

# Lexington High School

## PBC Meeting

04/10/2025



**smma** **dW** **Turner**  
DORE + WHITTIER

## **Building Design – Discussion (25 minutes)**

- Exterior Design
- Feature Space Design
- Floor to Floor Heights & Typical Ceiling Heights – **confirm today**

## **Building Floor Plan Review – Confirmation (25 minutes)**

- Space Layouts and Circulation
- Location & Access of Central Office
- Elevators
- Future Expansion GSF

## **Target Value Design (15 minutes)**

- Cost Estimating Timeline
- Progress to date

## **5/1 PBC Meeting Agenda (removed from 4/10)**

### **Site Design – Introduction & Confirmation**

- Materiality
- Bicycle Parking
- Alternative Modes of Transportation
- Off-Site Improvements

### **Renewable Energy – Discussion**

- Energy Storage Battery Location
- EV Charging Station Quantity

### **HVAC Design – Confirmation**

- LCCA for HVAC Option
- Select Basis of Design HVAC Option

## 5/8 PBC Meeting Agenda Lookahead

### Electrical Design – Confirmation

- Generator Load List and Diesel Generator Size
- Electrical Service Calcs
- Lighting Control Preferences
- Classroom Lighting
- Interior Lighting Approach
- Building and Site Lighting Design

### Renewable Energy – Confirmation

- Final PV Size
- Final Energy Storage Battery Size
- Location of Energy Storage Battery
- Final EV Charging Station Quantity

### Proprietary Items – Confirmation

- Low Carbon GWB
- Tectum Acoustical Panels

### HVAC Design – Confirmation

- Systems Required to be supported by Standby Power
- Integrated Automation System Approach

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## **Target Value Design (15 minutes)**

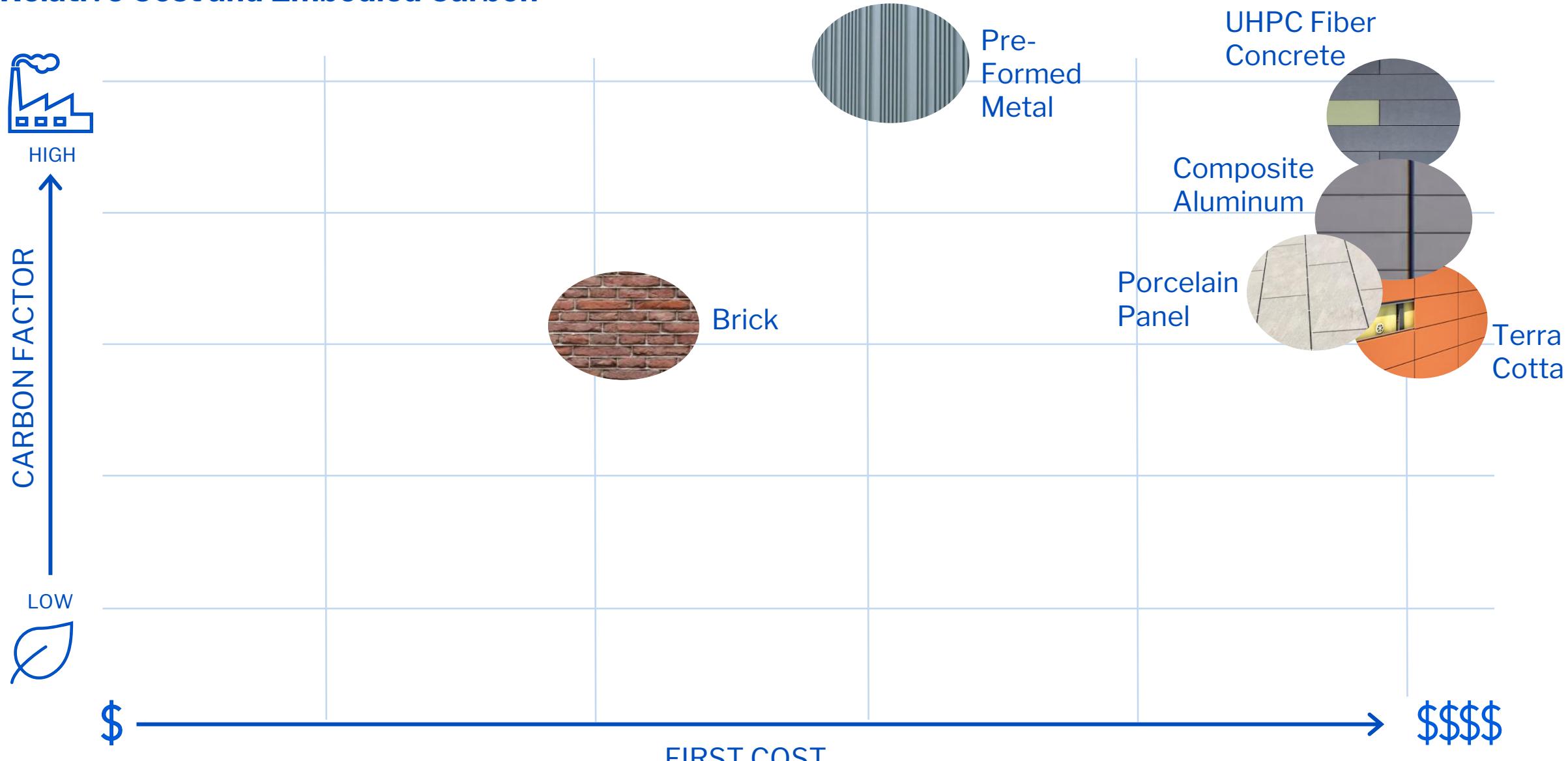
- Cost Estimating Timeline
- Progress to date



## Potential Materials & Systems / Scope Assumptions – No Change from PSR Estimates

Opaque Masonry Walls <b>(~60% of solid wall area)</b>	Brick Masonry, Precast Accents, Stone Base	<ul style="list-style-type: none"> <li><b>75% of Wall Enclosure</b></li> <li>High Insulation Value</li> <li>Proportion of Masonry to Rainscreen may be increased to reduce cost</li> </ul>
Rainscreen Accent Walls <b>(~40% of solid wall area)</b>	Pre-finished Metal Panel Spandrels and Fascias; Accents in Porcelain, Terra Cotta, Pre-formed Metal or Fiber Cement	
Windows <b>(~50% of glazed area)</b>	Triple Insulated-Glazed, Aluminum Frame	<ul style="list-style-type: none"> <li><b>25% of Wall Enclosure</b></li> <li>Utilizes Low-emissivity glass</li> </ul>
Curtain Walls and Storefront <b>(~50% of glazed area)</b>	Triple Insulated-Glazed, Aluminum Frame	
Roof Edges & Canopies	Pre-finished Metal	
Soffits	Pre-finished Metal, Phenolic or DEFS (stucco)	
Roof Screens	Pre-finished Metal	
Roofing	PVC Membrane	

## Relative Cost and Embodied Carbon



# Potential Materials & Systems

## Brick Masonry

- 60% of Opaque Walls at PSR
- Timeless and reliable
- Wide range of colors and textures available
- Inexpensive
- **Carbon Factor: 6.52  
(not including steel support)**



## Exterior Design – Option A



## Exterior Design – Option B



## Exterior Design – Option C



# Building Entrances

## West Entrance

- Highly visible from Worthen Road – good civic presence
- Connected to bus drop-off/pickup
- Visitor and accessible parking nearby
- Main Office / main security check-in for visitors
- Close to Guidance and Student Support hub
- Access to Central Office elevator/stair lobby in Wing A
- Entrance Plaza Pedestrian Zones should be large enough for mass groupings of students
- Plaza Design to frame entrance and develop scale transition
- Limited Program



## North Entrance

- LABBB entrance close to drop-off/pickup loop
- Limited parking nearby
- Smallest Entrance Plaza- potential for intimate gathering space
- North facing – more limited planting opportunities

## East Entrance

- Connected to car drop-off/pickup
- Visitor and accessible parking nearby
- May be used for after-hours events
- Should it be used for primary Gym access?
- Largest Entrance Plaza – design to frame entrance and develop scale transition
- Program Flexibility

## Field House Entrance

- Lobby connected to both Field House and Gym
- Visitor and accessible parking nearby
- May be used for after-hours events
- Should it be used for primary Gym access?

## Building Entrances – East





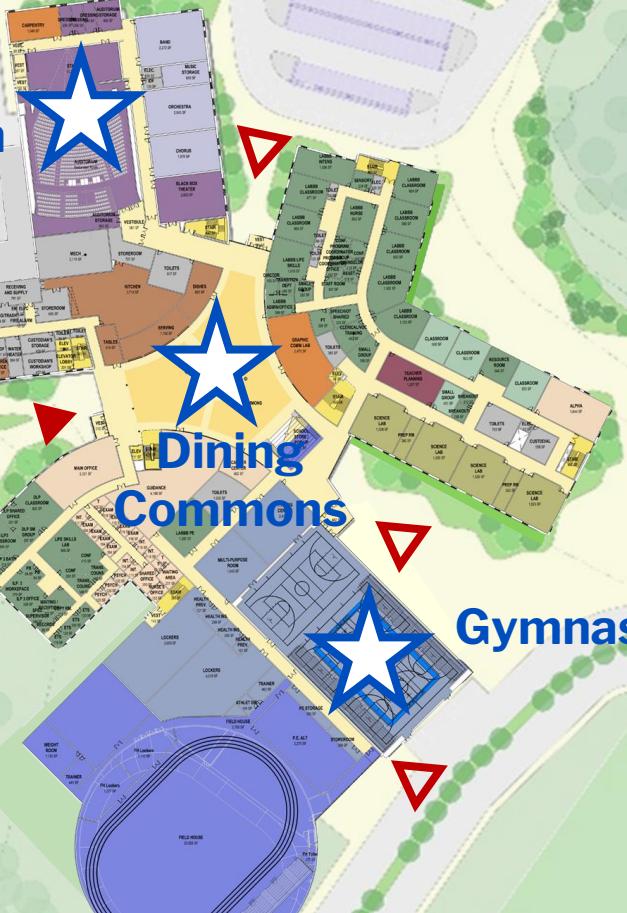
# Feature Spaces

## Level 1

- Core Academic
- Science
- Teacher Planning & Small Group
- Admin, Guidance, ALPHA, METCO, Central Offices
- Auditorium / Drama
- Art & Music
- Media Center
- Vocation & Technology
- Physical Education
- Special Education
- Medical
- Restrooms, Custodial
- Kitchen
- Commons
- Circulation
- Vertical Circulation
- Rooftop Open Space
- Other
- Expansion

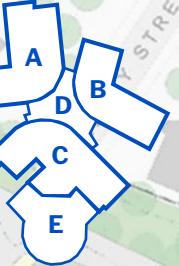


**Auditorium**



**Dining Commons**

**Gymnasium**



**KEY PLAN**

**WORTHEN ROAD**

# Building Floor Plans

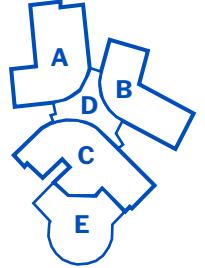
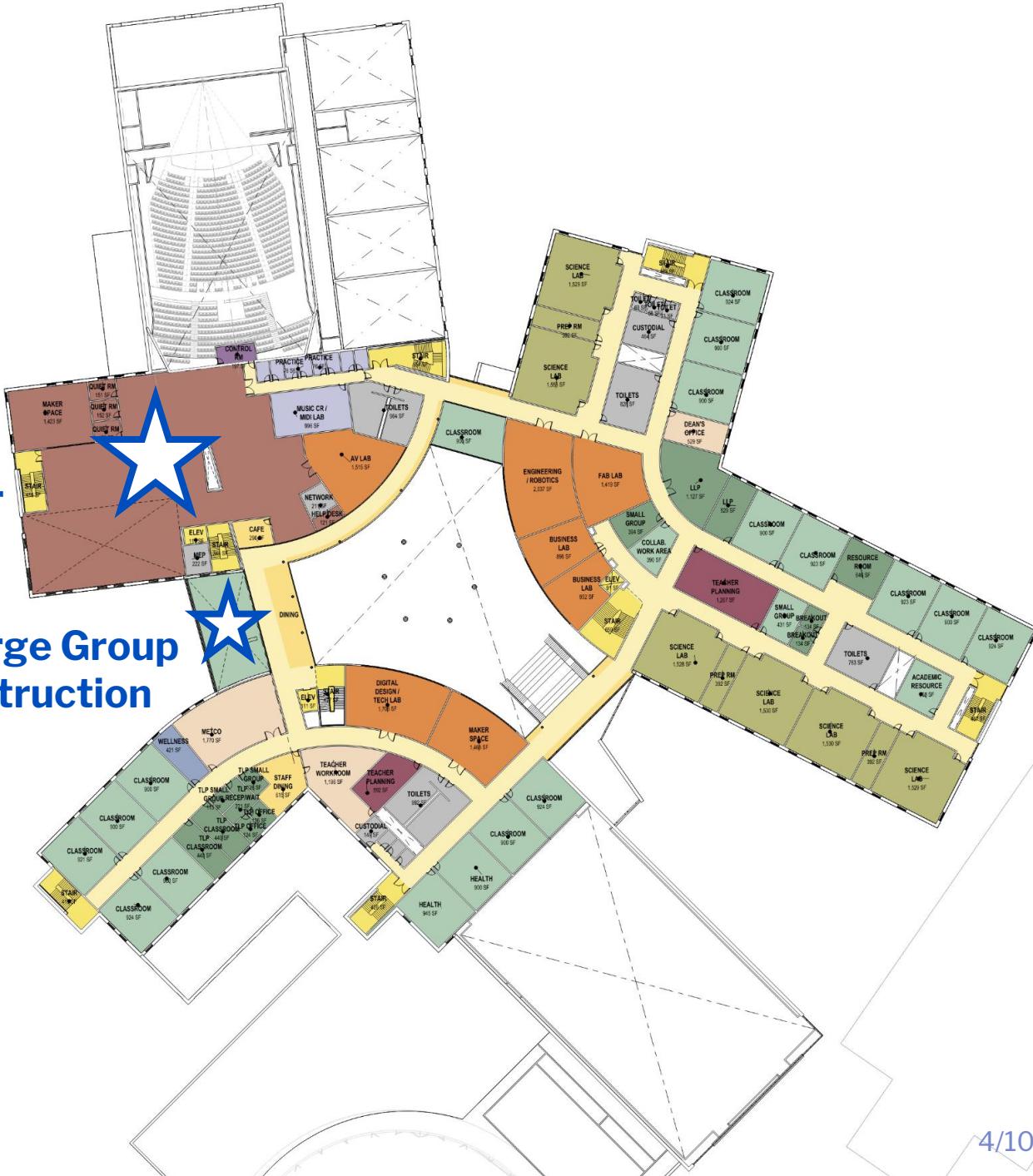
## Level 2

