ADVISORY TO THE PUBLIC: The Jones Library System is closed to the public; this special Jones Library Trustee Committee meeting will occur virtually via ZOOM and will be streamed live here:

You are invited to a Zoom webinar.
When: Sep 8, 2020 02:00 PM Eastern Time (US and Canada)
Topic: Joint "Buildings & Facilities" and "Feasibility & Design" Committees Meeting 9/8 at 2pm

Please click the link below to join the webinar:
https://amherstma.zoom.us/j/99762922718

Or iPhone one-tap :
US: +13126266799,,99762922718# or +16468769923,,99762922718#
Or Telephone:
Dial(for higher quality, dial a number based on your current location):
US: +1 312 626 6799  or +1 646 876 9923  or +1 301 715 8592  or +1 408 638 0968  or +1 669 900 6833  or +1 253 215 8782  or +1 346 248 7799
Webinar ID: 997 6292 2718
International numbers available: https://amherstma.zoom.us/u/aceBXfxnUG

Meeting Agenda

I. Call to Order (Welcome, Austin, Tammy, Alex, Lorin, Kent, Bonnie, Janice, Joan, George, and Sharon!)

II. Approval of Minutes (8-26-20) *

III. Schematic Design Recommendations *

IV. Adjournment

** Please note that the list of topics in this notice was comprehensive at the time of posting, however the public body may consider and take action on unforeseen matters not reasonably anticipated by the Chair 48 hours in advance of the meeting.

* Denotes handout(s) will be made available.

Red indicates vote required.
I. Sustainability meeting called to order at 1:03 pm.

II. Feasibility meeting called to order at 1:03 pm.

III. Minutes
   A. MOTION: To approve the minutes of July 2, 2020 for Sustainability Committee. Approved 4-0-0
   B. MOTION: To approve the minutes of July 2, 2020 for Feasibility Committee. Approved 5-0-0 (Bonnie joined the meeting after the vote)

IV. Sustainability Study Recommendations (Draper and Lefebvre)
   A. Alex said that the MBLC requirement to change the location of the Large Meeting Room presented an opportunity to look at sustainability for the Library building.
   B. Sara summarized the recommendations of the Sustainability Committee. There were 5 Climate Goals that would reduce carbon by 50% by 2030
      i. more efficient building (low energy use),
      ii. renewable energy supply,
      iii. avoid fossil fuels,
      iv. minimize carbon emissions of construction, and
      v. balance efficiency with low carbon construction.
      vi. These goals were sent to FAA.
   C. There was a Whole Life Cycle Analysis done for the Library building. The Energy Use Intensity (EUI) of the current Jones Library building was determined to be about 72, close to the average of 70 for library buildings. The design for the Jones project is likely to reduce this EUI by about 50% to about 34.5. Repairing the current building would not result in a reduction.
   D. The Sustainability Committee looked at costs/benefits of 12 Energy Conservation Measures (ECM). They recommended five measures – lighting controls, two types of HVAC controls, plug load controls, and photovoltaics (PV). Two measures (triple pane glass glazing and window overhang) should be considered and four are not recommended. The recommended measures would increase the cost by $290,650.
E. Using Cross Laminated Timber (CLT) rather than steel and concrete could reduce the carbon impact by about two-thirds. The cost would increase about $365,926. The Sustainability Committee recommends this change.

F. The carbon emissions over the next 60 years from the proposed building, including demolition, are expected to be about one-third less than they would be from the current Library building.

G. In summary, the Sustainability Committee is recommending Energy Conservation Measures at a cost of $290,650 and using Cross Laminated Timber at a cost of $365,926.

H. Discussion followed about additional funding, including the possibility of obtaining grants and rebates and finding savings in the current plan. Sarah said that if only one recommendation could be funded, she would choose CLT, a more permanent part of the building whereas some of the ECMs can be added later. Beth said that for some measures such as PV to be added later, wiring could be added into the original plan when it would be easier and less costly. Members of the Sustainability offered to help finding funding for these measures in the future.

I. For the Feasibility Committee, Kent made a motion seconded by Joan to approve the recommendation of the Sustainability Committee and forward this recommendation to the Buildings and Facilities Committee and then to the Jones Library Trustees, if they approve.

J. Discussion included comments mostly about the additional cost and affordability. There is a 10% contingency built into the estimate. These measures will reduce annual operating costs. The Feasibility Committee expressed appreciation to the Sustainability Committee for their work and for developing this sustainability plan.

