

Lexington High School

Exterior & Interior Design Focus Group

03/04/2025



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Agenda

- 1 Introduction
- 2 Project Update
- 3 Topics for Further Discussion
- 4 Schematic Design Topics

Introduction / Design Team



Lorraine Finnegan
Principal in Charge/
Project Manager

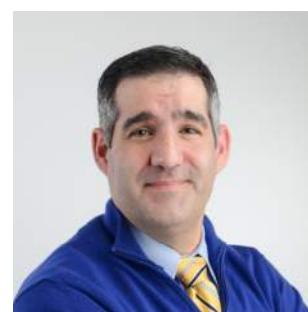
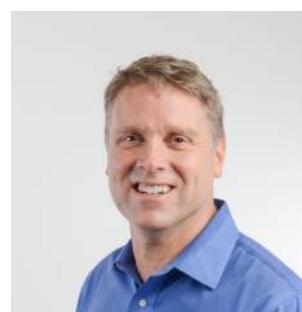
Brian Black
Project Designer

Thomas Faust
Project Architect

Rosemary Park
Educational Planner

Phil Poinelli
Educational Planner

Sarah Sopelak
Interior Designer



Martine Dion
Sustainability Lead

Erin Prestileo
Civil Engineering
Lead

Michael Dowhan
Landscape Architect
Lead

Anthony Jimenez
Electrical Lead

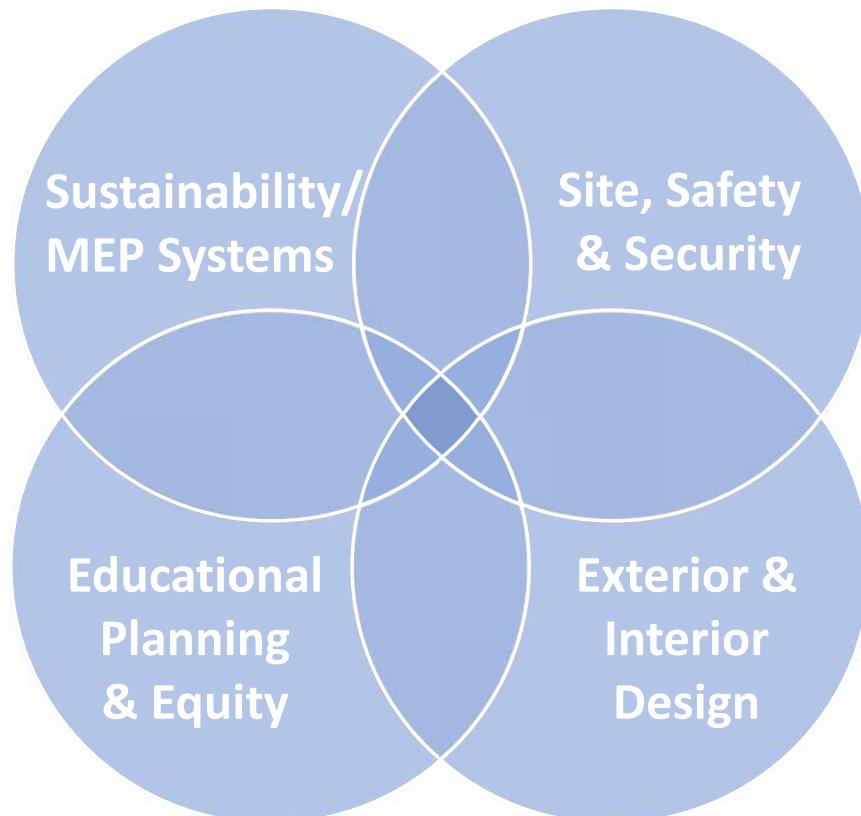
Andy Oldeman
HVAC Lead

Paul Elliot
Plumbing Lead

Introduction / Group Definitions

Reviews preferred MEP systems, Integrated Design Policy and sustainable design features and components, healthy materials; site design and landscape features for environmentally friendly design.

Reviews overall goals from educational planning perspectives, educational programming meetings and visioning sessions.



Reviews development of the site design for traffic, circulation, safety and security. Includes conversations about parking, driveways and circulation, fields, and offsite improvements and coordination with Town Departments.

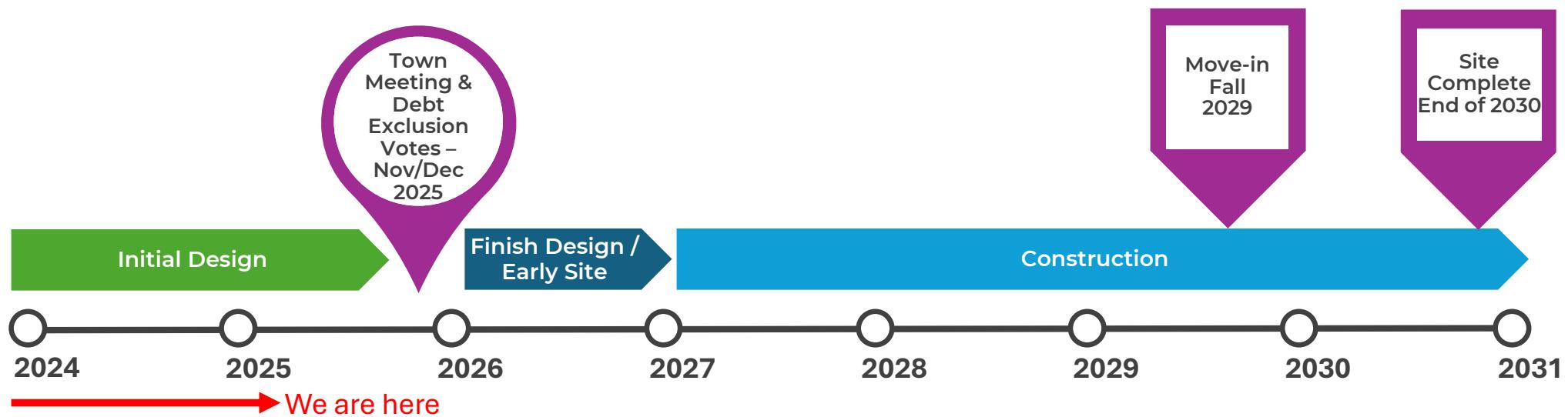
Reviews exterior design concepts including composition of form and material selections such as brick, precast, metal panels etc. Review of the products and materials selected for finishes such as flooring, tile, ceilings, wood paneling, paint colors etc.



Project Update

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Anticipated Overall Project Timeline



All dates after local vote in November / December 2025 are subject to change based upon the selected option.

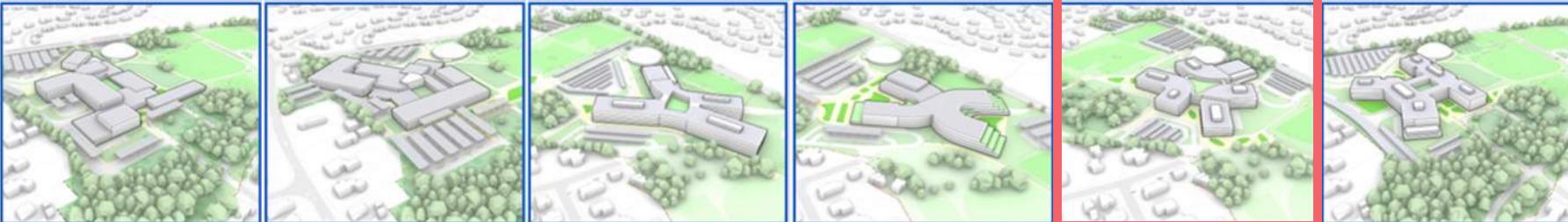
Construction duration is shown to provide a potential range. Final duration will be determined toward the end of initial design.

Move-in date will be determined after an option is selected. Anticipated move-in currently shown in the fall of 2029.



Preferred Option / Bloom

	B. Renovation & Addition		C. New Construction – On Fields			D. New Construction – Phased in Place
Alternative	B.1 Quad	B.4 Figure Eight	C.1d Branch	C.2b Braid	C.5b Bloom	D.2 Weave
Project Cost School + Add/Reno FH	\$690,000,000	\$692,000,000	\$637,000,000	\$636,000,000	\$639,000,000	\$711,000,000
Project Cost School + Add/Reno FH + Central Office	\$713,000,000	\$715,000,000	\$660,000,000	\$659,000,000	\$662,000,000	\$734,000,000
Construction Duration	6 Years	6.25 Years	4.5 Years	4.5 Years	4.5 Years	6.5 Years
# of Phases	4 + 1	5 + 1	1 + 1	1 + 1	1 + 1	4 + 1
Building Location	Existing Footprint	Existing Footprint	Fields	Fields	Fields	Existing Footprint
Modular Max Required	32	42	0	0	0	48




Preferred Option / Bloom



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Topics For Further Discussion

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Topics Needing Further Discussion

EID 5: Exploring vertical vs. horizontal future expansion

- Develop comparative study of vertical vs horizontal future expansion.

The Design Team is developing a two-pronged approach:

- 1) Future expansion by renovating Central Office, currently located at Level 4 of Wing A.
- 2) Future expansion by adding on to Wing B and renovating space adjacent to the Dining Commons

These combined approaches would result in total enrollment capacity of between 3,177 and 3,269 students before increasing the design utilization rate of 85%.

The SBC is scheduled to confirm the future expansion approach at the April 14 meeting.



Topics Needing Further Discussion

EID 9: Waste reduction/reusables/dishwashing in food service areas & teacher lounge spaces

- Waste reduction approaches to be considered, in alignment with the Town's waste reduction criteria and requirements. Refer to the MEP / Sustainability Focus Group recommendations.

Food service space design is in the very early stages, with an initial blocking diagram from the Consultant being integrated into the plan. The main kitchen is currently being designed with a dishwashing space and equipment. Operational considerations will be discussed with LHS and Whitson's once the plan is further developed. Costs of infrastructure, equipment, and small wares will be developed in this phase.

Space for composting is being allocated near the loading dock.

Detailed layouts of teacher lounge spaces will be developed in the next phase.

Topics Needing Further Discussion

EID 12-13: Consider environmental impact and insulation value of materials/envelope

- Exterior design to incorporate fundamentals of energy efficiency. Implementation of Passive House standards to be considered. Refer to the MEP / Sustainability Focus Group recommendations.

The exterior envelope is being designed to meet the requirements of the Specialized Energy Code and an EUI of 25. See following slide.

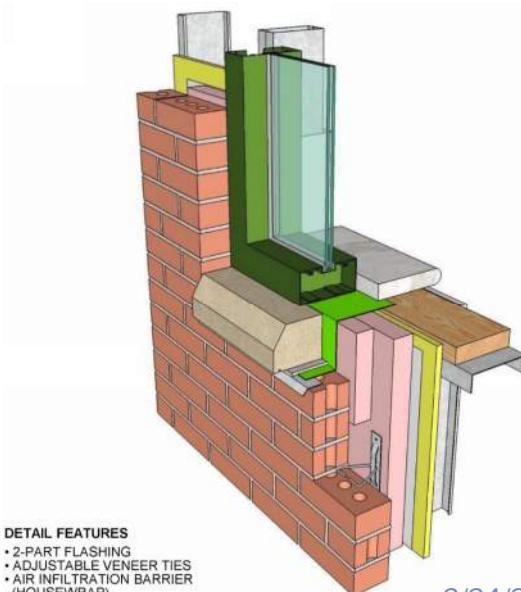
Pros and Cons of using Passive House standards will be discussed in the MEP/Sustainability Focus Group on March 10.



EID 12-13

Building Enclosure Design Parameters

- Window to wall Ratio (WWR) = **25%**
- Wall Insulation = **R-40**
- Roof Insulation = **R-60**
- High-performance glazing system
 - **Low U-value: 0.23 or better**
 - **High Solar Heat Gain Coefficient: 0.35 or better**
 - **High Visual Light Transmittance**
- Thermal Bridging Mitigation
- Air Infiltration Testing - Reduction Goal = **0.15 cfm/sf@ 75 PA or better**



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Topics Needing Further Discussion

EID 14: Using mass timber to reduce embodied carbon

- Consider options to include Mass Timber elements in design. Refer to the MEP / Sustainability Focus Group recommendations.

The Design Team developed three different scope options for including Mass Timber in the design. The SBC has directed the team not to include any Mass Timber scope in the project due to concerns about overall project cost.

Option A (Mass timber used for the entire structure)

Est. Total Project Cost = \$24,000,000

Option B (Hybrid system – all mass timber except steel used for columns)

Est. Total Project Cost = \$19,000,000

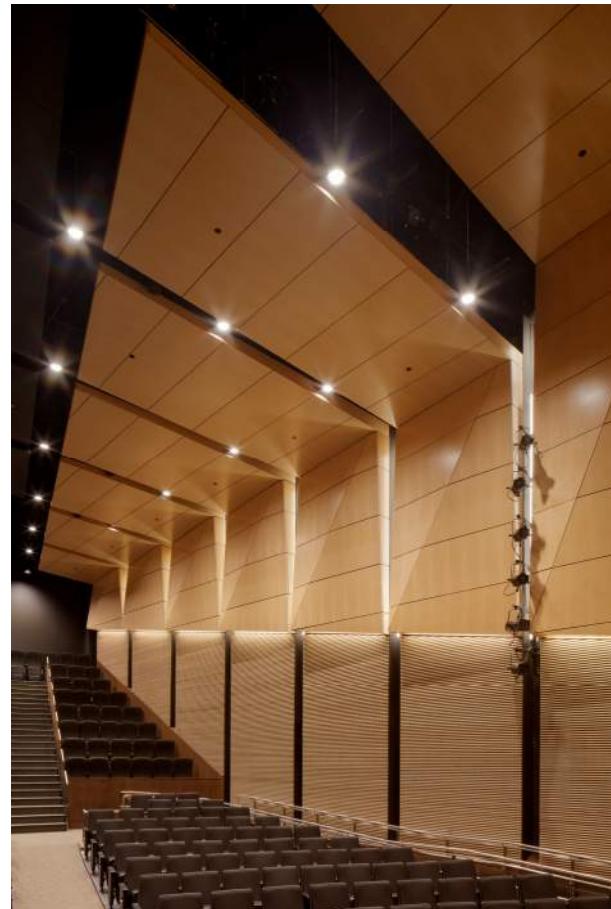
Option C (Mass timber used at the Gymnasium, Dining Commons and Media Center only)

Est. Total Project Cost = \$2,000,000

SMMA will present its findings regarding embodied carbon tradeoffs in the MEP / Sustainability Focus Group on March 10.



Other Wood or Wood-Look Finishes in Lieu of Mass Timber



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2/27/2025

15

Topics Needing Further Discussion

EID 15: Be creative with where we put solar panels

- Solar panels should be maximized at building rooftop and on-grade parking. Consider using building-integrated photovoltaics.

