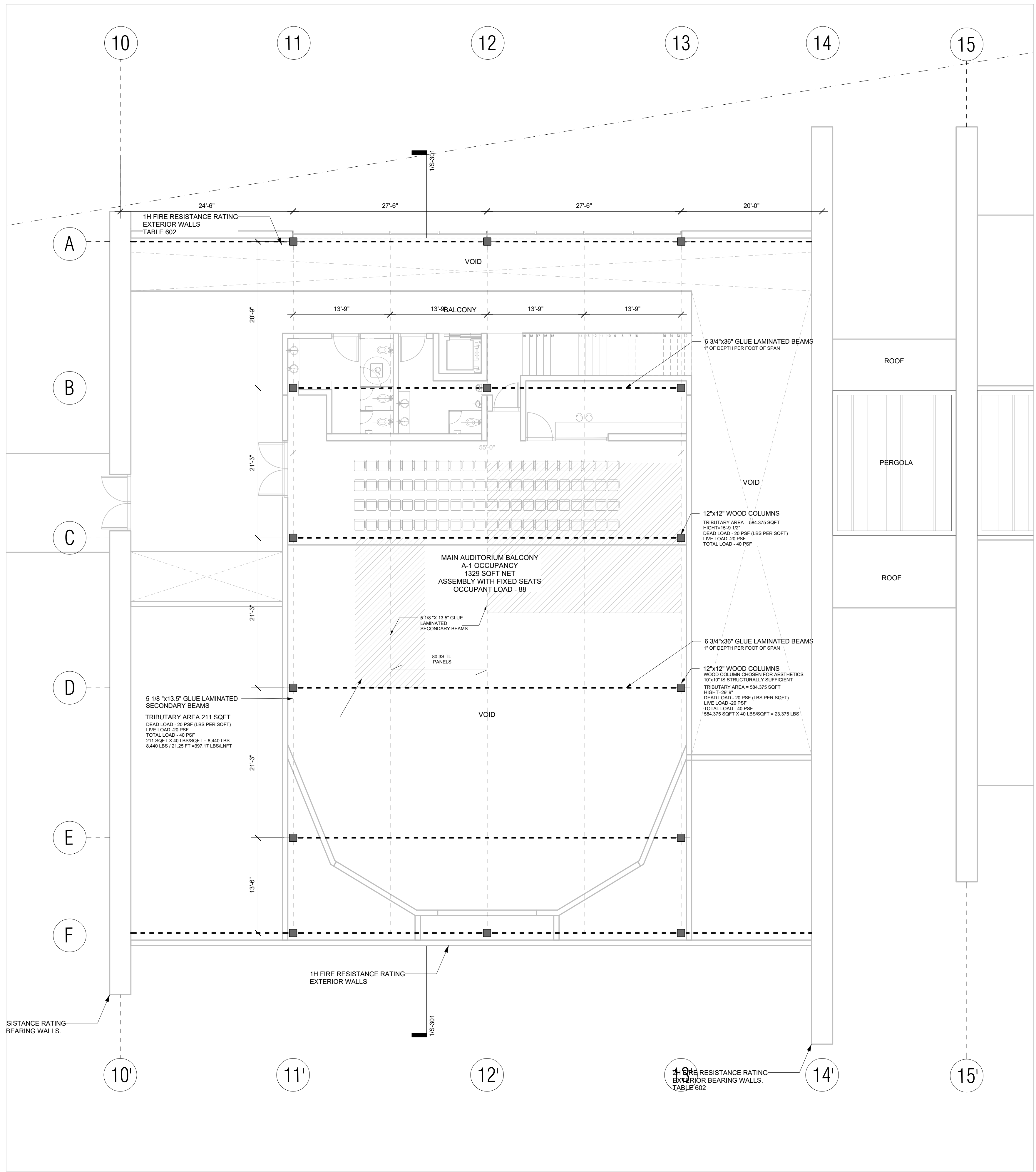
PRIMARY BEAM FOR THE BALCONY 6 3/4" x 36" GLUE LAMINATED MAIN BEAM

WOOD COLUMNS - TALL



4. WOOD COLUMNS CHART

COLUMNS 12"x12" SUPPORTING ROOF ONLY



2 SECOND FLOOR AUDITORIUM STRUCTURAL PLAN
SCALE: 1/8" = 1'-0"

Architectural Appearance Beams 5 1/8" Roof Load Tables – 115% Snow

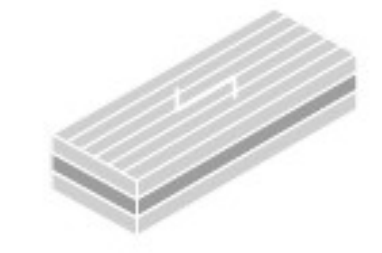
		24F-V4 Grade – 115% Load Duration In pounds per lineal foot (PLF)												
Span (ft)	Span Type	6"	7.5"	9"	10.5"	12"	13.5"	15"	16.5"	18"	19.5"	21"	22.5"	24"
		6	Simple	1564	2446	3525	4800	6232	7480	8906	10552	12472		
	Multiple	1204	1884	2715	3697	4529	5338	6229	7213	8307				
	Min. Bearing	1.5/3	2.2/4.3	3.2/6.1	4.3/8.4	5.6/10.2	6.8/12.1	8/14.1	9.5/16.3	11.3/18.8				
8	Simple	877	1372	1978	2694	3521	4459	5507	6524	7474	8525	9692		
	Multiple	674	1055	1522	2074	2711	3433	4146	4719	5332	5992	6702		
	Min. Bearing	1.5/3	1.7/3.2	2.4/4.6	3.3/6.3	4.2/8.2	5.4/10.4	6.6/12.5	7.9/14.2	9/16.1	10.3/18.1	11.7/20.2		
10	Simple	485	875	1262	1720	2248	2849	3518	4258	5070	5952	6702	7469	
	Multiple	429	672	970	1323	1730	2191	2707	3278	3903	4366	4833	5327	
	Min. Bearing	1.5/3	1.5/3	1.9/3.7	2.6/5	3.4/6.5	4.3/8.3	5.3/10.2	6.4/12.4	7.6/14.7	9/16.5	10.1/18.2	11.3/20.1	
12	Simple	277	547	873	1190	1557	1972	2437	2951	3514	4126	4787	5459	6173
	Multiple	295	464	670	914	1197	1516	1874	2270	2703	3175	3684	4137	4514
