uOttawa

Project Deliverable G

GNG 1103 A05, Group 19

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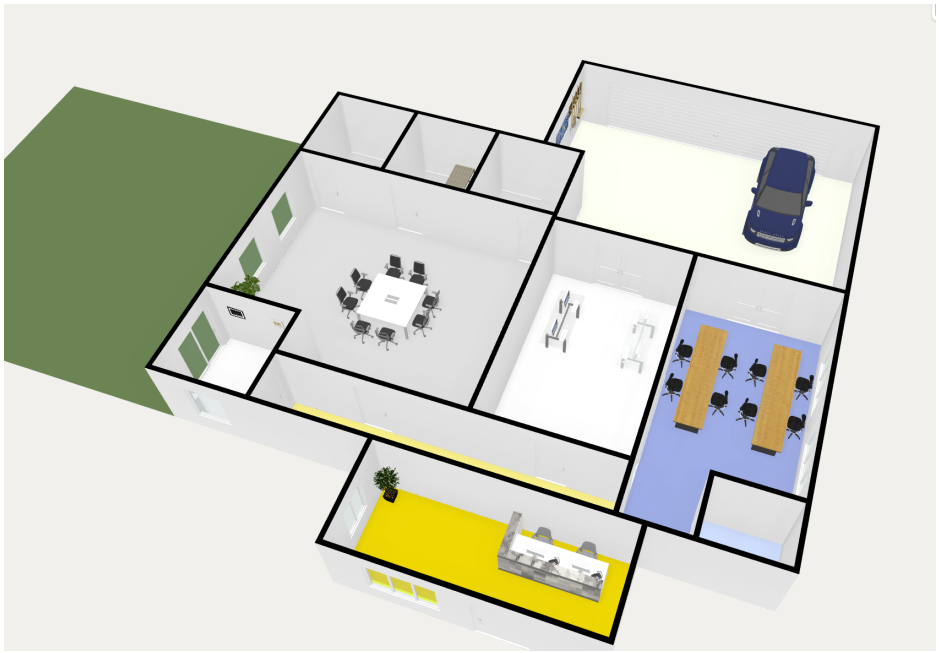
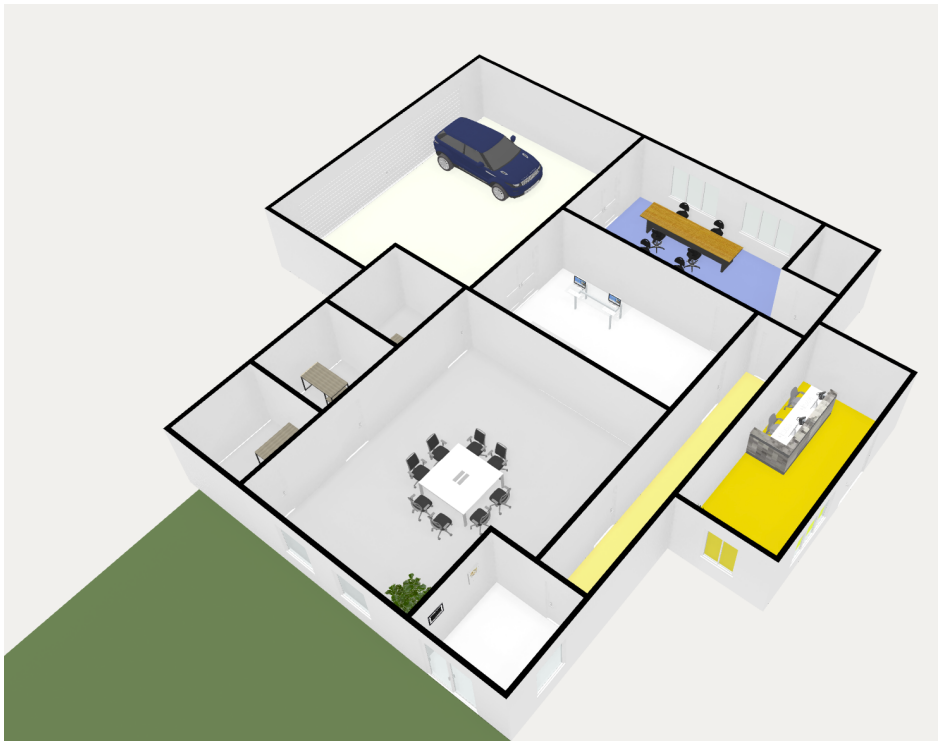
Section 1: Feedback received from Client Meet 3

No feedback received as of submission.