Solar panel design will seek to maximize placement on building rooftops and mounted on canopies over on-grade parking.

The design of architectural and site elements are currently in a state of flux. Layouts will be shared as the design progresses and settles. Building-integrated PV may be studied if more efficient systems cannot meet performance goals.



Topics Needing Further Discussion

EID 16: Balance design goals with energy constraints

- Include operational energy constraints in overall decision-making and LCC analysis.

Energy conservation will be a continual topic of consideration.



Topics Needing Further Discussion

EID 18: Balance open campus with security

- Consider design approaches that provide access to the outdoors for both educational and social purposes, while maintaining a safe and secure building. Refer to recommendations of Site, Safety & Security Focus Group.

The current design approach creates a single building that is highly accessible, but with multiple layers of physical compartmentation and electronic monitoring capabilities. It will include a major outdoor courtyard element located completely within the building at Level 3, as well as multiple outdoor spaces close to the building with varying degrees of enclosure. The site design is currently being designed to support both educational and social gatherings as well as ease and safety of pedestrian and bicycle circulation.



Topics Needing Further Discussion

EID 22-24: Separate parking and building access for athletics, performing arts, students and teachers

- Study access and parking needs of each constituency. Cross-reference with recommendations from Sustainability / MEP Focus Group to reduce dependence on single-occupant vehicles.

EID 38: Separate entrances for athletics and performing arts far away from each other

- All programs to have appropriately sized entrances, access and egress.

The design currently includes three separate entrances to the building, each of which can be independently controlled for the possibility of access by various groups. Each entrance is served by parking. All three entrances may be used for morning arrival and afternoon dismissal. The western entrance is envisioned as the main visitor checkpoint during school hours.

The Performing Arts wing and Athletics wing are located at opposite ends of the school but are each accessible from the central commons space.

Topics Needing Further Discussion

EID 33: Need for functional auditorium appropriate for programs that utilize space

- Review the auditorium design and get input from all stakeholders as it develops.

The Design Team, including the Theater Consultant has met multiple times with Music and Theater programs and has discussed needs in detail. Auditorium design is progressing accordingly.

EID 34: Orchestra pit is highly desirable

- Develop pros and cons along with costs of orchestra pit design.

Orchestra pit design options are being developed along with costs.



Topics Needing Further Discussion

EID 42: Provide food-appropriate spaces where students can study

- Review food policies to clarify design parameters of possibly distributed cafes.

A café is being planned for Level 2 adjacent to the Media Center, with seating overlooking the Dining Commons space. Operational considerations will be discussed with LHS administration and facilities staff.



Topics Needing Further Discussion

EID 45: Experienced problems with linoleum in the past (welded seams in particular)

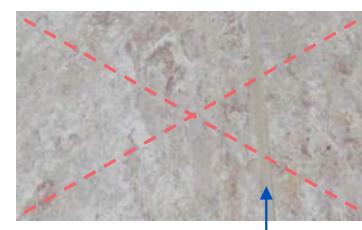
- All proposed interior materials to be reviewed by facilities and maintenance staff.

A net fit seam installation is recommended.

The rolled goods are installed with a tight butt-joint to the adjacent flooring section. Any design and shapes can be accommodated.

Net fit seams are as durable as welded seams and there is no difference in warranty or maintenance of the product.

Net fit seam installation is efficient which is a cost savings compared to heat weld seams.



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Schematic Design Topics

Interior Material Selection & Design

- Red List Materials Category Selection & Prioritization
- Classroom & Corridor: Floor, Wall and Ceiling Material Type Categories
- Feature Space: Floor, Wall and Ceiling Material Type Categories
- Define Specialty Items (Lockers, Toilet Accessories, Shades/blinds)

Building Design & Floor Plan Review

- Proposed space layouts and circulation
- Location of & Access to Central Office
- Exterior Design
- Feature Space Design
- Design of Building Entrance

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Interior Design/ Drivers



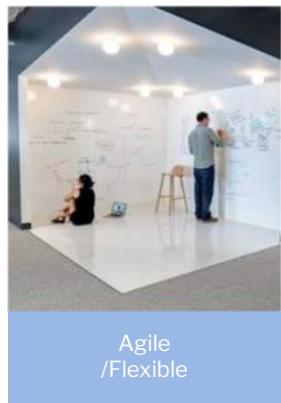
Joy in Learning



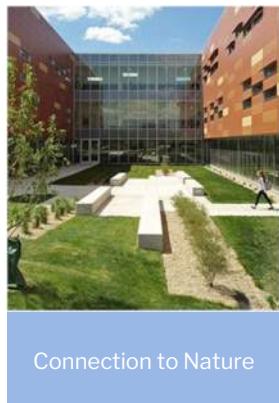
Curiosity in Life



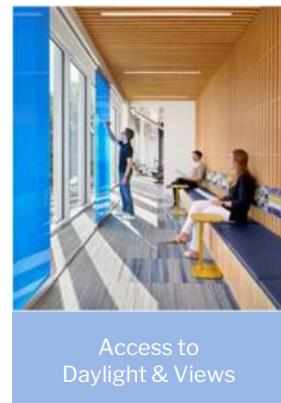
Compassion
in all we do



Agile
/Flexible



Connection to Nature



Access to
Daylight & Views



Intuitive Wayfinding



Sustainability &
Durability



Equitable
/Universal



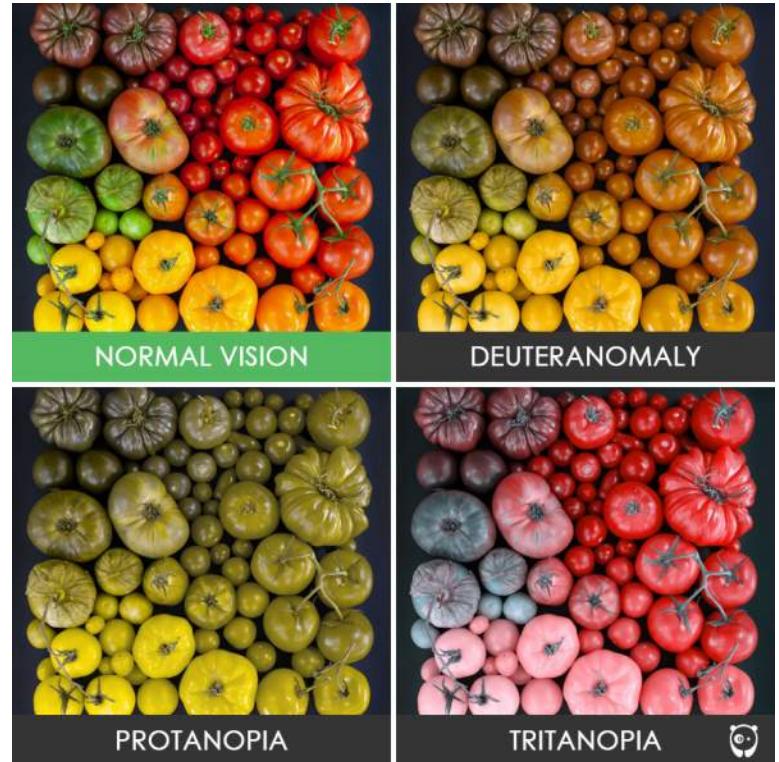
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Interior Design/ Color Introduction

THE COLOR WHEEL



Color Blind Accessibility



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Interior Design/ Color Introduction

Blues



Soothing, peaceful,
relaxing, inviting, trust,
reliable

Warm Neutrals



Calming, relaxing,
dependable, healing,
strength

Greens



Tranquil, serenity, balanced
emotions, calming,
renewal, optimistic

Yellows



Optimistic, playful,
happy, intellectual

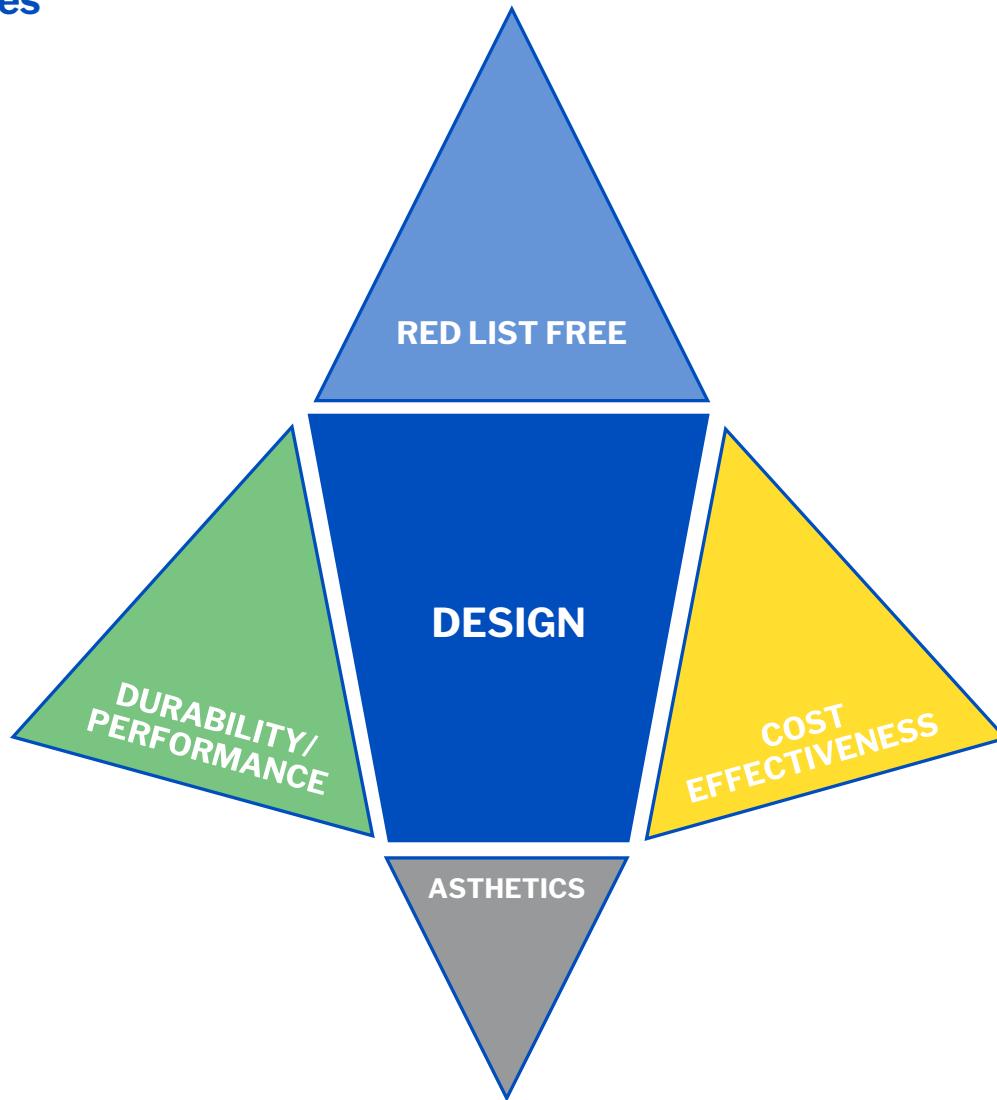


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Interior Design/ Town, Public School and Athletic Brands



Healthy Material Priorities



Red List Materials Category Selection

Declaration Status

LBC RED LIST FREE products disclose 100% of ingredients present at or above 100 ppm (0.01%) in the final product and do not contain any Red List chemicals.

LBC RED LIST APPROVED products disclose a minimum of 99% of ingredients present in the final product and meet the LBC Red List Imperative requirements through one or more *approved exceptions*.

DECLARED products disclose 100% of ingredients present in the final product, but contain one or more Red List chemicals that are not covered by an approved exception.

Thornton Tomasetti



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Declare.

Gold Bond® High Strength Fire-Shield 60° Gypsum Board
Gold Bond Building Products, LLC
provided by National Gypsum Company

Final Assembly: Multiple US Locations
Life Expectancy: 60+ Year(s)
End of Life Options: Recyclable (100%), Landfill

Ingredients:

Gypsum Core: Gypsum; Vermiculite; STARCH; Continuous Filament Glass Fiber, Non-Respirable; Dextrose; Sodium *polynaphthalenesulfonate*¹; Boric acid; Poliglycine Sodium; Metaphosphoric acid (H3P3O9), trisodium salt; Undisclosed (< 0.06%); Poly(oxo-1,2-ethanediyl), alpha-sulfo-omega-hydroxy-, C9-11-alkyl ethers, sodium salts; POTASSIUM SULFATE; Glycine; Sodium bisulfite; **Paper Facing:** Mixed Recycled Paper; Starch; Alkenyl succinic anhydride

¹LBC Temp Exception RL-009 - Formaldehyde
²LBC Temp Exception RL-004b - Proprietary Ingredients in Declare

Living Building Challenge Criteria: Compliant

I-13 Red List:

<input type="checkbox"/> LBC Red List Free	% Disclosed: 99.94% at 100ppm
<input checked="" type="checkbox"/> LBC Red List Approved	VOC Content: Not Applicable
<input type="checkbox"/> Declared	

I-10 Interior Performance: CDPH Standard Method v1.2-2017
I-14 Responsible Sourcing: Not Applicable

NGC-0002
EXP. 01 MAR 2024
Original Issue Date: 2023

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INTERNATIONAL LIVING FUTURE INSTITUTE™ living-future.org/declare

Declare.