	Min. Bearing	1.5/3	1.5/3	1.6/3.1	2.2/4.2	2.8/5.5	3.6/6.9	4.4/8.5	5.4/10.3	6.4/12.3	7.5/14.4	8.7/16.7	9.9/18.8	11.2/20.5
14	Simple	172	341	594	871	1140	1445	1786	2163	2576	3001	3456	3942	4458
	Multiple	215	338	489	668	875	1110	1372	1662	1980	2307	2658	3032	3429
	Min. Bearing	1.5/3	1.5/3	1.5/3	1.9/3.6	2.4/4.7	3.1/5.9	3.8/7.3	4.6/8.8	5.5/10.5	6.4/12.2	7.3/14.1	8.3/16.1	9.4/18.2
16	Simple	113	225	394	631	869	1102	1363	1643	1940	2261	2605	2971	3360
	Multiple	151	257	372	509	667	846	1046	1262	1491	1737	2002	2284	2584
	Min. Bearing	1.5/3	1.5/3	1.5/3	1.5/3.1	2.1/4.1	2.7/5.2	3.3/6.4	4/7.7	4.7/9.1	5.5/10.6	6.3/12.2	7.2/13.9	8.1/15.7
18	Simple	77	155	274	439	660	867	1065	1279	1510	1760	2028	2314	2618
	Multiple	103	201	292	399	523	665	817	981	1159	1351	1557	1777	2011
	Min. Bearing	1.5/3	1.5/3	1.5/3	1.5/3	1.8/3.6	2.4/4.6	2.9/5.6	3.5/6.8	4.1/8	4.8/9.3	5.5/10.7	6.3/12.2	7.2/13.8
20	Simple	54	111	196	317	477	684	850	1021	1206	1406	1620	1849	2092
	Multiple	73	149	234	321	421	531	651	782	925	1078	1243	1419	1606
	Min. Bearing	1.5/3	1.5/3	1.5/3	1.5/3	1.5/3.3	2.1/4.1	2.6/5	3.1/6	3.7/7.1	4.3/8.3	4.9/9.5	5.6/10.9	6.4/12.3
22	Simple	-	81	145	235	355	509	693	832	983	1146	1322	1509	1707
	Multiple	-	109	192	263	344	432	530	636	753	878	1013	1156	1309
	Min. Bearing	-	1.5/3	1.5/3	1.5/3	1.5/3	1.7/3.7	2.3/4.5	2.8/5.4	3.3/6.4	3.9/7.5	4.5/8.6	5.1/9.8	5.7/11.1

1. BEAMS TABLES

05 K LH® ROOF PANELS

5.1 ROOFS WITH L = 20 PSF

according to NDS 2015 and CLT Handbook, US ed.

