Sustainable Building and Historic Preservation: A Case Study of Kellogg House

Kellogg House from north east. Author's Photo

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ENVI 206 Final Project

Introduction

Since the plans for a new library addition to Stetson Hall were finalized, there has been debate about what to do with Kellogg House and Seeley House, both of which are in the way of the new building. It was determined that there is little value in keeping Seeley House, since it would be too expensive too bring up to code considering the results and since the house has little historical value (this will be discussed in more detail later).

Much has been written about the possible fates of Kellogg House, though. Laura Cavin's 2005 thesis was the first study done considering the new placement of Kellogg House and possible environmentally friendly designs. In 2006, an ENVI 302 Environmental Planning class final project looked at various case studies and then used a rating system to determine what the best sustainable features for the building would be. The 2005 and 2006 studies both used surveys to determine the positive and negative aspects of the current building (still in use at the time). A draft of the Kellogg Architectural Program from 2007 focuses more on specific types of spaces for specific users, like professors and staff, and details certain space requirements for various aspects of the program. The most recent study, an ENVI 302 final project from 2009, focuses on determining the best use for Kellogg house and on a developing a rating system to rate various sites.

Many of the issues raised in these papers have already been solved. The original portion of the building will be moved north of its current location, south of Goodrich House and west of Sewall House (Figure 1). The structure, which will consist of the renovated Kellogg House and a modern addition, will be the new home for the Center for Environmental Studies and will contain various office spaces, a classroom, seminar room, a kitchen, and more. There is still discussion about what sustainable design features the building will have. This paper will seek to address only some of those issues, since its main purpose is to look at the intersection of

sustainable design and historic preservation in general and then use Kellogg House as a case study.

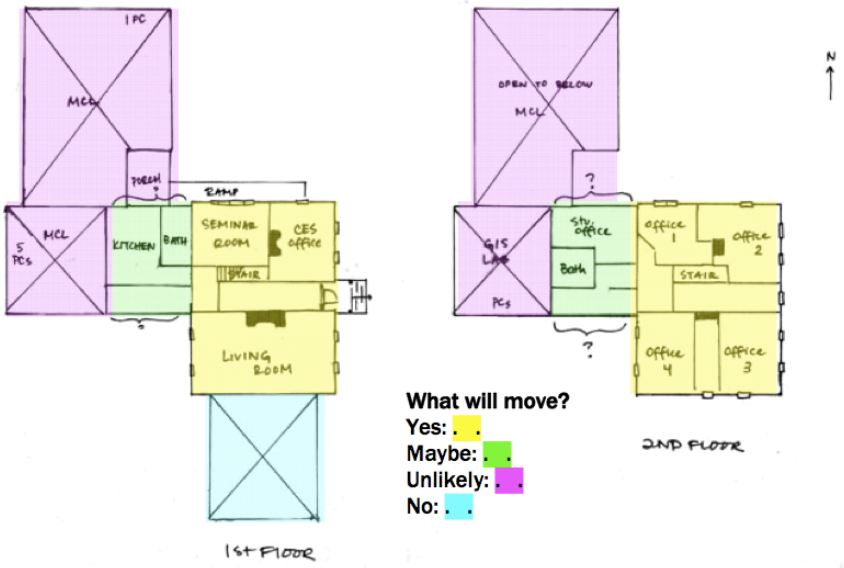


Figure 3. Current Kellogg House Plans and Relocation

Figure 1. (Davies, 2006, p. 5)

Background

I became interested in historic preservation and sustainable design for a number of reasons. I am interested in architecture and I am an Art History and Practice major specializing in architecture. In my opinion, the future of architecture lies in creating interesting architectural spaces that are environmentally friendly. But I think that historic preservation will also become more important in the future. The environmental movement is about using fewer resources and lessening the impact buildings have on the environment. Since the majority of buildings that we need are already built, upgrading them is as significant, if not more significant, than creating new buildings.

Additionally, I had thought that there was a lot of tension between preservation and sustainable features, and I wanted to investigate to see if there were. Sustainable features are often billed as “high tech:” light and carbon dioxide sensors, advanced windows, inventively

recycled materials, and low flow urinals are all *de rigeur*. Even the way we analyze buildings with energy monitors and computers is all based on fairly recent technology. So for a movement based on such technology it is not difficult to see why it would seem at odds with preserving past buildings.

