PORTLAND STATE UNIVERSITY

SCHOOL OF BUSINESS ADMINISTRATION
Renovation and Expansion

Design Review Appeal
September 8, 2016

SRG | BEHNISCH ARCHITEKTEN

APPEAL OF CONDITION D FOR GUIDELINE B5 & C6

CASE NUMBER LU 15-129978 DZM AD

Design Team's Position:

After extensive study, the design team believes the proposed windows on the east and west ends of the wood trays to meet Condition D are not an improvement architecturally. They introduce a new, foreign design language into the building composition that does not exist anywhere else on the building. Fundamental to the new building concept is the interplay between solid wood and glass volumes to contrast a reflective, metal renovation facade that operates more as the addition's backdrop. We firmly believe the inclusion of windows per Condition D, greatly detracts from the overall coherency of the building design, guideline C5, while only minimally responding to aspects of guidelines B5 and C6 dealing with transparency and view connections. Additionally, the technical solutions the team arrived at in the effort to meet condition D have created unexpected impacts to guideline C2, Promote Quality And Permanence In Development, due to cumbersome maintenance and operational requirements. The following pages argue that the design meets and exceeds the design guidelines listed above best without the inclusion of condition D.

DESIGN OVERVIEW

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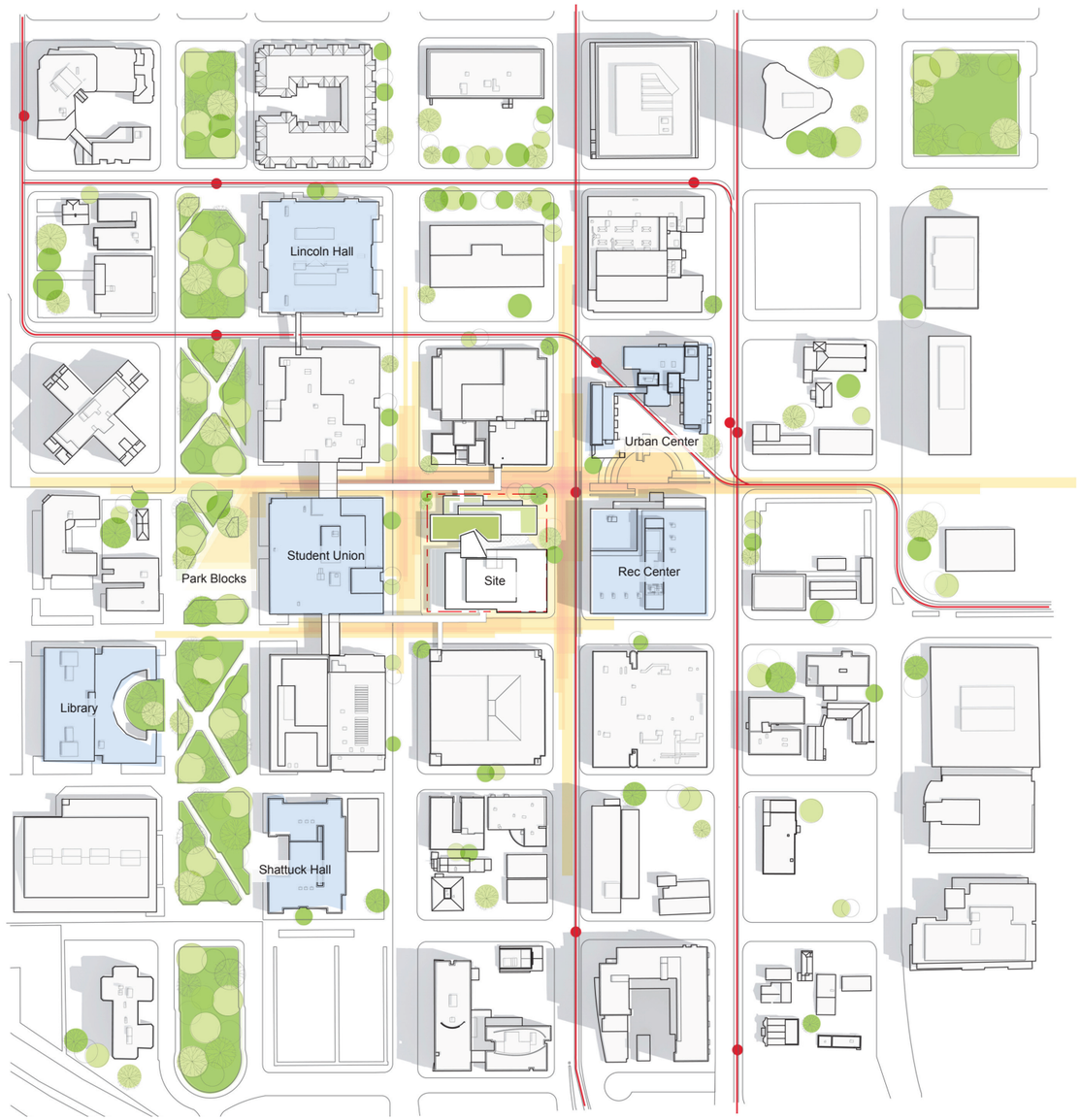
Site Plan



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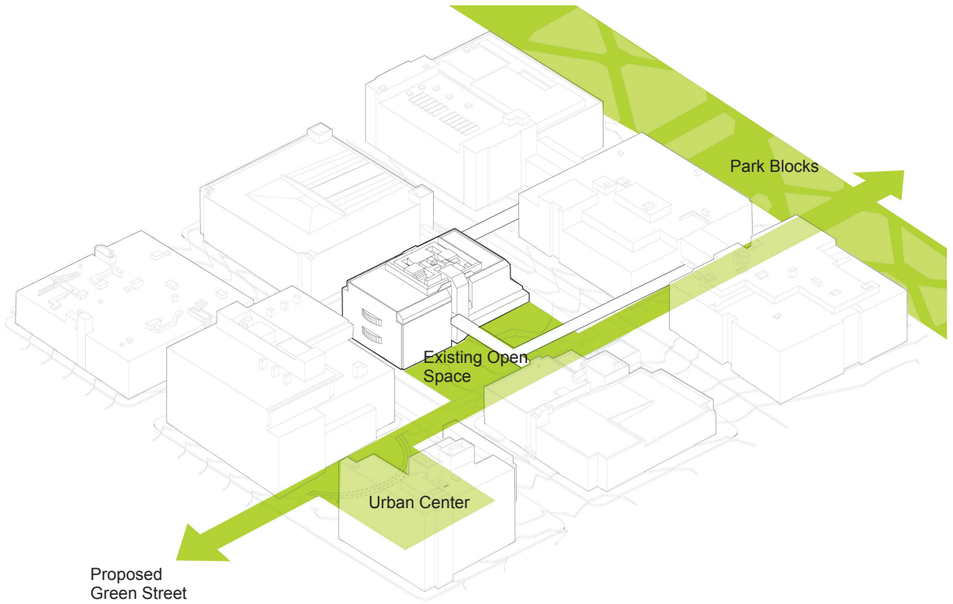
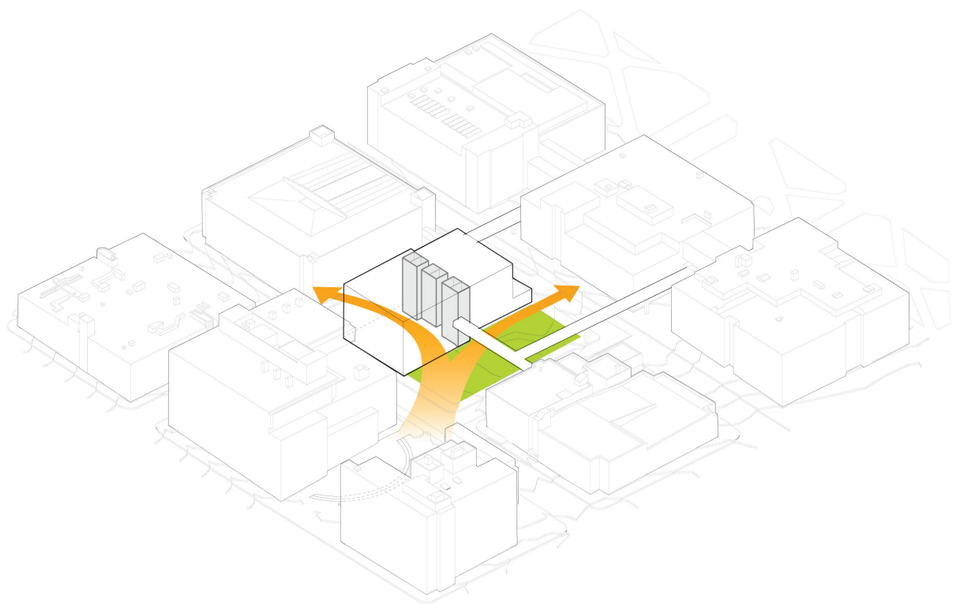
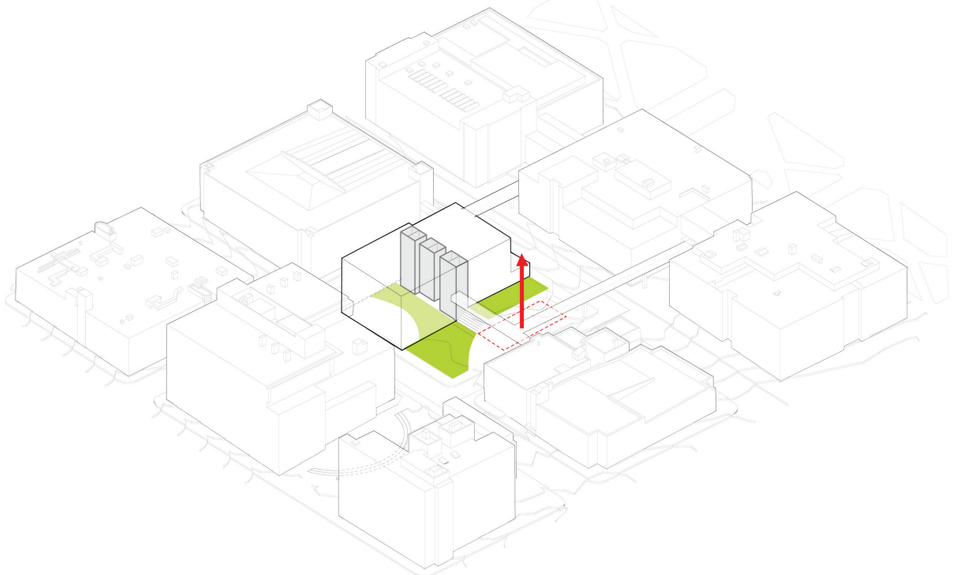
Concept Diagrams



