Lexington High School

MEP Systems & Sustainability Focus Group – Mtg. #3

04.03.2024

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

SMMA

Meeting #3 Agenda

- Design team will present draft recommendations to be shared to the SBC based on discussions in Meetings #1 and #2
- Focus Group will provide feedback and finalize recommendations so they can be shared with the SBC in Meeting #4.
- Next Steps

- Lexington High School Building Project Web Site
- https://www.lhsproject.lexingtonma.org/

Focus Group Objective

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

1. Listen — 1/25
2. Review & Respond — 2/12
3. Confirm & Recommend — 4/3
4. Reconvene — 5/16

Recommendation Review

Excel

Net Zero Energy: A Preliminary "Snapshot" -Updated

	Energy Usage		Energy Costs [and Benefits]			
	EUI (kBtu/SF/yr.)	**Predicted Energy Usage** (KWH)	**Utility Energy Costs** ($/SF) [Includes Peak Charges]	**Utility Solar PV Benefits**	**Other Annual Funding Benefits (AEC and SMART)**	**Solar PV System**
Proposed School *475,000 SF** [Full AC]*	25**	~3,480,400	~$1.82	~($0.66/SF)	~($0.83/SF)	*3.5+ MW*
			$0.33			
% reduction over Existing	75% less energy use per SF		~($700,000) [compared to a full AC existing HS]			
Existing Facility 352,000 SF [Partial AC]	109 *[~121 full AC]*		$1.63 *[~$2.35 with full AC]*	($0.13/SF)		40-50 KW
			$1.50 ***[$2.22 with full AC]***			

***Caveats:*

1. *Approximately 475,000 SF Building area is subject to flux, based on the Project's design progress and decision process*
2. *Additional program spaces leading to higher energy use not included may impact EUI 25 goal and Solar PV system sizing*
3. *Solar PV Financial Benefits do not include Solar PV ownership S-RECs revenues and potential MA CEC SMART Program incentives*

Preliminary Project First Costs Estimated Funding Benefits

	Major Renovations/Additions New Construction *	Code Upgrade**
TOTAL Estimated First Cost Funding	**$12.6M - $14.6M+**	**$3.6M+**
MassSave Incentives	**$4,587,500+**	**$3,519,000+**
Building EUI program	$ 950,000	$ 594,000
GSHP Program	$2,925,000	$2,925,000
NZE-POE Verification Program	$ 712,500	
Connected Solutions (e- storage)	TBD-Not Included	
MSBA Additional 4%**	**$8,000,000-10,000,000+**	
Specialized Code (3%)		
Indoor Air Quality (1%)		

*Based on preliminary project construction cost

**Code Upgrade alternative only qualifies for the MassSave GSHP program and Path 2/Tier 1 (EUI 30+) ($1.25/SF or less) - No additional 4% MSBA incentives

NOTE: Federal ITC (30%) for Building Envelope, HVAC systems, Solar PV and Battery Storage and Bond savings not included.

What to Expect in Meeting #4

Objective: The four focus groups will reconvene to discuss each group's recommendations

When & Where?

