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Teaching Tools for The School of The Built Environment

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Teaching Tools for The School of The Built Environment

Honors Project

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HNRS 4990: Honors Project

December 13th, 2021

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Dr. Arsenio Rodrigues, Linda Beall, Lisa Schaller

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INTRODUCTION

The goal for this honors project was to better the architecture program at Bowling Green State University. Currently, one of the challenges the program faces is a lack of knowledge/understanding about how the built environment is constructed. This project helped to fill that knowledge gap by creating learning/teaching tools that will benefit future classes of architecture students. This project was the result of an interdisciplinary study among the architecture program and the construction management program at Bowling Green State University.

RESEARCH QUESTIONS

The primary research question was how can I solve the lack of knowledge/understanding, among architecture majors, about how the built environment is constructed? From which, several smaller research questions stemmed:

1. What sort of learning/teaching tool should I make (research paper, graphic poster, a booklet, an architectural model)?
2. Should the teaching tools cater towards visual, kinesthetic, or auditory learners?

3. How can I make this learning tool unique, fun, and interactive so the knowledge it provides is more likely to be retained?
4. What types of construction should this project focus on (residential, commercial, civil, Institutional, etc.)?

LITERATURE REVIEW

The research questions guiding this project are primarily the result of meeting with faculty. During which, we discussed how the architecture program could be improved and how this project may be able to contribute to improving the program. Meetings with Dr. Rodrigues, The Director of the School of the Built Environment, provided insight into how the architecture program could be strengthened and how this project may be able to help improve the program (Rodrigues). Similarly, conversations with Professor Lisa Schaller provided a perspective from the construction management program and advice about the direction of the project (Schaller). Other sources that inspired the research questions for this project are books on architecture and construction. Most architecture books are full of diagrams, drawings, photos, and charts; very little of the books are purely writing (Ching)(Hall). The graphic nature of architecture books inspired the idea that the project should be highly visual and should teach architecture students in a way they will learn and retain information with ease. In the second half of the project, Professor Linda Beall provided vital insight into construction techniques and recommended literature for further research.

METHODOLOGY

In order to resolve the knowledge gap among architecture students concerning how the built environment is constructed, I created four learning/teaching tools that will aid in the understanding of how architecture is constructed. This project will aid students in understanding how two common types of architecture, commercial and residential, are typically constructed. To meet these goals, I made two scale models and two graphic posters. One model and one poster portray the typical construction techniques used in residential architecture, as seen in Figure 1 and 2. The other model and poster show the common construction technique used in commercial architecture, as seen in Figure 3 and 4. The models are scale representations of the structural systems of the two types of architecture. The posters contain construction details of each type of architecture. These details show how architects communicate how they want their designs constructed. The models represent the physical manifestation of those details. Together, the models and the posters convey to students how two of the most common types of architecture are typically constructed.



