MEETING NOTES

DORE + WHITTIER

Meeting Date: February 12, 2024
Project Name: Lexington High School
Project Number: Click or tap here to enter text.
Subject: MEP and Sustainability Focus Group Meeting
Attendees:

Present	Name	Affiliation	Present	Name	Affiliation
✓	Cynthia Arens	Sustainable Lexington Committee Chair	✓	David Pinnsonnault	Director of Public Works
✓	Susan Barrett	Town Transportation Manager		Todd Rhodes	Sustainable Lexington Vice Chair
✓	Chris Bouchard	Project Engineer	✓	Mark Sandeen	Select Board
	Phil Coleman	Permanent Building Committee		Sophie Shaw	Student
	Julie Hackett	Superintendent of Schools		Nancy Sofen	Tree Committee
	Wendy Heiger-Bernays	Board of Health		Bernardo Streithorst	Student
✓	Jon Himmel	Permanent Building Committee Chair	✓	Jillian Tung	Board of Health
✓	Lin Jensen	Support/Resident	✓	Dan Voss	Sustainable Lexington Committee
	Vincent Lerow	AV Technician		Dave Wininger	Digital Learning Coach
✓	Tina McBride	Support/Resident		Lorraine Finnegan	SMMA-Project Manager
	Asa Mele	Student	✓	Matt Rice	SMMA-Project Architect
✓	Shawn Newell	Assistant Director of Facilities	✓	Martine Dion	SMMA-Director of Sustainability
	Glenn Parker	Appropriation Committee Chair		Andy Oldeman	SMMA-Director of Engineering
	Maggie Peard	Town of Sustainability and Resilience Officer	✓	Anthony Jimenez	SMMA-Electrical Engineer
✓	Brian Black	SMMA-Design Architect	✓	Rachel Rahmlow	SMMA-Project Manager for Sustainability
✓	Chris Shaffner	The Green Engineer		Vamshi Gooje	SMMA-Principal in Charge for Sustainability
✓		The Green Engineer	✓	Mike Burton	Dore + Whittier
			✓	Christina Dell Angelo	Dore + Whittier
			✓	Rachel Rincon	Dore + Whittier
			✓	Elias Grijalva	Dore + Whittier

Agenda Item	Description
1.	**Introduction:** Refer to attendees list.
2.	Please refer to attached presentation for meeting materials. SMMA reviews their presentation:

Givens & Proposed Additional Goals

Givens
• MA Specialized Energy Stretch COde
• Lexington IDP
• LEEDv4 Gold Certification
• Net Zero Energy (NZE) and EUI 25
• Solar PV Systems/Battery Storage
• SITES Certification - Gold

Proposed Additional Goal
• Net Positive Energy
• Microgrid
• EV Charging for Buses and electric bicycles
• LEED Platinum Certification
• Enhanced Ventilation/Air Quality:
• 600 PPM (CO2 monitoring)
• Aircuity (VOC monitoring)

Specialized Energy Stretch Code
• Robust Building Enclosure
• Efficient MEP Systems

LEEDv4 Gold Certification and Lexington IDP (Integrated Design Policy)
• Sustainable Sites
• Water Efficiency
• Energy and Renewables
• Healthy/Low Carbon Materials
• Indoor Environmental Quality
• Resiliency/Healthfulness

Topics of Discussion

1. Net Zero Energy and Renewable Energy
2. Climate Preparedness and Adaptability
3. MEP Systems
4. Sustainable Transportation and Electrification of Transportation
5. General sustainability and MEP design planning
6. Sustainable Materials and Healthfulness [IAQ/IEQ]
7. Sustainable Sites
8. Environmental Literacy

Energy
• High-level context about net zero energy implications
• ~70% reduction in EUI from existing facility to proposed facility
○ 104 EUI --> 25 EUI
• Can be cost-neutral if not better than existing
• Solar PV System Preliminary Assessment = 3.4 MW
○ Based on estimated design roof and parking area
○ Gives us a sense of what's feasible

C. Shaffner: has any contact been made with Mass save yet? The earlier we contact, the more money we are likely to get. Yes

C. Arens: It's not net metering, we're offsetting the full cost of electricity. Are you still assuming net metering credits? It's still very high level, we'll dive in more in the next phases

Would you be willing to share the assumptions to get that?