May 16th, 3:30 – 5:30 PM

Virtual, Zoom link to come

Exterior & Interior Design Focus Group Proposed PDP Recommendations						
	Focus Group Suggestions/Comments	Suggested Recommendation to the School Building Committee	Given	Needs Further Discussion	Has challenges / trade-offs Requires further discussion	Comments
Designing for the Future						
EID 1	Need an expandable design that has the potential to grow if student population grows in the future.	Consider concepts for future expansion space, as required in the SBC's Construction Alternative Evaluation Criteria.	●			
EID 2	Design needs to be flexible enough to respond when new teaching methods evolve	Pedagogical flexibility should be a fundamental aspect of the design of the school.	●			
EID 3	The building will be large and will have impacts on the surrounding environment. As an overall sustainable and economical approach, let's not build a space that's bigger than needed.	Promote design that is right-sized.	●			
EID 4	Make sure programs have spaces they need, but that they are well utilized throughout the day.		●			
EID 5	Would be interested in learning about schools that build upward when space on site is constrained	Develop comparative study of vertical vs horizontal future expansion.		●		
EID 6	Consider potential of another pandemic	Collect lessons learned from the COVID pandemic that could affect approaches to design, including: mechanical ventilation, access to the outdoors, social distancing, hybrid learning and quarantine space.	●			
Sustainability						
EID 7	Avoid toxic materials; use green list materials to support health and productivity	Red List screening will be applied to a selected list of interior materials. Refer to the MEP / Sustainability Focus Group recommendations.	●			
EID 8	Consider embodied carbon in both construction and demolition, including possibility of salvage and reuse onsite.	Explore opportunities to minimize embodied carbon, including early siting considerations. Refer to the MEP / Sustainability Focus Group recommendations.	●			
EID 9	Think about 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.	●			
EID 10	Be prepared to have optimal ways for students and staff to return reusables		●			
EID 11	Building orientation to maximize solar exposure on south-facing elements	Consider building massing options that provide optimal solar orientation for energy savings and quality of natural daylighting.	●			
EID 12	Consider impacts of envelope design on energy performance of a building.	Exterior design to incorporate fundamentals of energy efficiency. Implementation of Passive House standards to be considered. Refer to the MEP / Sustainability Focus Group recommendations.		●		
EID 13	Graph the environmental impact and insulation value of materials			●		
EID 14	Study pros and cons of using mass timber to reduce embodied carbon	Consider options to include Mass Timber elements in design. Refer to the MEP / Sustainability Focus Group recommendations.		●		
EID 15	Be creative with where we put solar panels. Consider using building-integrated photovoltaics.	Solar panels should be maximized at building rooftop and on-grade parking. Consider using building-integrated photovoltaics.		●		
EID 16	Need to balance all of the design goals with operational energy constraints.	Include operational energy constraints in overall decision-making and LCC analysis.		●		

Integrating Site Design						
EID 17	Emphasize the importance of access to the outdoors	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.	●			
EID 18	The building design needs to balance the tradition of allowing upper classes to leave the building with security needs			●		
EID 19	Create spaces in nature where students can both learn and gather informally		●			
EID 20	Building should seamlessly fit into the environmental context (i.e. wetlands, walking paths/etc.)	Integrate building and site designs with careful review at each milestone.	●			
EID 21	Make the site design for the school feel unified with the town's open space resources, not separated from them.	Prioritize design options that integrate in one design both high school and community elements.	●			
EID 22	Consider a separate parking area for PE/Athletic wing	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 23	Consider a separate parking area for Performing Arts wing			●		
EID 24	Consider separate parking and access areas for teachers and for students			●		
EID 25	Consider where delivery dock is in relation to food services, especially if there are multiple food spaces	Locate loading dock in proximity to the main kitchen.	●			
Designing in the Context of Lexington - Creating a Sense of Place and Identity						
EID 26	The design should create a place people want to be.	Promote design that combines a unique character, beauty, a sense of welcoming, and is a place where people want to be.	●			
EID 27	The design should have personality		●			
EID 28	Create a welcoming and attractive school entrance		●			
EID 29	The school should have a unique sense of place		●			
EID 30	Create a contemporary building but with a nod to the history of Lexington	Develop designs that explore degrees of modern and traditional expression.	●			
Student Experience During Constuction						
EID 31	Concerned about how construction activities affect students in high school at time of construction. Need a solution that doesn't distract from learning experience.	Consider construction impacts of each design alternative on ongoing high school operations.	●			
Desire to see Precedents						
EID 32	Would love to go on site and visit other school projects to see what's out there before we create something new. Suggest to visit similar sized buildings and urban schools.	Tours of several schools in Massachusetts are to be scheduled. A group led by LPS visited two schools in Virginia in February.	●			
Auditorium						
EID 33	It's important for the community to have a functional auditorium appropriate to the programs that will utilize the space.	Review the auditorium design and get input from all stakeholders as it develops.		●		
EID 34	A hydraulic orchestra pit in the Auditorium is highly desirable.	Develop pros and cons along with costs of orchestra pit design.		●		
EID 35	The Auditorium stage should have adequate wing space and a full fly tower.	The base design of the Auditorium will include wing space and full fly tower.	●			

