GNG 1103 – Engineering Design

Deliverable G – Prototype II & Customer Feedback

Team B1-05

Name	Student #
Fell, David	300186311
Galagedara, Niki	8728488
Hanna, Andro	300211677
Picard, Jacob	300207379

Date Submitted: November 20th, 2020
Professor: Dr. Muslim Majeed

Faculty of Engineering
University of Ottawa

Abstract

A detailed report that establishes an effective test plan and presents the project's second prototype. Unfortunately, client feedback was not given from the previous prototype.

Table of Contents

1 Introduction

On November 14, 2020 we were successfully able to produce and test out first prototype for this project. Since then, we as a team have met extensively to discuss and elaborate upon our project. In this report, we have extended our goals, interpreted previous client feedback, and re-implemented our concept. As such, we and have built an impressionable second prototype to test our project's most critical functionalities and target specifications.

2 Prototype II

Based on beneficial (previous) feedback of our clients and the pre-determined target specifications and criteria, we have produced our second prototype below. In this model, we believe we have validated our assumptions and have efficiently presented an encapsulation of the needed design criteria.

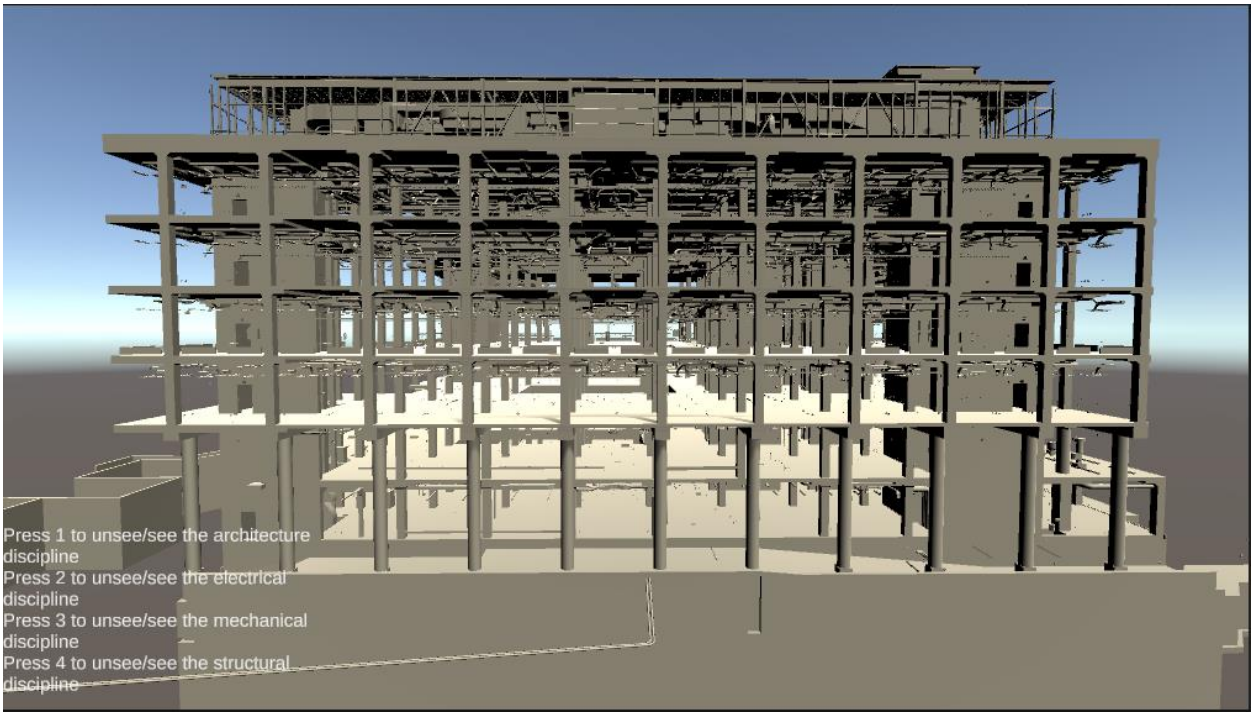

Figure 1: Entire BIM View

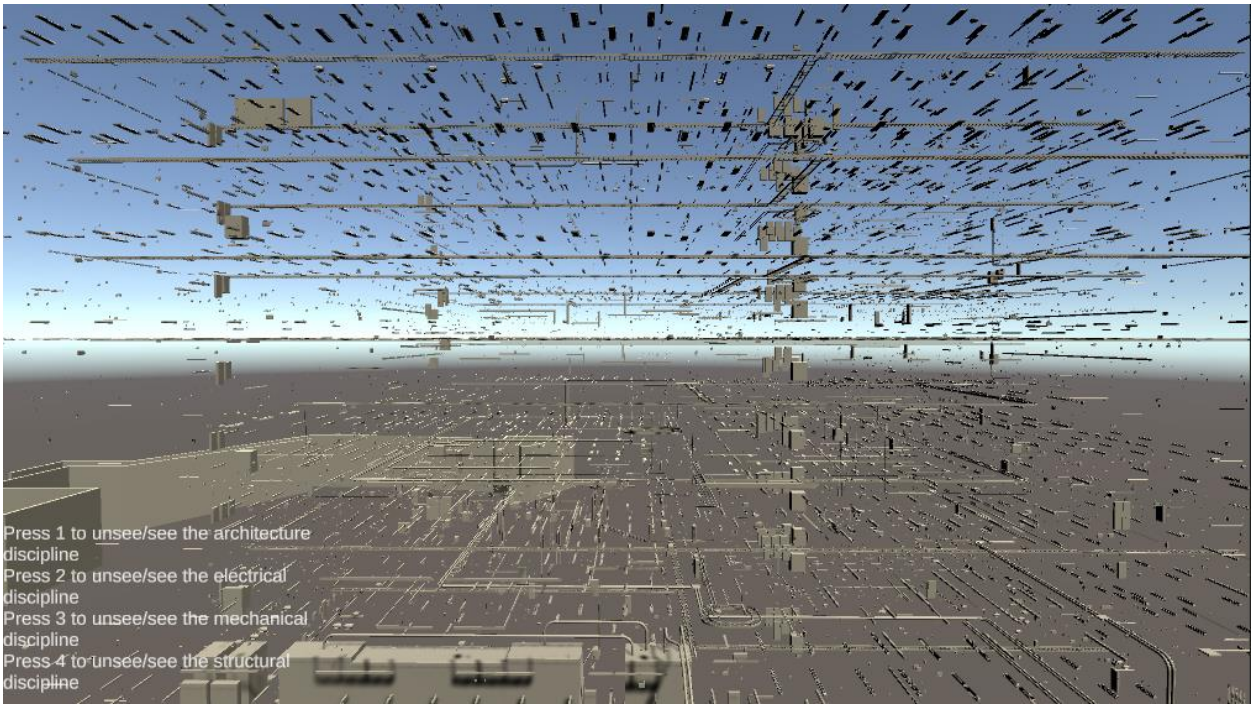

