CRIPE ARCHITECTS + ENGINEERS:
4th year Capstone Project

An Honors Creative Project (ARCH 401)

by

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The global community is finally beginning to realize that the signs of global warming, due to pollution and our current ways of life, are affecting the planet that we inhabit. While many governments are still somewhat sluggish on introducing policies to help control pollution and energy consumption, individual organizations have taken it upon themselves to comply with a higher level of sustainability. Ball State University is one of these organizations. Every new building on the university’s campus must make an effort to be sustainable and lower its energy usage. To show their commitment to this pledge, the university has also decided to look into the development of multiple new majors based around the new areas in the environmental movement. The theoretical design of the new Environmental Studies Building was given to the 4th year architecture studio in 2008. The project, known as the “CRIPE ARCHITECTS + ENGINEERS 4th year Capstone Project,” was geared towards showcasing all of the knowledge gained by the students over their time spent in the Architecture program. In this document I give some insight into the process and reasoning behind the final design of my building proposal. I wanted to design a proposal that embodies Ball State’s new outlook on the architectural environment, and provides a good example to all who interact with the building.
I want to thank Dr. Stephen H. Kendal for his help with the constant revision process that took place over the course of the buildings design. His ability to look at every design element from a different angle helped to shape the eventual final design.

I would also like to thank Dr. Barbara A. Stedman for her availability and willingness to help me through the thesis process.

A special thanks to Sandi Hostetler for taking the time to check the final draft for technical errors and for encouraging me to keep going with the project until the end.
Throughout my four years in the Architecture program I have been taught, when giving a presentation of a proposed project, it is best to pick just a few main design concepts. These concepts are to be the main focus when designing the building. After establishing the primary concepts smaller, concepts can then be integrated into, and built off of, these three principal goals.

To find these goals I started by first looking at the context of the site. On one side of the proposed site stands the Arts and Journalism building. The other side of the site is occupied by the Teachers College. Both of these buildings are icons of the existing campus. Everyone knows where they are located and what the buildings look like. With the proposal for the new building's location to be between these two structures, their presence cannot be simply overlooked.

Another thing that I looked at was the existing trend of all of the buildings on the city block between Petty Road and Riverside Avenue. When looking at the context for a new building it is not enough to simply consider the two neighboring buildings. The context for each site varies but, for the design of this new campus building I felt it necessary to look, at the minimum, to the edges of the block that it occupies.

The final design area that I took a closer look at into was the function and meaning of the building's purpose.
When completed, the building will house the Environmental Studies majors. Many of the buildings on Ball State’s campus do not adequately portray the activities of the building in their architecture. However, there are a few examples of buildings that physically look like the objects found within the building. For example, Bracken Library is said to resemble a stack of books, and the College of Architecture and Planning’s solar chimney does slightly resemble a drafting desk. But other than these physical representations, there is nothing about either of these buildings that would inform visitors of the activities contained within the walls of the buildings.

After determining that I could produce three major design concepts from the areas of interest, I came up with three statements that would represent my goals in the designs of my competition entry.

1. The building must serve as a connector between two already dominant campus landmarks. It needs to incorporate two completely different façade schemes and join them together to make a complete and comprehensible final scheme.

2. The continuation and exploration of the interior street created by the connection of the buildings on the West side of McKinley between the streets of Petty and Riverside.

3. As the new Environmental Studies Center, the building must act as a teacher to the occupants that walk through its halls and make an outstanding statement to all who see the building, letting everyone know of Ball State’s commitment to a greener future.

These would then become the basic drives of my project and would inform the development and process, which in turn would lead to a final design.
I looked at the building as a connector in two ways. The first way involved the external appearance of the building. Both the Arts and Journalism building, also known as the Atrium, and the Teachers College have their own, very distinct façade language. The Atrium has a much more horizontal façade pattern, whereas the Teachers College has a much more vertical pattern.

The Atrium is made primarily out of brick with thin horizontal bands of limestone that separate the larger bands of brick. The building stands two stories tall on the side where it connects to the proposed building site and four stories tall on the side facing the Ball Communication building. At its center the Atrium also serves as one of the campus's centrally located dining facilities. The cafeteria space has large window walls facing the East. These window walls cover a large enough area of the façade that they also become a large design element.

