<table>
<thead>
<tr>
<th>AGENDA</th>
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<tbody>
<tr>
<td>• Preferred Schematic Tasks</td>
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<tr>
<td>• Site Investigations</td>
</tr>
<tr>
<td>• Site &amp; Floor Plan Development</td>
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<tr>
<td>• Systems Considerations</td>
</tr>
<tr>
<td>• Evaluating Alternatives (Pros/Cons)</td>
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<tr>
<td>• Woodland Elementary Site Visit</td>
</tr>
<tr>
<td>• Public Outreach Plan</td>
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<table>
<thead>
<tr>
<th>MOD 3: Feasibility Study</th>
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<tbody>
<tr>
<td>3. Existing Conditions Investigation</td>
</tr>
<tr>
<td>4. Preliminary Design Program Initiative</td>
</tr>
<tr>
<td>a. Visioning Sessions</td>
</tr>
<tr>
<td>b. Educational Program</td>
</tr>
<tr>
<td>c. Initial Space Summary</td>
</tr>
<tr>
<td>d. Evaluation of Existing Conditions</td>
</tr>
<tr>
<td>6. Preliminary Design Program Submission (PDP)</td>
</tr>
<tr>
<td>7. Preferred Solution Study</td>
</tr>
<tr>
<td>8. Preferred Schematic Report Submission (PSR)</td>
</tr>
</tbody>
</table>
PREFERRED SCHEMATIC TASKS
District

- Address Supplemental Educational Plan Comments
- District Operating Budget Matrix
SITE INVESTIGATIONS
- Elm Street: Limited site survey completed
- Pearl Street: Wetlands delineation completed
- Pearl Street: Geotechnical Test Pits (scheduled 11/20/18)
- Pearl Street: Aerial Topographic Survey (complete by end of December)
Waterford Street
WATERFORD ADD/RENO PK-1 – SITE PLAN
Elm Street
ELM STREET PK-4 – FLOOR PLAN – SCHEME 1
Pearl Street
(Middle / High School Site)
PEARL STREET SITE – CONTEXT
PEARL STREET PK-4 – FLOOR PLAN – “E” SCHEME
PEARL STREET PK-4 – FLOOR PLAN – “Z” SCHEME
PEARL STREET PK-4 – SITE PLAN – 2-STORY SCHEME

- 6' TALL RETAINING WALL
- 10' TALL RETAINING WALL
- 20' TALL RETAINING WALL
- Option 3B
- Parking: 190 spaces
SYSTEMS CONSIDERATIONS
MECHANICAL SYSTEMS OPTIONS - INTRODUCTION

1. Option 1 - Variable Air Volume
   • with OR without Air Conditioning

2. Option 2 - Displacement Ventilation
   • With dehumidification OR with full Air Conditioning
     • A/C systems are optimized for cooling air while dehumidification systems are optimized for dehumidifying (drying) air.
     • Typical air conditioning systems supply air to spaces at 55F.
     • Systems designed for dehumidification purposes are controlled by humidity setpoints instead of space temperatures. They provide code required ventilation to the building, but are not sized to meet all of the buildings’ cooling needs.
OPTION 1 – VARIABLE AIR VOLUME (VAV)

Pros:
- Lower piping costs
- Low maintenance

Cons:
- Moderate room noise levels
- Reduce room control
- Reduced air quality (mixing)
- Slightly higher energy consumption
OPTION 2 – DISPLACEMENT AIR

- Ventilation air is provided from high efficiency heating/cooling Roof Top Unit w/ Energy Recovery Ventilation
- Air is delivered at low velocity and at low levels within the space
- The system uses naturally occurring buoyant forces within the space to create a vertical rise of the air throughout the space.
- Air rises with pollutants to ceiling
- Air returns at ceiling back to air handling unit
OPTION 2 – DISPLACEMENT AIR

Pros:
• Improved pollution removal
• Low noise levels
• Low air velocity
• Low moisture levels
• Reduced cooling loads
• Variable volume reheat is not required
• High ventilation effectiveness

Cons:
• Requires perimeter radiation heating
• May requires perimeter radiation cooling to maintain full AC setpoints during peak cooling conditions
FULL A/C VS DEHUMIDIFICATION ONLY

Full Air Conditioning (maintains 75 degrees & 50% relative humidity):
• Increased duct sizes
• Increased construction cost by approximately $8 / sq ft for area served
• Increased operational cost by approximately $0.30 – 0.70 / sq ft (depending on hours of use and utility rates)

Dehumidification (temperature floats, with a typical max of approximately 80 degrees)
• Reduced duct sizes
• Reduced construction costs
• Similar operational costs when compared to conventional non-conditioned buildings (typically $1.20 - $1.70 / sq ft depending on hours of use and utility rates)
Exact system does not need to be chosen yet

Both systems (or alternates) can be estimated – initial costs and life cycle costs