USG Sheetrock® Brand EcoSmart Panels Firecode® X
United States Gypsum Company

Final Assembly: Multiple Locations in USA
Life Expectancy: 60+ Year(s)
End of Life Options: Salvageable/Reusable in its Entirety, Recyclable

Ingredients:

Core: Gypsum; **Paper Facing and Backing:** Cellulose; **Fire Endurance:** Vermiculite; **Binder:** Starch; **Core Strengtheners:** Metaphosphoric acid (H3P3O9), trisodium salt; **Reinforcing:** Mineral wool; **Drying Additive:** Dextrose; **Dispersant:** Polycarboxylate Polymer; **Accelerator:** Aluminum sulfate; **Polyvinyl Alcohol:** Adhesive

Living Building Challenge Criteria: Compliant

I-13 Red List:

<input checked="" type="checkbox"/> LBC Red List Free	% Disclosed: 100% at 100ppm
<input type="checkbox"/> LBC Red List Approved	VOC Content: Not Applicable
<input type="checkbox"/> Declared	

I-10 Interior Performance: CDPH Standard Method v1.2-2017
I-14 Responsible Sourcing: Not Applicable

USG-0001
EXP. 01 MAR 2025
Original Issue Date: 2017

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Red List Materials Category Selection & Prioritization

Flooring and Base Materials

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Material Selection Priorities
(Durability and Cost will be reviewed in DD phase)

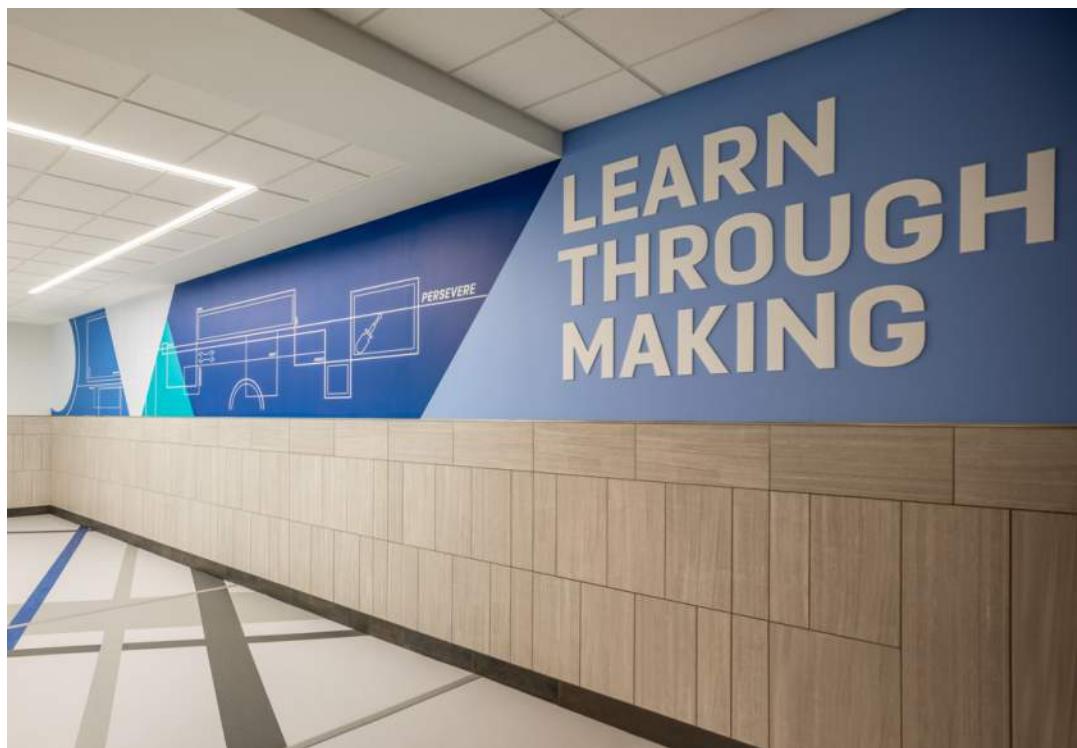
Specification Section Number	Specification Name	Product Type	Manufacturer	Product Name	Red List Status	Declare Label Expiration Date	Poor, Good, Best	Low, Medium, High	Dropdown	Y/N	Y/N	Low, Med, High	Y/N	
							Priority 1	Priority 2						
							Durability/ Performance	Cost						
096566		Athletic Flooring (Rubber)	Zandur	Vulcanized Rubber Sports Fitness Flooring - Sustain, Sophros & Flex	Red List Free	2/1/2025			Other	N	N		N	https://zandur.com/products/sophros-solid-rubber/
096566		Athletic Flooring (Rubber)	Ecore	Ultratile	Product Research Required				FloorScore	Y	Y	Medium	N	https://ecoreathletic.com/products/rubber/performance/ultratile
096566		Athletic Flooring (Rubber)	Flexco	Tuflex Force Rubber Flooring	Red List Free	Self Declared Red List Free			FloorScore	Y	Y	Medium	N	https://flexcofloors.com/product-category/rubber-tile-samples/tuflex-force-recycled-rubber-tile-samples/
096566		Athletic Flooring (Rubber)	Capri Collections	Fitness & Rec EPDM Rubber Flooring	Red List Free	10/1/2025			FloorScore	N	N		N	https://declare.living-future.org/products/fitness-rec
096566		Athletic Flooring (Rubber)	Ecore International	ECOfit	Product Research Required				SCS Indoor Advantage	Y	Y	High	Y	https://ecosurfaces.com/products/rubber/ecofit
096466		Athletic Flooring (Wood)	Tarkett	Flexlock Wood Sports Flooring	Product Research Required				None	N	N		N	https://professionals.tarkett.com/en/EU/collection-C001408-flexlock
096466		Athletic Flooring (Wood)	Aacer Flooring	Infinity Wood Floors	Product Research Required				None	N	N		N	https://www.aacerflooring.com/
		Carpet (Broadloom)	Milliken	Broadloom Carpet	Red List Free	5/1/2025			CRI Green Label Plus	N	N	High	N	https://fcatalogblob.milliken.com/fcatalogblob/documents/67/F7/Formwork_Brochure.pdf
		Carpet (Broadloom)	Mohawk Group	Comercial Nylon Broadloom	Red List Free	8/1/2025			CRI Green Label Plus	Y	Y	High	N	https://www.mohawkgroup.com/products/soft-surface?product_type=Broadloom
		Carpet (Broadloom)	Godfrey Hirst	100% Wool Broadloom Car	Red List Free	9/1/2025			Other	N	N		N	https://www.godfreyhirst.com.au/products?type=CPT&subType=wool_cot
		Carpet Tile	Mohawk Group	Nylon Modular Carpet on Edge	Red List Free	1/1/2026			CRI Green Label Plus	Y	Y	High	N	https://www.mohawkgroup.com/products/soft-surface?product_type=Carpet%20Tile&red_list_free=true
		Carpet Tile	Milliken	First Sight Sandscape - PVC Free WellBAC Comfort cushion backing	Red List Free	7/1/2025			CRI Green Label Plus	Y	Y	High	N	https://fcatalogblob.milliken.com/en-us/search/color?sort=recent&regionName=Americas&marketName=Contract&catalogName=Products&regionId=76&marketId=73&catalogId=178&totalResults=188&collectionId=599&collectionName=first+sght
		Carpet Tile	Milliken	First Sight Surface Current - PVC-Free WellBAC Comfort cushion backing	Red List Free	7/1/2025			CRI Green Label Plus	Y	Y	High	N	https://fcatalogblob.milliken.com/en-us/search/color?sort=recent&regionName=Americas&marketName=Contract&catalogName=Products&regionId=76&marketId=73&catalogId=178&totalResults=188&collectionId=599&collectionName=first+sght
		Carpet Tile	Bentley Mills	All Carpet Products (Tile & Broadloom)	Red List Free	2/1/2025			CRI Green Label Plus	Y	Y	Low	N	https://www.bentleymills.com/bentley-publicizes-declare-labels-achieves-red-list-free-status-for-all-carpet-products/
096813		Carpet Tile	Bentley Mills	NexStep Cushion Tile - Burn	Red List Free	2/1/2025			SCS Indoor Advantage	Y	Y	Low	Y	https://declare.living-future.org/products/nexstep-cushion-tile
096813		Carpet Tile	Bentley Mills	NexStep Cushion Tile - Red	Red List Free	2/1/2025			SCS Indoor Advantage	Y	Y	Low	Y	https://declare.living-future.org/products/nexstep-cushion-tile

Snip of SMMA's Healthy Material Matrix (material research is ongoing)



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Classroom and Corridor/ Material Type - Introduction

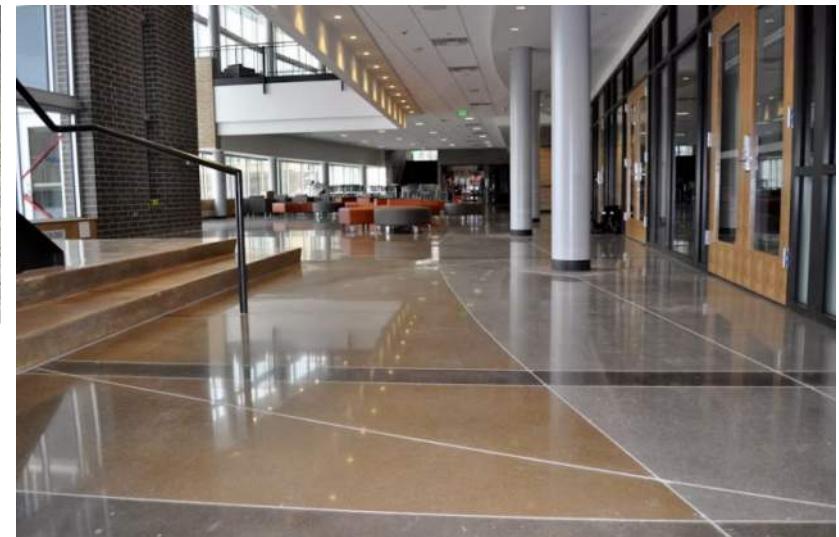
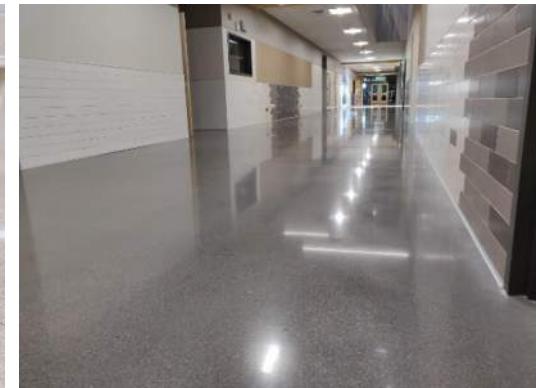
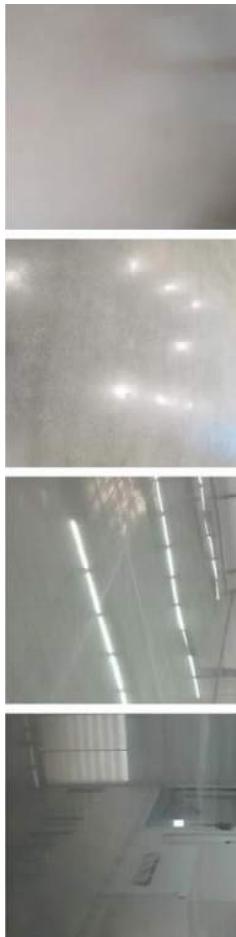


Classroom and Corridor/ Floor Finish/ Concrete (polished, stained, painted)

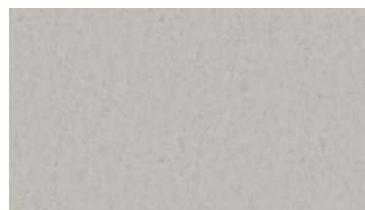
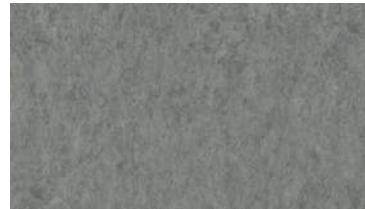
Aggregate



Sheen



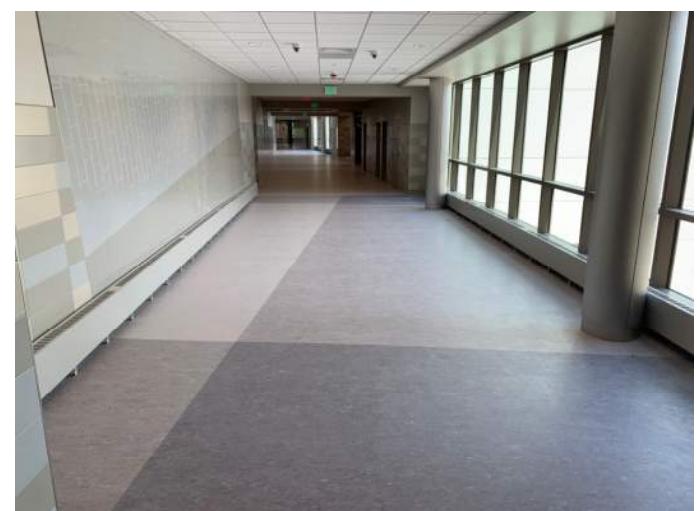
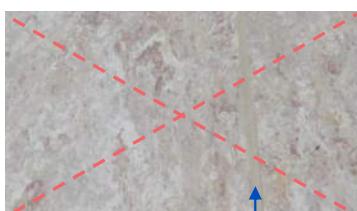
Classroom and Corridor/ Floor Finish/ Linoleum



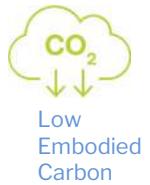
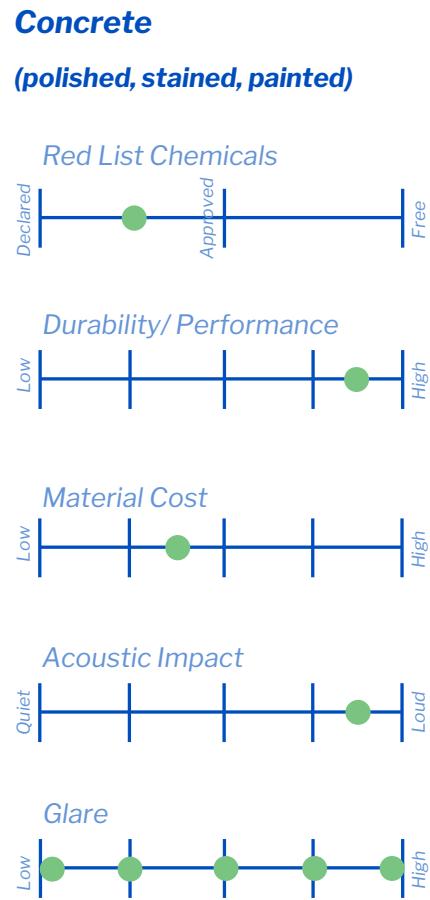
Sheet product installed
with net fit seams
(recommended by SMMA)



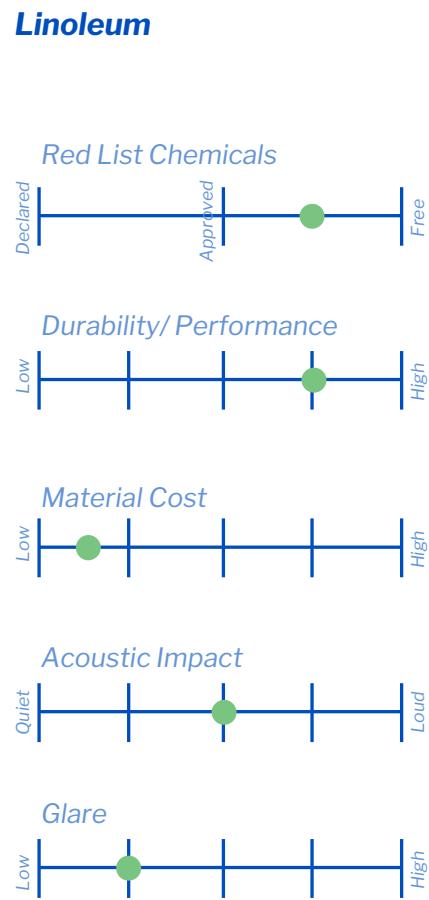
Sheet product installed
with heat weld seams,
disliked by DPF