K. The Feasibility Committee voted 6-0 to approve this motion.

V. Adjournment
   A. Sustainability Committee adjourned 2:34 pm
   B. Feasibility Committee adjourned 2:34 pm.

Respectfully submitted by Janice Ratner
Sustainability Goals
Jones Library
Sustainability Goals Schematic Design Package

August 5, 2020
Report

Date: August 30, 2020

To: Sharon Sharry, Sustainability Committee (SC)
From: Finegold Alexander Architects (FA)

Project Name: Jones Library
Project No.: P0095.00
Subject: Sustainability Goals for Jones Library

The Jones Library was built in 1928 and has since had only one major renovation in 1993. The proposed project would create a 3-story addition at the rear of the building and renovate the existing historic building to meet the contemporary needs of the facility. Among the goals of this project are a series of sustainability goals as outlined in the memo dated October 28th, 2019. Finegold Alexander Architects appreciates the clear goals of the Sustainability Committee and its strong commitment to sustainable design. The design team has performed an investigation of the design goals as reflected in the proposed Schematic Design1. As a Schematic Design report, the findings enumerated within this report are to inform a baseline which can be studied and improved upon at each subsequent phase. The findings are presented below and in the attached documents.

EUI Goal/Net Zero

Based on email correspondence from the Jones Library, the current site EUI of the existing library building is 73.2 kBtu/sf/year. This is consistent with data collected by the 2012 Commercial Building Energy Consumption Survey (CBECS) which lists the Median site EUI for library buildings in the United States as 71.6 kBtu/sf/year. An analysis of the proposed design based off the schematic energy model (Attachment A) indicates a predicted Energy Use Intensity (pEUI) of 34.4, showing a 52% decrease in energy performance over the median site EUI for library buildings. The pEUI does not assume the use of any on site renewable energy sources which could further decrease the EUI. The design team has

1 An alternate low carbon composite wood and CLT structural system was also developed.
enumerated additional energy conservation measures (ECMs) that could further decrease the site EUI at the discretion of the client (Attachment B). With the implementation of selected ECM’s, Net-Zero Energy could be achieved through purchased off-site renewable energy.

Investigation of On-Site Renewable Source Options

The proposed design currently includes a high efficiency VRF space conditioning system. Under the current design, the yearly cost of space conditioning would be $27,255.09. An investigation of an alternative geothermal system shows that, the yearly cost of space conditioning with a geothermal system would be $19,559.45. Due to the current moratorium on limiting gas usage to the current installed capacity, information on possible rebates is not currently available. Without rebates, the simple payback period for a geothermal system would be 148 years (Attachment C).

Eliminate Use of Fossil Fuels

The existing building is serviced by natural gas that is powering the heating boilers and hot water heater. The proposed design eliminates all gas-powered systems and replaces them with systems that are powered by electricity (Attachment D).

<table>
<thead>
<tr>
<th>ECM #</th>
<th>Measure Description</th>
<th>kWh</th>
<th>$/h</th>
<th>Electric savings</th>
<th>Total Cost Savings</th>
<th>Total EUI Savings</th>
<th>Budget Implications</th>
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<td>ECM#1</td>
<td>Attic Insulation</td>
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<td>$600</td>
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<td>$5,412</td>
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<td>$343,052.00</td>
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<td>Triple Pane Window Glazing for All Windows</td>
<td>17,153</td>
<td>$3,430</td>
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<td>$3,430</td>
<td>0.00</td>
<td>$7,258.00</td>
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<td>$14</td>
<td>0</td>
<td>$14</td>
<td>0.00</td>
<td>4,258.00</td>
</tr>
<tr>
<td>ECM#5</td>
<td>Window Overhang</td>
<td>3,084</td>
<td>$617</td>
<td>0</td>
<td>$617</td>
<td>0.16</td>
<td>1,062.12</td>
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<tr>
<td>ECM#6</td>
<td>Lighting Controls</td>
<td>20,150</td>
<td>$4,602</td>
<td>0</td>
<td>$4,602</td>
<td>1.06</td>
<td>18,236.00</td>
</tr>
<tr>
<td>ECM#7</td>
<td>Geothermal Heating/ Cooling</td>
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<td>$7,716</td>
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<td>$7,716</td>
<td>2.02</td>
<td>25,530.00</td>
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<td>ECM#8</td>
<td>HVAC Occupancy Controls</td>
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<td>$246</td>
<td>0</td>
<td>$246</td>
<td>0.07</td>
<td>35,530.00</td>
</tr>
<tr>
<td>ECM#9</td>
<td>HVAC Demand Temperature Controls</td>
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<td>$12,083</td>
<td>0</td>
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<td>3.16</td>
<td>35,530.00</td>
</tr>
<tr>
<td>ECM#10</td>
<td>Plug Load Controls</td>
<td>8,650</td>
<td>$1,300</td>
<td>0</td>
<td>$1,300</td>
<td>0.35</td>
<td>35,530.00</td>
</tr>
<tr>
<td>ECM#11</td>
<td>Photovoltaics</td>
<td>12,238</td>
<td>$2,448</td>
<td>0</td>
<td>$2,448</td>
<td>0.64</td>
<td>7,257.57</td>
</tr>
</tbody>
</table>