- Core Academic
- Science
- Teacher Planning & Small Group
- Admin, Guidance, ALPHA, METCO, Central Offices
- Auditorium / Drama
- Art & Music
- Media Center
- Vocation & Technology
- Physical Education
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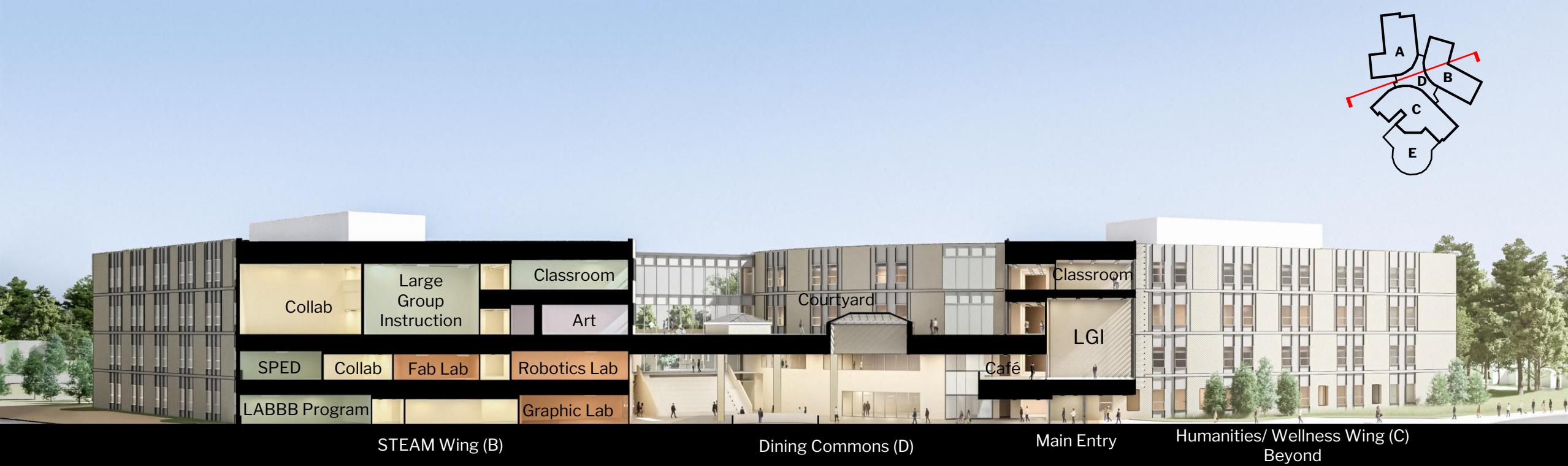
### Library/ Media Center

Large Group  
Instruction



KEY PLAN

# Building Section



## Dining Commons – Framed Skylight Option



## Dining Commons – Solatube Option



## Dining Commons – Oculus Option



## Dining Commons / Material Application



- Porcelain Wall Tile
- Acoustical Ceiling Panels (ACP)
- Wood Paneling
- Linear Light Fixtures
- Polished Concrete or Terrazzo

## Auditorium / Material Application



- Acoustical Panels
- Acoustical Ceiling Panels (ACP)
- Wood Panels
- Accent Lighting
- Carpet Tile