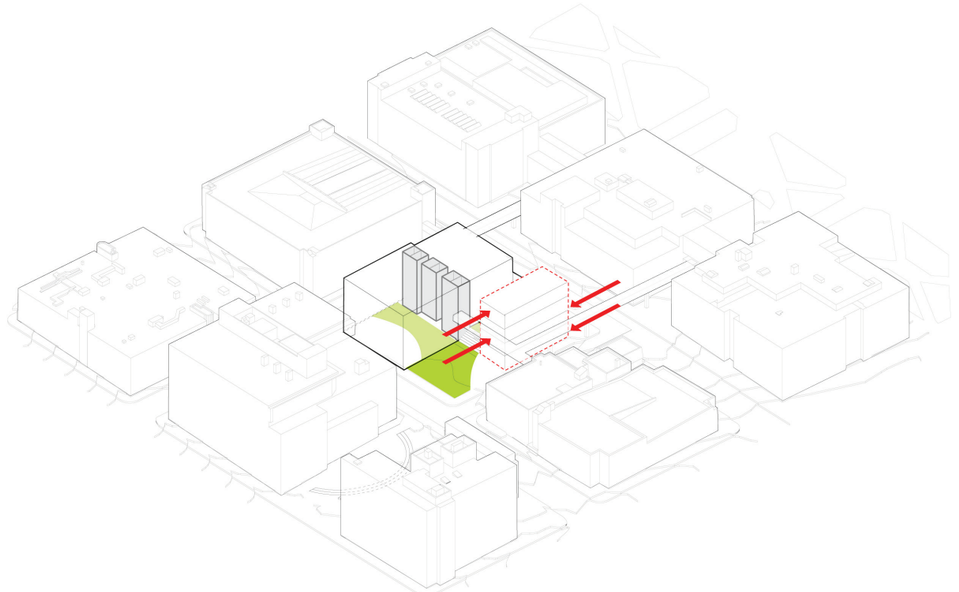
1. Existing Conditions



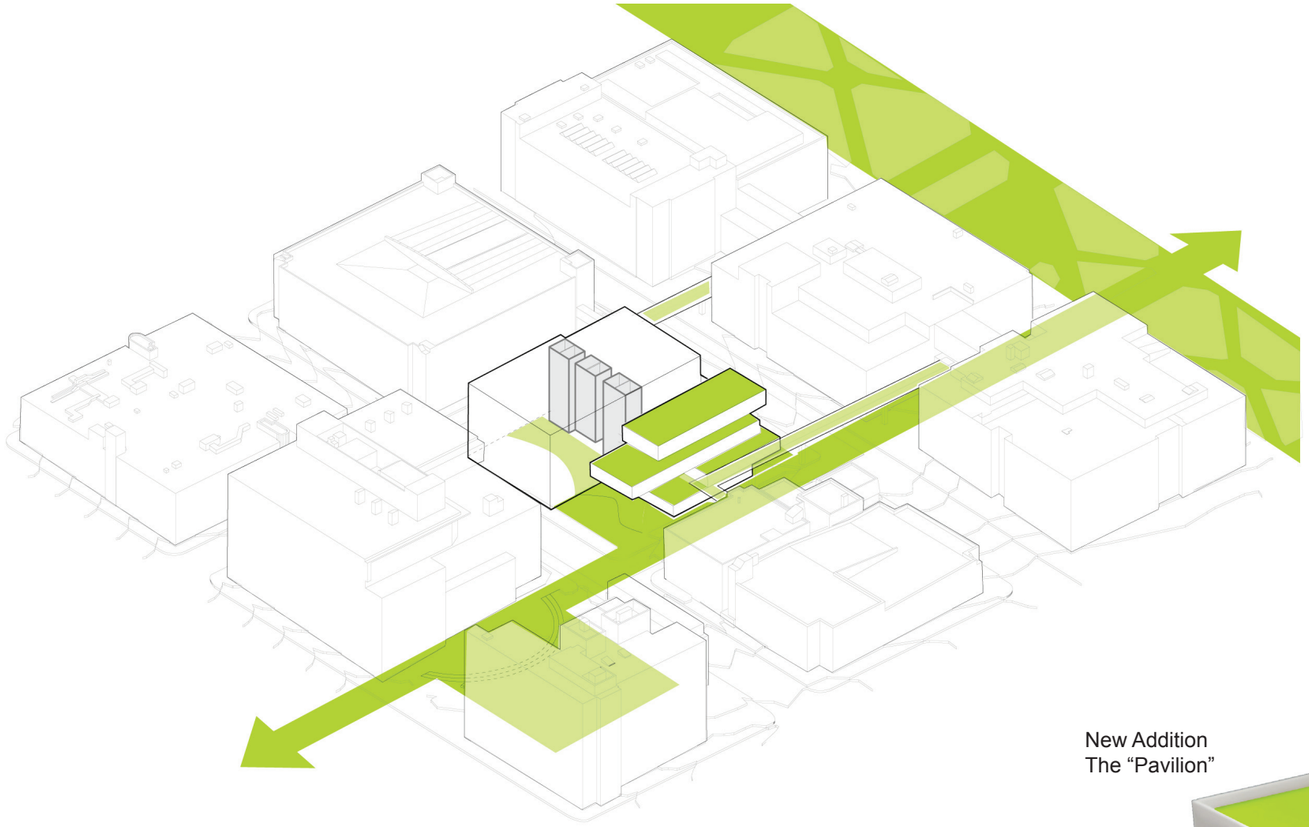
2. Proposed Circulation



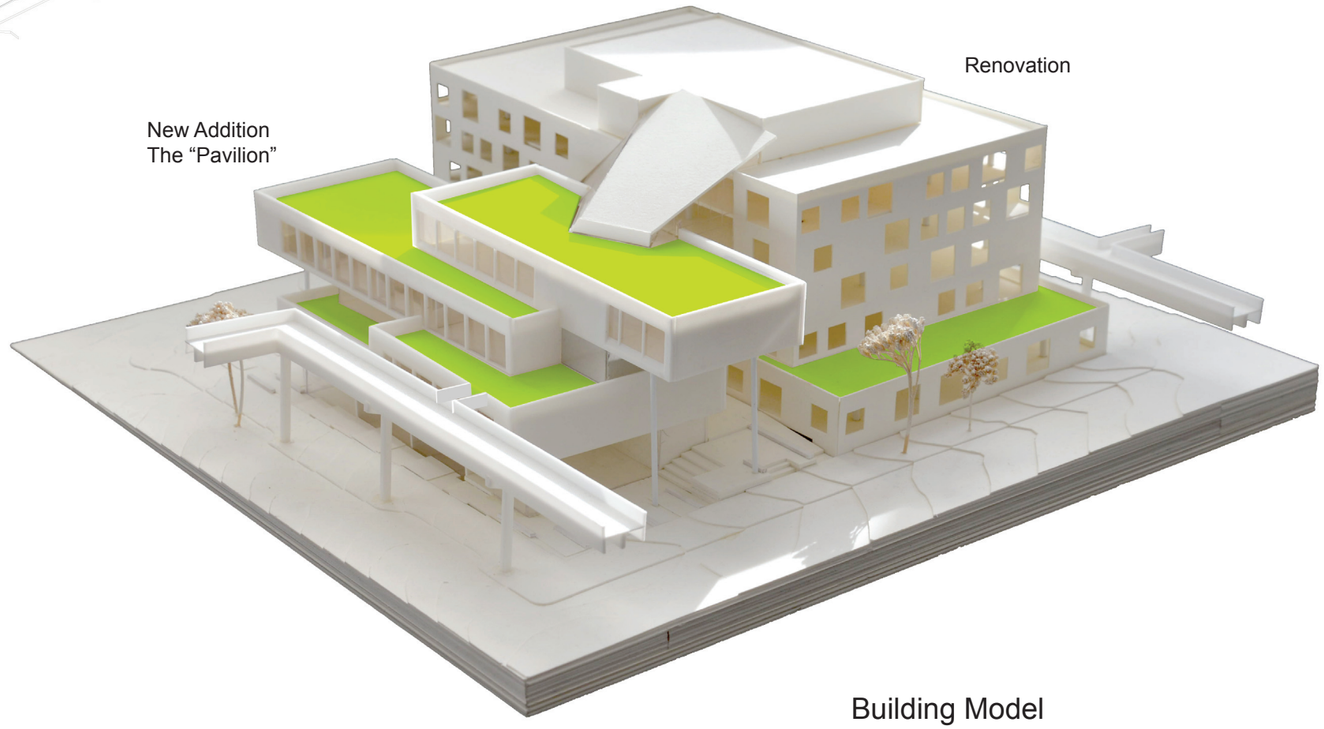
3. Locate Building Footprint



4. Shift building programs to create additional exterior spaces



4. A new urban park



Building Model

Rejecting the singular building construction that dominates the 200' x 200' city blocks, the proposed design appears as two distinct buildings sharing a city block. This approach enhances the public realm by providing a more diverse streetscape and by reinvigorating existing links and creating new arteries between the urban center and nearby park. The result creates a pedestrian-friendly block along the proposed green street with a high degree of transparency advocating for new architectural opportunities and future development along 6th Avenue, Broadway and Montgomery Street.

Exterior Rendering
Montgomery at 6th Ave.

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Exterior Rendering

Montgomery at Broadway

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Interior Rendering

Atrium

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GUIDELINE B5 & C6
CONDITION OF APPROVAL ITEM D
CASE NUMBER LU 15-129978 DZM AD

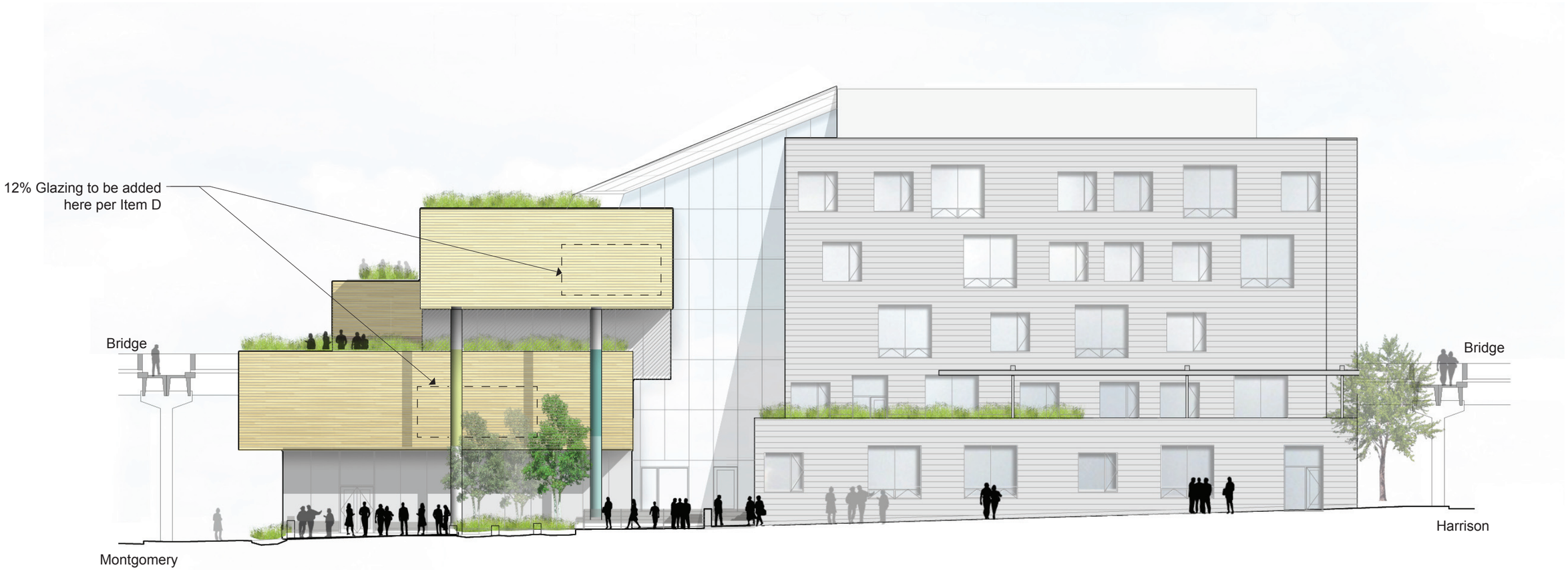
Condition of Approval for Guideline B5 Make Plazas, Parks and Open Space Successful & C6 Develop Transitions Between Buildings and Public Spaces:

"Glazing (with operable shade screens) to be added to each level of the east and west facades of the pavilion trays (12% of each building face)" with the goal of "providing a degree of transparency...to fully enhance the adjacent plaza."

6th Avenue Elevation

Southeast Facade

Broadway Elevation
Northwest Facade



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Condition D Design Study
View from Montgomery @ 6th Avenue

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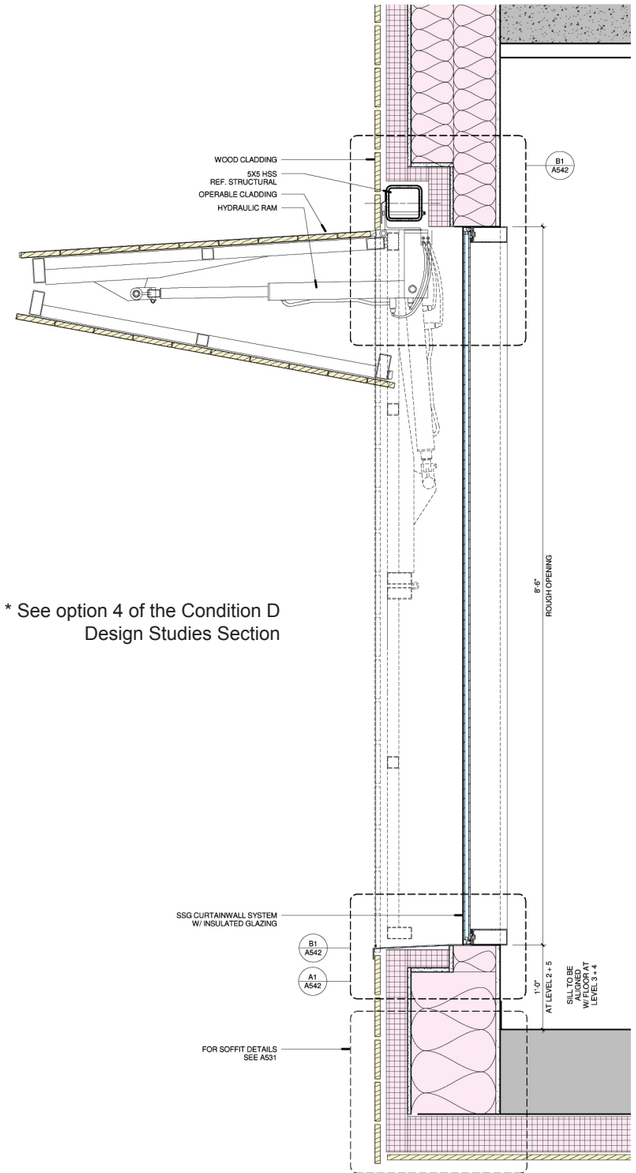
Condition D Design Study

View from Montgomery @ Broadway



* See option 4 of the Condition D Design Studies Section

Section

MEETING GUIDELINES B5 AND C6

CASE NUMBER LU 15-129978 DZM AD

Guideline B5- Make Plazas, Parks and Open Space Successful

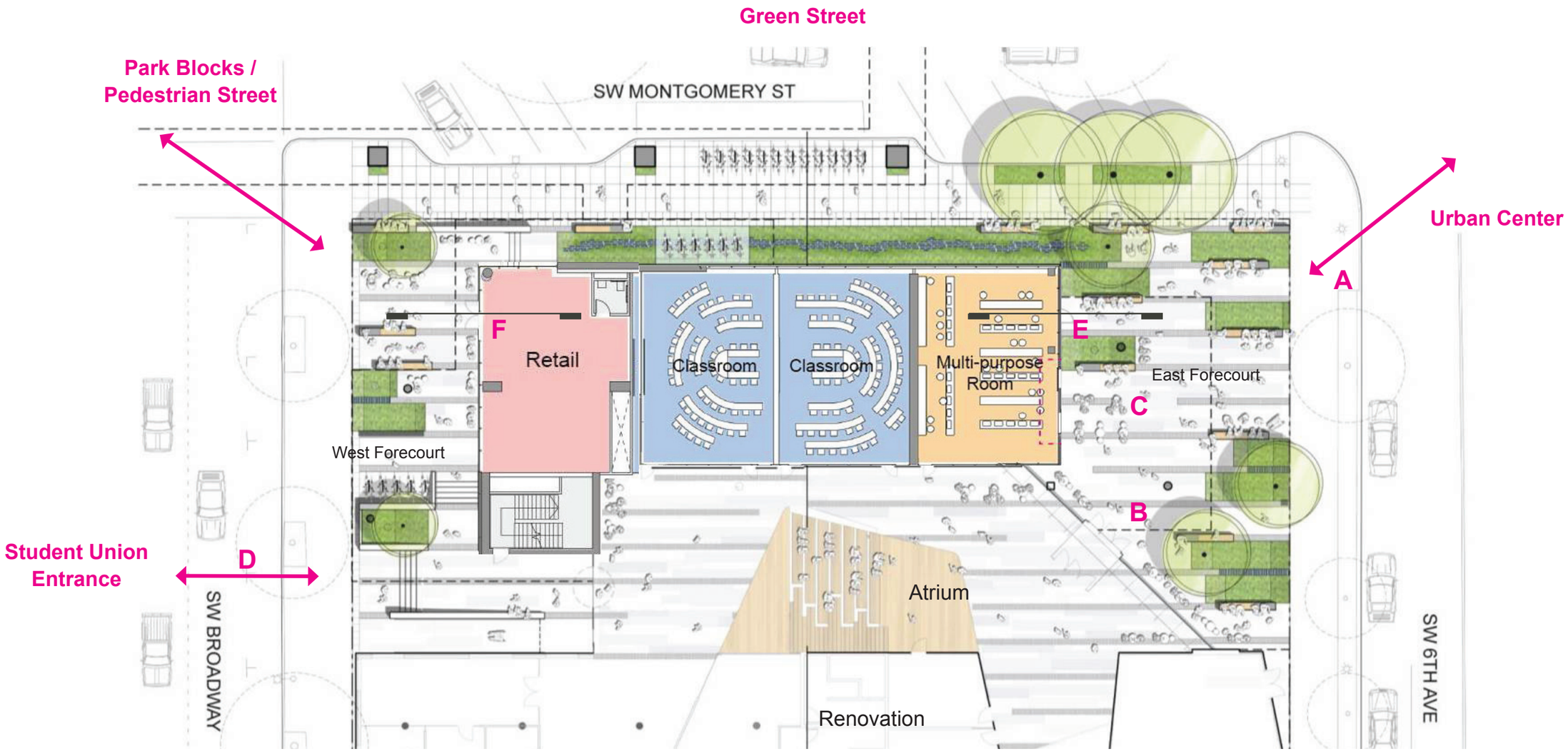
-Orient building elements such as main entries, lobbies, windows, and balconies to face public parks, plazas, and open spaces.
- Where provided, integrate water features and/or public art to enhance the public open space
-Develop locally-oriented pocket parks that incorporate amenities for nearby patrons.