In contrast, the Teachers College is made primarily out of limestone with smaller portions of brick. The building stands ten stories tall and therefore has a much different language than the Atrium. The Teachers College also has a number of windows integrated into its façade. However, unlike the Atrium, the windows are individual instead of being part of a large glass wall is where the cafeteria space for the food court is located.

Front façade of the Teachers College. The canopy on the right side of the picture is positioned above the main entrance from McKinley.
large window wall.

Looking at these facts, I knew that the proposed connector building would need to use a lot of brick, glass, and limestone in its façades. It would also need to utilize both a horizontal and vertical banding system. Because both buildings have an established pattern, the new building will need to find a way to mesh both façades based on the cues already designed into the two existing buildings.

As a result of these observations, I designed the north end of the building to mimic the patterns found in the Atrium. For example, one of the limestone bands from the Atrium meets with the wall of the Environmental Studies building and an overhang for one of the entrances starts at the same level. I also chose to keep the width of the bands the same from one building to the other. The primary materials for this end of the building are also kept the same as what is used in the Atrium.

On the South end of the building I chose to mimic the Teachers College. The vertical banding on the Environmental Studies building is the same width and spacing as found on the main façade of Teachers College. Just as the North end of the building is primarily brick to match the Atrium, the South end of the building is primarily limestone to match the Teachers College.

There were two real challenges with making this idea work. The first of these was mimicking both flanking buildings, and still creating a new informed language with its own character. The second was taking both primary patterns, Atrium on the North and Teachers College on the South, and making them mesh through the proposed building.

Altering the layout of the windows and introducing greenwalls formed a new language between the buildings. On the North end of the building, I added in horizontal window bands to emphasize the horizontal nature of the Atrium. On the South end of the building I continued the Teachers College window pattern all the way to the ground, skipping the base pattern found on the actual Teachers College. This helps the building look taller by making the floors of the building look the same.

Both designs eventually come together in the center of the building. Both the horizontal and vertical patterns merge together in the center atrium space of the Environmental Studies building. The major mullion patterns of the window wall are the same dimensions as found on both neighboring buildings.
The second way that the new Environmental Studies building would serve as a connector is the continuation of the interior street. With the completion of the David Letterman building in 2008 all of the buildings in the block between Petty and Riverside, with the exception of the Teachers College, share a connected hallway. This hallway, informally dubbed the interior street, provides an interior path from one building to the next.

On any given day the interior street may not be recognized as a major avenue for student travel. On a rainy day however the interior pathway becomes crowded with students who have to make the long trek from one end of campus to the other. The path allows for a good portion of the campus’s length to be traversed in a dry environment. The other time that the street sees a large number of pedestrians is around meal times. The street path provides a means of travel for all of the students who have classes in either the Ball, David Letterman, or Bell buildings without having to go outside and then back into the Atrium.

The street does have one major functional flaw. Between the Ball Communication building and the Atrium there is no connection on the first floor. This means that a person traveling from one end of the street to the other at some point must traverse at least two flights of stairs to travel the full length of the path. There are stairs in the David Letterman and Ball buildings that can be used to reach the second floor on the north side of the path and then there is a staircase in the Atrium to get back to the first floor. This process of changing floors while trying to traverse the pathway in its entirety can be confusing for first time visitors to campus.

I wanted my building to finish this interior street. It connects the Atrium and Teachers College on both the first and second floors. By connecting them in this way, someone who is trying to make it from Bell to Teachers College now has
the ability to traverse the entire route on the second floor as well as on the first floor.

Another important aspect of the street is how it chooses to interact with each building that it passes through. I have already stated that it is confusing to pass from the Bell building to the Atrium because of the level change. However in the Ball building the street is a simple straight shot from one end of the building to the other. There is no interaction with the function of the building. I wanted my building to have its purpose known to all those who travel through it. By placing a small diagonal bend into the path through the building, it provides some diversity for the people traversing the path without making the route too difficult. The point of this is to interrupt the straight view through the building. There needed to be something that disrupted the direct path from one end to the other to provide some sort of draw that would make people interested in stopping and viewing some of the lessons that the building has to teach.

The second reason for the bend in the pathway was to connect the two openings in the existing buildings. On the North side it connects to the Atrium where the current small glass vestibule is located. On the South side it connects to the existing lobby of the Teachers College, right next to the main entrance from the McKinley side of the building.
Because this building will serve as the home of all of the Environmental Studies majors, I thought it was important that the building reflect this in its construction. I wanted anyone who saw the building to know what kind of majors inhabit the building. At the same time there needed to be something more than the standard adding of solar panels and miniature wind turbines to the building.

