Medford High School



Sustainability and MEP Systems Advisory Team Meeting

Meeting #3

03/10/2026

smma

LeftField

THE RIGHT CHOICE IN PROJECT MANAGEMENT

Meeting #3 Agenda

- Welcome & Introductions
- Advisory Team Recommendation Development
- Life Cycle Cost Analysis (LCCA) Overview
- Next Steps

Welcome & Introductions

Sustainability and MEP Systems / Team Intro

SMMA



Matt Rice
Principal-in-Charge



Helen Fantini
Project Manager



Soala Ajienka
Architectural Designer



Andrew Barros
Electrical Engineer



Emily Ehlers
Mechanical Engineer

SMMA



Martine Dion
Sustainable Design Director



Brenda Lam
Sustainable Design Team Member

Transsolar



Tommaso Bitossi
Sustainable Design Consultant

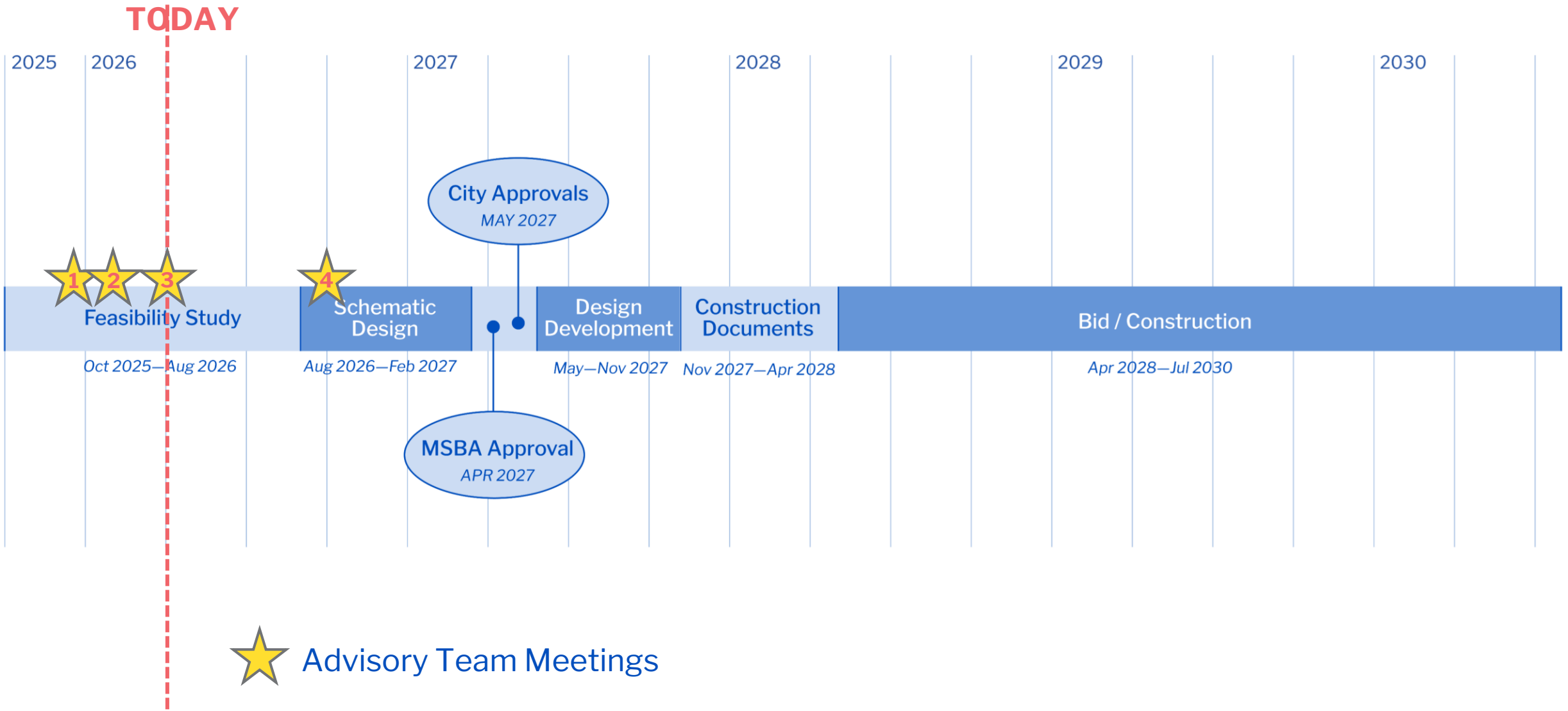
AKAL



James Job
Plumbing and Fire Protection Engineer

1. Libby Brown
2. Suni Dillard
3. Austin Ditz
4. Audrey Feitor
5. Jenny Graham
6. Chris Hogan
7. Elisabeth Krautscheid
8. Ken Lord
9. Sarah Michelman
10. Nicole Morell
11. Jessica Parks
12. Brenda Pike
13. Luke Preisner
14. Chris Richard
15. Paul Ruseau
16. Nathan Scott