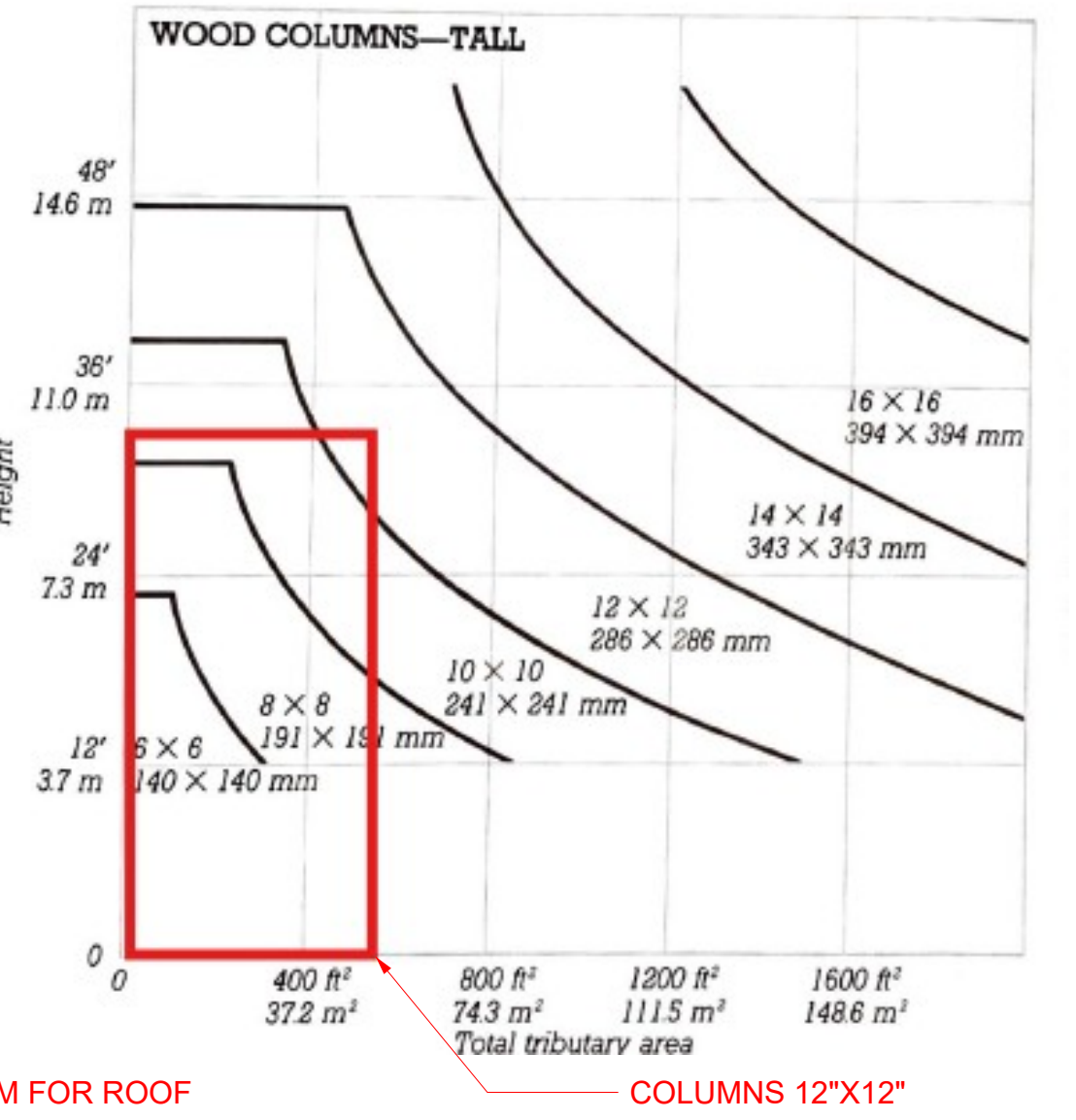
