The University of Vermont
STEM Initiative

Pre-Construction Services
Site Visit and Informational Meeting
Angell Hall Room 112
January 8, 2014
Science Technology Engineering and Mathematics (STEM) Pre-Construction Services Site Visit Agenda

Introductions and Project Description
Robert Vaughan
Director
Capital Planning & Management

General Overview of Program Status
Michael Lauber, FAIA
President
Ellenzweig Architecture/Planning

Utilities: Infrastructure and Systems
David Blatchly, PE
Zone Manager
Physical Plant Department

Review of RFP Requirements
Todd Merchant
Senior Construction Administrator
Facilities Design and Construction

Questions
UVM STEM Vision

- The STEM vision for the University of Vermont is to design interdisciplinary facilities to provide 21st century classroom, teaching and research laboratories, enhanced with the latest in technology.

- This multidisciplinary approach will include the program requirements of Chemistry, Physics, Engineering, Mathematics and Statistics, and Psychology in a phased project concept.
## Conceptual Program Components
### By Department/Function

<table>
<thead>
<tr>
<th>STEM Program</th>
<th>Net Assignable Square Feet (NASF)</th>
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</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>43,349</td>
</tr>
<tr>
<td>Physics</td>
<td>23,315</td>
</tr>
<tr>
<td>Psychology</td>
<td>22,023</td>
</tr>
<tr>
<td>Mathematics &amp; Statistical Sciences</td>
<td>15,336</td>
</tr>
<tr>
<td>Computer Science</td>
<td>5,066</td>
</tr>
<tr>
<td>School of Engineering</td>
<td>37,111</td>
</tr>
<tr>
<td>Engineering, Dean’s Office</td>
<td>11,112</td>
</tr>
<tr>
<td>Registrar’s Office (General Purpose Classrooms)</td>
<td>6,035</td>
</tr>
<tr>
<td>Chiller Plant (Utility Area)</td>
<td>8,400</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>171,747</strong></td>
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The University of Vermont Campus Map
Facilities – Existing Buildings Impacted

- Dewey Hall
  - Psychology
  - Year Built: 1905
  - 45,109 Gross SF

- 12 Colchester (Pearl House)
  - Math & Stats
  - Year Built: ca1789
  - 9,165 Gross SF

- Mansfield House
  - Math & Stats
  - Year Built: 1861
  - 6,679 Gross SF

- Angell Lecture Hall
  - Year Built: 1969
  - 11,079 Gross SF

- 16 Colchester (Henry Lord House)
  - Math & Stats
  - Year Built: ca1890
  - 11,475 Gross SF

- Perkins Hall
  - Engineering & Math
  - Year Built: 1891
  - 21,868 Gross SF

- Votey Hall
  - Engineering & Math
  - Year Built: 1964
  - 51,234 Gross SF

- Cook Physical Science
  - Chemistry & Physics
  - Year Built: 1969
  - 117,494 Gross SF
Facilities – Existing Building Deficiencies

Dewey Hall
- Psychology
- Year Built: 1905
- 45,169 Gross SF
- DM: $4,000,000
- Roof replacement
- Front stair replacement
- Rebuild interior to improve functionality

12 Colchester (Pearl House)
- Math & Stats
- Year Built: ca1799
- 9,195 Gross SF
- EST DM: $595,000
- New metal roofing required
- Aged plumbing
- Elevator upgrade required
- Local fire alarm only

Mansfield House
- Math & Stats
- Year Built: 1891
- 6,679 Gross SF
- DM: $366,000
- New boiler required
- Aged fire alarm & electrical
- Aged interior
- Moisture issue in basement

Angell Lecture Hall
- Year Built: 1969
- 11,079 Gross SF
- DM: N/A
- Inefficient use of land
- Classroom standards

16 Colchester (Henry Lord House)
- Math & Stats
- Year Built: ca1900
- 11,475 Gross SF
- DM: $620,000
- Total building envelope work required
  (siding, porches, roof)
- Aged interior
- Aged lighting, power, fire alarm, plumbing
- Single glaze windows; storm windows required
- ADA lift; non-functioning

Perkins Hall
- Engineering & Math
- Year Built: 1881
- 21,858 Gross SF
- DM: $2,000,000
- Roof replacement
- ADA codes
- Exterior
- Heating system

Votey Hall
- Engineering & Math
- Year Built: 1964
- 81,204 Gross SF
- DM: $5,000,000
- Lack of research space

Cook Physical Science
- Chemistry & Physics
- Year Built: 1969
- 117,494 Gross SF
- DM: $24,000,000
- Building envelope
- Ventilation & exhaust rates
- Temperature & humidity control
- Vibration limitations
- Emergency power & system redundancies

