Wood & Well-being: Design Strategies for Deaf and Hard of Hearing

February 12, 2025

Presented by
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Center for Deaf and Hard of Hearing Youth / Mithun / Photo Lara Swimmer

Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.

Course Description

Join us for an insightful session on an innovative project at the intersection of architecture and accessibility. We'll explore design strategies behind the Center for Deaf and Hard of Hearing Youth in Vancouver, Washington, where designers followed DeafSpace principles as part of a deaf-led design process for the bilingual school. This case study presentation explores how an exposed wood structure contributes to the sustainability, accessibility, and inclusivity of the Center, including ADA-compliant and barrier-free design. Further discussion will detail how the biophilic benefits of wood helped frame strategies for visual aids and wayfinding. And, in a pioneering mass timber application, how wood’s acoustic vibrations help extend occupants' sensory reach. Don't miss this webinar on designing inspiring, safe, and inclusive learning environments.

Learning Objectives

1. Identify key strategies for creating a sensory-inclusive learning environment that addresses the diverse needs of students, including those who are deaf or hard of hearing.

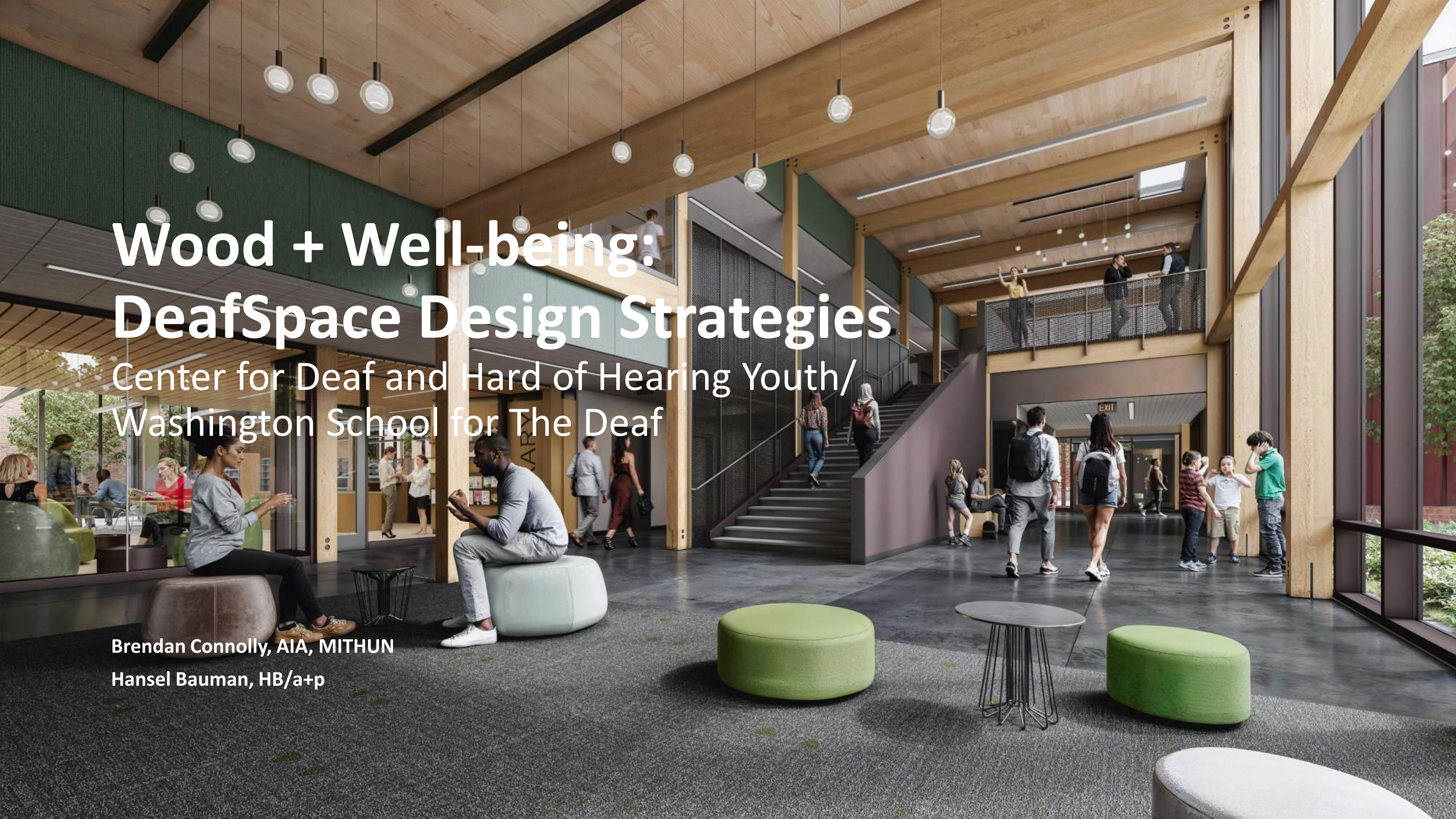
2. Evaluate the biophilic benefits of wood and its role in informing design strategies for visual aids and wayfinding within educational facilities.

3. Examine the innovative use of mass timber in the construction of the Center for Deaf and Hard of Hearing Youth and its impact on acoustic vibrations to enhance occupants' sensory experience.

4. Explore the code-compliant, ADA-compliant, and barrier-free design of a mass timber building through a case study example.

Wood + Well-being: DeafSpace Design Strategies

Center for Deaf and Hard of Hearing Youth/ Washington School for The Deaf

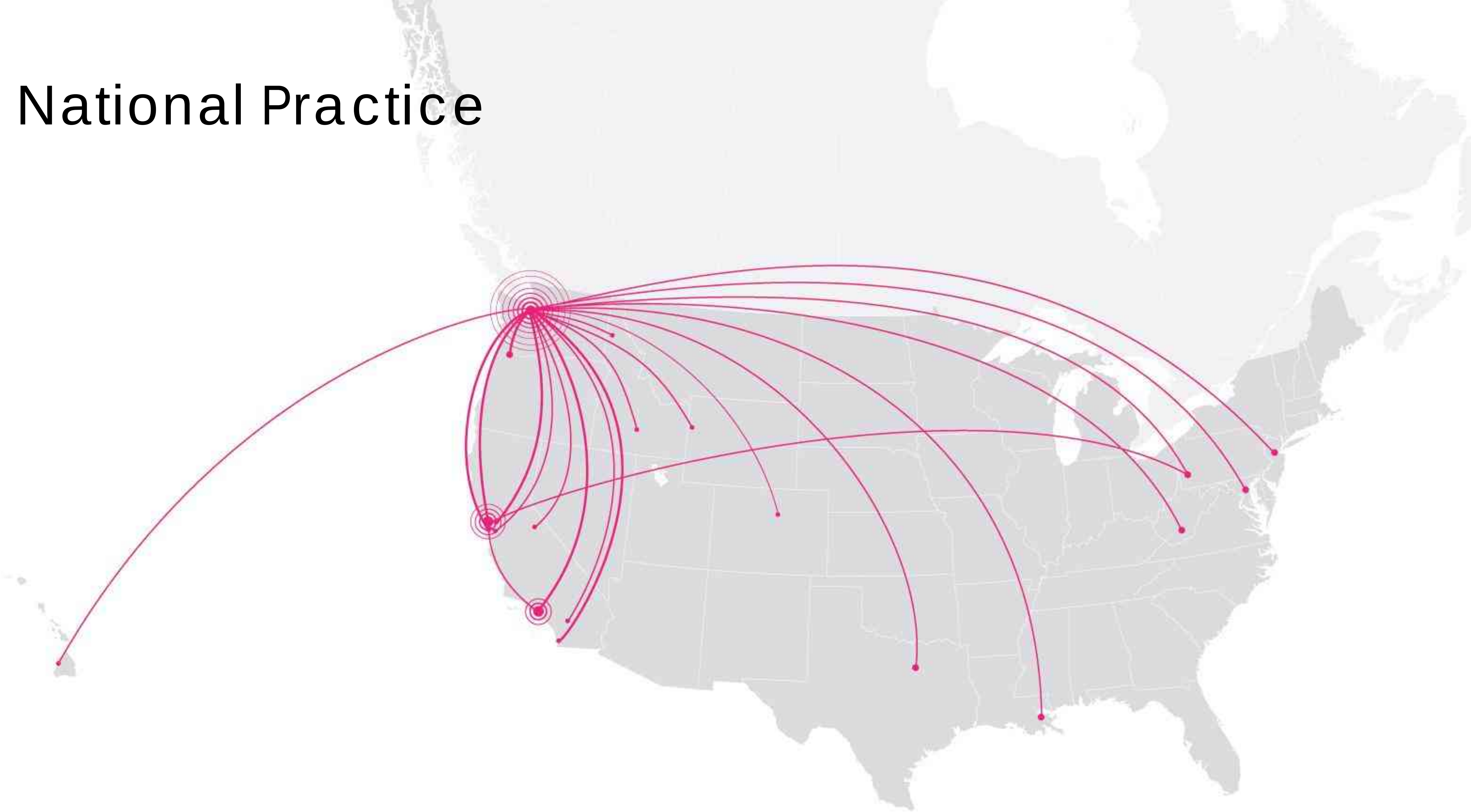


Brendan Connolly, AIA, MITHUN

Hansel Bauman, HB/a+p


CO
LAB
panda

National Practice



8 **AIA COTE**
TOP TEN GREEN AWARDS

10+ NET ZERO ENERGY BUILDINGS

AIA 2030 COMMITMENT

4 Living Building Targeted Buildings

150+ Green Stormwater Projects

15+ **PROJECTS WITH GREEN DISTRICT SCALE SYSTEMS**

500+ Sustainable Design Presentations

Carbon Neutral Operations Since **2004**

100+ LEED Certified Projects

8 District Projects with Healthy Equity Assessments

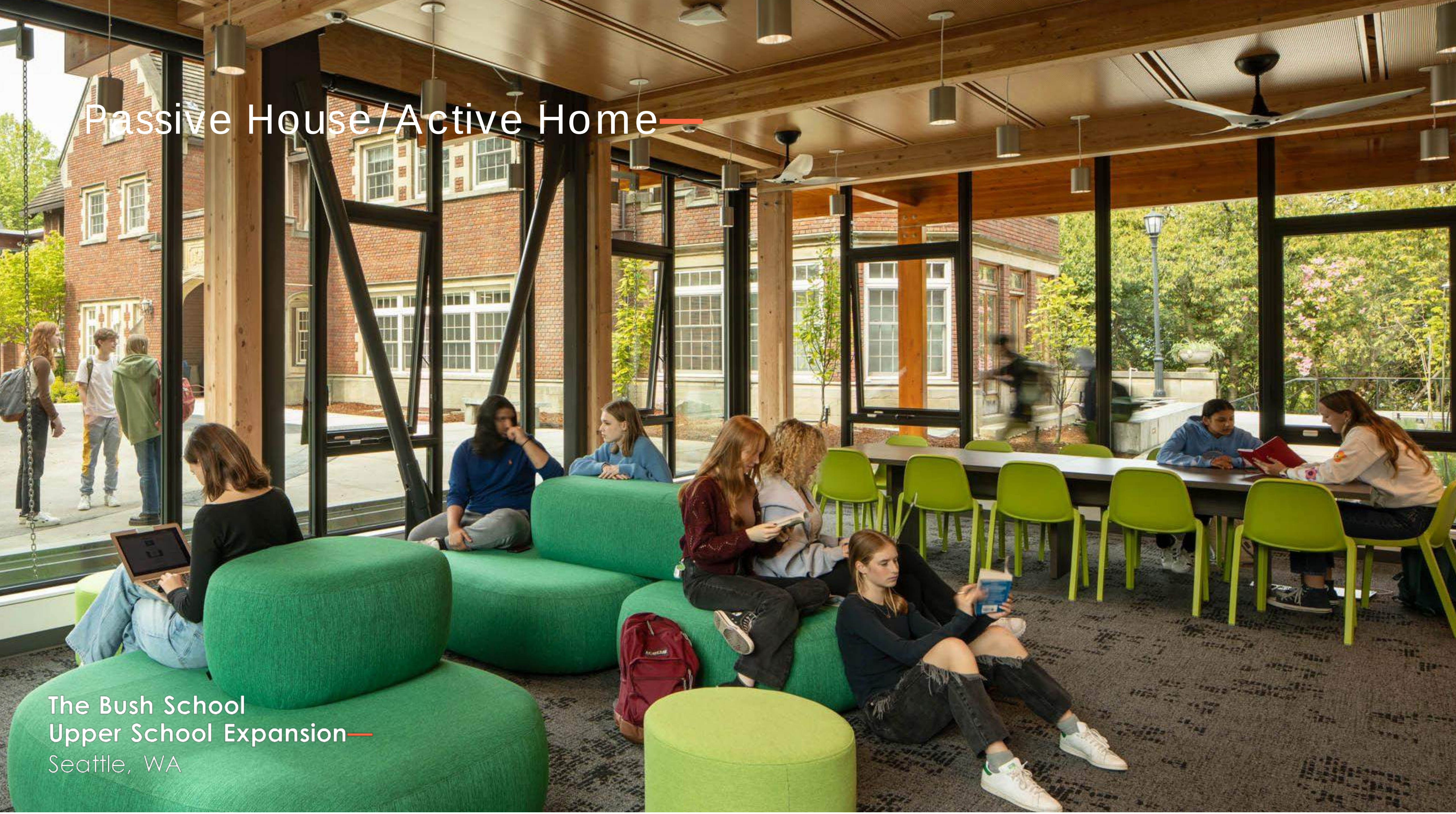
5 FITWEL + WELL Registered Projects

2 Ecodistricts Registered Projects

Using Wood to Amplify Educational Outcomes

Creating Visible Change

The Bush School
Mass Timber Upper School Expansion
Seattle, WA


Passive House/Active Home
The Bush School
Upper School Expansion
Seattle, WA

Washington School for the Deaf

Deaf-led School Design

Original Vision

1889 Campus Origins

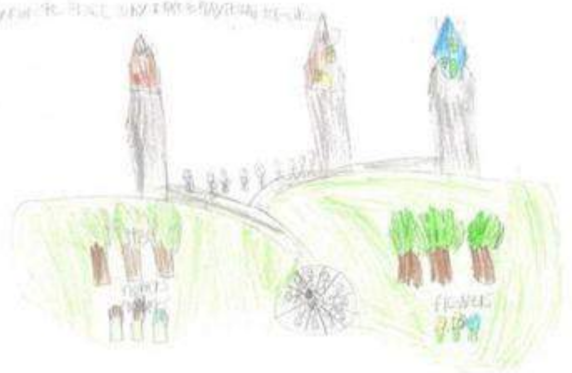
LOTTIE K. CLARKE HALL
Girls' Dormitory Building School for the Deaf, Vancouver, Wash.
Olof Hanson, Architect

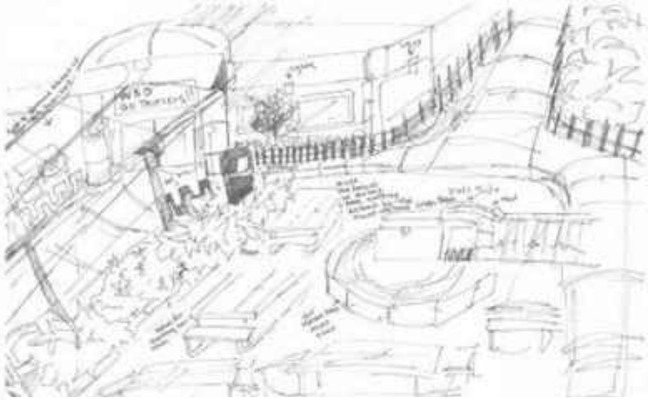

Connecting a Campus and Community

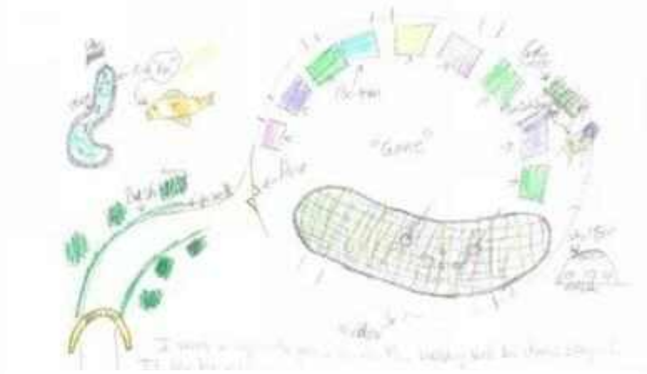

Integrated Team : Design/Build/Research/Interpretation
Researchers
Architects
Interp.
Builder
Builder
Builder
Stunt Double

Stakeholder Engagement

Design Empathy







Project Charter

Integrated Campus with a Heart

EVERYONE IS TOGETHER

Workshops


TERRIERS
BRAVELY


Campus Site Plan
Center for Deaf and Hard of Hearing Youth
Academic and Physical Education Building


Lloyd Auditorium
Kastel Hall
Clarke Hall
Cottages
Cottages
Athletic Field
SUN PATH LIGHT

Physical Models

Layers of Inclusion

	Design	Construction	Experience
Racial + Cultural Diversity + Equity			
Neurodiversity + Cognitive Variation			
Universal Design + Physical Accessibility			

DeafSpace Origins

Demographics

National Center for Health Statistics:

- 37 million deaf and hard of hearing people in the US
- 2 – 3 of 1,000 children are born in the US with hearing loss
- Over 2.2 million are considered deaf
- 90 % born to hearing parents

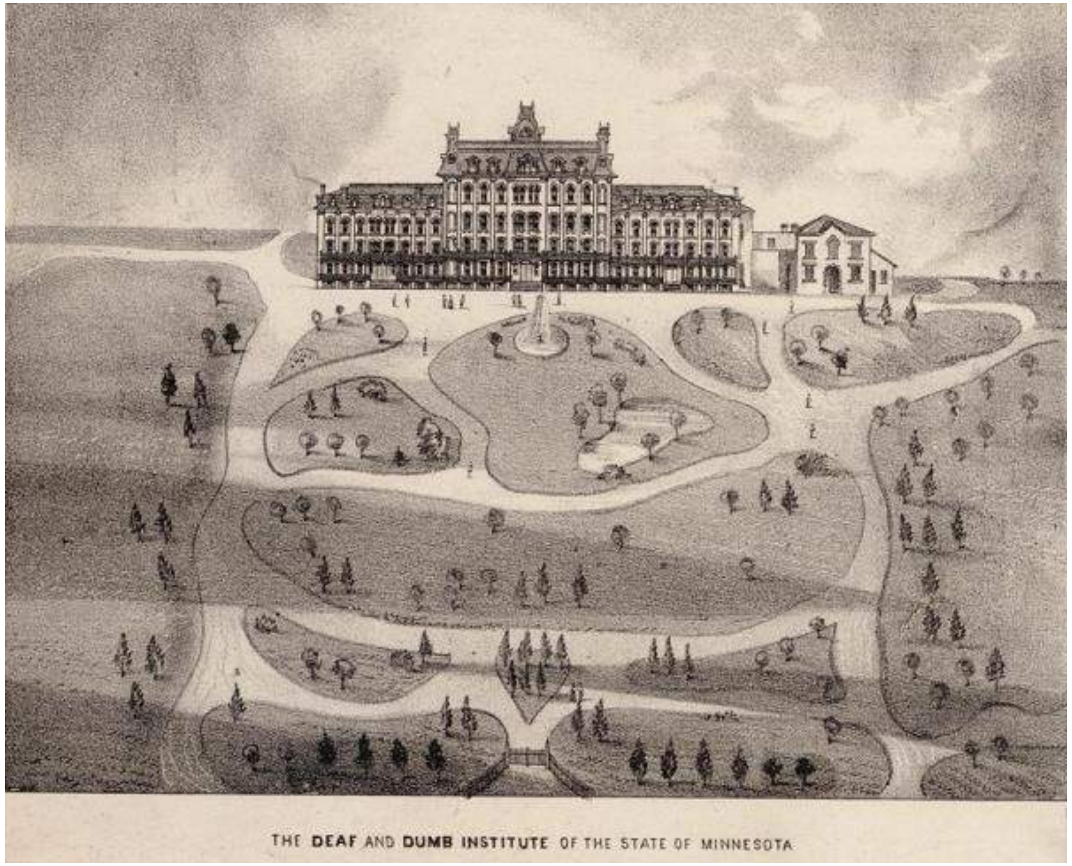
DeafSpace : WHAT?