## Gymnasium / Material Application



High Output Pendant Light Fixtures

Paint

Tectum Acoustical Wall Panels

Paint & Graphics

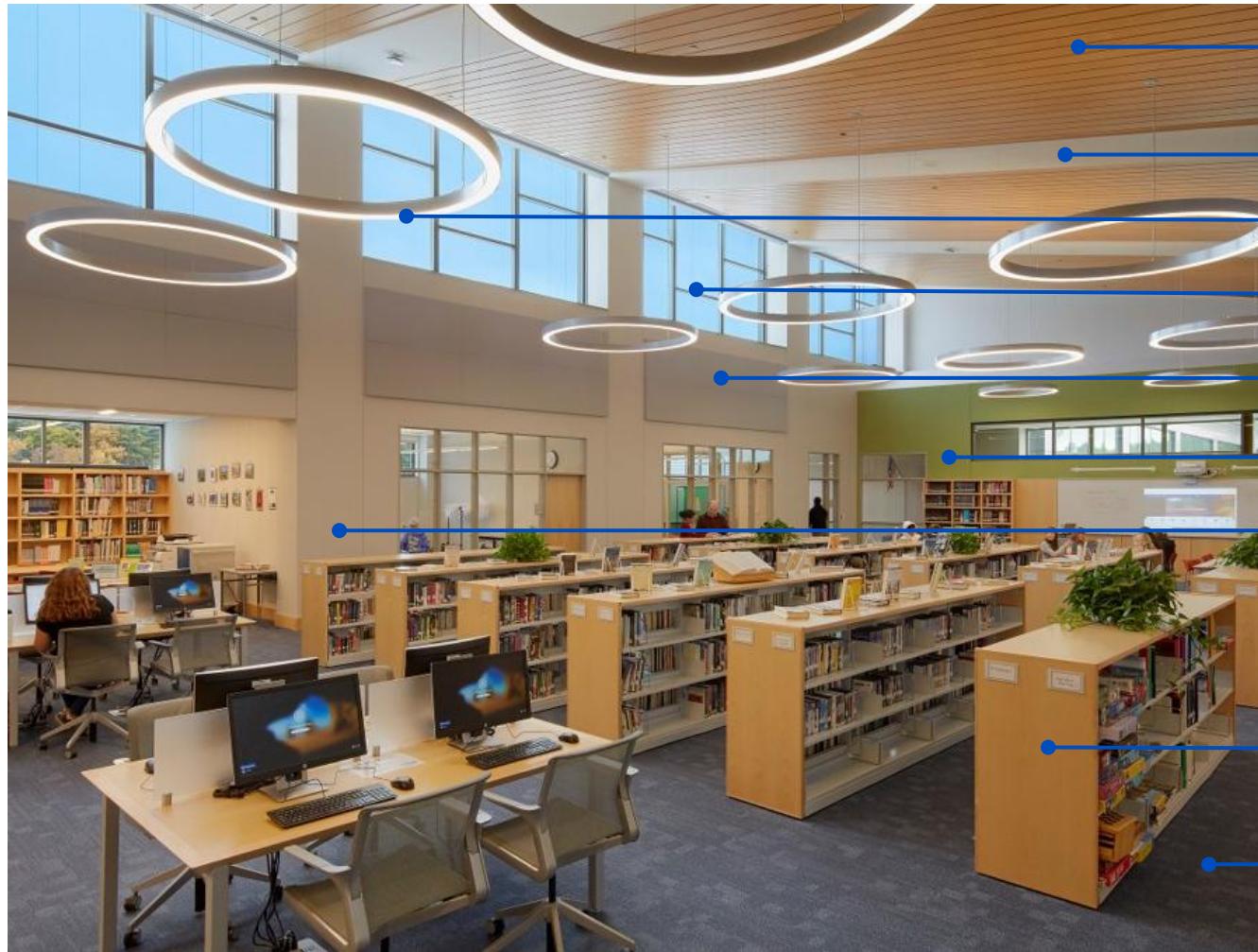
Wall Pads

Sports Floor

## Library Media Center

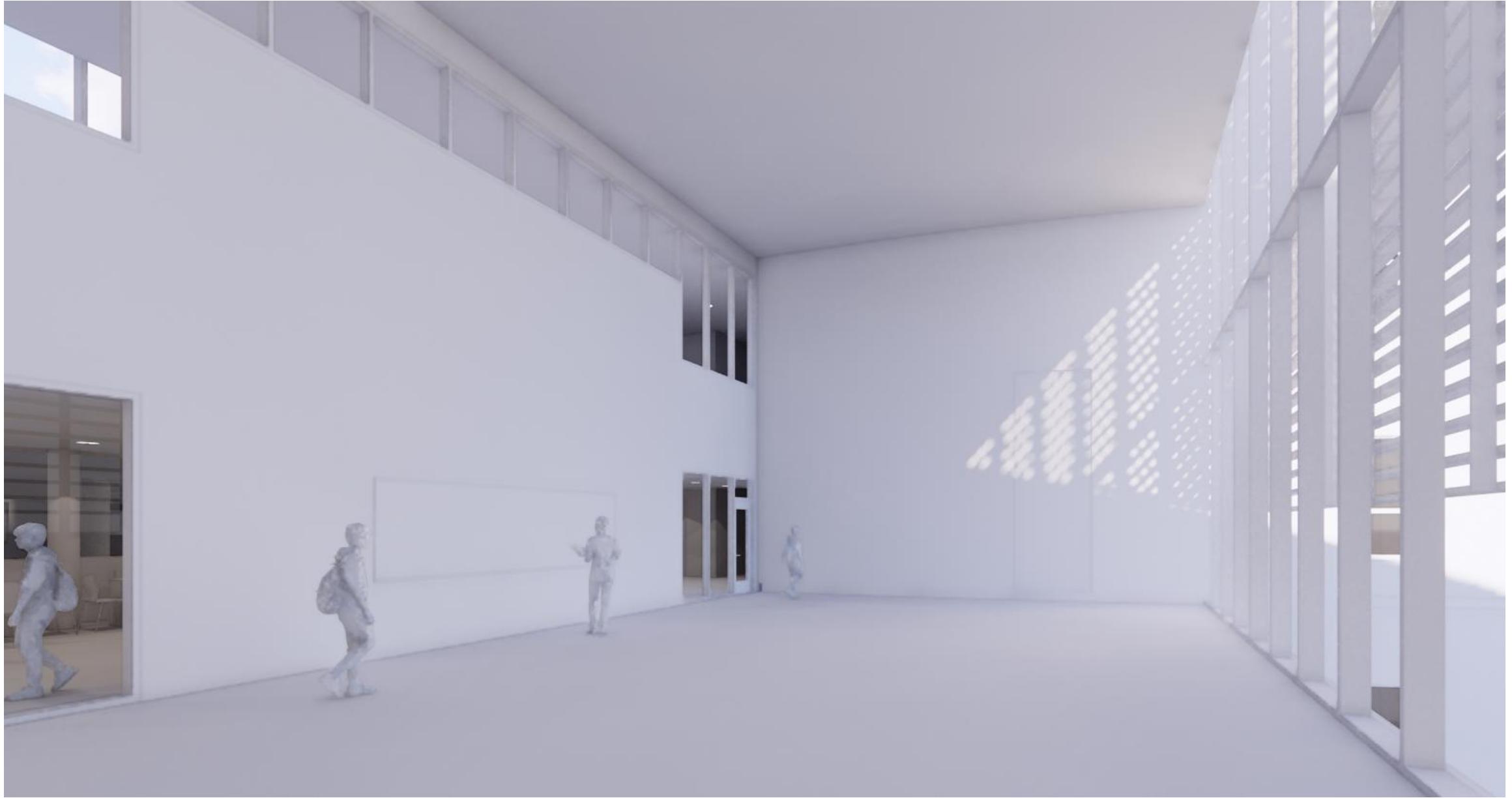


## Library Media Center / Material Application

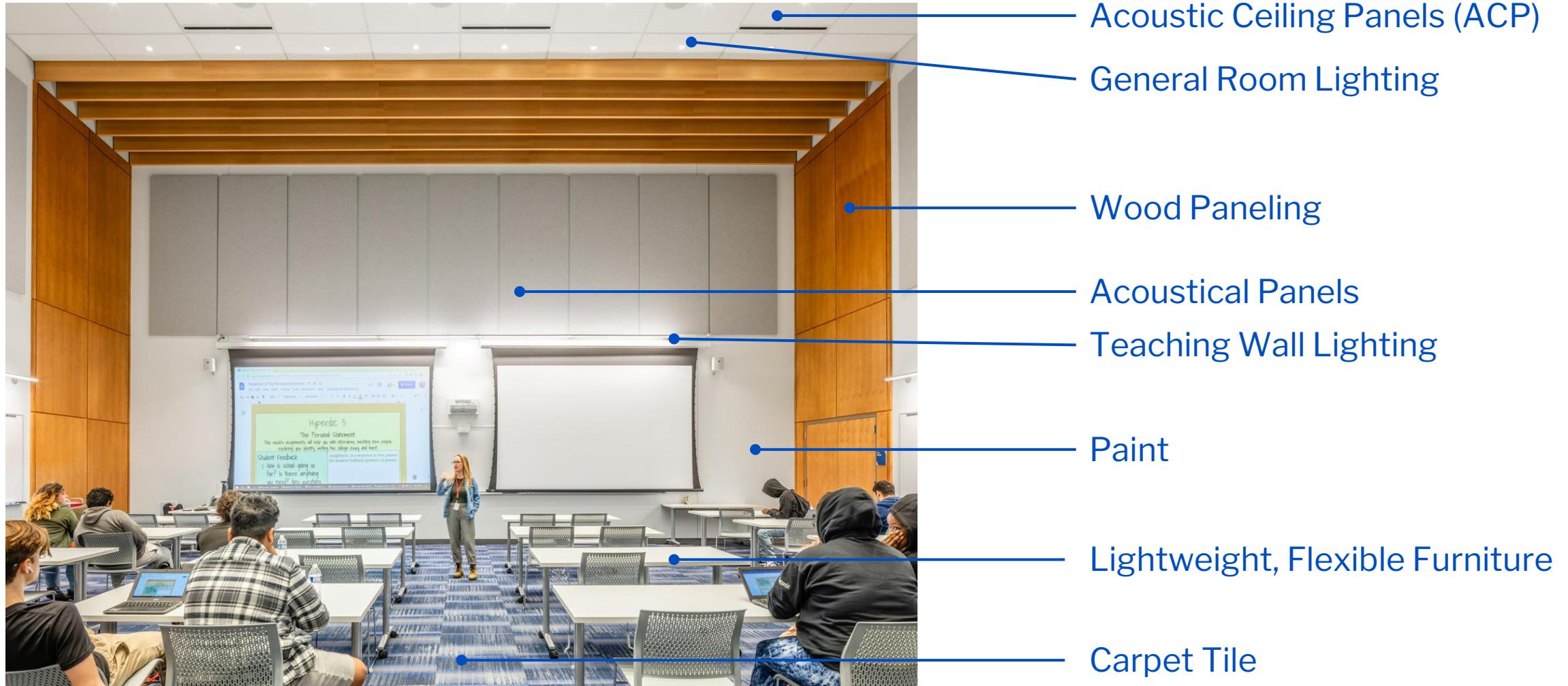


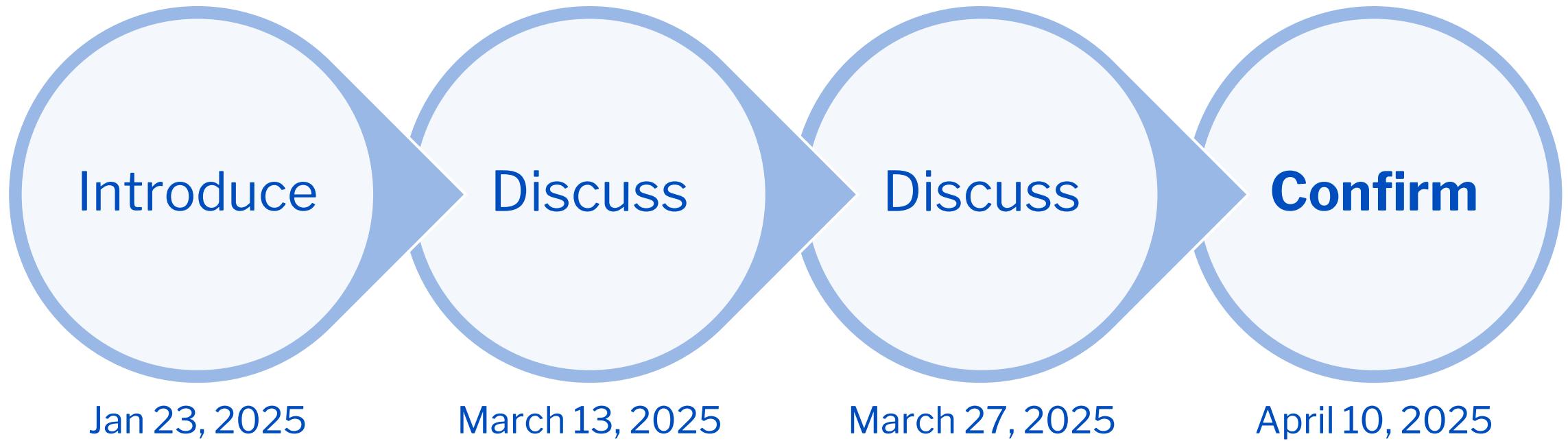
- Wood Look Acoustic Ceiling
- Acoustic Ceiling Panels (ACP)
- Accent Pendant Light Fixtures
- Natural Daylighting
- Acoustical Panels
- Accent Paint
- Neutral Paint
- Low Book Stacks (may be movable)
- Carpet Tile

## Large Group Instruction (LGI)



## Large Group Instruction (LGI) / Material Application



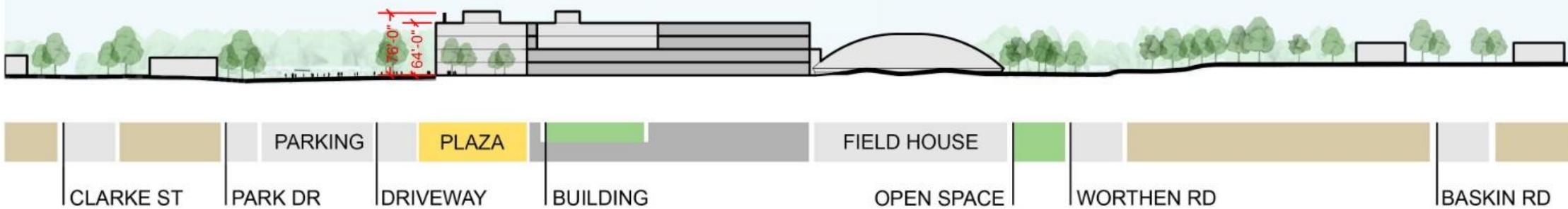
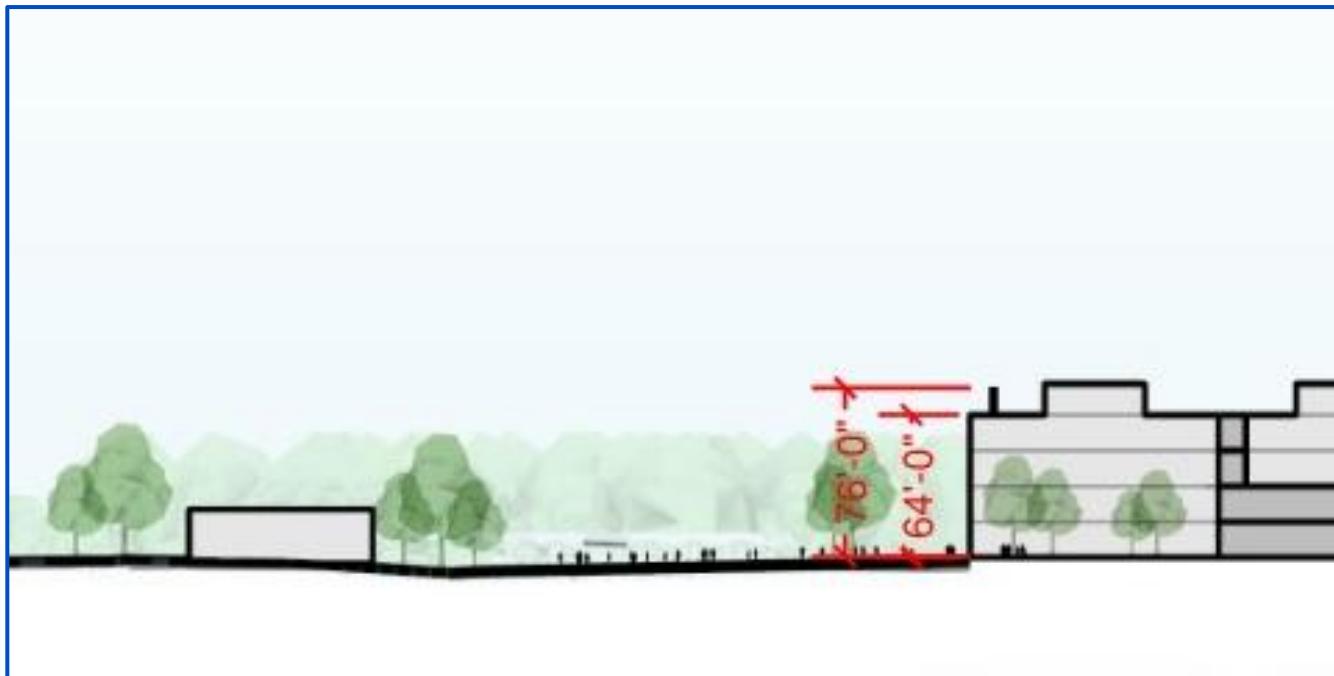


# Floor to Floor Heights

## Impact on Total Building Height

16'-0" floor to floor height

$$\begin{aligned} &= 64'-0" \text{ building height to top of roof*} \\ &+ 12'-0" \text{ mechanical roof screen} \\ &= 76'-0" \text{ height to top of screen} \end{aligned}$$



SECTION B

0 100' 200' 500' 1000'

\* Zoning building height is defined by the vertical distance between the lower elevation (defined as the natural grade of land at the point of measurement prior to disturbance for construction) and the upper elevation (defined as the highest point of any ridge, gable, other roof surface, or parapet). The lower elevation has yet to be determined.

# Floor to Floor Heights

## Current Section at B Wing

### Heights:

Floor to Floor = 16'-0"

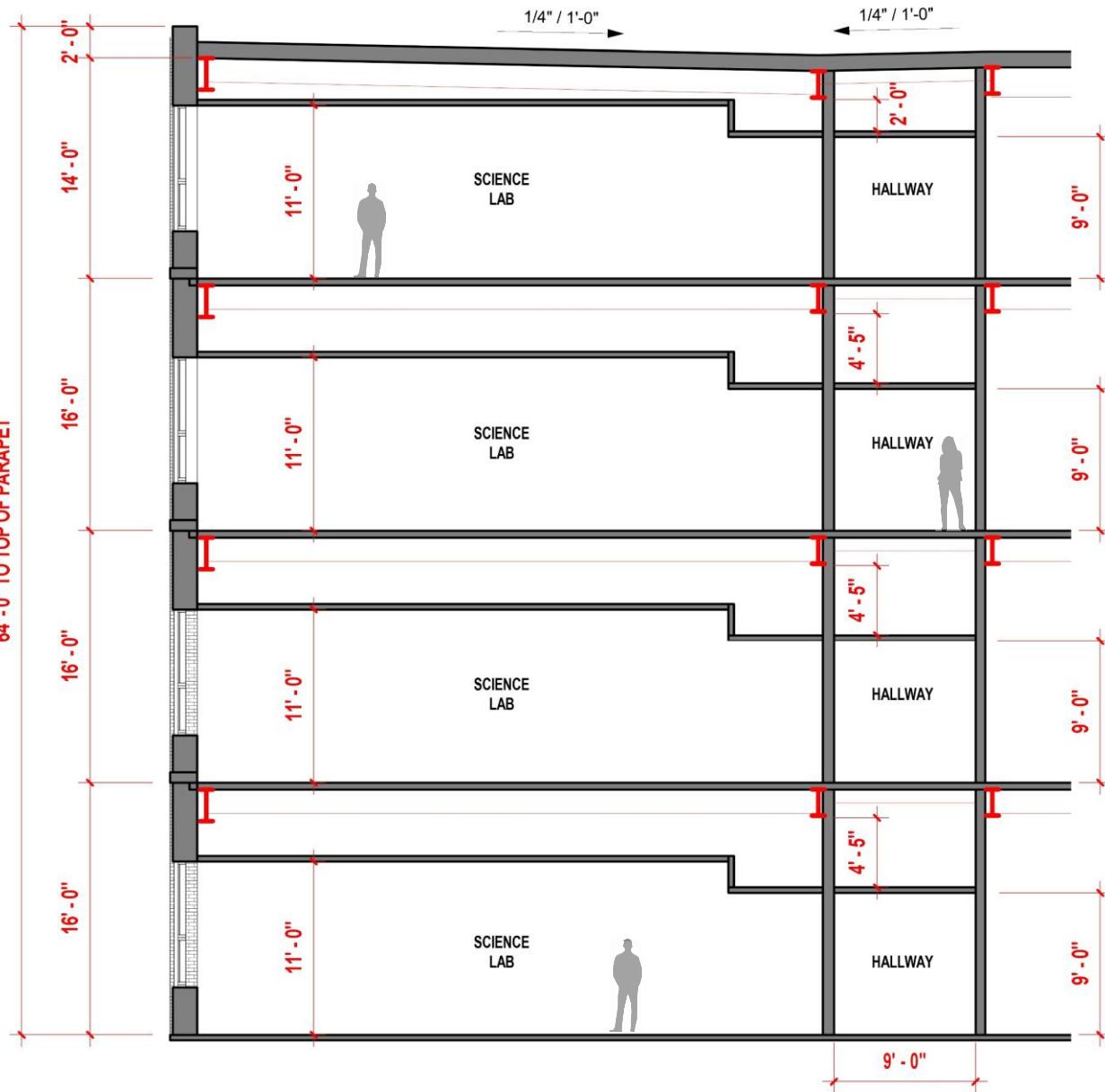
Corridor ceilings = 9'-0"

- Lvl 1-3 clear plenum area = 40sqft
- Lvl 4 clear plenum area = 27sqft

Classroom ceilings = 11'-0"

- No window pockets

Building Height to Parapet = 64'-0"



# Floor to Floor Heights

## Potential Height Reductions

### Heights:

Floor to Floor = varies

- Lvl 1 = 15'-4"
- Lvl 2 = 16'-0"
- Lvl 3 = 14'-8"
- Lvl 4 = 14'-0" to top of roof steel

Corridor ceilings = 9'-0"