M. Sandeen: As we start to build, plug loads start to be a higher percentage of building loads. Can you elaborate on what we can do to manage plug loads?
• We want to discuss with community
• Try to push to 70%
• Monitoring is also something we want to discuss
○ Need data from the curriculum
• Occupant education/behavior modification to try to get everyone to understand the importance of plug load consumption
• Can gamify it, put in metering for competition although it's very expensive

Energy cost per square foot are low, Eversource has raised peak demand/delivery charges
• Going to be closer to. 1.2M for facility

Personal feedback is we should do an all-electric kitchen

2% EV charging is LEED standard, Lexington bylaw is higher than that
• Code requires more anyway, Lexington zoning policy will dictate

Looking forward to hearing how we address embodied carbon

??: Do you use a software as part of standard practice to assess the tradeoffs- we use Equest
Would that incorporate incentives? - software mostly looks at energy savings
Lifecycle costing - use output of software

D. Voss: in terms of energy use estimate, doesn't include EV charging?
• EV buses are an additional goal but not given, did not include in the analysis
EV charging for cars will be part of bylaw
Do you have any examples or case studies to help estimate load? For the vehicles, we've done it for other projects, not for buses
• Would suggest acknowledging buses as an add on and vehicles need to be included

Can you describe how you take this 3.4 MW and represent that on the plan from a siding standpoint?

M. Dione: Right now we don't have a design yet, we looked at concepts that we had presented at the interview (3-story and 4-story) and looked at what that meant in terms of roof area.

• 225,000 SF roof, 167,500 SF Parking area
• We stayed conservative with numbers because we don't have site/building design yet
• To get to Net Zero energy we're going to need a combination of roof and parking canopies

C. Shaffner:
• Code requirement is 10% is EV ready
• Building energy consumption separate from EV
• What are you going to be charging for electricity is important

D. Voss: The moment we start making drawings we should show the equivalent of 3.4 MW of solar
• The expectation of the community is that we have 3.4 MW of solar, so it needs to be incorporated into the site plan

We have to have a degree of charging behind the meter and behind the solar
There is a capacity to charge vehicles

***Need to have EV bundled into overall load

Mechanical, Electrical, Plumbing

System Design Considerations
• All electric
• Best system for intended building use

Load Calculations
• Critical for understanding what incentives we can receive

Life Cycle Cost Analysis

Systems that will last the life of the building
• Typically, doesn't last the full 50 years

Desire for 24/7 HVAC and Humidity Control

Leak detection and valve shutoff to mitigate loss
• Use flow meters
• Automatic control valves

Supplemental backup for HVAC

Lessons learned from 2-pipe system
• We typically don't like to implement, we go for 4 pipe systems

Implementing simultaneous heating and cooling
• Each zone will provide either heating or cooling

Higher electrical load in theatre spaces
• We will look into this

Ventilation Goals
• 600 PPM
○ Carbon dioxide in the air
• Minimum air change rate of 3ACH (air changes per hour)

Geothermal Overview
• Open loop vs closed loop
○ Open loop: deeper wells, less wells, can have lower reliability
○ Closed loop: shallower boreholes, more wells, less maintenance risk
• Incentives available for both
• Great to serve internal systems withing school

How many wells will be required?
• Open loop ~10s
• Closed loop ~100s

Heat Pumps Overview

Metering of Services
• Utility metered
• Water metered
• Battery storage is separately metered
• Submetering throughout school
***We will meter as much as we possibly can to track for incentives

Integrations of Automation systems
• Security
• HVAC

• Lighting
• Fire Alarm
• Other
○ Any big load for the building will integrate back into the building

Electric Vehicle Charging Stations
Level 3
• Space required to have infrastructure for level 3 charging is a trade off
• We haven't calculated buses into Net Zero goals
• 300 KW bus would take ~2 hours to charge
○ A lot of solar panels to offset that
○ Could require a separate utility line

Level 2
• LEED requires 2%
• Infrastructure for future installations

Level 1
• Flexible charging options

Questions:

What is fleet charging at the school and what is community charging at the school
Currently there could easily be 15-17 fleet EV on top of faculty and student charging