Environmental Barriers

Daily acts of Cultural Customization


fSpace has been around along as there has been deaf peopl
Dr. Ben Bahan

Medical Model + Space



Marginalization – early 18th Century

Acculturation (not integration) -- late 20th Century

Cultural Model + Space

Spatial Modification :
Social Cohesion

Architectural Expression : Cultural Presence + Agency

Gallaudet University A beginning Place

DeafSpace Workshop : Paradigm Shift…

SLCC (Sorenson Language + Communication Center)
Smith Group Architects

SLCC DeafSpace Workshop 2005
HB/a+p

“If no one was around, how could you tell Gallaudet is a deaf place?”

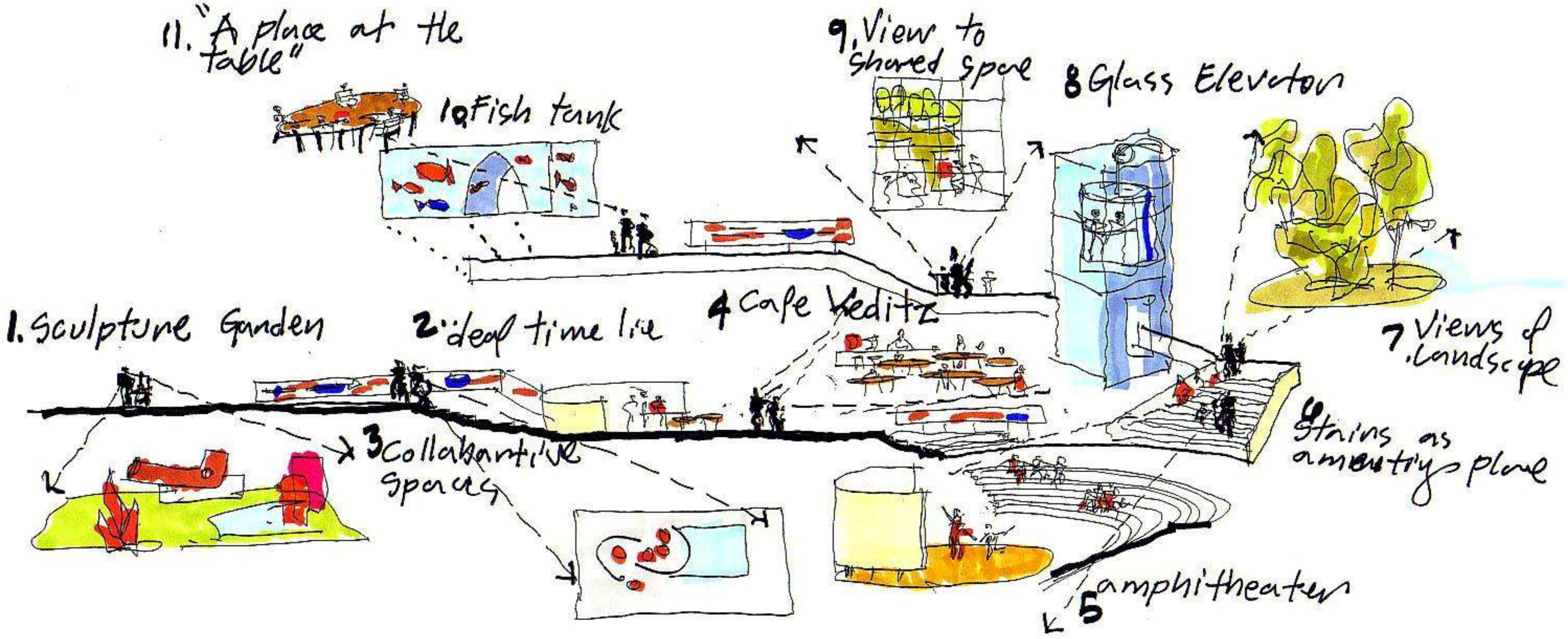
Chapel Hall, Gallaudet University, Vaux & Withers

Memorial Hall, Harvard University, Ware & Van Brunt

“Where I first became a deaf person”

The Mary Thornberry Building, Gallaudet University Audiology Department

“We want a A Place of Our Own!”



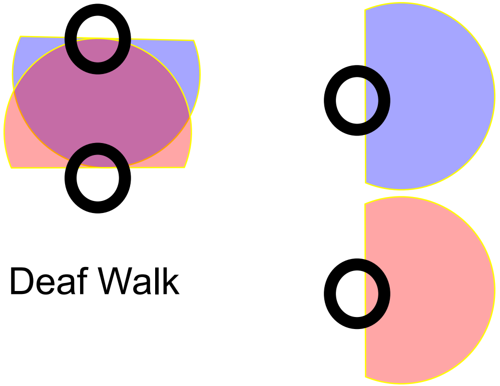
“A Cultural Journey into Deafhood ”

DeafSpace Project

User Driven Research, Campus As Laboratory

Exploration Through Design

User-driven Research

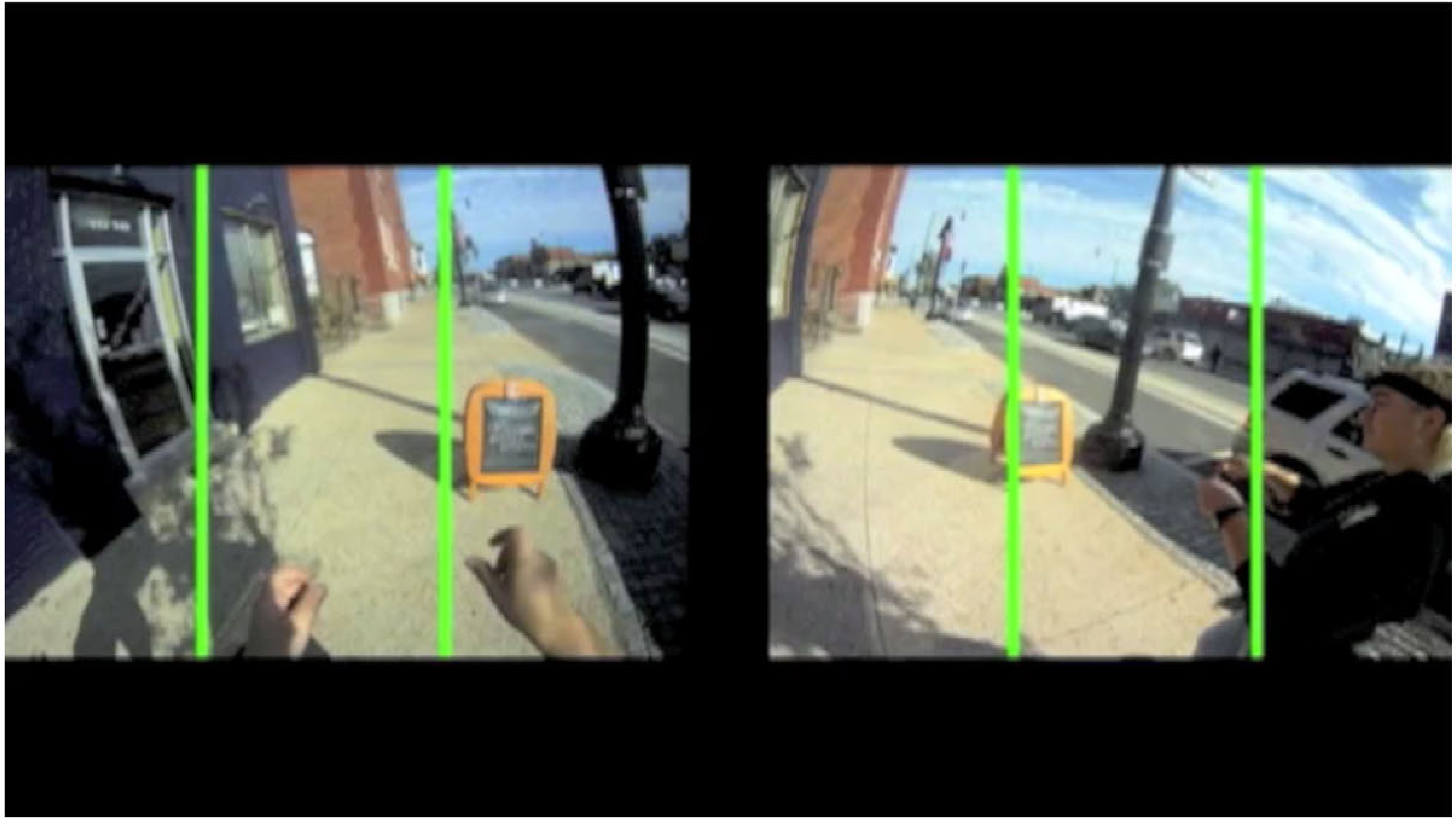


Deaf Walk

Hearing Walk

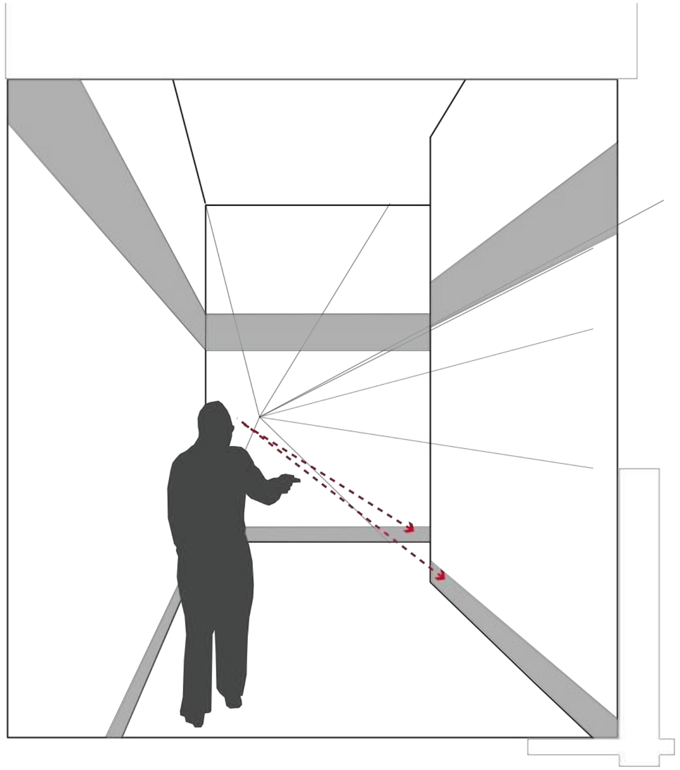
Research by Robert Sirvage, Gallaudet University

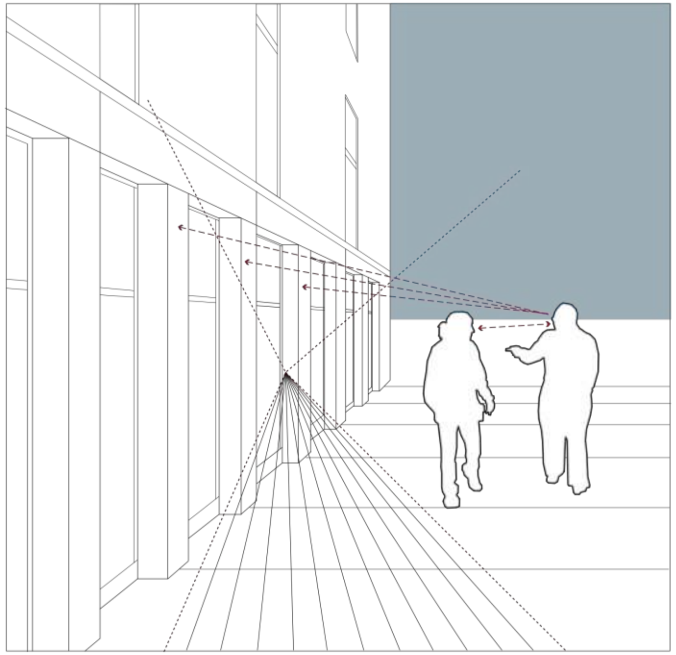
Single Point , Hearing Perspective Vs. Dyadic Deaf Perspective



Research by Robert Sirvage, Gallaudet University

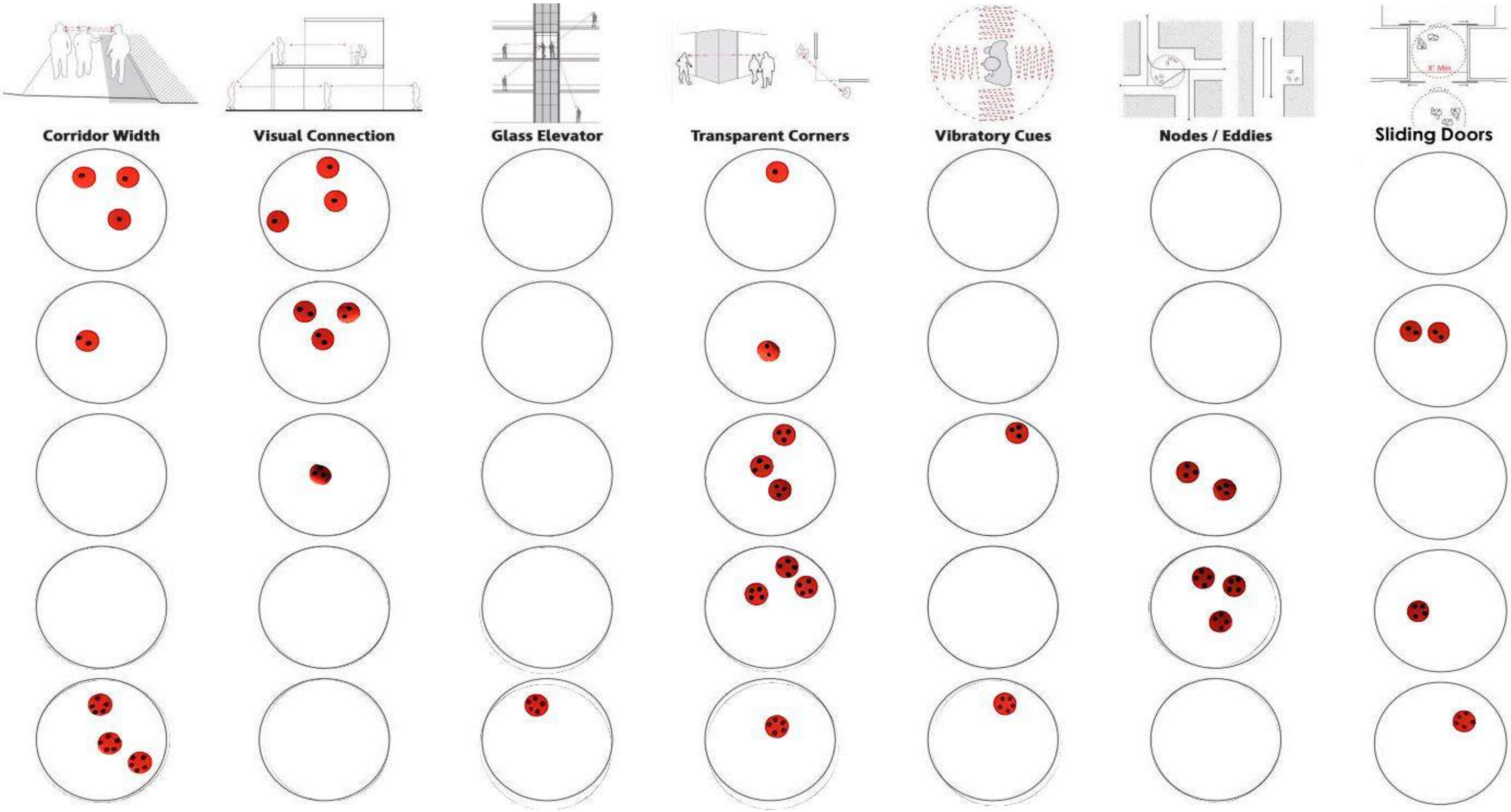
Application of Research





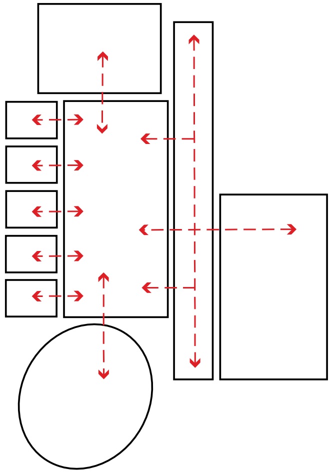
DeafSpace Design at CDHY

DeafSpace Considerations



Building Layout

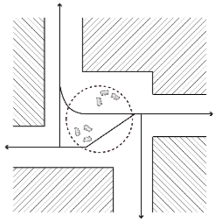
Density + Connectivity



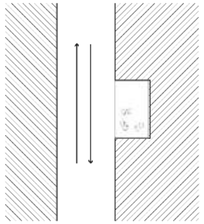
1.3.1 Program Distribution

Building Layout

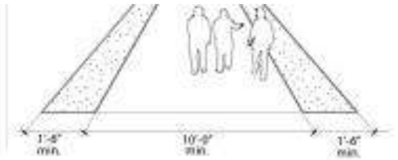
Circulation + Connectivity



1.3.2 Nodes

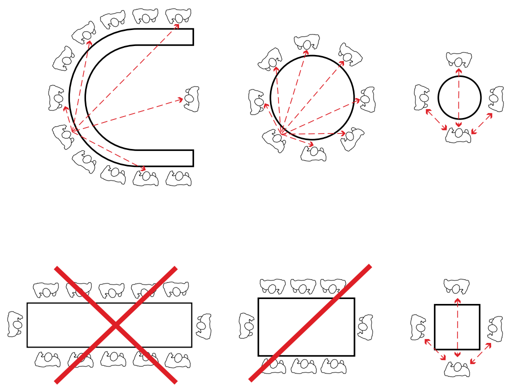


1.3.3 Eddies



3.1.7 sign

Space Size + Shape
Learning Spaces

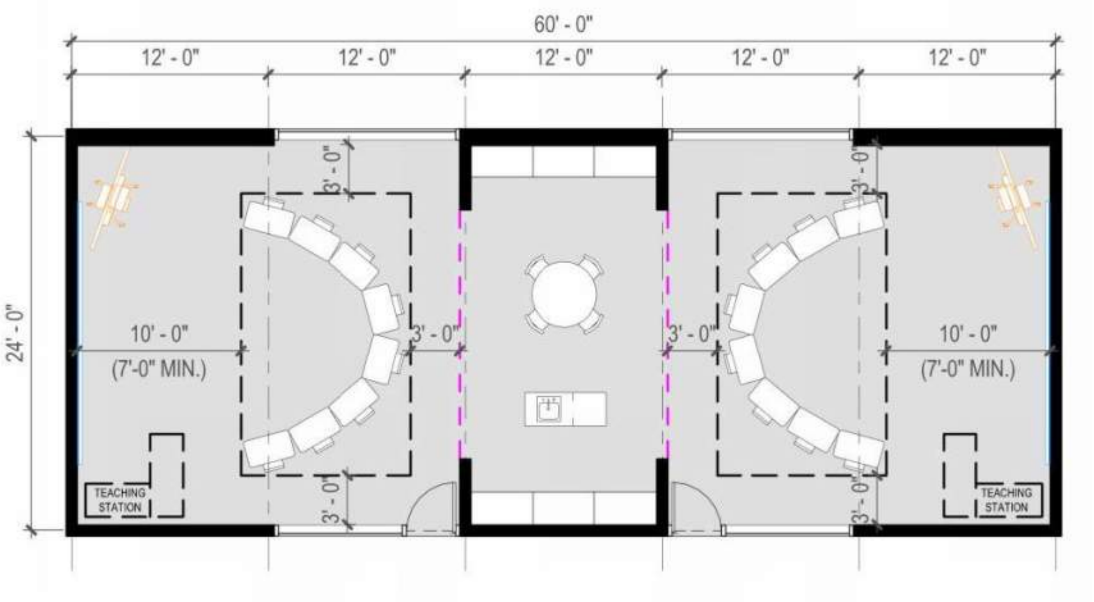


1.2.1 Groups + Seating Arrangements

Classroom Clusters

Select Instructional Space Diagrams

The following room data sheet diagrams are provided for reference to help validate the program and square footage allocated to instructional space. The diagrams are not intended to be a representation of the final design, but rather showing potential "test-fits" of how the space might be organized. Furniture, fixture and fittings are shown for illustrative reference only. Casework in classrooms may be open shelving with brackets and standards where locking cabinetry is not required.