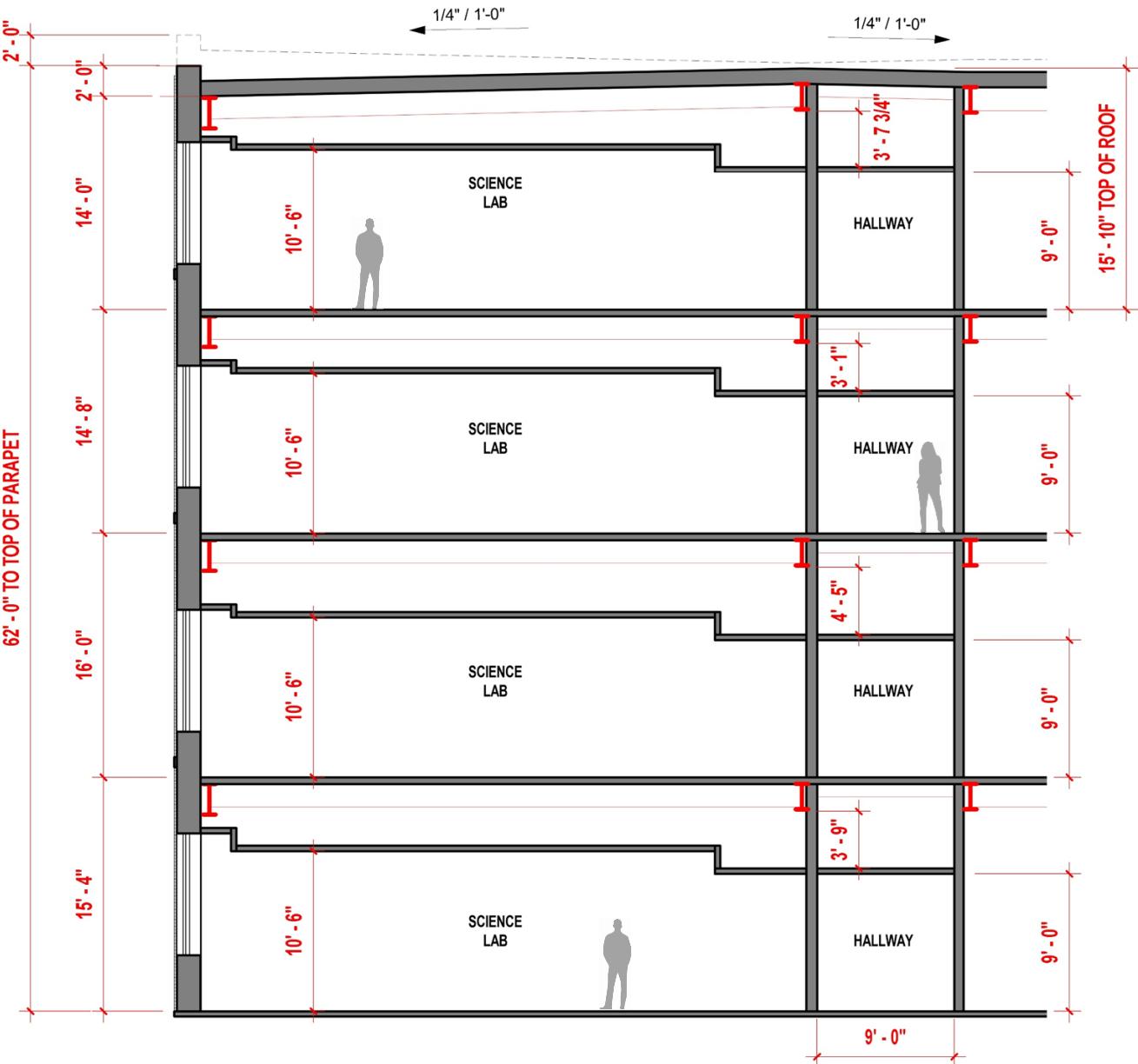
- Lvl 1 clear plenum area = 34sqft
- Lvl 2 clear plenum area = 40sqft
- Lvl 3 clear plenum area = 28sqft
- Lvl 4 clear plenum area = 33sqft

Classroom ceilings = 10'-6"

- Requires window pockets

Building Height to Parapet = 62'-0"  
**(2'-0" total height reduction)**

\*Floor to floor and total building height must conform to brick coursing dimensions in 4" increments

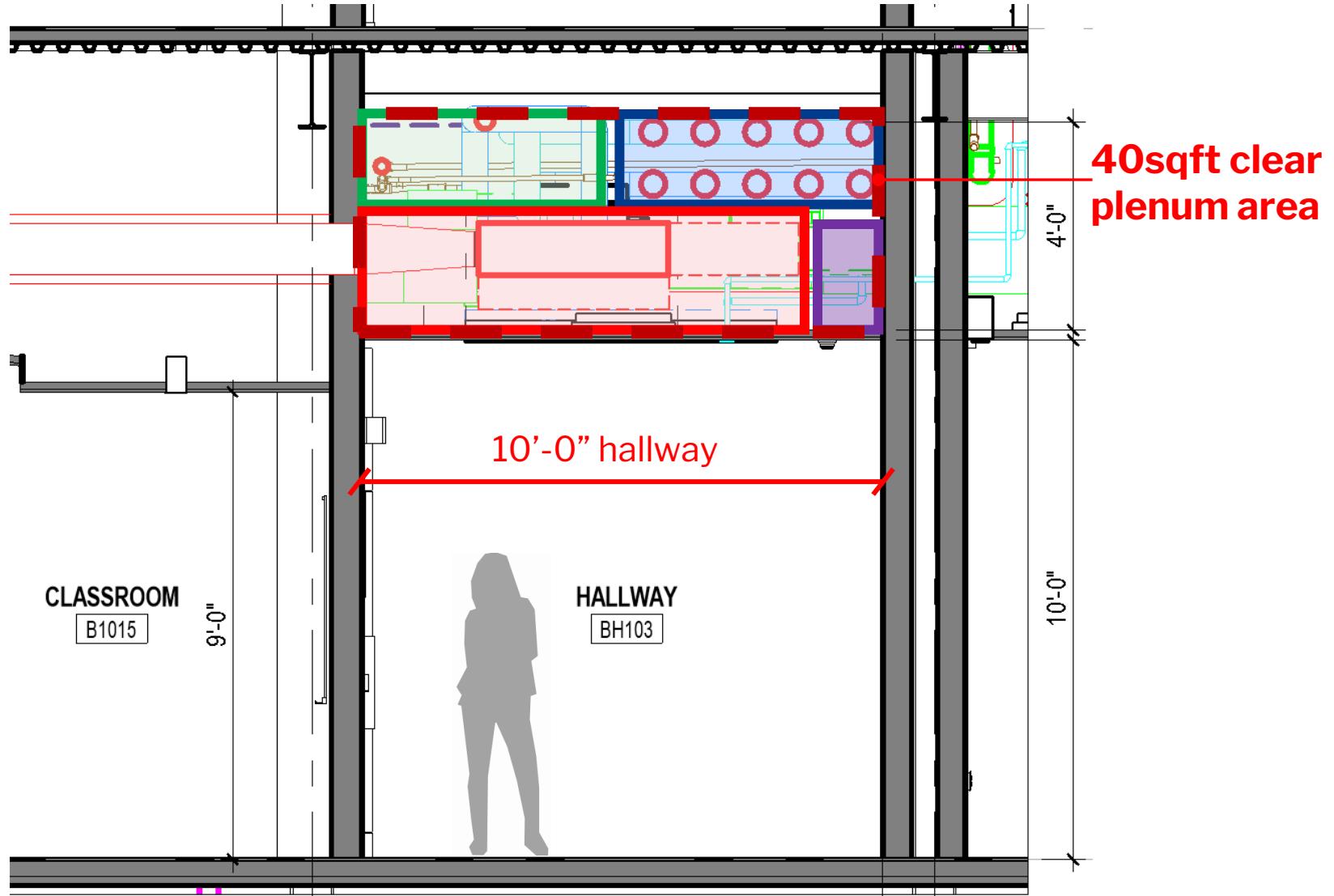


# Floor to Floor Heights

## 16'-0" vs 14'-8" Plenum Comparison

Example: Wakefield Memorial High School (16'-0" fl to fl)

- General plenum discipline zones
  - **Red** = Mechanical + Mechanical Clearances
  - **Green** = Plumbing and Fire Protection
  - **Blue** = Mechanical Piping
  - **Purple** = Electrical/Tech

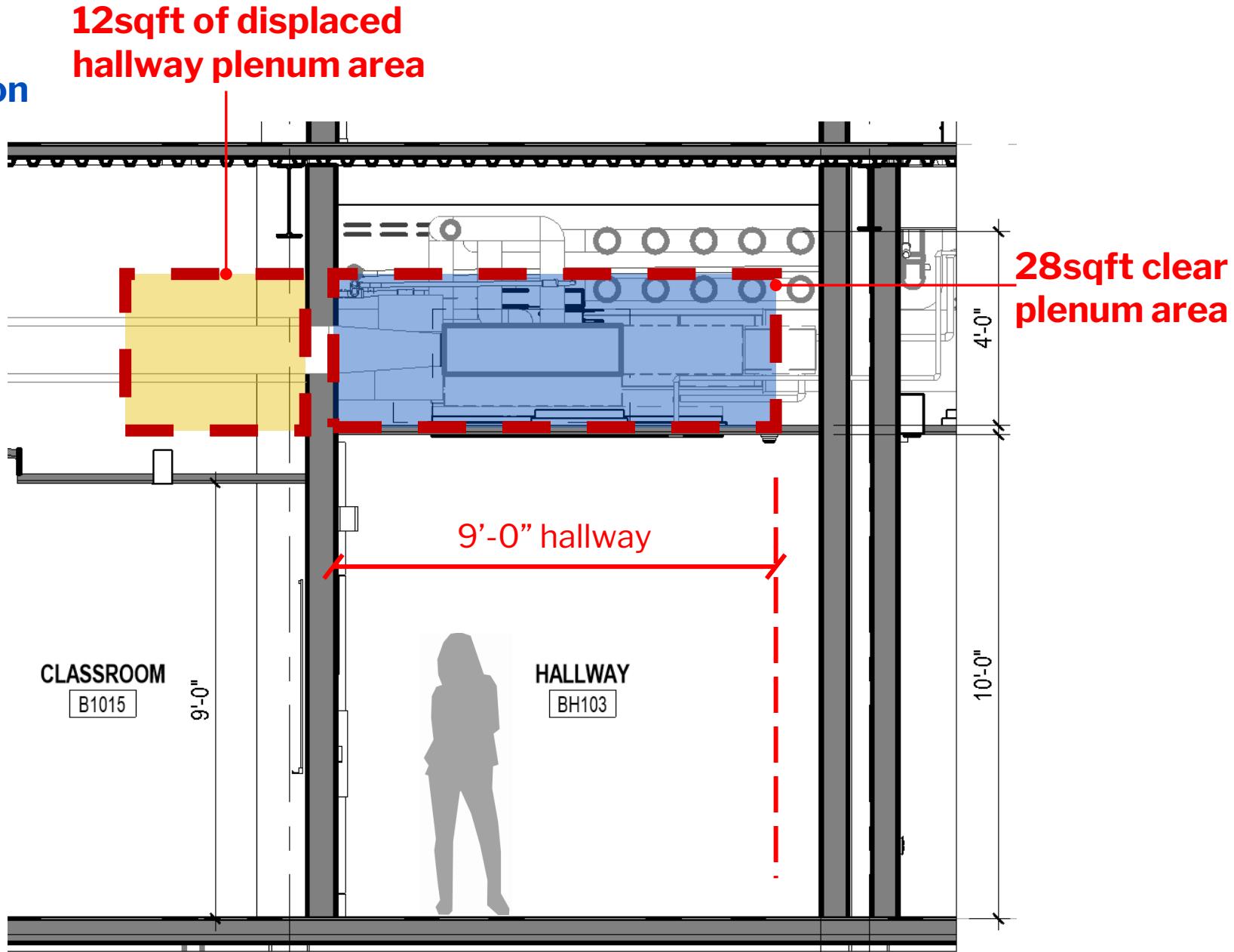


## Floor to Floor Heights

### 16'-0" vs 14'-8" Plenum Comparison

A 14'-8" floor to floor height with a 9'-0" wide hallway leaves roughly 28sqft of clear plenum space.

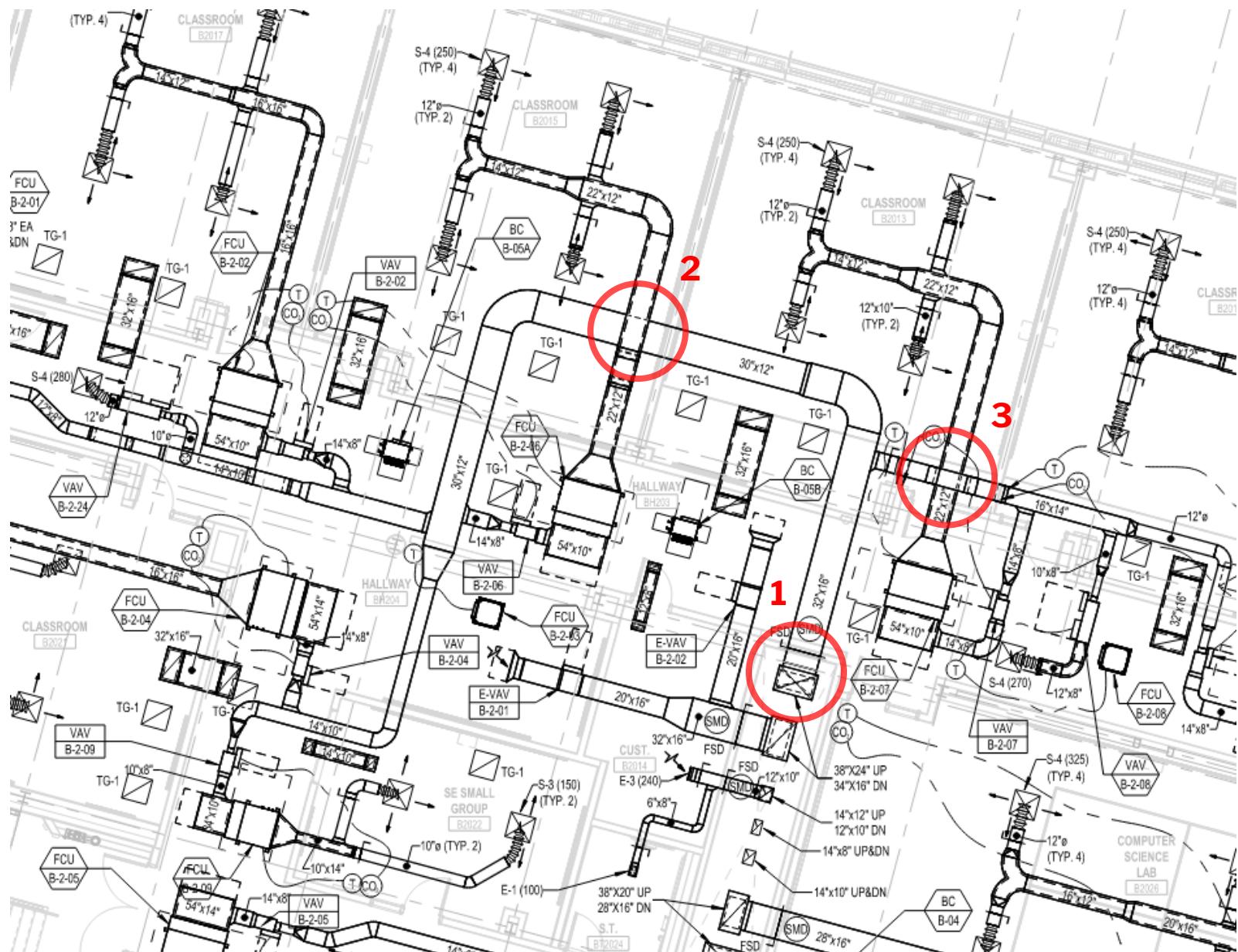
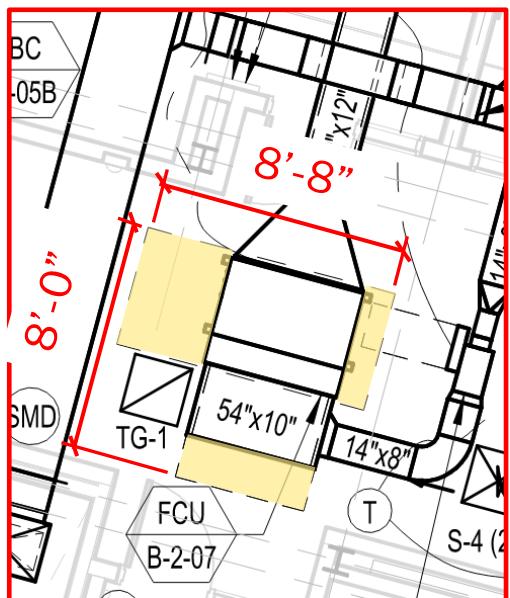
Mechanical piping will be particularly difficult to run as a group through the hallway and will require more intensive coordination that will likely utilize plenums above program spaces.