Comment about submetering, we have to understand water metering systems in the town, how do we incorporate towns systems

600 PPM, what's the design criteria during winter vs summer
• We are designing to ASHRAE code

C. Shaffner: I hope you not seriously considering open loop, we don't want it
• Its not preferred

What is demolition doing to reaching 25 EUI?
• We would take all into consideration when doing lifecycle calculations
• Health of the building takes priority over efficiency
• 750 is most stringent as a benchmark
• This is a recommendation that we will need to make in meeting #3

C. Arens:
• Mention about ventilation and air quality, heat recovery, energy recovery, ventilation helps quite a lot with a lot of things we're talking about here.

• Lexington IDP says it's an all-electric building, generators aside, including kitchen

Pricing Chart feedback
• Pricing should include considerations of battery storage paired with solar behind meter to lower costs
• Renewable energy credits that will lower ongoing cost of energy
• Be clear about incentives and rebates
• What do you expect
○ Number would be much higher if building would be fully ACed
• Make it clear that we're paying very little for a very uncomfortable/unhealthy building right now
○ There's may other factors that come into the cost
Do you have a sense of the 25 EUI target what is the relative proportion of heating load vs cooling load?
We will know that better once we start energy model

M. Sandeen: Load analysis in future PSR, what is the time frame for PSR? June of this year

The earlier we can get to its similarity to hastings the better

3ACH is absolute minimum, hope to put up a larger number

If we're monitoring everything were going to be swamped with data
• Should give them smart monitoring
• Is it possible that smart monitoring data show trends

T. McBride
In terms of maximizing solar, hoping that when we consider adding solar we should also consider wall-mounted solar panels similar to alewife

J. Himmel:

2 reports that SMMA has in draft
• Existing conditions talks about how poor existing systems are
• Integration of rebates and incentives and a design
○ OPM has created a draft schedule and there happens to be a 45 day activity at beginning of PSR
○ Seems like first time we're actually beginning to look at options
○ June is the appropriate time to start talking about the complexity of what is normally planned and incentives
▪ An opportune time to start getting involved in conversations

Healthfulness
embodied Carbon
• Majority of embodied carbon lives in the building structure
• How does this impact decisions were making when designing a building
○ Mass timber over concrete/steal
▪ Opportunity to reduce embodied carbon in structure
▪ Construction efficiency, prefabricated
▪ Reduce construction waste
▪ Deconstruct ability
▪ Improving the experience of occupants

Healthy material decisions
• Minimizing exposure to hazards
• Light and quality views
• Air quality
• Thermal health
• Acoustics

SMMA Red List Analysis Precedent

Material Assessment tiers
1. LEED
2. Targeted Products
3. Division 9 Focus
4. Division 9 &beyond

Biophilia
• Access to natural materials/nature
• How do you create connection to place
• Transitional spaces

	Questions: N. Sofen: as you mentioned what materials students will be in contact with, staff are also exposed to materials and there exposure is much higher C. Arens Cost will become a factor when considering materials • Smaller it is the less environmental impact it will have • We need to always look at optimizing space so we are meeting the needs we have an not overbuilding M. Sandeen: Red List • Focus on how red list products might affect the health of people not in building • Severe health problems for manufacturers and downstream of disposal Refrigerants • new equipment have global warming potential S. Barret: • Regarding electric school buses, it's important to keep in mind the right balance of school buses vs public buses, vs walking/biking ○ Start taking a deep look at recommendations and planning for that ○ Number of buses right now is not the right number, there is a better way to balance things Next Steps SMMA will formulate draft recommendations to review and discuss at meeting #3 • We will send out a spreadsheet in advance L. Jensen: hoping for Net Positive, room for adding more solar panels. How much flexibility could there be? We can look at 10-20% will be related to bus charging decisions.
3.	**Close** The next site, safety and security focus group meeting will be held on April 3, 2024 3:30-5:30pm. Estabrook Hall, Cary Memorial Building.

Sincerely,

DORE + WHITTIER
Christina Dell Angelo
Project Manager

Cc: Attendees, File
The above is my summation of our meeting. If you have any additions and/or corrections, please contact me for incorporation into these minutes.