

**Building and Construction Sustainability at Colgate University
Colgate University Bicentennial Anniversary**

ENST 390: Community Based Perspectives on Environmental Issues
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Executive Summary

The higher education sector is often referred to as a “living laboratory;” a place where components of sustainability can simultaneously be taught, practiced, studied, invented, produced, and shared. Often, liberal arts colleges such as Colgate University succeed in a few of these areas, but fall short of achieving them all. As Colgate approaches its 2019 goal of carbon neutrality, it is important to assess how principles of sustainability have been prioritized and applied throughout the university’s history. By understanding what has been done well and what needs improvement, effective plans and solutions can be made for the future of Colgate’s sustainability initiatives.

Our group was assigned to focus on sustainability in the context of Colgate’s building design and construction. Our research question is as follows: *How have principles of sustainability have been taken into consideration throughout the history of Colgate’s building design and construction?* We are using case studies of West Hall, James B. Colgate Hall, Lathrop Hall, and Stillman Hall as a way to study buildings that not only span multiple years in terms of construction and renovation, but also buildings that serve multiple purposes (academic, residential, and administrative).

In order to answer our research question, we analyzed documents from the Buildings and Grounds Collection of the Colgate Library’s University Archives Collection. These included construction specifications, relevant correspondence, photographs, and programs from ceremonies, for example. We also conducted interviews with individuals of relevant positions, who provided information concerning how sustainability has evolved and been taken into consideration more recently, over the last ten or so years.

According to Colgate’s Green Building Standards, published in 2015, all new construction and major renovation projects are required to achieve Leadership in Energy and Environmental Design (LEED) Silver certification. Thus, we used a relevant selection of LEED metrics to measure sustainability through our archival research. These LEED metrics applied to the three pillars of sustainability: environmental, economic, and social.

Our findings displayed some interesting, broad trends. Beginning in 1827, there is evidence for a focus on using local materials, primarily stone from the local quarry. In the early 1900s, we begin to see evidence of a desire to blend buildings into the landscape, a desire to use natural light, and a desire to prevent construction-related pollution. In the late 1900s, there is more of a focus on using durable and economically efficient materials, as well as preserving the surrounding landscape and flora throughout the construction process.

In our analysis, we use existing literature to explain why the results we’ve found are meaningful. We primarily discuss how many of the themes that we’ve seen seem to have been prompted by the students and faculty due to a desire that the campus is aesthetically appealing. In this way, the buildings were naturally constructed in a way that was unobtrusive to and influenced by the surrounding environment.

We conclude our report with a few recommendations for the future of Colgate’s building design and construction. These include goals such as more accountability on the part of the administration in terms of holding to the Green Building Standards, as well as more of an effort to renovate current buildings so that they can perform as efficiently as possible.

Introduction

As Colgate University is rapidly approaching its bicentennial year, it is also approaching its goal of becoming a carbon neutral campus. Sustainability is becoming an increasingly important focus in the realm of higher education institutions such as Colgate, and it is essential to constantly reevaluate the ways in which campuses encompass sustainability's different facets. With the goal of a carbon neutral campus in mind, it becomes evident just how important the buildings and grounds on Colgate are. Colgate's buildings and ground contribute to over half of the entire university's carbon footprint, therefore making them very important players in the context of Colgate's sustainability efforts. For our group's project, we have set out to discover how sustainable or unsustainable the buildings on our campus are. By studying the history of the buildings selected, we are able to see how sustainability principles have been taken into account throughout the university's history and develop themes and trends based on our findings. In order to achieve a focused and detailed analysis, we narrowed our focus to four specific buildings to use as case studies. The four buildings are West Hall, James B. Colgate Hall, Lathrop Hall, and Stillman Hall. Each of the four buildings experienced construction and/or renovations in a variety of time periods, and each of them serves different functions on the campus. By studying the archival documents and sources of these buildings, we were able to detect and interpret trends and themes throughout time. We were also able to obtain more current information from interviews with key stakeholders in campus sustainability. By using the Leadership in Energy and Environmental Design (LEED) standards to organize and measure our data, we are able to translate it to current sustainability goals and develop future recommendations for the university.

Literature Review

History of Sustainable Construction

The green building movement emerged along with the broader sustainability movement of the 1970s after the US and other nations became aware of the realities of global resource loss and degradation (About the USGBC, n.d). In 1987, the Brundtland Report took place as a result of the World Commission on Environment and Development (Kibert, 2004, p. 498.) The US Green Buildings Council was formed in Washington, D.C. in 1993 (Kibert, 2004, p. 498). In 2007, the Energy Independence and Security act was passed, which provided a specific framework through which to require, regulate, and monitor environmental improvements to construction (Page, 2010, p. 376). Although there were many other conferences and documents released in between those given years, these specific dates provide a general framework through which one can understand the progression of how the sustainability movement has evolved from something extremely abstract and vague to something that can be tangible and regulated.

There are multiple issues of sustainability that can be directly applied to building design and construction. Buildings deplete a vast amount of resources in the US; using 68% of all consumed electricity, releasing 38% of CO2 emissions, and absorbing 12% of all water resources (Page, 2010, p. 374). In general, construction projects in the US produce around 2.5 pounds of solid waste for every square foot of completed floor space (Ried, 2008, p. 5), which is around the weight of a liter of water per square foot. It is shown that the US construction industry has used about 90% of all of the raw materials

that have ever been extracted, and 6 billion tons of those materials are mobilized per year for various construction and renovation projects (Kibert, 2004, p. 493).

Clearly, construction majorly contributes to how sustainable or non-sustainable the US is as a nation, so it is necessary that it is examined and addressed in as much detail as possible. The primary way through which sustainable building design and construction is achieved is through the “greening” of buildings. Green buildings are those that are “designed, built, operated, renovated, and disposed of using ecological principles for the purpose of promoting occupant health and resource efficiency plus minimizing the impacts of the built environment on the natural environment” (Kibert, 2004, p. 491-2). The green building movement has most definitely been successful, as the term “green building” tripled in frequency in the US popular press between 2005 and 2010 (Eichholtz, Kok and Quigley, 2013, p. 50).

U.S. Green Building Council and Leadership in Energy and Environmental Design

The Leadership in Energy and Environmental Design (LEED) rating system was developed in 1993 by the US Green Buildings Council (USGBC), as part of an effort to establish clear guidelines and metrics for sustainable buildings (Page, 2010, p. 377). This system pays attention to the building design practices of entire systems, with a clear division of categories, sub-categories, and how many points are awarded when those categories are achieved (Page, 2010, p. 377). The 5 primary categories are: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality (USGBC, 2009, p. 11).

Another way in which LEED promotes sustainability is through awarding higher points to buildings that take into considerations the specialized needs and conditions that are caused by the local contexts in which they are constructed. Not every environment is the same, so buildings need to be able to adapt to whichever landscape they are in, the resources that it offers, and the ability for it to support the high energy and resource requirements that most buildings entail (USGBC, 2009, p. 13). A clear marker of success for the USGBC and its implementation of LEED is the statistic that there has been an annual doubling in the number of buildings that apply for green building certification (Kibert, 2004, p. 492). There has also been a more recent understanding of the reality that although the costs for green building practices can be higher at the time of initial construction, they are actually much more cost efficient over the long term, an idea that was highly contested up until recently (Page, 2010, p. 378). In fact, LEED certifications have evolved in concordance with this change in mindset.

