Manchester Memorial Elementary School

Feasibility Phase - SBC Meeting #16

December 18, 2017

1. Call to Order
2. Previous Topics & Approval of December 12, 2017 Meeting Minutes
3. Working Groups Update
4. Schedule/Look Ahead
5. Project Update
6. Building Systems Discussion/MEP
7. Design Update
8. Next Steps
9. Other Topics Not Reasonably Anticipated 48 hours prior to Meeting
10. Public Comments
11. Adjourn

1. Call to Order

2. Previous Topics & Approval of December 12, 2017 Minutes

7.11 Site: swing space availability

3. Working Groups Update

Educational Programming

Facilities Assessment

Budget Collaboration

Communications

4. Schedule/Look Ahead

2018 January

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
01	02	03	04	05
08	09 SC Meeting @ 6pm	10 **SBC Meeting @ 7pm**	11 *SBC Snow Date*	12
15	16	17	18	19
22 **SBC Meeting**	23 SC Meeting	24 Comm. Mtg.#3 Prep @ 10-12	25 *SBC Snow Date*	26 Comm. Mtg.#3 Slide Review
29	30 SC Meeting	31 **Community Meeting #3**	01	02

2018 February

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
29	30	31	01	02
05 SBC Meeting	06 SC Meeting	07	08 *SBC Snow Date*	09
12	13 Joint SC/SBC Meeting 7pm - Approve PSR	14	15	16
19 Cost Estimating	20	21 Submit PSR	22	23
26	27 SBC Meeting	28	01	02

5. Project Update

TODAY'S AGENDA

Project Update

Building Systems

Evaluating the Options

TODAY'S AGENDA

Project Update

Tour of the West Parish School

Takeaways

Survey Update

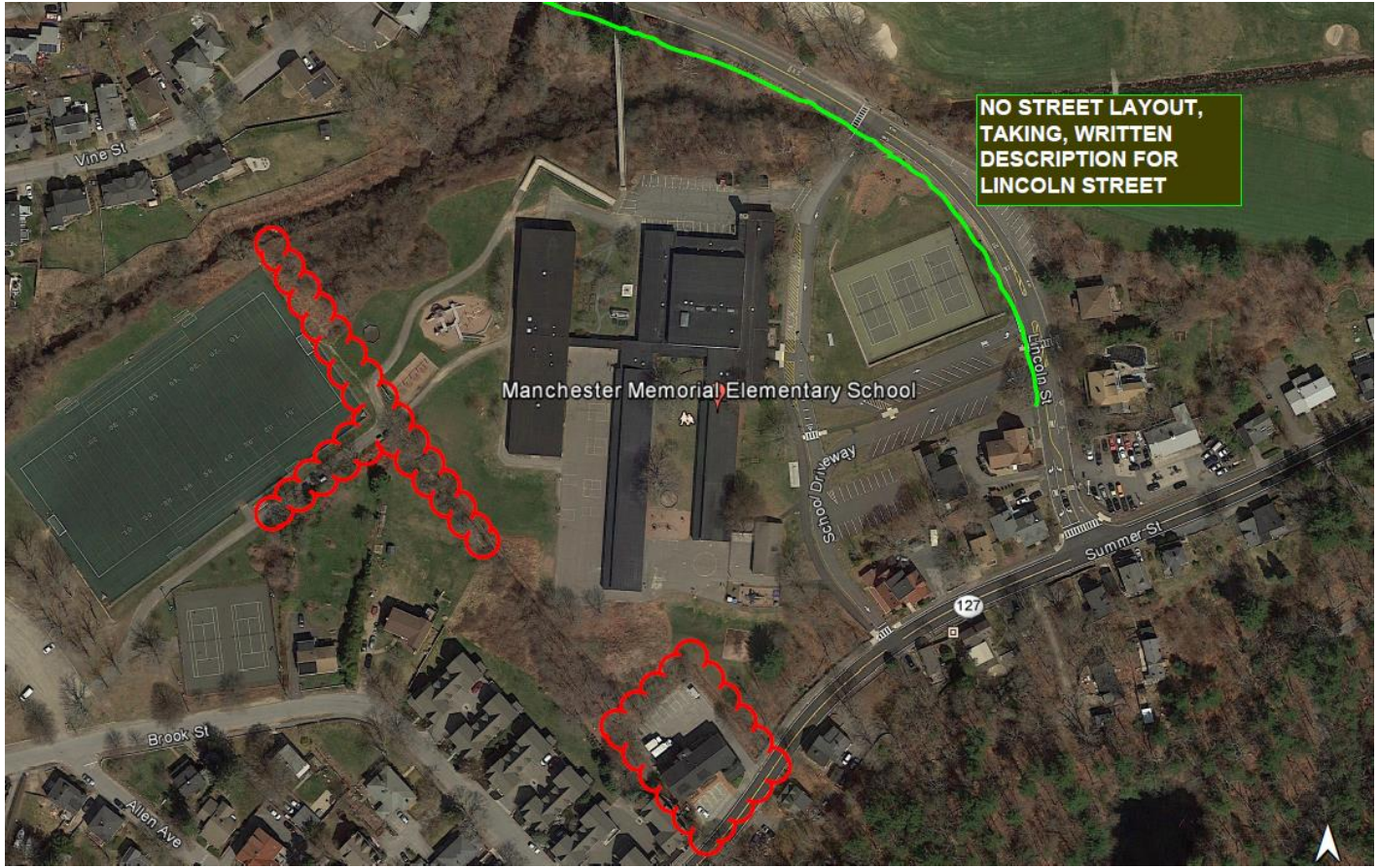
Completion of the Survey Delayed Due to Some Conflicting Data