Classroom / Lab
540nsf

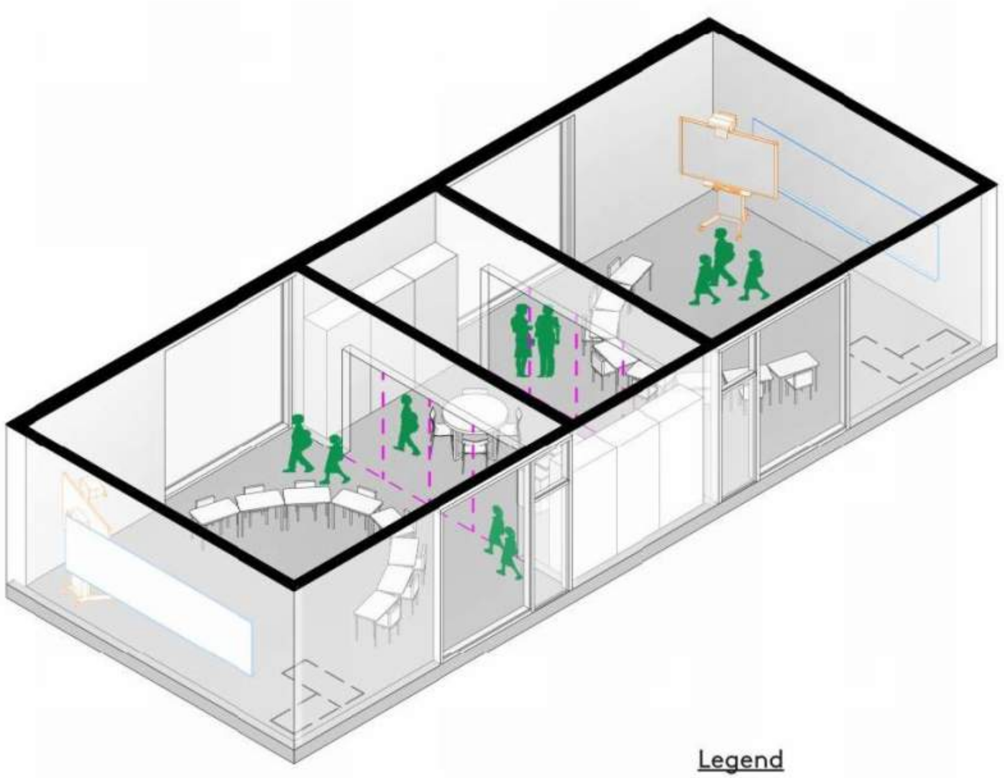
- Elementary (2-6)
- Secondary (7-12)

PBL / Storage
270nsf

- Option A

Classroom / Lab
540nsf

- Elementary (2-6)
- Secondary (7-12)



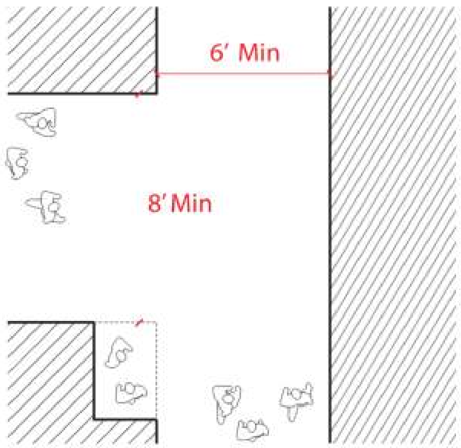
Legend

- Mobile Smart Screen
- Dry Erase Board
- Operable Partition

Circulation + Flow

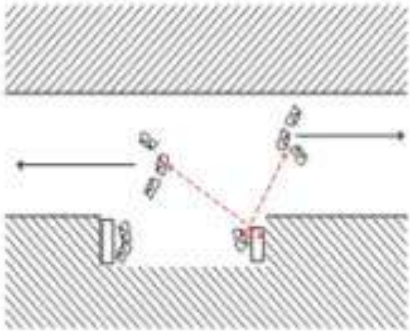
3.1.1 Corridor Dimensions

Primary corridors should be a minimum of 8 feet wide and secondary corridors should be a minimum of 6 feet wide. Corridors should be designed to provide conversation nodes located outside of the pathway flow. (See 3.1.2, 3.1.3)



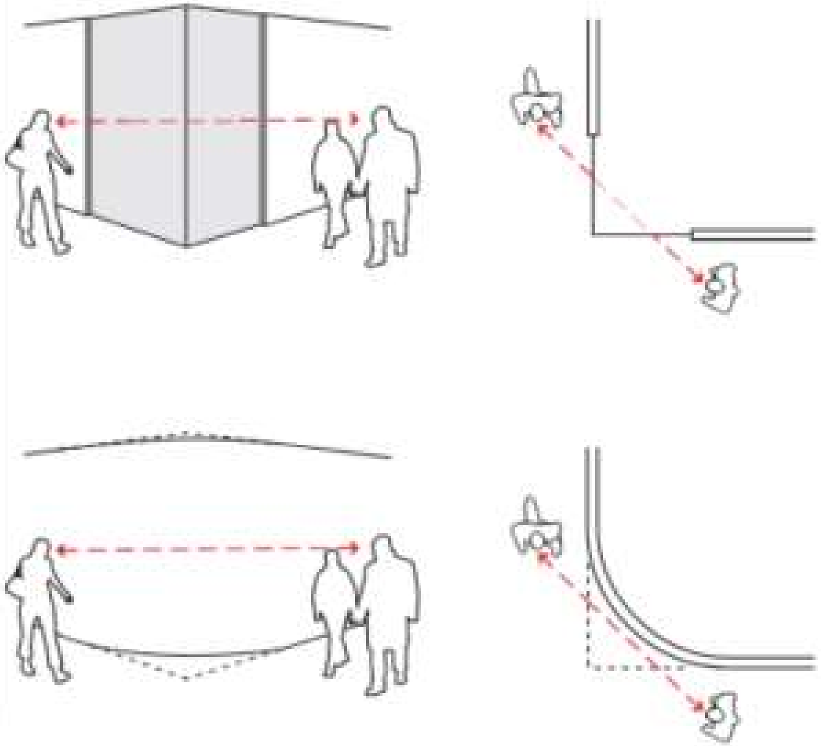
3.1.3 Corridor Ancillary Uses

Major circulation routes such as building corridors, campus walks and public sidewalks often require non circulatory uses to be located adjacent to or within them. This includes, but is not limited to, drinking fountains, building directories, display furniture, waste receptacles and video phone booths. These items should be placed within adjacent Shoulder Zones (See 3.1.8) or corridor Conversation Eddies and out of the clear path of travel (See 3.1.2). Elements such as drinking fountains and phone booths should orient the user parallel to the flow of traffic and should utilize reflective wall surfaces (See 2.4.3) to enable continuous visual connection.



3.1.6 Soft Intersections

Eased, or "soft" corners allow pedestrians to see others and avoid collisions.

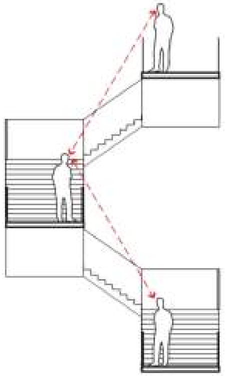



K-1
122
ELEC.
120B
059
ASL OFFICE
131A
E003
E003
E036
E003
SLP OFFICE
133
E002
002
5-6 CLASSROOM
135
E002
E003
PBL B
135A
009
009
5-6 CLASSROOM
137
E002
E003
VESTIBULE
130G
009
PBL A
122A
TOILET
122B
015
009
ASL LAB
131
2-3 CLASSROOM
124
E003
E002
E004
CUSTODIAL / LAUNDRY
130F
COUNSELOR OFFICE
126A
COUNSELOR THERAPY
126
002
009
E003
VESTIBULE
130A
K-6 "ALL CLEAR"
132
E003
E002
3-6 STRIVE
134
E002
E003
PBL C
134A
009
3-4 CLASSROOM
136
E002

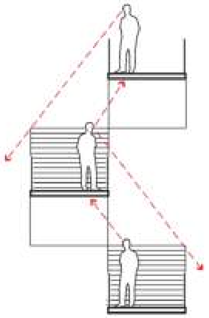
Vertical Connections

3.2.1. Stair Configuration

Stairs that have a vertical opening between switchback flights allow more graceful movement as well as views to others across the open space. Seeing a colleague descending the opposing stair flight reduces the chance of collision on the intersection.



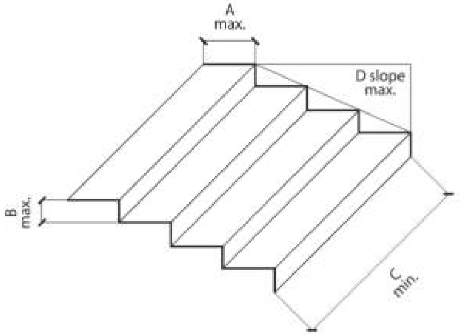
GOOD



BAD

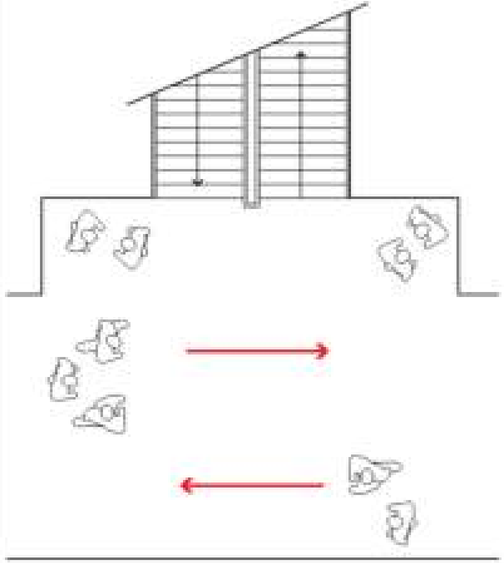
3.2.2 Stair Dimensions

Like paths and corridors, wider stairs are preferred. Stairs should have gentle rise/ run ratios.



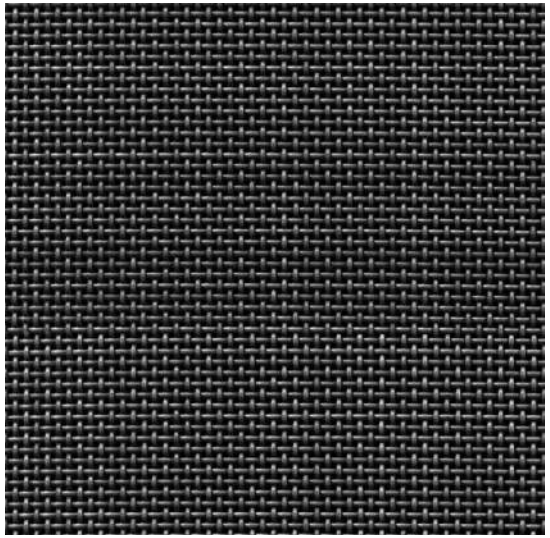
3.2.4 Stairs & Cross Circulation

When stairs empty into a circulation path like a corridor or campus pathway, extra dimension should be provided to allow uninterrupted flow in all directions.

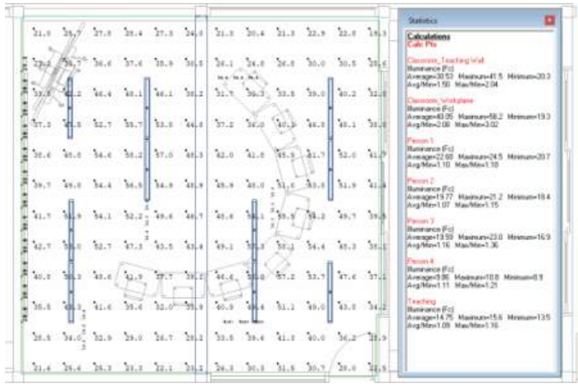


Vertical Connections

Testing Through Mockups



Illumination



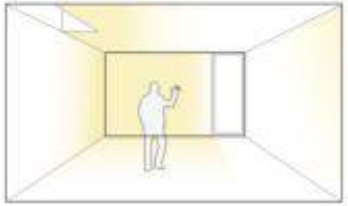
4.2.1 Avoiding Backlighting

Bright windows located behind people or focal points in spaces cause high contrast between subject and environment. A person standing in front of a bright window will be silhouetted, causing difficulty in reading facial expressions and making eye contact.

4.2.2 Wash Surfaces with Light

Lighting surfaces rather than spaces helps avoid hotspots and shadows that can compromise visual communication. Windows and skylights should not be located in the middle of rooms, but should be located so that they wash walls, floor and ceiling surfaces with natural light.

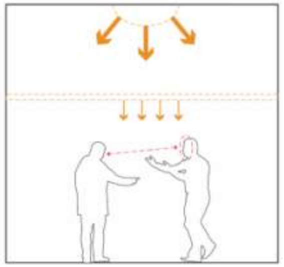
BAD



GOOD

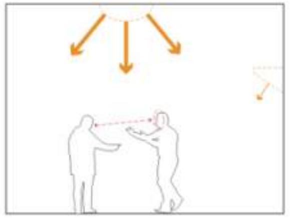
4.3.1 Shaping Space: Light Layers

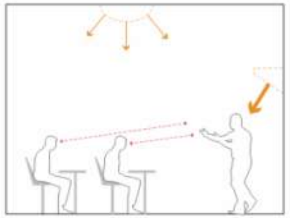
Layers of illumination built up from multiple sources and fixture types should be used to break down large spaces into sub-spaces that are tailored to the needs of deaf individuals and the programs being enacted within each zone. For example, in tall collective spaces, a horizontal datum of light can create sub-spaces that introduce a human scale that encourages more intimate signed conversations. Other spaces might utilize light layers in a different way to facilitate comfort and ease of communication.



4.3.2 Light Dimming: Comfort & Control

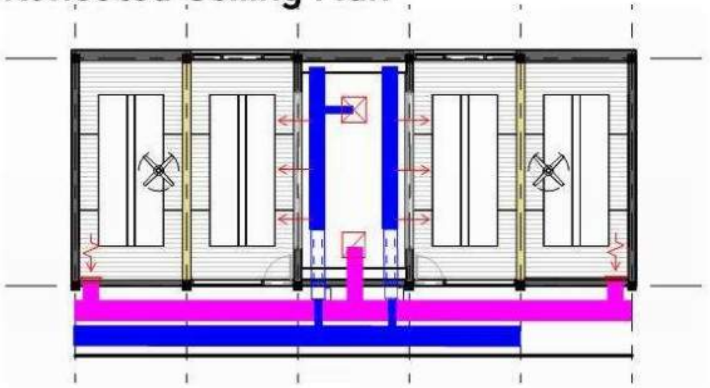
The ability to control and revise light levels depending on how a room is being used is particularly important in the visu-centric Deaf community. To ensure that lighting levels are appropriate for a given space or activity, users should be given access to methods of dimming the lighting in their environment.



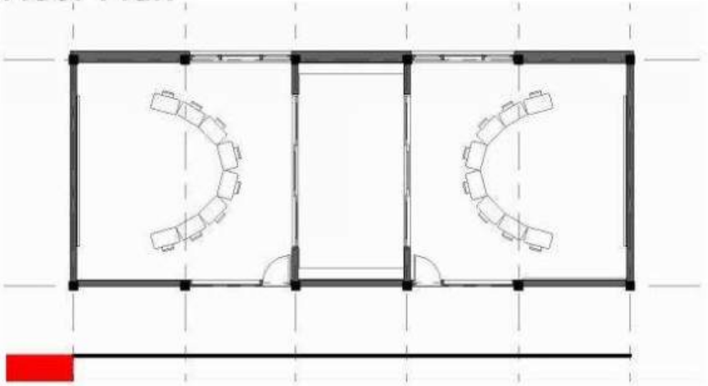


Illumination

Reflected Ceiling Plan



Floor Plan



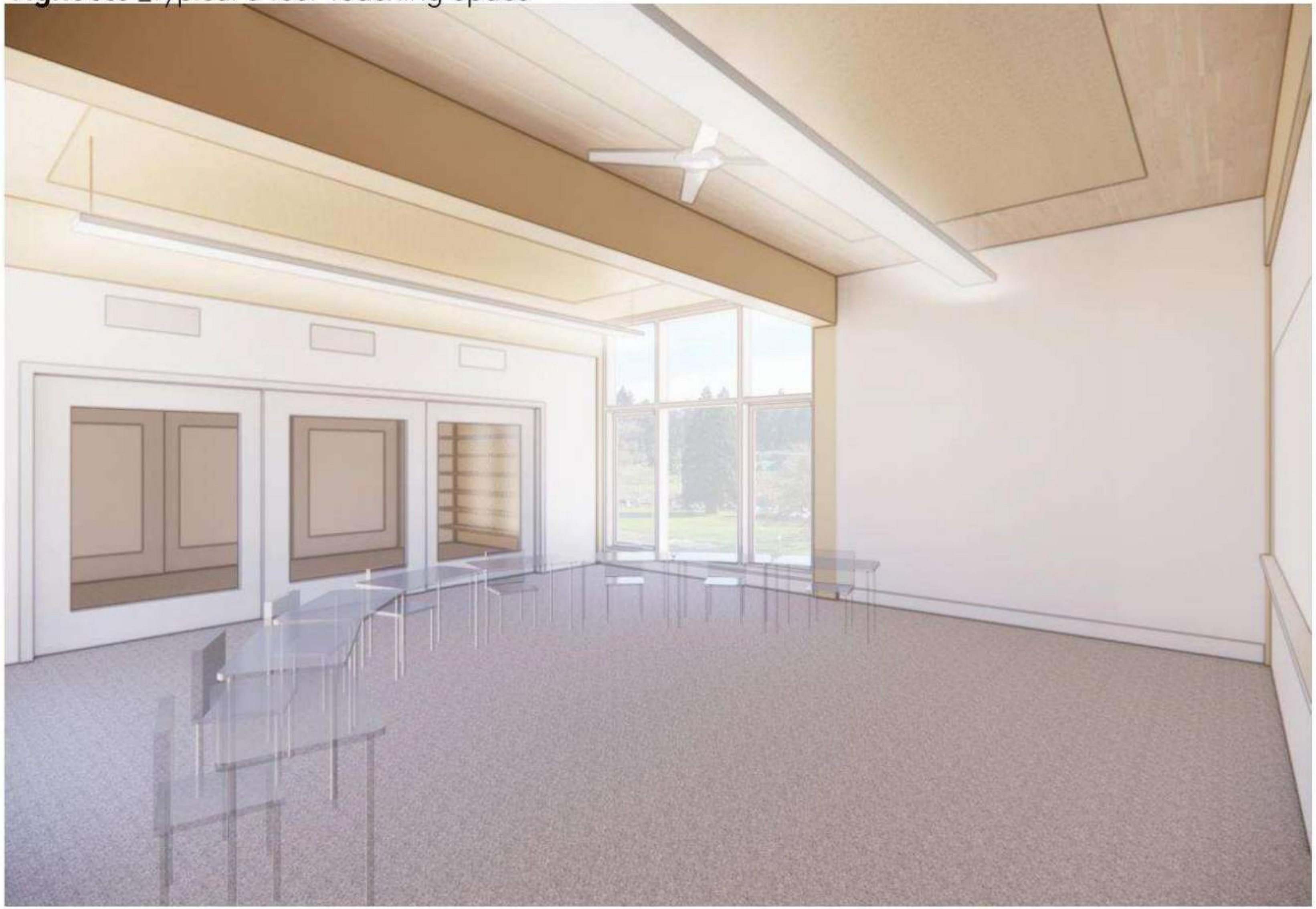
Advantages

- Ductwork isolated to PBL's in typical classroom
- Maintains square footage of teaching spaces and PBL's

