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Lexington High School

Exterior & Interior Design Focus Group – Mtg #2

02.14.2024

Setting the benchmark for future projects in the Commonwealth, and across the country, for innovative design, efficiency, sustainability, and positive impact for the community.

DORE + WHITTIER

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Focus Group Timeline

1	Listen	1/26
2	Review & Respond	2/14
3	Confirm & Recommend	4/1
4	Reconvene	TBD

Meeting #2 Agenda

- Introduction
- Topics of Discussion
  - Givens
  - Additional Goals
- Next Steps

Topics of Discussion

Topics of Discussion

- **Topic #1**: Designing for the Future – Economy, Flexibility and Growth
- **Topic #2**: Sustainability: Lexington's Integrated Building Design & Construction Policy and Building Performance Requirements
- **Topic #3**: Access to Outdoors & Integrating Exterior and Interior Learning Environments
- **Topic #4**: Balancing Educational and Community Space Needs
- **Topic #5**: Designing in the Context of Lexington - Creating a Sense of Place and Identity

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1. Designing for the Future:
Economy, Flexibility & Growth

Design "Givens":

- The building design will be based on an **enrollment of 2,395 students**.
- Summary of Spaces and plans will be **right-sized** based on extensive study and discussions, including with MSBA, of current and planned course offerings and the Educational Program.
- The design will seek a high degree of **plan efficiency and construction economy** within an overall space "grossing factor" (GFA/NFA) of 1.5

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PDP Design Workflow

Existing Conditions Investigations

Curriculum and Schedule Analysis

Educational Programming Meetings

Visioning

Focus Groups

Photo credit to Vikram Anantha, Lexington High School, Class of 2024.

THE EDUCATIONAL PLAN FOR LEXINGTON HIGH SCHOOL

ROOM TYPE	ROOM NFA[1]	# OF RMS	ar
CORE ACADEMIC SPACES			
(List classrooms of different sizes separately)			
Classroom - General	850		
Teacher Planning	100		
Small Group Seminar (20-30 seats)	500		
Science Classroom / Lab	1,440		
Prep Room	200		
Central Chemical Storage Rm	200		
SPECIAL EDUCATION			
(List classrooms of different sizes separately)			

Summary of Spaces

Site Analysis

Program Adjacency Diagramming

Massing/Site Concepts

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1. Designing for the Future:
Economy, Flexibility & Growth

Design "Givens":

- Spaces will be designed to support a **wide array of potential uses**, including 85% classroom utilization, Hands-on and Project-Based Learning, Co-teaching and small group breakout
- The building will be designed to allow **growth toward** an ever-increasing degree of **interdisciplinary organization** of the school.
- The preferred design will include a strategy for **future expansion**, as required by MSBA.
- Lessons learned from the Covid pandemic will inform the Design Team's thinking about space planning and **access to the outdoors**.

ECONOMY, FLEXIBILITY & GROWTH

Interdisciplinary Planning

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Agile Classrooms

- General Ed. Classrooms
  - Existing: 695 SF avg
  - MSBA: 850-900 SF (min. 825)

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Science Labs

- Science Labs
  - Existing: 1,069 SF avg
  - MSBA: 1,440 SF

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Technology Labs

Technology Labs

- Support Hands-On Learning
- What kinds of labs?
  - Maker Space
  - Engineering
  - Digital Design Lab
  - Fabrication
  - Robotics
  - TV Production/ Broadcast

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Small Group Meeting Rooms

ECONOMY, FLEXIBILITY & GROWTH

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Informal Gathering & Collaboration

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Student Display

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Large Group Instruction

Library & Media Center

ECONOMY, FLEXIBILITY & GROWTH

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Library & Media Center

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Student Dining

- Dining Commons
  - Existing: 9,390 SF
  - MSBA: 11,980 SF

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Auditorium

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Gymnasium & PE

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Alternative PE

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1. Designing for the Future:
Economy, Flexibility & Growth