Property Line Discrepancies with Abutters

and

Layout of Lincoln Street

PROJECT UPDATE



Survey Update

Property Line Discrepancies with Abutters

To be resolved by Standard Practices

Suggest Resolving Layout of Lincoln Street

By Having Town Recording Survey at Essex Registry of Deeds

6. Building Systems Discussion/MEP

TODAY'S AGENDA

Building Systems

Why Are We Beginning to Look at Building Systems?

Per the MSBA

(Provide) "A narrative of the major building systems including;

- *Plumbing,*
- *HVAC,*
- *Electrical (incl. proposed IT and/or multi-media systems)*

With estimated mechanical and electrical loads including applicable heating, cooling, domestic hot water and electrical block loads; by the District based on further evaluations and considerations."

Process & Timeline

- *Identified a Number of Possible Approaches*
- *Meet with MEP Working Group (12/4)*
- *Introduce Future Decision Points to Full Committee (12/18)*
- *Initial Estimate of the Various Approaches (PSR)*
- *Life Cycle Cost Analysis (SD)*
- *Review of Options & Estimates by Working Group (SD)*
- *JCJ/ GGD to Make Recommendations (SD)*
- *SBC to Finalize System Choices (SD)*

Life Cycle Economics Methodology

- **Architecture**
- **Weather data**
- **Building occupancy & usage**
- **System Operating Characteristics**
- **Utility Rates**