Guideline C6 - Develop Transitions Between Buildings And Public Spaces

- Develop transitions between private development and public open space.
- Use site design features such as movement zones, landscape elements, gathering places, and seating opportunities to develop transition areas where private development directly abuts a dedicated public open space.

Guideline B5

Orient building elements such as main entries, lobbies, windows, and balconies to face public parks, and open spaces

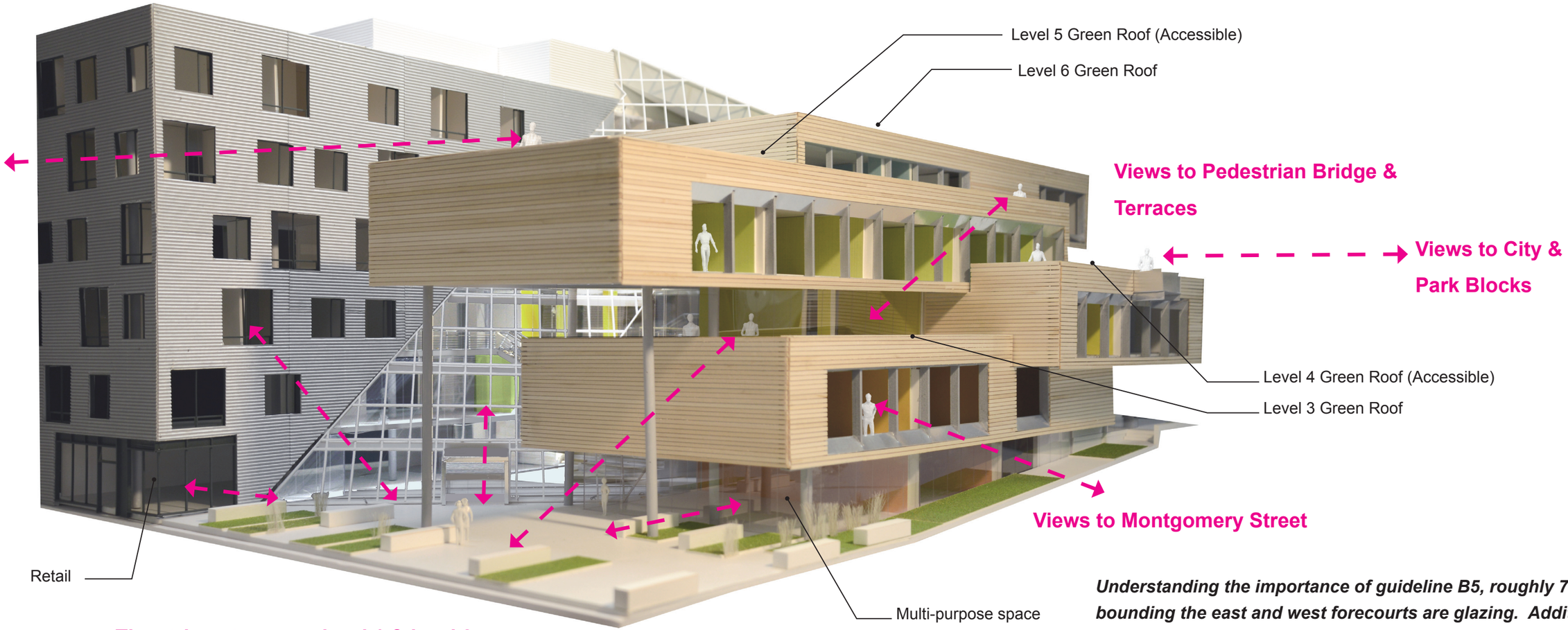


Open space is designed on both the east and west sides of the new building to accept patrons from both the Urban Center and the Park Blocks. The larger forecourt (figure A) faces the urban center and provides spaces for large gatherings and smaller group settings based on the planter and bench layout. The ground level facades shaping this plaza are primarily glass. 12'-0" wide sliding glass doors (figure C) allow for a multi purpose space to open directly into this plaza which will allow for the building program to spill into exterior spaces. In addition, a 6 floor sloped glass skylight (figure B) is oriented 45 degrees to this plaza to face the Urban Center. This orientation will provide complete transparency into a vibrant atrium space and will help animate the forecourt and provide visual interest from the sidewalk along 6th Avenue and the Urban Center. These design aspects play a large role in not only meeting but exceeding design guidelines B5 and C6.

C

A

B



The atrium, terraces, level 1 & level 3 classrooms, retail, and north facing offices, provide visual connections to the Urban Center and the east side forecourt

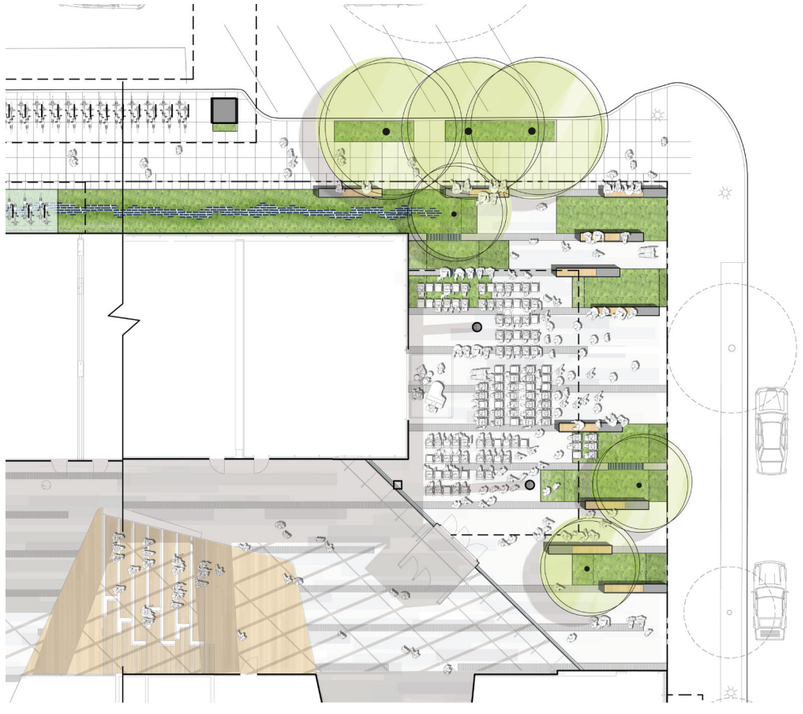
Understanding the importance of guideline B5, roughly 75% of the facade bounding the east and west forecourts are glazing. Additionally, the building design incorporates 100% glazing along Montgomery Street to help activate the future green street and a significant percentage of glazing along the 6th Avenue transit street for retail use.

As seen in the model picture above, by incorporating landscaping planters, benches, exterior terraces at different levels, and an atrium volume facing the Urban Center and forecourt, the building also meets guideline C6. While the high degree of transparency in the design helps increase view connections from the interior to the exterior, we feel the exterior terraces will actually produce the most tangible and direct connections between this new building and the surrounding forecourts and open spaces.

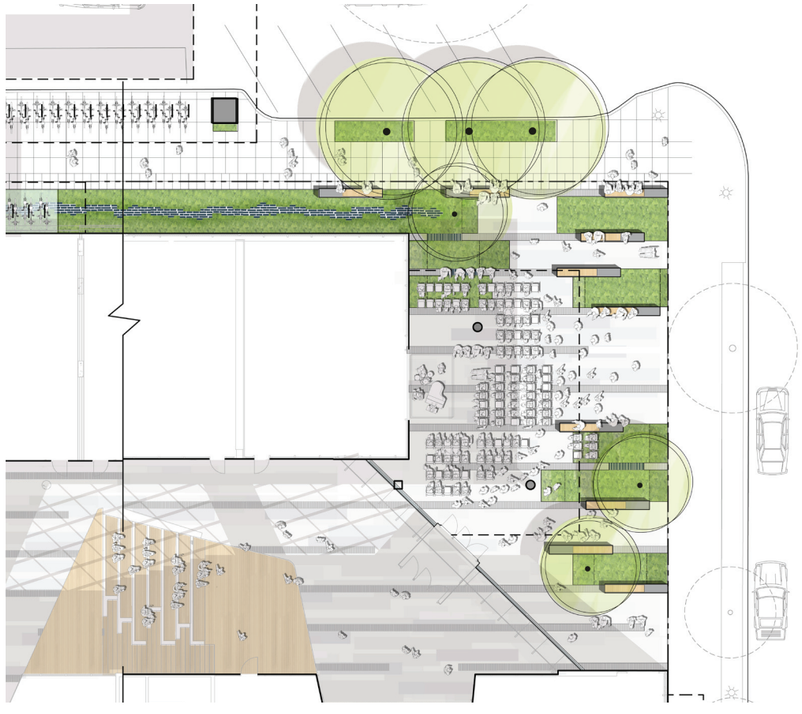
Guideline B5

Orienting incorporated open spaces to receive sunlight

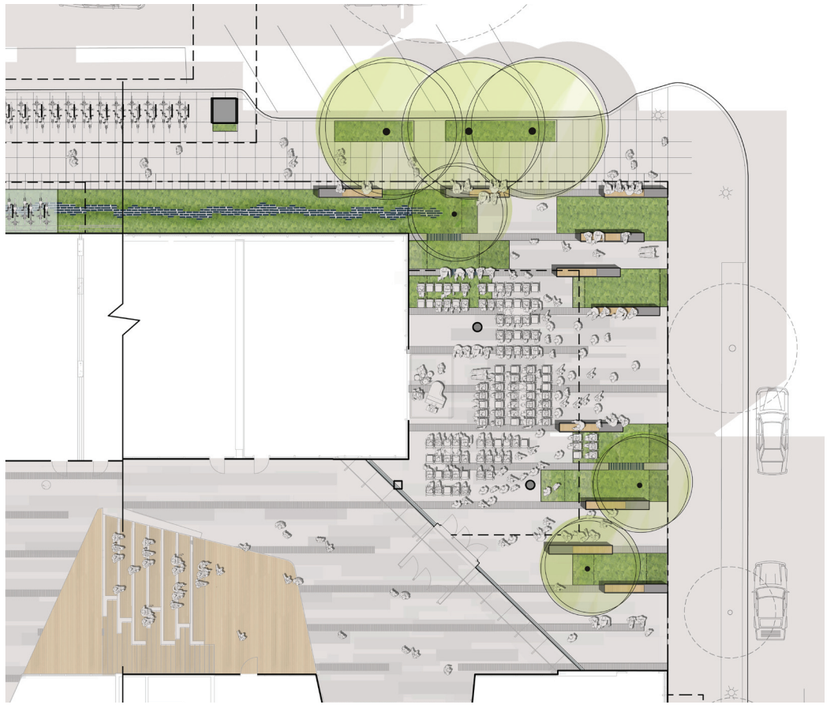
The design team worked to ensure the east and west forecourts would feel like an outdoor room. Each forecourt, comprised of warm finishes provided by the wood (Alaskan Yellow Cedar) walls and soffits above, will be create a welcoming environment for patrons. Additionally, sun angle studies as seen below ensure the space would receive ample sunlight throughout the day. While the building volumes above cantilever almost 25' over the forecourt below, the geometry allows necessary sunlight but also provides a large area of cover for rainy days. Careful consideration has been taken to ensure the exterior open spaces will be used all year long.