Figure 2: The Electrical Discipline

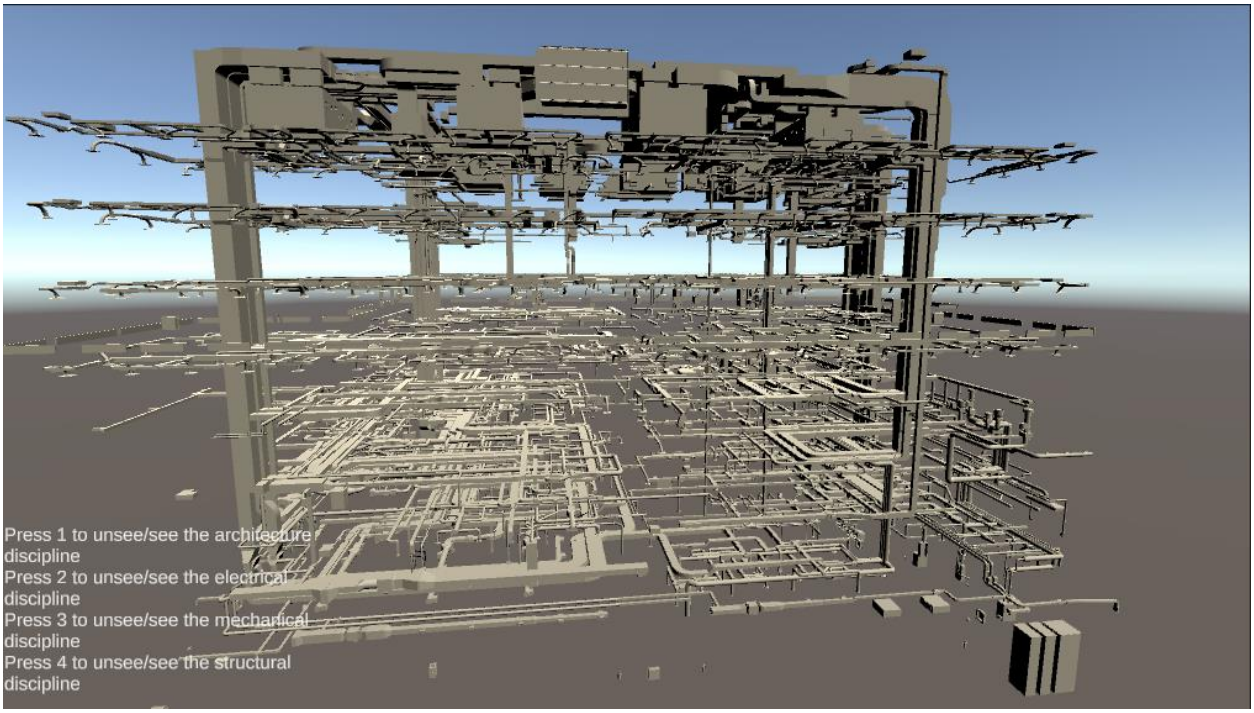

Figure 3: The Mechanical Discipline

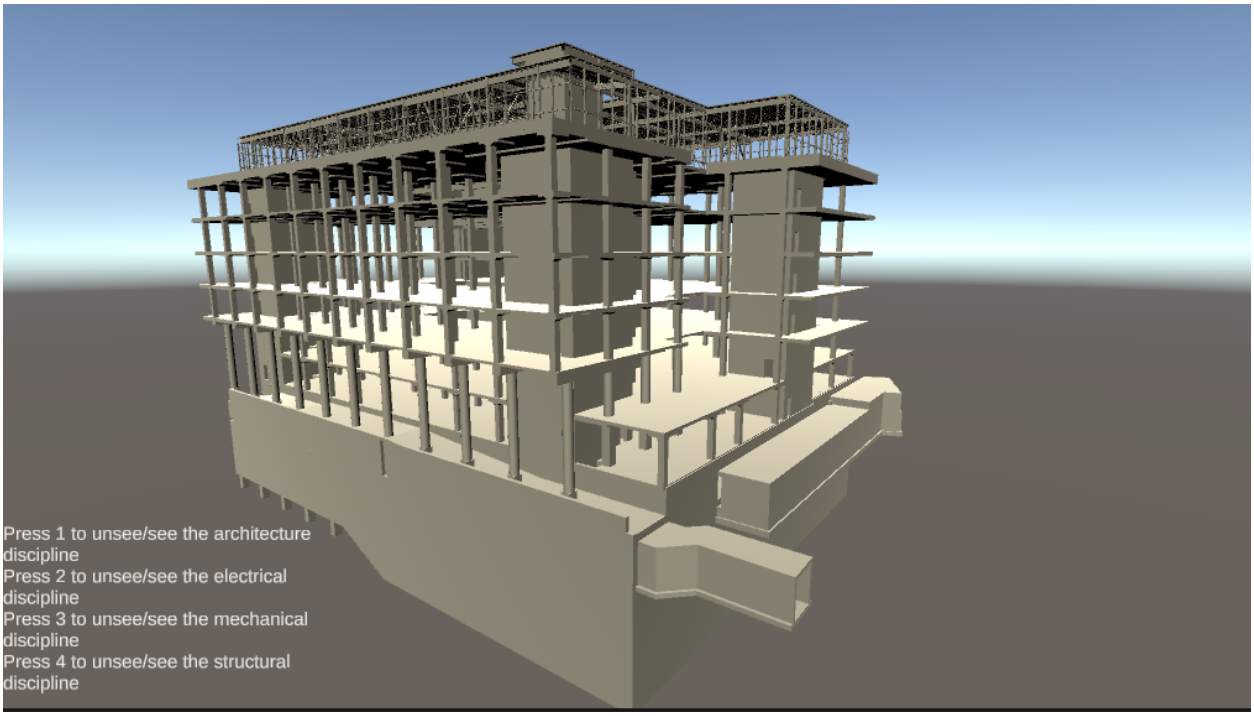

Figure 4: The Structural Discipline

In these 4 figures, a breakdown of each multi-discipline of the STEM building has been provided. For this prototype, our main goal was to establish these disciplines and ensure their visualisation. As such, we have elaborated from our previous prototype of selecting rooms, floors, and angles, and have no combined it with the choice of viewing disciplines. Therefore, we are on track to meeting our clients needs of navigating a building and selecting which discipline(s) are needed to be viewed.