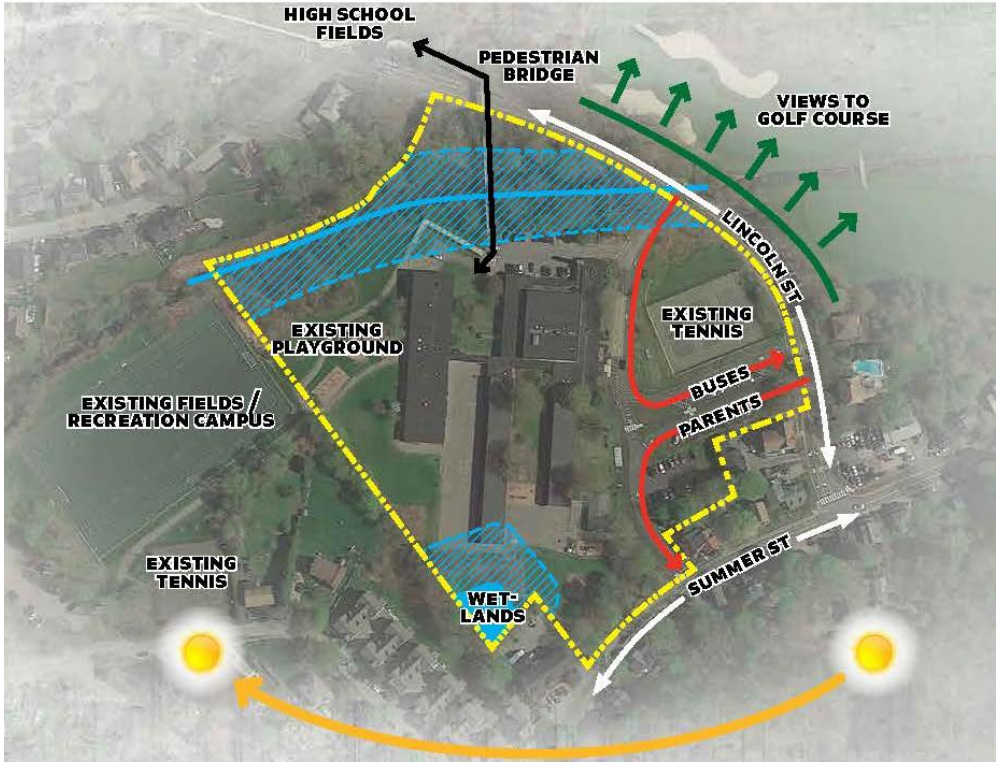
Energy Simulation

Energy Economics

- **Operating Costs**
- **Installation costs**
- **Maintenance cost**

Life Cycle Cost Analysis

Architectural Considerations



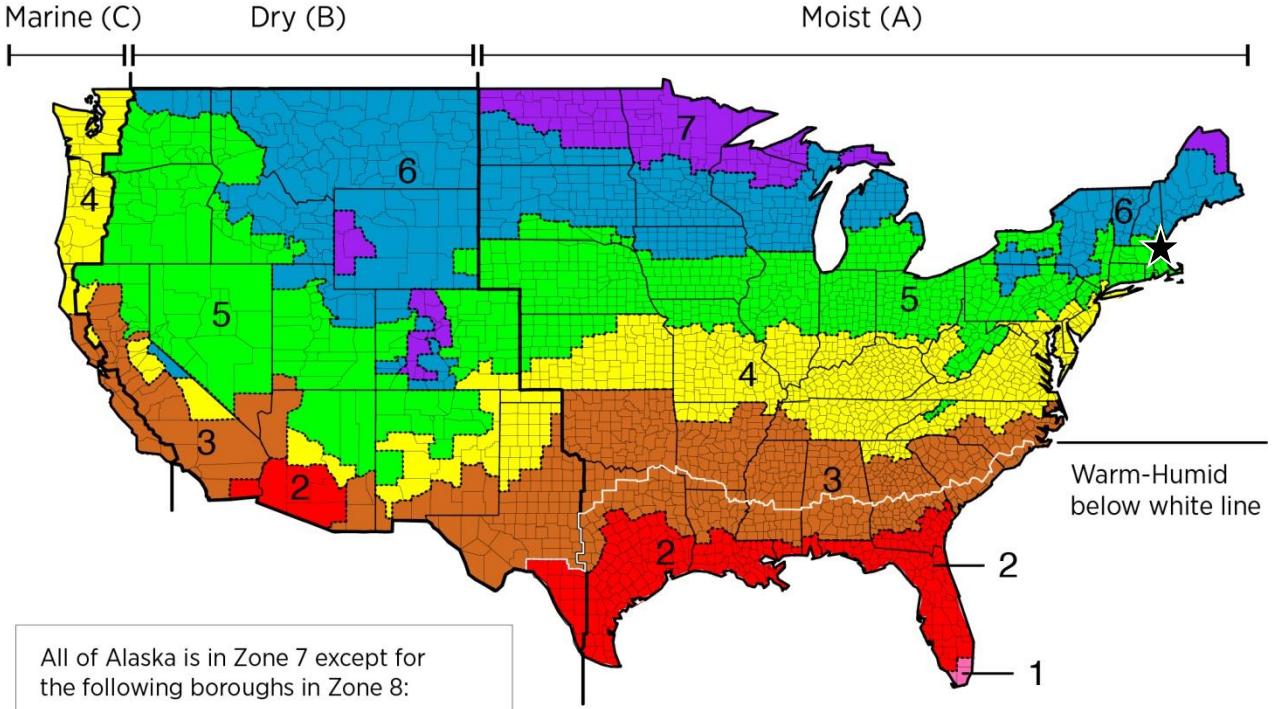
Building Orientation

- *Solar Gain*
- *Shading*

Architectural Considerations

- Building Envelope (MASS Code – 2015 IECC - Minimum R/U Values)
  - *Roofs: White, Vegetated, Sloped*
  - *Walls:*
    - *Wall construction – CMU, Metal Stud, Insulated Cavity Wall*
    - *Glazing (Heat Mirror, Triple Glazed)*
  - *Floors: Slabs on grade, Continuous Insulation*

BUILDING SYSTEMS



BUILDING SYSTEMS

TABLE C402.1.3
OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, *R*-VALUE METHOD[a]

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	R-20ci	R-25ci	R-25ci	R-25ci	R-25ci	R-25ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-35ci	R-35ci	R-35ci	R-35ci
Metal buildings[b, h]	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-25 + R-11 LS	R-25 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS
Attic and other	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49	R-49	R-49	R-49	R-49	R-49
Walls, above grade																
Mass	R-5.7ci[e]	R-5.7ci[e]	R-5.7ci[e]	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building	R-13+ R-6.5ci	R-13 + R-6.5ci	R13 + R-6.5ci	R-13 + R-13ci	R-13 + R-6.5ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13+ R-19.5ci	R-13 + R-13ci	R-13+ R-19.5ci
Metal framed	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-7.5ci	R-13+ R17.5ci
Wood framed and other	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R13 + R-15.6ci or R-20 + R-10ci	R13 + R-15.6ci or R-20 + R-10ci
Walls, below grade																