# Floor to Floor Heights

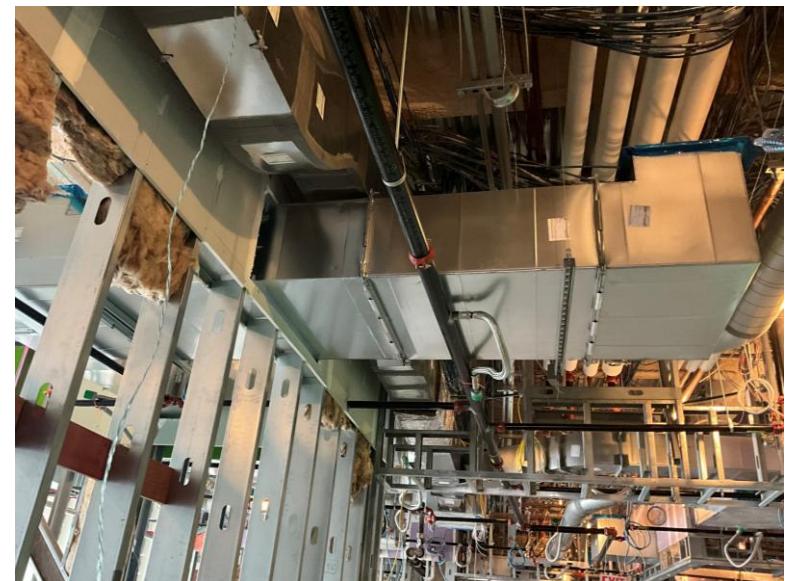
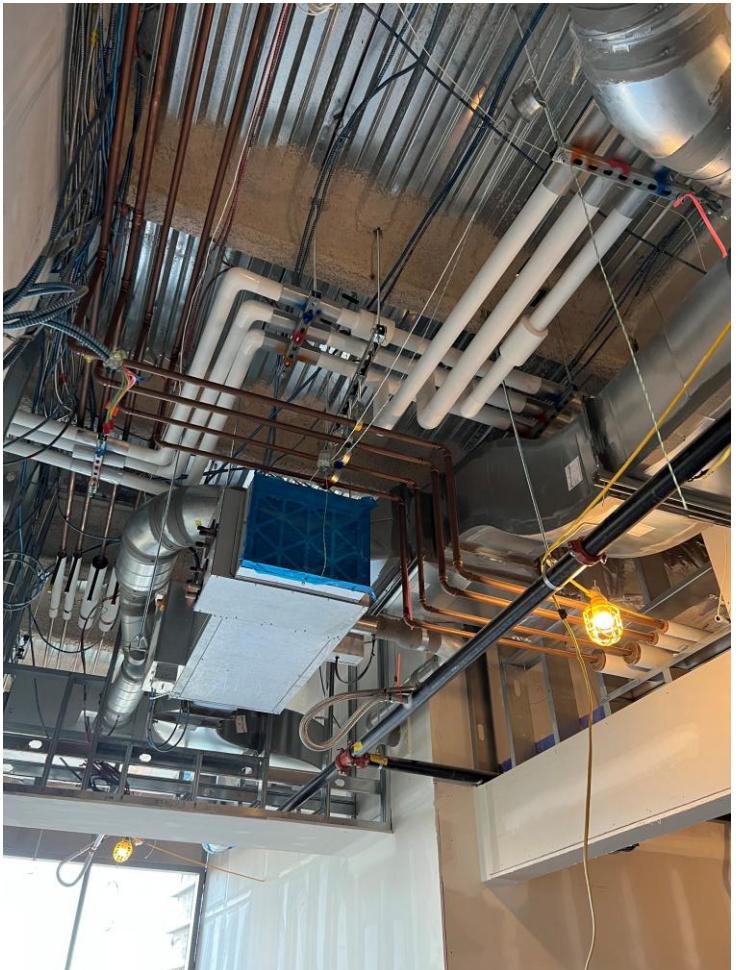
## Typical Mechanical Plan Example (from Wakefield)

1. Supply duct branches off the riser at shaft and connects to FCUs across the floor
2. Even with a 10'-0" hallway width, the duct is at times too large to fit within the corridor and runs over classroom spaces
3. Multiple duct crossings due to plan constraints require accommodation in section
4. FCUs are large and require clearances on 3 sides and at bottom



## Floor to Floor Heights

### Photos of Plenum Spaces on Recent Projects



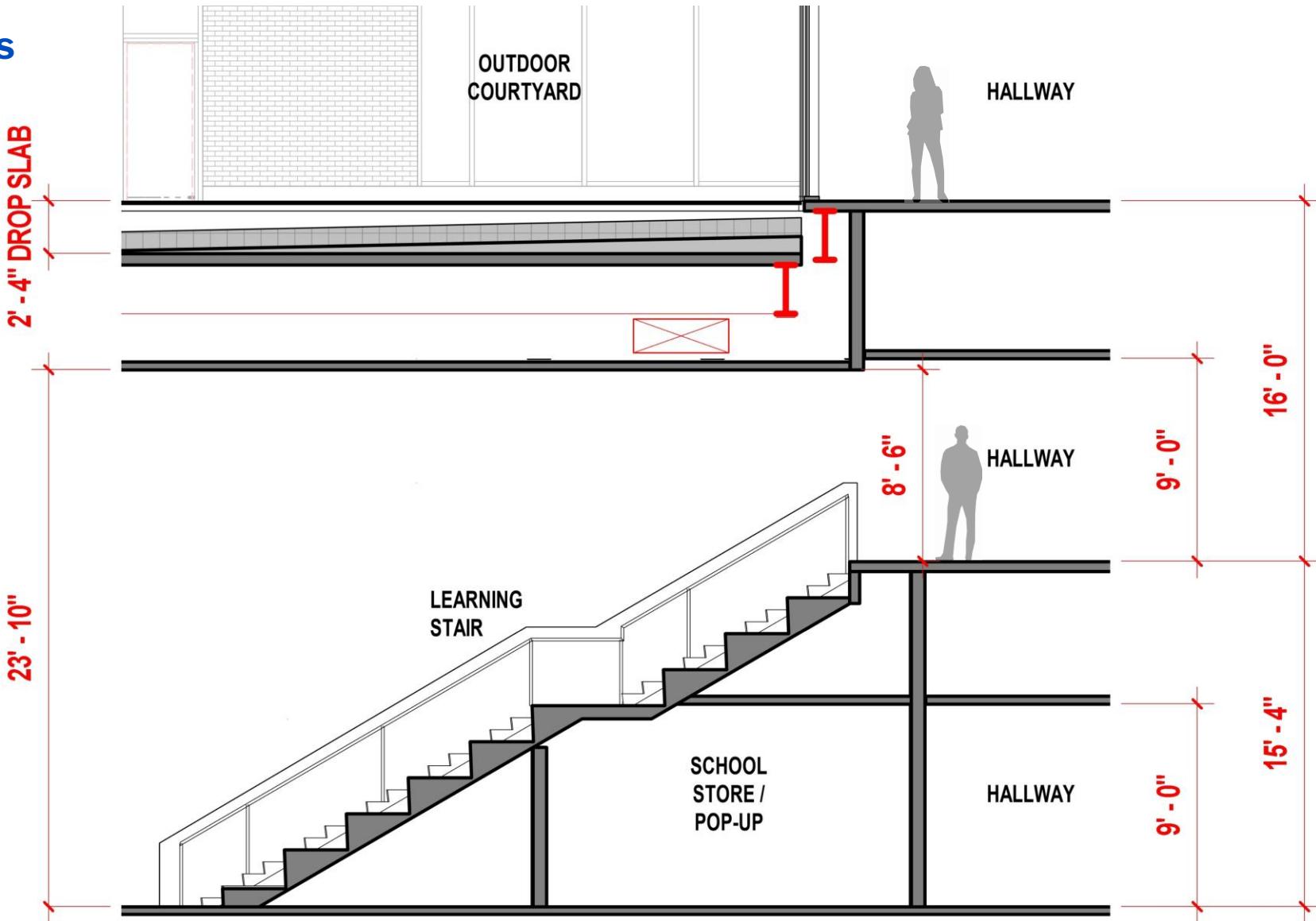
# Floor to Floor Heights

## Level 2 Height / Dining Commons

Level 2 will need to maintain a 16'-0" floor to floor height due to the outdoor courtyard at Level 3, which requires a dropped slab of 2'-4" to account for the sloped topping slab, rigid insulation and paver system assembly.

2'-0" between the bottom of roof beams and finish ceiling is provided as a conservative estimate of required space for ductwork and piping.

This results in an 8'-6" ceiling height above Level 2 at the Dining Commons.



## Floor to Floor Heights

### Recent Project Comparisons



### Waltham High School

Hallway ceiling height = 9'-0" AFF typical

Floor to floor height = Level 1 to 2 = 18'-0" / Level 2 to 3 = 14'-0" / Level 3 to 4 = 16'-0" / Level 4 to Roof = 15'-6"

# Floor to Floor Heights

## High Bay Spaces

### Music Spaces

= 32'-0" to top of roof steel.

- There may be a potential for height reduction and will be studied during coordination.

### Auditorium

= 49'-10" to top of stage roof steel.

- 50'-0" is the max height to bottom of roof allowed at stage per fire code. The roof over the house may slope down and will be developed during coordination.

### Gymnasium

= 32'-0" to top of roof steel.

- There is a 23'-0" clearance minimum to bottom of any obstruction for volleyball. A potential for height reduction will be studied during coordination.

### PE Alt Space (falls within FH expansion)

= 16'-0" to top of roof steel.

- The height in this space is likely to increase to allow for the use of a mat roller.

### Field House Dome

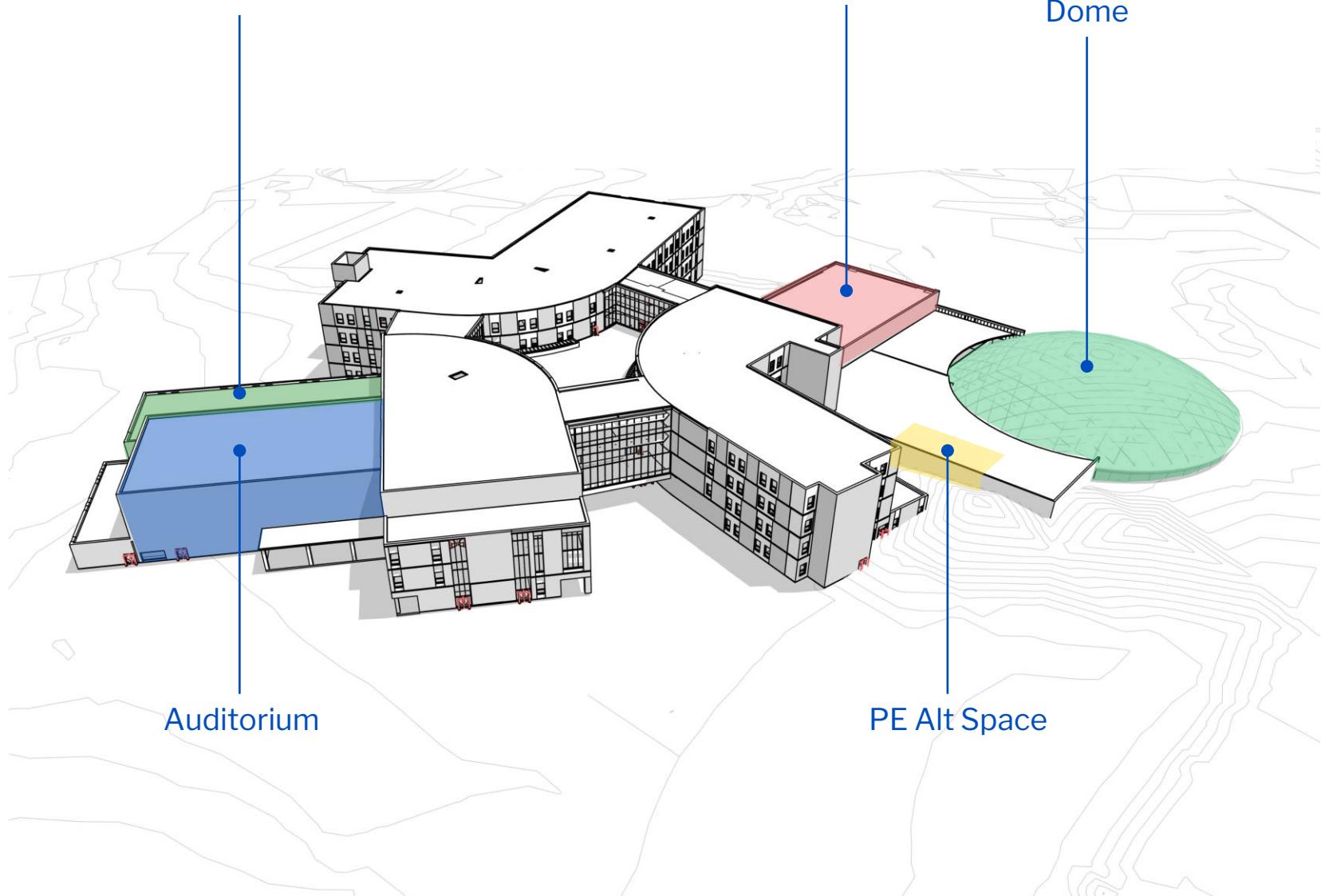
= 48'-0" AFF to dome peak

- Existing height is fixed.