The newest version of the certification is LEED v4, which, relative to the previous LEED 2009, focuses more heavily on water and energy efficiency after construction and promotes careful selections of materials (Summary of Changes: LEED 2009 to v4, 2013). For example, “After five years of piloting LEED projects across the university.... Harvard was able to achieve its first LEED platinum renovation... at no added cost to the project (Sharp, 2009, p. 5). LEED metrics are used for all of Colgate’s construction and major renovation projects, which is why it was chosen for this particular research project.

Sustainability in Higher Education and at Colgate University

Sustainability has grown increasingly popular in the specific context of higher education. Universities are spaces in which sustainability is taught to students, who then

have the potential to create and develop new ideas and methods of practicing sustainability. Thus, the environment that they inhabit should match the ethics and ideals that are being taught to them. "A university can greatly reduce its impact on the natural environment while also serving as a living laboratory for the advancement and education of sustainability" (Ried, 2008, p. 5). Historically, universities have not always followed through on this, and simply preach sustainability to students while exemplifying practices that can very much contradict goals of sustainability and environmental consciousness. "...While universities were amassing project successes in a piecemeal fashion, they were not achieving the kind of deep organizational transformation many of us now see as fundamental" (Sharp, 2009, p. 1-2). Leith Sharp suggests that there have been two movements of sustainability in the higher education sector, with the first occurring in the 1990s, and consisting of green building projects as were discussed in the previous sections. The second movement, she argues, occurred in the early 2000s, when there was more of a push to hire individuals for jobs specific to sustainability and create mandatory regulations and frameworks as part of school governance systems (Sharp, 2009, p. 2). A third movement that has yet to really take form is the movement to establish sustainability as part of the liberal arts core curriculum. This movement definitely faces more obstacles than simply constructing green buildings and developing sustainability standards, as it is more of a systemic issue. However, the interdisciplinary nature of sustainability makes it a subject that could be studied in almost any liberal arts academic program. "Investigation of climate change, particularly, and sustainability, generally in terms of biology, chemistry, earth science, or physics, quickly spills over into the realm of economic and social impacts and policy formation" (Weissman, 2012, pg. 7). Sustainability has the potential to work its way into almost any component of the liberal arts education, whether it be the physical campus or the academic mindset.

The sustainability program at Colgate did not really exist in a tangible manner until 2005 when there was an effort of the Sustainability Council to create a plan for short-term and long-term environmental sustainability. It wasn't until 2009 that John Pumilio, the first director of sustainability, was hired (Colgate Bicentennial Plan, 2017, p. 8). As of 2011, Colgate University had 160 buildings, covering 2.3 million square feet of floor space. Buildings contributed to 80% of the electrical and fuel oil consumption on campus and released 46% of the school's greenhouse gases (Sustainability and Climate Action Plan, 2011, p. 35). In the university's 2011 Sustainability and Climate Action Plan, it was established that any future construction and renovation projects would be required to achieve a LEED silver standard, and a substantial improvement in energy and resource consumption (Sustainability and Climate Action Plan, 2011, p. 35). 2011 also marked the construction of Colgate's LEED Gold certified building, Trudy Fitness Center (Green Buildings and Energy, Colgate University, n.d). Lathrop Hall achieved LEED certification during its renovation in 2012 (Energy and Green Buildings [website], n.d). In 2015, the first Green Building Standards document of Colgate was published. This document outlines guidelines for all major renovation and new construction projects at Colgate University, with a special focus on the carbon neutrality goal of 2019. It emphasizes the importance of achieving LEED certification, choosing sites that are sustainable, and maintaining awareness of each step of the construction process and how it contributes or does not contribute to Colgate's sustainability as a whole (Colgate University Green Building Standards, 2015, p. 13).

Working Definition of Sustainability

In order to fully understand and critique the sustainability of Colgate University's past, present, and future building construction and design practices, it is essential to establish a working definition of sustainability in the relevant context. The most commonly used definition of sustainability originated in the Brundtland report of 1987, and is as follows: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Theis and Tompkin, 2012, p. 6). There are three main facets of this definition, those being the environmental, economic, and social components of sustainability. The environmental component involves factors such as the impact on land, waste, and renewable energy, for example. The social component consists of how humans are impacted, and preservation of culture and functions that influence human knowledge and health. The economic component is primarily concerned with how financial capital is moved around in the involved processes, how skills of commerce and other relevant skillsets are promoted and continued, among other things (Theis and Tompkin, 2012, p. 7). In the context of sustainable building design and construction, these three pillars can be applied to provide a more specific definition of sustainability as it relates to the topic. The environmental component of sustainable buildings often involves energy and water use that is not excessive, preservation of the natural land and using local and environmentally friendly resources (Kibert, 2004, p. 491-2). The social component can consist of the health effects of the buildings, the way the building is utilized, and the choice and regulations around the construction workers and their rights. The economic component for buildings is primarily the way in which financial costs of using more sustainable practices compare to less sustainable practices, both in the immediate time frame and over longer time periods. Based on all of these definitions, our working definition of sustainable building design and construction is: Construction and design that avoids environmental degradation, promotes economically efficient building practices, and allows for the continuation of culture and maintenance of good health.

Methods

Overview

The aim of our research project was to answer the following question: How has Colgate, throughout its 200 years, taken principles of sustainability into consideration for the university's building design and construction? We approached our project utilizing case studies of James B. Colgate Hall, Lathrop Hall, Stillman Hall, and West Hall.

In order to do this, we first selected the four university buildings, then conducted archival research focusing specifically on each building. We critically examined our findings utilizing the Leadership in Energy and Environmental Design (LEED) rating system criteria. Finally, we conducted two interviews with key stakeholders on Colgate's campus to gather more information about discussion of sustainability across campus, both generally and specifically for buildings.

Building Selection

In order to obtain a wide range of evidence with which to answer our research question, we chose four buildings that spanned different time periods and different

purposes. West Hall, the university's oldest building, was built in 1827 and was originally an academic and religious building. Its original construction was led by Daniel Hascall, who was the building's supervisor, designer, fund-raiser, and a professor. Students assisted with the construction of the building in return for PE credit. Fairly soon after its construction, it became a residential building, and it has been renovated in 1910, 1930 and 1954. James B. Colgate Hall, currently an administrative building, was built in 1874 as a library and renovated in 1964 and 2014. Lathrop Hall was constructed in 1906 as a science building. It was renovated in 1971 to house more science labs and classrooms and was recently renovated in 2012 to LEED silver standards. Finally, we also examined Stillman Hall, a residential building built in 1927 that is currently undergoing renovations.

Our hope in selecting these four buildings was that the various years these buildings were both built and renovated in would provide us with evidence of an increase in the university's consideration of sustainability in their building practices. We also chose buildings that served various purposes for the university to determine whether or not a building's purpose impacted the university's building practices as well.