Below-grade wall[d]	NR	NR	NR	NR	NR	NR	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-10ci	R-10ci	R-10ci	R-12.5ci
Floors																
Mass[c]	NR	NR	R-6.3ci	R-8.3ci	R-10ci	R-10ci	R-10ci	R-10.4ci	R-10ci	R-12.5ci	R-12.5ci	R-12.5ci	R-15ci	R-16.7ci	R-15ci	R-16.7ci
Joist/framing	NR	NR	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30[f]	R-30[f]	R-30[f]	R-30[f]	R-30[f]
Slab-on-grade floors																
Unheated slabs	NR	NR	NR	NR	NR	NR	R-10 for 24" below	R-10 for 24" below	R-10 for 24" below	R-10 for 24" below	R-10 for 24" below	R-15 for 24" below	R-15 for 24" below	R-15 for 24" below	R-15 for 24" below	R-20 for 24" below
Heated slabs[g]	R-7.5 for 12" below	R-7.5 for 12" below	R-7.5 for 12" below	R-7.5 for 12" below	R-10 for 24" below	R-10 for 24" below	R-15 for 24" below	R-15 for 24" below	R-15 for 36" below	R-15 for 36" below	R-15 for 36" below	R-20 for 48" below	R-20 for 24" below	R-20 for 48" below	R-20 for 48" below	R-20 for 48" below
Opaque doors																
Nonswinging	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75	R-4.75

Preliminary Decision Points

LEED Level versus Net Zero

Requires Very Different Approaches

LEED/ CHPS

(*99% of all MSBA Projects*)

(Min. Requirement)
LEED Silver + Stretch Code
20% Better than Energy Code to get 2% Reimbursement

LEED Gold

LEED Platinum

Preliminary Decision Points

LEED Level versus Net Zero

Requires Very Different Approaches

Net Zero
(Few MSBA Projects)

Geothermal Wells
Photovoltaic Panels
Higher Efficiency Equipment
Improved Envelope
Glazing
Higher Capital & Maint Costs
Lower Utility Costs

Net Zero Carbon
(No MSBA Projects Yet)

Zero Carbon Emissions
All Electrical System
More Geothermal Wells
More Photovoltaic Panels
Higher Capital & Maint Costs
Lower Utility Costs