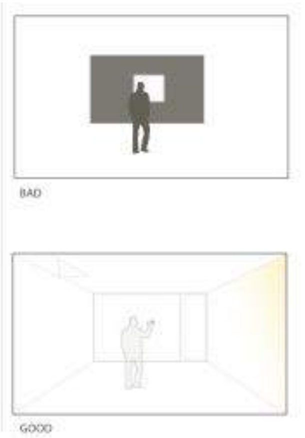
Challenges

- Shaft space taken from corridor, near toilets
- Lower ceiling height in corridor
- Large rooftop units

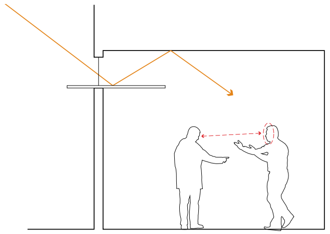
Vignette _Typical 540sf Teaching Space



Balanced Daylight + Glare Avoidance

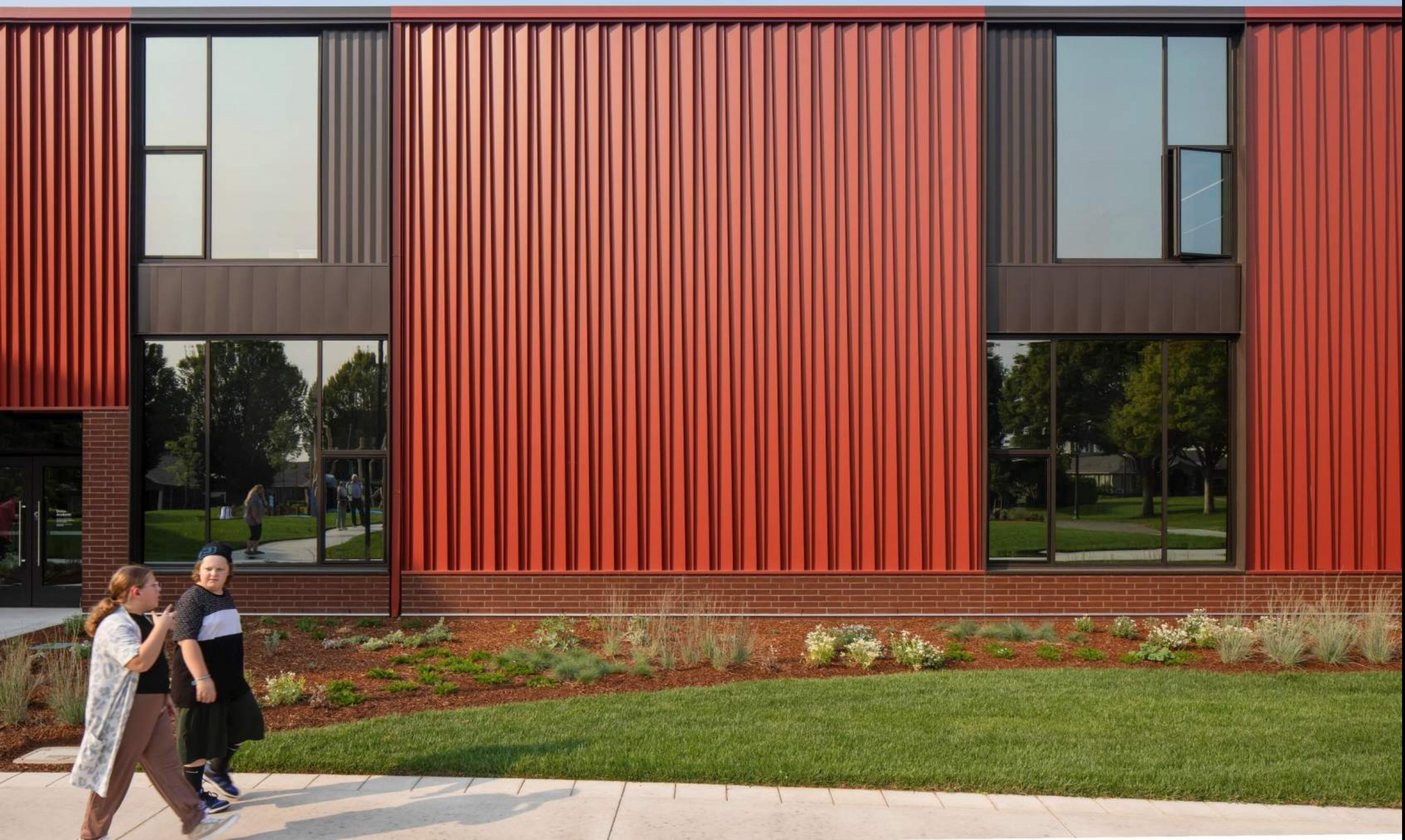


4.2.2 Wash Surfaces with Light

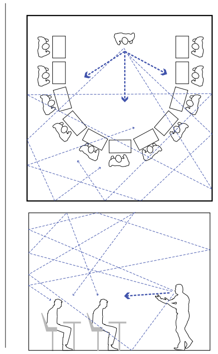


4.2.5 Light Shelves

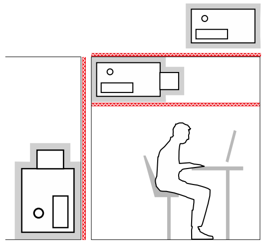
Exterior Glare Avoidance



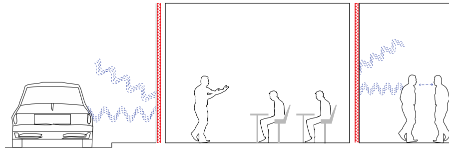
Acoustic Performance



5.1.1 Sound Reverberation



5.1.2 Equipment Noise



5.1.3 Background Noise

SECTION 808
ENHANCED ACOUSTICS FOR CLASSROOMS

808.1 General. Classrooms not exceeding 20,000 cubic feet (565 m^3) and required to provide enhanced acoustics shall comply with Section 808.

808.2 Reverberation time. Classroom reverberation times shall comply with either Section 808.2.1 or Section 808.2.2, depending on the size of the room.

808.2.1 Performance method. For each of the octave frequency bands with center frequencies of 500, 1000, and 2000 Hz, the reverberation time (T60) shall not exceed the times specified below:

1. 0.6 seconds in classrooms with volumes up to and including 10,000 cubic feet (285 m^3).
2. 0.7 seconds in classrooms with volumes of more than 10,000 cubic feet (285 m^3), but less than 20,000 cubic feet (566 m^3).

Reverberation times shall apply to fully-furnished, unoccupied classrooms. Reverberation times shall be field verified via measurements over a minimum 20 dB decay in each octave frequency band in accordance with ASTM E2235 listed in Section 106.2.13.

808.2.2 Prescriptive method. The Noise Reduction Coefficient (NRC) ratings for floor, wall and ceiling surface finishes shall conform to the following equations:

For a classroom with a volume less than or equal to 10,000 cubic feet (285 m^3):

(NRCFloor x SFloor)+ (NRCCeiling x SCeiling) + (NRCWall x SWall) ≥ Volume/12

For a classroom with a volume between 10,000 cubic feet (285 m^3) and 20,000 cubic feet (565 m^3):

(NRCFloor x SFloor)+ (NRCCeiling x SCeiling) + (NRCWall x SWall) ≥ Volume/14

Where:

NRCFloor = NRC rating of the floor finish material

SFloor = floor area in square feet

NRCCeiling = NRC rating of the ceiling finish material

SCeiling = ceiling area in square feet

NRCWall = NRC rating of the wall acoustical treatment

SWall = wall treatment area in square feet

Volume = room volume in cubic feet

Where a floor, ceiling or wall has multiple surface finishes, the NRC x S product for each surface finish shall be added to the left side of the equation.

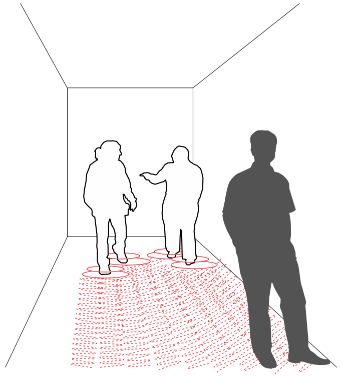
808.3 Ambient sound level. Classroom ambient sound levels shall comply with Sections 808.3.1 and 808.3.2. Ambient sound levels from sound sources outside and inside the classroom shall be evaluated individually. The greatest one-hour averaged sound levels shall be evaluated at the loudest usable location in the room at a height of 36 inches (915 mm) to 42 inches (1065 mm) above the floor and no closer than 36 inches (915 mm) from any wall, window or object. The ambient sound level limits shall apply to fully-furnished, unoccupied classrooms, and with only permanent HVAC, electrical and plumbing systems functioning. Classroom equipment, including, but not limited to, computers, printers and fish tank pumps shall be turned off during these measurements.

808.3.1 Sound sources outside of the classroom. Classroom ambient sound levels shall not exceed 35 dBA and 55 dBC due to intruding noise from sound sources outside of the classroom, whether from the exterior or from other interior spaces.

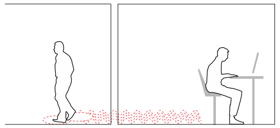
808.3.2 Sound sources inside the classroom. Classroom ambient sound levels shall not exceed 35 dBA and 55 dBC for noise from sound sources inside the classroom.

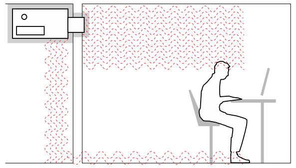
2017 ICC Accessibility Standard: A117.1

Sensory Vibration

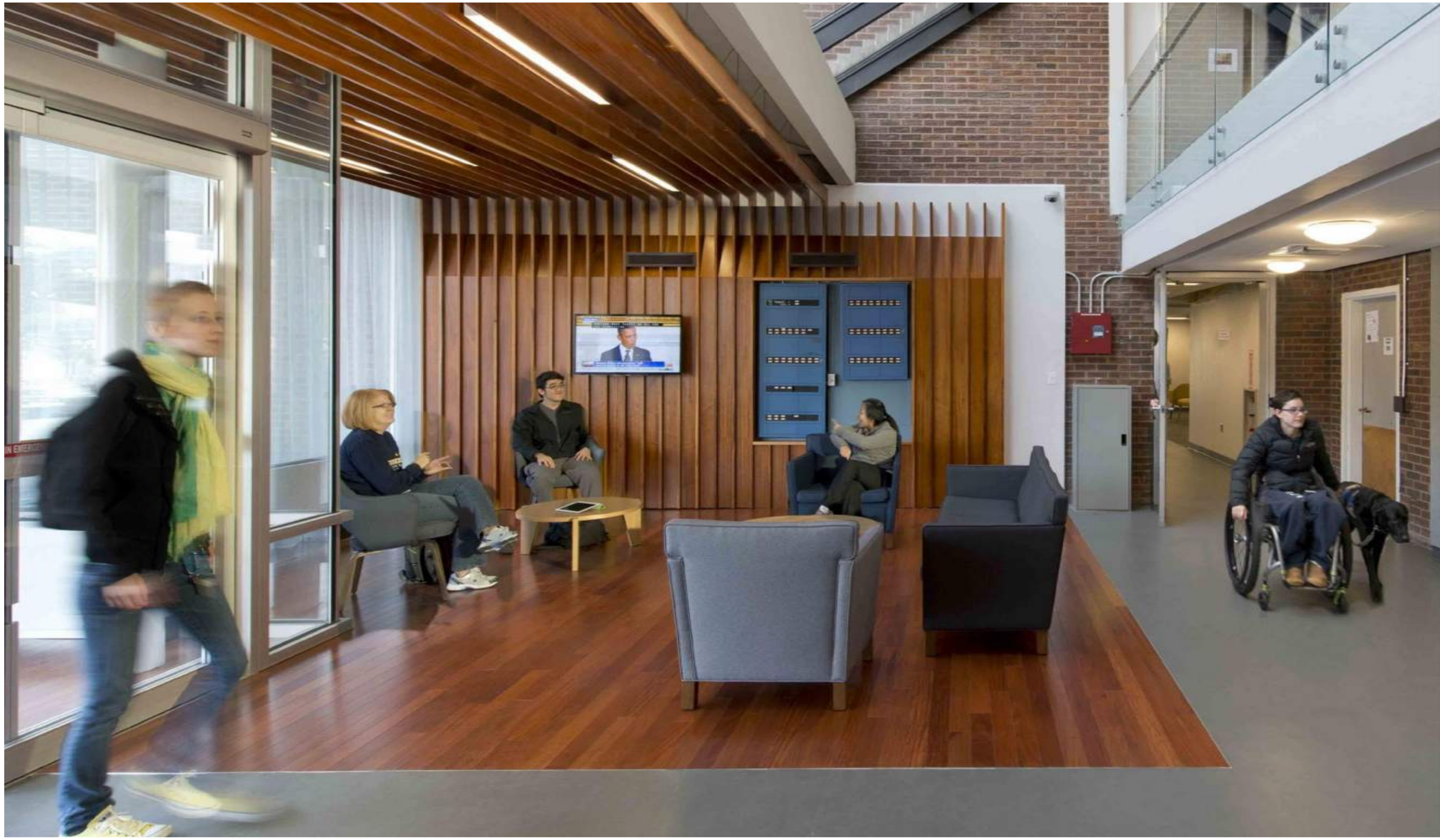


2.5.2 Vibration Zones





4.5.3 Reduce Unwanted Vibration



Sensory Vibration

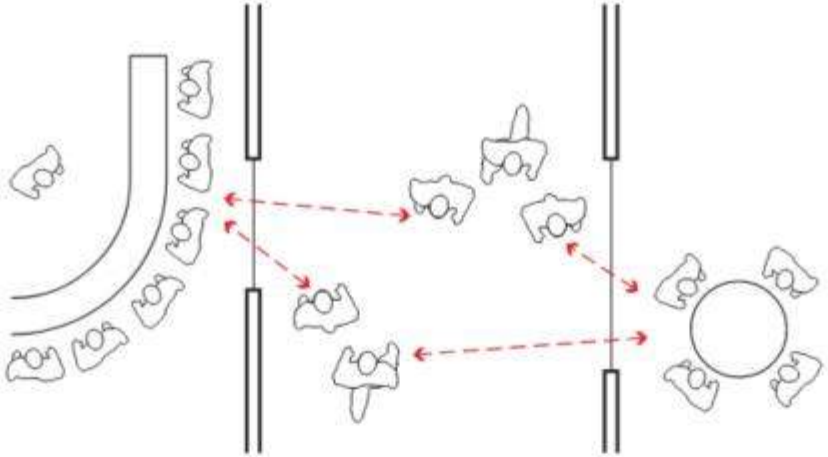
Transparency

1.3.8 Fixed Casual Seating Arrangements

Architectural elements which can be used as seating or simply a place to set down one's belongings encourage gathering and conversation. These elements should be located in casual indoor and outdoor social spaces and configured such that a group of 2 or more individuals may sit within 1'-6" to 3'-0" of one another. When arranged in clusters, this allows individuals to circulate freely and chose their place in a group as it forms. The seating elements should vary slightly in height to allow clear sightlines among a variety of participants. Conversation pedestals and shelves should be included in these clusters (1.3.9).

2.1.6 Transparency in Movement Spaces

In hallways, corridors and other movement spaces within buildings, it is desirable to provide transparency into adjacent spaces, allowing visual access to the activities taking place throughout the building.



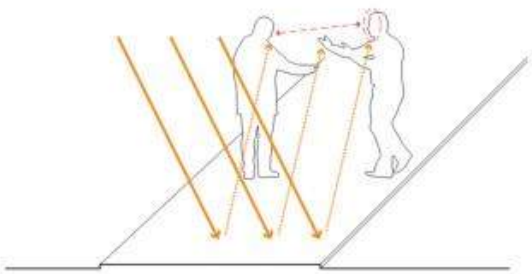
3.3.1 Sliding Entrances

Providing automatic sliding doors at major building entrances helps ease flow into and out of buildings, especially for those engaged in signed conversations.

Colors & Finishes

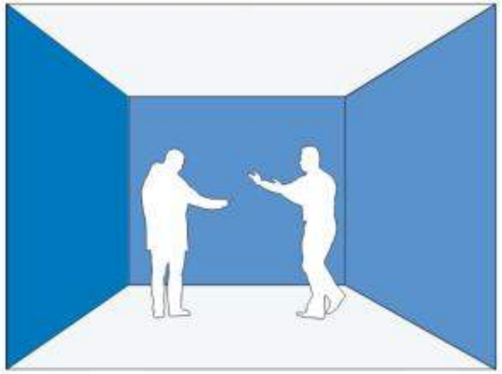
4.1.3 Surface Glare: Mobility & Communication

Glare on surfaces can be distracting and disorienting for people holding a signed conversation. Highly reflective or specular surfaces for building skins, signage and other elements should be limited in order to reduce exterior glare. For example, brushed metal surfaces should be used instead of polished metal. Plastics should be matt finished instead of gloss. Stone surfaces should be textured or honed instead of polished.



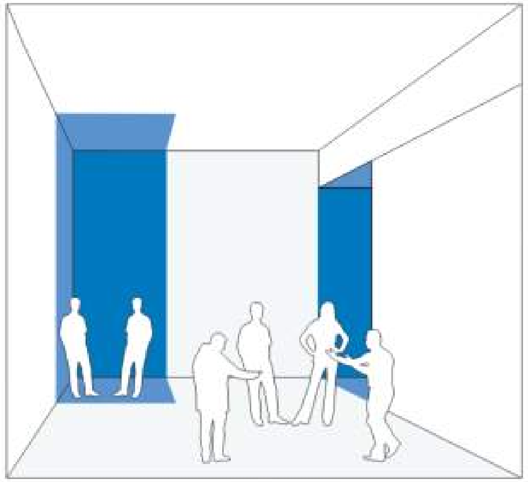
4.1.4 Color: Contrasting Surface & Visual Language

Since communication between deaf and hard of hearing individuals is so dependant on visual clarity, colors that are contrasting and complimentary to skin colors are best for backgrounds to sign language. Blues and greens contrast with most skin colors. In addition, blues and greens visually calm space by avoiding overstimulating eyes and providing a restful backdrop for movement and signing. In large and active spaces, painting surfaces blue or green will help deaf and hard of hearing individuals better and more comfortably communicate.



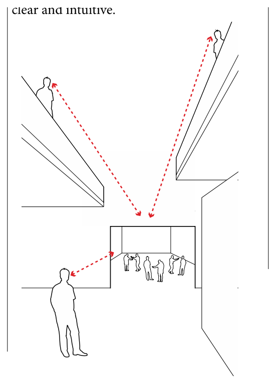
4.1.2 Color Eddies: Shaping Space

Intimate spaces for signed conversations should be created off of main movement and gathering spaces. Darker colors applied to surfaces in select smaller spaces can create an intimate experience that arises from a feeling of being enveloped. Color and floor pattern can create feelings of intimacy for smaller conversations while allowing a connection to a larger space (see 1.3.3, 3.1.2, 3.1.3, 4.2.6).