Forecourt
June 21st @ 9am



Forecourt
June 21st @ 12pm



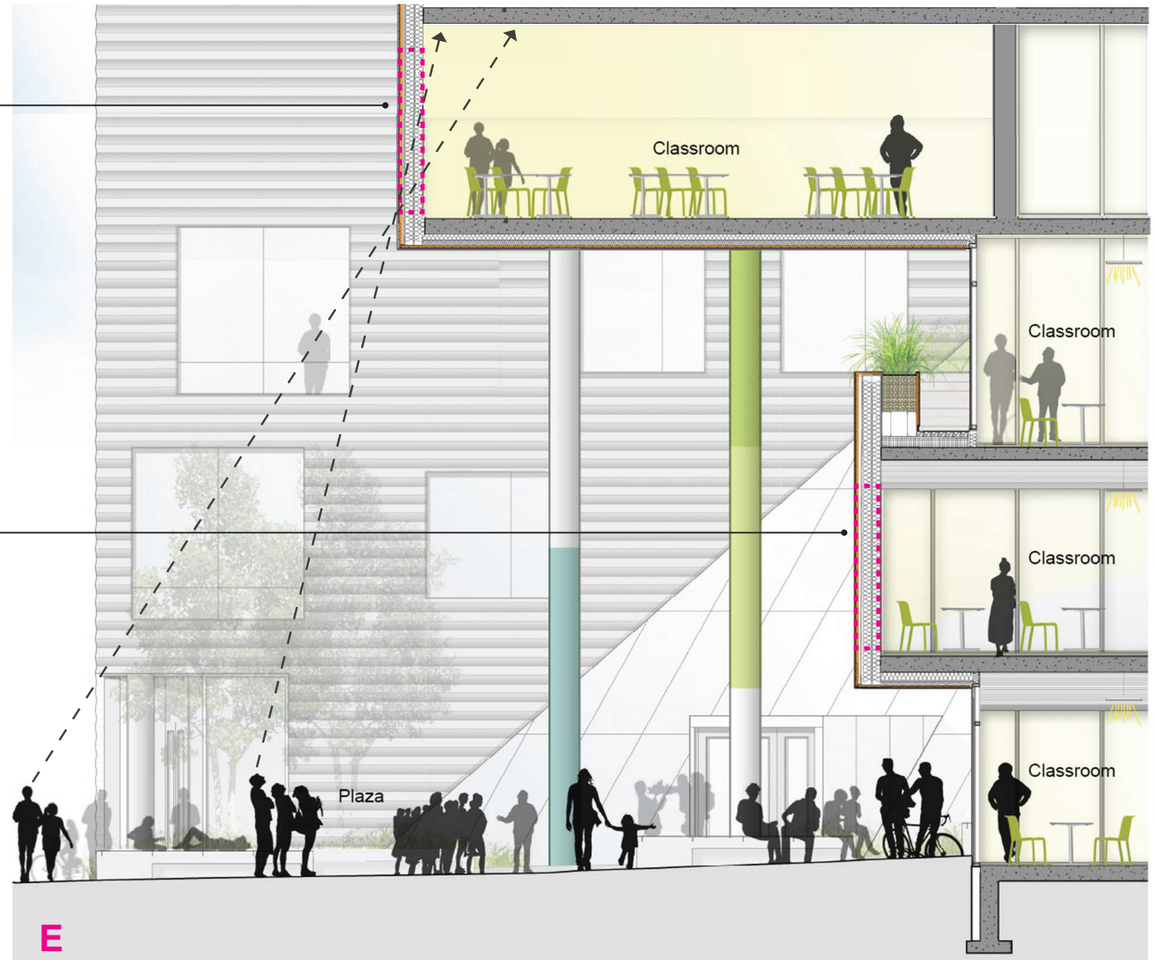
Forecourt
June 21st @ 3pm

Floor to ceiling windows at levels 1 and 3 of the pavilion provide views directly into the forecourt and the urban center. As seen in the section below, the sloped atrium and the large punched office windows of the renovation beyond are also oriented toward this space. This high degree of transparency will help enrich and activate the space.

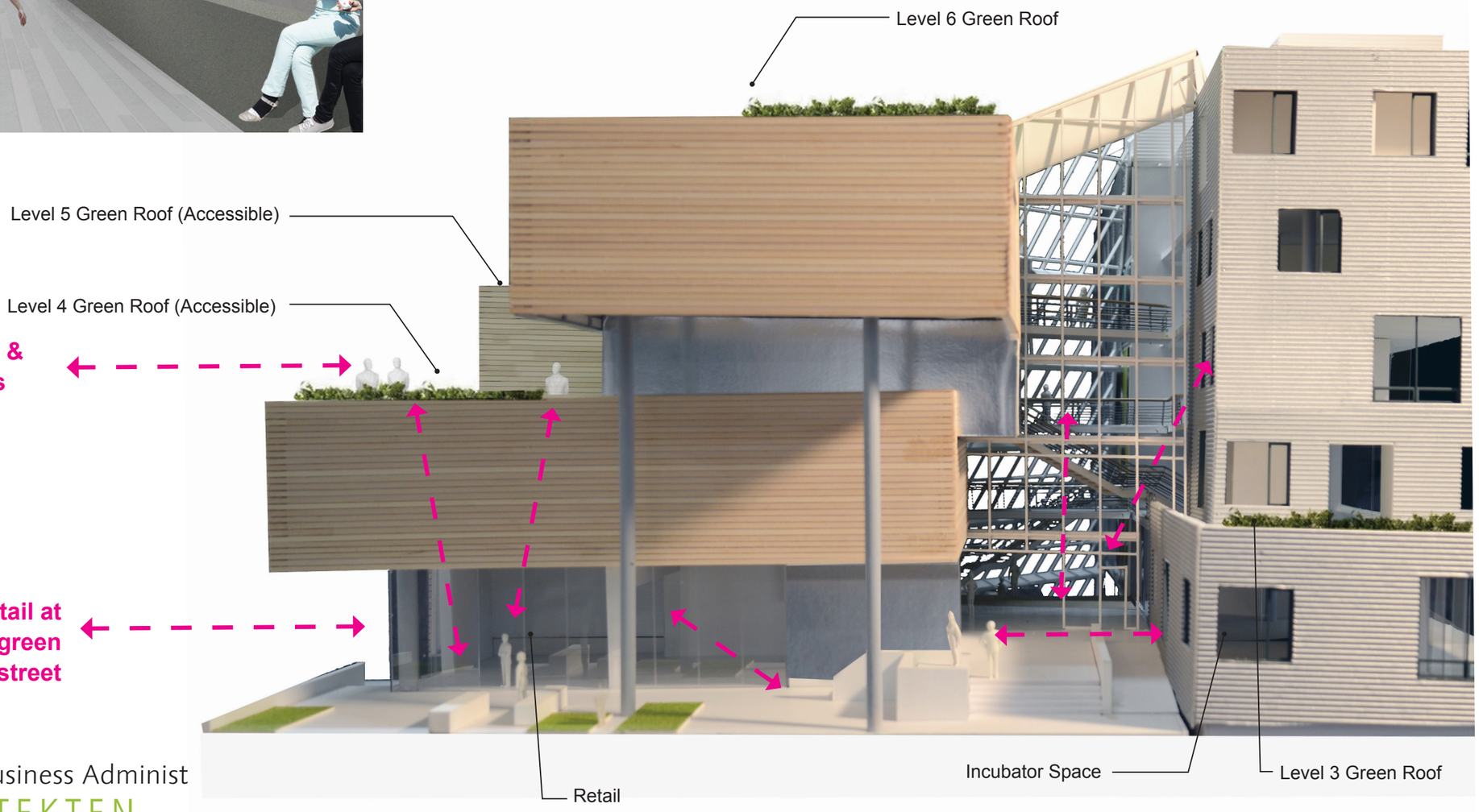
Section through East Forecourt

Condition D proposed location of glazing. As seen in the section, glazing at this elevation will not contribute to the vitality of the open space below. Patrons outside and users inside would not make any visual connections.

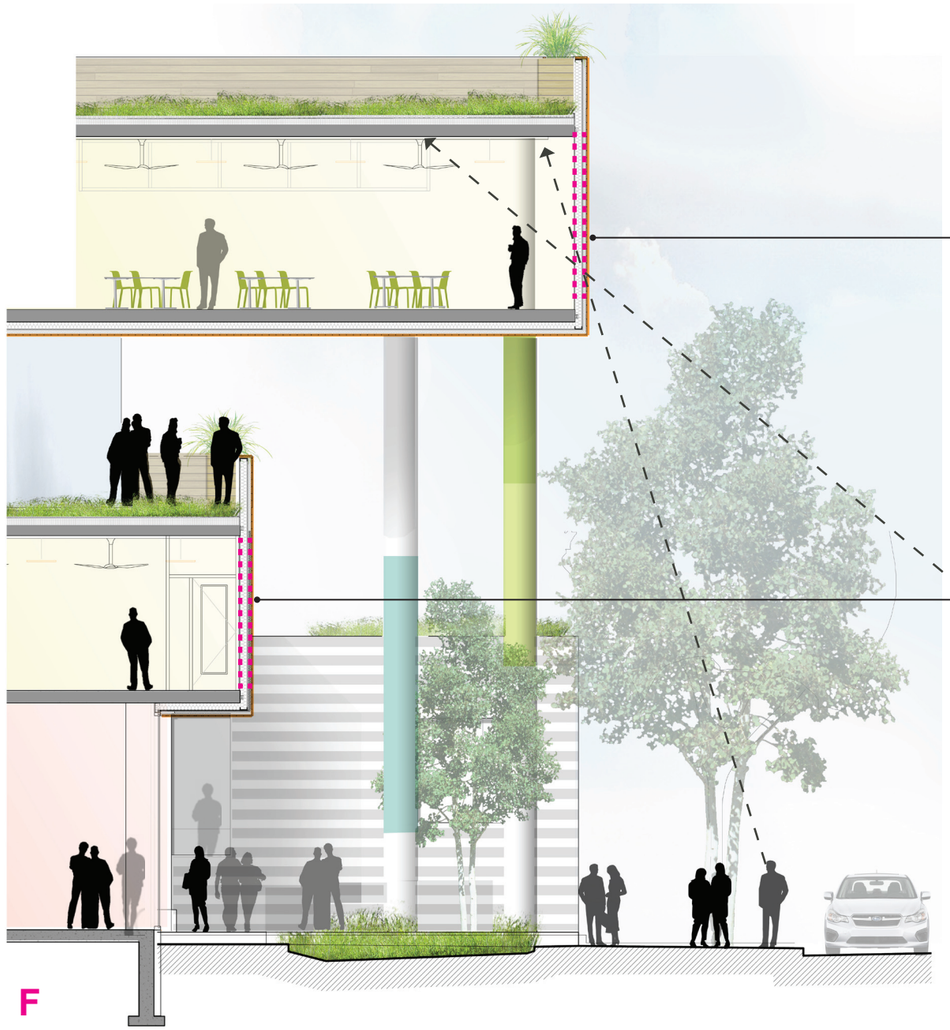
Condition D proposed location of glazing. While glazing here would provide some views into the open space below, the design team believes the glass curtainwalls above and below this wall, the terraces overlooking the space, the atrium, and the large punched windows beyond provide many other openings to ensure the space is successful. Additionally, the added glazing would reduce the amount of wood in the space, break up the coherency of the alternating glass and wood volumes, and impact its quality and permanence.



A second forecourt is located at the intersection of Broadway and Montgomery. Bounding this open space is a 1,250sf retail space with a full height glass curtainwall. The atrium, office windows above, and three large windows of a PSU sponsored incubator space all face this forecourt. As seen in the image below, three green roofs also overlook this forecourt, two of which will provide additional view connections to the forecourt, the pedestrian street adjacent, and the park blocks beyond.



Section through West Forecourt

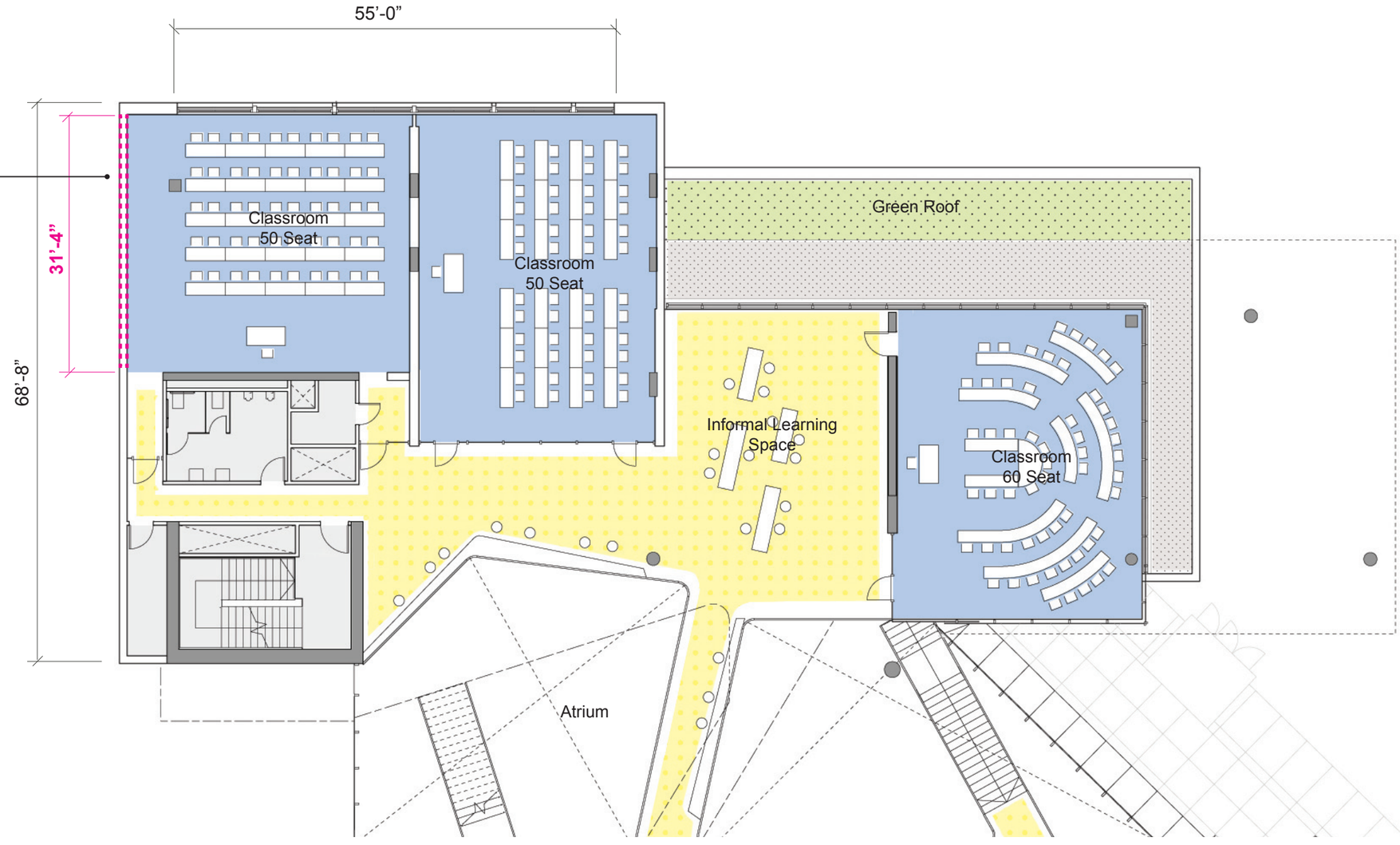


Similar to the east forecourt, the mixture of wood, glazing and terraces, create a very inviting exterior space. Floor to ceiling windows at levels 1 open the retail space to the forecourt and the pedestrian street beyond. As seen in the section below, large punched windows of the renovation space are oriented toward this space. The interior program within the renovation beyond is an incubator, which will be used by PSU students and the Portland business community. While not visible in this section, the 6 floor glass atrium will also create visual connections to the exterior space. The variety of program and visibility of the forecourt from all of these points will create a very vibrant exterior space.