UVM BOUNDARY (APPROXIMATE)
STEM Conceptual Plan – Phased Approach
STEM Conceptual Plan – Phase I
Demolish Angell Lecture Hall, Construct STEM Laboratory Facility
STEM Conceptual Plan – Phase II
Renovate Cook Physical Science Building into STEM Classroom/Administrative Facility
STEM Conceptual Plan – Phase III
Renovate Laboratories in Votey Building in Phased Sequence
Main Green View Corridor
### STEM Facilities – Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>February 1, 2014</td>
<td>Complete conceptual design</td>
</tr>
<tr>
<td>February 15, 2014</td>
<td>Select pre-construction services firm</td>
</tr>
<tr>
<td>May 1, 2014</td>
<td>Complete schematic design and cost estimate</td>
</tr>
<tr>
<td>Jan/Feb 2015</td>
<td>Complete construction documents</td>
</tr>
<tr>
<td>June 1, 2015</td>
<td>Begin construction on new lab/teaching building</td>
</tr>
<tr>
<td>December 1, 2016</td>
<td>Complete lab building construction</td>
</tr>
<tr>
<td>January 1, 2017</td>
<td>Begin Cook reconstruction</td>
</tr>
<tr>
<td>June 1, 2018</td>
<td>Complete Cook reconstruction</td>
</tr>
<tr>
<td>2015-2018</td>
<td>Periodic renovations in Votey Hall</td>
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</tbody>
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Some Basic UVM Info

• 425 acres of maintained acreage..
• Central Steam Plant (4) 40K #/hr (1) 64K #/hr (Nat Gas/ #6 Interruptible)
• Central Chilled Water Plant (2) 1300 Ton YST Steam Driven
• HSRF Chillers (2) 1000 ton single effect absorbers
• Several smaller electric chillers not typically used.
• Back Up/Peaking Boilers  Given, Marsh Life Sci, PFG, L&L, Simpson, MAT
• Research to Day Care
• Over 5.7 Million Square Feet, 5.2 On Main Campus, Over 200 Buildings
• 70,000 Control Points On Johnson and Honeywell Systems
• Delta V Boiler Controls
# Square Footage Growth

## Main Campus Burlington

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total Gross - All Sites - Owned-Leased Bldgs</th>
<th>Total Gross - All Sites - Owned Bldgs</th>
<th>Gross - Main Campus - Owned Bldgs</th>
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</thead>
<tbody>
<tr>
<td>2001</td>
<td>4,318,565</td>
<td>4,249,930</td>
<td>3,679.764</td>
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<tr>
<td>2002</td>
<td>4,578,173</td>
<td>4,571,338</td>
<td>3,935.475</td>
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<tr>
<td>2003</td>
<td>4,906,520</td>
<td>4,758,640</td>
<td>4,192.295</td>
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<tr>
<td>2004</td>
<td>4,939,002</td>
<td>4,775,467</td>
<td>3,865.460</td>
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<tr>
<td>2005</td>
<td>4,842,607</td>
<td>4,777,795</td>
<td>4,231.921</td>
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<tr>
<td>2006</td>
<td>5,210,647</td>
<td>5,210,647</td>
<td>4,566.574</td>
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<tr>
<td>2007</td>
<td>5,672,984</td>
<td>5,556,868</td>
<td>5,036.836</td>
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<td>2008</td>
<td>5,736,856</td>
<td>5,624,856</td>
<td>5,071.471</td>
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<tr>
<td>2009</td>
<td>5,731,465</td>
<td>5,616,335</td>
<td>5,062.602</td>
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<td>2010</td>
<td>5,751,742</td>
<td>5,633,091</td>
<td>5,080.988</td>
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<td>2011</td>
<td>5,862,283</td>
<td>5,740,406</td>
<td>5,191.147</td>
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</tbody>
</table>

**Main Campus includes the following districts: Trinity, Central, Centennial, University Heights, Redstone, Athletic.**

39.5 % Increase In Square Footage
Capacity of Plant

Steam

• We reduced steam demand although campus expanded. 150K vs 130K
• Steam investment and strategies set up for more expansion
• Distribution lines close by project site
• Low pressure vs. Higher pressure for new buildings

Chilled Water

• Chilled water plant at capacity
• No additional reserve
• Need to tie in capacity to central system.
• (future?) hybrid, storage, steam, electric etc.
Existing Services to Cook Building

- 4" Cold Water
- 6" Fire/Sprinkler
- 2" Gas
- 6" Steam
- 2" Condensate
- 8" Sanitary/Lab Waste
- 10" Storm Drain
- 750 Kva Transformer (Primary 13.8v from Votey Switch)
- No Central Chilled Water
2010 Steam/Chilled Water Improvements

Cook North: Two vaults
10” HPS & 16” CHW
2011 Steam/Chilled Water Improvements

Cook East:
One vault
12” HPS & 18” CHW w/10” CHW futures