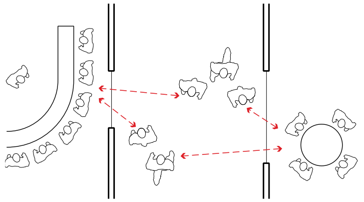


Occupant Experience

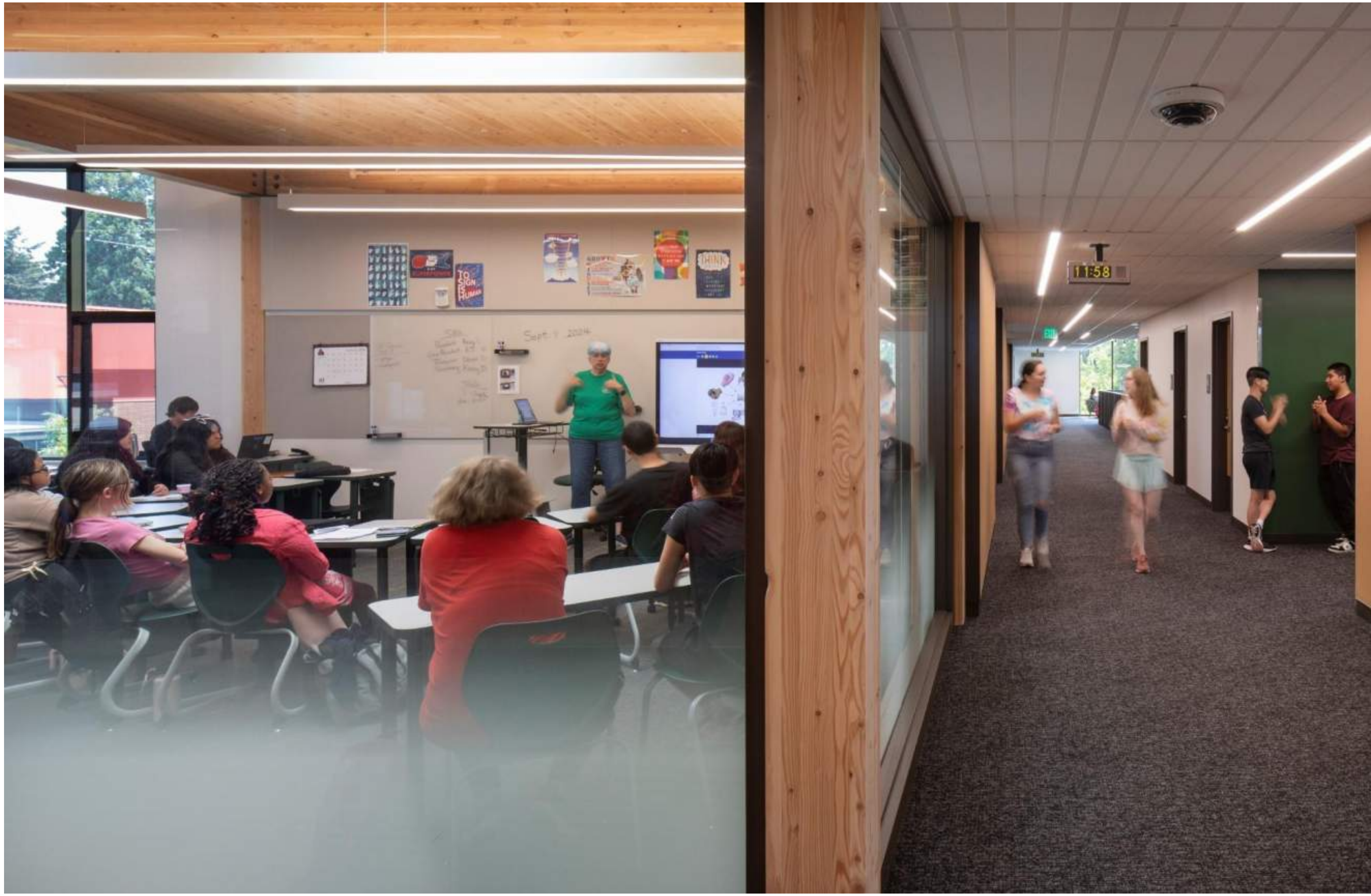
Visual Connection



2.1.5 Visible Destinations Within Buildings

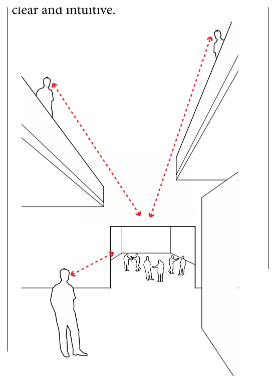


2.1.6 Transparency In Movement Spaces

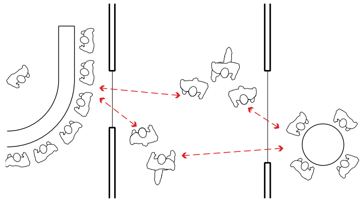


Occupant Experience

Visual Connection



2.1.5 Visible Destinations Within Buildings



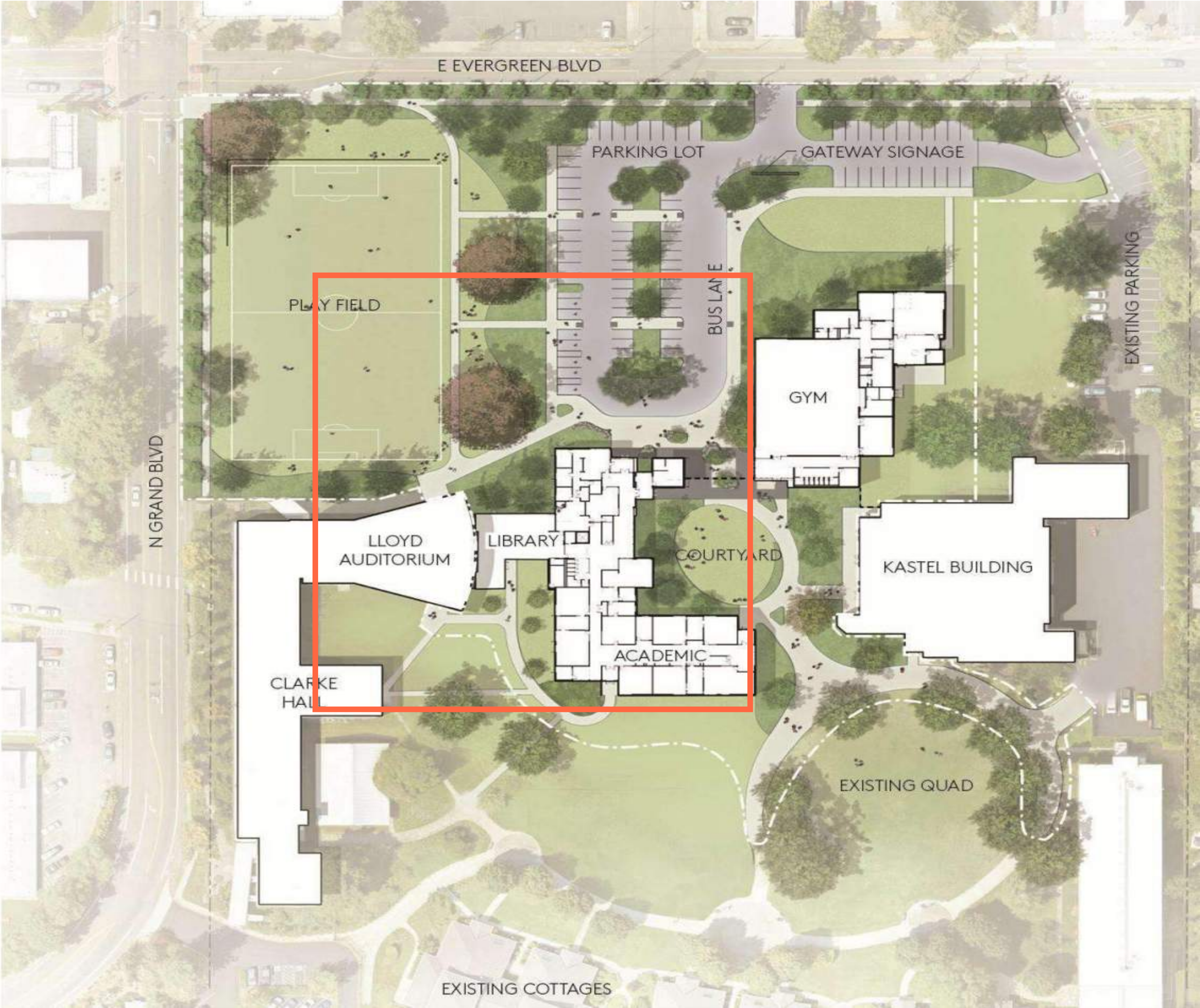
2.1.6 Transparency In Movement Spaces

Site Design

Site Plan


E EVERGREEN BLVD
PARKING LOT
GATEWAY SIGNAGE
PLAY FIELD
BUS LANE
EXISTING PARKING
GYM
N GRAND BLVD
LLOYD AUDITORIUM
LIBRARY
COURTYARD
KASTEL BUILDING
ACADEMIC
CLARKE HALL
EXISTING QUAD
EXISTING COTTAGES

Site Plan



E EVERGREEN BLVD
PARKING LOT
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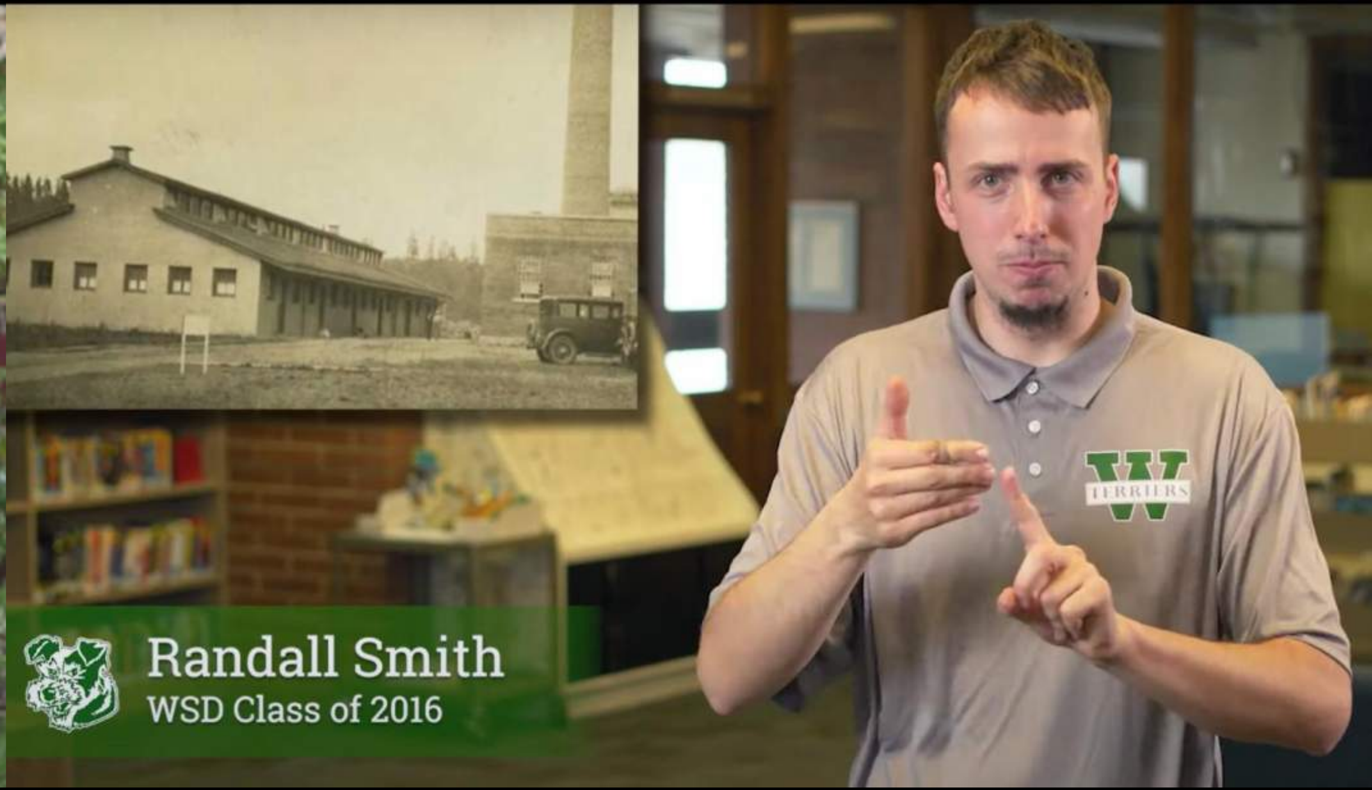
LIBRARY
COURTYARD
KASTEL BUILDING
ACADEMIC
CLARKE HALL
EXISTING QUAD
EXISTING COTTAGES

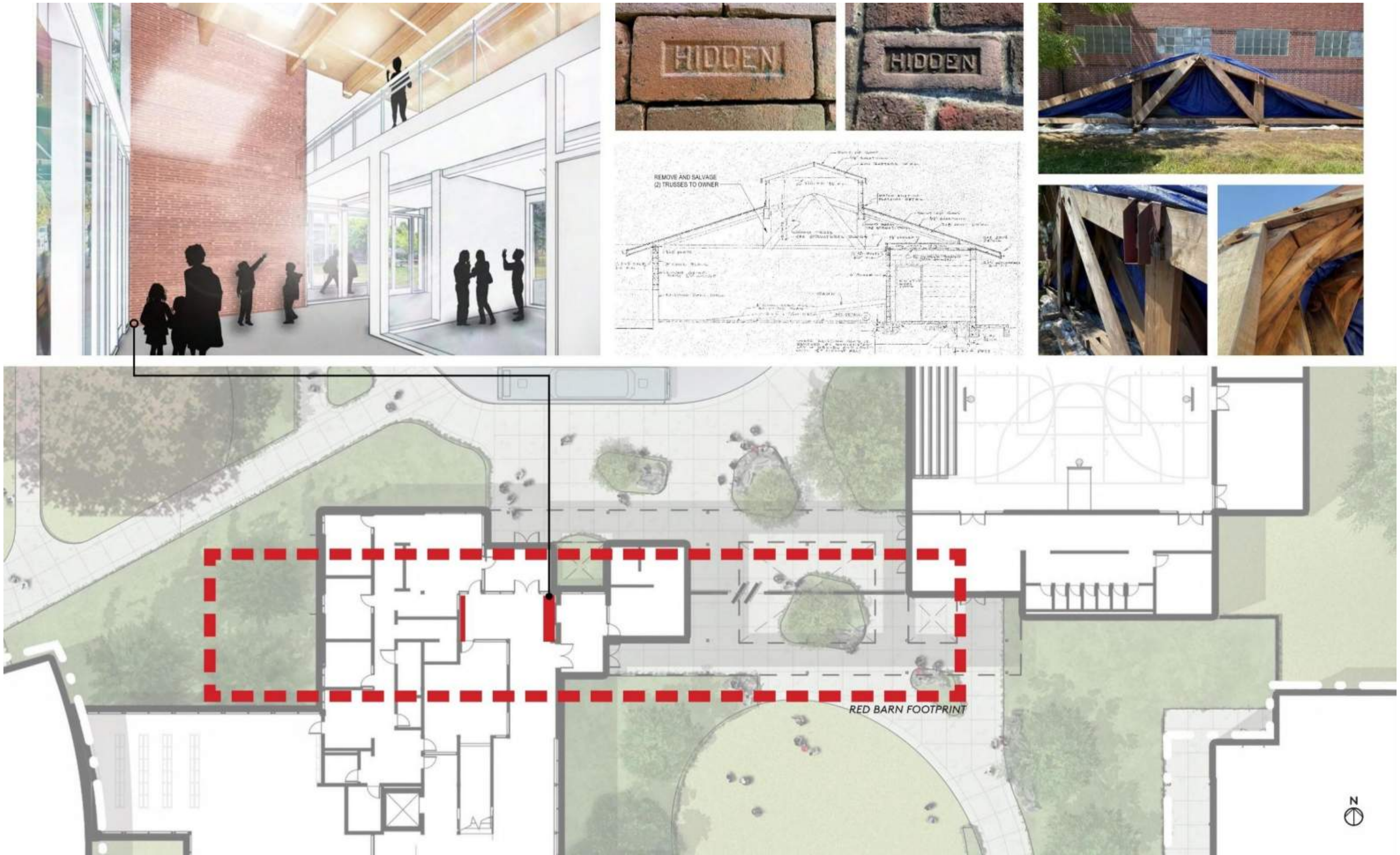
Honoring Memories of the Past

A History of the Washington School for the Deaf

A History of the Washington School for the Deaf



Honoring Memories of the Past



Honoring Memories of the Past

Celebrating Culture

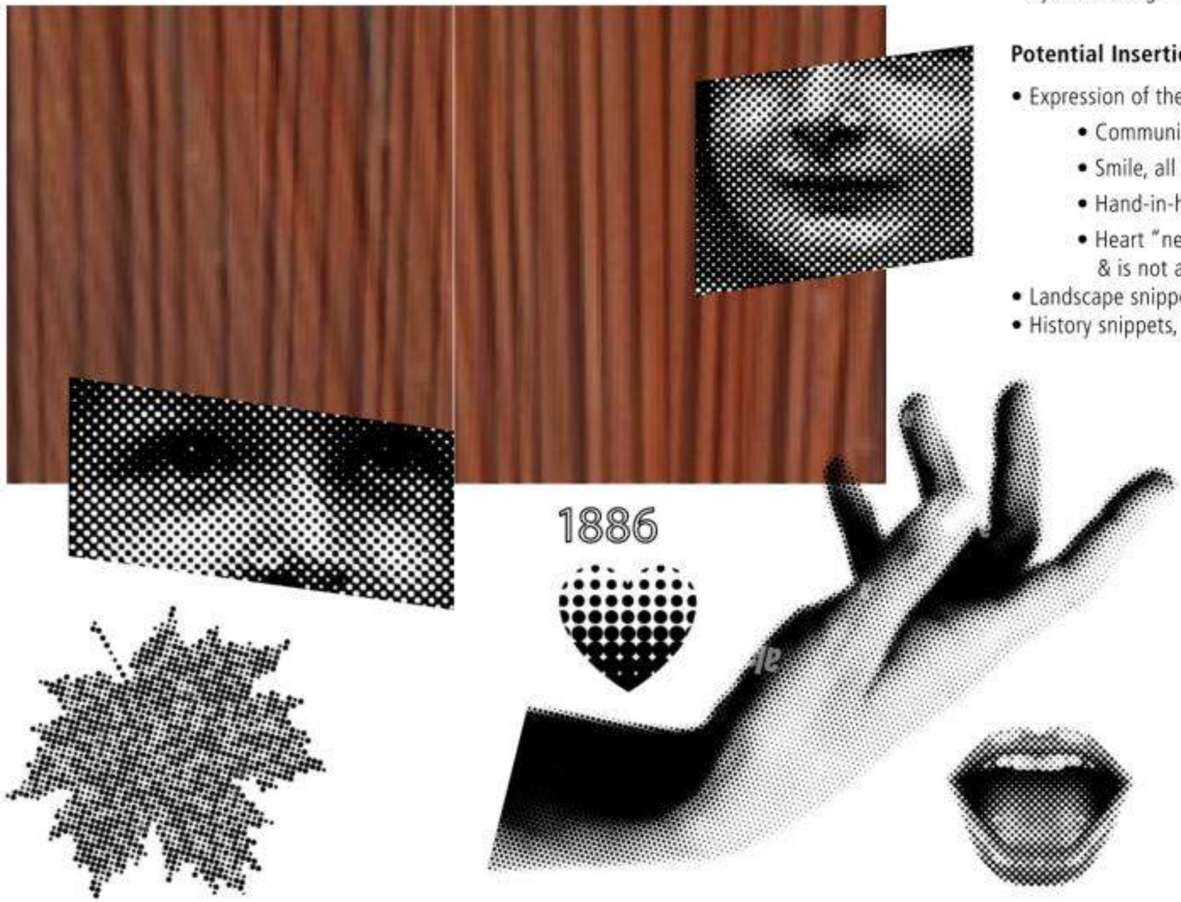
ART GATE STUDIES

CONCEPT 3 -
Celebration of New Campus Integration

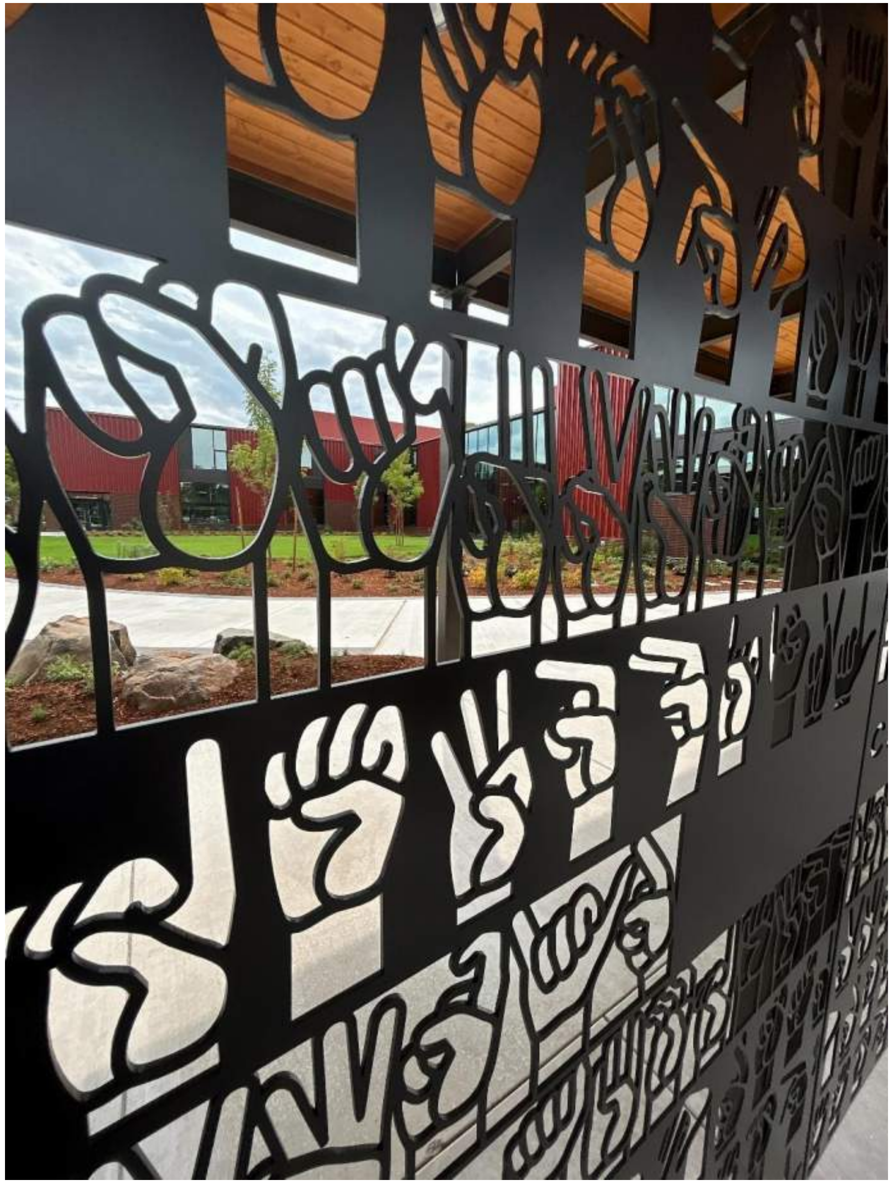
- Extension of architectural language
- Linear but not static
- Implies movement, flow & directionality
- knitting together architecture & expression by embedding imagery in selected segments

Potential Insertion Images:

- Expression of the senses
  - Communication w/hands, eyes, mouth, gestures
  - Smile, all are welcome, kiss fist
  - Hand-in-hand
  - Heart "new transplant heart that integrates campus & is not a barrier"
- Landscape snippets
- History snippets, dates, etc.