Music Spaces

Gymnasium

Field House Dome



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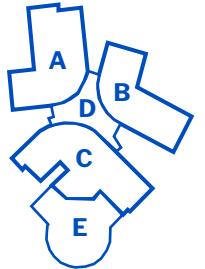
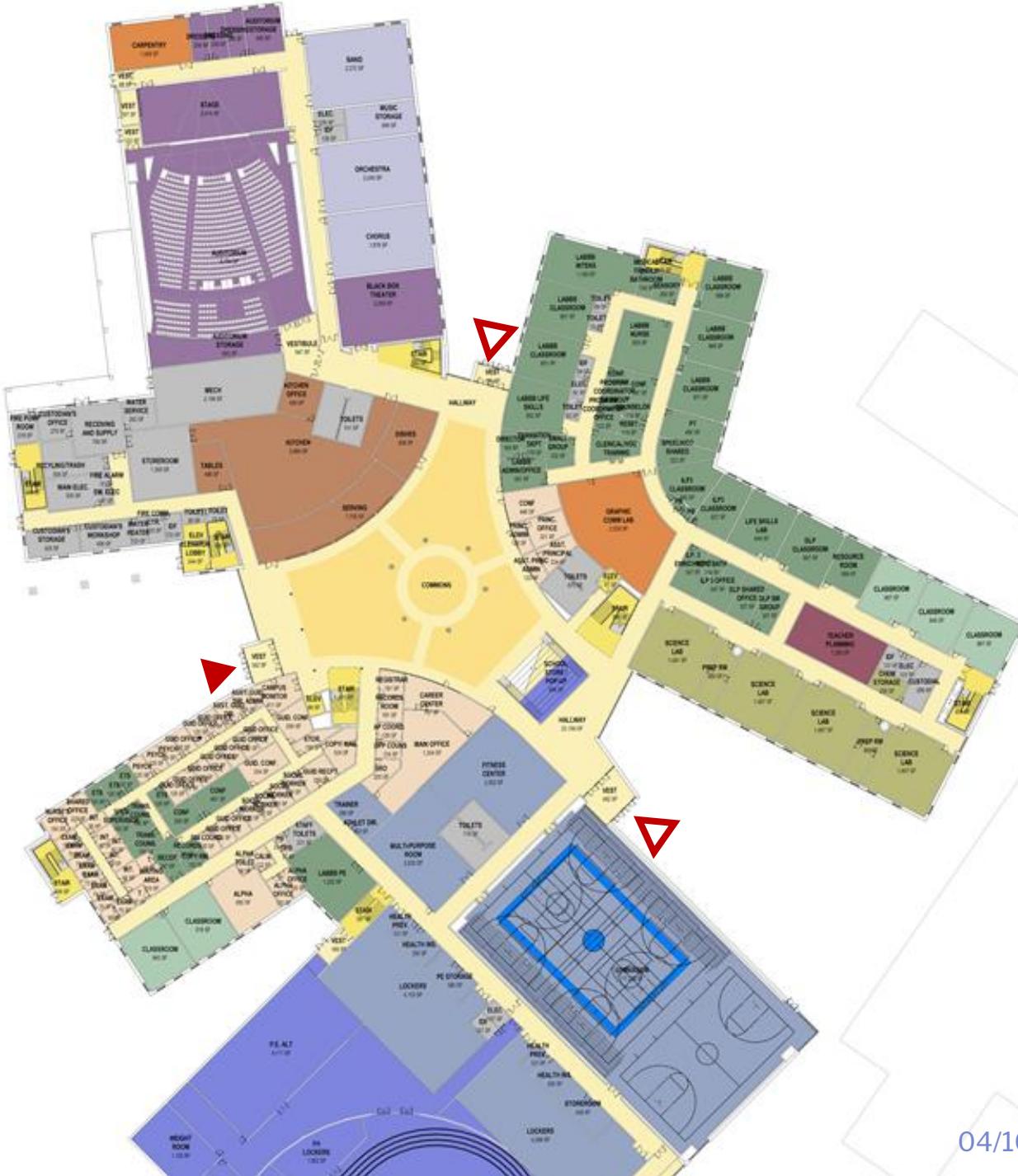
- Cost Estimating Timeline
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# Building Floor Plans

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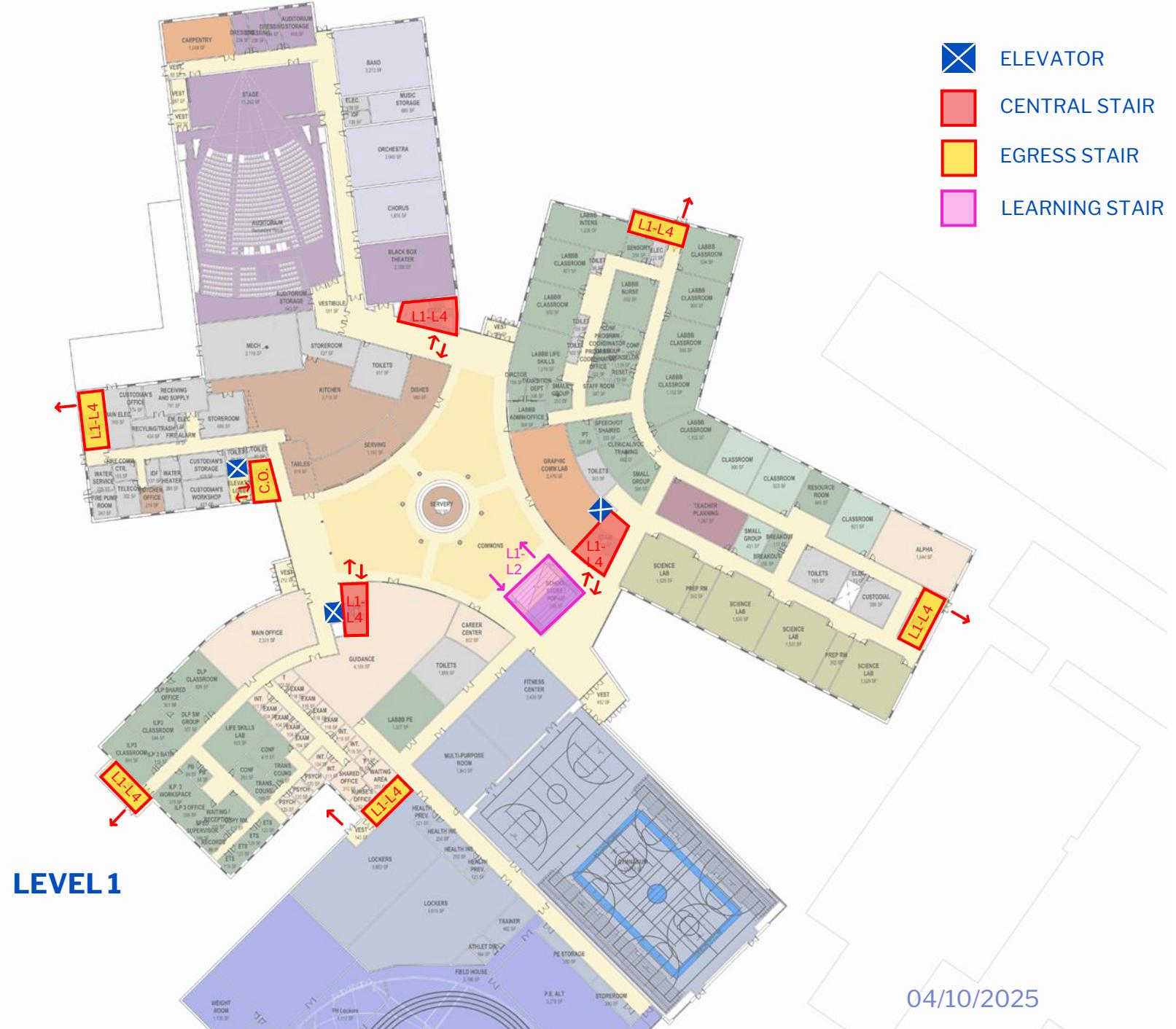


**KEY PLAN**

# Building Floor Plans

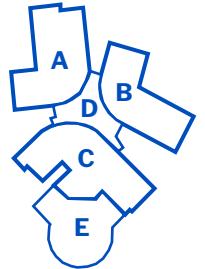
## Vertical Circulation

- Open stairs and elevators adjacent to the Dining Commons are the primary vertical circulation in the central part of the school
- The Learning Stair provides additional access between Levels 1 & 2
- Additional communicating stairs may be considered
- Egress stairs are located at the ends of each wing. These also act as local communicating stairs.
- (3) Elevators shall be traction type, sized for stretcher with 5,000lb capacity @ 200fpm
- One elevator will serve Central Office on Level 4, but also programmed to serve students with accessibility needs



# Building Floor Plans

## Level 2



**KEY PLAN**

- Core Academic
- Science
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- Admin, Guidance, ALPHA, METCO, Central Offices
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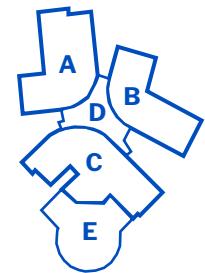


04/10/2025

# Building Floor Plans

## Level 3

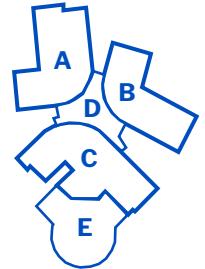
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**KEY PLAN**

# Building Floor Plans

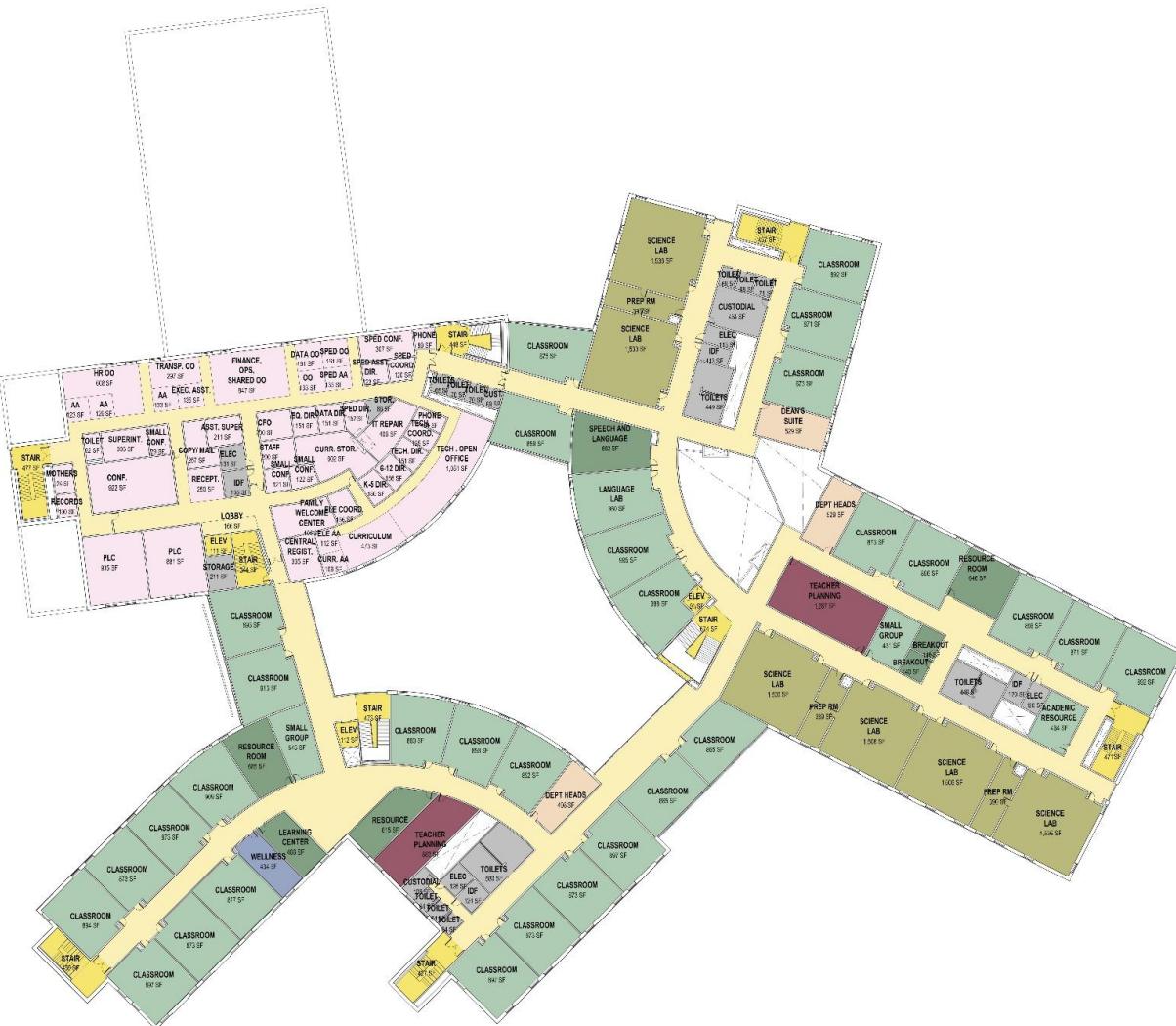
## Level 4



## KEY PLAN

- Core Academic
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  - Restrooms, Custodial
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  - Commons
  - Circulation
  - Vertical Circulation
  - Rooftop Open Space
  - Other
  - Expansion

## Central Office / Expansion



## Student Enrollment Considerations

Increase #of Students per Class and Classroom Utilization Rates		
# of Students per Class	Classroom Utilization Rate	Total # of Students
23	85%	2395
24	85%	2491
25	85%	2587
25	90%	2738

**Increased Class Size:** This would be across the board except in rooms that have identified capacities. E.g. special education, science labs where safety is a concern; science lecture/labs. In each of these cases, additional rooms would need to be added.