Classroom and Corridor/ Floor Finish

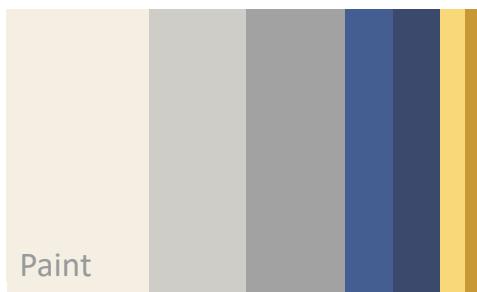
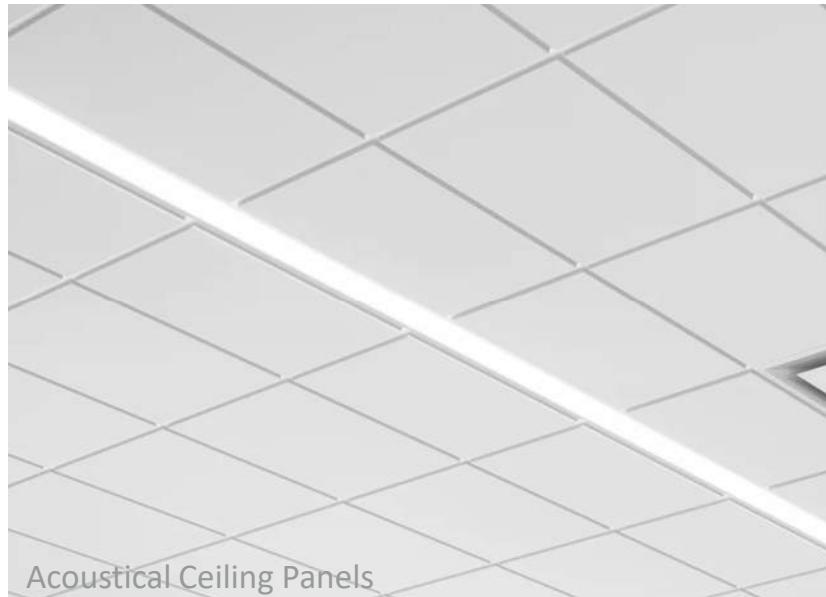


Low
Embodied
Carbon



Low
Embodied
Carbon

Classroom and Corridor/ Wall & Ceiling Finishes

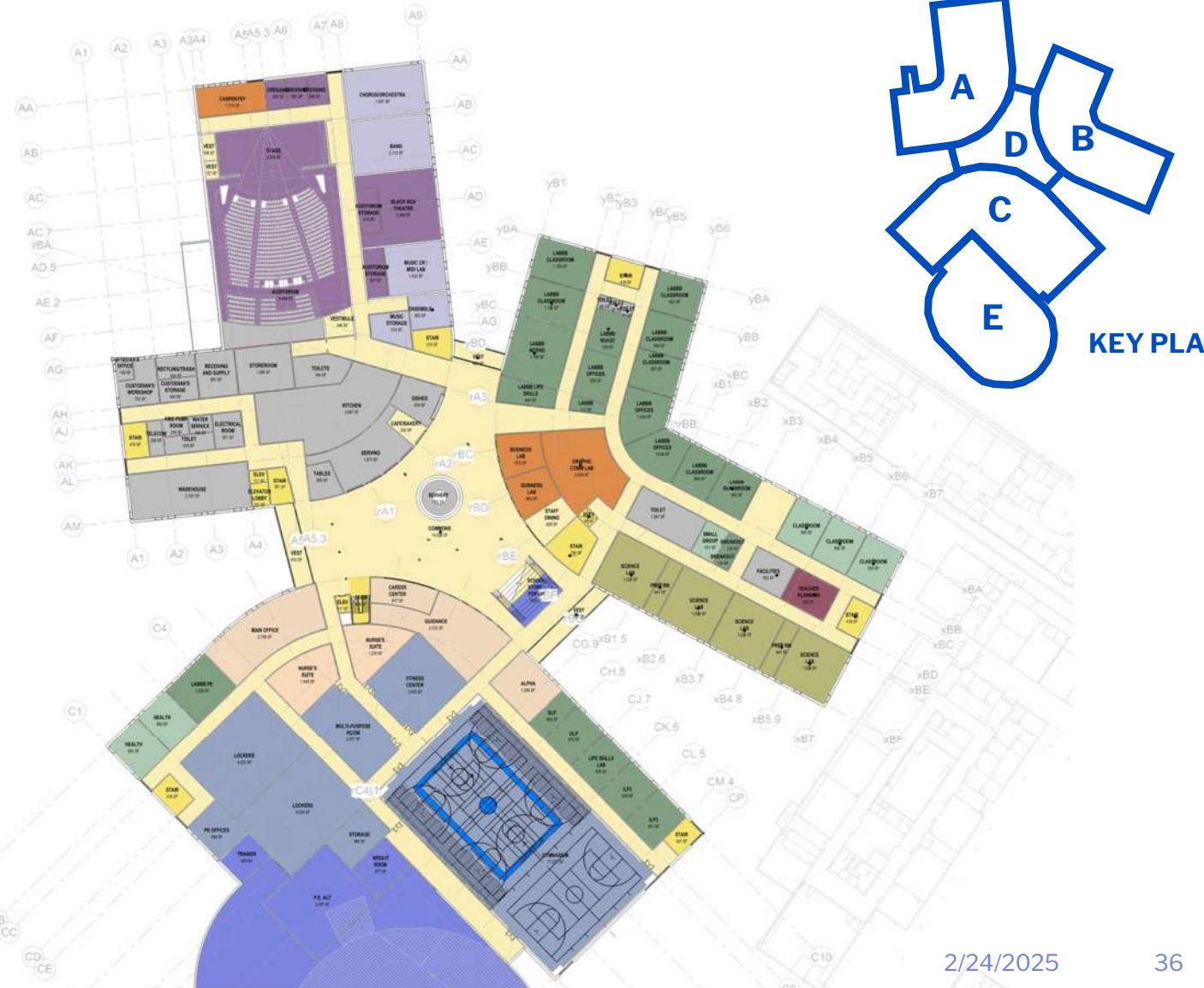


Building Floor Plan

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



LEVEL 1



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2/24/2025

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Feature Space Model Images/ Dining Commons



Feature Space Model Images/ Dining Commons



Feature Space Model Images/ Dining Commons



Feature Space Precedent Images/ Dining Commons



Feature Space Precedent Images/ Auditorium



Feature Space Precedent Images/ Gymnasium



Building Floor Plan

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

Kitchen, Restrooms, Custodial

Commons

Circulation

Vertical Circulation

Rooftop Open Space

Other

Expansion



LEVEL 2



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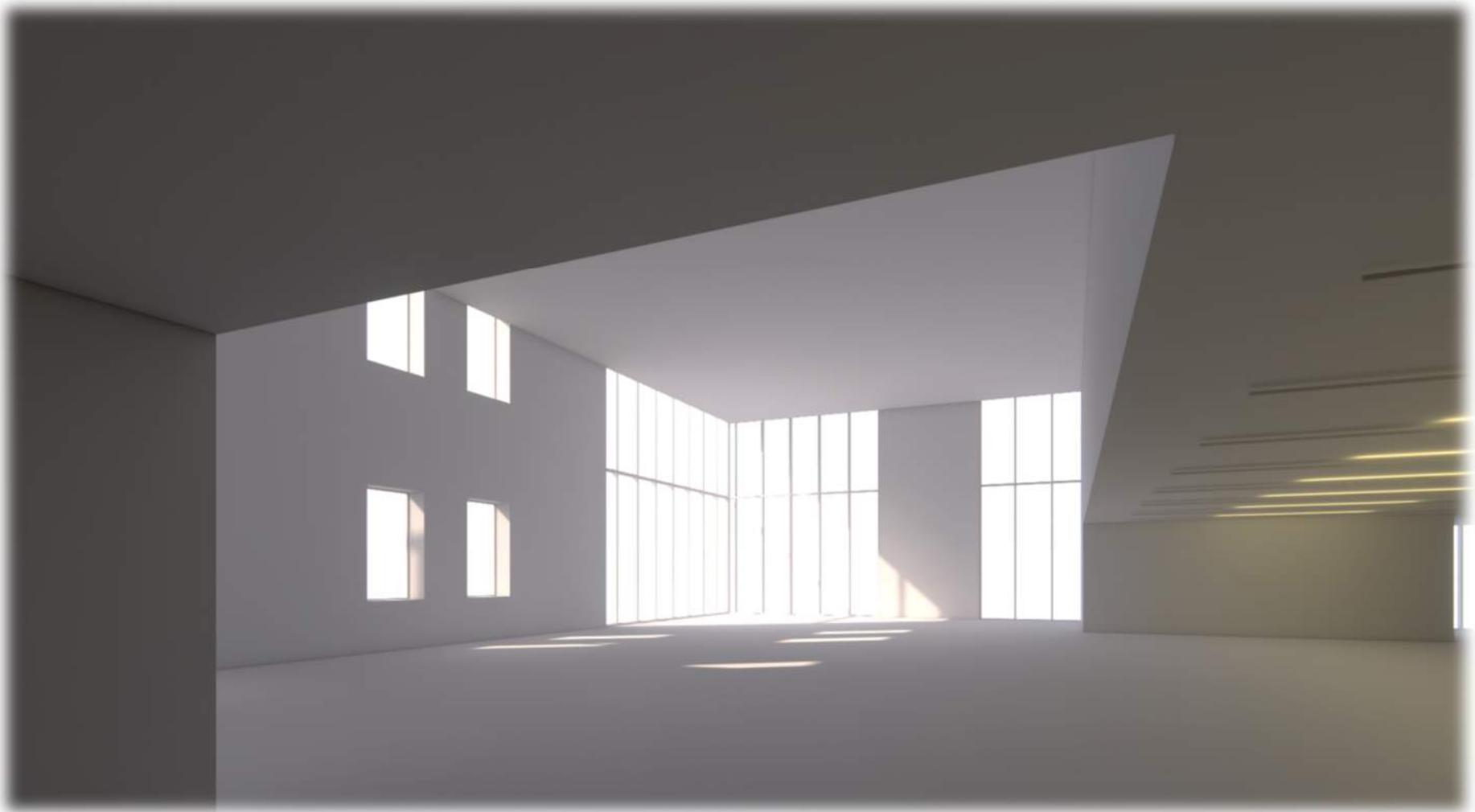
2/24/2025

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Feature Space Model Images/ Media Center



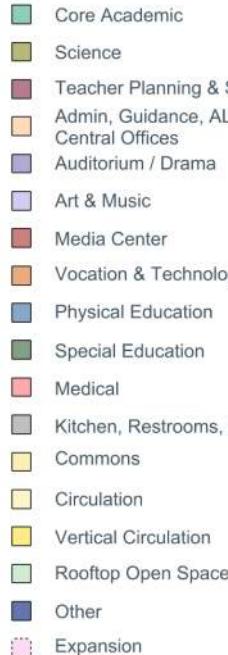
Feature Space Model Images/ Media Center



Feature Space Precedent Images/ Media Center



Building Floor Plan



LEVEL 3

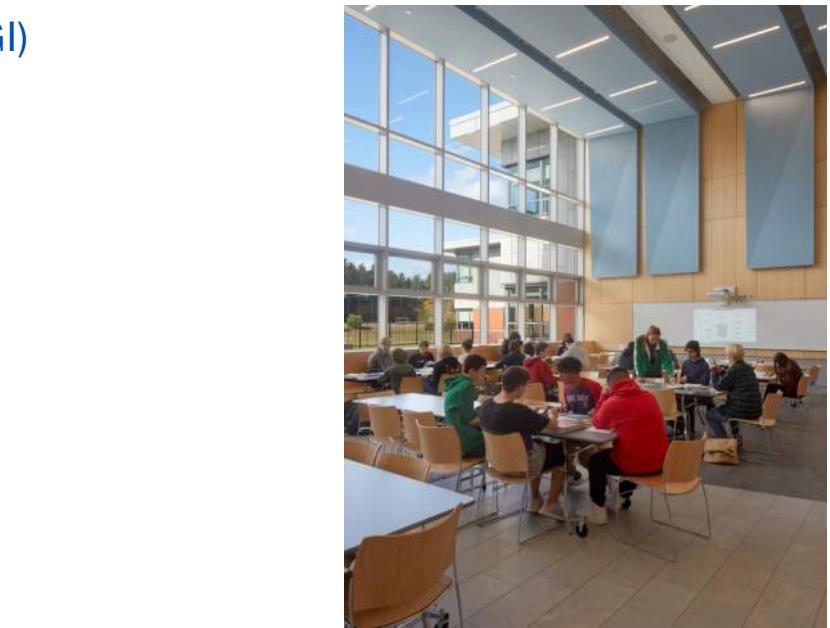


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Feature Space Precedent Images/ Large Group Instruction (LGI)