Figure 1

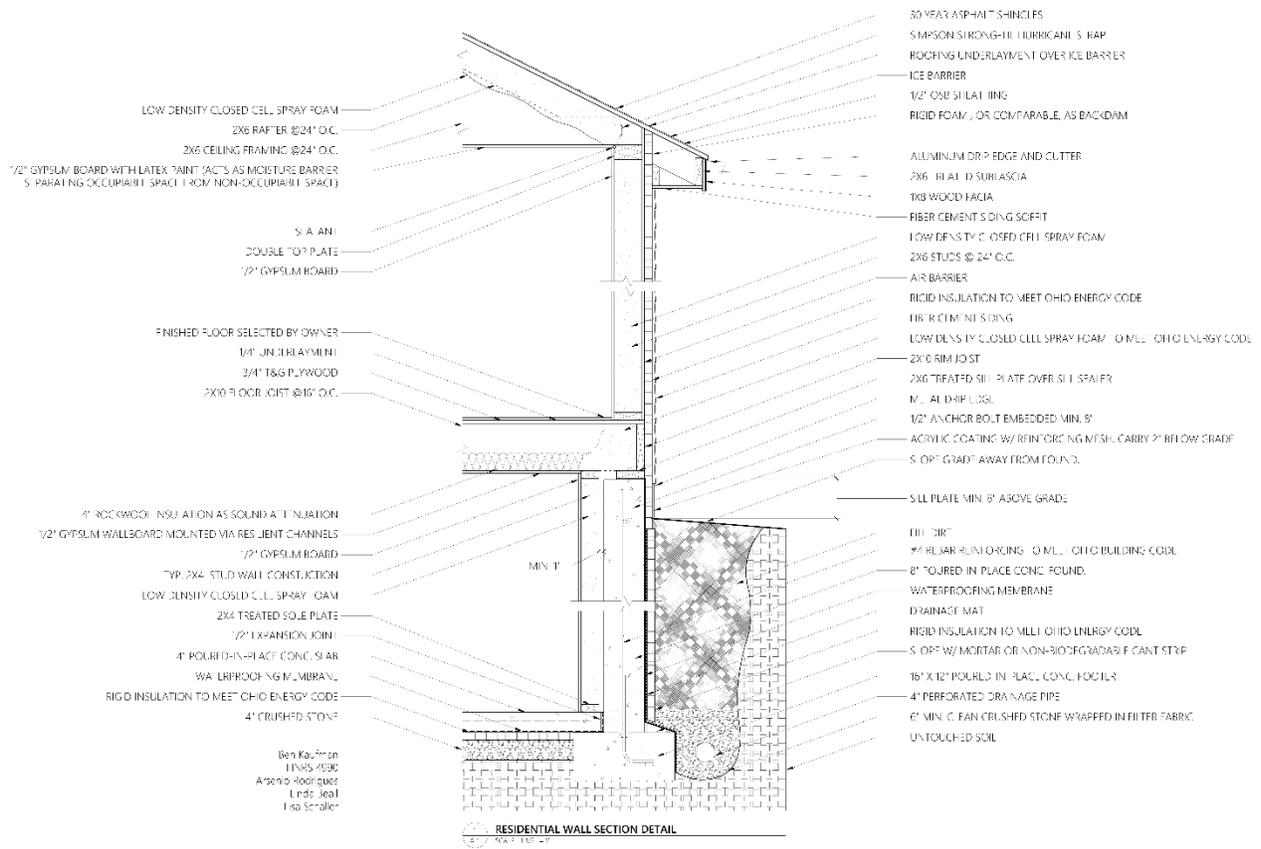


Figure 2



Figure 3

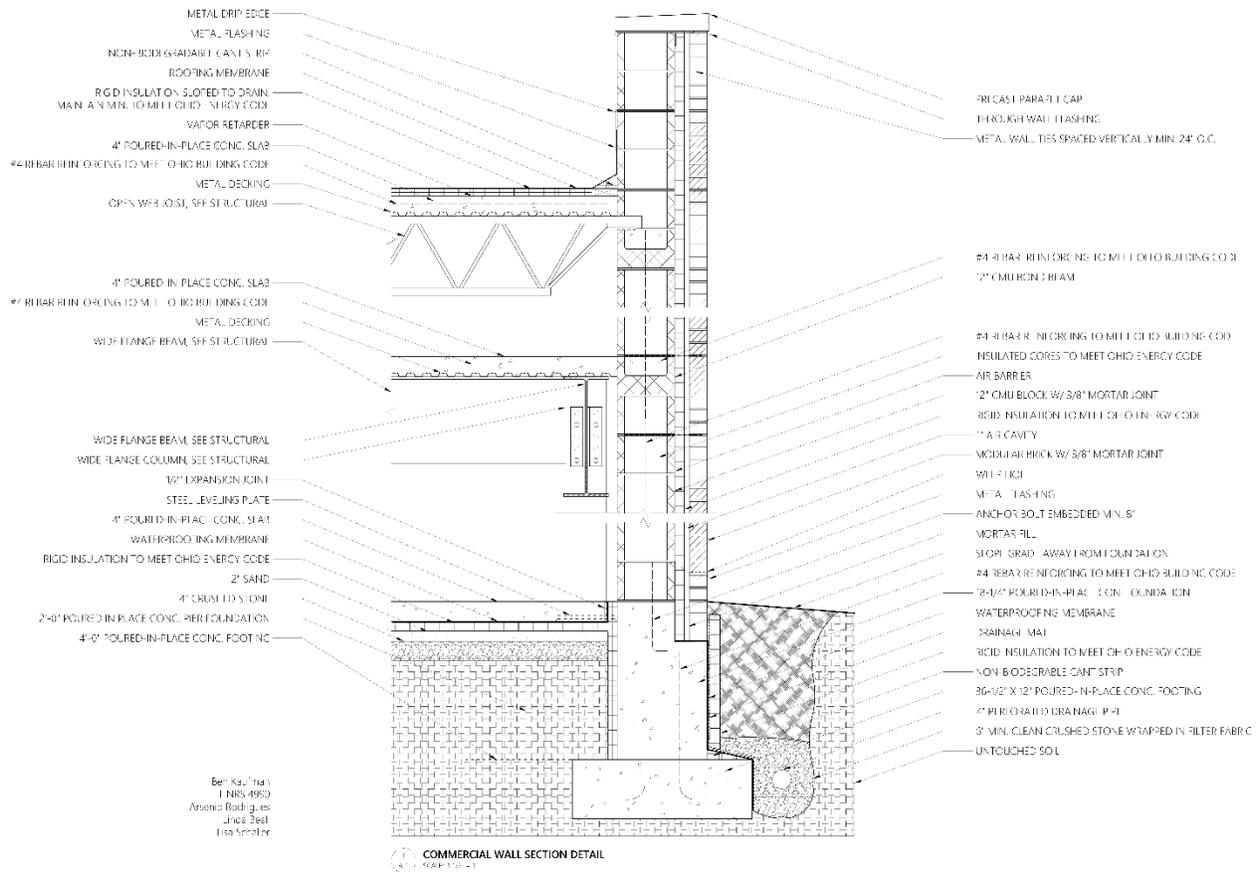


Figure 4

I chose scale models and graphic posters to serve as the teaching tools because architecture students are often heavily visual and kinetic learners; the models and the posters cater to these learning styles. Moreover, I chose to make both models and graphic posters to cater to more than one learning style. The posters appeal to visual learners while the models appeal to both visual and kinesthetic learners. The interactive nature of models also helps to make the learning/teaching tool engaging, unique, and fun. Additionally, combining models with graphic posters allowed me to illustrate how architects communicate three-dimensional concepts through two-dimensional graphics.

I concentrated on typical construction methods use in residential and commercial architecture as they are two very common types of architecture that students will likely do projects in academically or professionally. Moreover, residential and commercial architecture provide a great juxtaposition to one another since their construction methods are so different.

I determined it would be best to focus on stick frame construction techniques for the residential construction model and poster as it is the most common construction method used in residential architecture. The residential construction model and poster feature a poured-in-place concrete basement foundation to contrast with the slab on grade foundation featured in the commercial construction model and poster. Additionally, I chose to portray an unvented roof assembly in the residential model and poster as it resolves issues related to energy efficiency and heat loss/gain in our climate zone.

I decided to focus on structural steel construction methods for the commercial model and poster as it is a common and cost-effective construction method used in commercial architecture. The commercial construction model and poster feature load bearing walls made of concrete masonry units in order to parallel BGSU's Architecture and The Built Environment Building. This will allow for a great comparison, as well as provide the opportunity to perceive the construction at multiple scales. The model and poster also feature a brick facade to illustrate a common building material.

INTERDISCIPLINARY STUDY

My Honors Project is an applied/creative, interdisciplinary project that combines the fields of architecture and construction management. This project marries the construction management program's insight into construction techniques and building materials with the architecture

program's skills of drafting, model making, and design. The result are two graphic posters with drafted details of construction techniques and building assemblies. As well as, two scale models that represent construction methods and materiality.