**Utilization:** It is industry standard to program a High School at 85%. One cannot simply translate an increased utilization rate to an increased number of students. Utilization is the percentage of time a room is used. The higher the rate, the more reduced opportunity for students to be accepted into the desired classes. The higher the rate the more difficult it is for Administration to schedule the spaces.

## Student Enrollment Considerations

Plus Expansion into Central Office Space		
# of Students per Class	Classroom Utilization Rate	Total # of Students
23	85%	299

**Central Office Retrofit:** At this level of analysis this space has been calculated as general education classrooms only, although some of that space may need to be SPED or Admin space.

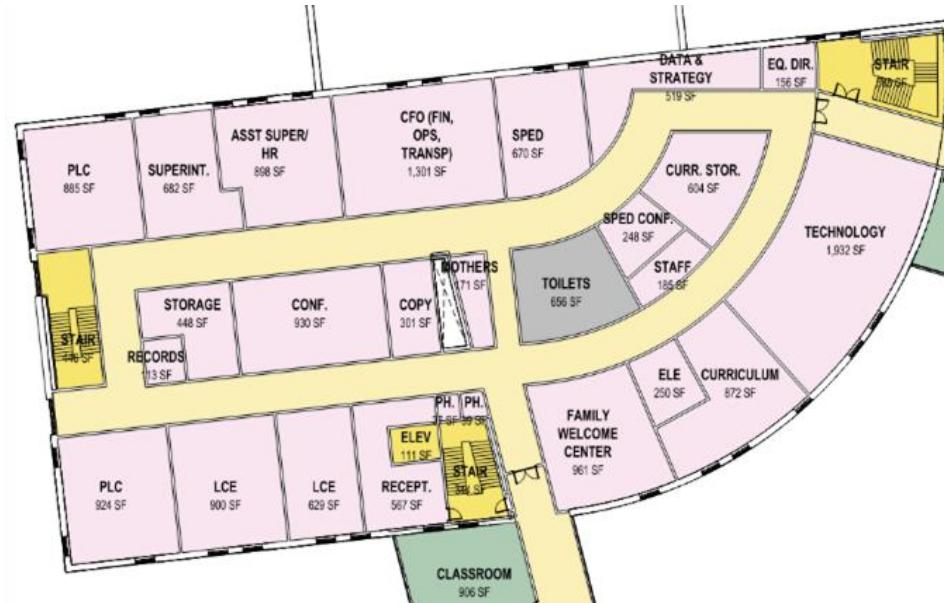
Plus Additional Expansion		
# of Students per Class	Classroom Utilization Rate	Total # of Students
23	85%	Option 1: 552
23	85%	Option 2: 460

**Expansion Space:** At this level of analysis this space has been calculated as general education classrooms only, although some of that space will most likely need to include SPED classrooms, Additional Dining and Media Center capacity and Admin space. Field House addition may allow future flexibility for Health/PE program overcrowding.

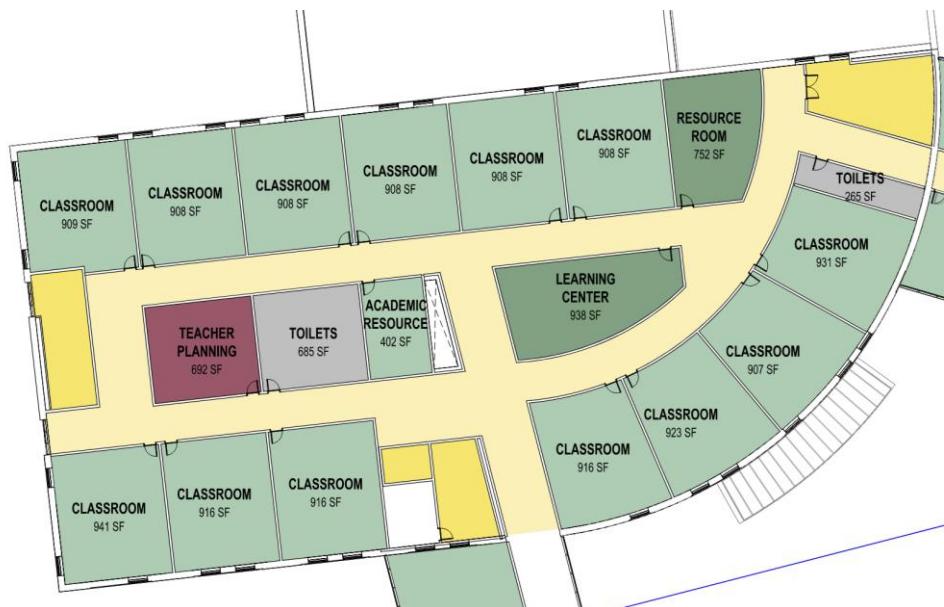
# Student Enrollment Considerations – Prior to 4/10/2025

## Level 4 Central Office Expansion Space

- Office spaces are being planned within classroom bay dimensions for ease of future conversion to educational space
- Additional Capacity based on Gen Ed classroom layout: **299 students**  
(conversion to science classrooms or other lab space may reduce total)



Schematic Design with Central Office



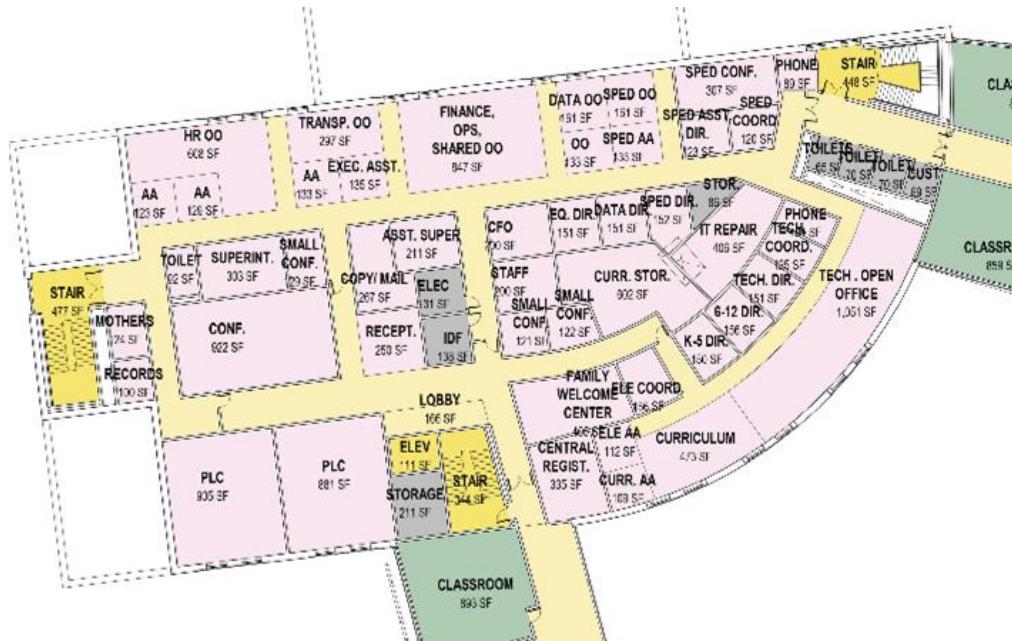
Future Classroom Wing Conversion

# Student Enrollment Considerations - Current

## Level 4 Central Office Expansion Space

- Office spaces are being planned within classroom bay dimensions for ease of future conversion to educational space
- Additional Capacity based on Gen Ed classroom layout: **253 students**
- **Two additional classrooms (46 students) are possible with exterior enclosure additions as part of future renovation**

(conversion to science classrooms or other lab space may reduce total)



Schematic Design with optimized Central Office

Updated 4/10



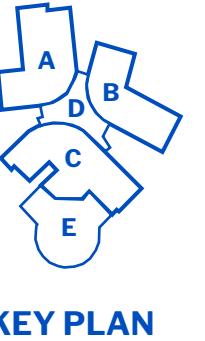
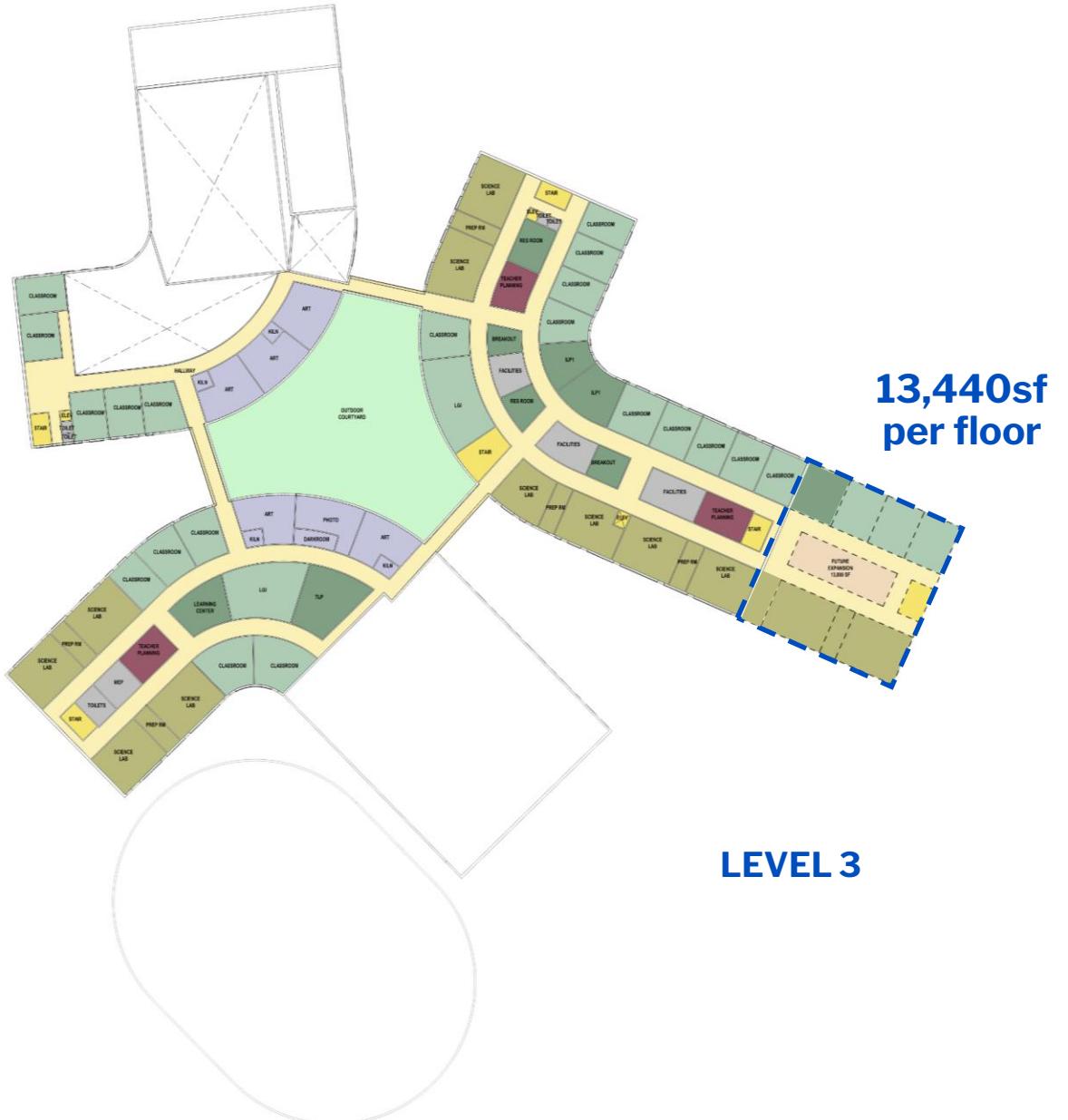
Future Classroom Wing Conversion