History

Kellogg House was built in 1794 on land given to the College for the express purpose of building a house for the President of the College. The house served as the President's house until 1858 when the Sloan House became the President's house (Hall, p. 1). Since then, Kellogg has served as housing for professors and students, and it has been used as office and classroom space when it was the CES.

Kellogg was originally located where Hopkins Hall currently stands. When Hopkins was built it was moved north to the where Stetson Hall stands; when Stetson was built it was moved into its current location. Over the years, as the building has been moved and its uses changed, many additions and alterations have been made to the house.

Goals

The Kellogg House renovation and addition must be a showcase in multiple ways. First, it must be at the forefront of green building technology. Williams College is a leader in many fields of higher education, and its dedication to sustainable principles is well noted-it received an A- from The College Sustainability Report Card (Williams). In addition, Williams has one of the oldest Environmental Sciences departments in the country (Cavin, 2005, p. 20). Williams has made strides in its new building policy and in renovating old buildings, so the new Center of

Environmental Studies must go beyond these measures and show the full extent of green building.

Additionally, this project is an opportunity to restore the second oldest building at Williams and make it into a unique architectural space. Williams has moved many buildings and has restored almost all of the buildings on campus, some with more success than others. The College must take the opportunity to keep the building historically accurate but interesting and inviting. The new Kellogg House should be a showcase for local craftsmanship and and historical detail.

Definition of Historic Preservation

Historic preservation comprises the restoration of original details and the recreation of details that once existed. The resulting building is not an exact copy of the building from an earlier point but rather an amalgam of modern and historic details and technologies. The history of the building continues as opposed to going all the way back in time.

Definition of Sustainable Design

The focus of this paper is on the intersection of sustainable building and historic preservation. However, I think it is necessary to talk about some possible design features/typologies because of their close relationship with preservation.

The renovated Kellogg House and new addition will be at least LEED Platinum. New buildings at Williams College must be at least LEED Gold, as per the new building policy, but since this is the home for the CES it will be LEED Platinum (the school will most likely pursue certification) (Williams).

I believe that the building can go beyond LEED Platinum, though. Since Kellogg will be oriented south, I think it should be designed to be a passive solar building. Passive solar buildings take all of their heat energy from the sun and store it in the mass of the building, so that the building stays at a constant temperature throughout the day and into the night. I think it will also be possible for the house to achieve Living Building 2.0 certification. The Living Building standard tries to minimize all aspects of building and construction on the environment. For example, the building must get 100% of its energy from renewable sources, and the building must fit into its local human and natural environment (Living, p. 20).

The purpose of this paper is not to discuss the possible sustainable strategies per se, though. I want to show that no matter what standards the building tries to meet and no matter what its features are, a renovated Kellogg can be historically preserved to a very high degree. The goals of sustainable building and preservation are remarkably similar. In fact, as Carl Elefante writes, "The long term view of building and development is common to both historic preservation and sustainability components" (Elefante, 2005). I will show that in many cases, sustainable design features double as historic preservation features.

Sustainability + Design Features

Building Envelope

A tight building envelope is one of the most important features of an environmentally friendly design. By preventing air leaks, the envelope allows a building to stay at a comfortable temperature with less energy and more consistency.

The walls and roof of a building are the most important parts of a building's envelope. They are where most of the heat is lost (Historic, p. 1). An appropriate quantity of efficient insulation in these areas can lower energy usage greatly.

Kellogg House has a lot of room for improvement in both of these areas. The attic is a particular mess. It is not insulated well at all, and the insulation there is falling out in many places (Cavin, 2005, p. 18). Many original beams visible in the attic show the house's historic construction. In order to properly insulate the space and keep the beams visible, I propose placing energy efficient windows or glass over particular beams so the beams and construction will still be visible. I do not believe there is much precedence for anything like this, nor am I quite sure if the engineering would work. But if it can then there is no loss either way.

The walls of the house have a much simpler solution. A tour by a knowledgeable local architect in 2006 concluded walls were not original and in many places were not load bearing (Davies, 2006, p.9). Additionally, as Laura Cavin writes, "there is inadequate space in the existing walls because of the plank construction, so considerations should be made to add a new wall with more insulation behind it" (Cavin, 2005). However, she is wrong when she continues her analysis that insulating the attic will be easier than insulating the walls.

Because there is little historic value in the current walls, adding new walls will present no such difficulty. The proper amount of insulation can be added and there are no worries about showing visible construction, as there are in the attic. I will discuss wall treatments and the attic more in the section about architectural details below.