Archival Research

A great deal of our data on each of our chosen buildings was obtained from the university's archival collection. All of our archival sources were found in the Buildings and Grounds Collection, A1000. This collection had separate boxes for each building, with subdivided folders within each box. The archives included documents such as specifications for construction, correspondence between the university and potential contractors, budget documents, blueprints, photographs of construction, and programs from post-construction ceremonies. Another helpful source for the older buildings was the *History of Colgate*, written by Howard Williams and published in 1969. The archival sources, as well as the book, were examined closely, and relevant pieces of evidence were extracted and organized in a spreadsheet based on our metrics of sustainability, which will be explained in the next section.

LEED Standards

Sustainability, as defined by the Brundtland report, is any type of development that can satisfy what is necessary for the current generation without taking away the ability of future generations to do the same (Theis and Thompkin, 2012). The three pillars of sustainability are environmental, economic, and social. These three pillars can be applied to the common definition of sustainable buildings, which are "designed, built, operated, renovated, and disposed of using ecological principles for the purpose of promoting occupant health and resource efficiency plus minimizing the impacts of the built environment on the natural environment" (Kibert, 2004, p. 491-2). A useful measurement for sustainability specifically for building design and construction is the framework of standards set forth by Leadership in Energy and Environmental Design (LEED). LEED is the most widely used procedure for planning, constructing, maintaining, and operating green buildings. We decided to use the LEED standards as a guideline for determining Colgate's level of sustainability throughout the years because LEED has a rating system and scorecard specifically for building design and construction. Since LEED is currently being incorporated into the university's building construction and design, we felt this benchmark would be both relevant and helpful

(Colgate University Green Building Standards, 2015, p. 13). Also, the criteria for LEED building design and construction is very thorough and we feel it adequately addresses the three pillars of our definition of sustainability.

Table 1 below displays the five general categories of sustainability criteria that we created, and how they fit into the three pillars. The environmental pillar is split into three categories, while the social and economic pillars are their own categories. Table 2 displays the subsections of each category, each of which is a separate criterion from the LEED v4 metrics.

Table 1: Division of Broad Categories

Environmental	Social	Economic
-Assimilation into/Preservation of Surrounding Natural Landscape -Choice and Sourcing of Materials -Energy, Electricity, Water Use	Social Pillar	Economic Pillar

Table 2: Broad Categories in Subsections of LEED v4 Metrics

Assimilation into/Preservation of Surrounding Natural Landscape	Energy, Electricity, Water Use	Choice and Sourcing of Materials	Social Pillar	Economic Pillar
-Construction Activity -Pollution Prevention -Sensitive Land Protection -Protect or Restore Habitat	-Interior Lighting -Daylight	-Sourcing of Raw Materials	-Sourcing/Treatment of Laborers -Quality Views -Indoor Air Quality	-Optimize Energy Performance -Lifecycle Impact Reduction

Definitions of LEED v4 Metrics (USGBC Credits, n.d)

Construction Activity Pollution Prevention: This metric is fairly self-explanatory, and serves to address the ways in which pollution from the construction or renovation projects will be restrained.

Sensitive Land Protection: The goal of this metric is to reduce the impacts of constructions and renovations on the surrounding landscape, as well as an overall effort to not construct on sensitive or damaged sites.

Protect or Restore Habitat: This metric includes goals such as conserving existing plants and natural areas, promoting biodiversity, and restoring areas that are previously damaged.

Interior Lighting: This LEED metric requires the use of energy efficient lighting.

Daylight: The aim of this metric is to both decrease the reliance upon electrical lighting, and also to boost the connection between the people in the buildings and the outdoors.

Optimize Energy Performance: The aim of this metric is to promote high-quality energy performance so as to avoid detrimental environmental and economic burdens.

Sourcing of Raw Materials: This metric promotes the use of materials that are locally sourced, environmentally friendly, reusable, and durable.

Lifecycle Impact Reduction: This metric promotes adaptable buildings, and encourages materials that are durable and long lasting.

Quality Views: This LEED metric aims to increase the connection between the individuals within the building and the environment outside of the building.

Indoor Air Quality: This LEED metric encourages high air quality in the building after construction.

Sourcing/Treatment of Laborers: This is not an actual LEED metric, but we felt as though it was important to study the impact that the construction and renovation projects had on the laborers.

Interviews

We conducted two interviews with key stakeholders during the course of our research process. We initially contacted both individuals via email, introducing our project and ourselves and inquiring about the possibility of an interview. Prior to each interview, each individual was presented with a formal consent form to review and sign. Each interview was approximately thirty minutes long and audio recorded with the permission of our interviewees. The questions varied somewhat based on the two interviewees, as they both fulfill different roles and therefore have different experiences with sustainability. However, there were some overarching themes and questions that we discussed during each interview. These include the following:

1. How have discussions and definitions of sustainability changed throughout your lifetime and career?
2. What are some ways in which Colgate has achieved principles of sustainability in terms of building design and construction? What are some ways in which it has failed?
3. How does Colgate compare to other higher education campuses with regard to sustainable practices and green building?
4. Do you think Colgate addresses all three pillars of sustainability?

Limitations to Methods

It is important to recognize the limitations present in our research methods. First, due to the fact that we only used four buildings as case studies, it is likely that we are missing other key pieces of evidence that may alter the trends that we established from our results. Although we tried to use specific rationale for our building choices, there were many buildings to choose from so it would not be surprising if a more inclusive study found more pieces of key data.

Second, applying LEED metrics to historical data was somewhat subjective and up to our interpretation in many cases. The LEED standards were not created until 1993, which is more than 100 years after the construction of West Hall. We did our best to choose metrics that could be applied to the data we were finding, but we may have made connections that stretch the meaning of the metrics. This is primarily due to how recent the sustainability movement originated, which prevents the finding of any explicit mentions of sustainability in the historical archives.

Results

Our results are split into five main categories: Assimilation Into/Preservation of Landscape, Energy Water, and Electricity Usage Post-Construction, Choice/Sourcing of Materials, the Economic Pillar, and the Social Pillar. Within these categories are subsections that apply to more specific LEED metrics. Within each subsection, the information is organized in chronological order, with the goal of displaying trends and patterns evident in each time period.

Assimilation Into/Preservation of Landscape

LEED v4 Metric: Construction Activity Pollution Prevention

From the original construction of Lathrop in 1906 onwards, there was an effort to prevent all construction-related pollution from accumulating and remaining on Colgate property. “The contractor is to clear away all dirt and rubbish resulting from his operations, and is to cover and protect his work and materials from weather or damage..” (Harding and Seaver, 1906). This is also required in the specifications for Stillman Hall from 1927 (Walter B. Chambers Architect, 1928), the specifications for West Hall after it experienced a fire in 1930 (Specifications for Repairing Damage by Fire, 1930), and the specifications for James B. Colgate Hall in 1964 (Frank C. Delle Cese , 1964). “This contract shall include the furnishing of all labor, materials and equipment for removal from building of all the damaged material and for carting the same away from the University grounds” (Specifications for Repairing Damage by fire, West Hall 1930). Perhaps this desire to keep the sites clean was due to the aesthetic-based focus that the school’s administration had, but regardless, it functioned as a means through which to prevent pollution.



Figure 1: This is a photograph of the construction of Stillman Hall in 1927. It highlights the tidy and well-kempt construction site (Untitled photograph of Stillman construction, 1926).