There are three primary green technologies, in addition to solar panels and wind turbines, which I wanted to incorporate into the design of the building. These technologies would be working examples, which would demonstrate what green technologies are capable of. Each technology would be taken care of by staff and students as a learning experience. This constant use would keep the technologies operational, unlike the solar chimney on the College of Architecture and Planning building, which had no one to take care of it so it fell into disuse.

The first of these technologies is the most obvious to the building façade. When looking at façade designs, I wanted to use something that would stand out from other buildings on campus. But the material also had to have significance to the inhabitants of the building. I decided to use something called a green wall. These green walls use a system of shallow plastic pots that hook into a wall bracket system. These shallow pots look similar to the black plastic flats that flowers come in. Contained within the system, I looked at a variety of different plants that would survive well even when growing on a vertical surface. It was also important that the walls stay a green color all year round. I found a variety of sedums that stayed green throughout the year and did not grow very long, this being an important part of keeping the overall maintenance of the walls low.

The second technology that I wanted to make available to the classrooms and labs of the building was something called a brown roof. Many people have heard of green roofs as their usage in new building designs becomes more
popular. Green roofs are definitely a good green technology but, depending on what activities are to take place on the planted roof space, brown roofs can be even better.

The primary difference between a green roof and a brown roof is what is planted. In a green roof the normal plantings are a mix of grasses that are closer to what you would find in a lawn. This provides a very durable and more aesthetic roof covering for roofs that will be used by occupants of the building. Brown roofs, on the other hand, use more local vegetation that does not require quite as much maintenance. Brown roofs incorporate local tall grasses, mosses, and sedums. Doing this also creates more of a natural habitat for insect populations. The downside is that the plantings are generally not able to stand up to regular foot traffic like the more hearty grasses used in a green roof. This means that the roof spaces that had the brown roofs would become more classroom exclusive spaces, rather than large gathering spaces.

The third technology that I wanted the building to showcase was the living machine located on the West side of the building. A living machine is a system that allows for the recycling of the water used by the building. The system even has the ability to recycle brown water from restroom facilities.

A living machine works by using a series of tanks with increasing sizes of organisms in each successive tank. The first few tanks hold only microorganisms, which begin breaking down the solids and adding oxygen into the water. In later tanks larger organisms and plants are introduced to start taking the ammonia and other harmful substances from the water. In one of the last stages the water is returned to a small man-made lagoon with all of the creatures that would be found in a natural marshland. At the end of the entire process the water is clean enough to drink or be reused by the building.

The living machine on the site is housed within a greenhouse located on the Western side of the building. By placing the building on the West and slightly Northern end of the site, the greenhouse receives the most daylight throughout the day. The warmth of the sun warms the greenhouse throughout the day and helps keep the plants inside warm through the generally cooler nighttime.

Another reason for choosing the greenhouse and living machine’s position was its proximity to the interior street that runs through the building. Pedestrians passing through the building must walk past the large window wall that looks into the greenhouse space. Because I wanted to showcase the green technologies used in the building, the interior of the greenhouse is sunken by a few feet. This allows the passersby to look down into the greenhouse space and receive a much better view of all of the activities and operations.


At the beginning of the design process there was a list of final presentation requirements laid out. These requirements were decided upon to best show the final designed project. The final drawn submissions were to fit on one 36"x72" board and be accompanied by a physical model of the proposed design. The following few pages showcase the final drawing and model submissions for the competition.
Right: View of the rear of the building. In the center of the photo the glass greenhouse can be seen. It becomes a major design element to the composition of the back façade. Building provides numerous places for bicycle parking to encourage commuters to use greener modes of transportation.

Below: Birds eye view of the building and surrounding site. The picture is oriented with West at the top. Teachers college is to the left and the Atrium is to the right.
Above: Another view of the rear façade. The terrace off of the third floor holds one of the building's brown roofs. It is directly accessible to two of the lab classrooms. The picture also shows the greenwall systems incorporated into the window pattern taken from the Teachers College.

Right: A view of the building looking North down McKinley. The front entrance of the building also has a number of bicycle holders for traffic coming to the building from the East side of campus.

Below: Front on view of the entire East façade of the building. Glass atrium at the center of the building provides the means for two separate building languages to overlap one another.
Final Drawings