Mechanical Systems

Elements to Be Explored

Renovation vs. New Construction

Air Conditioning

Enclosed Units vs. Exposed

Renovation & Add/ Reno versus New Construction

Not all Systems are Appropriate or Possible for Each Choice

Renovation & Add/ Reno

- *HVAC Systems with Smaller Ductwork (Exposed or Soffits Req'd)*
- *Displacement Dehumidification*
- *Chilled Beams or Fan Coil*
- *Typically Higher Install & Operating Costs*

New Construction

- *More Compatible HVAC System Options*
- *Reduced HVAC Loads*
- *Reduce HVAC Equipment Sizes*
- *Reduced HVAC System Costs*

Preliminary Decision Points
Air Conditioning

Full Building A/C – All Areas

- *Improved Comfort*
- *Allows Summer Use*
- *Higher Capital Costs*
- *Higher Energy Use*
- *Greater Maintenance*

Dehumidification, With A/C in Selected Areas

- *Select Areas: Administration Suite & Media Center*
- *Reduced Capital, Energy, and Maintenance Costs*
- *Same System at MERMHS*

Preliminary Decision Points
RTUs: Enclosed vs. Exposed

Enclosed

- *Protection from Salt Air*
- *Ease of Maintenance*
- *Acoustical Control*
- *Additional Costs (Envelope and Additional Ductwork/Louvers)*

Exposed

- *Salt-Rated Equipment Possible*
- *Lower Costs*
- *Reduced Expected Service Life versus Enclosed Units*

Electrical Systems

Elements to Be Explored

Emergency Power

Emergency Power System

Required Life Safety Loads & Optional Standby Loads

Provide Emergency Generator
or Emergency Lighting Battery Back-Up Only?

Estimated Size of Generator: 125 – 150 KW

Will the Building be an Emergency Shelter?
(This has Electrical, Architectural, and Structural Impacts)

Emergency Power System: *Required Life Safety Loads*

Corridors
Electrical Rooms
Gymnasium Cafeteria
Media Center
Lobbies
Central Administration Area
Health Suite/Nurses office
Toilets
Cafetorium
Data Rooms (MDF & IDF)
Kitchen & Servery
Exterior Building Mounted Lights
Code (Egress Areas)

Emergency Power System: *Optional Standby Loads*

Boilers, Water Pumps
Security / CCTV / Door Access
ATC Controls
Strategic Power Receptacles
Elec. Faucets & Sinks
Heating & Ventilation
Unit Heater Serving Water Room
Critical Colling Units (IT)
IT Equipment
Fire Alarm Systems (+ Batteries)
Refrigeration