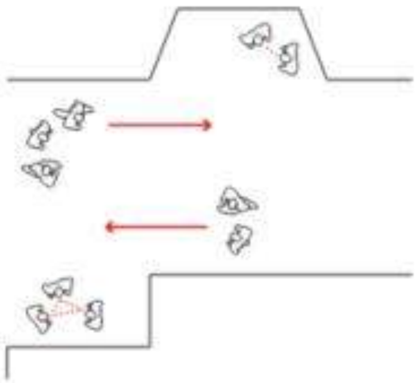
Celebrating Culture



Site Design Considerations

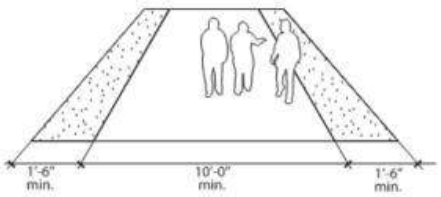
3.1.2 Conversation Eddies & Pathway Flow

Along campus paths and primary corridors, provide space to allow small groups to have stationary conversations outside of the flow of traffic. These conversation nodes can be relatively small for standing conversations or can be larger in instances where it is appropriate to incorporate loose seating. These nodes are especially valuable at campus entrances, decision points and crossroads as well as along long interior corridors. (See 1.3.2)



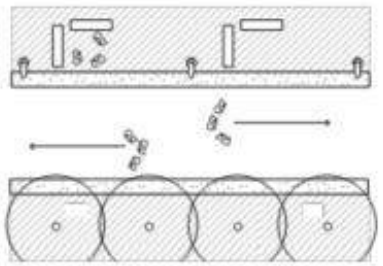
3.1.7 Sidewalk & Pathway Dimension & Design

Sidewalks and paths should be a minimum of ten feet wide to allow for several groups of signers to pass each other easily. Textured edges on the ground plane placed along walkways and can provide subtle clues to the presence of edges.



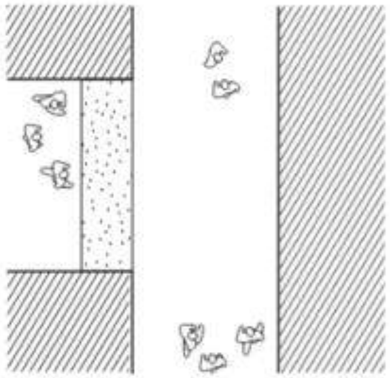
3.1.8 Shoulder Zones

In order to maintain the desired uninterrupted path of travel, Ancillary Uses (see 3.1.3) and Conversation Eddies (See 3.1.2) should be located within "Shoulder Zones"- dedicated zones parallel to one or both sides of the path of travel. The width of these zones as well as the number and type of uses within them will vary but at a minimum, should accommodate a comfortable layout for signed conversation. Shoulder Zones along sidewalks that parallel streets play a dual role as a safety buffer between vehicular and pedestrian traffic. Street elements such as signage, pole lighting, fire hydrants and trees should be located within Shoulder Zones.



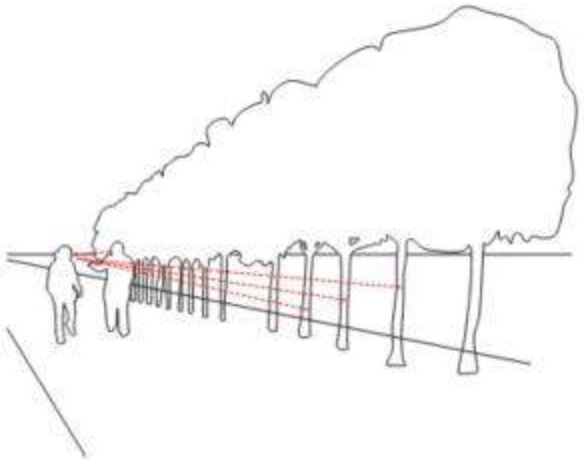
3.3.4 Textured Transitions

Textured edges on the ground plane at transitions between different paths can provide subtle clues to the presence of thresholds, entrances and decision points.

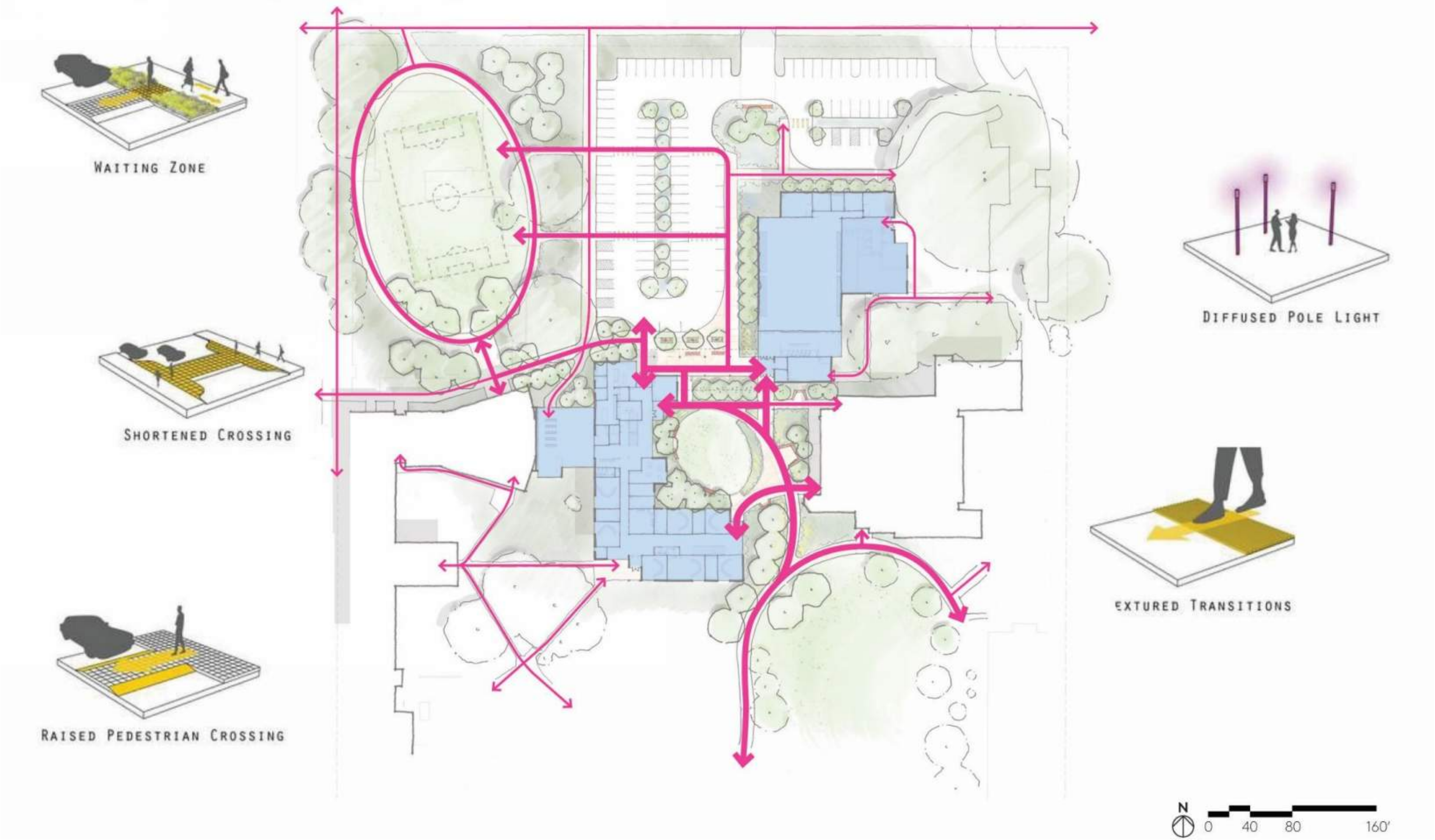


3.4.4 Landscape

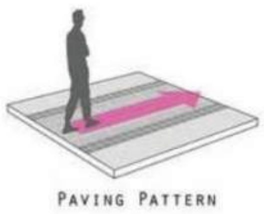
Landscape elements and vegetation should be used along major paths of travel to provide a recognizable, and continuous, visual reference for signers. Placement of trees, light standards or other elements should be placed in an easily understood rhythmic pattern relating to pedestrian cadence.



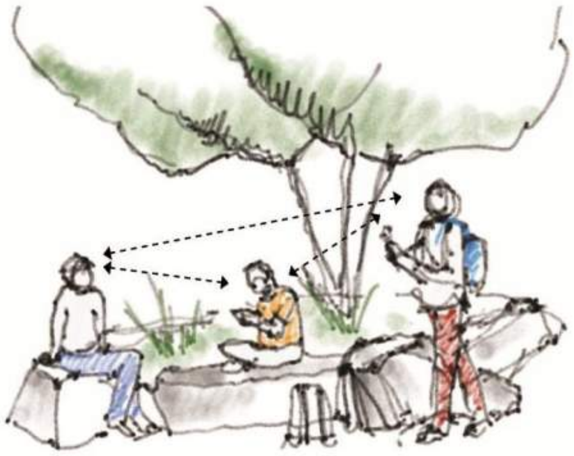
Pedestrian Circulation



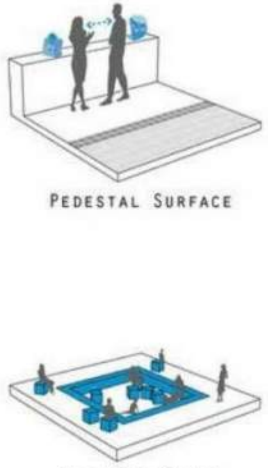
Pedestrian Circulation

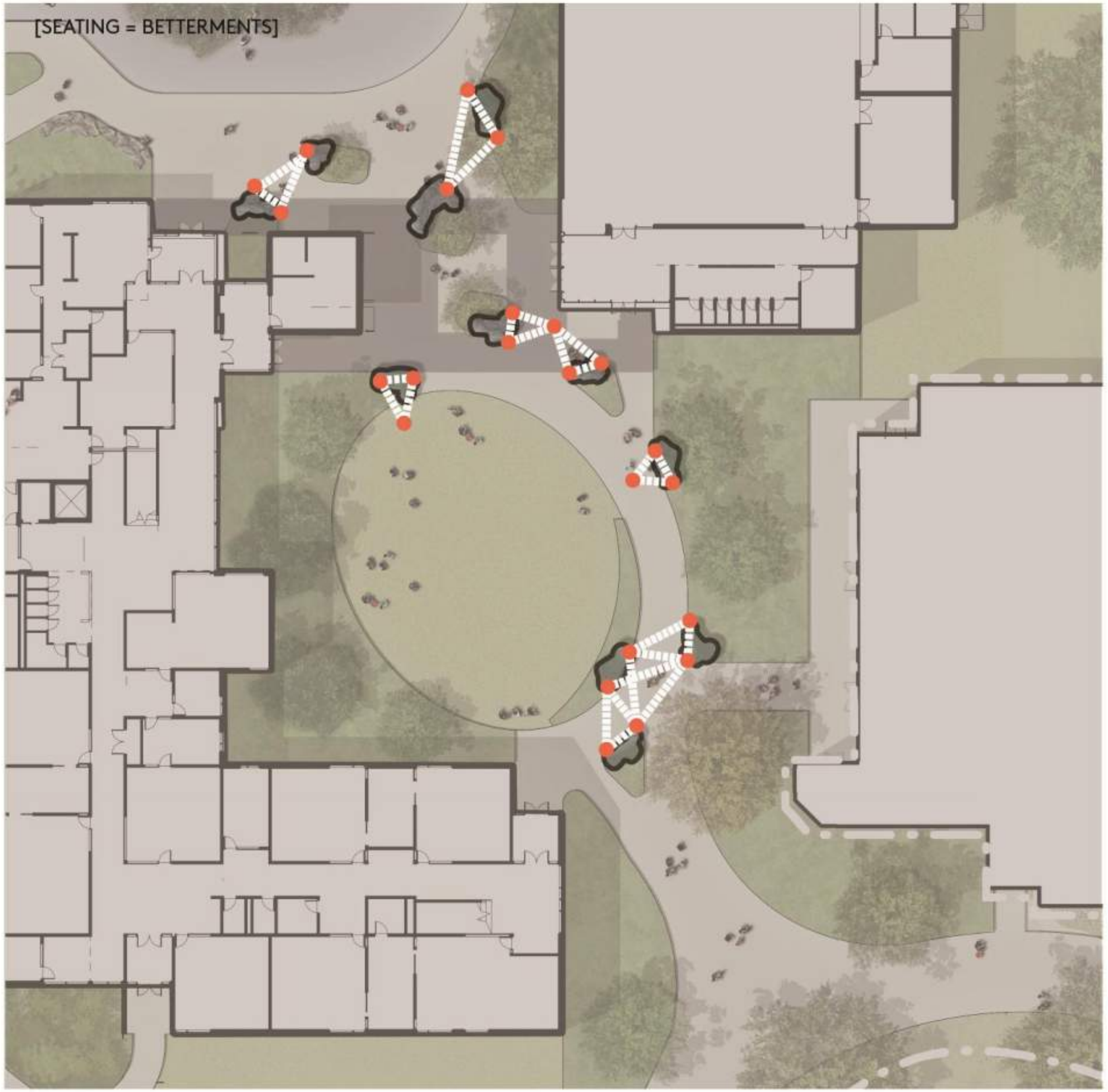


Conversation Triangles



CONVERSATION TRIANGLES

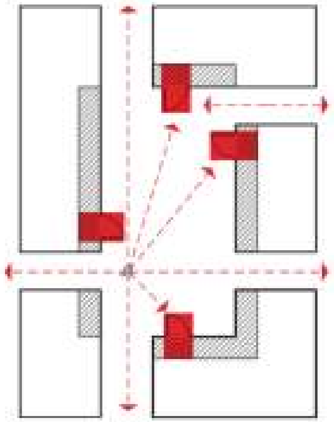




Clear Wayfinding

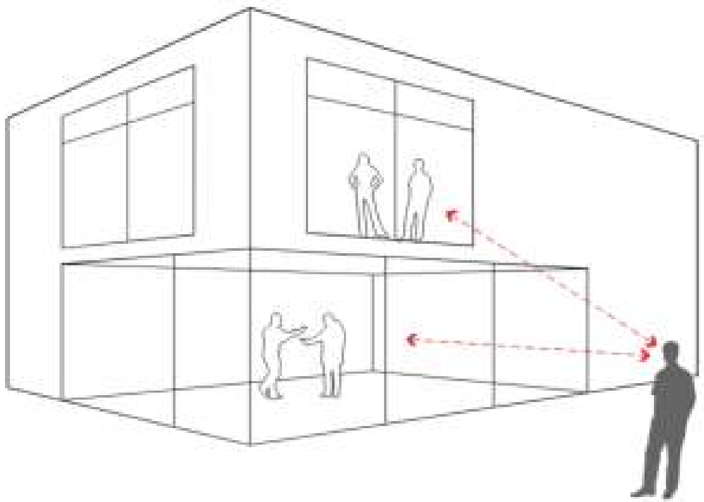
2.1.3 Location of Building Entrances

Primary building entrances should be located such that they are highly visible from decision points along major campus circulation and from open spaces.