PROJECT STRENGTHS

A successful aspect of this project has been the utilization of both graphic posters and scale models. The two mediums complement one another by allowing for greater detail and more information to be conveyed. The models have proved to successfully prompt curiosity and engage students, and the graphic posters aid in conveying detailed information related to construction methods. The pair foster curiosity and knowledge in the Architecture and the Built environment program. By having both mediums, the project also appeals to a greater range of learning styles. Additionally, the combination also illustrates the relationship of the architect to the built environment. The architect conveys three dimensional ideas via two dimensional drawings; these drawings result in a physical building. Similarly, in this project the scale models represent the physical manifestation of the construction details presented in the graphic posters.

LIMITATIONS

The built environment is ever evolving and complex. As a result, the construction methods we use are always progressing and changing to solve new problems and meet higher standards. Due to the complexity of the built environment, there are many ways of achieving the same goal. Take residential construction techniques for example, a house can be constructed via dimensional lumber, heavy timber, structural insulated panels, light gauge steel framing, or any materials the client wants. So, there is a plethora of ways to build a house. However, there is no

way to convey all the alternative construction techniques in one project. So, I optimized this project to convey the most common construction techniques used in residential and commercial architecture. This will provide architecture students with a foundational knowledge of residential and commercial construction methods that will aid them in their educational and professional pursuits.

CONCLUSION

Based on the feedback from my peers and professors in the Architecture and the Built Environment Program teaching tools, like the four I have made, are a fantastic way to educate young architecture majors about construction techniques in the built environment. Throughout this project I have seen my peers interested and engaged by the work I have been doing. This project has instilled a curiosity within them and has allowed them to learn about the construction methods used in the built environment. In conclusion, this project has successfully aided in educating architecture majors about the construction techniques employed in the built environment, and I hypothesis it will continue to strengthen BGSU's Architecture program for years to come.

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