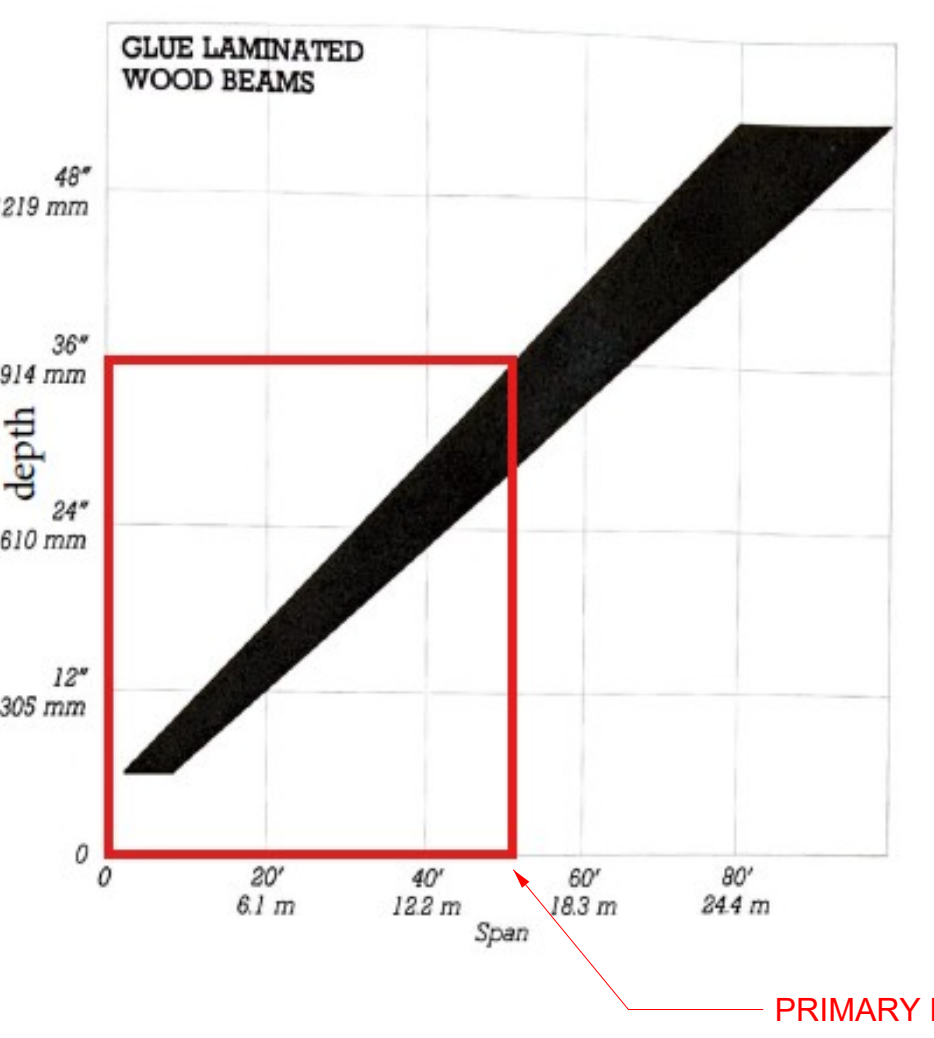