LEED v4 Metrics: Sensitive Land Protection, Protect or Restore Habitat

In the initial specifications for the construction of Lathrop in 1906, there was a mention that the contractor should remove the trees, but no mention of what they should do with the trees once they were removed, implying that the trees were simply disposed of. In 1930, West Hall was repaired due to fire damage and the specifications required that “Care must be taken not to disturb the ivy on the outside of building, and properly protect the grounds. Keep the premises broom clean” (Specifications for Repairing Damage by Fire, 1930). This focus increases in the 1964 specifications for the renovations of James B. Colgate Hall, which require the contractor to “Remove complete all trees, shrubs and stumps from area to be covered by building. Remove without injury to trunks, interfering branches and roots of trees to remain. Do cutting and trimming only as directed. Box and protect all trees and shrubs in construction area to remain, maintain boxing until finished grading is completed” (Frank C. Delle Cese , 1964, Section 1 p. 1). These specifications clearly require that the trees are preserved throughout the construction process so that they can be replanted afterward.

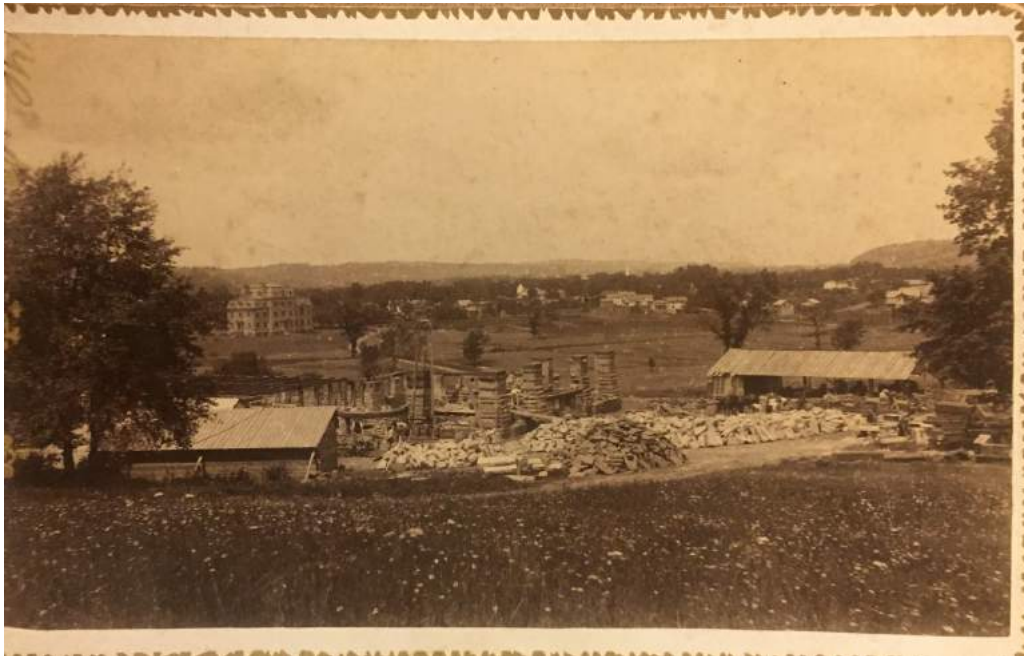


Figure 2: This image is from the initial construction of James B. Colgate Hall. It displays the organization of the work site and highlights the landscape surrounding the building. The card is from 1889.

Energy, water, and electricity use Post construction*LEED v4 Metric: Interior Lighting, Daylight*

Another component of sustainability that can be seen beginning with West Hall in the late 1800s is the use of natural and/or energy efficient lighting. “The occupants were left to supply wood or coal for their stoves and tallow candles and sperm oil lamps for illumination.” (Williams, 1969, p. 161). Prior to electricity, students living in West Hall were responsible for their own lighting, using methods that were not excessive or wasteful. In 1906, with the construction of Lathrop, there was also an evident desire to utilize natural light. This was primarily because the building was being used for a central museum in a two-story tall room, so natural lighting was naturally desirable for the

purpose. This specific window can be seen in Figure 3 ([Untitled photo of Lathrop Hall Window], A100 Box 41 Folder 11).

In the specifications for the 1930 renovations of West Hall after the fire, there were instructions to “install three new skylights in the new roof to match the present ones” (Specifications for Repairing Damage by Fire, 1930), which implies that skylights were in the building prior to 1930 and that the contractors wanted to maintain and improve upon their utility.

Choice/sourcing of materials

LEED v4 Metrics: Sourcing of Raw Materials

Throughout Colgate’s history and spanning all four of the studied buildings, local quarry stone was heavily used throughout the initial construction processes. Beginning with the construction of West in 1827, “the gray limestone for the walls was quarried from the hill above the old golf course” (Williams, 1969, p. 31).



Figure 3: Lathrop Hall Skylight in the main museum room

([Untitled photo of Lathrop Hall Window], A100 Box 41 Folder 11).



Figure 4: This image is a picture of West Hall circa pre-1920. It illustrates that West Hall has remained fundamentally the same throughout time. (Leozach, [photograph] n.d)

The 1906 specifications for Lathrop said that the underpinning of the building was to be made of local quarry stone. The 1927 specifications for the construction of Stillman required that the “stone for exterior walls.... Will be obtained from the University quarry” (Chambers, 1927). Also, sand for the construction “was to be procured from Boonville, NY” (W. B. Chambers, 1927). Although the archives of James B Colgate Hall don’t have an explicit mention of local quarry stone, the 1889 image of the building’s construction highlights the use of stone, and it can only be presumed that the building would use the same stone as the other buildings. However, it is certain that the building used locally manufactured brick (Williams, 1969, p. 182).

Although it didn’t mention stone, the 1964 renovations of James B Colgate Hall did require that the soil utilized for landscaping was of the “local variety,” so as not to disrupt the ecosystems too excessively (Frank C. Delle Cese, 1964, Section 1 p. 2). The renovation of James B. Colgate Hall in 1964 showed an effort to use specific grasses in the landscaping. In particular, the seeds that they planted were a mix of Kentucky bluegrass and Illahee red fescue.

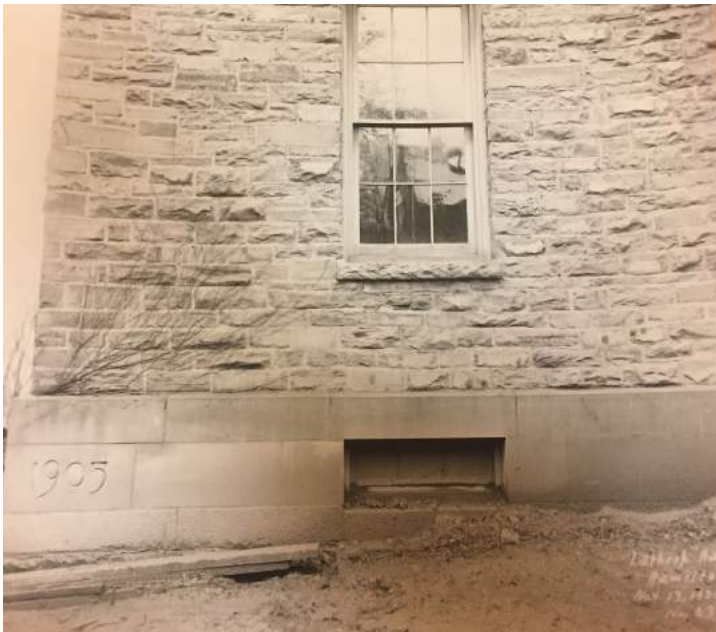


Figure 5: This image of Lathrop Hall highlights the usage of the local stones from the quarry and an effort to make the buildings look similar to each other ([Untitled photograph of Lathrop], A100 Box 51 Folder 4)



Figure 6: This is an image of the construction of James B. Colgate Hall. This image also highlights the stone and locally made brick utilized on the exterior of the building ([Untitled photograph of James B. Colgate Hall], A1000 Box 10 Folder 10)



Figure 7: This is a current-day image of the quarry, taken from the Colgate website. It has not been used for a long time, as evident by how overgrown it appears to be. Despite this, it was most certainly an interruption in the landscape and continues to be today.
(Daniels, M.)