Interior Planning and Design						
EID 36	Provide a certain level of compartmentalization of building layout, to extend the usefulness of communtal spaces and to keep the public out of academic spaces after school hours	All space layouts will include the ability to allow after hours access to community spaces while allowing other areas of the school to be closed to the public.	●			
EID 37	Consider creating neighborhoods within the building.	Educational neighborhoods were identified in the Visioning as highly desirable for their ability to foster interdisciplinary learning. This should be explored as a design approach to organizing the school.	●			
EID 38	Athletics and Performing Arts have large groups of visitors. Consider placing separate entrances for each on opposite ends of the building.	All programs to have appropriately sized entrances, access and egress.		●		
EID 39	There should be low sensory areas throughout the school.	Prioritize designs that integrate places for respite, biophilia, wellness and mental health.	●			
EID 40	The Media Center should be a place of respite, not a high-traffic area.	Consider planning approaches that allow access to the Media Center space to be controlled and deliberate.	●			
EID 41	Consider a flexible cafeteria space with movable furniture that can be used for performances or other functions	The Dining Commons is to be a highly flexible space with many possible uses.	●			
EID 42	Provide food-appropriate spaces where students can study.	Review food policies to clarify design parameters of possibly distributed cafes.		●		
EID 43	There is a need for acoustics-absorptive materials in classrooms	New classrooms will have very high absorption acoustic tile.	●			
EID 44	Interior design should incorporate natural light and colors to add life, vitality and ease of wayfinding.	Prioritize designs that are well lighted, vibrant and intuitive to move through.	●			
EID 45	Have experienced problems with linoleum in the past	All proposed interior materials to be reviewed by facilities and maintenance staff.		●		
Questions						
Q01 - Arch	Could we run a study to understand space usage maximization?	The design team is willing to discuss potential investigations along these lines if more defined parameters are proposed.				
Q02 - Arch	Is there logic to having multidisciplinary spaces? Does this apply to a high school?	Departments will likely remain organized largely by discipline, but collaboration among those disciplines is increasing in the LHS curriculum. The planning of the new school should reflect this evolution toward active inter-departmental collaboration.				
Q03 - Arch	Have the users of SMMA-designed schools had good experience utilizing the same space for multiple purposes?	Yes, many spaces are designed for flexibility from the outset, either by allowing segmentation or differentiation of space, or by integrating technology, or by the introduction of highly flexible furniture, or a combination of all.				
Q04 - Arch	How can different science classes move around classrooms?	We try to plan labs as flexibly as possible so if courses change over time, labs can support the curriculum.				
Q05 - Arch	Is there a corresponding after school plan to the ed plan?	Yes, we will compile after school hour program list at susbequent stages of the feasibility study.				
Q06 - Site	In terms of site, is the site specific to where the high school is or does it include field and grounds surrounding it?	Site parameters are indicated on the conceptual massing diagrams for each of the MSBA Construction Alternatives.				
Q07 - Site	Will smaller parking areas be able to support large trailers?	Yes, parking areas at auditorium/gymnasium and associated site circulation serving these areas will need to be sized to accommodate these vehicles				
Q08 - Site	How will we utilize recreational fields?	Recreational fields are assumed to have the same geometries and functions as they currently have.				
Q09 - Site	Does SITES certification include protection of mature trees, preservation of tree canopy/wetlands/waterways?	Yes, these are all elements that are required in SITEs certification				
Q10 - Arch	There is a trend with the big stairs as a common area, is this actually used?	The stairs are very well received by students. It allows students to be out in the open but also tucked away, "hidden in plain sight". Additionally, provides functionality for formal and informal presentations. Materials used on the learning stairs will be considered in terms of cleanbility.				
Q11 - Int	Do you design interior materials to be in place for 50-75 years, and do you design them to be easily replaced?	Some materials will have a shorter life span (i.e. paints/tiles) some have a long lifespan (i.e. terrazzo flooring). Interior materials (i.e. ceilings) are designed to be replaced more frequently.				

Q12 - Arch	Will the space be tuned for music only or will it be flexible?	We have an acoustician. Main reflectors are fixed but there may be elements that can be altered to be better suited for speaking. Digital amplification of some types of sound will be considered as part of the auditorium design.				
Q13 - Arch	Is there a plan to have a balcony?	We are not at that point of design yet				
Q14 - Arch	Are there comparable 1000 seat examples?	Yes, Waltham High School is one example. We may be able to tour some.				
Q15 - Arch	What do people do without a pit?	Without a pit, a collapsable stage extension (with or without a hydraulic lift) can be implemented to increase stage size. When the extension is not in use, a group of musicians can sit on the floor of the house.				
Q16 - Arch	What's the typical standard square footage of a new stage?	1600 SF is reimbursible within the MSBA guideline. Non-programmed gross square footage may be considered to increase the technical functionality of the stage as we move into more detailed and latter stages of the design.				


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