Building Floor Plan

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

Kitchen, Restrooms, Custodial

Commons

Circulation

Vertical Circulation

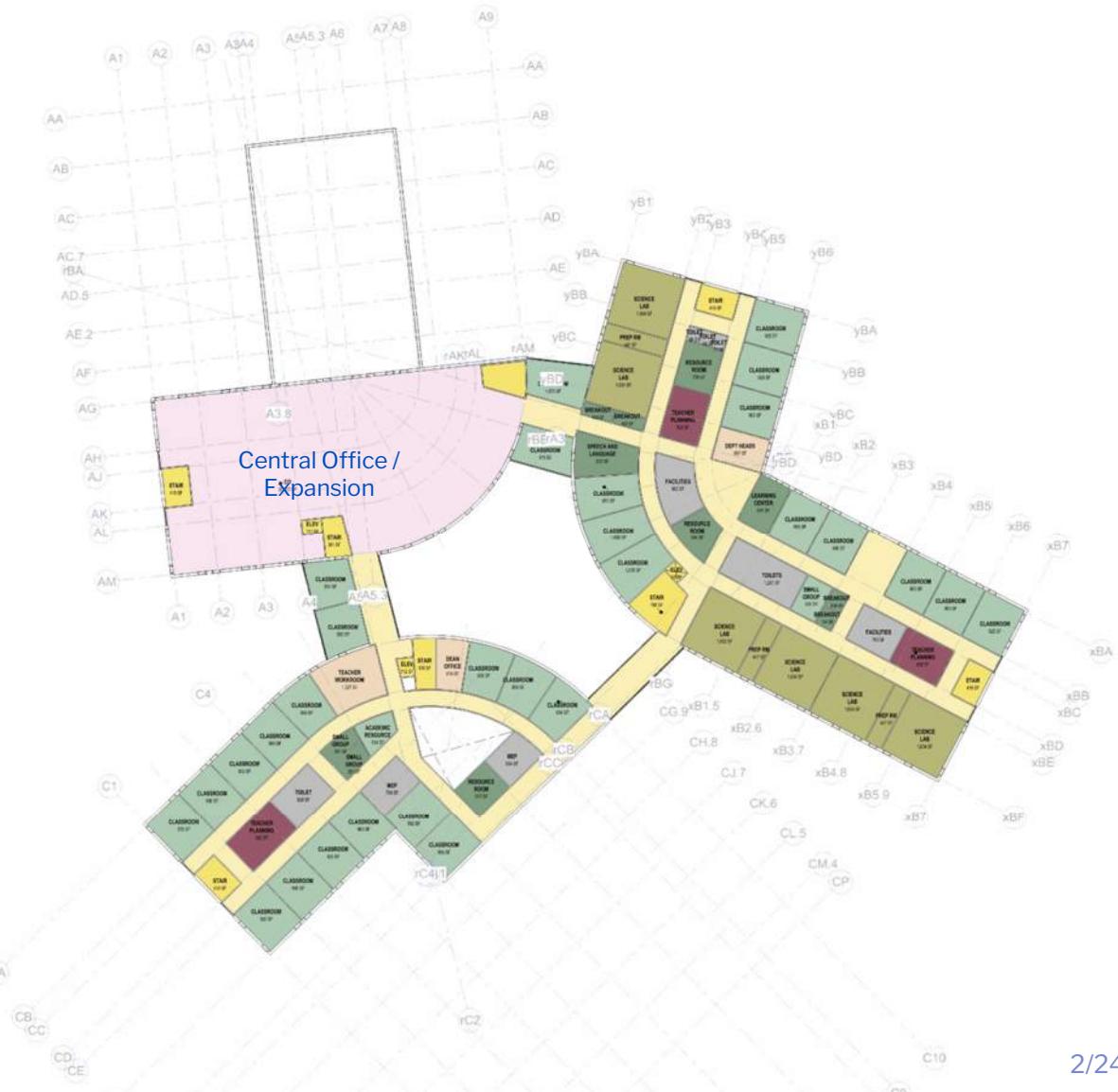
Rooftop Open Space

Other

Expansion



LEVEL 4



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Feature Space/ Material Type Introduction

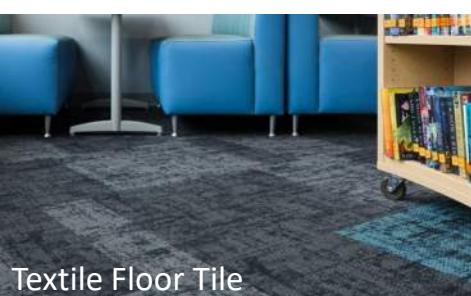
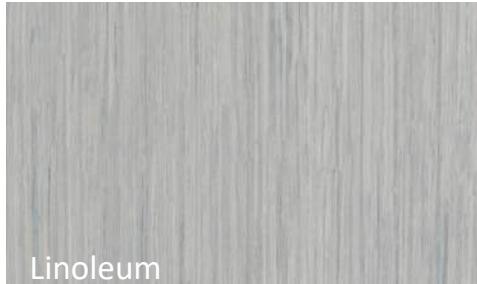
Commons	Gymnasium
Media Center	Art/Maker Space
Auditorium	<i>Large Group Instruction</i>



Feature Space/ Floor Finishes



Polished Concrete – Large Aggregate



Textile Floor Tile



Terrazzo

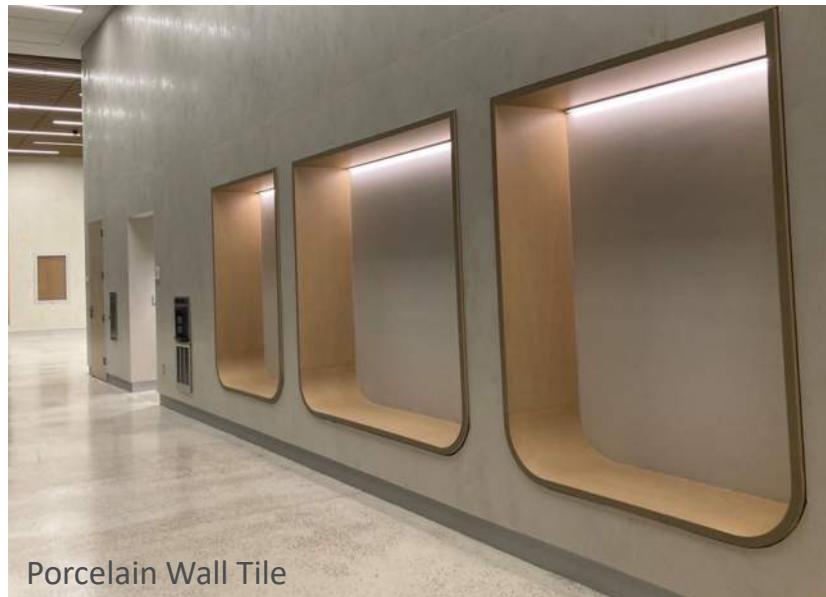


Stained Concrete



Carpet Tile

Feature Space/ Wall Finishes



Porcelain Wall Tile



Wood Paneling



Acoustical Panels



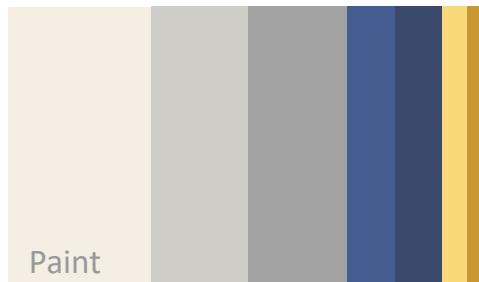
Metal paneling – wood look



Wood Fiber Acoustical Panels

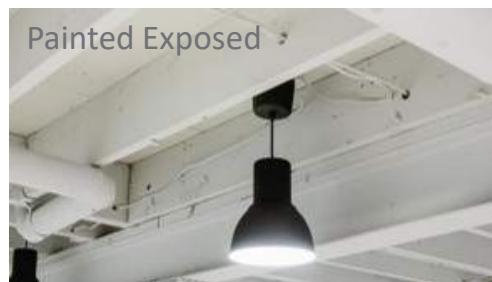
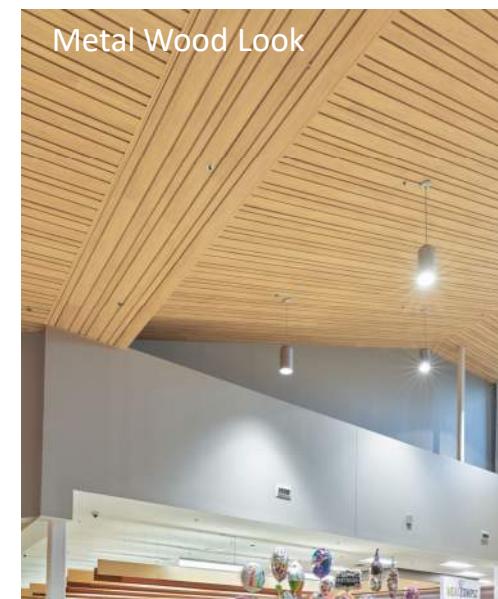
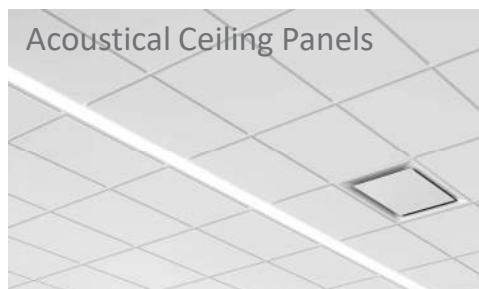
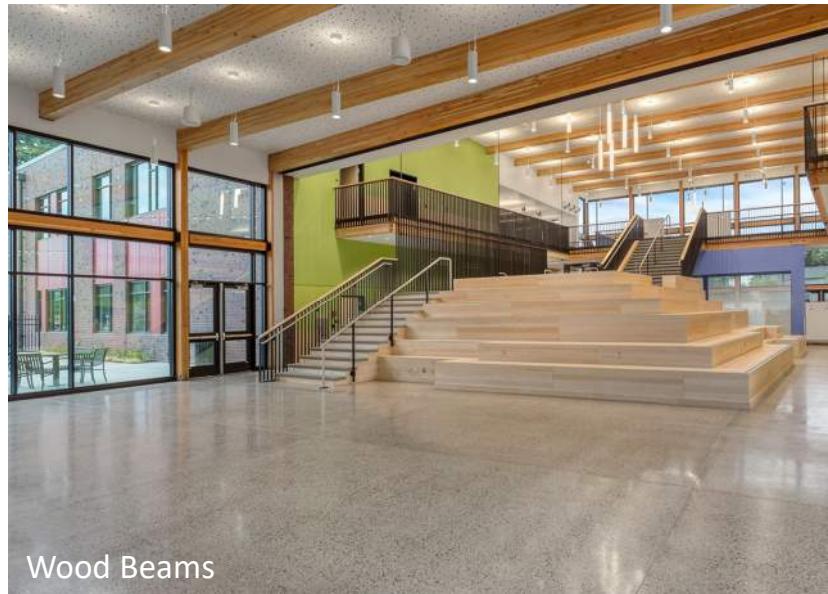


Wall Tile



Paint

Feature Space/ Ceiling Finishes



Specialty Items / Lockers

650 Lockers for general population

(Music and Athletic locker quantities are additional)



Specialty Items / Toilet Accessories

Contactless, automatic, hard-wired accessories



Specialty Items / Shades

Each space to have:

- Black out shade – manual
- Sunshade - 3-5% openness - manual



Exterior Design



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Exterior Elevation “Types”



Long sides of wings

- Primarily Classrooms
 - Lots of repetition

Short ends of wings

- Stairwells and ends of corridor
 - Corner room conditions

Entrances and “bridges” between wings



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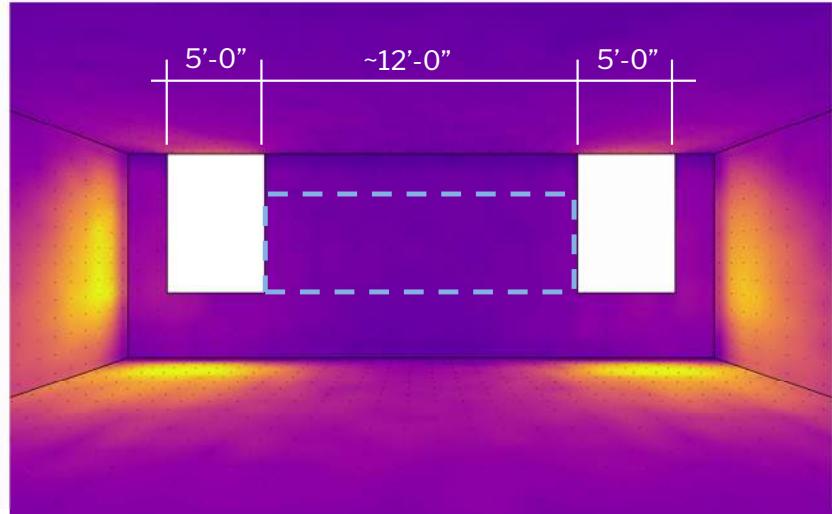
58

Fenestration Approach

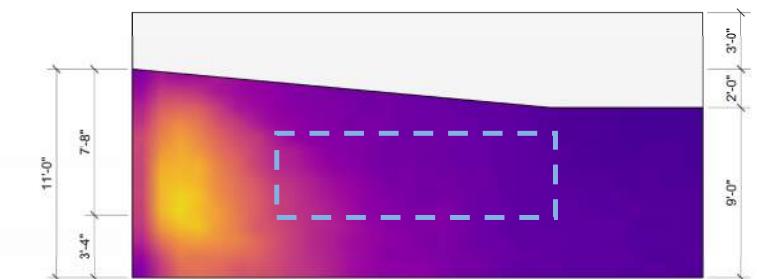
Classroom Window Placement for Optimized Natural Daylighting



RECESSED CEILING
vs.



Exterior Wall



SLANTED CEILING

= Teaching Wall



Annual Solar Exposure



Eye-Level View from Worthen Road Entrance Drive



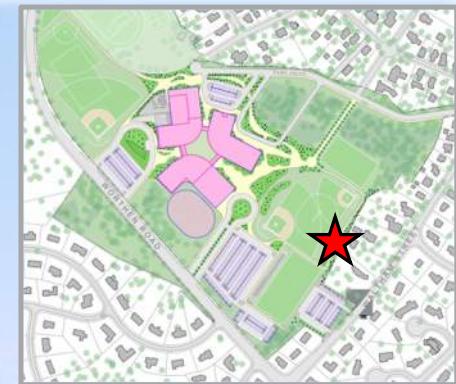
Eye-Level View from West



Eye-Level View from Clarke Street / Park Drive



Eye-Level View from East Across New Fields



Lexington Context

Some Architectural Examples



Lexington Context

Building Materials Across the District's Schools – Color and Character



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Designing for 21st Century Education

Large Group
Instruction



Performing
Arts



Gen Ed
Classrooms



Media Center



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POTENTIAL MATERIALS AND SYSTEMS