Besides using local materials, there was also clearly a desire to use top quality durable materials. This may have been prompted by the fires that occurred in a few of the buildings including West and James B Colgate, both of which required hefty renovations. In the 1927 Specifications for Stillman Hall, the materials were required to be “of good quality and... in accordance with the best shop practices”. The 1930 West Hall renovation specifications also indicated that the skylights were to remain, except they were to be changed to “copper, with rough wire glass with copper vent hoods.” This implies a realization that the previous construction was not as resistant, and that changes needed to occur.

Wood was and continues to be used heavily in the buildings as well, especially in Lathrop (1906) and Stillman (1927). For Lathrop, the main tree species from which wood was obtained were red oak, white pine, and brown ash. For Stillman, white pine and red oak were also utilized. Both white pine and red oak are very plentiful throughout the Northeast US and are also not endangered. However, this wood wasn't recycled, which means that deforestation had to occur in order to obtain it. Currently, as we learned during our interview with the Director of Sustainability, recycled wood is being used more and more in construction and renovation projects.

"If you look at our two newest buildings, we did use a lot of recycled materials, post-consumer content. Trudy has a lot of wood in it, a lot of that wood is repurposed wood. I just think that that's better for forests, for recycling so you're not using virgin materials or products"

Economic Pillar

LEED v4 Metric: Optimize Energy Performance, Enhanced Commissioning

The economic pillar proved most difficult in terms of finding archival evidence. As we learned in one of our interviews, it wasn't until *extremely* recently that institutions learned how economically efficient it actually was to build using sustainable practices. However, we did find data of how much money was allotted to certain projects, which could give some indications of which types of projects were prioritized. West Hall was built for around \$6,500 in 1827. The construction of James B. Colgate Hall in 1874 was built for about \$60,000. The original cost for the construction of Stillman in 1927 was at or below \$200,000. Another interesting piece of information from the Stillman specifications was that the local quarry stone did not cost the contractor any money, although they did have to pay for transportation of the stone. "The stone for exterior walls, except cut bluestone and limestone, will be obtained from the University quarry. The contractor will not be charged for this stone, but he shall pay all costs of quarrying, transportation and cutting" (W.b Chambers, 1927). Finally, the 1971 renovation of Lathrop was assisted by a grant of \$426,000. There is an obvious increase in the amount of money spent on buildings over the years, which could be for any number of reasons. This could be due to changing values of the dollar, or to an increase in the amount of money that Colgate University as a whole had. Perhaps the fact that Lathrop received such a large grant for its renovation in 1971 (which was for the purpose of expanding a largely science-focused academic building) implies that academic/scientific projects were of higher value.

With regard to economically efficient energy and heating systems, none of the building's archives had any mention of sustainable energy/heat efforts after construction except for Stillman's dormitory regulations from 1936 (Dormitory Regulations, 1862-1940). These gave a maximum room temperature, as well as a rule that radiators needed to be turned off prior to opening any windows. It is good that this regulation was in place, as students occupy a high number of rooms.

In terms of construction, the 1964 specifications for the renovations of James B Colgate hall required that "extreme care" was to be taken to avoid electrical, water, and telephone lines during the excavation processes (Frank C. Delle Cese, 1964). This requirement led to a lower risk of spilling, leaking, and pollution, as well as less of a potential for these systems to need to be re-installed.

LEED v4 Metric: Lifecycle Impact Reduction

Another way in which economic efficiency can be examined is how much forethought is put into preventing the need for future renovations and maintenance that will require major expenses. First of all, when Lathrop was originally built in 1906 as an extension of the previous chemistry lab, it was turned into primarily a museum for the studies of biology and geology, with marvelous natural light that made it perfect for the role that it was attempting to fulfill. However, by the 1950s, the student body had grown by huge numbers and it was determined that the museum was no longer what was necessary for the building to provide. Thus, it was expanded to include many more labs and classrooms. In the 1972 rededication of Lathrop Hall, there was a panel hosted in the building that focused on maintaining government support of science, with four speakers from various institutions. These pieces of data make it clear that Lathrop has evolved

throughout the years based on the human needs that it was meant to fulfill. This type of adaptability is important, as it is much more sustainable and cost efficient to renovate and reset buildings than it is to break down a building and create a completely new one for a different use. There was definitely an awareness of this, at least in the 1972 renovation of Lathrop, as an individual who spoke at the event said that “It is not possible to say what facilities will be desired in another 65 years, for equipment will change and educational styles may differ substantially from those of today, but in planning the remodeling every effort was made to build in flexibility for accommodating later needs” (Rededication and Renovation of Lathrop Hall, 1972.) There wasn’t any explicit information on the economic pillar in the archival resources for James B. Colgate Hall, but it should be noted that it has been used as a library, an administration, and an admissions building. There were likely structural changes that needed to take place for these shifts to happen, but the building looks relatively similar today compared to how it did at initial construction, indicating that it was also flexible and adaptable. West Hall also looks very similar today, although it has primarily been used as a residence hall (exempting its first few years of existence when it was one of the only buildings on the entire campus). The building originally contained a chapel that was transformed into student rooms in 1867. “Extensive Renovations have obliterated all traces of the original interior but externally the building is the same as it was in 1827” (Williams, 1969, p. 33). In an interview with one stakeholder, we discussed this exact issue and how it is coming into light currently:

“This campus is pretty old, and our buildings weren’t really designed, some of them are not being used for what some of them were originally designed for. For instance in some of the lab buildings, we are going back through that cycle now. I think Wynn Hall in particular they’re looking at the mechanical side of the systems to upgrade and change some of the parameters, obviously windows and things like that we’re looking at changing out, but there is obviously a cost to everything you do, you take the money and try to plan smarter for what you do next time” (Interviewed Stakeholder, 2017).

In the same interview, the interviewee talked about how discussions of sustainability have changed over his lifetime.

“It’s like a different age. We did talk about, we took classes in passive solar design back in the day and it was a big movement, everyone was excited about it, the problem was the technology was there yet, it didn’t work. People would put these solar panels on and about January 1st they’d freeze up until March or something, it just wasn’t anything worth while. Now I see it everywhere” (Interviewed stakeholder, 2017).

In terms of how economic aspects of sustainability are being looked at now, we learned from our interviews that Colgate has only recently begun to understand the economic efficiency of building sustainably. In 2007, with the construction of Ho, there was a conscious decision to not achieve LEED certification. Instead, the contractors attempted to pick and choose certain LEED guidelines that they’d try to achieve, and it had its consequences.