Project Timeline

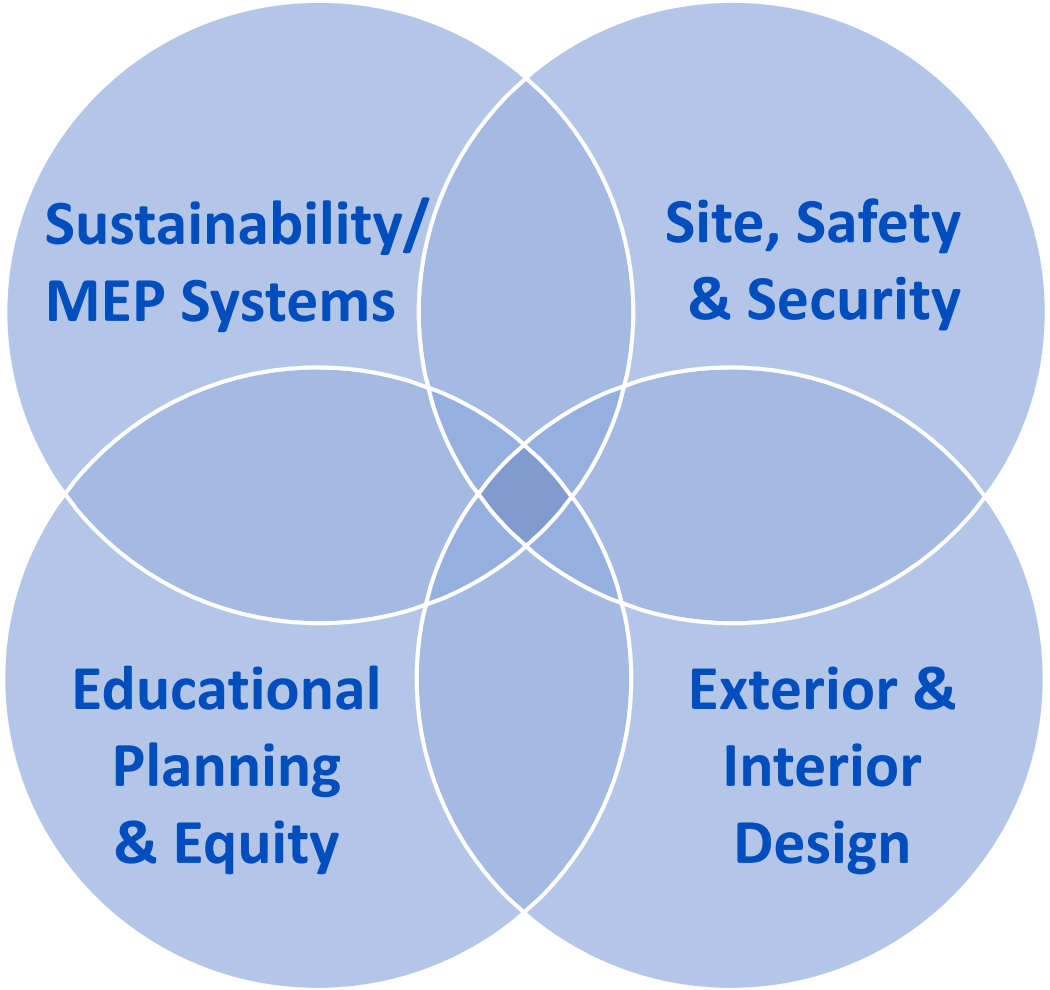


Community Stakeholder Engagement / Advisory Teams

Advisory teams are a method of collecting broad community input on key priorities and desired outcomes for the project.

***Who* : Educators, Students, City Departments, Boards & Commissions, Expert Community Members**

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



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 City Departments.

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

Reviews exterior design concepts including composition of form and exterior material selections. Review of the products and materials selected for interior finishes such as flooring, paint colors, wall finishes and ceilings.