Exterior Cladding Options

Brick/Precast/Stone



Thin Mfd. Stone



Metal Panel,
Siding & Tiles



Porcelain Panel
Phenolic Panel

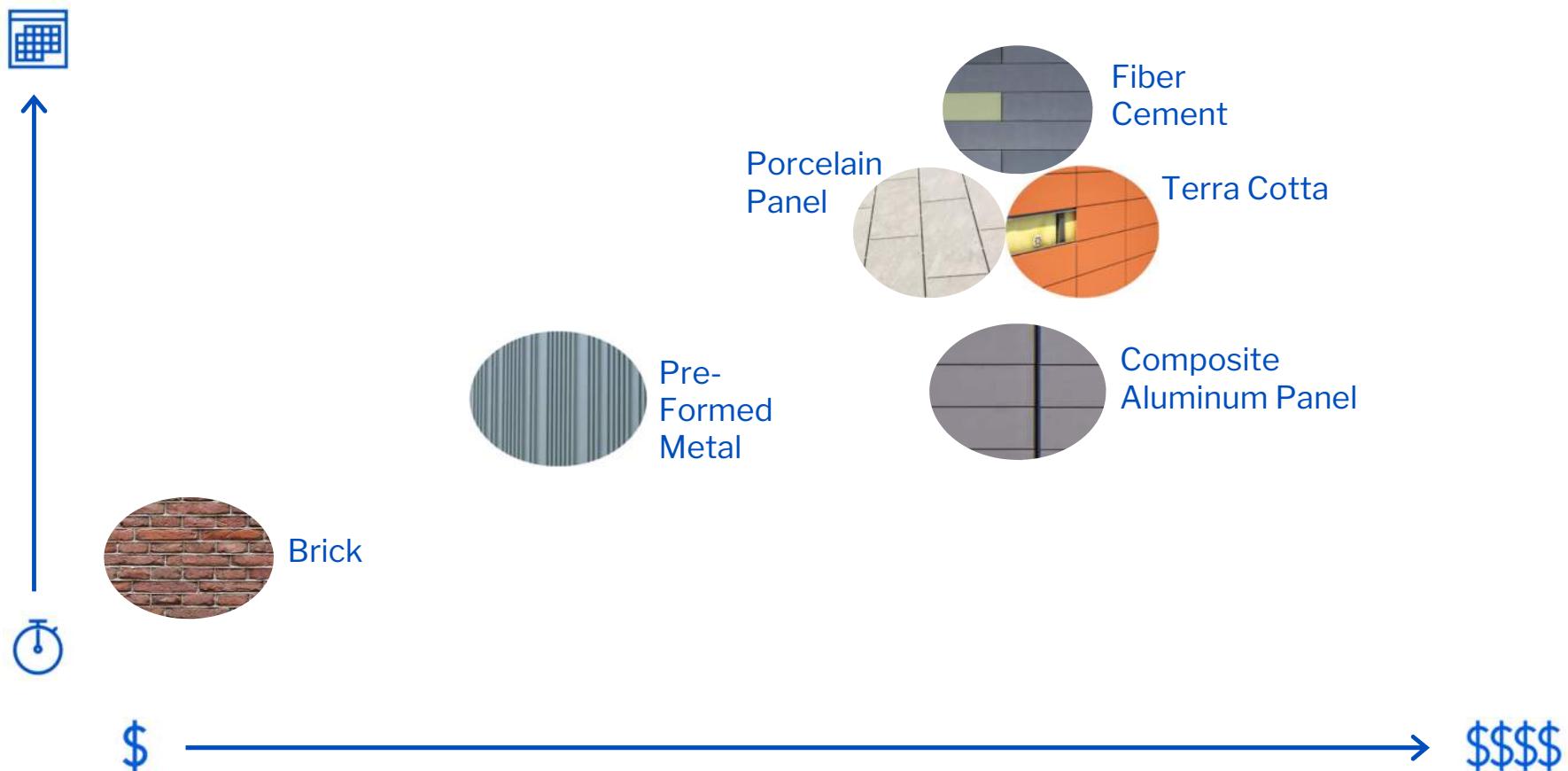


Terracotta
Curtain Wall



POTENTIAL MATERIALS AND SYSTEMS

Exterior Cladding Materials: Market Outlook



Potential Materials and Systems

Exterior Cladding Materials: Embodied Carbon

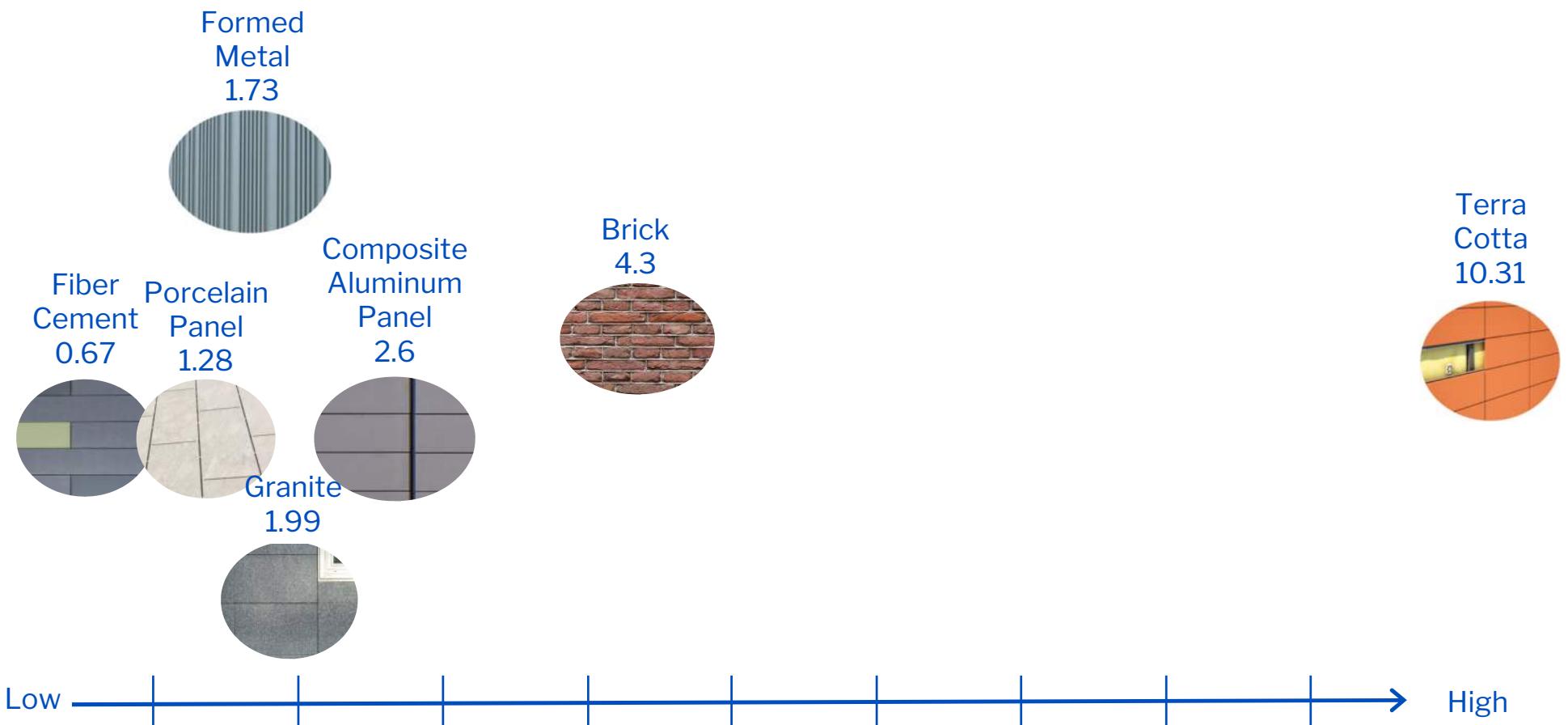
Materials	Embodied Carbon Level (based on IW EPD, in kgCO2e/sf)**	% of Total Enclosure
Brick	4.3	60%
Composite Aluminum Panel	2.6	18%
Formed Metal Panel	1.73 (Aluminum) 1.42 (Steel)	18%*
Terra Cotta	10.31	20%
Fiber Cement	0.67	20%*
Phenolic Panel	2.37	20%*
Porcelain Panel	1.28	20%*
Granite	1.99	2%

** Values are through Manufacturing.
LCA is needed to assess remaining
life cycle stages. Rainscreen does
not include supporting girts.

*Alternate material option

Exterior Cladding Materials

Embodied Carbon Factor (based on Industry-Wide Environmental Product Declarations, in kgCO₂e/sf)

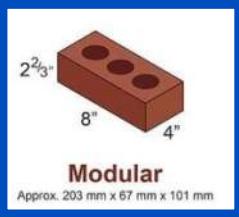
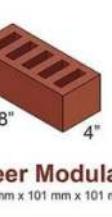
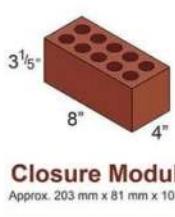
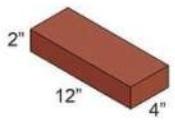
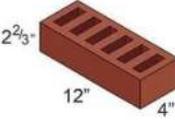
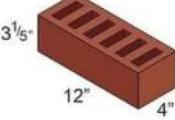
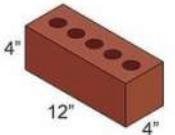
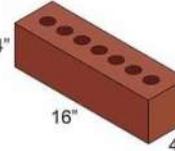
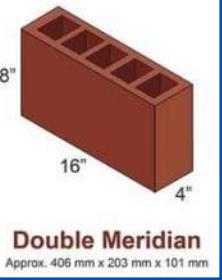


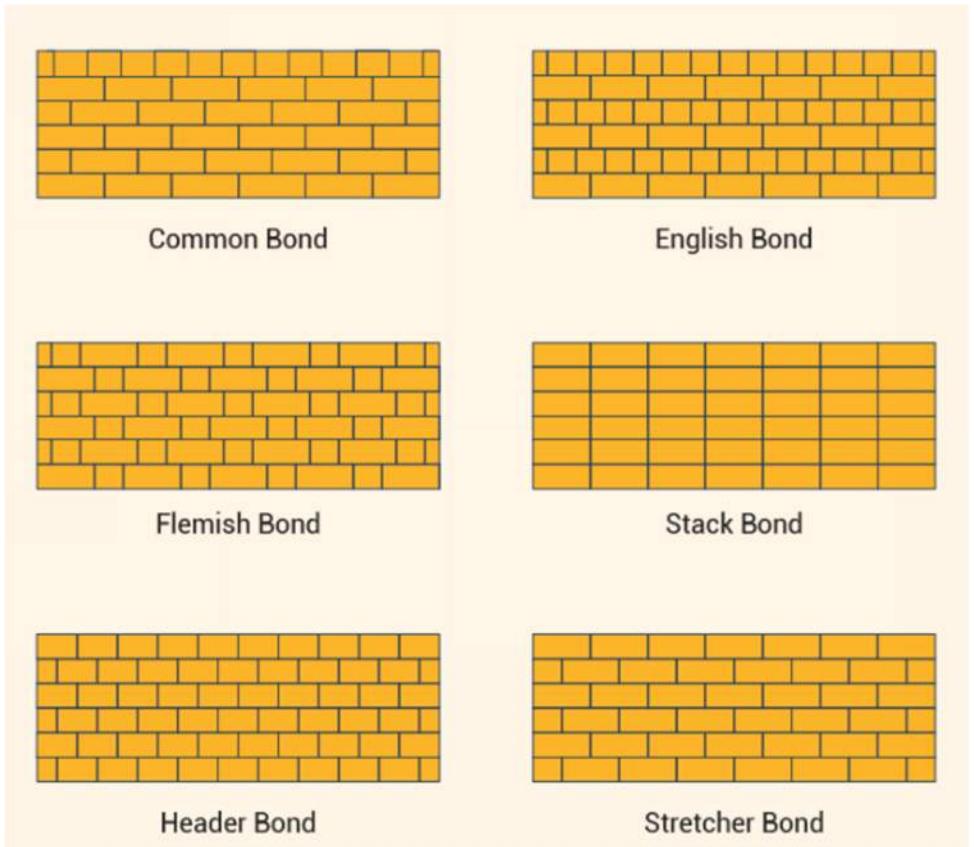
POTENTIAL MATERIALS AND SYSTEMS

Opaque Masonry Walls	Brick Masonry, Precast Accents, Stone Base	<ul style="list-style-type: none"> • Target 75% of Wall Enclosure • High Insulation Value
Rainscreen Accent Walls	Pre-finished Metal Panel Spandrels and Fascias; Pre-formed Metal and Terra Cotta Accents	
Windows	Triple Insulated-Glazed, Aluminum Frame	<ul style="list-style-type: none"> • Target 25% of Wall Enclosure • Utilizes Low-emissivity glass
Curtain Walls and Storefront	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	

Potential Materials and Systems

Brick Masonry

MODULAR BRICK SIZES		
Nominal Dimension		
 Modular Approx. 203 mm x 67 mm x 101 mm	 Engineer Modular Approx. 203 mm x 101 mm x 101 mm	 Closure Modular Approx. 203 mm x 81 mm x 101 mm
 Roman Approx. 304 mm x 50 mm x 101 mm	 Norman Approx. 304 mm x 67 mm x 101 mm	 Engineer Norman Approx. 304 mm x 81 mm x 101 mm
 Utility Approx. 304 mm x 101 mm x 101 mm	 Meridian Approx. 406 mm x 101 mm x 101 mm	 Double Meridian Approx. 406 mm x 203 mm x 101 mm



Potential Materials and Systems

Brick Masonry

- 60% of Opaque Walls at PSR
- Timeless and reliable
- Wide range of colors and textures available
- Inexpensive
- **Carbon Factor: 4.3**



Potential Materials and Systems

Terra Cotta Rainscreen

- 20% of Opaque Walls at PSR
- Beautiful, refined aesthetic
- Wide range of colors and textures available
- Similar cost to other rainscreen systems (~2x brick masonry)
- **Carbon Factor: 10.3**



Potential Materials and Systems

Porcelain Tile Rainscreen

- Beautiful, refined aesthetic
- Can mimic stone or wood
- Similar cost to other rainscreen systems (~2x brick masonry)
- **Carbon Factor: 1.28**



Alpha Vci.40 - Concealed Anchor



Stone Series

Our stone-effect ceramic collection is ideal for high-performance exterior applications. Our standard color palette boasts 20 nature-inspired colors.



Concrete Series

Our neutral, exceptionally versatile smooth concrete collection for exterior cladding. Includes 10 neutral, concrete-inspired colors.



Clay Series

Warmth and depth. Inspired by earthy mineral clay deposits from around the world... Our standard color palette has 11 earth-inspired colors.



Metallic Series

Our aged metals series for exteriors, scratched & colored by the passage of time. Includes 11 metallic looking finishes.



Timber Series

This series captures the essence of aged, material wood for high performance exteriors. Our standard color palette includes 10 nature-inspired woodgrains.

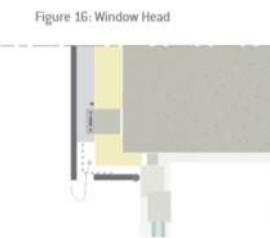


(Multiple tiles shown to illustrate range of color variation.)