“You either build to LEED standards or you do not. There are no “LEED-like” buildings, because as the project gets close to opening, people find easy to cut costs, which is exactly what happened in Ho. A few years after construction, the building was hemorrhaging energy, so we had to go in and dump a lot more money into that building to get the systems back online (Interviewed stakeholder, 2017).”

After this unsuccessful decision, Colgate began to require LEED certifications for all new construction and renovation projects, as mentioned in the literature review section of this report.

“They replaced James C. Colgate last year with something that isn’t slate but it is an equivalent and it is expensive but it will be here for our great grandchildren” (Interviewed stakeholder, 2017).

Social Pillar

Sourcing/Treatment of Laborers

One component of the social pillar concerns the sourcing of the labor, and how laborers are treated. Colgate has an interesting history regarding this specific component, seeing as many of the original laborers that contributed to the construction of West Hall and other similar projects were in fact, students. “Students organized by classes contributed a good deal of the labor and for this purpose were given holidays in the spring and fall. Since many had grown up on farms they were not unused to planting or felling trees, digging stumps, or drawing stone. Additional labor came from the Irish immigrants who were being hired as janitors and groundsmen, the best known of whom, Lant Gilmartin, became head janitor in 1888” (Williams, 1969, 180). Irish immigrants were also hired as groundsmen around the same time period. In most of the examined documents, there are requirements that the contractors insure their laborers, protect them, and treat them fairly. The specifications for Stillman Hall in 1927 required that the men work in harmony with each other and that all laborers are skilled craftsmen (W.B. Chambers, 1927). In the specifications for the construction of Lathrop Hall, in 1906 the contractor was required to legally protect the construction workers. There is not a specific mentioning of this in the 1964 James B Colgate Hall renovation specifications, but it is implied, as the contractor is responsible for monitoring and controlling the rest of the workspace.

LEED v4 Metrics: Site Assessment, Quality Views

It is clear from the archival data that there has long been a preoccupation with making Colgate’s buildings extremely aesthetically appealing and non-abrasive. Perhaps this preoccupation began in the early 1870s, which is when Professor James M Taylor requested that the campus’s buildings look “less like a country poor-house, and more like a university.” In 1887, a professor “planted ivy around Alumni, East and West Halls to hide their bare stones and mortar” (Williams, 1969, p. 181). Throughout most of the school’s history, local quarry stones were used in order to make the buildings look more like they were part of the landscape. For example, the specifications for Lathrop’s construction in 1906 said to use granite “of a warm color to harmonize with the limestone used in the building” (Harding and Seaver Architects, n.d). Clearly, aesthetics were and continue to be important. One interesting note is that, during the ceremonial “Laying of the Cornerstone” in 1906, the alma mater was sung and it included the line “When, through thy valley, fair Chenango, twilight falls. Bringing its silence to our college halls” (Laying of the Cornerstone, 1906). If not a physical manifestation of environmental sustainability, this is clearly a cognizant awareness of the interconnectedness of the campus and the surrounding natural landscape. Also, there are explicit directions in most

cases covering how exactly landscaping should be carried out. For instance, in the 1964 specifications for the renovations of James B. Colgate Hall, the process of landscaping contained the following details: "Work under this item shall include preparation of surface of areas to be seeded. Furnish and sow lawn seed as specified below. Roll, water, protect and maintain in accordance with these specifications. Seed for a distance of ten feet around building platform and steps and blend into surrounding areas. Maintain seeded areas by watering, weeding, replanting, rolling, mowing, trimming, cutting and by other operations as necessary. Protect seeded areas against damage including erosion" (Frank C. Delle Cese, 1964, Section 1 p. 2-3). This metric was placed in the social pillar because a building's quality of views can have a major impact on its social perception.

LEED v4 Metric: Indoor Environmental Quality

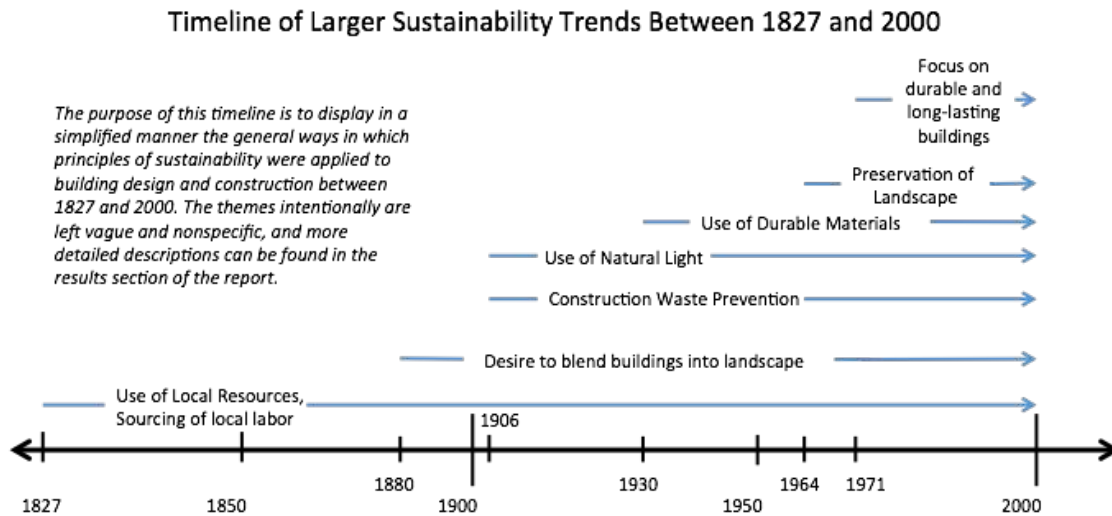
In an interview with one stakeholder, we asked if Colgate currently addresses all three pillars, or if there is still work to be done:

"I think more and more on the environmental side of things. We're just dipping our toe in the water in terms of recognizing the health and wellness aspects of buildings, I think that's an area for a lot of growth. There's a lot of research coming out now about the cognitive function of buildings. So a building that's energy efficient and a clean environment has really measurable impacts on the function of your mind. It's really alarming actually. And because we spend so much of our time in buildings, that's a major considerations. People make better decisions, they think faster, there's less sick days, that's important for an academic building in particular."

This brought up the idea that indoor environmental quality (which is a LEED metric) is a very important aspect of social sustainability that has not been taken into consideration enough throughout Colgate's history. Indeed, we found no information on it in the archives. This most likely has something to do with the amount that scientific knowledge on the subject has developed over time. Generally, based on our findings, the economic and social pillars of sustainability have been focused on to a lesser extent than the environmental pillar.