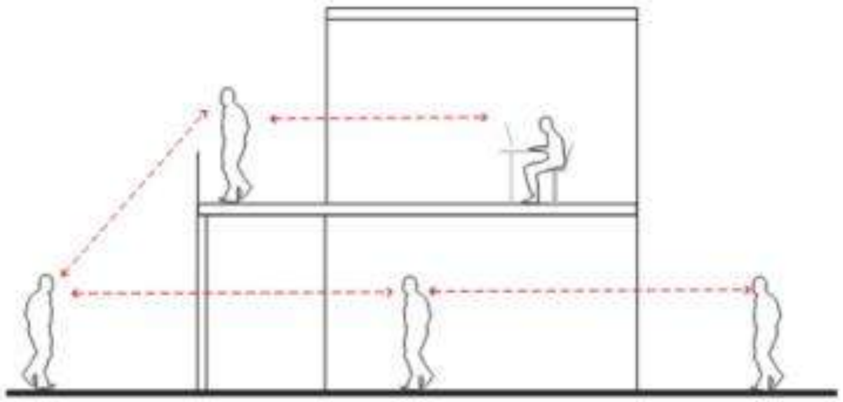
2.1.4 Building Legibility

Primary building uses, especially interior social spaces like lounges, conference rooms and large assembly spaces, should be made legible from the outside whenever possible. This legibility aids in wayfinding at both the campus and building scale. (see 2.1.2)



1.3.6 Linking Exterior & Interior Spaces

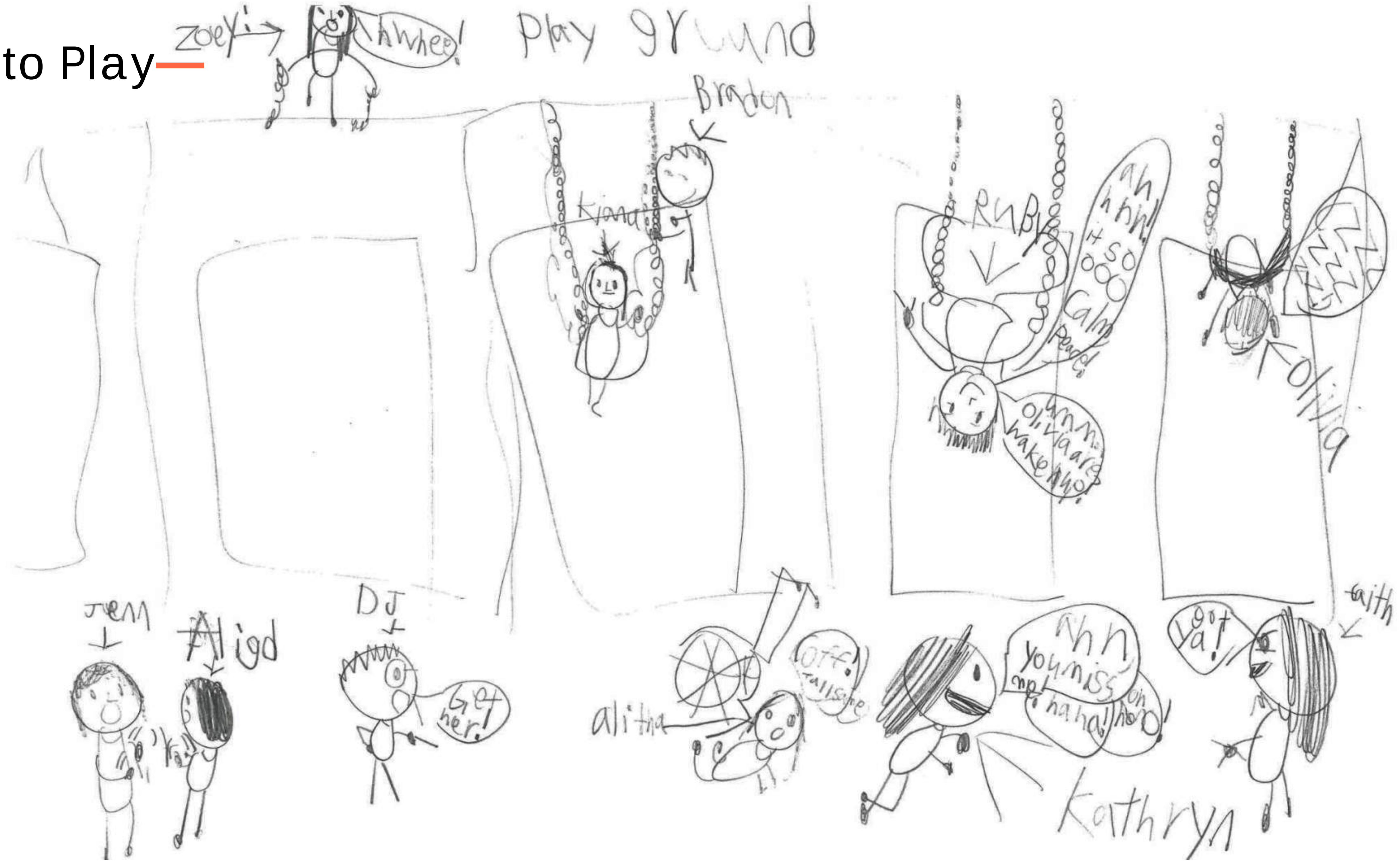
It is highly desirable to open up interior building spaces, especially social spaces such as conference rooms, lounges, building lobbies and eating areas to exterior circulation paths and common areas. Making a ground floor that is as transparent as possible is an effective means for achieving this, but upper level building spaces may communicate with outdoor areas as well (see 2.1.4). Highly transparent glazing should be used and heavily reflective or tinted glass should be avoided.



Clear Wayfinding

Multiple Forms of Play

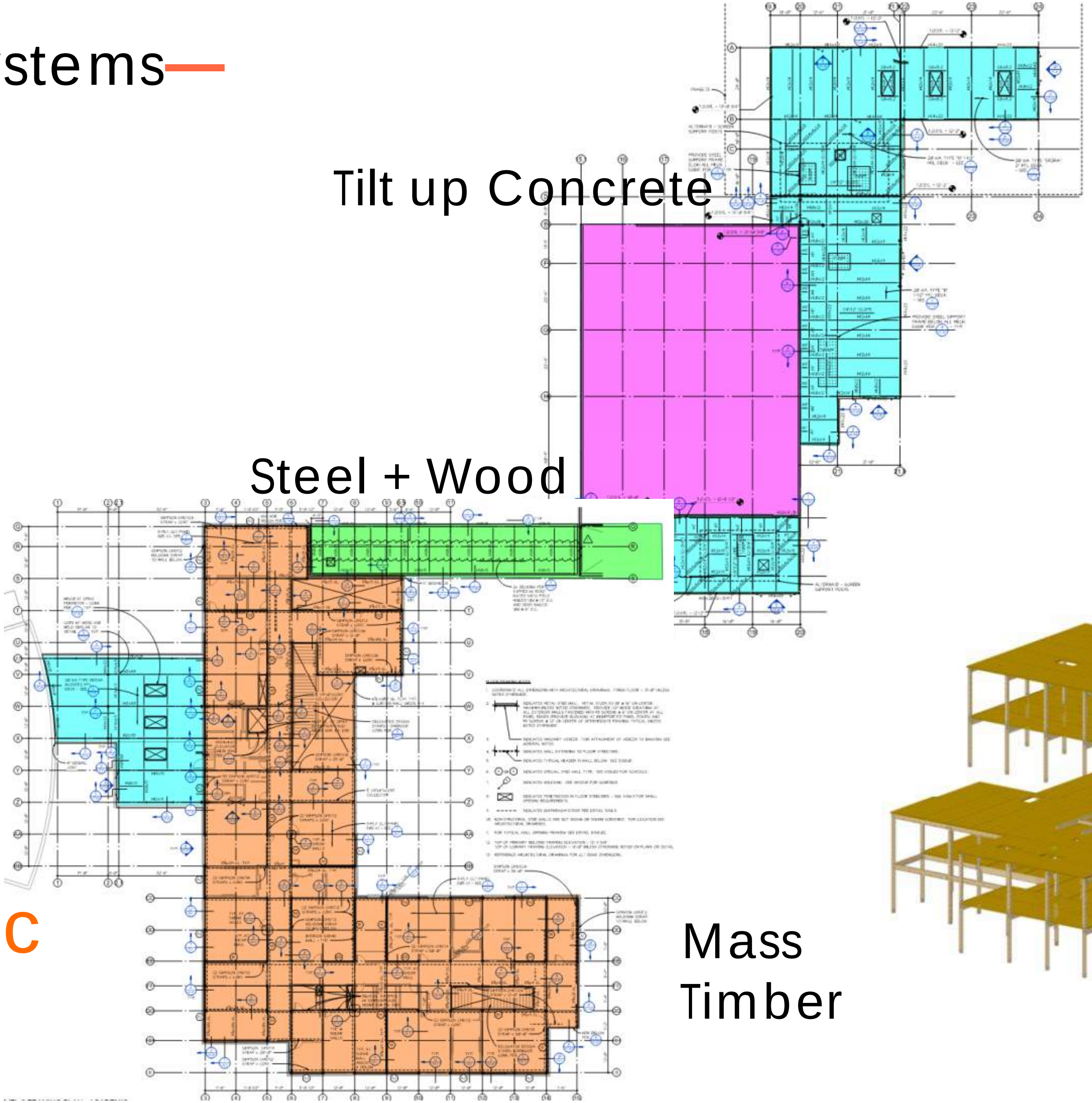
How to Play

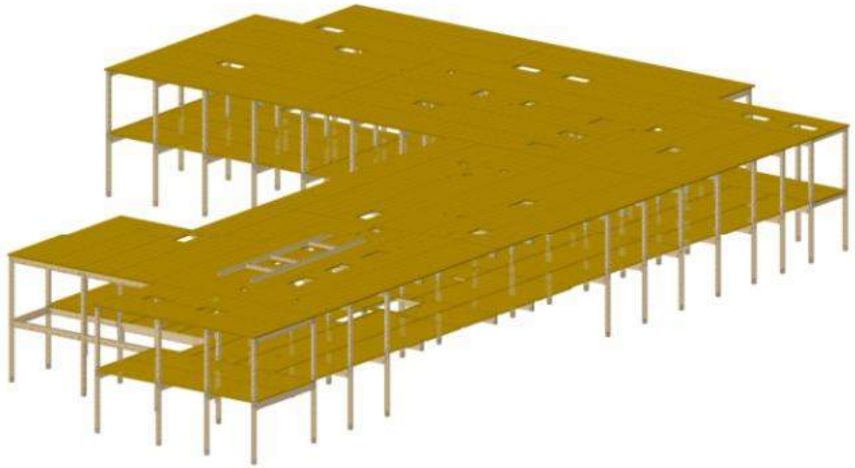

Play grund
Zoey
Whee!
Bradon
Kima
RUBY
ahhh! it so ooo
Calm peaceful
Olivia
Jenn
Aligd
DJ
Get her!
Off.
alitha
Ahh you miss me!
haha!
got ya!
Kathryn

Prioritizing Inclusive Play

Mass Timber Design

Structural Systems

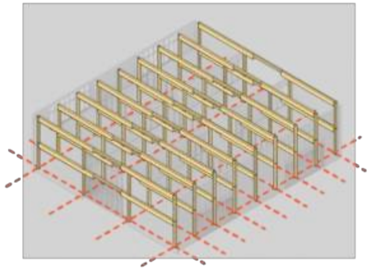




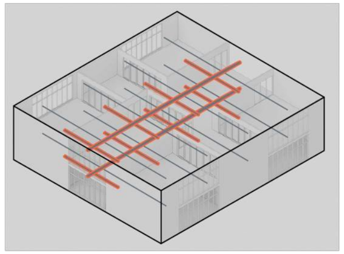
Designing with Mass Timber

There is a growing body of research that associates biophilic spaces with student health and cognitive benefits. **+** **Emerging mass timber technology is positively impacting the way we design and construct buildings.** **=** **By combining timber technology and growing biophilic research, we can Build Better Schools.**

