smma

Advisory Team - Sustainability & MEP Systems 8

Project Name:	Medford High School	Project Number:	25100
RE:	Advisory Team - Sustainability & MEP Systems	Meeting Date:	11/10/2026
Prepared by:	Brenda Lam, Martine Dion	Meeting Number:	08
Distribution:	Attendees		

Owner

- ☑ Libby Brown, *SBC Member, Architect at Goody Clancy*
- ☑ Suni Dillard, *Medford Resident, Sustainability Leader at HMFH Architects*
- ☐ Austin Ditz, *Medford Resident, Solar Project Manager*
- ☑ Audrey Feitor, *Medford High School Teacher*
- ☐ Jenny Graham, *Chair of SBC, Vice Chair of School Committee*
- ☐ Chris Hogan, *Medford Resident*
- ☑ Elisabeth Krautscheid, *Medford Resident, MassSave Decarbonization Program*
- ☑ Ken Lord, *MPS Chief Operating Officer*
- ☑ Sarah Michelman, *Medford Resident, Sustainable Design Consultant at The Green Engineer*
- ☐ Nicole Morell, *SBC Member*
- ☑ Jessica Parks, *Medford Resident, MIT Energy Efficiency Project Manager*
- ☐ Brenda Pike, *City of Medford Climate Policy Planner*
- ☐ Luke Preisner, *SBC Member*
- ☐ Chris Richard, *Medford Resident, Senior Project Superintendent at Turner*
- ☑ Paul Ruseau, *SBC & School Committee Member*
- ☐ Nathan Scott, *Medford Resident, Capital Construction at Tufts University*
- ☑ Sam Riley, *City of Medford Climate Policy Planner*
- ☐ Alicia Hunt, City of Medford Director of Planning & Sustainability

SMMA & Consultants

- ☑ Martine Dion, *Director of Sustainable Design*
- ☑ Brenda Lam, *Sustainable Design Project Coordinator*
- ☑ Helen Fantini, *Project Manager*
- ☑ Matt Rice, *Principal-in-Charge, Architect*
- ☐ Abigail Ransmeier, *Head of Research*
- ☐ Soala Ajienka, *Architectural Designer*
- ☐ Jamay Li, *Architectural Designer*
- ☐ Emily Ehlers, *Mechanical Engineer*
- ☐ Stella Drizin, *Electrical Engineer*
- ☐ Andy Oldeman, *Director of Engineering*

- ☑ James Job, *Plumbing & Fire Protection Engineer*, AKAL Engineering
- ☐ Rohan Kollu, AKAL Engineering
- ☐ Tommaso Bitossi, Transsolar

Leftfield

- ☐ Jen Carlson, *Project Director*
- ☐ Matt Gulino, *Project Manager*
- ☐ Adele Sands, *Educational Liaison*
- ☐ Linda Liporto, *Director*

Item No.	Action	Discussion
08.01	Record	**Meeting #8 Agenda** • Welcome & introductions • Pool Water Heating Life Cycle Cost Assessment (LCCA) • Red List Free Materials • Embodied Carbon & Mass Timber • Water Efficiency & Stewardship • Next Steps
08.02	Record	**Pool Water Heating 50-yr LCCA** • The design team shared the results of an early 50-year LCCA of the Pool Water Heating System with 2 options: ○ Option 1: Natural gas boilers [Code Baseline] ○ Option 2: Air-to-Water Heat Pump (AtWHP) with Back-up Electric Boilers. • **Option 1: Natural Gas Boilers** - The 50-yr LCCA includes: ○ Estimated installation costs for electrification readiness per the requirements of the Massachusetts Specialized Stretch Code ○ A Solar PV PPA, as renewable energy is required under the Massachusetts Specialized Stretch Code and a Solar PV PPA is also planned for the school building. The Solar PV PPA provides for a fixed reduced electrical rate. ○ The estimated installation costs of a natural gas service upgrade. ○ When looking solely at the simple payback, the Option 1-Natural Gas boilers result in a higher upfront estimated costs due to the Code requirements listed above, with a payback of 7.5 years. ○ The Natural Gas Option 1 would not have natural gas incentives for MassSave. • **Option 2: All-Electric AtWHP system with a back-up electric boiler -** 50-yr LCCA: ○ Option 2 resulted in a less expensive upfront installation cost, however has a higher estimated annual energy cost. ○ Option 2 would be cheaper to install now than in 25 years (escalation costs). ○ Option 2 brings considerable carbon emission reduction ○ . The All-electric Option 2 may potentially have custom incentives to be determined as part of the utility incentives process. Typically, the heating and cooling systems' Heat Pump incentives program does not apply to pool hot water heating systems under the MassSave program. • **Two alternative scenarios were presented:** ▪ Alternative 1: assuming the energy code would allowed the replacement of the pool hot water heating system in 25 years to remain a fossil fuel would be allowed to replace the natural gas boilers in 25 years. If allowed, this alternative results in an estimated $534,000 savings over 50 years [again, only if a natural gas system replacement is allowed in 25 years (2051)] ▪ Alternative 2: assuming the energy code would require the replacement pool hot water heating system in 25 years to be all-electric. The Option 2 all-electric AtWHP/back-up electric boiler results in an estimated $846,000 with a Code/State requirement for an all-electric system replacement at 25 years or earlier. ▪ The current Specialized Stretch Energy Code requirement for electrification readiness suggest that Alternative 2 may be more likely in 25 yrs. *Discussion/Comments:* • Comment: Considering carbon emissions in gas system and if gas becomes more expensive (same can be said for electricity). Carbon taxes for natural gas