Eliminated Total Savings of ECM #4 | 191,030 | $30,207 | 0 | $30,207 | 10.00 |

Percentage Reductions | 29% | 0 | 0% | 29% | 29% | $3,014,515.00

Note: Assuming all Energy Conservation Measures are implemented, it is possible for the project to achieve a pEUI of 24.4 kBtu/sf/year

The above highlighted Energy Conservation Measures would indicate a predicted Energy Use Intensity of approximately 29 kBtu/sf/year

Table 1: Summary of Energy Conservation Measures

<table>
<thead>
<tr>
<th>ECM #</th>
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<td>1,062.12</td>
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<tr>
<td>ECM#6</td>
<td>Lighting Controls</td>
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Eliminate Use of Fossil Fuels

The existing building is serviced by natural gas that is powering the heating boilers and hot water heater. The proposed design eliminates all gas-powered systems and replaces them with systems that are powered by electricity (Attachment D).
Low Embodied Carbon Materials
The feasibility completed in 2016 and the revised schematic design focused on a conventional steel framed structural system that consisted of a composite concrete and metal deck slab on a structural steel column and beam system. In the interest of pursuing a building with low embodied carbon materials, we worked with our structural engineer (RSE) to prepare a schematic package with an alternative heavy timber hybrid structural system. The alternative proposes maintaining a conventional steel column system in the basement and a heavy timber structural on the upper floors. The heavy timber system consists of cross-laminated timber (CLT) floor slabs on glue laminated (glulam) columns and beams. The system alternates are detailed in the attached structural documentation (Attachment E). The design team performed a comparative Life Cycle Assessment (Attachment F) that examined the environmental impact of the structural systems as shown in attachment E. The results showed that the timber structure resulted in significantly less Global Warming Potential than the steel structure.

To fully understand the impact of the structural system options, the building estimate includes a cost comparison (Attachment G). This estimate shows that the hybrid heavy timber and steel system would result in a cost increase of $365,926.00. The full breakout of this cost is detailed in the attached cost estimate.
**Columns Supporting Steel beams**

- Metal deck over steel beams.
- Steel 1st Floor Framing: 6.25" Concrete Slab on Grade.

### Scheme 1: (Transfer Columns at 1st Floor)

- 6 Columns down (CD) at seating perimeter.
- 6 Columns up (CU) at interior.

### General Notes

1. Remove all non-structural masonry walls. Keep only 1.6" hollow core unit cores, unless noted.
2. Provide New concrete slab on grade as indicated on plans.
3. No concrete finish is assumed to remain.
4. Provide New concrete finish as noted on plans.
5. Remove existing concrete floor, slab on grade, as noted on plans.
6. Provide new concrete finish as indicated on plans.
7. Provide New concrete finish and exterior finishes as noted on plans.
8. Remove Existing concrete floor, slab on grade, as noted on plans.
9. Provide New concrete finish as indicated on plans.
10. Provide New concrete finish and exterior finishes as noted on plans.
11. Provide New concrete floor, slab on grade, as indicated on plans.
12. Provide New concrete finish as indicated on plans.
13. Provide New concrete floor, slab on grade, as indicated on plans.

### Structural Narrative - New Slab

- Existing Wall to Remain
- New Wall to be flush with existing slab.

### Exterior Finishes

- Provide New Ice and Water Shield, Copper Flashing, Snow Guards, Gutters, and Soffits.

### Project Information

- Finegold Alexander Architects
- Project Issue Date: 5/11/2020
- Project #:
- Construction Administrator: Finegold Alexander Architects
- FA Project Template
- Project #:
- 5/11/2020
- RSE Associates.

### Geometric Key

- Finegold Alexander Architects
- Sheet A101
- Project Issue Date: 5/11/2020
- Project #:
- Construction Administrator: Finegold Alexander Architects
- FA Project Template
- Project #:
- 5/11/2020
- RSE Associates.
Scheme 1:
- 2nd & Roof Framing: 2" Topping over 1''
- Acoustic Layer over 5 Ply CLT (6.7'')
- Glulam beams & Glulam columns
Whole Building Life Cycle Assessment (LCA) is the most widely accepted method for assessing embodied carbon. In addition to exploring alternative structural systems to reduce the embodied carbon of the new addition, the design team has prepared a Whole Building Life Cycle Assessment that explores the embodied carbon of the proposed addition. This number is listed as Global Warming Potential and the results are expanded upon below. The design team is prepared to continue to work towards lowering the embodied carbon of the building with comparative analyses in subsequent phases.

**Whole Building Life Cycle Assessment**

The attached Life Cycle Assessment (LCA) was performed using the Tally Life Cycle Assessment software (Attachments H, I and J). The scope of the assessment includes core, shell, footings, foundations, structural wall assemblies from cladding to interior finishes, structural floors and ceilings, interior non-structural walls and finishes, and finishes on structural floors and ceilings for the new addition and the existing portion that will remain. The assessment found that, among other environmental impacts, the proposed design had a total Global Warming Potential of 1,433,189 kgCO₂eq. This number is based on the schematic design and should be considered a baseline. To gain a fuller understanding of the impact of the new work being performed, the design team also produced a LCA that evaluated the new addition alone and an LCA that evaluated the portion being demolished. The report of the new addition found that it has a total Global Warming Potential of 1,274,228 kg CO₂eq. It can be assumed that for the purposes of this report, Global Warming Potential of the demolition portion of the project can be represented by the End of Life impact alone. The report of the demolished portion found an End of Life Global Warming Potential of 17,773 kg CO₂eq. The environmental impacts as quantified by the impact categories in the LCA can be improved through various measures such as adding fly ash to the concrete and reducing material usage throughout the design. The design team is prepared to present options to lower the environmental impacts of the facility at the discretion of the client as the project progresses into later stages of design.
In addition to studying the environmental impacts of construction, the design team studied the impacts of operational energy. Based on the current EUI of the existing building (73.2 kBtu/sf/year) and assuming 22% of that energy is heating from natural gas, over 60 years the Global Warming Potential is 18,288,925 kgCO$_2$eq. In addition to the proposed project having an initial Global Warming Potential of 1,433,189 kgCO$_2$eq, the study showed an operational Global Warming Potential of 11,382,681 kgCO$_2$eq and a total Global Warming Potential of 12,815,870 kgCO$_2$eq.

**Attachments:**
Attachment A: Energy Model pEUI report  
Attachment B: Potential Energy Conservation Measures  
Attachment C: Summary of Renewable Energy Investigation  
Attachment D: Summary of Proposed New Systems  
Attachment E: Structural System Schematic Schemes and Narrative  
Attachment F: Life Cycle Assessment Design Option Comparison  
Attachment G: Structural System Estimate  
Attachment H: Life Cycle Assessment Report (New and Existing)  
Attachment I: Life Cycle Assessment Report (New)  
Attachment J: Life Cycle Assessment Report (Demolition)
In summary, FAA will proceed into Design Development moving forward with the green highlighted ECM measures below and the schematic heavy timber alternate. Yellow highlighted items will be reviewed during Design Development.

<table>
<thead>
<tr>
<th>ECM #</th>
<th>Measure</th>
<th>Electric Savings kWh</th>
<th>Total Cost Savings</th>
<th>EUI Reduction</th>
<th>Initial Cost</th>
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<td>ECM#7</td>
<td>Lighting Controls</td>
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<tr>
<td><strong>Total</strong></td>
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<td></td>
<td><strong>$20,142</strong></td>
<td><strong>-5.28</strong></td>
<td><strong>$290,650</strong></td>
</tr>
</tbody>
</table>

✓ EUI for the expanded and renovated building would be reduced from 34.4 to 29.12 meeting the goal of 25-30.

| ECM#4 | Triple Pane Window Glazing *      | 17,153               | $3,430             | -0.90         | $1,346,798   |
| ECM#6 | Window Overhang **                | 3,084                | $617               | -0.16         | $216,400     |
| **Total Savings with ECM#4** |                             | 191,038              | $38,207            | -1.06         | $1,563,198   |

*Limit to north facing windows. Cost to be included as a line item during design and development.
** Review during design development to determine cost/benefit analysis.

Schematic Alternate: Cross Laminated Timber Additional Cost: $365,926
As requested by Jones Library, in light of current events regarding COVID-19, we have developed a list of items that may want to be considered and/or addressed moving forward. Some of these items may become permanent changes moving forward. Once we proceed into Design Development, this list will need to be reviewed and updated as things are evolving and changing daily at the moment.

1. Circulation Paths
   a) One-way paths of travel to maintain the required minimum distances.
   b) If multiple entry points are an option, entry and exit can be kept separate. Current proposed design has entry points at the front and rear of the building and at the Children’s on the west wing.
   c) Perhaps multiple entry points may cause security concerns; other things to consider is that staff now might be separated to maintain physical distancing so they could potentially be relocated to an entry/exit point.

2. Vertical Circulation
   a) With more people using stairwells, if possible, try to keep each stairwell designated for one-way travel.
   b) Implement mirrors at landings as visual cues for people to see if someone is approaching.
   c) Major open central stair could potentially maintain two-way travel.

3. Meeting Rooms
   a) How will this space be used moving forward?
   b) Separate entry and exit points with one-way circulation within the room.
   c) Space for waiting - Foot markers potentially located where people should be waiting prior to entry and upon exiting if there will be “X” number of people in the room.
   d) Seats can be removed or taped off during social distancing protocols - Plexi-barriers could potentially help with some separation.
4. Space Planning/Furnishings
   a) Rearranging of furniture will require a sufficient amount of storage space to
      house furniture not in use during the pandemic.
   b) Book stacks and furniture to be relocated to maintain clear paths of travel and
      maintain one-way aisles.
   c) Book stacks should have sufficient space at the aisles:
      - One person per aisle at a time
      - Waiting space for patrons to enter the aisles.
      - Distance between the stacks or plexi-barriers
   d) Any seating, lounge or otherwise, should not be in the path of circulation.
   e) Plexi barrier for reception desk, computer stations, etc.
   f) Adding more mobile partitions and barriers to loose furnishings budget.

5. Administrative Spaces
   a) Circulation within administrative spaces will need to be reviewed.
   b) Can staff be separated?

6. Signage
   a) Signage, in addition to typical building signage, will need to be an important
      factor to maintain the desired circulation patterns and adherence to
      distancing guidelines.

7. Touchless Technology
   a) Door and entryways
   b) Touchless sign-in procedures/kiosks
   c) Bathrooms
      - After-hours UV disinfection
      - Automatic flushometers
      - Enclosed bathroom stalls
      - Automatic closing lids
      - Automatic bathroom doors or foot pulls
      - Automatic paper towel dispensers
      - Open trash dispensers located by door
   d) Sanitization stations at entry points

8. Enhanced HVAC Systems
   a) Air Quality
      o Disable demand-controlled ventilation.
      o Extend hours of operation and consider pre/post occupancy
         Purge ventilation
      o Provide CO2 sensors in densely occupied spaces.
      o Increasing air quantity (air changes per hour).
o Provide normal units capable of normal sequence of operation and epidemic mode of operation of ventilation.

o Create epidemic mode building sequence of operation to operate exhaust fans 24/7, pre-purge and post purge building with ventilation air before and after occupied hours, continuously maintain space temperature setpoints 24/7, override CO2 demand control sequences of operation, operate at increased ventilation per above, operate building in purge mode during cleaning or disinfection operations, monitor CO2 levels, reset discharge air temperature of units that serve variable air volume terminal units to maximize ventilation, etc.

b) Air Treatment

  o HEPA filters – Provide MERV 13 filters
  o Electronically charged filters
  o Bipolar ionization (inside the air handling unit)
  o UV Lighting/Plasma Decontamination Systems
    ▪ UV lights can be installed as upper room light sources directed up towards the ceiling.
    ▪ UV lights can be installed in ceiling tiles if on occupancy sensors can sanitize spaces when unoccupied.
    ▪ Provide UV decontamination lighting for highly touched surfaces.
    ▪ Can be installed inside return duct or in air handling equipment – this can be done for all equipment that recirculates air.
    ▪ Portable fully automated units can be controlled remotely.
    ▪ Key is time and intensity the air is exposed to UV.
    ▪ Emerging technologies and new equipment currently being developed.

c) Humidification

  o Higher levels of indoor relative humidity has been shown to decrease the dispersion of droplets.
  o Provide humidifiers for mechanical equipment to maintain RH to 40%-60% in winter months.
  o Provide cooling systems with hot gas reheat or reheat coils to maintain RH to 40%-60% in summer months.
  o Use smaller HVAC zones within the building footprint.