Preliminary Sizing of CLT Roof Panels	
D	= 10 psf + panel self weight
L	= 20 psf, C ₀ = 1.25
Allowable spans for K LH®-CLT in major strength direction	
Single span = L and two equal spans each = L	
Governing span in bold font	

Panel Type	Thickness (in)	Both span conditions		Single span		Two equal spans	
		Allowable	Long term	Live load Δ _L	Long term	Live load Δ _L	
		Moment (ft)	Δ _T = L/180	@ Allowable Moment span	Δ _T = L/180	@ Allowable Moment span	
60 3s TL	2.36	14.18	10.17	L/183	13.72	(5)	
70 3s TL	2.76	16.00	11.60	L/197	15.67	(5)	
80 3s TL	3.15	18.57	13.36	L/200	18.03	(5)	
90 3s TL	3.54	20.41	14.77	L/211	19.94	(5)	
100 3s TL	3.94	22.65	16.36	L/218	22.06	(5)	
105 3s TL	4.13	23.26	16.85	L/225	22.79	(5)	
120 3s TL	4.72	26.06	18.94	L/239	25.58	(5)	

2. FLOOR PANNELS TABLES

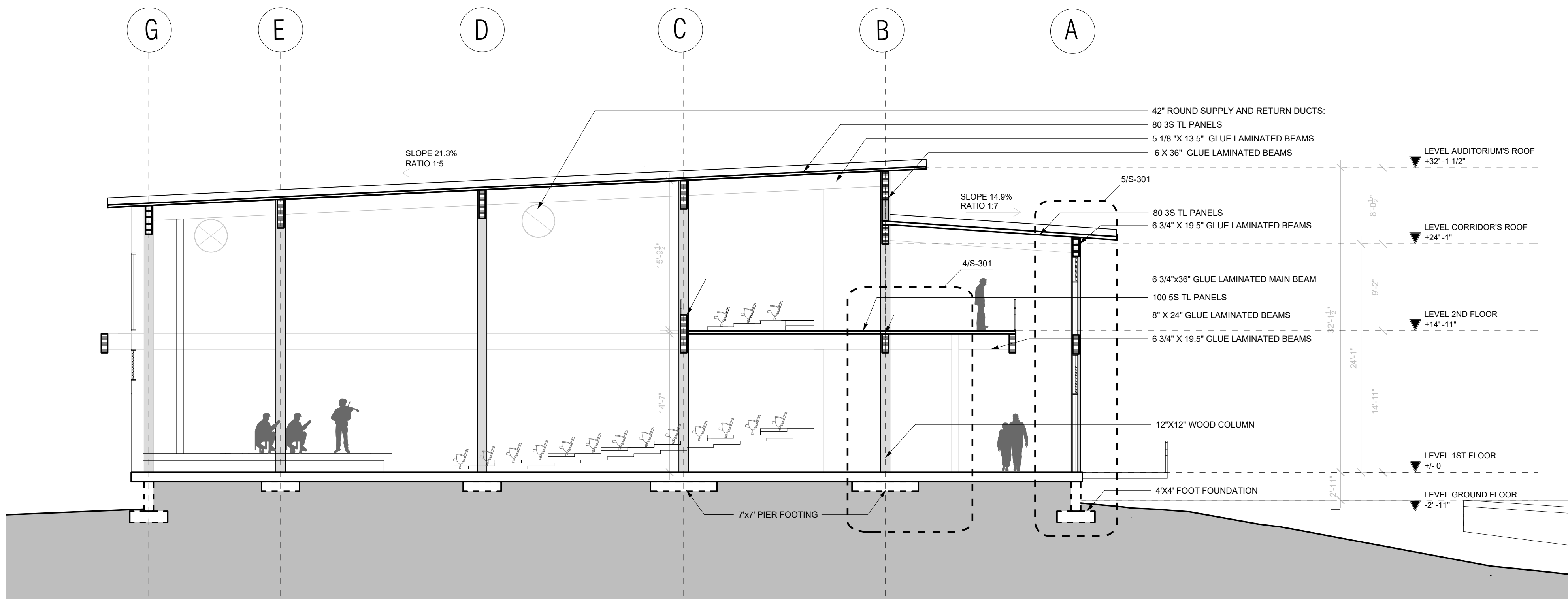