Updated 4/10

# Student Enrollment Considerations

Option 1 – 53,760 GSF

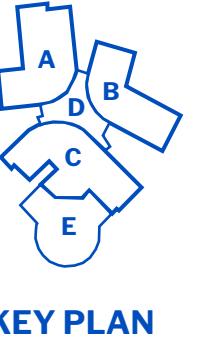
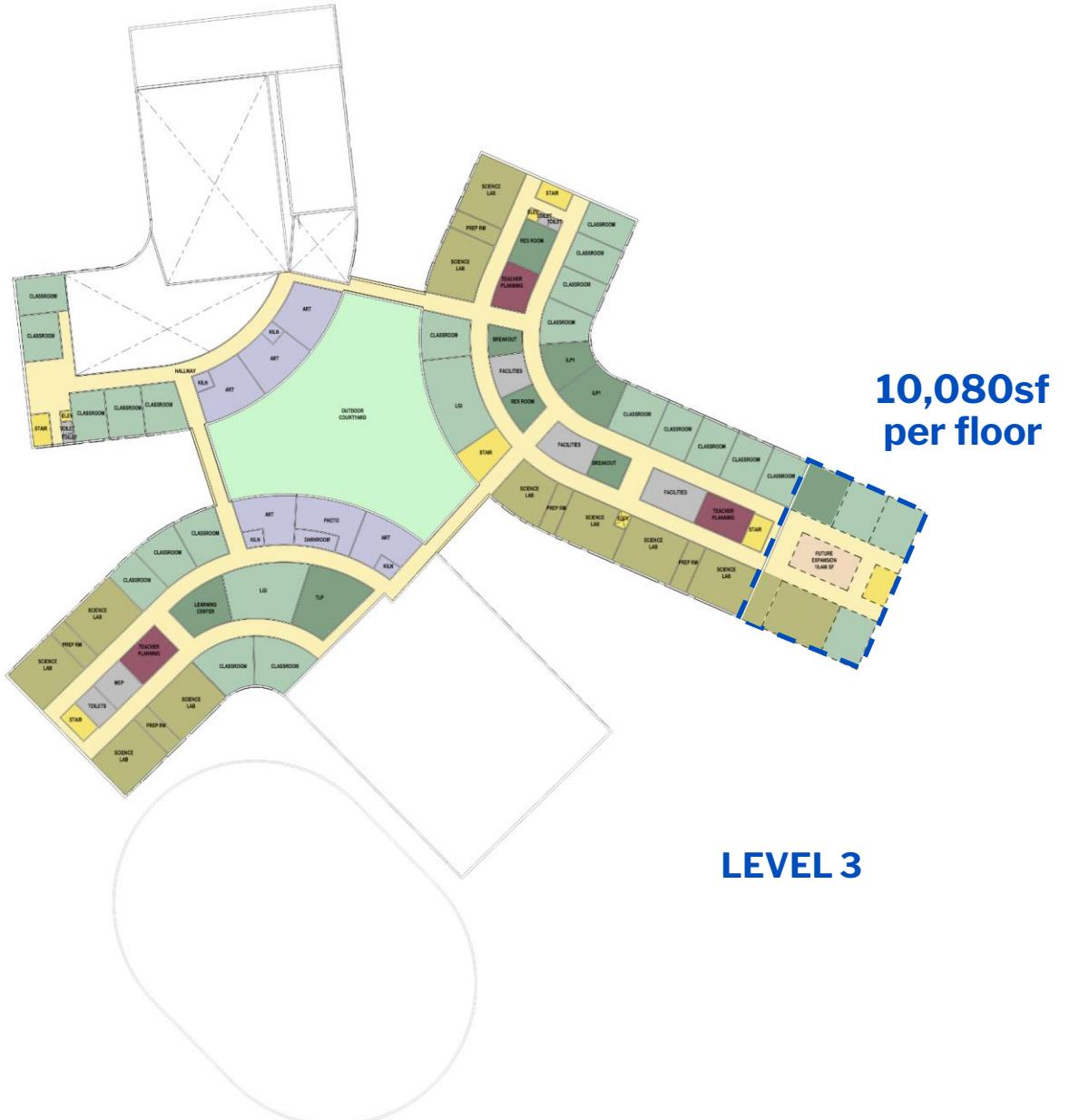
- Adds (4) full Gen Ed Classroom bays floors 1-4: Total 16
- Adds (2) Science Labs and (1) Prep Room floors 1-4: Total 8/4
- Adds an egress stair at end of wing
- Allows space for exit from internal egress stair
- Includes internal zone for support space, toilets
- Additional Capacity: **552 students**
- Total Capacity at 85% Utilization: **3,200 students (enrollment + CO + Larger Addition)**



# Student Enrollment Considerations

Option 2 – 40,320 GSF

- Adds (4) full Gen Ed Classroom bays floors 1-4: Total: 16
  - Adds (1) Science Lab and (1) Prep Room floors 1-4: Total: 4/4
  - Adds an egress stair at end of wing
  - Allows space for exit from internal egress stair
  - Includes internal zone for support space, toilets
- 
- Additional Capacity: **460 students**
  - Total Capacity at 85% Utilization: **3,108 students (enrollment + CO + Smaller Addition)**



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## **Target Value Design (15 minutes)**

- Cost Estimating Timeline
- Progress to date

## Cost Estimating Timeline

**6/4** - SMMA issues Drawings, specs and Cost Assumption memo to AMF & Turner

**6/5 - 7/3** - AMF & Turner develop estimates

**7/3** - AMF & Turner issue Cost Estimates including VE matrix with costs

**7/8** - Reconciliation meeting

**7/15** - AMF & Turner issue reconciled estimates for review

**7/16** – Distribute reconciled cost estimate to the SBC & PBC

### Round 1 Estimates & VE List Review

- **7/17** - PBC
- **7/21** – SBC

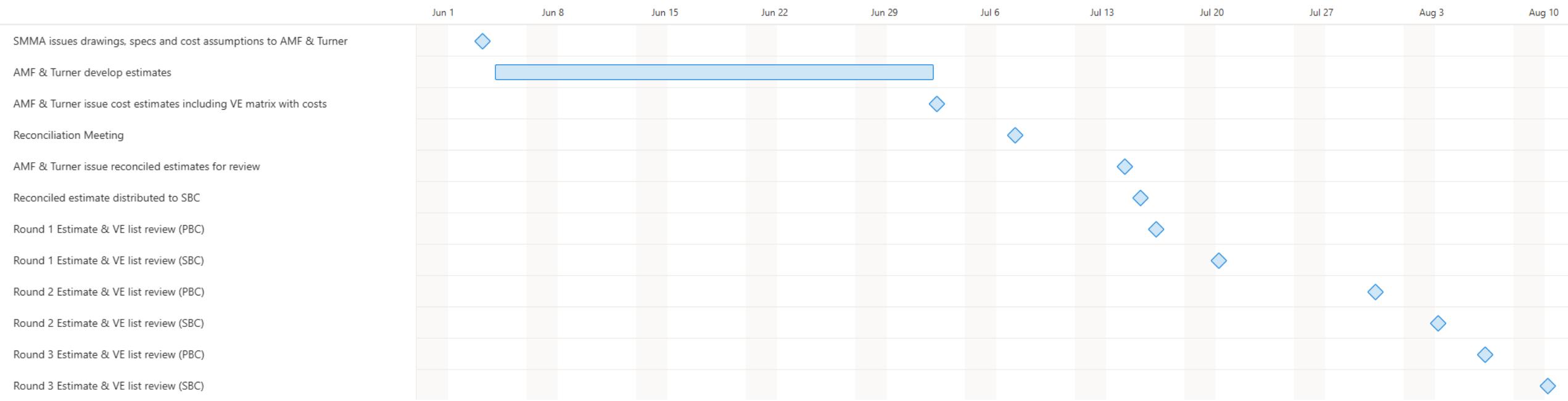
### Round 2 Estimates & VE List Review

- **7/31** - PBC
- **8/4** – SBC

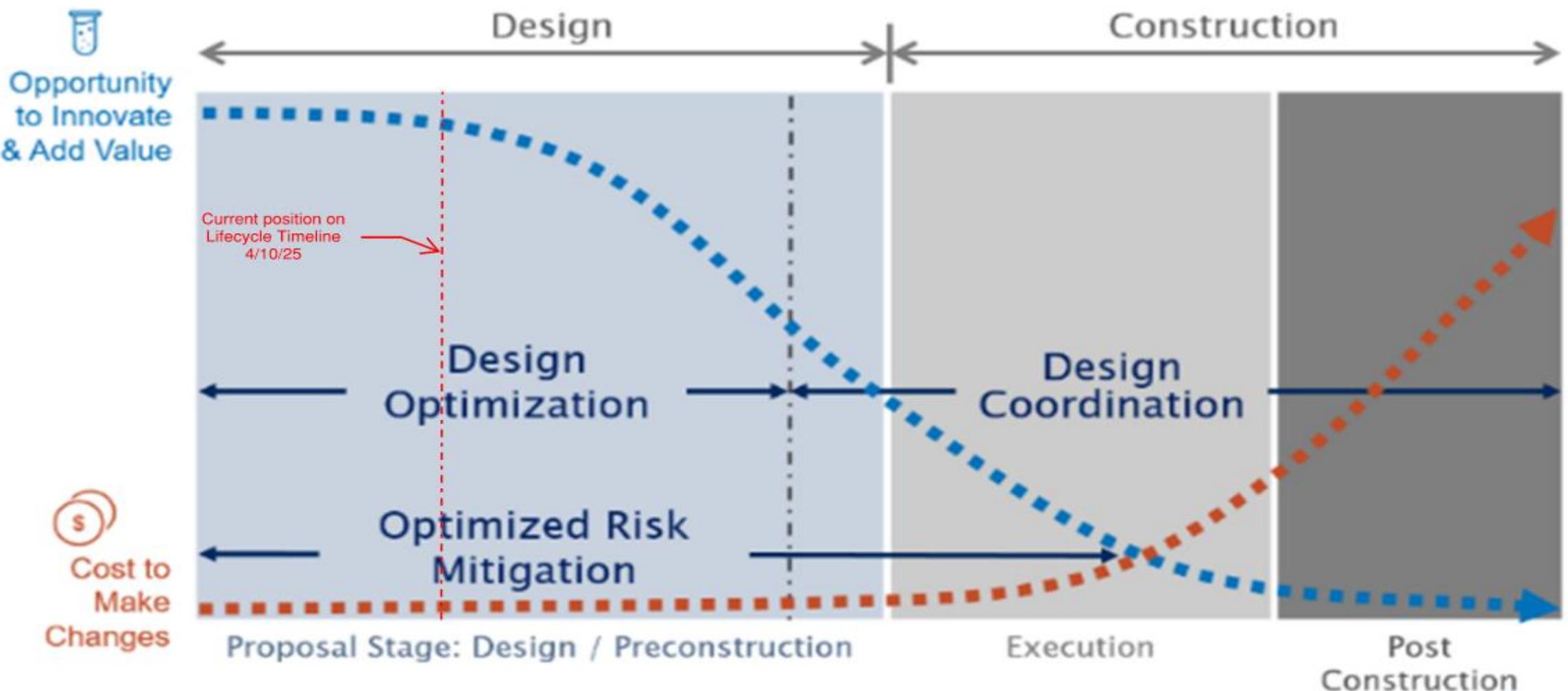
### Round 3 Estimates & VE List Review (if necessary)

- **8/7** - PBC
- **8/11** – SBC

# Cost Estimating Timeline



## IMPORTANCE OF TIMING ACROSS THE PROJECT LIFECYCLE



Cost to make changes  
increases over time

Opportunity to add value  
decreases over time

# TARGET VALUE DESIGN

## Budget Control Report - SAMPLE

Component Team	Sitework (Bldg), Excavation, Foundations & Structure	Envelope - Exterior Wall & Roofing	Interiors	Plumbing & Mechanical	Electrical	Site Improvements	Indirects	Project Construction Costs
	<b>Sitework (Bldg), Excavation, Foundations &amp; Structure</b> A10 Foundations A20 Subgrade Enclosures A40 Slabs On Grade A60 Water and Gas Mitigation A30 Substructure Related B10 Super Structure	<b>Envelope - Exterior Wall &amp; Roofing</b> B20 Exterior Enclosure B30 Roofing/Place Waterproofing	<b>Interiors</b> C10 Interior Construction C20 Interior Finishes D10 Conveying E10 Equipment E20 Furnishings F10 Special Construction	<b>Plumbing &amp; Mechanical</b> D20 Plumbing D30 HVAC D40 Fire Protection D80 Integrated Automation	<b>Electrical</b> D50 Electrical D60 Communications D70 Electronic Safety and Security	<b>Site Improvements</b> F20 Facility Remediation F30 Demolition G10 Site Preparation G20 Site Improvements G30 Liquid and Gas Site Utilities G40 Electrical Site Improvements G50 Site Communications		

<b>Baseline Budget - Concept Estm dtd 11-01-2023</b>	<b>\$42,889,000</b>	<b>\$38,990,000</b>	<b>\$64,251,000</b>	<b>\$84,883,000</b>	<b>\$45,784,000</b>	<b>\$45,911,000</b>	<b>\$151,073,000</b>	<b>\$473,781,000</b>
<b>440,816</b>	<b>Cost / SF</b>	<b>\$97</b>	<b>\$88</b>	<b>\$146</b>	<b>\$193</b>	<b>\$104</b>	<b>\$104</b>	<b>\$343</b>
<b>PM&amp;C Target Budget (Set 10-07-2024)</b>	<b>\$42,384,624</b>	<b>\$36,893,160</b>	<b>\$66,326,876</b>	<b>\$79,883,632</b>	<b>\$50,206,180</b>	<b>\$44,517,709</b>	<b>\$155,407,170</b>	<b>\$475,619,351</b>
<b>440,816</b>	<b>Cost / SF</b>	<b>\$96</b>	<b>\$84</b>	<b>\$150</b>	<b>\$181</b>	<b>\$114</b>	<b>\$101</b>	<b>\$353</b>
<b>Delta Overage</b>		<b>\$504,376</b>	<b>\$2,096,840</b>	<b>(\$2,075,876)</b>	<b>\$4,999,368</b>	<b>(\$4,422,180)</b>	<b>\$1,393,291</b>	<b>(\$4,334,170)</b>
<b>Percentage</b>		<b>1.2%</b>	<b>5.7%</b>	<b>(3.1%)</b>	<b>6.3%</b>	<b>(8.8%)</b>	<b>3.1%</b>	<b>(2.8%)</b>

Component Team	Sitework (Bldg), Excavation, Foundations & Structure	Envelope - Exterior Wall & Roofing	Interiors	Plumbing & Mechanical	Electrical	Site Improvements	Indirects	Project Construction Costs
<b>Current Forecast</b>	<b>\$42,889,000</b>	<b>\$38,990,000</b>	<b>\$64,251,000</b>	<b>\$84,883,000</b>	<b>\$45,784,000</b>	<b>\$45,911,000</b>	<b>\$151,073,000</b>	<b>\$473,781,000</b>
<b>TVD Progress To Date (Accepted, incld)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>TVD Pending Items (Requiring ELT Approval)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>TVD Approximate Items (Pending Pricing)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Subtotal of TVD Items</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Remaining To TVD Target</b>	<b>\$504,376</b>	<b>\$2,096,840</b>	<b>(\$2,075,876)</b>	<b>\$4,999,368</b>	<b>(\$4,422,180)</b>	<b>\$1,393,291</b>	<b>(\$4,334,170)</b>	<b>(\$1,838,351)</b>

# Thank you.