Recommendation Discussion (Excel)



Life Cycle Cost Analysis (LCCA)



Sustainability and MEP Systems – 50-year Life Cycle Cost Analysis (LCCA)

Life Cycle Cost Analysis

MSBA required

- Schematic Design
- Whole Building with 3 HVAC system options
- 50-yr. LCCA

Comprehensive Approach

- Initial costs
- Maintenance and replacement costs
- Energy costs and savings
- Incremental costs and payback
- 3% Cost escalation

Utility Incentives

Early discussions with Utility (National Grid)**:**

- Electrification Upgrade
- Utility MassSave Incentives
- EV Charging Stations
- Solar PV/Interconnection
- Demand Response

Sustainability and MEP Systems – 50-year Life Cycle Cost Analysis (LCCA)

SAMPLE - Preliminary SD LCCA Analysis Summary

Estimated 50-year LCCA Costs as Net Present Value

HVAC System	Installation Cost	Replacement Cost	Maintenance Cost	Energy Cost	Total 50-year LCCA Costs	Total 50-year LCCA w/ Construction Incentives and Associated Costs
						MassSave
Code Baseline	$69,586,840	$46,041,831	$4,691,113	$38,599,898	$158,920,000	
1-Ground Source HP	$73,789,000	$19,246,00	$4,010,000	$26,267,000	$123,312,000	**$116,131,000**
2-Air Source to Water HP	$54,620,000	$20,157,00	$4,010,000	$27,799,000	$106,586,000	**$104,879,000**
3-Hybrid 1 and 2	$64,241,000	$19,701,000	$4,010,000	$27,089,000	$115,041,000	**$110,852,000**

SAMPLE

SAMPLE Notes:

1. Installation costs are based on the PSR project cost estimates. Replacement costs are specific to each system, based on ASHRAE useful life data and using unit costs for equipment and labor, brought forward as Net Present Value (NPV) costs. Maintenance costs are estimated to include third-party service to systems, but not in-house routine maintenance.
2. Energy costs based on energy modeling analysis, using the 2-yr High School utility bills' average [blended] annual $0.--/kWh (baseline $1.--0/Therm), with a 3% cost escalation rate. The energy costs do not include peak load reductions expected from a project's Solar PV/Battery Storage systems. Peak demand costs are approximately xx% of _____ High School's annual utility costs. The battery storage peak load reduction support utility energy costs benefits. The Total 50 yr. LCCA Cost is the sum of Installation, Replacement, Maintenance and Energy costs. Net Present Value modeled on a 50-year lifecycle cost, 3% cost depreciation.
3. Construction Incentives include MassSave Incentives. Post-occupancy annual incentives (revenues) are not included: Demand Response and peak load reduction utility incentive programs, and potential annual Renewable Energy Certificate (REC) for the GSHP.

Sustainability and MEP Systems – 50-year Life Cycle Cost Analysis (LCCA)

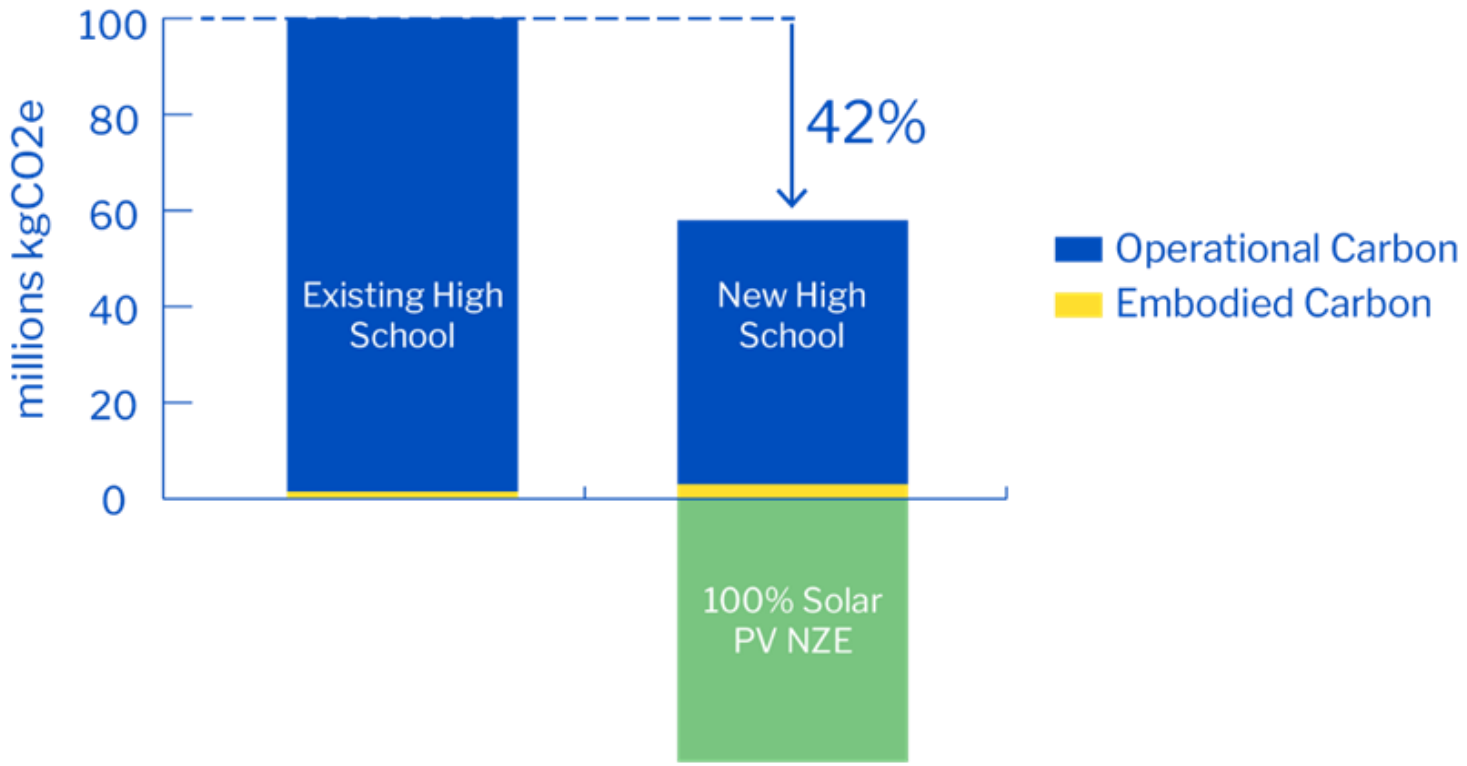
SAMPLE - Summary Incremental Costs & Paybacks