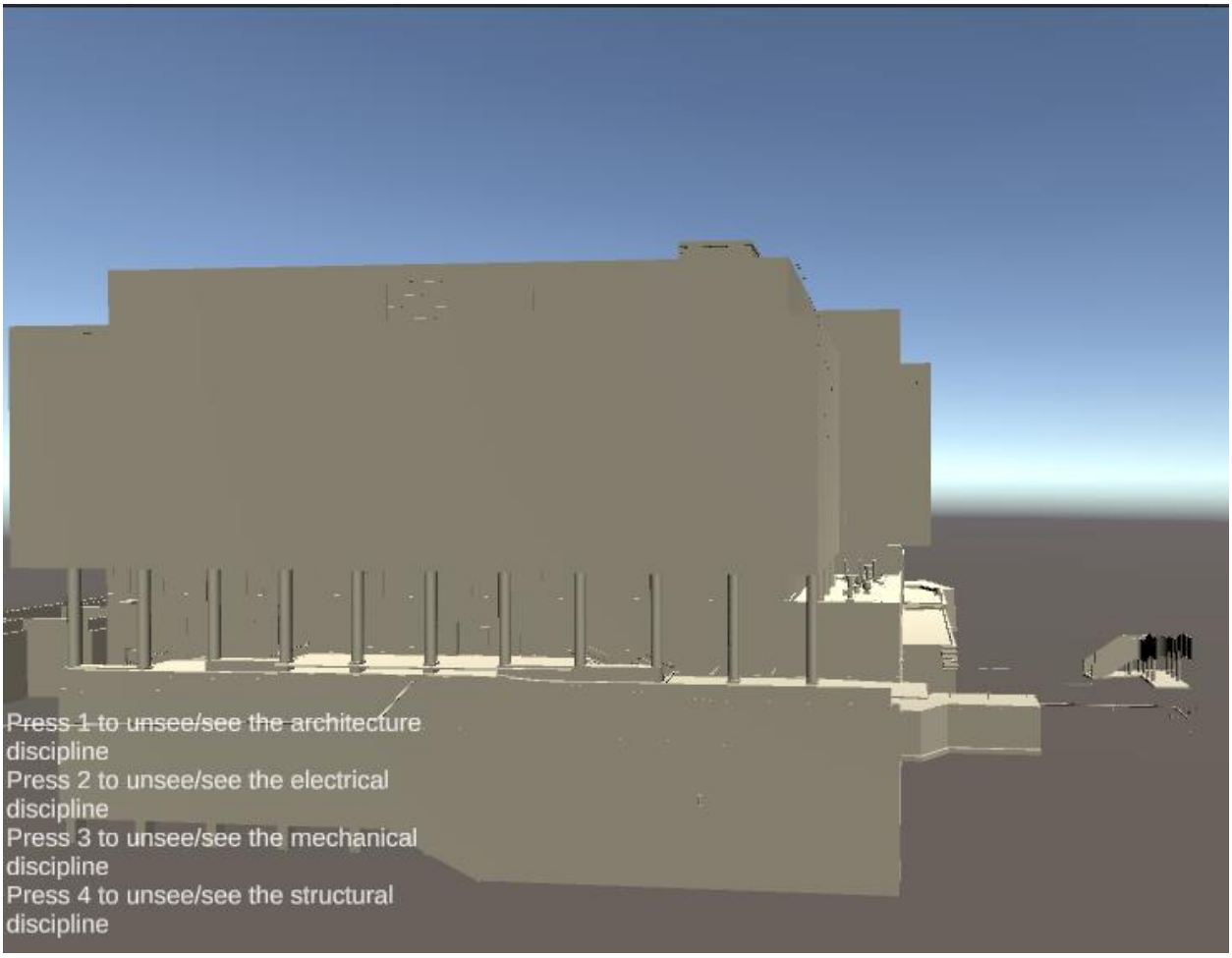

Figure 5: The Entire Building

Figure 5 is a side profile of the entire STEM building showing all the available disciplines one may choose to see. As shown in the image, the user has the easy option to simply press the corresponding number to discipline in order to determine which element they wish to see.