GLUE LAMINATED WOOD BEAMS



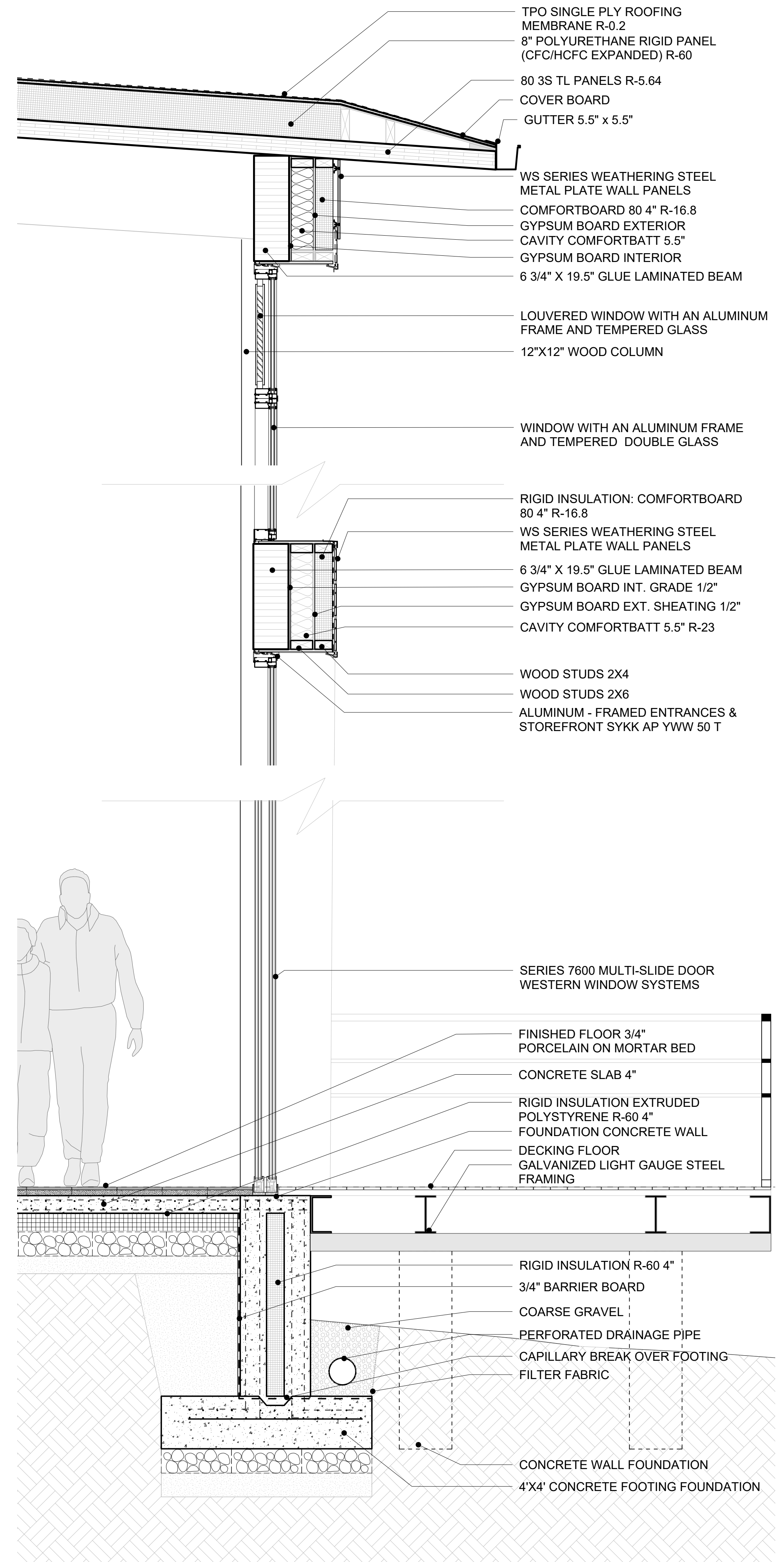
3. GLUELAM BEAMS CHART

4. WOOD COLUMNS CHART

2 SECOND FLOOR AUDITORIUM STRUCTURAL TABLE ANALYSIS TABLES



3 SECTION
SCALE: 1/8" = 1'-0"



5 DETAIL WALL SECTION
SCALE: 3/4" = 1'-0"

BUILDING STRUCTURE DESCRIPTION

CONSTRUCTION TYPE:
Assembly Group A-3 in the International Building Code (IBC).
specific requirements for fire protection, means of egress, and interior finishes to ensure the safety of occupants.

Type III construction is characterized by the use of non-combustible materials for exterior walls and any structural elements that are part of the exterior. However, the interior building elements (such as floors, ceilings, and partitions) can be constructed using any material allowed by code, including combustible materials.