- Is there a strong desire to fully air condition the building?
- Can certain wings of the building be air conditioned? To allow for heavy summer use in portions of the building?
- Can dehumidification provide enough perceived cooling for shoulder seasons?
- Smaller spaces can also be air conditioned using Variable Refrigerant Flow system (mini-splits)
  - Medical Suite
  - Media Center
  - Administration
  - Server Rooms
EVALUATING ALTERNATIVES
(PROS / CONS)
<table>
<thead>
<tr>
<th>Project</th>
<th>Opt 2 Waterford Add/Reno PK-1 81,828 sq ft</th>
<th>Opt 4 Elm Add/Reno PK-4 164,592 sq ft</th>
<th>Opt 6 Pearl St New PK-4 143,880</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reno &amp; Additions</td>
<td>$ 20,000,000</td>
<td>$ 36,200,000</td>
<td>$ 37,300,000</td>
</tr>
<tr>
<td>Demo</td>
<td>$ 46,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowance for Hazmats</td>
<td>$ 750,000</td>
<td>$ 1,250,000</td>
<td></td>
</tr>
<tr>
<td>Allowance for Add’l Site</td>
<td>$ 150,000</td>
<td></td>
<td>$ 2,000,000</td>
</tr>
<tr>
<td>Sitework</td>
<td>$ 2,400,000</td>
<td>$ 4,344,000</td>
<td>$ 5,595,000</td>
</tr>
<tr>
<td>Contingencies and Escalation</td>
<td>$ 5,350,000</td>
<td>$ 9,710,000</td>
<td>$ 8,105,000</td>
</tr>
<tr>
<td>General Conditions &amp; Overhead</td>
<td>$ 3,800,000</td>
<td>$ 6,900,000</td>
<td>$ 7,005,000</td>
</tr>
<tr>
<td><strong>Total Estimate Construction Cost</strong></td>
<td><strong>$ 32,300,000</strong></td>
<td><strong>$ 58,600,000</strong></td>
<td><strong>$ 60,000,000</strong></td>
</tr>
<tr>
<td>Approx Project Costs</td>
<td>$ 42,000,000</td>
<td>$ 76,250,000</td>
<td>$ 78,000,000</td>
</tr>
<tr>
<td><em>Extremely Approx City Cost</em></td>
<td><em>$ 16,800,000</em></td>
<td><em>$ 30,500,000</em></td>
<td><em>$ 33,200,000</em></td>
</tr>
<tr>
<td>Option 2: Waterford Add/Reno PK-1</td>
<td>Option 4: Elm Add/Reno PK-4</td>
<td>Option 6: Pearl Street New PK-4</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
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<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>Estimated Project Cost: $41-43 Million</td>
<td>Estimated Project Cost: $75-77 Million</td>
<td>Estimated Project Cost: $77-79 Million</td>
<td></td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td><strong>Cons</strong></td>
<td><strong>Pros</strong></td>
<td><strong>Cons</strong></td>
</tr>
<tr>
<td>Least costly</td>
<td>Working with Waterford Street plan</td>
<td>One 21st Century building for all PK-6 students</td>
<td>Working with Elm Street building plan</td>
</tr>
<tr>
<td>Higher MSBA reimbursement for building reuse</td>
<td>Only addresses PK-1 student needs</td>
<td>Rehabilitates Existing Historic Building</td>
<td>Extremely tight site for vehicular requirements</td>
</tr>
<tr>
<td>School is in a neighborhood location</td>
<td>Hydrologic issues at this site</td>
<td>Higher MSBA reimbursement for building reuse</td>
<td>Requires additional environmental testing</td>
</tr>
<tr>
<td>Structurally sound, well-built building</td>
<td>Requires additional environmental testing</td>
<td>School is in a neighborhood location</td>
<td>Parking required at Stone Field</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Capitalizes on prior building investments</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Structurally sound, well-built building</td>
</tr>
</tbody>
</table>
WOODLAND ELEMENTARY SITE VISIT
MSBA Story of a Building - Woodland Elementary School, Milford, MA

PROJECT FACTS:

A. Grades: 3-5
B. Enrollment: 985 students (now at 1,000)
C. Year Completed: 2016
D. Building Area: 132,530 sq. ft.
E. Project Cost: $59,400,000 ($448/sqft)
F. Const. Cost: $49,450,000 ($373/sqft)
G. Reimbursement Rate: 51%
H. Construction Method: Construction Manager at Risk (Shawmut)
I. No Debt Exclusion required because of town reserves
J. 1:1 school – with assigned Chrome Books – that stay at school overnight
PROCESS LESSONS LEARNED:

A. Have teachers start packing early – and restrict what can be moved to new building as much as possible
B. The three weeks before school opens are crazy and daunting
C. Punch list may continue to be addressed throughout the whole first year of opening the school
D. 3 lunches/day works well
E. School circulation patterns and scheduling have to be figured out over time
F. Negotiate. Cisco phone system was negotiated down in price since the whole town went with Cisco
SITE LESSONS LEARNED:

~200 dedicated parking spaces is enough for daily operation, but prevents the school from having school-wide events, or inviting all of the parents at once. Open House is spread over a week for instance.
PUBLIC OUTREACH PLAN
Public Meetings - January

Key City Leaders?

Flyers?

Info tables at Public Events?

Website?

Social Media Presence?
### FEASIBILITY STUDY & SCHEMATIC DESIGN SCHEDULE

**August 30, 2018**

**Assumption - SBC Meetings (3rd Wednesday of Month)**

#### Feasibility/SD Schedule

<table>
<thead>
<tr>
<th>MOD 2: Forming the Team</th>
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<tbody>
<tr>
<td><strong>CPA Review/Panel Meeting:</strong> March 5</td>
</tr>
</tbody>
</table>

| DSP meetings: May 13 & 27, April 11 & 24, May 8 & 22, June 5 & 19, July 13 & 24, Aug 7 & 21 |

**MOD 3: Feasibility Study**

- **5 wks**
- **13 wks**
- **TBD**
- **TBD**
- **TBD**

- **Aug 31**

- **December 17, 2018**

- **FAS Meeting: January 16 or 23, 2019**

- **February 13, 2019**

**MOD 4: Schematic Design**