3 Prototype Testing

3.1 Client Feedback

Below, we have summarized all the points of suggestion, concerns, and feedback given by our clients. As mentioned, we were not able to receive feedback on our first prototype but have continued to use the suggestions that were previously given. We have used these points to further develop our initial prototype and create the next steps for a finalized second prototype.

- Add a note function to the program
- Fix light issues

3.2 Feasibility Verification

The project that we are currently doing is one that is easy enough to realize. The only difficult part of this project would be the programming and actual construction of our project. There is little programming experience within our team, however, we have slowly been able to overcome this obstacle. Through many tutorials, trials, and troubleshooting, we believe we are on track to present a viable solution for our client. In addition, Unity is a very popular program so almost everything that we want to do has already been done by other designers, and therefore, we can reflect on and develop codes that have already been produced. As such, we firmly believe that whilst we may be a slower group to learn, we will present a strong and well-thought-out product. Comparing our skills from the first prototype development to this prototype, we strongly believe we have greatly improved and hope to continue this path of success in developing the final solution for out clients.

3.3 System Analysis

Since the prototype is an online application, there a limited number of materials and components to be analyzed.

1) List of components and materials:

- User's android/iOS device

We also considered a study in reducing any risks/uncertainties that may arise in the system:

Risk	**Severity**	**Contingency plans**
Lack of experience in programming	3	Research, watch tutorials & reach out to TA's
Unity, as well as other necessary coding programs may crash	5	Debug and research troubleshooting options
VR headset may be affected by shipping delays or empty stock	3	Order the headset early in advance
Elements may only be producible through Asset store	2	Use the Unity Asset Store as an alternative
Severity: *scale is 1-5, where 1 is not severe and 5 is very severe*		

Functional Requirements:

Design Specifications	**Relation**	**Value**	**Units**	**Verification Method**
Ability to view 3D Building Information Models (BIM) in Visual Augmented Reality	=	Yes	N/A	Analysis/ Test
Compatible with common Mobile Devices	=	Yes	N/A	Test/ Use IOS and/or Android
Software application must be open source or free to use	=	0	$	Estimate/ Final Check
Navigation and interface must be user friendly	=	Yes	N/A	Test/ Evaluate User
Training and implementation documentation must be provided	=	Yes	N/A	Instructional Reports
Presented through VR or AR on a mobile device	=	Yes	N/A	Test/Evaluate platform
Easily operated by any individual regardless of technical skill level	=	Yes	N/A	Final test/ Evaluate User

Non-functional Requirements:

Design Specifications	Relation	Value	Units	Verification Method
Take obstructions into consideration	<	Yes	N/A	Test
Use Google Cardboard or similar device	>	Yes	N/A	Test
Display markups (dimensions, annotations, etc.)	=	Yes	N/A	Simulation/ Test

Constraints:

Design Specifications	Relation	Value	Units	Verification Method
Available on IOS and Android	=	Yes	N/A	Report/Test on multiple devices
Cost	=	0	$	Estimate/Receipts of purchases, in app purchases

3.4 Next Client Meet Preparation

Based on our previous client meeting and refinement of the prototype, we have composed a number of concerns to clarify. Regrettably, there was no client meeting following prototype I, and thus we face the same concerns that need to be discussed. Nevertheless, our next immediate steps would be to continue suiting the needs of our client:

- Another important part of the program we will discuss with the client is the tutorial. We want to implement a tutorial of some sorts to show the user how our app works.
- The last major thing we are going to add is a camera at the entrance of the STEM building.

4 Conclusion

Therefore, with the original feedback of our clients, along with our own brainstorming and troubleshooting of steps, we believe we have successfully completed all the necessary aspects of this report. We ensured that the given clients' comments were implemented into our first prototype, and thus, an adequate second prototype. In addition, we ensured that there was an emphasis on our project's most critical functionalities and target specifications through detailed testing and analysis.