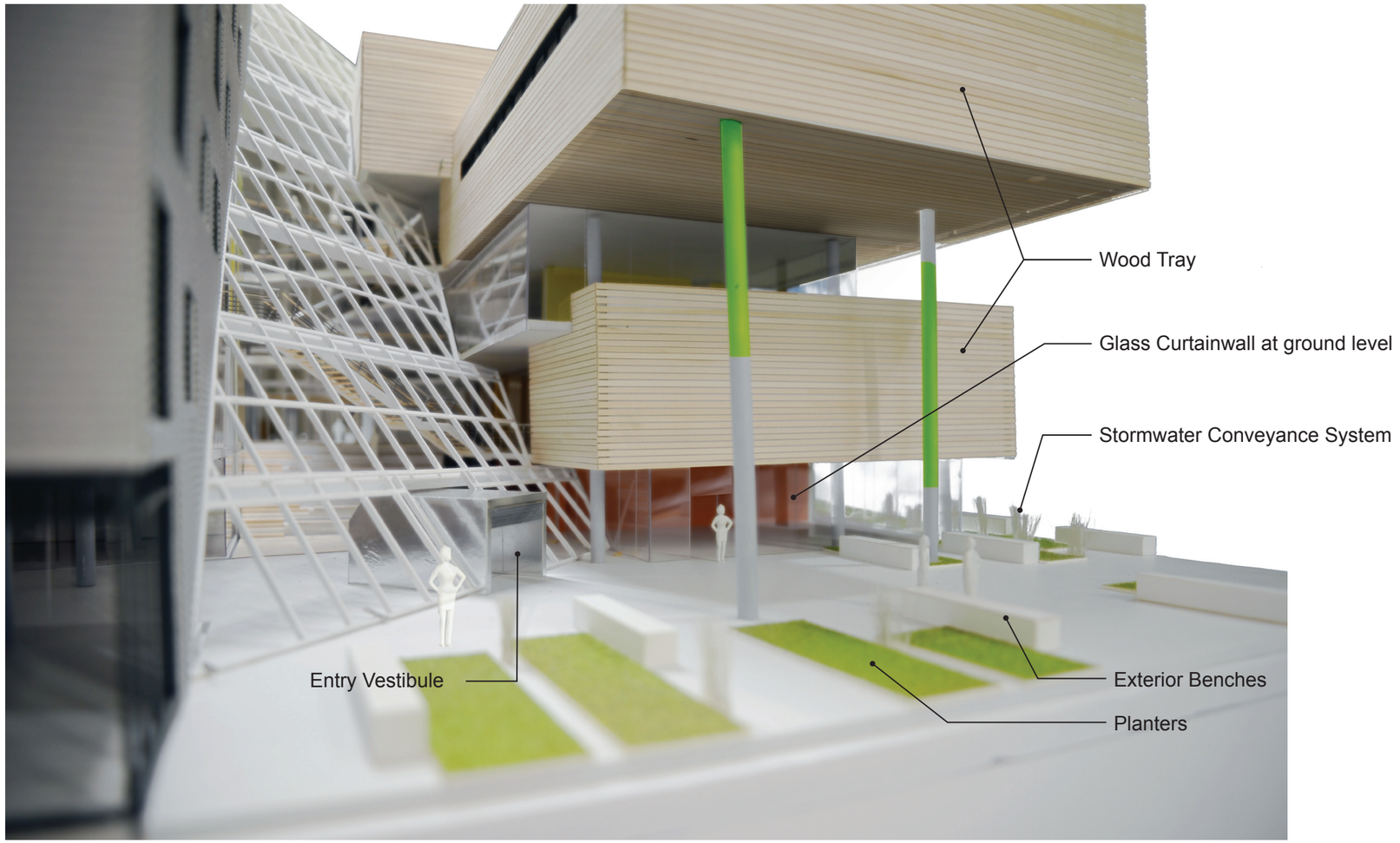
Condition D proposed location of glazing. Since this building volume is located at the property line, any glazing here will not aid the open space below. Patrons using the west forecourt will only make visual connections to the retail, incubator space beyond, and the terraces above.

Condition D proposed location of glazing. Similar to the east side condition, this glazing here would provide some views between the exterior and interior spaces. However, as referenced on the following page, this facade primarily runs past a storage room and back corridors serving emergency egress purposes. Due to the glass curtainwall at the retail wrapping onto Montgomery Street, the terraces above, the atrium, and the large punched windows of the renovation facade beyond, this forecourt will be active and successful with this high percentage of glazing and visual connectivity between the interior and exterior.

The only area for glazing on the west side of level 3 is in the highlighted area. The area south of this classroom is an egress corridor and a storage room. Based on the building massing with fenestration primarily located on the north elevation of the pavilion, glazing in this area breaks up the clarity of the building massing. With 550sf of glazing along the north elevation of this volume, 600sf directly below the wall serving retail, and 1,400sf of glazing at the atrium to the south, turning the corner of this volume needs to remain a solid wall to provide visual relief.



Level 3 Pavilion Floorplan



With an overall exterior facade square footage of 68,000, the solid wood walls at the ends of the wood trays comprise only 7% of the exterior envelope. Due to the complexity of the overall building geometry, creating new exterior semi-public outdoor spaces above and a dynamic interior atrium space, the building design benefits from some simplicity. The incorporation of solid wood walls facing east and west are not only a benefit to the performance of the building (see the following section) but they also create an alternating rhythm between glazing and wood on the east and west sides of the building. The proposed 12% of additional glazing at the east and west ends of the wood trays accounts for less than 2% of the facade square footage. While there might be some benefit to visual connections created by the additional windows on levels 2 and 3 facing the forecourts, this inclusion greatly compromises a strong coherent building massing and impacts the overall quality of the building.

DESIGN STUDIES TO COMPLY WITH CONDITION D

MAINTAINING COHERENCY WITH DESIGN CONCEPT

Option 1

No Shading

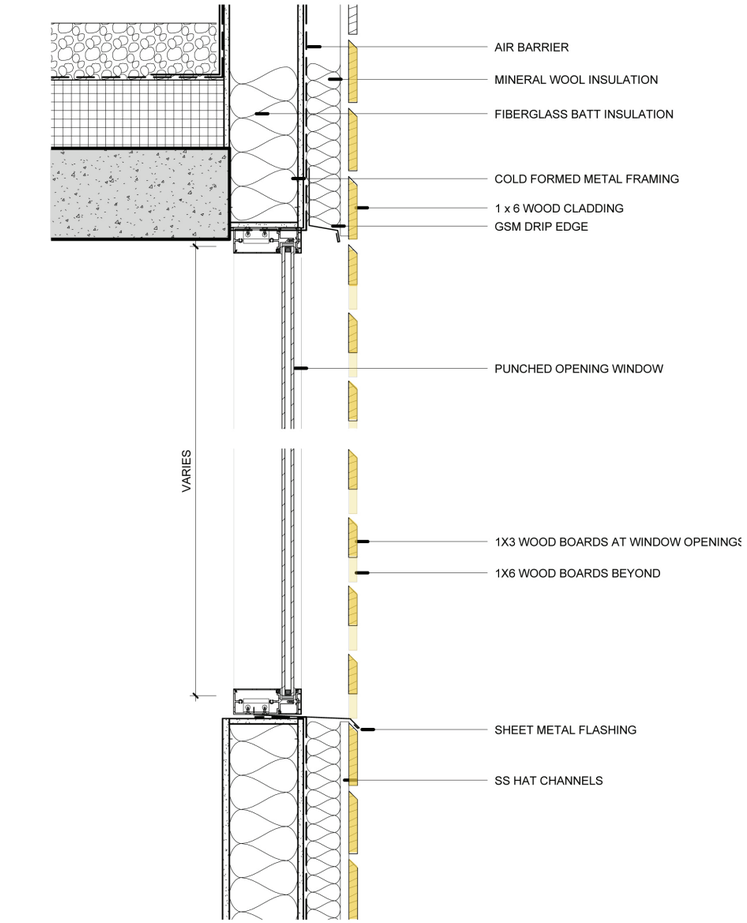
The design team studied many different massing and facade studies early in the design process. One of them was simply incorporating glass at the ends of these wood trays without any sunshading. However, after extensive analysis by our climate engineer, Transsolar, and our goals to implement passive cooling in the pavilion, the design would not support glazing oriented on the east and west elevations during the months of May through October. In an effort to contribute to a vibrant streetscape (A8), reinforce and enhance the pedestrian system (B1), enhance view opportunities (C1), and develop transitions between the building and public spaces (C6), the design team added floor to ceiling glazing on east-west walls directly under overhangs protected from solar heat gain. This occurs at the ground level and at floor 3. Due to limited solar heat gain exposure on northern elevations and the fact that glazing oriented north provides the most consistent ambient lighting (great for classrooms) the design team incorporated the majority of glazing for the pavilion to the north. This also allowed building users views to the green street and the city beyond. We believe these adjustments through the design phase also aided in a more coherent building aesthetic, reading as stacked wood volumes contrasting the porous metallic renovation facade. As the image to the left suggests, there is a definite loss of coherency in the building with the incorporation of these windows.

In an effort to hide these windows yet still meet condition D, the following pages illustrate three options studied by the design team.

Option 2

Fixed Slats

This design option was previously presented to the design commission as our first attempt to address the issue. This option however was not received well as it did not provide enough transparency. After further studies with our climate engineer, the fixed slats still allowed roughly 50% light transmittance into the room leading to an additional 16 hours of overheating for the room the window was servicing.

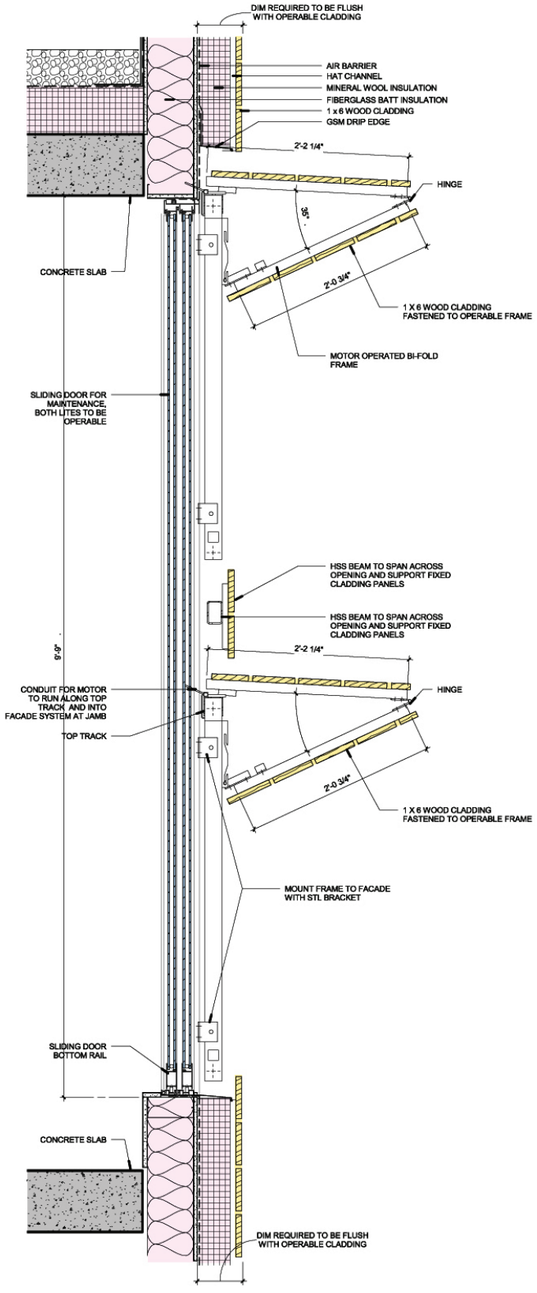


13 / A520 Typical Pavilion E/W Screened Window Section

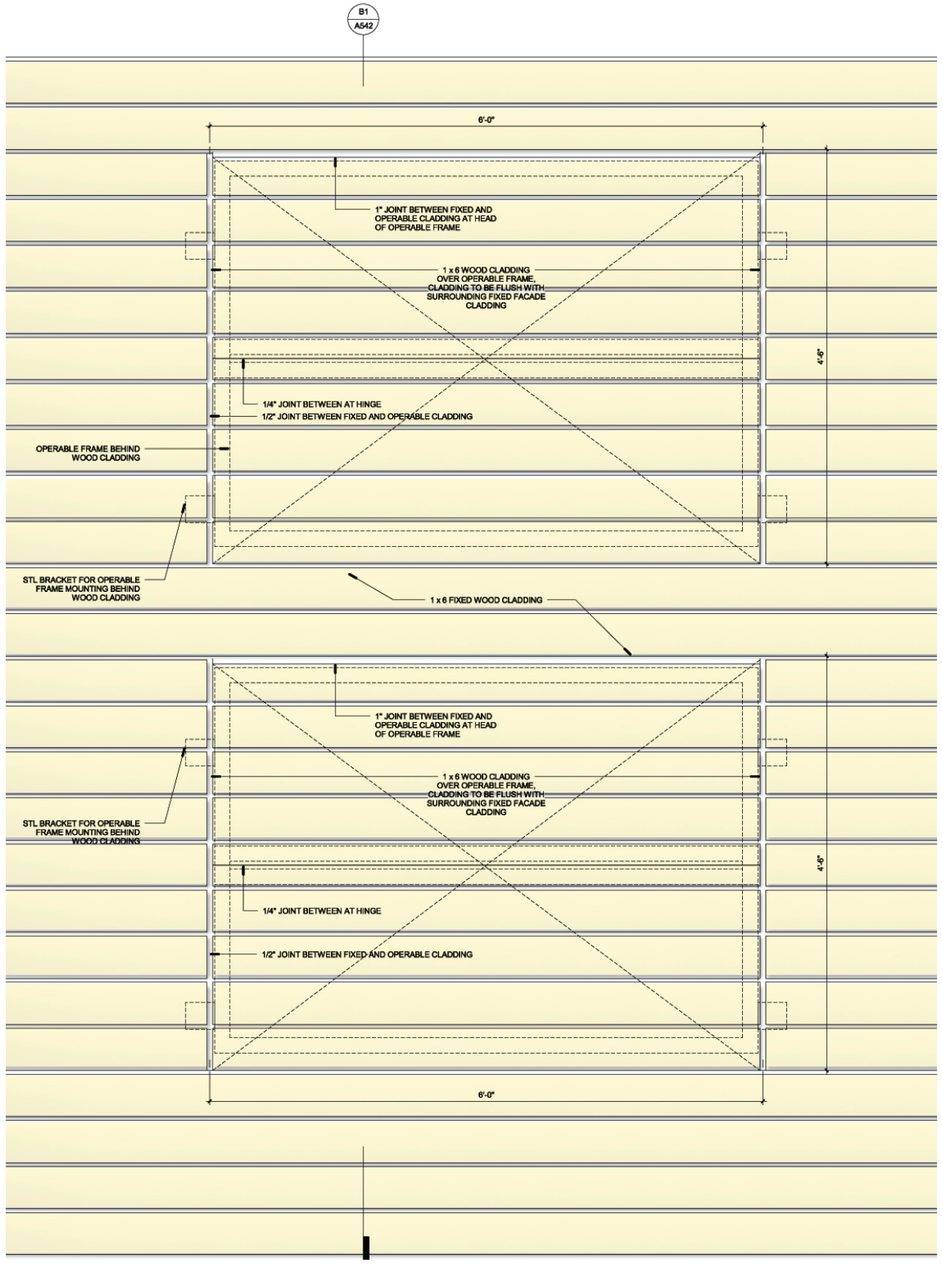
1 1/2" = 1'-0"