		will become more expensive. Recommend all-electric system. • Question: What is a life span for gas system? Response: It is estimated 25 years depending on how well it is maintained. • Question: How mature is the Air to Water Heat Pump (AtWHP) market? Response: The AtWHP system to be used for the pool hot water would be similar to the main school building heating and cooling system heat pump technology. While the use of AtWHP systems is fairly new for pool hot water use, there are a few new all-electric projects including a Boston public pool (not yet completed) and Tufts University new pool project. The option includes all-electric boilers for backup. • Comment: It does not make sense to put natural gas boiler when the rest of the building is an AtWHP system from maintenance, upkeep perspective, and carbon savings. If the code is requiring an upgrade in 25 years to go all-electric, the AtWHP option would make more sense. • Comment: If the state is pushing in the direction, source of electricity is not going to be fossil fuel (power grid). Grid needs to get cleaner. Response: The Project includes a Net Zero Solar Photovoltaic System (under a PPA approach). The design team is investigating Solar PV on both building and site to achieve net zero for the building, however, it is unlikely the building and site PV would cover the pool emissions. • Question: Is this an add or deduct to the overall project cost? Response: No. • Motion to go all-electric: "**Recommend for pool water heating system to be All-electric: Air-to-Water Heat Pump with back-up electric boilers (Option 2) (9 voted affirmatively/unanimously). "**
08.03	SMMA	**Healthy Materials & Red List** • The interior design goal is to balance healthy materials, maintenance and durability, and aesthetics. • Healthy Materials is inherent to LEEDv4, with Low-Emitting Materials, reduced embodied carbon materials, and sustainable material attributes (EPD, HPDs, recycled content, FSC wood) already embedded to the project. • The design team will vet finishes in Division 3-13, with a focus on interior materials that have exposure and human interaction (floors, walls, ceilings). • Red List is one way to frame healthy materials, but the building material market is not there yet in terms of achieving a fully Red List free project on all materials, due to market availability, potential cost premiums, limits in availability, limits in transparency and documentation. The project approach to the integration of Red List Materials is as follows: ○ Specifications will require Declare red list reporting when no Red List Free/Approved materials are available (a large part of Div. 3-13) or when there are only 1 manufacturers or 2 equals. Excluding major manufacturers impacts price competition and specifying proprietary materials have shown to be costly. ○ Materials with 3 equals (Red List Free/Approved) are unlikely to impact costs. Those materials will require Red List Free or Red List Approved. • The original School Committee motion language is proposed to be updated for the reasons mentioned above, and presented to the SBC and School Committee for their approval at the next meetings: ○ The original School committee resolution language states, "Prioritize LEED healthy materials points to obtain the additional 1% MSBA reimbursement." ○ The School Committee current resolution language states, "Specify red list-free, healthy materials for all materials except MEP/FP and prioritize LEED healthy materials credits necessary to obtain the maximum IAQ MSBA reimbursement to ensure superior indoor air quality for students and staff." *Discussion/Comments:* • Question: The overarching school committee resolution is to achieve all of these things as financially feasible to operating costs or upfront costs, and with material availability considerations. The intent is to make sure that we are doing the cost benefit analysis for materials and would not want to exclude materials that are not included in the list. Response: The goal is to discuss clarifying the language with this Advisory Team that still adheres to the intent of the resolution, without requiring "all materials" as the red list market availability is ever-changing. • Comment: Include "breathable space" to emphasize the importance of indoor air quality. • Question: What if there is an unexpected price escalation and need to find ways to make budget cuts. Who will make that decision for budget cuts? It seems like this area may be an easy way. Response: The LEED Silver certification IAQ (healthy materials) points are tied to the project base MSBA reimbursement and represent about 2/3 (if not all) of the required 1% reimbursement points. Healthy materials are unlikely to be cut. The potential budget cut would be materials that had cost premiums. The Red List materials with 3 equals would not have premiums, as there is adequate competition amongst the major manufacturers. • Comment: This is not addressing low-embodied carbon and bio-based materials, and we do not want to lose sight of those materials. Response: Materials with lower embodied carbon will also be considered, as part of the LEEDv4 Silver Certification. • Comment: Lighting should be RoHS certified. Response: SMMA will look into this possibility. • Motion to recommend for resolution language to be updated to state: ***"Specify red list-free as economically feasible within occupant "breathable space". Specify healthy materials for all materials and prioritize LEED healthy materials credits necessary to obtain the maximum IAQ MSBA reimbursement to ensure superior indoor air quality for all occupants.* (9 voted affirmatively/unanimously)."**
08.04	SMMA	**Embodied Carbon & Mass Timber** • Wood & mass timber construction involves considerations for costs, structural and fire safety code regulations, early coordination with manufacturer needed, acoustics, and tighter column spacing/deeper beams. • Please note that independent from the use of Mass Timber, the embodied carbon (and healthy materials) strategies embedded in the project include low carbon materials procurement, high-recycled content in new building materials (concrete, steel, insulation), optimization of building re-use, locally/regionally sourced materials and FSC wood. • The design team shared the results of an early embodied carbon analysis of the proposed design and impact of including mass timber construction, compared to a LEED Baseline building scenario. The design team shared the results of an early total carbon analysis (operational + embodied carbon) compared to the existing school building, showing significant operational carbon reductions (energy usage, lighting) and embodied carbon reduction (low carbon materials, as well as the approximate embodied carbon savings from a full mass timber construction building). • The current PSR mass timber cost alternates included: ○ TIMB1: replace 50% of the new addition structural steel frame with mass timber, estimated $17,830,714 ○ TIMB2: replace 100% of the new additional structural steel frame with mass timber, estimated $35,661,427. ○ It was mentioned that these were not economically feasible for the project. • The design team presented a new set of Schematic Design Mass Timber cost alternates, proposed based off of design progress and review of code requirements and opportunities with the code consultant. • The Advisory Committee to confirm: ○ Due to the high cost of mass timber, using mass timber for a large percentage of the new addition structural frame is not recommended. ○ Obtain Schematic Design Cost Estimate options for the following Mass Timber options, for acceptance/rejection by the SBC prior to finalizing the SD budget: ▪ TIMB3 – Use Mass Timber (Dowel Laminated Timber – DLT) decking for the replacement gymnasium roof ▪ TIMB4 – Use a composite Mass Timber / Structural Steel frame for the ECC Wing. SMMA to develop finish adjustments in the ECC Wing to offset first cost of Mass Timber structural frame components and expose Mass Timber structural elements. • The design team provided the considerations for the two proposed options. ○ TIMB3 was developed as DLT is recommended for gymnasium roof only will limited moisture exposure and equivalent acoustics, whereas the pool (with mezzanine area) would be required to have a fire-rating. ○ TIMB4 was developed as ECC wing can be a different construction type from the main building from a code perspective, which would make a mass timber frame more viable. Extent and level of mass timber approach (decking, columns, etc.) will be worked out as design develops. • Before we move the project forward, Advisory Committee to provide recommendation to the building committee to approve mass timber option(s). *Discussion/Comments:* • Question: Does the use of mass timber have anything to do with LEED certification that is tied to the MSBA reimbursement? Response: The project does not need mass timber to get The MSBA base reimbursement and it would not impact the 1% additional reimbursement, for LEEDv4. • Comment: Solar over mass timber parking structure looks great (from precedent photo shown in the presentation). Response: Cost for mass timber parking structure can be evaluated with PPA negotiations down the road, however it is not their base structure for parking canopies. • Question: Has Suffolk been engaged to discuss potential mass timber construction, timeframe and site safety impacts? Response: The design team has reviewed erection time for the frame (potentially a few months comparison) and will continue to understand the impacts (including costs) with the CM. • Question: Is there an embodied carbon goal set? Response: The goal is 20% reduction, however, the project team will attempt to optimize beyond 20%. • Motion to recommend that: "**Due to the high cost of mass timber, using Mass Timber for a large percentage of the New Addition Structural Frame is not recommended. Recommend to obtain Schematic Design Cost Estimate Options for the TIMB3 and TIMB4 options (noted above), for acceptance/rejection by the SBC prior to finalizing the SD budget. (9 voted affirmatively/unanimously). "**