Another important aspect of the building envelope is windows. Windows are essentially a hole in the envelope, and in older buildings there are often leaks around the window and in the window itself. Modern efficient windows are often mentioned since they are one of the easiest and most effective design features a building can have. There is a lot of new window

technology, including windows that can self-tint and, in the future, windows that could act as solar panels (Reilly)(Novitski).

But historic windows with storm windows are just as effective a solution. The National Trust for Historic Preservation says "an historic wood window, properly maintained and fitted with a storm window, can be just as energy efficient as a new window" (Historic, p. 1). In addition such wood windows will also last much longer than "vinyl, aluminum, or composite with wood" (Historic, p. 1).

Maintaining original windows and adding storm screens therefore both creates a tight building envelope and allows the building to maintain its historic character. The wood windows currently on Kellogg are most likely Colonial Revival windows from the early 20th century, but they go with the house and are historic themselves (Davies, 2006, p. 8). The windows on the condemned Seeley House are from the same vintage and are also in nice condition. They could be recycled for use in either the renovated Kellogg House or the new addition.

Using the original windows with storm windows is preferential to a single, modern, efficient window in this project. The CES is one of the few buildings used year round at the College. It can get very hot in the summer, but for economic, efficiency, and environmental reasons it is not worth installing traditional compression air conditioning. Storm windows can be replaced with screen windows in warmer months. It may be possible to get students to change the storm windows out. This will raise awareness of energy saving techniques, since many people do not even know what storm windows are.

In addition, using storm and screen windows will engender active participation with the building. In some ways, green building techniques can be deceptive because they often occur in the background. But for a showcase like the new CES, participation should be actively

encouraged. Additionally, storms and screens will help preserve the building in an active sense. The building was meant to have open windows taking advantage of the strong summer breezes.

Figure 2. Window Detail, Kellogg House. Author's Photo

Architectural Details

Whether or not the new Kellogg complex is a passive solar house, solar heat gain in the summer is always an issue (especially now that the main massing of the house will face south). There are a number of strategies to deal with this heat problem.

Some strategies rely on fixed environmental or architectural features to shade portions of the house in the summer. For instance, a deciduous tree placed south of the building will shade

the building in summer but allow sunlight through in winter. Other strategies involve placing overhangs on windows, as was done in the North and South Academic Buildings.

For a while I thought that rebuilding the porch seen in earlier photos (Figure 4) of the house was a good idea. It would shade the windows of the lower story and provide a comfortable outdoor space. However, in the winter the sun would be blocked from coming in these windows, and heating the building in the winter is a more important consideration than cooling in the summer because of our climate and school schedule. Additionally, the house looks quite different in that photo than its original iteration, which I decided was the best style for the house for aesthetic and environmental reasons.

One strategy that might work, though, is putting moveable shutters on the house. The 2006 tour of the house revealed that the shutters were historically accurate but nailed to the house as to prevent them from functioning. The authors of the 2006 paper concluded that "though we obviously don't use shutters anymore, they are an important device to help the house retain its historic integrity" (Davies, 2006, p. 8). I disagree. The National Trust for Historic Preservation writes that old shutters on houses in colder climates have "louvered slats...to allow for air circulation while blocking solar gain on hot days" (Historically). This is the perfect solution to the problems of keeping the building cool in the summer. I advise, then, that the shutters be returned to working condition precisely for this purpose.

Figure 3. Shutters (Davies, 2006) Figure 4. Kellogg House c. 1890 (Williams College Archives)

And using the shutters as an active part of temperature control in the house provides another level of interaction with the house, like the storms and screens do. People would have to actively close and open the shutters. Even seeing shutters closed might come as a shock to pedestrians, who, even in this part of the world, are not used to seeing closed shutters. Additionally, even though the shutters themselves may not be as historically accurate, they will return to the house a certain type of historic usage; the house was meant to have shutters that would protect it from the elements.

Depending on where the addition to Kellogg is places, it also may make sense to rebuild some of the original porches. The porch on what is now the south side of the building was turned into the Matt Cole Reading Room, and then offices; this blocked out a window and made the room much darker (Cavin, 2005, pp. 10-11). Returning or adding certain porches can provide comfortable outdoor spaces while allowing light in.