Installation Incremental Cost & Payback Summary
Relative to HVAC Systems Code Baseline Costs

HVAC System	Estimated Incremental Costs (Savings) Incl. MassSave	*Estimated Annual Energy Costs Savings*	*Estimated Payback* Vs. Baseline
Code Baseline [ASHRAE system 7]	SAMPLE		
1-Ground Source HP (BOD)	($2,979,340)	$415,234	0 yr.
2-Air Source to Water HP	($16,673,840)	$363,654	0 yr.
3-Hybrid Option 1 and 2	($9,535,590)	$387,580	0 yr.

SAMPLE Notes:
1. Energy Savings: based on total annual kWh savings, using the average 2-yr $0.--/kWh (utility bills). Peak demand savings not included
2. Incremental Costs are based on the PSR Cost Estimates and include materials and labors and are based on a per cost comparison to the analysis system baseline (ASHRAE 90.1-2019 App G).
3. Code Baseline system: Natural gas boilers and water-cooled chillers (VAV) – ASHRAE App G system #7.

Existing Facility vs. Proposed Design over 60 Years



Total Building Carbon

1. Listen 12/18
2. Review & Respond 1/13
3. Confirm & Recommend 3/10
4. Reconvene 9/2026

Next Steps/ What to Expect in Meeting #4

Objective: The Advisory Team will reconvene in September at the beginning of the Schematic Design phase to both review the Preferred Alternative design through the lens of this Advisory Team and to finalize the list of recommendations that will be shared back to the full building committee.

When & Where?

September 2026 – Date/Time TBD

Remote

Thank you.