08.05	SMMA	**Water Stewardship** • Project has a goal of 30% indoor water use reduction, contributing to 3 points in LEEDv4, which would include water-efficient toilet, faucets, and other plumbing fixtures and appliances. • The Project has a goal of reduced outdoor water use, contributing to at least 1 point in LEEDv4, which would include native plantings and limited irrigated areas. • Additional strategies for consideration (not previously included in budget) include a large scale rainwater harvesting system and demo system for educational purposes. • Consider the long term maintenance for rainwater systems. SMMA had a 2012 project with a rainwater harvesting system re-used for graywater for toilets. (not irrigation), that was eventually turned off due to the high maintenance demand. *Discussion/Comments:* • Comment: There are many projects that are liking, enjoying and benefiting from rainwater harvesting systems. There is not enough information to make an informed decision, such as what are the quantities, roof areas, related costs / what is the amount of water trying to capture / what land is being irrigated / do we have programs in CTE who want to advocate and manage systems. Have seen success in rainwater harvesting for irrigation and water was used in the summer. Response: The SMMA Site team will work to understand the potential irrigation needs and potential size for rainwater system in the next design phase. • Comment: I would want to eliminate potable water for irrigation. • Comment: I don't think we can use potable water for irrigation for LEED? Seems like it couldn't hurt to collect water for irrigation for when that is necessary.
08.06	Info	**Next Steps** • SBC Meeting October 16th, 2026 - Summary of Advisory Team Recommendations: