

First UU Roof and Clean Energy Task Force

Presentation of Findings and
Recommendations

Agenda

- ▶ Current State of Roof
- ▶ Climate Change, Net Zero Buildings and UU Principles
- ▶ Suitability for Solar
- ▶ Scope of replacement
- ▶ Additional Sustainability Measures
- ▶ Recommended Plan

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The current
state of the
roof....



Current State of the Roof

- ▶ 25+ years old, problematic for decades

Installed in 1995 (approx), repaired in 2015

- ▶ Multiple water leaks, large amount of HVAC inefficiency
- ▶ Pooling water
- ▶ Window trim around clerestory windows rotting and compromised
- ▶ Side paneling deteriorating

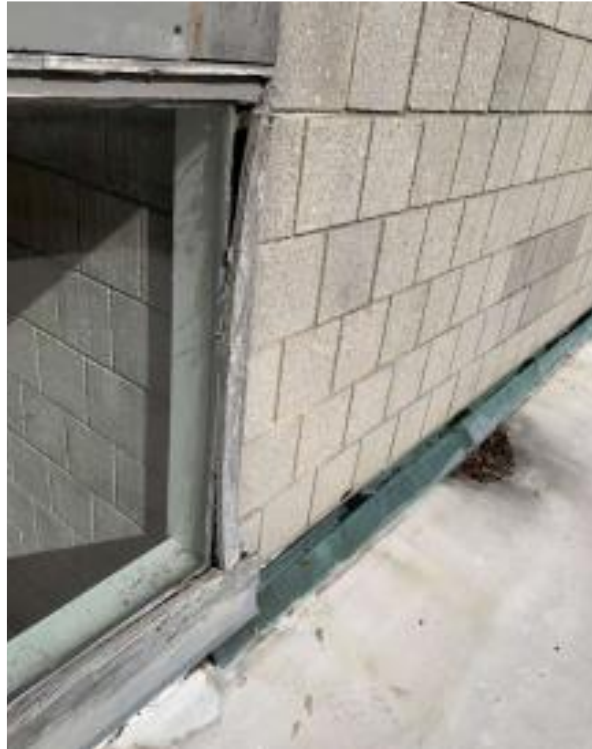
Current State of the Roof

► Pooling Water on the Roof



Current State of the Roof

- ▶ Compromised windows and trim



Current State of the Roof

- ▶ Deteriorating side paneling



Roof - Feedback from Contractors

- ▶ This is a full replacement, not a repair or patch
- ▶ Need to address the full building envelope, meaning not just the roof but also the windows, trim and side paneling
- ▶ Taper on roof is incorrect, water pools instead of flowing to drainage points

Climate Change

- ▶ The roof is in disrepair and needs to be addressed
- ▶ But our building produces significant climate emissions and we shouldn't take on any major renovation of our facility without considering how such work serves to reduce our carbon footprint.

Climate Change and UU Principles

- ▶ Our 7th principle, “the interdependent web of life,” calls us to act on climate.
 - ▶ Climate Change threatens to disrupt life across the planet.
- ▶ Our 6th principle, “the goal of world peace, harmony and justice,” calls us to act on climate.
 - ▶ Sea levels will rise; extreme weather events will become more common; large swaths of the planet will become uninhabitable, exacerbating famines, food and water shortages.
 - ▶ The global poor will be hit the hardest. Developing nations have contributed the least to the problem but will bear the brunt of its effects.

How Does First UU Create Carbon Emissions?

- ▶ **We consume electricity**
 - ▶ First UU used 134,240 kWh of electricity over the past 12 months.
 - ▶ Our electrical use alone equates to roughly 11.5 average US homes.
 - ▶ Because Dominion Power currently gets the majority of its electricity by burning coal and gas, we're burning a lot of fossil fuels in order to turn on our lights.
- ▶ **We heat our church with natural gas**
 - ▶ First UU has 14 heating units on its roof. Of those, 10 are powered by natural gas. Burning gas to heat our church produces emissions.
- ▶ **We are very inefficient with the electricity and heat we produce**
 - ▶ A recent energy audit found that we're losing a large amount of the heat and cool air our HVAC system produces.

Reducing First UUs Emissions and Getting to Net Zero

We can't achieve Net Zero Carbon Emissions all at once. It will take a decade if we move quickly.

But it's important to have a long-term strategy and goal... and take advantage of opportunities when renovations, repairs and replacements are needed in order to move toward Net Zero.

The roof replacement provides a big opportunity to take some first steps. The next few slides outline the steps we should take during this project and steps we should take over the next decade but which are not in this project's scope.

Getting First UU to Net Zero

Steps we can take during this project

- ▶ Prioritize high grade insulation during roof replacement
- ▶ Install double-pane windows when time to replace**
- ▶ Rooftop solar
 - ▶ Best sections for solar are over Great Hall.
 - ▶ An array over Great Hall will offset 30-40% of our electrical use and cost roughly \$85K.

**We are proposing to replace the clear-story windows with double-paned windows. But we are not replacing any other windows during this project.

Getting First UU to Net Zero

We can and should take additional steps over the the next decade, but these steps are not in the scope of this particular project

- ▶ Increase Energy Efficiency
 - ▶ Utilize thermal blanket on water heater
 - ▶ Set automatic thermostat
 - ▶ Install weather stripping on all external doors
 - ▶ Purchase high efficiency HVAC units when time to Replace
- ▶ Transition off gas to electric heat
 - ▶ 10 of the 14 heating units on our roof are gas. Replace these with electric heat pumps at end of life.
- ▶ Source Electricity from clean sources
 - ▶ Add more rooftop solar
 - ▶ Purchase clean energy credits

Roof/Solar - Recommended Scope

- ▶ Replace roof with modern membrane product
- ▶ Build up insulation with ISO product for improved R value
(*meaning better energy efficiency*)
- ▶ Properly taper insulation to drain points
- ▶ Replace tectum deck where damaged
- ▶ Replace clerestory windows (seven locations)
- ▶ Replace fascia
- ▶ Install solar-ready stanchions over Great Hall
- ▶ Install solar panels over Great Hall

Roof and Solar Budget Recommendations

- ▶ **Budget \$815K for full roof replacement and building envelope upgrade.**

Including replacement of clerestory windows and trim and replacement and sealing of side paneling. This should prevent water leaks and improve energy efficiency.

- ▶ **Budget \$85K for one solar array to be installed over the Great Hall.**

Ensure array is installed in such a way that additional arrays over the Library and Entrance could be added a later date. Continue exploring alternative financing approaches.

Roof and Solar Budget Items

Estimate of Probable Cost - Roof and Solar

Item	Cost	Source
Roof replacement	\$350,000	One written proposal and two verbal/informal estimates from roofing contractors
Edge buildup for insulation	\$20,000	Estimate based on unit price from one contractor
Tectum deck replacement	\$10,000	Estimate based on unit price from one contractor
Replace (7) sets of clerestory windows	\$60,000	Estimate, budget quote received from one contractor
Facia replacement	\$30,000	Allowance
Solar Ready Stanchions over Great Hall	\$20,000	Estimate \$5/sqft (allowance recommended by subcommittee)
Solar Panels over Great Hall	\$85,000	Quote from supplier
Construction Manager and Architect	\$100,000	Estimate by subcommittee lead
Contingency/Escalation	\$225,000	33% based on current market volatility and to cover a portion of the upside estimate accruacy
Total Recommended for Budget	\$900,000	

Roof and Solar Recommendations

Budgetary Recommendations:

- ▶ Budget \$900K in total for the roof and solar portions of this capital campaign -- \$815 for the roof and whole-building Envelope, \$85K for solar panels. This budget includes hiring a consultant/architect to oversee this project.

Non-Budgetary Recommendations:

- ▶ Request that the Board reconstitute the Strategic Facilities Planning Committee.
- ▶ Request that the Board name a subcommittee to oversee this roof project.

Members

- ▶ Tom Norton
- ▶ Michael Gibson
- ▶ Reggie Henderson
- ▶ Joe Rupp
- ▶ Charles Gerena
- ▶ Michael Testerman