Option 3

Electric Powered Opening



Section

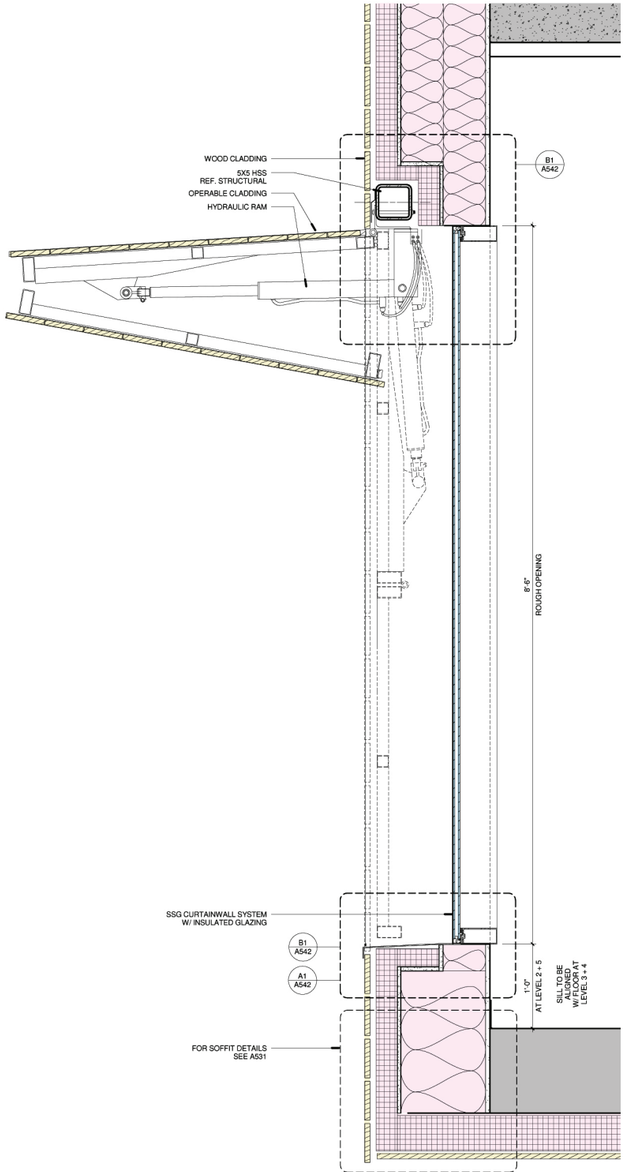


Elevation

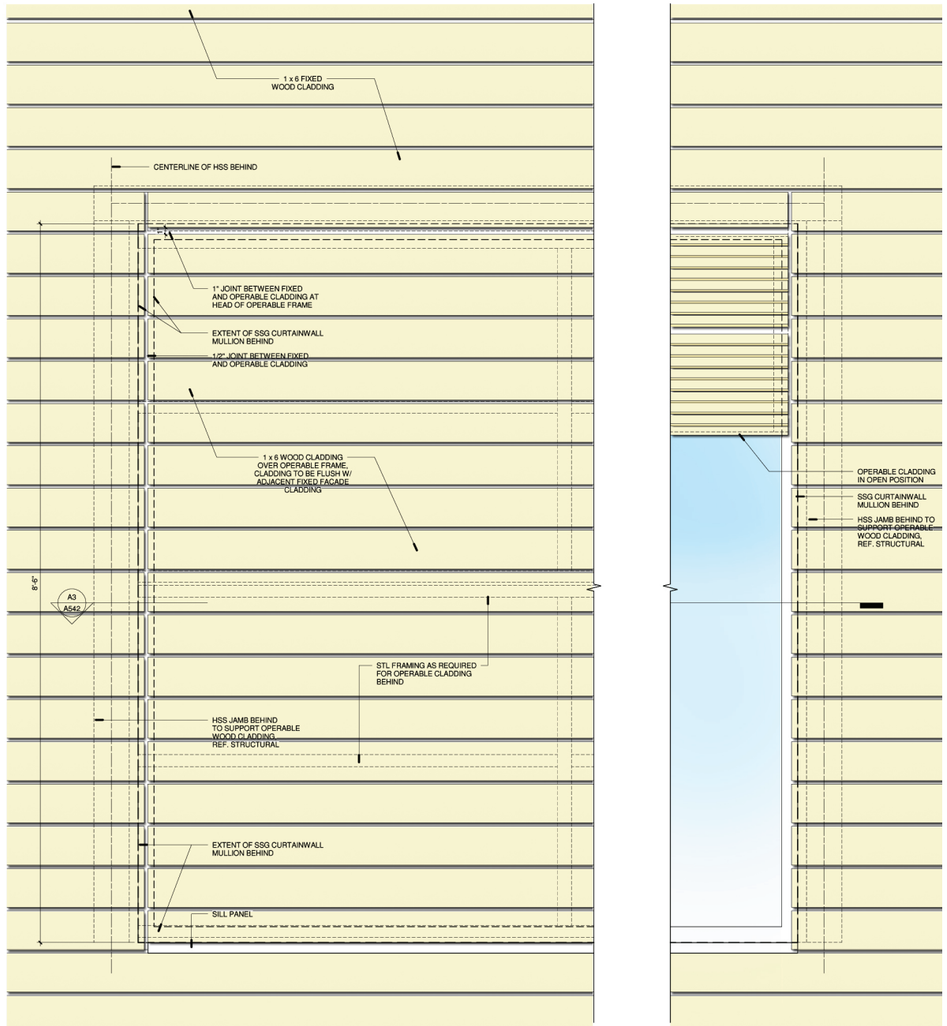
Options 3 was developed with a foreign manufacturer and priced by the CM/GC on the project. This option allowed for the use of Alaskan yellow cedar wood boards and for operation to take place within the plane of the wood wall with which it was located. This would allow for the opening to seemingly disappear when closed to better match the original design intent. The system however was only available with an electric motor, thus limiting its total size. To meet the 12% glazing requirement four operable bi- folding doors were required on each wall on the east and west ends of the pavilion. This added up to 16 operable components. Not only did this become a cost issue (~$300,000) it would also add 16 areas where additional maintenance would be required, compromising the permanence of the design (Guideline C2). Additionally, due to the window locations and the thermal requirement for these to be closed for most of the year to keep the number of overheating hours minimal, a strict operational plan would need to be in place to open and close these windows.

Option 4

Hydraulic Ram Powered Opening



Section

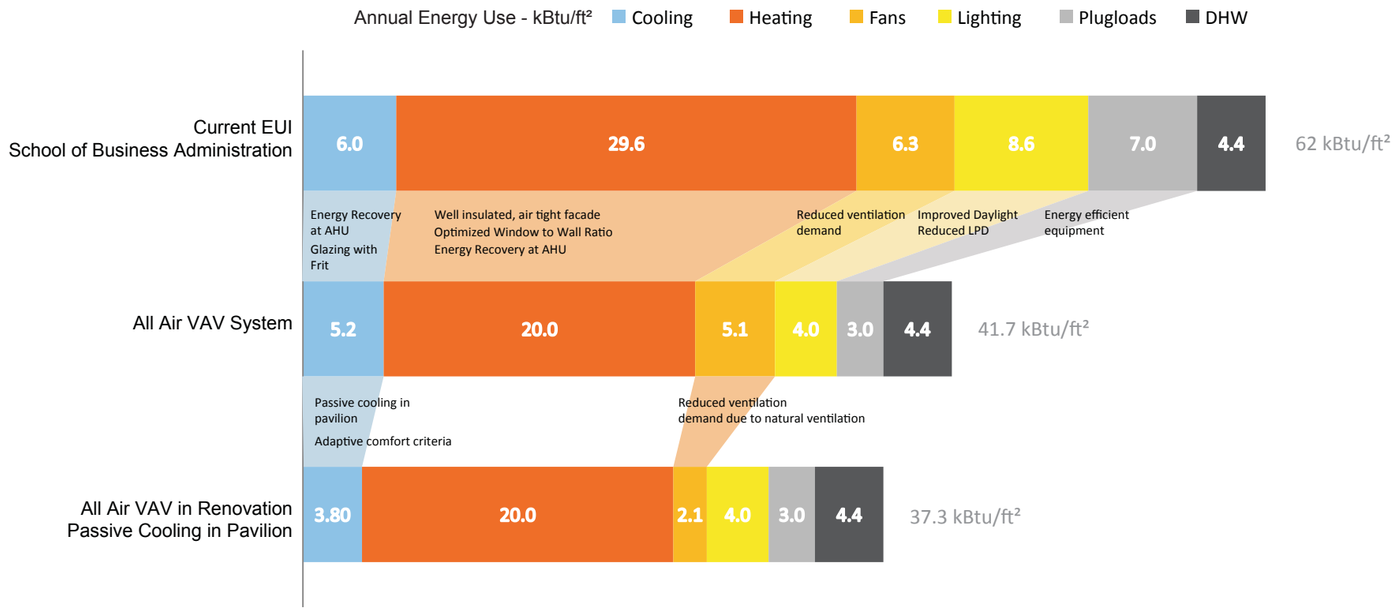


Elevation

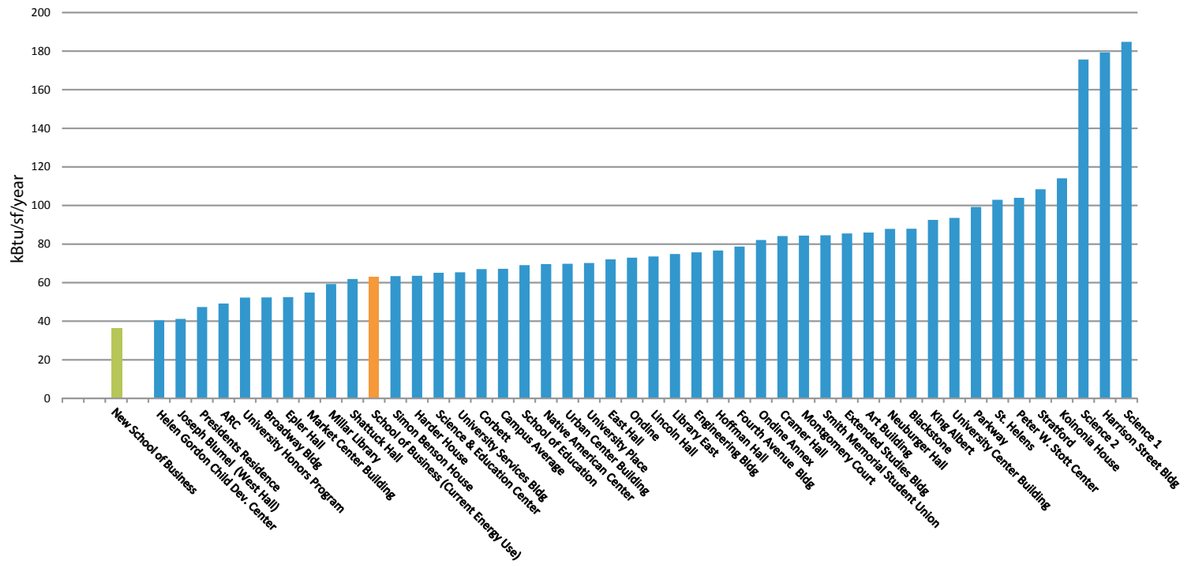
Options 4 was developed with a domestic manufacturer and was a value engineered option. This option also allowed for the use of Alaskan yellow cedar wood boards and for operation to take place within the plane of the wood wall with which it was located. The benefit of this system was that it utilized a hydraulic ram capable of opening walls up to 30'-0" wide. To meet the 12% glazing requirement, only four operable bi- folding doors were required for the entire pavilion. This ended costing half the price of Option 3, however Portland State University was extremely concerned with the use of a hydraulic ram within the facade as they are prone to leaks and would require frequent maintenance checks. There were also concerns about the additional cantilevering of an operable component like this, which could lead to ice buildup or debris falling onto the plaza below. Similar to option 3, this solution also compromised adherence to guideline C2 and would also require a strict operational plan to ensure the windows stay closed during the majority of the year to minimize solar heat gain.