Potential Materials and Systems

Fiber Cement Rainscreen

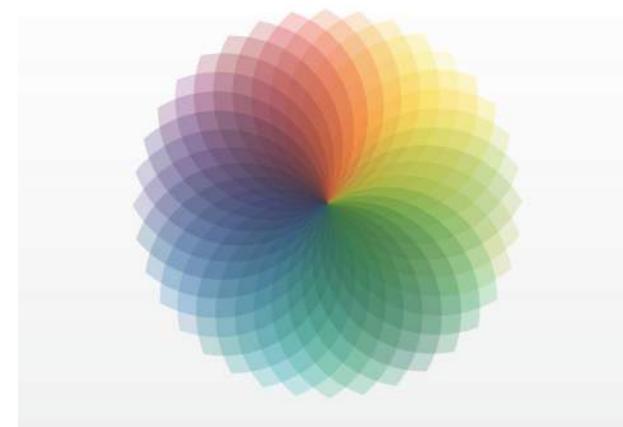
- Open joint system
- Visible or concealed fasteners
- Moderate range of colors and some textures available
- Cost TBD
- **Carbon Factor: 0.67**



Potential Materials and Systems

Pre-Finished Metal Panel

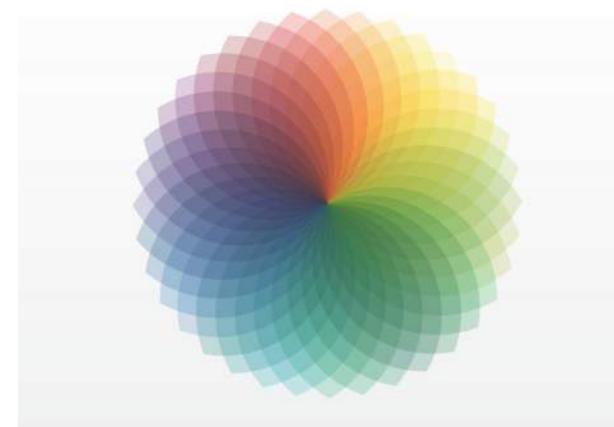
- 18% of Opaque Walls at PSR
- Accent Material
- Flat panels, perforations available
- Full spectrum of colors available including metallics
- Similar cost to other rainscreen systems (~2x brick masonry)
- **Carbon Factor: 2.6**



Potential Materials and Systems

Pre-Finished Metal Siding

- Secondary Accent Material,
- Thin gauge, profiled for strength, perforations available
- Full spectrum of colors available including metallics
- Less expensive than other rainscreen systems
- May be less refined visually, depending on detailing
- **Carbon Factor: 1.7**



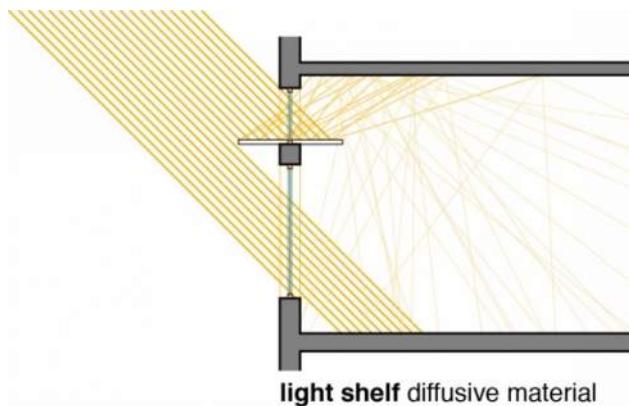
Potential Materials and Systems

Granite Base and Trim

- Extremely hard and durable, resists damage
- Prevents efflorescence of brick at grade
- Range of local colors readily available
- Similar cost to rainscreen
- Natural beauty
- **Carbon Factor: 1.99**



Daylight Optimization



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Exterior Design – Pattern A



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Exterior Design – Pattern B



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Exterior Design – Pattern C



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Daylight Optimization

Integral Solar Control Glass Options



Ceramic Fritted Glass
Cost Premium, Moderate Utility



Integral Wood Screen
(X – Proprietary Product)

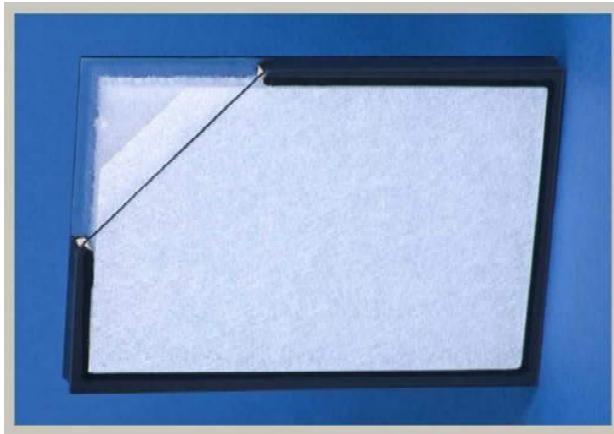


Light Diffusing Glass
High Performance at Elevated Cost
(Excellent for Gymnasium)



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Light-Diffusing Glazing Options



Glass (Recommended)

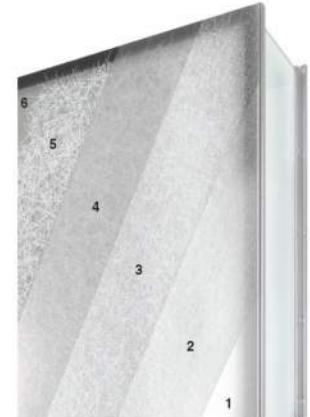
- Long-term durability, maintainability
- Will not discolor
- Higher cost
- Impact reinforcement needed

FRP Face Sheet Construction: 0.070" Exterior Series

- 1 Kalwall UV-blocking Weatherable Surface (KWS)
- 2 Super-Weathering UV-stable thermoset polymer matrix
- 3 Encapsulated glass veil erosion barrier
- 4 Super-Weathering UV-stable thermoset polymer matrix
- 5 Prismatic glass fiber reinforcing (including high impact and specialty options)
- 6 Super-Weathering UV-stable thermoset polymer matrix



Cross section through exterior FRP face sheet (above)



Fiber Reinforced Panels (Kalwall)

- Better impact resistance
- Lower cost
- Warranty on appearance may be limited
- Long-term maintenance may be needed

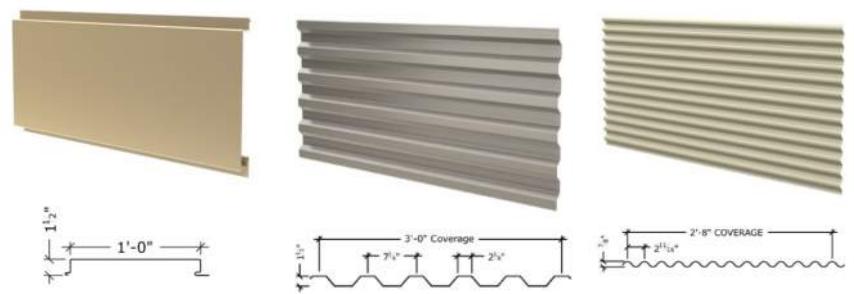
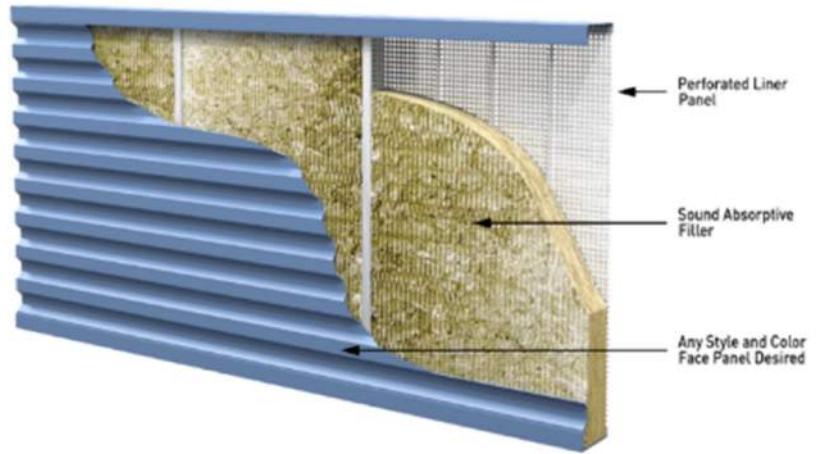


Rooftop Screens - Acoustic

Specifications

- NRC of 1.10 (ASTM C423)
- STC=32(ASTM E90).
- Wide selection of colors, materials and finishes available. Custom color available.
- Good design flexibility. Outward face can be chosen from the entire list of panel types and can be customer specified material.

Premium Cost (excluding structural frame)



Rooftop Screens - Visual

Specifications

- No acoustical requirements
- Sight-proof, heavy gauge aluminum louvers or perforated panels
- Wide selection of colors, materials and finishes available.

Moderate Cost (excluding structural frame)



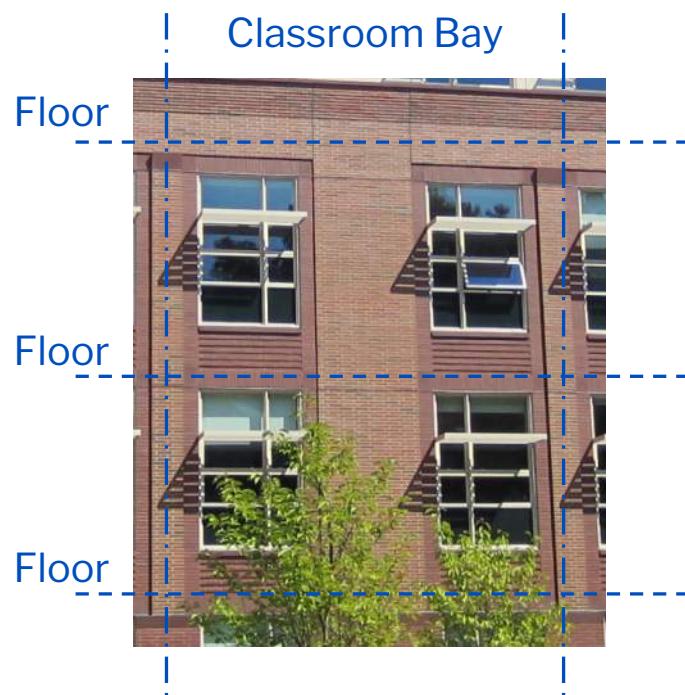
Thank you

smma

Fenestration Approach

Classroom Window Patterns:

Wellesley High School



Two punched windows per classroom

Efficient, with lots of repetition

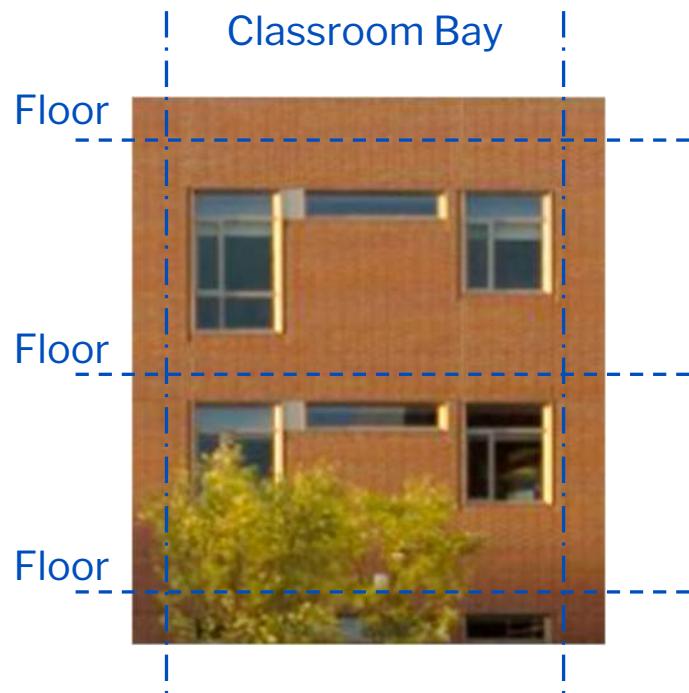
Architectural interest is in the details of material differentiation



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Fenestration Approach

Windows and Curtain Walls



Adds a clerestory between punched windows

Better daylighting, and doesn't impact teaching wall

Window more expensive than masonry, which also needs more supporting steel

More difficult to achieve within 25% Window to Wall Ratio

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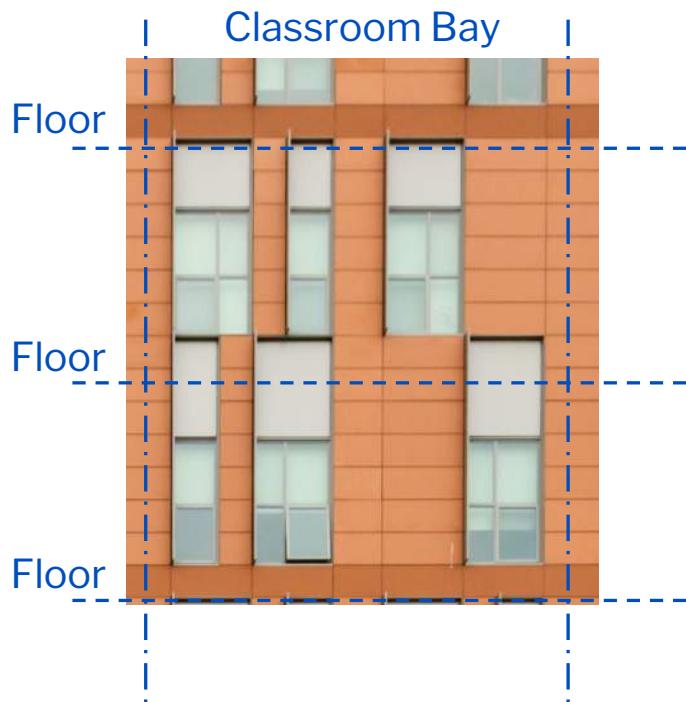


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Fenestration Approach

Classroom Window Patterns:

Somerville High School



Three windows per classroom, in alternating pattern

Better daylighting, but displaces teaching wall

Interesting architectural expression with minimal detailing

Needs more small windows to achieve 25% Window to Wall Ratio



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Floor to Floor Heights

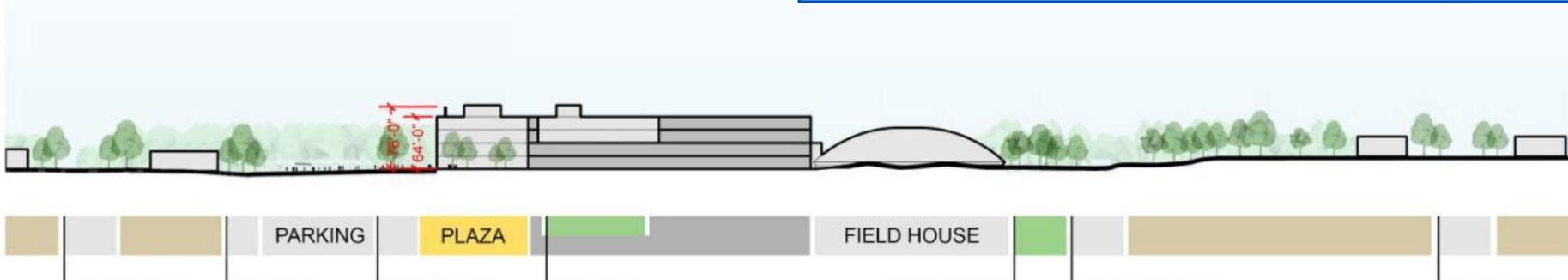
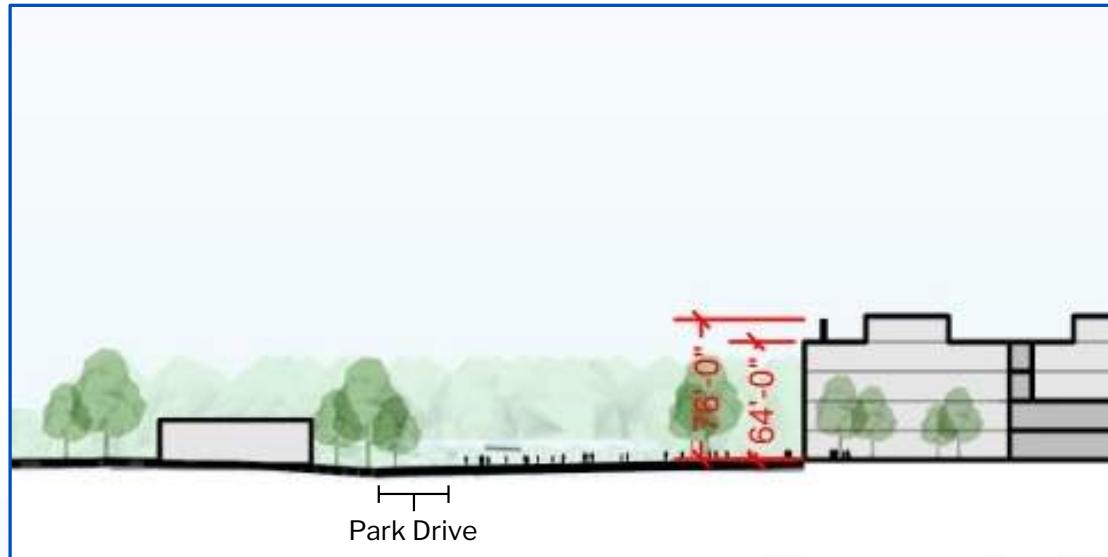
Impact on Total Building Height

16'-0" floor to floor height

= 64'-0" building height to top of roof*

+ 12'-0" mechanical roof screen

= 76'-0" height to top of screen



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.