MEP Systems

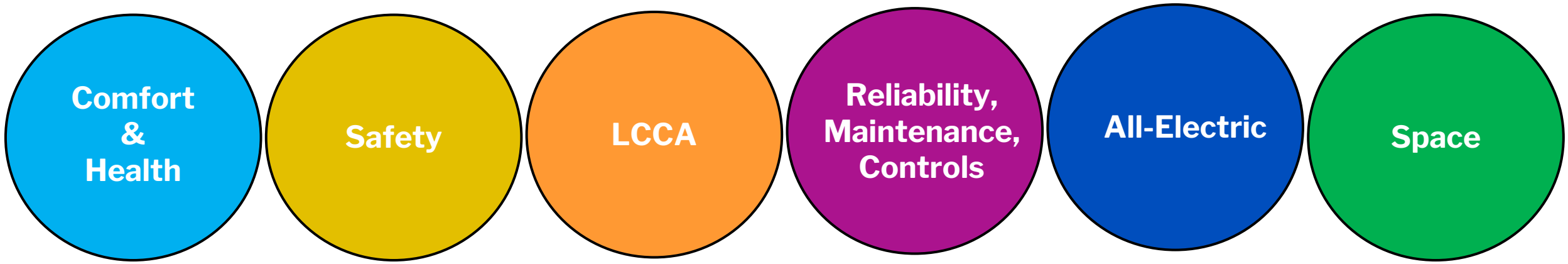


Sustainability and MEP Systems – MEP Insights from Meeting #1

- **Building Operations and System Maintenance**
  - Well-trained Facilities Team
  - Educating the Staff
  - Building systems that operate as designed
  - Commissioning
- **Life Cycle Cost Analysis**
  - Upfront cost & maintenance/operation cost
  - System lifespan (50+ years)
- **Additional Mentions**
  - Geothermal Interest
  - Passive Opportunities
  - Indoor Air Quality
  - Acoustics
  - Cold Weather Feasibility



Sustainability and MEP Systems – HVAC Design Considerations



Acoustics

Temperature Control

Occupant Experience

Refrigerants

Indoor Air Quality

Alarms

Incentives

Upfront & Operational Costs

Embodied & Operational Carbon

System Lifespan

All-Weather Operation

Setpoints & Schedules

Centralized BMS

MA Specialized Stretch Code Req.

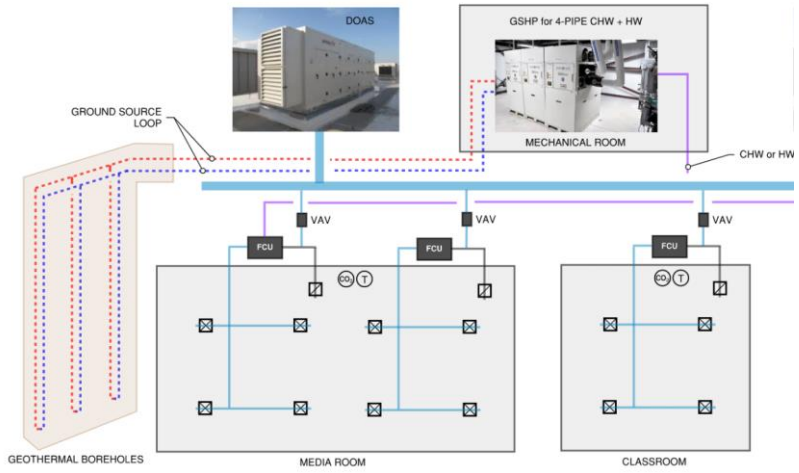
LEED V5

Site Potential

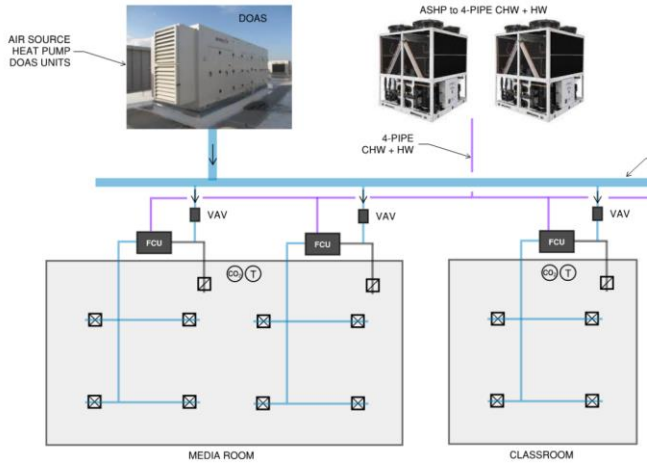
Roof Space

Sustainability and MEP Systems – Potential HVAC System Options

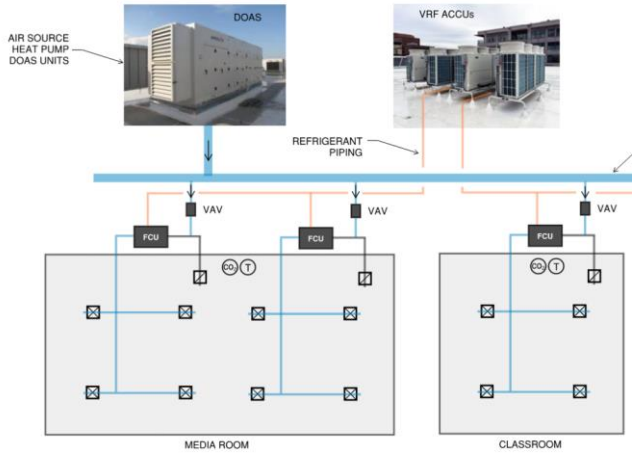
Ground Source Heat Pump



Air Source to Water Heat Pump



Air Source Heat Pump



Hybrid