I also advocate getting rid of the triangular roof gable (Figure 4). Like the now-gone porch on the front, the gable was a Victorian addition (Phillips, 1992, p. 4). There are numerous reasons to get rid of it. One reason to get rid of the gable is the additional heat it allows into the house. Now that that the house will face south, the small window up in the attic will allow a lot

of heat into the building. Because of the insulation being added to the attic and walls this extra heat is not important to warming the building in the winter, and it will only add heat in the summer. The gable also breaks up the roof and makes it harder to put on solar panels or solar hot water heaters, both of which may go on the roof.

The gable also significantly changes the architectural character of the building for the worse. The College has a lot of smaller houses that were built in the mid-1800's, when the gable addition was added. The gable makes Kellogg look more like these Victorian houses and less like the Colonial simplified Georgian house it is. Removing the gable will return the house closest to what it looked like when it was built (See Figure 5) (Phillips, 1992, p. 5). Considering that College buildings from the Colonial period have been altered so much, returning the building to this style and adding architectural interest to the campus seems beneficial.

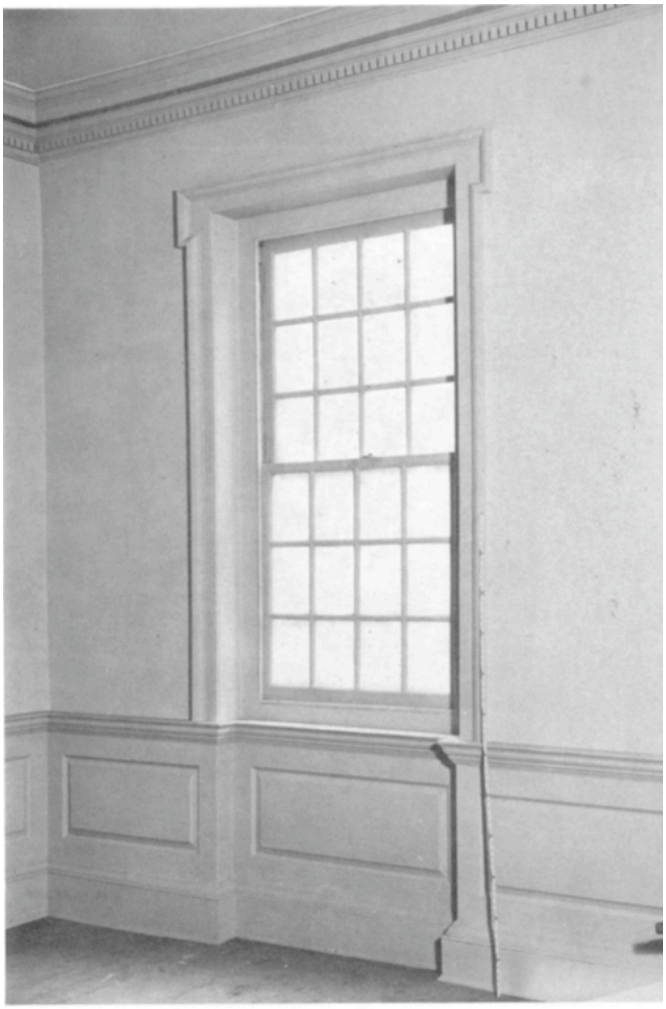
Figure 5. Kellogg House c. 1860 (Williams College Archives)

Some of the most important stylistic changes should occur in the interior of the house, though. Fortuitously, many of the original details do not exist. It seems contradictory that I should be celebrating the lack of historic design features; after all, is not historic preservation mainly about keeping these features? The reality is that having more original details would only complicate the renovation process. For example, if many of the walls were original, it would be more difficult to create larger walls for insulation while simultaneously keeping the details. The details can be re-created to give the house a certain feel, even if it is not completely original.

Putting in panelling and molding similar to the simple, colonial style contemporary with Kellogg when it was first built adds both to the historic feel of the house and its sustainable design. In order to move Kellogg, a number of white pine trees will need to be cut down. White pine was in fact a popular choice of builders in the colonial era because it is softer and easier to carve than many other woods (Haddon, 1920, p. 15). I suggest that the wood from these trees be used to create moldings and panelling.

The moldings and panelling may be the most important part of the renovation. As I have described, many historic renovations have a sort of "time-lessness;" that is, to say, that a building's details will not all be from the same era. However, as a result of this phenomenon, many renovations on historic buildings end up feeling sterile. The authors of the 2009 article write that at Middlebury College's Franklin Environmental Center at Hillcrest, an historic renovation with a new addition, "the façade of the building is well preserved and certainly pays homage to the heritage, but the interior of the house becomes sterile and less inviting because of all of the modern renewal" (Charest, 2009, p. 13). Additionally, surveys from the 2005, 2006, and 2009 articles showed that many students found Kellogg House cozy and one of its best attributes.