Questions

Comments

Concerns

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2. Sustainability

Givens

- MA Specialized Energy Stretch Code
- Lexington Integrated Building Design & Construction Policy
- LEEDv4 Gold Certification
- Net Zero Energy (NZE) and EUI 25
- Solar PV Systems/Battery Storage
- SITES Certification - Gold

Proposed Additional Goals

- Net Positive Energy
- Microgrid
- EV Charging for Buses and electric bicycles
- LEED Platinum Certification
- Enhanced Ventilation/Air Quality:
  - 600 PPM (CO_2 monitoring)
  - Aircuity (VOC monitoring)

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Givens – LEEDv4 Gold Certification and Lexington IDP

Healthy/Low Carbon Materials

Embodied Carbon
- LEEDv4 LCA credit
- LEX IDP: TBD % Goal
- Low Carbon Structure/Enclosure Materials

Sustainable Materials Attributes [Recycled Content, FSC wood, Regional Materials, etc.]

Construction Waste Management [95% goal]

Environmental Product Declaration - EPDs

Health Product Declaration - HPDs

Red List Screening [IDP]

Low-Emitting materials

Recycling Planning and Program

Indoor Environmental Quality

Daylight Optimization

Access to views

Enhanced Indoor Air Quality Strategies

Interior Lighting Design

Acoustical Performance [LEEDv4 pre-requisite]

Thermal Comfort

Construction IAQ Practices, including Flush Out

Resiliency/Healthfulness

Climate Resiliency [IDP]

Emergency Shelter:
- Level 2 – Gym/Field house
- Level 3 – Remainder of Bldg.

Environmental Literacy

Access and Interaction with Nature

Other Considerations:
- Biophilia

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Building Orientation – Part of an Integrated Approach

- Overall **East-West orientation** of building massing is typically advantageous for energy efficiency and natural daylighting.
- **Solar control** devices may enhance performance.
- This orientation may also be beneficial for passive ventilation with prevailing NNW wind.
- Potential effect on rainwater harvesting to be determined.

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Building Enclosure – Part of an Integrated Approach

- 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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Daylight Optimization

External Shading Devices

Where is Embodied Carbon?

65% in the structure
(super + sub)

Sustainability of Mass Timber

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Areas of Impact:

1
Embodied Carbon

2
Construction Efficiency

3
Deconstructability & Material Circularity

4
Biophilic Design

5
Occupant Wellbeing

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SMMA Red List Analysis Precedent

Material	Manufacturer/ Product	Six Classes of Chemicals Compliance						Red List Compliance
		PFAS	Antimicrobials	Flame Retardants	Bisphenols & Phthalates	Solvents	Metals	
Vinyl Composition Tile	Tarkett VCT II	Yes	Yes	Yes	Yes	Yes	Yes	No
Vinyl Composition Tile	Kahrs Upofloor Quartz	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resilient Flooring	Kahrs Upofloor Zero	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Epoxy Flooring	Tnemec Powertread	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Carpet Tiles	Interface Net Effect	Yes	Yes	Yes	Yes	Yes	Yes	No
Carpet Tiles	Interface CQuest Bio	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rubber Flooring	Nora by Interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gypsum Wall Board (typical)	USG Sheetrock Brand	Yes	Yes	Yes	Yes	Yes	Yes	No
Gypsum Wall Board (Low-Carbon)	USG Sheetrock Brand EcoSmart Firecode	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Red List Free

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Educational Purpose & Performance Requirements

Every material choice is evaluated for how well it supports the immediate learning environment, as well as the long life of the facility.