Key Features

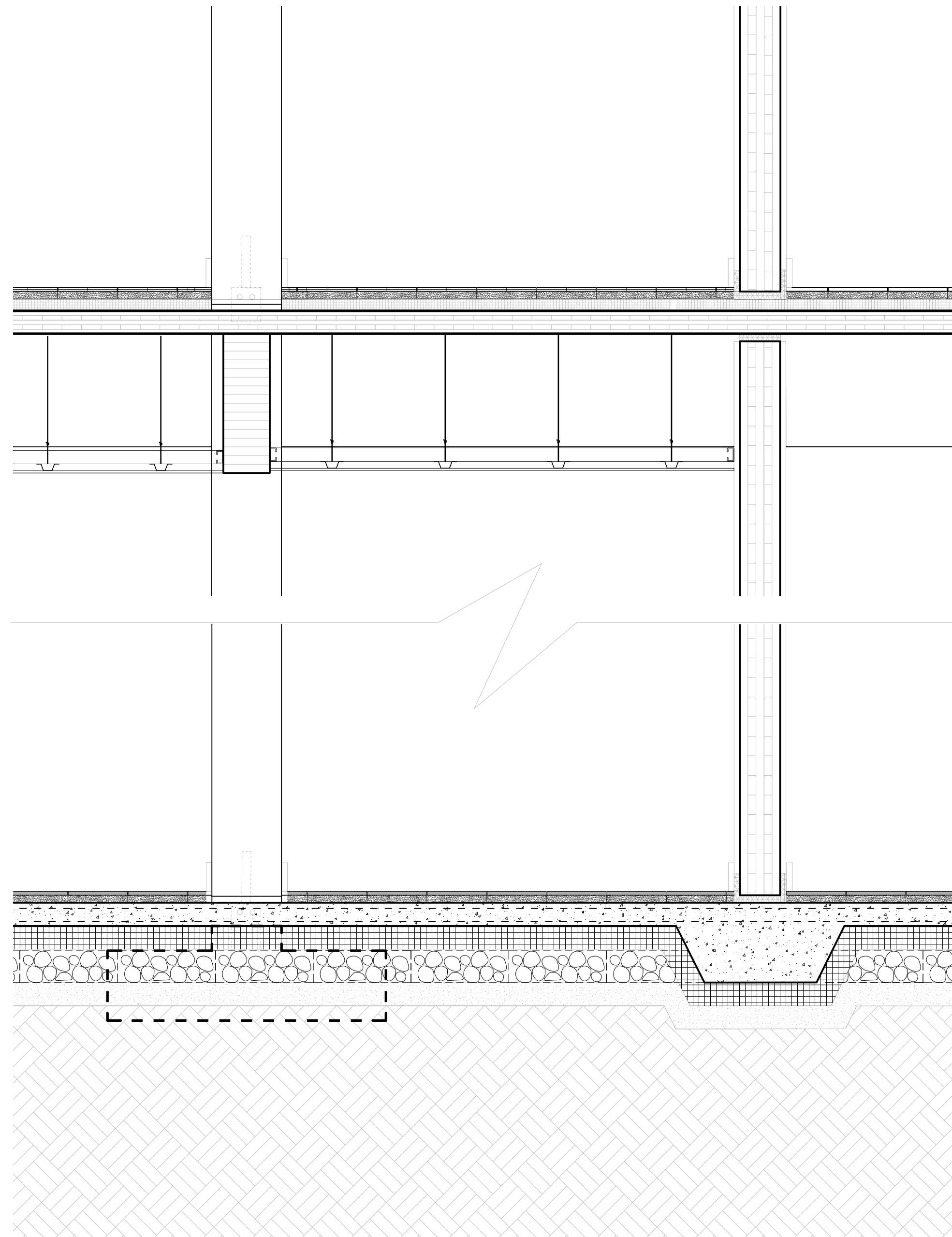
Exterior Walls:
Non-combustible materials such as concrete, brick, block, or other approved materials. Exterior walls typically have a fire-resistance rating of 2 hours or more, depending on the building's height and occupancy type.

Interior Building Elements:
Can be constructed with combustible materials like wood or other approved materials. The fire-resistance ratings for interior elements can vary based on specific building design and occupancy requirements.

Fire Safety Considerations:
Type III construction offers a balance between fire resistance and flexibility in interior materials, making it a popular choice for many mid-rise buildings.

Required spans - long spanning spaces in the Auditorium of 55" will require a 6 3/4"x36" glue laminated beam.

Sustainable materials
-Materials with low embodied carbon:
Heavy mass timber for the main structure and, wood, metal, curtain steel for the cladding system and interior spaces
-Local Materials: Limestone for bearing walls and landscape walls.



4 DETAIL WALL SECTION
SCALE: 3/4" = 1'-0"