Analysis

Figure 8: Timeline of Larger Sustainability Trends Between 1827-2000



From our research in the archives as well as our understanding of Colgate's current environmental approaches, it seems reasonable to infer that many of Colgate's seemingly sustainable practices throughout its history of building design and construction have been motivated by a concern for aesthetics. This prioritization of aesthetics is demonstrated as early as the 1870s by both students and professors. Professor James M. Taylor likened the condition of the campus to a "third class farm" (Williams, 1969, p.179), and student criticisms were memorialized in the student newspaper, the *Madisonensis*, mentioning their envy of other institutions and their disgust of various aspects of the landscape that were eyesores, such as overgrown fields, tree stumps, run-down barns. The students "sarcastically urged that something be done to make the buildings and grounds 'look less like a county poor-house, and more like a University'" (Williams, 1969, p.179). This provided us with a framework for understanding the attitude toward the appearance of the university and the stress placed on it in years to come. As a new and growing institution, it would seem that the approval of and pride in the school from students and faculty, both in an educational sense as well as physically/aesthetically, would have been prioritized by the administration in order to attract more students and maintain success. Therefore, it is reasonable to conclude that such sentiments from students and faculty about the university's appearance heavily influenced Colgate's approach to building design and construction throughout its history. Aesthetics, then, was and is the primary motivation for many of the seemingly (and coincidentally) sustainable building design and construction practices that have been outlined in building specifications of the four buildings we studied. LEED criteria that we focused in on in our research that (unintentionally) prioritize aesthetics include the prevention of pollution from construction activity, preservation of the natural surrounding landscape and quality views.

We first see a concern for the prevention of pollution in the *Harding and Seaver Specifications* for the original construction of Lathrop in 1906, "The contractor is to clear away all dirt and rubbish resulting from his operations..." (Harding and Seaver, 1906).

This concern for construction pollution is also present in the specifications of Stillman Hall in 1927, and the renovations of West Hall in 1930 and James B. Colgate Hall in 1964. It is evident that the university's emphasis on this aspect of sustainability has increased as the specifications for cleaning up the construction of James B. Colgate Hall in 1964 were more detailed than previous requirements had been, "The contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his employees or work, and at the completion of the work he shall remove all his rubbish from and about the building and all his tools, scaffolding and surplus materials and shall leave his work 'broom clean' or its equivalent, unless more exactly specified" (*Specifications for Alterations and Additions for the Administration Building*, 1964, 10). It is unclear whether or not such regulations were at all motivated by a desire to protect the surrounding environment and keep it clean, or if they were solely motivated due to the unappealing aesthetics resulting from rubbish. The removal of debris is a key sustainability concept as waste accumulation has a direct effect on the health and functionality of the surrounding natural ecosystems and species (including humans). Materials used in construction often consist of various chemicals, can contaminate soil and water sources, or can even be mistaken for food by wildlife. Construction also involves many hazardous waste materials that need to be disposed of in a certain manner (Cole, 2010, p.951). The university has maintained this concern for the pollution generated by construction through to the present day, yet nowadays these requirements are certainly motivated by a desire to be sustainable. The university's *Sustainability and Climate Action Plan*, released in 2011, states, "It's Colgate policy that contractors are required to recycle or responsibly remove any construction debris as part of doing work on the Colgate campus" (*Sustainability and Climate Action Plan*, 2011, p. 44). The language used for these requirements has evolved throughout the university's history to be increasingly more focused on sustainability.

Similarly, our results also indicated a greater concern for preserving the surrounding natural landscape. This can be explicitly depicted by the juxtaposition of the building specifications of Lathrop Hall in 1906 and those for the renovation of James B. Colgate Hall in 1964. In 1964 the specifications stated, "Remove complete all trees, shrubs and stumps from the area to be covered by the building. Remove without injury to trunks, interfering branches and roots of trees to remain. Do cutting and trimming only as directed. Box and protect all trees and shrubs in construction area to remain, maintain boxing until finished grading is completed" (Frank C. Delle Cese, 1964, Section 1 p. 1). The same specifications further outline lawn seeding requirements for the surrounding site area that include maintaining the area and protecting it from damage like erosion. The specifications delineated specific grasses that should be used in the landscaping, Kentucky bluegrass and Illahee Red Fescue. Kentucky bluegrass seemed like a logical choice for the grassed areas surrounding the building due to its fast growing nature and its ability to grow a strong root system which helps against erosion (Seedland). To complement the sod-like Kentucky bluegrass, the university also planted Illahee Red Fescue. Illahee Red Fescue is also another great grass that is erosion resistant as well as what drought resistant which would have helped the school save money and water, as it needs less watering (USDA). Although only two examples, it is clear that the university took into account what the landscape around the building was and how they would work on maintaining the current landscape even after the building was constructed.

Again, from the information provided in the archives, we are unable to know for certain the primary concerns that motivated regulations such as these. Figure 2 (in Results) depicts the original site of James B. Colgate Hall during construction preparation, and shows tall grasses in the surrounding area which could indicate a desire to keep the surrounding area as similar to its natural state as possible.

Further emphasis on aesthetics can be found in the desire to blend the buildings into the natural surroundings and existing built environment. The university's desire to blend the buildings into the natural surroundings simultaneously contributed to the use of local materials. West Hall, Lathrop Hall, and Stillman Hall were all constructed from gray limestone acquired from the local quarry. The exact rationale for use of stone from the quarry is not stated but convenience of location of and access to the quarry as well as a desire for the buildings to reflect the region's natural environment seem probable. It is uncertain whether environmental sustainability reasons (ex. Native to the environment and minimized emissions due to transport distance) for using local stone over other material were considered in the decision. Specific evidence from Lathrop's specifications indicate a desire for the building to fit into the built environment seamlessly, "The exterior walls of the building, except as otherwise shown or specified are to be of rubble work of local quarry stone similar to that in Alumni Hall" (Harding and Seaver, 1906), and "Granite is to be of a warm color to harmonize with the limestone used in the building". Local wood has also been used and continues to be used in buildings on campus. Two common types include red oak and white pine, both explicitly used in the construction of Lathrop (1906) and Stillman (1927). Both red oak and white pine are flourishing, native species of New York state. It can be presumed that the prevalence of such trees throughout the state allowed for the cost of the material to be affordable, if not inexpensive for the university to invest in. It seems reasonable to determine that the university was primarily concerned with the cost of the material and not with the environmental impact of the wood as there is no indication of consideration for utilizing recycled wood, and thus deforestation was a direct result. As we learned from the Director of Sustainability, the university is now placing greater focus on utilizing recycled materials in construction and renovation projects, "If you look at our two newest buildings, we did use a lot of recycled materials, post-consumer content. Trudy has a lot of wood in it, a lot of wood that is repurposed wood. I just think that that's better for forests, for recycling so you're not using virgin materials or products" (Director of Sustainability, 2017).

In terms of energy use, efficiency and conservation, Colgate has somewhat maintained a concern for energy efficiency/natural energy and conservation since the early years. Prior to electricity, students utilized wood or coal in their stoves to heat their rooms, which they had to supply for themselves. While this saved the university money, there are several environmental consequences to utilizing coal and also implications depending on the students' sourcing of the wood, as well as health impacts to burning coal and wood indoors. "Using coal and other mineral solid fuels for home heating will usually result in higher emissions of both local air pollutants (such as particles and sulphur dioxide) and carbon dioxide (the greenhouse gas) than an equivalent natural gas-fired system, and therefore coal-fired heating will normally have a higher environmental impact than gas" (Environmental Protection UK, 2017). Though there is less environmental impact due to the burning of wood, the manufacturing of and transport of

wood fuel products leads to deforestation and produces carbon emissions. In later years it became clear that the university was eager to incorporate more natural lighting into their constructions. The construction of Lathrop in 1906 included the installation of a large skylight window, in the two-story room intended to be a museum. Motivations for installing the skylight were likely centered around aesthetics, so the museum could be better lit throughout the day, and economics as the museum would likely be lit for the entirety of the day incorporating natural lighting would help to reduce the amount of electricity needed to light it during daylight hours. The utilization of skylights was also referred to in the renovations of West in 1930, which indicated that the original construction of West also included skylights. The implementation of skylights at this point in history was likely motivated by the quality of lighting prior to electricity and provided by electricity at the time as well as the cost of electricity. Another reference to energy usage in the archives was seen in dormitory regulations from 1936 indicating a concern for conserving energy usage in the dorms most likely to save on expenses. Economic concerns also motivated the requirement to take extreme caution during excavation to avoid electrical, water, and telephone lines as severing such lines would pose costly losses due to cost of loss of water and re-installment fees.