Comfort & Well Being

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Light Quality & Views

Air Quality

Thermal Health

Noise

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Interior Materials

Flooring

Linoleum/Terrazzo / Polished Concrete

Tile /Carpet tiles /Resilient

Walls

Tile/Wood Paneling /Acoustic Panels / Paint

Ceilings

ACT/Linear Wood Look Metal Tile

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Interior Materials

Windows

Blinds/Shades

Counters

Solid Surface/
Epoxy / Quartz

Casework/Millwork

Wood / Laminate

Back of House Materials

Restroom Wall Tile / Ground Face CMU / Walk Off Mat / Epoxy Flooring

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Environmental Graphics

Respond to Architectural Concepts & Elements

School Identity

Engaging Educational Opportunities

Enhance Playmaking & Functional Wayfinding

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2. Sustainability

Questions

Comments

Concerns

3. Access to Outdoors

Summarizing what we heard:

- Ability to have access to useful and healthful outdoor space is important.
  - Should include student gathering space.
  - Would like to see exterior extensions of the classroom and other educational opportunities.
  - Should be thoughtfully placed relative to scale of building masses.
  - Should connect people with nature and its health benefits.
  - Can be a place or places of respite.
  - Provide protective overhangs.

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Outdoor Learning Environments

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Outdoor Learning Environments

3. Access to Outdoors

Summarizing what we heard:

- Building and Site should work together harmoniously.

ACCESS TO OUTDOORS

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Harmonious Building and Site

3. Access to Outdoors

Summarizing what we heard:

- The Quad is a feature that many will remember fondly as part of the LHS culture, despite its current condition/limitations.
- Outdoor spaces should create connections to nature with multimodal pathways.

ACCESS TO OUTDOORS

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Creating Connections To Nature

3. Access to Outdoors

Summarizing what we heard:

- Need to balance access to outdoors with security needs.

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Balance Outdoor Access with Security Needs

Crime Prevention Through Environmental Design (CPTED) is an approach that focuses on designing the physical environment to reduce opportunities for crime and enhance safety. The success of a CPTED plan relies on a holistic approach, combining physical design elements with policies, procedures, and community involvement. Regular evaluations and adjustments should be made to adapt to changing circumstances and emerging threats.

When developing a CPTED plan for a school, several design considerations should be taken into account:

1. Natural Surveillance
2. Natural Access Control
3. Territorial Reinforcement
4. Maintenance and Visibility
5. Activity Support

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3. Access to Outdoors

Questions

Comments

Concerns

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4. Balancing Educational and Community Site Needs

Summarizing what we heard:

- Consider separate parking areas for each:
  - Athletic wing
  - Performing arts wing
  - Teacher parking
  - Student parking

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4. Balancing Educational and Community Space Needs

Givens for Design:

- **Consolidate commonly-used Community spaces** at access-controlled entrance(s).
- A certain level of **compartmentalization** is needed to limit access at later hours of the evening
- Create **wings** that can be separated from main building to be open to the community

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Example Access Plan – Waltham HS

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4. Balancing Educational and Community Needs

Questions

Comments

Concerns

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5. Designing in the Context of Lexington

Summarizing what we heard:

- How do we maintain our **identity** in such a large, complex building?
- The building and campus should have **character, personality**.
- It should be **a place people want to be**.
- How one approaches and enters the building are important – the **scale, materials, look and feel need to be appealing**.
- Site and building should feel like part of **one environment**.
- Incorporate surrounding **natural features** and **multi-modal circulation**.

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A Campus Ecosystem

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(Some) Architecture of Lexington

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(Some) Open Space in Lexington

Lexington Green

Emery Park

Parker Meadow

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Building Materials Across the District's Schools

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Potential Materials and Systems

CMU/Brick/Stone

Thin Mfd. Stone

Metal Panel
Metal Tiles

Porcelain Panel
Phenolic Panel

Terracotta
Curtain Wall

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Exterior Cladding Materials: Market Outlook

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Welcoming Entrance Identity

Building in Context – Grafton HS

Building in Context – Waltham HS

Building in Context – Somerville HS

5. Designing in the Context of Lexington

Questions

Comments

Concerns

Next Steps

What to Expect in Meeting #3

Objective Based on the discussions in meeting #1 and #2, the design team will present some draft recommendations to be shared with the SBC. The focus group will provide feedback and finalize recommendations so they can be shared with the SBC.

When & Where?

Monday, April 1st, 2024, 1:00-3:00 PM

Estabrook Auditorium, Cary Memorial Building