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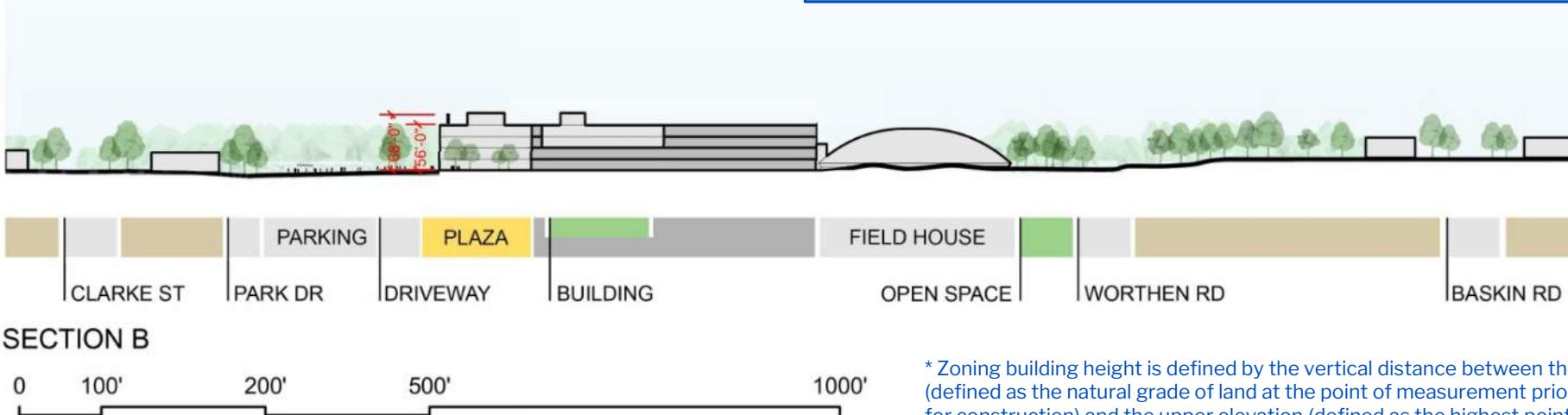
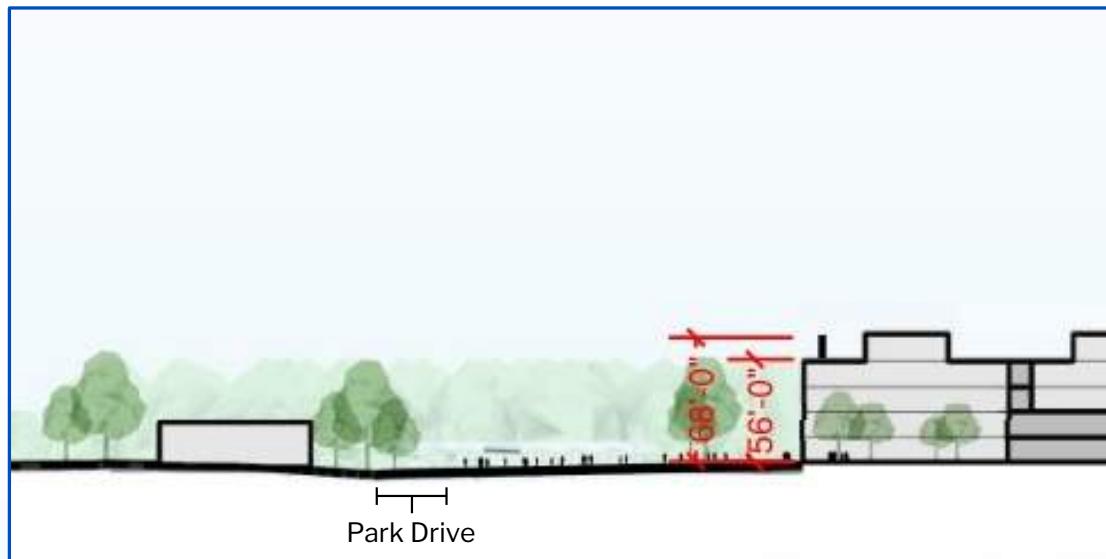
92

Floor to Floor Heights

Impact on Total Building Height

14'-0" floor to floor height

- = 56'-0" building height to top of roof*
- + 12'-0" mechanical roof screen
- = 68'-0" height to top of screen

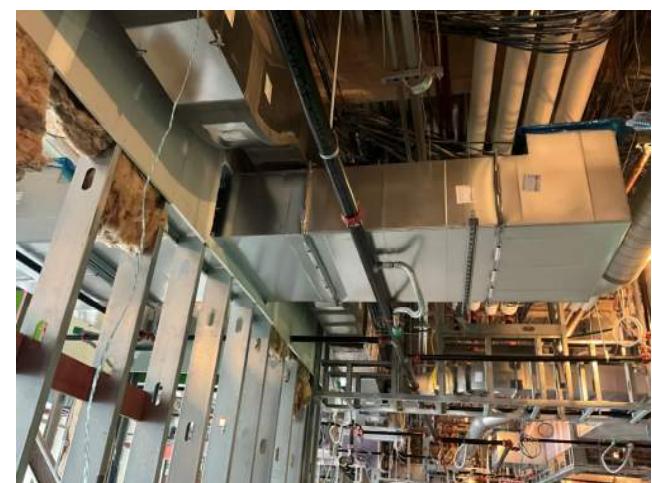
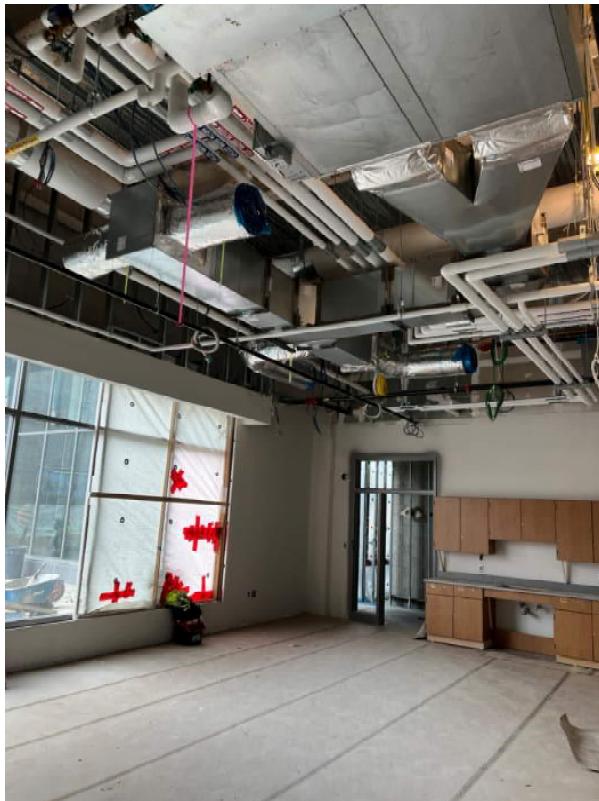


* Zoning building height is defined by the vertical distance between the lower elevation (defined as the natural grade of land at the point of measurement prior to disturbance for construction) and the upper elevation (defined as the highest point of any ridge, gable, other roof surface, or parapet).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



Floor to Floor Heights

Photos of Plenum Spaces on Recent Projects



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Floor to Floor Heights

Typical Plenum Section at 16'-0" Floor to Floor Height

Example: Wakefield Memorial High School

- Ceiling height = 10'-0" AFF
- Effective usable space above finish ceiling = +/- 4'-0"
- All-electric building
- Each classroom is served by one fan coil unit located in the hallway. Access for filter and fan replacement necessitated large clearances on 3 sides and underside of fan coil unit.
- General plenum discipline zones
 - **Red** = Mechanical + Mechanical Clearances
 - **Green** = Plumbing and Fire Protection
 - **Blue** = Mechanical Piping
 - **Purple** = Electrical/Tech



Floor to Floor Heights

Level 3 Courtyard Impact

Precedent example: Waltham High School
(at center)

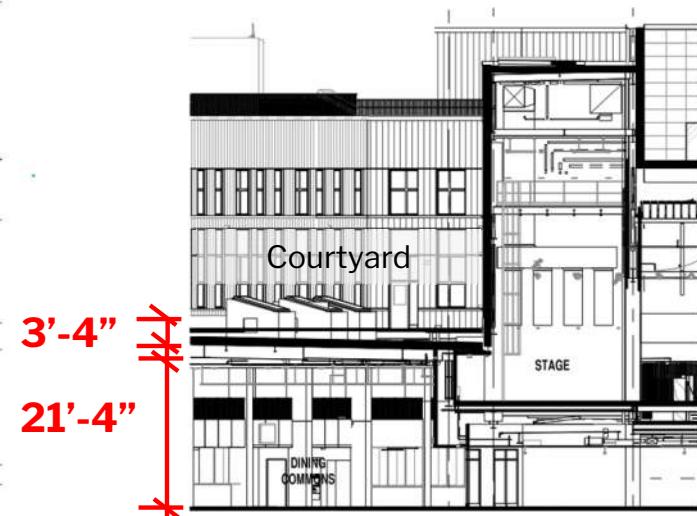
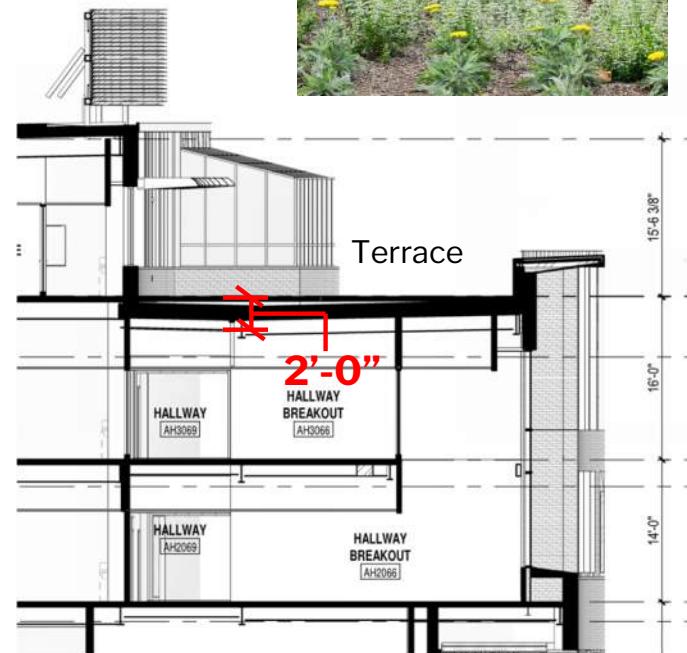
A green roof and paver system section is deeper than a typical metal deck roof, and a structural offset is needed to accommodate both the added depth and the sloped drainage. The section is through the Level 4 terrace and shows that a 2'-0" drop in structure was required due to its location above a classroom hallway.

The floor to floor between Level 3 and 4 was raised from 14'-0" to 16'-0" to offset the impact on the spaces below the terrace.

Precedent example: Somerville High School (at right)

The interior courtyard required a drop in structure of up to 3'-4" to maintain the accessible finish floor transition while allowing for roof assembly construction and slope to drains below pedestal pavers.

Because the courtyard space is above the double-height Dining Commons, the overall level height of 14'-0" could be maintained.



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Floor to Floor Heights

Recent Project Comparisons



Somerville High School

Hallway ceiling height = 9'-0" typical with conditions as low as 8'-0" AFF (varies)

Floor to floor height = 14'-0" typical at above-grade levels, except 15'-7 at L5 to roof



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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"



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Floor to Floor Heights

Recent Project Comparisons



Wakefield Memorial High School

Hallway ceiling height = 10'-0" AFF typical

Floor to floor height = 16'-0" / Level 3 to Roof = 17'-0"**



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** Due to the need for a large area of roof surface to be allocated for solar panels, rooftop mechanical units were constrained to a very compact footprint, allowing for less horizontal flexibility in locating transitions into vertical duct shafts, thus the top level was increased by one foot vs lower floors.

Floor to Floor Heights

Lower Floor to Floor Height Trade Offs

Pros

- Less steel at columns
- Less exterior finish materials
- Shorter overall building height
- Reduced building volume and surface area reduces energy usage
- Reduced building weight = potential reduction in foundation size

Cons

- Lower finish ceiling heights
- Shorter window heights = less daylight into spaces
- MEP coordination within ceiling plenum is more difficult
- Placement of rooftop mechanical units may limit flexibility of duct routing
- Less forgiving if duct size & pipe sizes are increased during design
- Less flexibility if structural beam sizes are increased



Floor to Floor Heights

Schematic Design Considerations

- Mechanical system has yet to be selected
 - Ductwork size is not impacted by use of either ground source or air source heat pumps
 - Every classroom requires a dedicated fan coil unit
 - VRF cassette systems are effective in smaller plenums, but are noisy and not ideal for instructional spaces and are more often used in office spaces
- The structural beam sizes have yet to be designed
- The use and scope of mass timber has yet to be determined
 - Mass timber beams will be deeper than steel beams
- The Level 1 survey elevation has yet to be finalized
- The optimal finish ceiling heights have yet to be determined

- 16'-0" floor to floor was carried as a slightly conservative assumption in the PSR cost estimate
- Potential height reductions can be worked towards as major elements listed above are decided upon



Ceiling cassette example