CLIMATE ANALYSIS

Energy Use Comparison &
Estimated Energy Use Intensity (EUI)
Campus Comparison

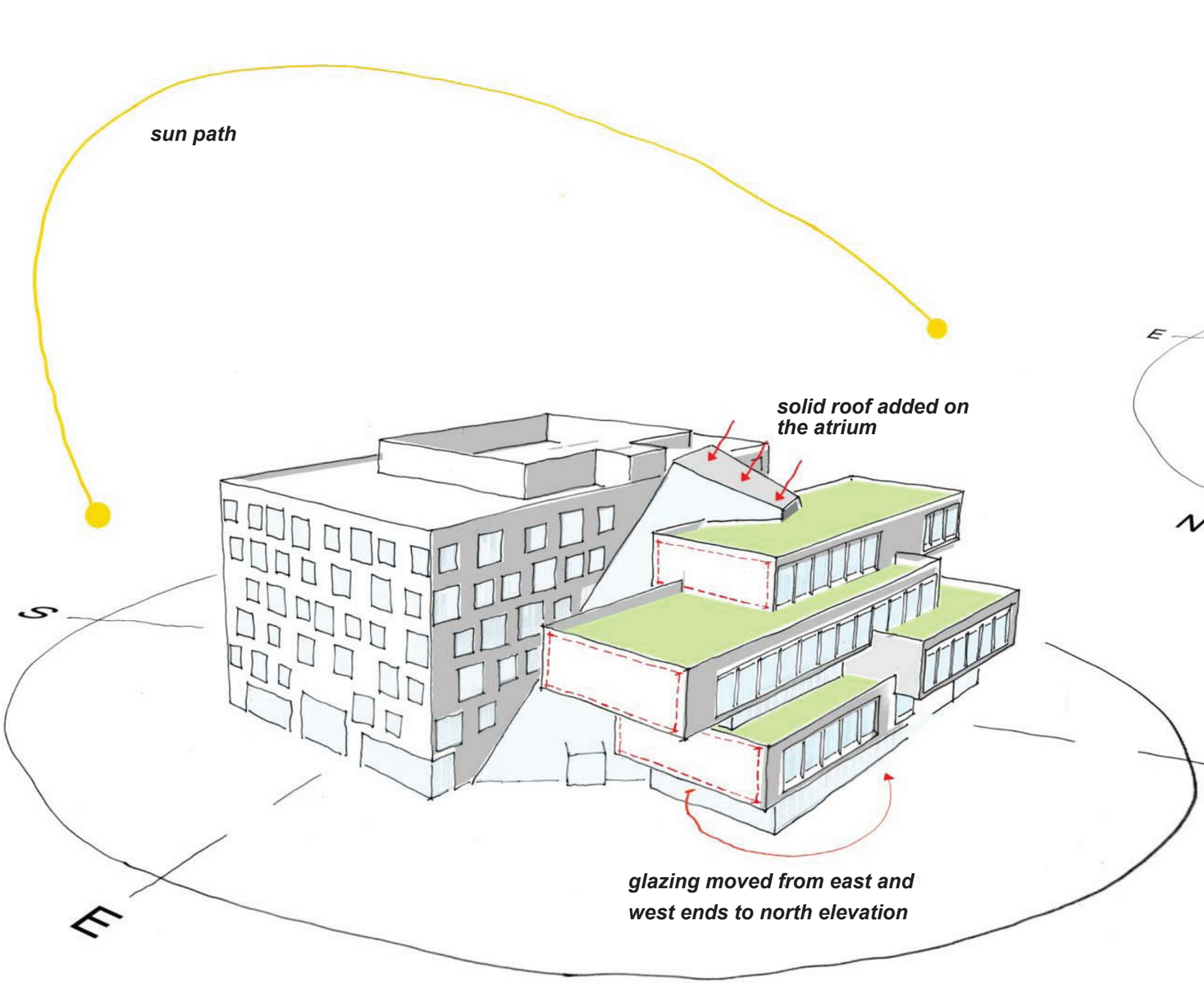


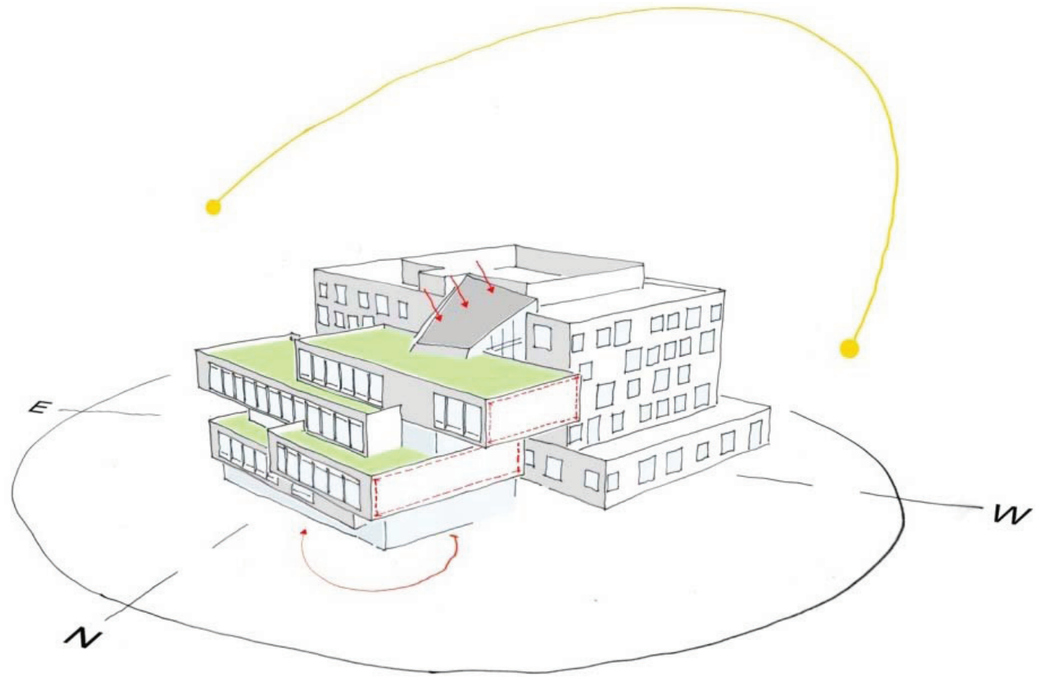
* Lighting, plug loads and domestic hot water demand are rough estimates and may change in DD.



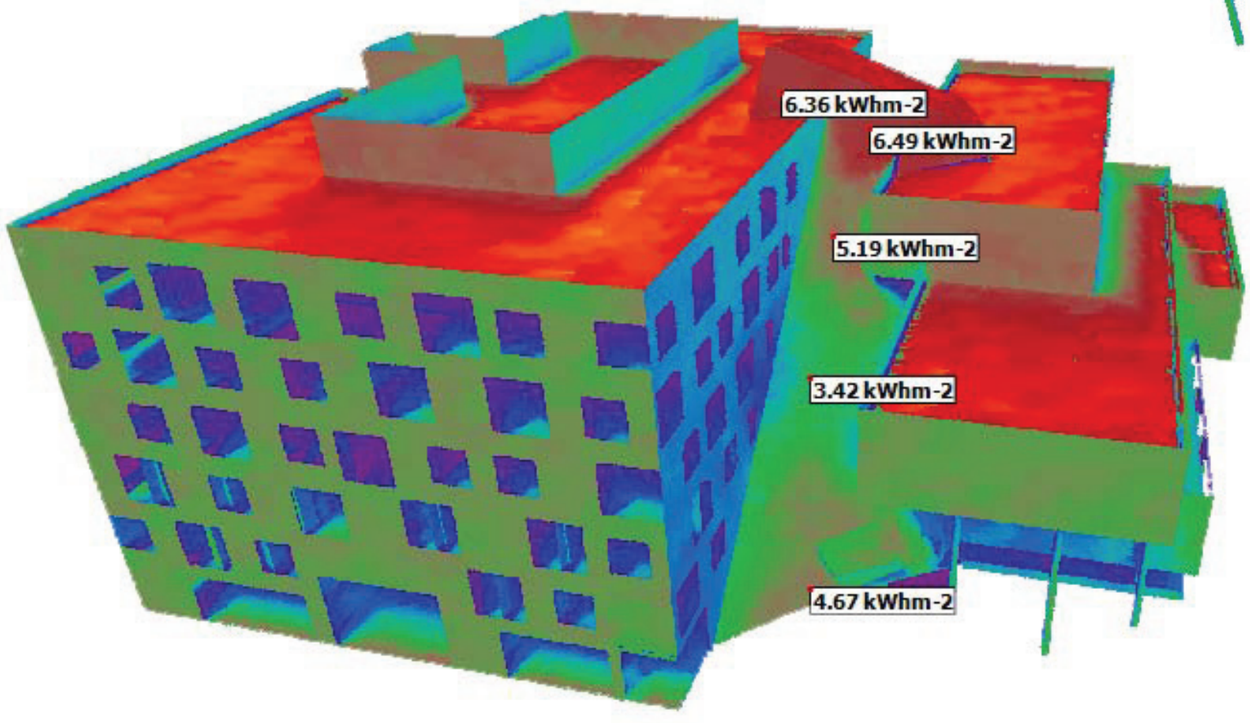
Energy Use Estimate
Estimated Energy Use Intensity (EUI) for the new business school is shown below in comparison to measured EUI for various buildings on PSU's campus.

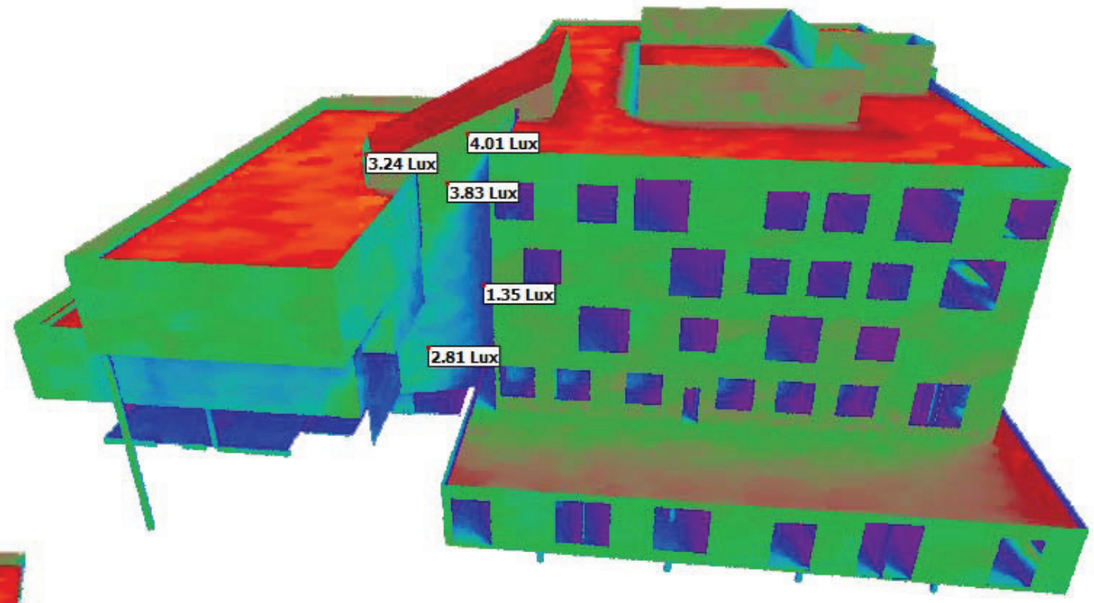
If all the energy efficiency measures stays and with the potential for further improvement and refinement in the Design Development, we feel that the new School of Business Administration can achieve an EUI in the range of 20-30 kBtu/sf/year (in line with our recommended target EUI in section 2). This will make the new SBA building approximately 50% - 66% more energy efficient than the current building and probably the most energy-efficient building on PSU campus.

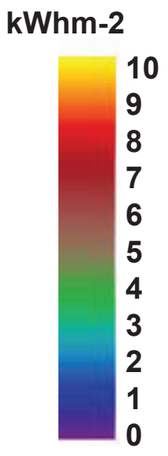




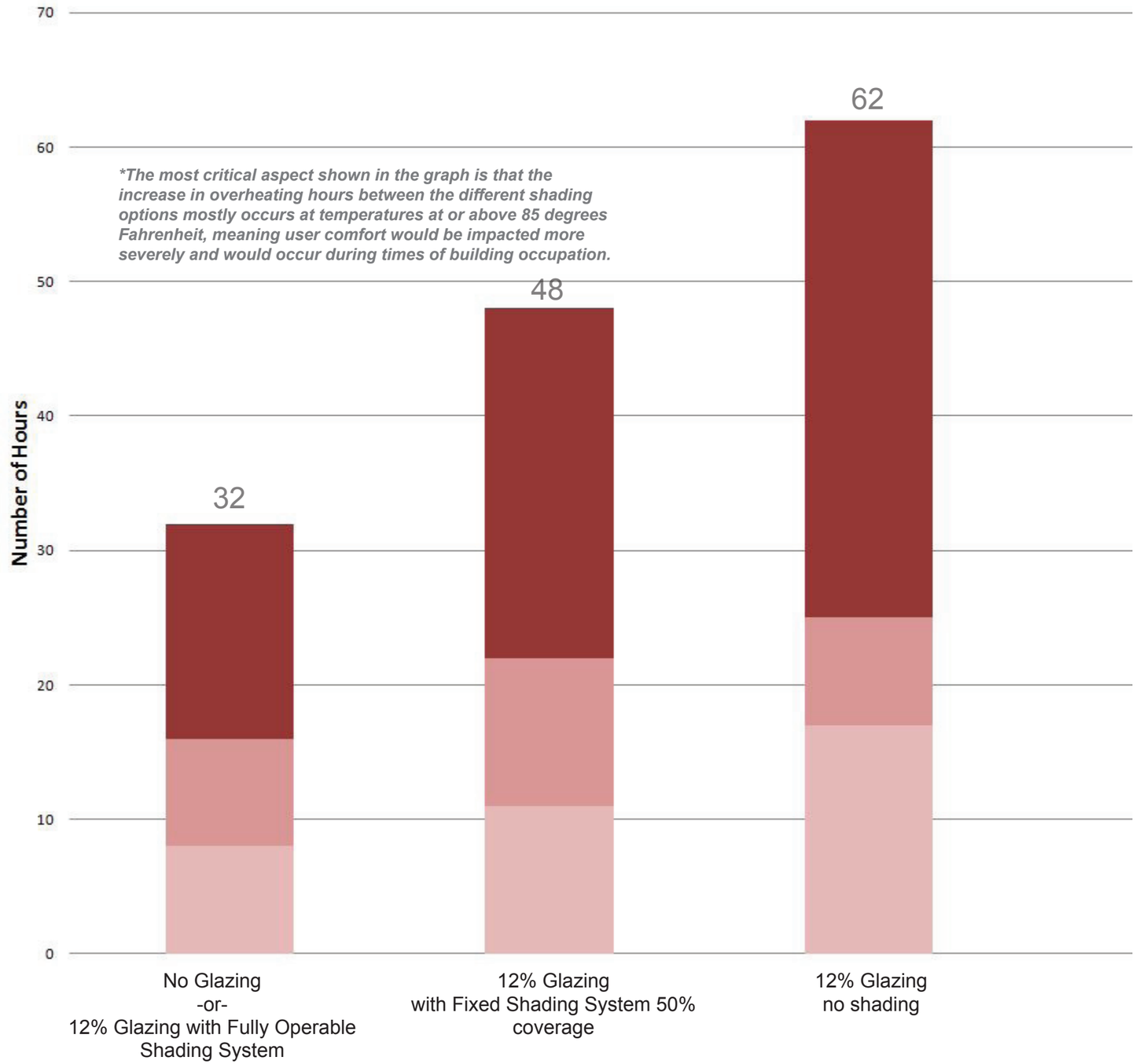
On the following page, solar radiation analysis was performed by Transsolar at the beginning of the Design Development phase. The sketches on the page illustrate some of the design changes made at that time to improve the building performance and reduce energy use as much as possible.