It is evident that intentional implementation of and focus on the environmental pillar of building design and construction practices was not present in Colgate's history until the turn of the century. In the school's present-day construction projects, the mindset has changed: we are shifting to valuing utilizing durable materials that minimize environmental impact over the initial costs. This can actually be seen after the 1971 renovation of Lathrop when there seemed to be an awareness of the both economic and social value of constructing buildings that are adaptable and will be beneficial to future generations. The utilization of environmentally responsible materials is also economically responsible for the university as they are also more durable, "They replaced James C. Colgate last year with something that isn't slate but it is an equivalent and it is expensive but it will be here for our great grandchildren" (Interviewed stakeholder, 2017). Yet, costs have still had a heavy influence over the decisions Colgate has made in terms of buildings and is detrimental for becoming more sustainable. We learned from one interviewee, who said that in the construction of the Ho Science Center, there was a conscious decision to not have the building LEED certified due to the cost of doing so. "The part about buildings that I think has been a shift for Colgate is we spend a lot of time focusing on the cost of the initial construction, which is generally about 1-2% of the cost of a building. I have to keep reminding people of that. Because, [Ho] is an expensive building. We will end up spending 5-10% more just on maintenance and energy costs. Its way more expensive to operate a building than it is to build it" (Interviewed stakeholder, 2017). So, Colgate still has a way to go in balancing the three pillars for truly sustainable building design and construction practices.

Conclusion

Our goal was to assess how principles of sustainability have and/or have not been taken into account throughout the history of Colgate's building construction and design. Through the archival research and the in-person interviews, we were able to develop trends of how and when different principles of sustainability were manifested in architecture and design. Whether it was the sourcing of local materials, the preservation

of the surrounding landscape, the effort put into maximizing economic efficiency or the desire to incorporate aesthetically pleasing views, it is clear that sustainability has been given physical form in Colgate's history through building construction and design. However, there is still a lot of room to grow in this regard. We have come up with a few recommendations for the future that may assist the university with achieving goals of sustainability and, ultimately, carbon neutrality.

Recommendations

Our first recommendation concerns the fact that Colgate is no longer growing at the exponential rates that it was in its earlier years. In the early to mid-1900s, the student population at Colgate was steadily increasing very quickly due to innovations in transportations and the increasing popularity of the school. Thus, new residential buildings had to be built more often than not. However, we are currently at a time when the student population is not necessarily increasing as rapidly. Therefore, Colgate has the chance to look at its existing buildings and improve them in terms of their environmental, economic, and social sustainability. We are hoping that the school could conduct renovations to ideally get each building LEED certified. The opportunity has presented itself for the university to upgrade our buildings, because of the stabilization of our student enrollment. We are no longer expanding, so we should make what we have better, more efficient, less wasteful, and more sustainable.

The second recommendation that our group has would be for a heightened sense of accountability on the part of the university. Meaning, if Colgate has set forward guidelines to make every future building and renovation of a building to meet, at a minimum, LEED Silver rating, then they must abide by these guidelines. More important than following guidelines that the university agreed to would be the fact that the university will be saving money by making our buildings meet the LEED standards. Both of our interviewees pointed to this fact during their respective interviews. For instance, after learning about how blatantly economically inefficient Ho is from one interview, it is clear that the costs of achieving LEED standards are more economically ideal than those required for maintenance and damage repair. Our other interviewee mentioned how, according to them, LEED standards are not at all a difficult or inconvenient achievement. Since this is the case, we think there is a responsibility on the part of the university to abide by their guidelines. If more research is necessary to prove that achieving LEED is better in the long run, then more research by the university is absolutely necessary. The university agreed to follow the LEED Silver guidelines, it is now time for them to follow up on their agreement.

A third recommendation that we have is to incorporate sustainability more heavily into the academic curriculum. Colgate does a good job of influencing students to act sustainably in their everyday life. The university also has succeeded in developing clear sustainability frameworks and goals on the administrative side of things. However, if sustainability were to be incorporated into the core curriculum, it could become more systematically embedded in our institution and therefore have more influence. One way in which sustainability could be incorporated into academics that is relevant to our project is through art classes. A sustainable architecture class could be interesting, or perhaps sculpture or photography classes could have projects based on sustainability ideals. There could also be classes in the hard sciences that focus on the social

sustainability of buildings, in terms of how they maintain or degrade the health of students, faculty, and employees.

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Appendix 1: Certificate of Informed Consent

Overview and Procedure: We are a group of students from Colgate University working on a project concerning the history of sustainability in Colgate's building design and agriculture. We would like to ask you some questions concerning this topic. The interview will take 20-30 minutes of your time.

Risks and Benefits: Your participation in this project is low risk, as none of the questions should be too personal. We cannot offer compensation in the interview, but recognition of your name and the information with which you provide us will be included in our final report.

Confidentiality: We will respect your wishes regarding confidentiality. As per the questions below, if you would prefer us not to use your name, voice, or image in our project then everything that you say in this interview will be kept confidential and will not be linked to your name in our report. If you give consent for us to attach your name to your words, we will properly cite any information that that you provide us with. If at any point during or after the interview you wish to retract any or all of the information you gave us, you have the right to do so.

Your Rights: As your participation is fully voluntary you have the right to withdraw from this study at any point or decline to answer any question without penalty.

Contact Information: If you have any questions about this study or your rights please contact either of our professors: Professor April Baptiste (abaptiste@colgate.edu; 315-228-6740) or Mr. John Pumilio (jpumilio@colgate.edu; 315-228-6487).

Please circle the appropriate choice for each of the following:

Yes or No: I give permission for my voice, image, name etc. to be used for your video component of your class project

Yes or No: I give permission for my quotes to be used in your project

By signing below, you are agreeing 1) to participate in this study, and 2) that you have read and understand all of the information provided on this form.

Participant Name (please print)

Researcher Name (please print)

Participant Signature

Researcher Signature

Date

Date

Appendix 2: Questions for Interviews

1. Please tell us a bit about your job, how long you've worked at Colgate, and which types of positions you held prior to coming to Colgate.
2. Have you seen Colgate's approach to sustainability change during your time here?
3. How often does sustainability come up in your conversations in the professional setting? In which form does it manifest itself?
4. Relative to how other universities have progressed in terms of green building design, where does Colgate stand?
5. Do you think Colgate addresses all three pillars of sustainability in building construction and design?
6. What are some sustainability initiatives at Colgate that have succeeded? Are there any that have failed?
7. Does building sustainable green buildings inconvenience the process at all?