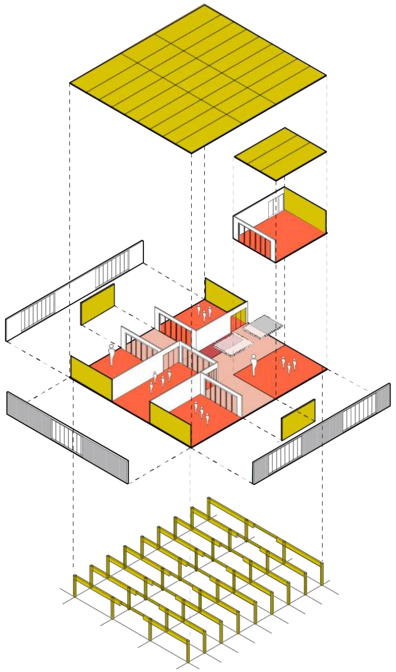
STRUCTURAL BONES



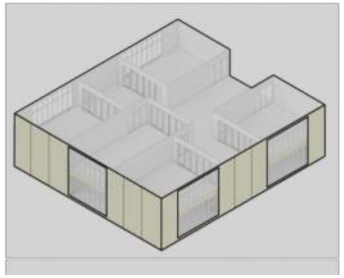
MECHANICAL SYSTEM



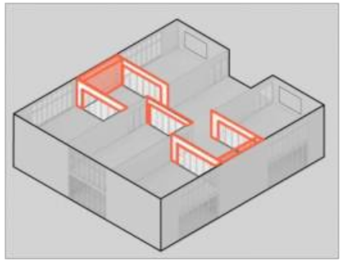
KIT-OF-PARTS



EXTERIOR ENCLOSURE

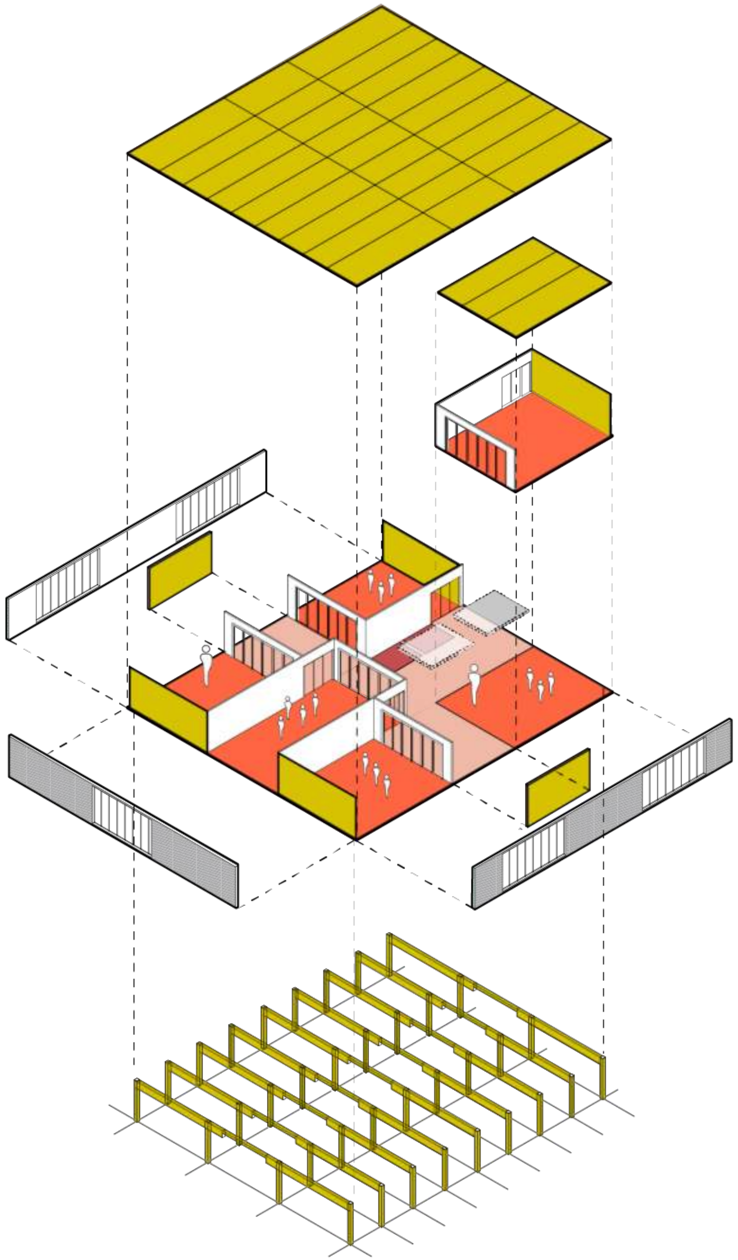


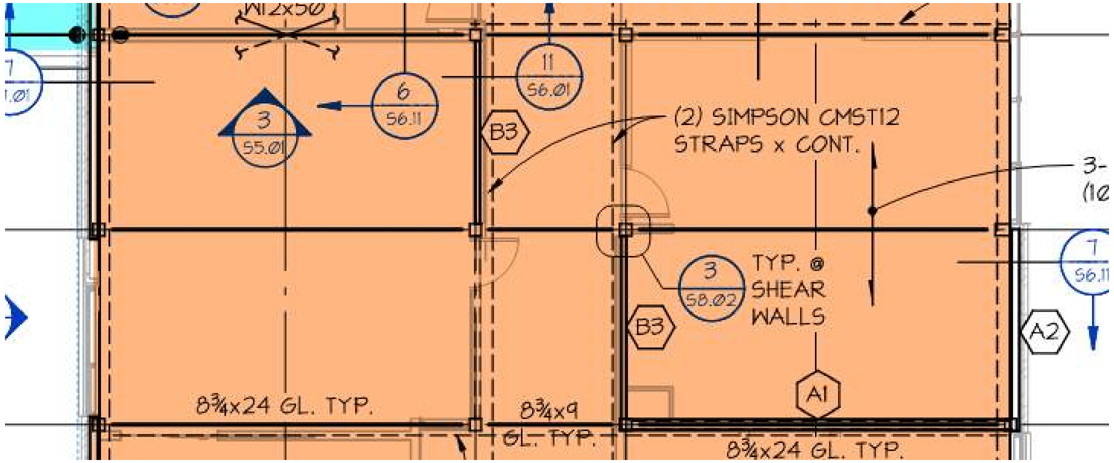
INTERIOR FLEXIBILITY



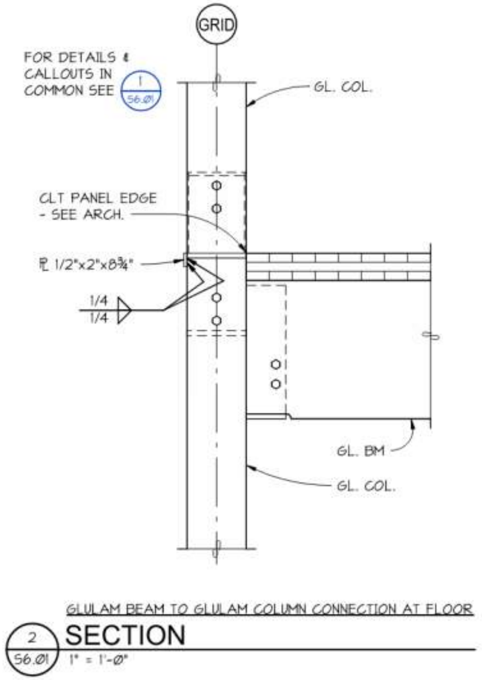
BUILDING BETTER SCHOOLS

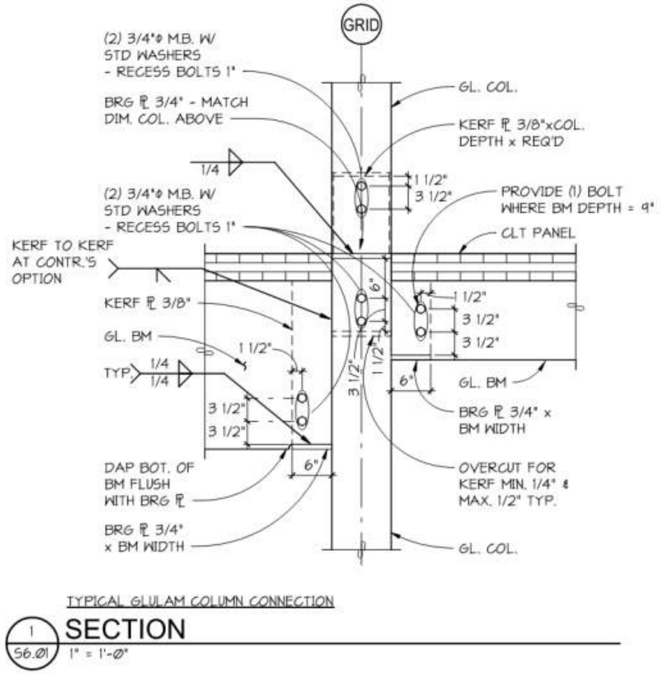
Mass Timber System



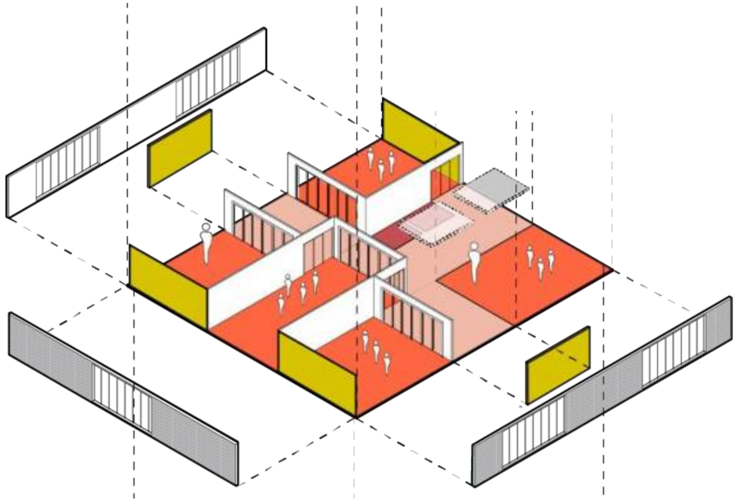


12’ x ~24’ grid

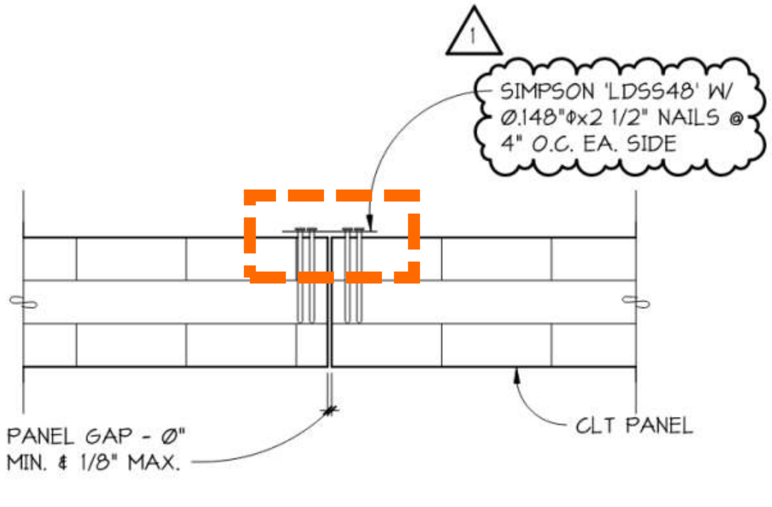




Mass Timber | Shear

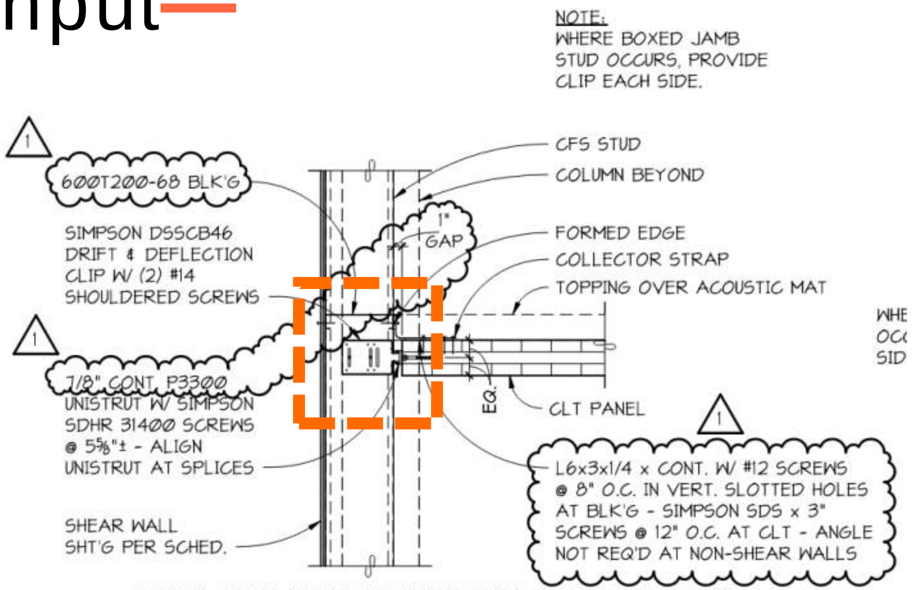


Mass Timber Details w/ Contractor Input



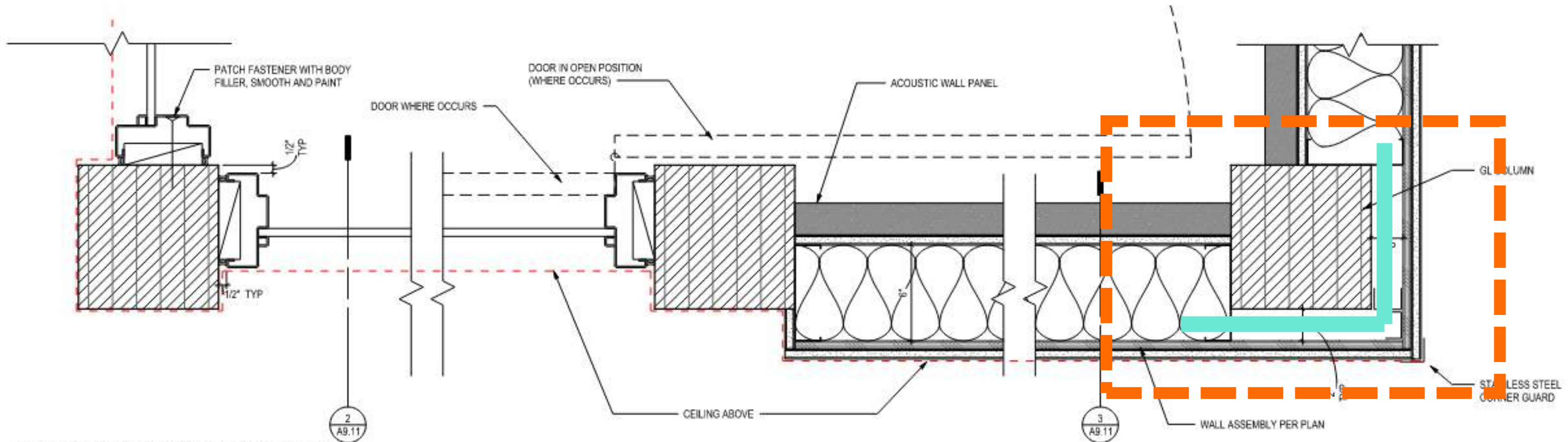
3-PLY CROSS-LAMINATED TIMBER PANELS

1 S6.11 DETAIL
3" = 1'-Ø"



TYPICAL CROSS-LAMINATED TIMBER PANEL EDGE AT SHEAR WALL

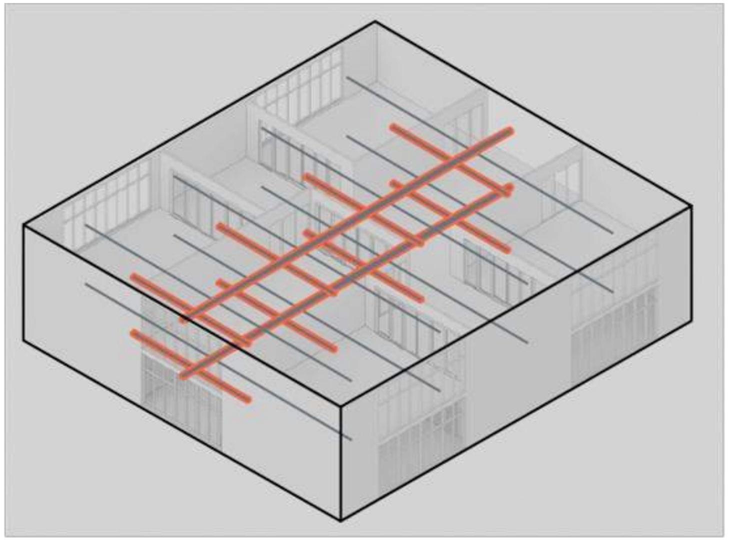
7 S6.11 SECTION
1" = 1'-Ø"

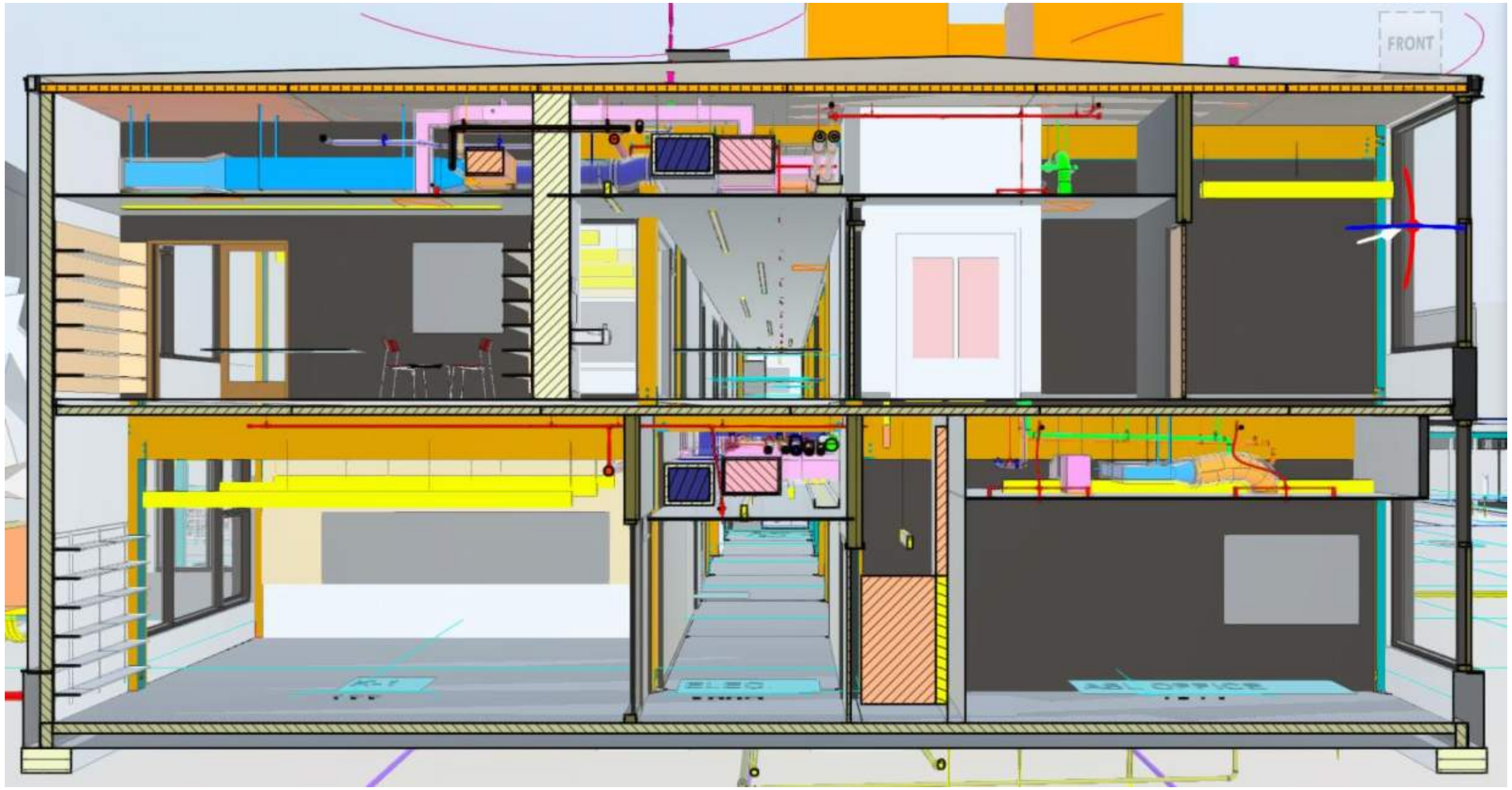


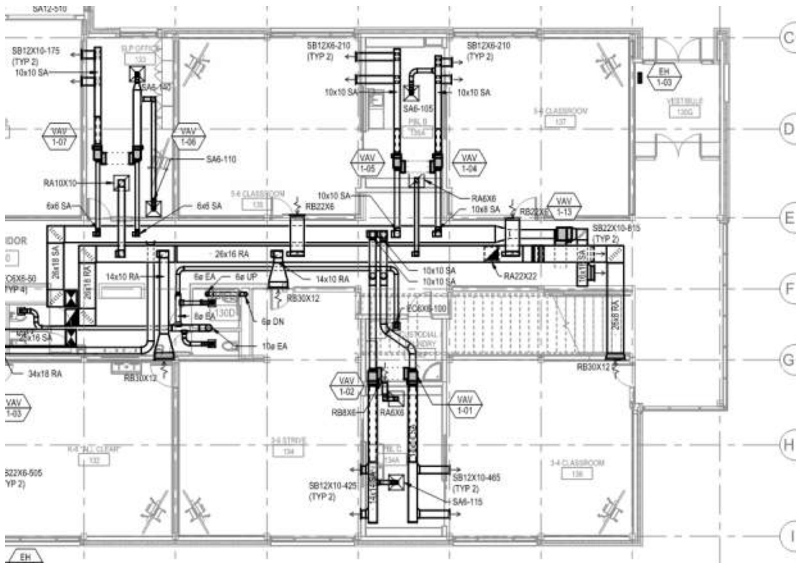
1 CORRIDOR COLUMN PLAN DETAILS
3" = 1'-0"

COLUMN
COLUMN

Utility Routing







Sense of Home

Biophilic Connection to Wood

Sharing Knoweldge

CLT RESEARCH + INNOVATION

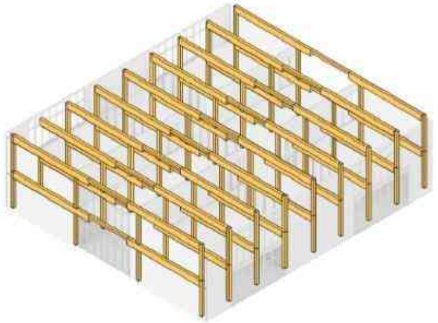
Building Better Schools

©Mithun

A Systems Based Approach

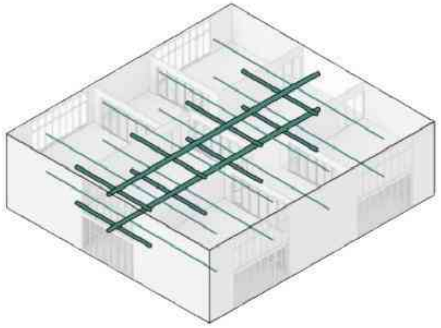
To promote flexibility, economy, and customization of the kit-of-parts, a systems-based design approach is taken, integrating the building's structural 'bones', air distribution systems, exterior enclosure and key interior components.

Structural "Bones"



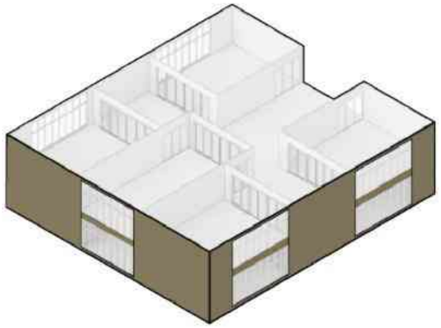
The structural grid and framework optimizes beam span, removes girders, and mass timber panel thickness, while considering mechanical routing and exterior glazing heights for daylight.

Mechanical System



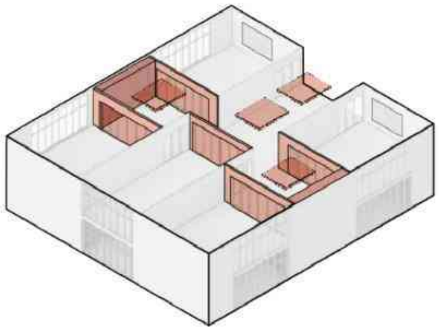
The mechanical distribution approach is centralized with strategic routing primary at shallow center beams.

Exterior Enclosure



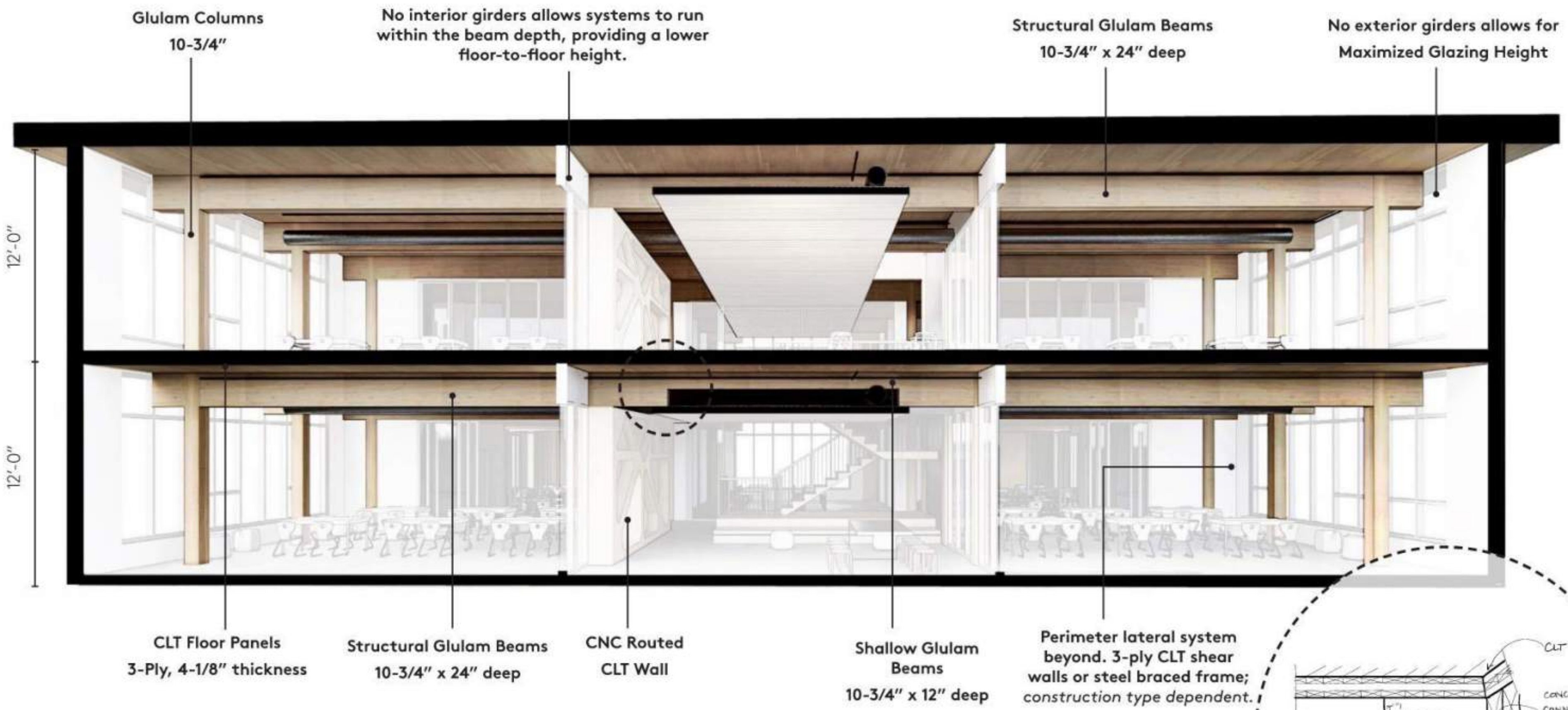
Exterior skin maximizes glazing to the underside of the CLT ceiling for improved daylighting. The repetitious grid provides opportunities for pre-fabricated exterior wall panels as an additional layer to the kit-of-parts.

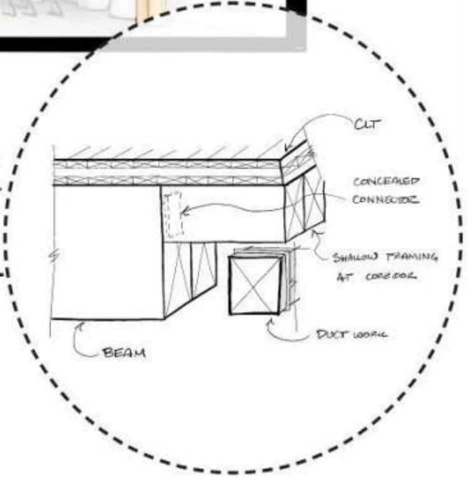
Interior Flexibility



Interior layouts are designed to maximize options and long term flexibiity. Ceiling solutions, where needed, may be incorporated as a pre-fabricated cloud solution including MEP components, acoustics and lighting.

A Systems Based Approach: Structure





To achieve a cost competitive and efficient mass timber system, three primary structural parameters include:

Reduce the Amount of Wood Fiber

To utilize the 3-Ply CLT floor and allow it to remain exposed, the building construction type should not require a floor rating. This is achieved with buildings of Type III-B and V-B Construction. 3-ply CLT floor and wall panels are the optimal number of laminated plys to limit the amount of cubic meters of wood fiber in the project. Panels are produced in maximum lengths to achieve trucking efficiencies.

Perimeter CLT Lateral System

The building seismic design uses 3-ply Cross-Laminated Timber (CLT) shear walls at building perimeter to allow for maximum future interior flexibility. This also eliminates the steel trade on-site.

Eliminate Girders & Provide Shallow Beam Depth to Allow for MEP Distribution

The framing system is comprised of glulam beams and columns. Columns are spaced at an approximate interval of 10'-8" in order to eliminate girders to achieve efficient air distribution routing and potential floor-to-floor height savings. The central structural bay also uses a shallow beam, permitting the main mechanical ducts to distribute to classrooms without significant impact to ceiling height at the expanded learning core.

Thank You

QUESTIONS?

This concludes The American Institute of Architects Continuing Education Systems Course

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