6.36 kWhm-2
6.49 kWhm-2
5.19 kWhm-2
3.42 kWhm-2
4.67 kWhm-2


4.01 Lux
3.24 Lux
3.83 Lux
1.35 Lux
2.81 Lux


kWhm-2
10
9
8
7
6
5
4
3
2
1
0

Annual Number of hours above 80°F Operative Temperature

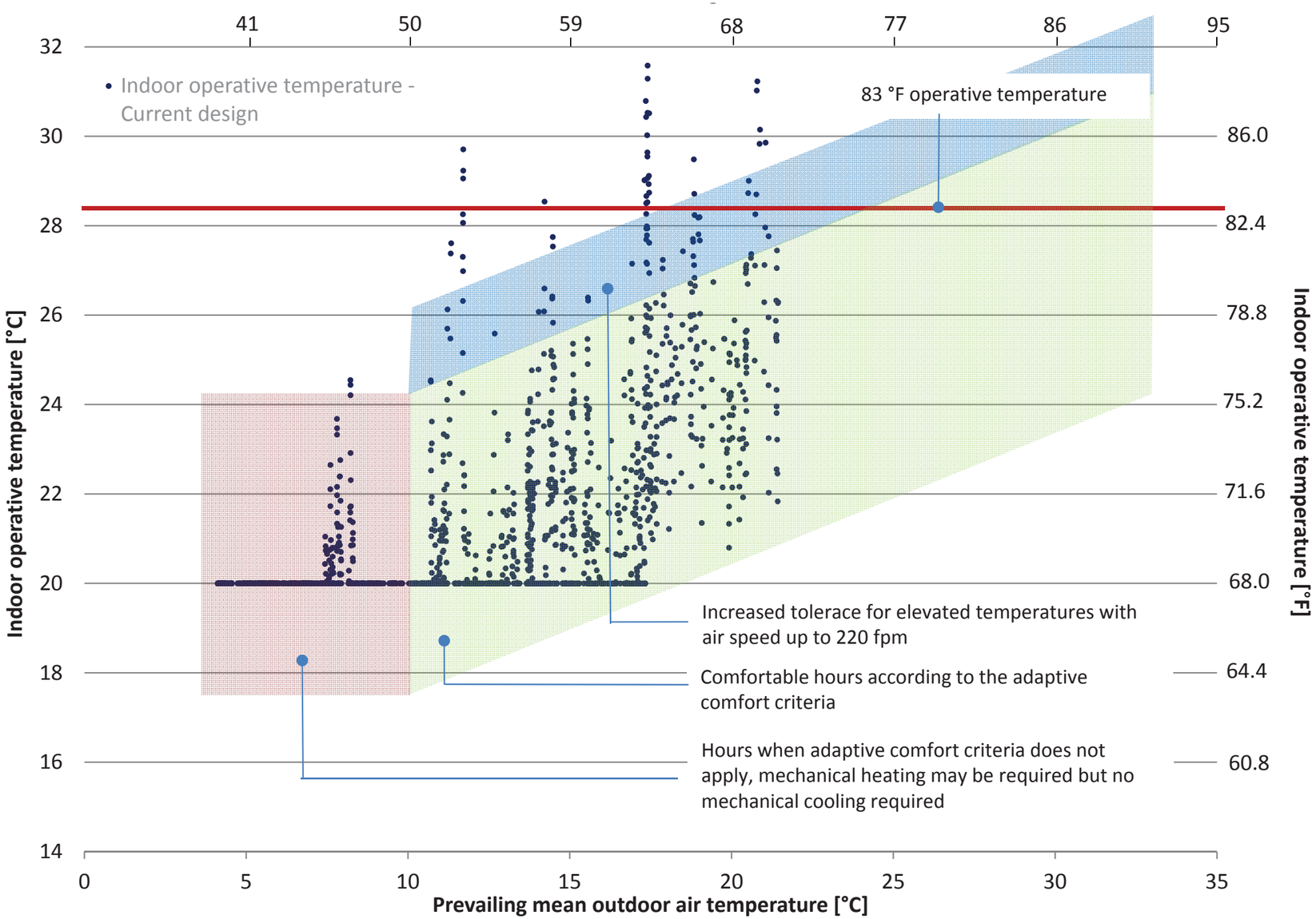


Energy Use Comparison
Operative Temperatures for Typical East or West Facing Classroom

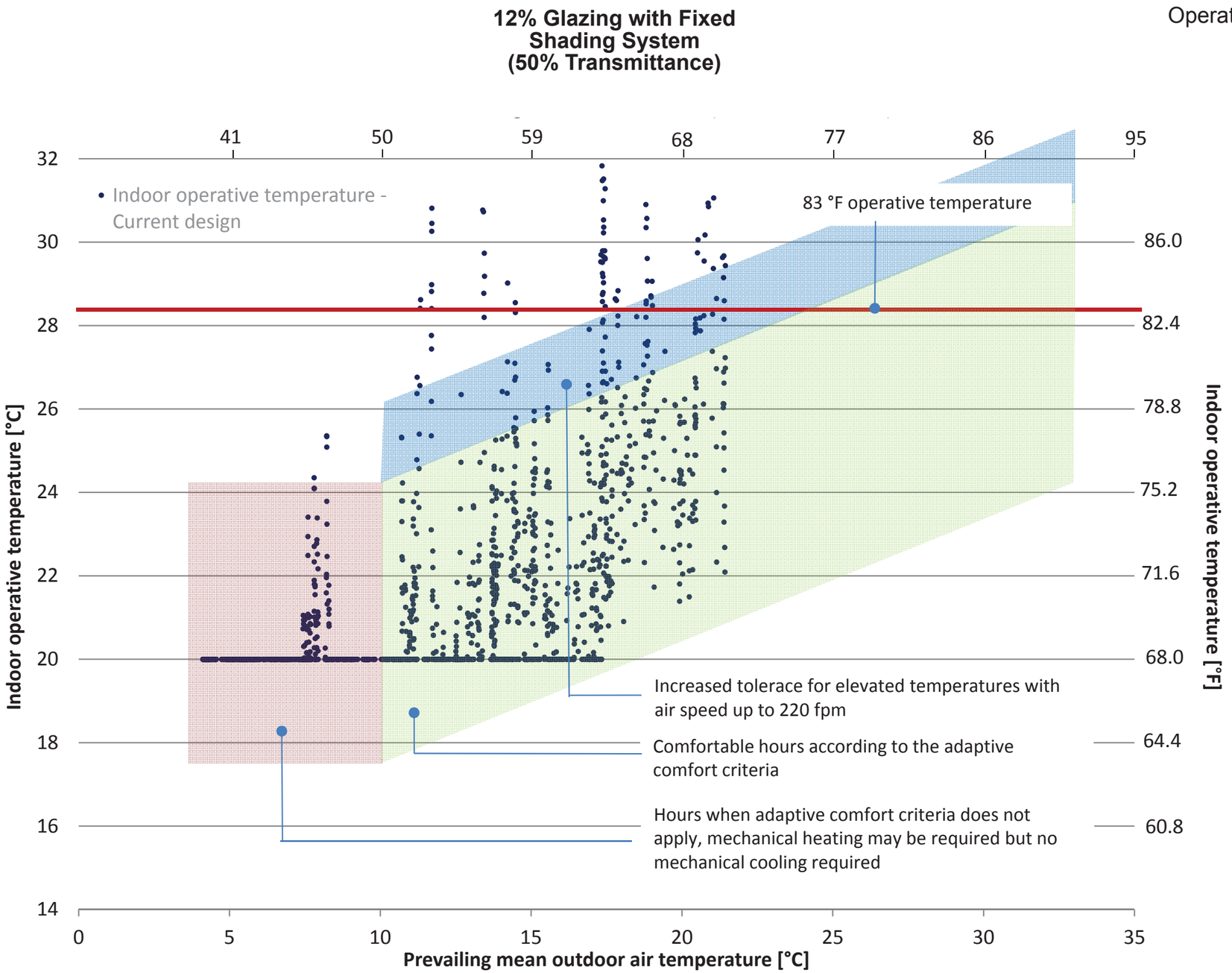
In order to achieve a passively cooled building, keeping the number of overheating hours to a minimum is critical to user comfort. The team was able to bring down the total number of overheating hours to only 32 for a representative year. Based on PSU scheduling, this would impact very few days when the building is occupied. This is shown in the far left bar. The center and right bars show the thermal analysis for incorporating a fixed shading solution or for adding glazing without any shading strategy. The number of hours increases to 48 and 62 respectively. These increases were absolutely too high if the building were to keep its passive goals.

Energy Use Comparison
Operative Temperatures for Typical East
or West Facing Classroom

0% Glazing (Original Design)
-or-
12% Glazing with Fully Operable Shading System (0% Transmittance)



Energy Use Comparison
Operative Temperatures for Typical East or West Facing Classroom



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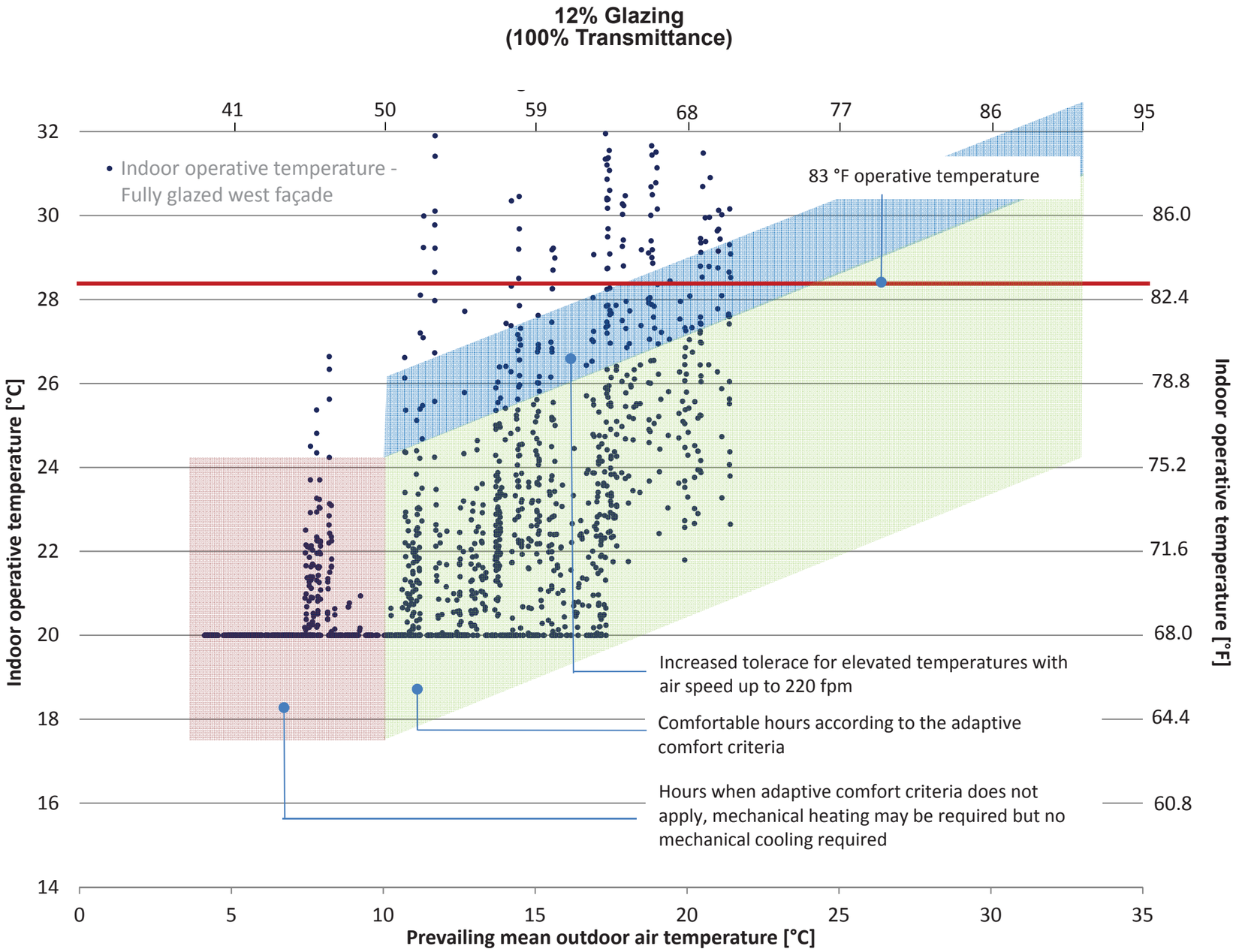

COMPLYING WITH THE DESIGN GUIDELINES

As illustrated in the previous pages, the design team believes the inclusion of the four windows to comply with Condition D of LU 15-129978 DZM AD is not necessary for the success of the building design or for compliance with the city design guidelines. Due to the high degree of transparency within the renovation and pavilion facades, the multiple accessible outdoor roof terraces, and a 6-story glass atrium volume centrally located between the renovation and new addition, we feel the visual connectivity between the interior and exterior is achieved and the open spaces adjacent to the building will be successful.

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