Plumbing Systems

Elements to Be Explored

Water Conservation

BUILDING SYSTEMS: PLUMBING

Manual Flush Valve
1.28 gpf Water Closet

Option:
Battery Sensor Flush Valves
1.28 gpf Water Closet / 0.125 gpf Urinal

Manual Flush Valve
0.125 gpf Urinal/waterless

Option:
Battery Sensor Faucet
0.35 Gallons per cycle

Manual Metering Faucet
0.35 Gallons per cycle

BUILDING SYSTEMS: PLUMBING

Drinking fountain
w/bottle filler

Accessible shower
w/1.5 GPM shower head

Staff/Classroom Sinks
w/manual 0.5 GPM faucet

7. Design Update/Evaluating the Options

TODAY'S AGENDA

Evaluating the Options

EVALUATING THE OPTIONS

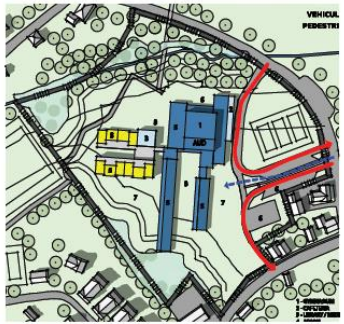
R-1 FOUR WALLS

RENOVATION ONLY

AR-2 SAVE THE CORE

ADDITION/RENOVATION
RETAIN CORE BLOCK ONLY

AR-4 OUT WEST

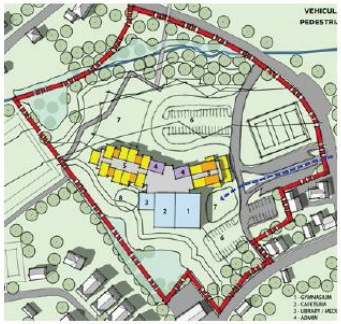


ADDITION/RENOVATION
MODERATE INTERVENTION

N-1 THE PIANO

NEW CONSTRUCTION
PHASED - STUDENTS ON-SITE

N-3 THE HUB



NEW CONSTRUCTION
PHASED - STUDENTS ON-SITE

N-8 TWO WINGS

NEW CONSTRUCTION
PHASED - STUDENTS ON-SITE

N-9 THE HOOK

NEW CONSTRUCTION
PHASED - STUDENTS ON-SITE

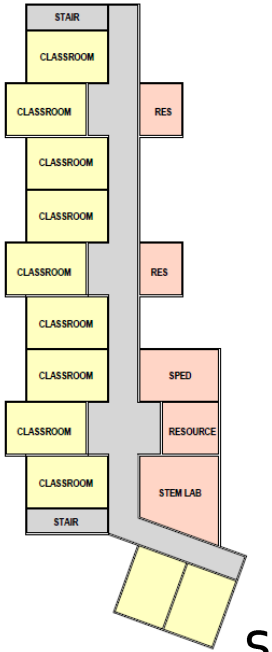
Classroom Community Arrangements

Classroom Communities

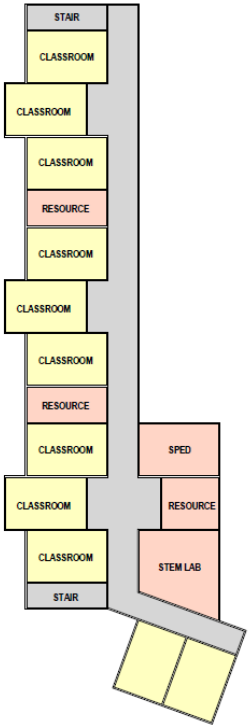
Linear vs. Cluster

EVALUATING THE OPTIONS

Classroom Community Arrangements: Linear

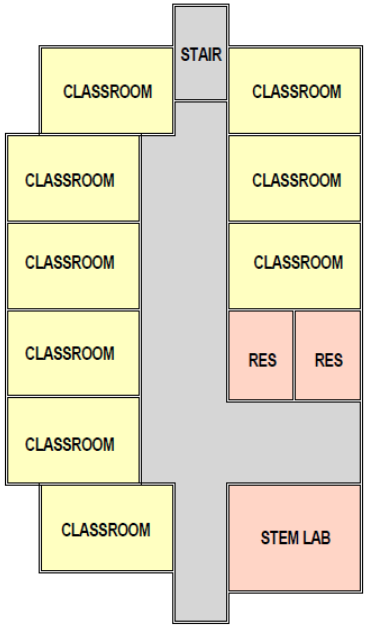


Scheme A

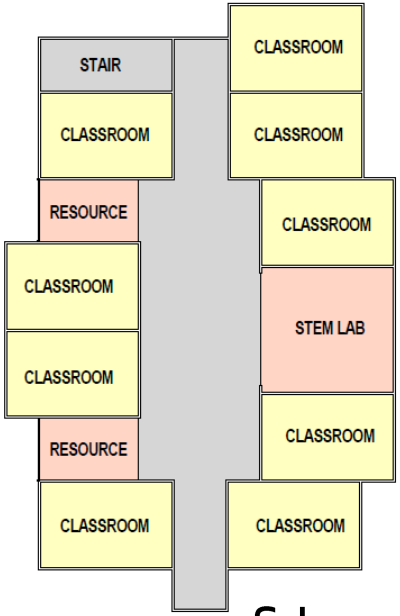


Scheme B

Classroom Community Arrangements: Cluster



Scheme A



Scheme B

8. Next Steps

Next Steps

1/10	Evaluating Options / Select Schemes for Estimating
1/22	Design Update
1/31	Community Meeting
2/1	Review Cost Estimates
2/5	Select Preferred Option
2/13	Joint Committee Approval of PSR
2/21	Submit PSR to MSBA

9. Other Topics Not Reasonably Anticipated (48 hours prior to meeting)

10. Public Comments

11. Adjourn

THANK YOU