Such panelling will not be expensive and will be very environmentally friendly. We know that the trees will not have to travel far, and they are being cleared anyway. I suggest hiring local craftsmen to make the panelling, since an important part of the environmental movement is using local resources and craftsmen. As you can see in Figure 6 and Figure 7, this is not very detailed panelling and should not add much cost to the project. Figure 7 is the Alexandria Ballroom from Alexandria, Virginia, from 1793. Although this is a grand room in a different climate this style of interior decoration was seen throughout the colonies. I do not recommend window or door moldings this detailed, though. As can be seen in Figure 6, some simple beveled panels, a chair rail, simple molding around the windows and at the ceiling are all that is needed to obtain a Colonial style. The sage green color of the Alexandria Ballroom would work quite well, especially in a "green" building. Other colors, like a darker blue or even a vibrant red, might work better, depending on the flooring (which may be wood or some stone depending on whether the house is passive or not).



Window Detail in Parlour—1765

POWEL HOUSE, 244, SOUTH 3RD ST., PHILADELPHIA

Figure 6, from "Colonial Interiors" Plate 146.

Figure 7, from "A Walk" pp. 34-5

I contacted George Faison, who grew up in Kellogg House in the late 1940's, to see if he had any pictures of the interior but he did not have any. To my knowledge there are no known photos of the interior; there are none in the archives. But using historical details as a template in this case will add a lot to the house visually.

And although Kellogg House was considered cozy, in its current state it is a little cramped. The study of the CES's needs in 2007 stated that many of the rooms were small and cramped and the building needed a better layout (Kellogg, 2007, p. 2). It may be worth it to gut the interior and rearrange the spaces. The authors of the 2006 article wrote that "a laywoman's investigation of the code and discussion with Ken [Jensen] has suggested that the steep central staircase will almost certainly have to be replaced and the handicap-access elevator currently in

Matt Cole Library will need to be incorporated into the new addition" (Davies, 2006, p. 34). Rearranging rooms and creating a new staircase should not be seen as obstacles but opportunities. The current building has issues that can be rectified through sustainable means to recreate interesting historical details.

Conclusion

A thorough analysis of the building should be done before much more work on the project is done. Andy Burr went through and identified many historically important details, as did Morgan Philips, who was hired to analyze several building on campus about a decade ago (Phillips, 1992, p. 4). Depending on the the size and importance, it may be worth removing these details and displaying them in the house, to show what construction and domestic details from the Colonial era were like. Also, as work is done on the wall and floor, more details may be revealed. Nobody know the condition of the floors; the original white pine floors may still be there. Either way, if Kellogg is to be a passive solar house, the architects may decide to have a masonry floor like slate that can hold thermal energy well.

The layout of the new house also depends on the placement of the addition. This will require that the architects take a holistic approach to the problems, which is good for the project: it will feel like a unified whole, as opposed to a renovated old house and a brand new addition.

And of course, many important decisions will have to be made about the subject I talked about the least, the green design features. The structure will be LEED Platinum and very likely passive solar. I also mentioned Living Building 2.0; there are other standards like Energy Star and Green Globes. It may seem excessive, but I think the school should aim to get Kellogg certified by all of these standards. As I mentioned in the "Goals" section, this building must be a showcase for green building at college campuses and more specifically at Williams.

But Kellogg can also be a showcase for all green design. As green design becomes more and more popular, there will be more renovation. Kellogg House can be a pioneer in terms of its sustainable features and historic design. The College will get a lot of good publicity, something that school has had issues with for a while.

And on a more personal level, I believe in doing something right the first time around. Williams has never had an organized, planned campus, and the College has moved a ridiculous number of buildings. The fact that this Kellogg project exists is a result of two instances of bad planning. A structurally sound library is being demolished as a result of bad planning, only 40 years after being built. And Kellogg house itself has been the victim of numerous moves, additions, renovations, and unfortunate circumstances. The green building features I've mentioned and the standards I think the building can meet will make the project more expensive than projected. But if it is done right then the College will not have to worry about CES for a very, very, long time and it will have a showcase that may become historic in what it can achieve, let alone its history at the college.

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