Section 2: Prototype update



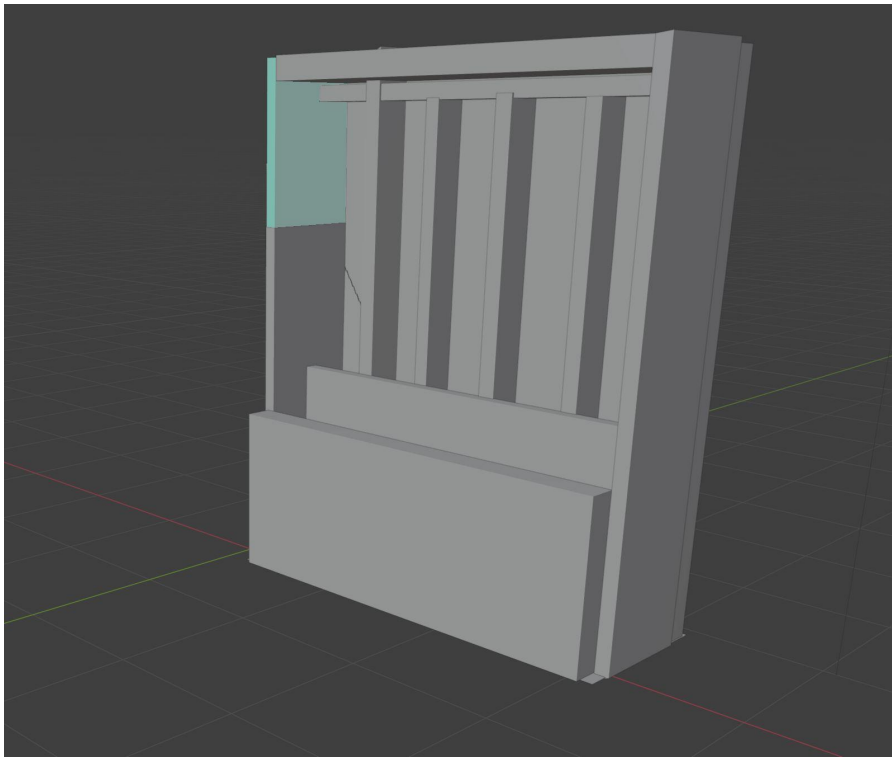


Section 3: Simple analysis of critical components

Critical components and subsystems with a model:

Exterior Walls:

The exterior walls are layered which provide insulation and structure for the building. Starting from the inside out the exterior walls consist of drywall, studs, fiberglass insulation, plywood, air spacers and the wood siding. The exterior walls surround the lobby, office wing, cultural space, the analysis lab and main lab. The exterior walls are 12 ft high.



Interior Walls:

The interior walls are much more simple only consisting of drywall and studs for support. They divide the building up into the different sections and extend up to the 9 ft ceilings.

Garage walls:

The walls that surround the garage/workspace are stripped down to the studs and do not have insulation. The walls are made of sheet metal as the area of the garage is much larger than most of the building and using sheet metal is a good way to save money.

Foundation:

Framing of the Building:

Plumbing:
Standard plumbing in the building connected to the washrooms and kitchenette.

Electricity:
Possibly Generator?

Section 4: Prototype testing documentation

Through research and hard work, we aim to produce a design prototype incorporating the indigenous people's culture by indulging sustainable practices, such as the use of eco-friendly materials and renewable energy sources, to minimize the environmental impact of the building among others. The prototype should integrate having facilities for various traditional activities, such as researching and preserving plants and animals, as well as creating traditional medicines. As part of fulfilling these cultural needs, the building should be constructed sustainably to not harm the local environment, as well as being situated in a remote location.

Below are the prototyping plans, analysis, and results;

Plan(Use Of 3D For Basic Layout)

To receive effective feedback on the basic layout of the prototype we constructed a 3d model intended for the building project. Using a model, in the design of buildings offers a tool for gathering feedback from clients. By presenting a visually engaging representation of the proposed design clients can easily understand the layout, aesthetics, and functionality of the building.

When interacting with clients during meetings, the 3D model allows for exploration enabling them to navigate through areas and perspectives. This interactive experience promotes communication between us the designers and clients as clients can express their preferences and concerns in an informed way.

Analysis

During the second and third meetings, we used on shape for the sketches and 3d to project our prototype. The subsequent analysis involves a thorough examination of the 3D model, considering factors such as sustainability, technological integration, and community spaces. Moreover, annotations were added to the model to highlight design elements or modifications ensuring that feedback would be precise and actionable. Overall incorporating a model improved collaboration in the design process by facilitating a comprehensive understanding and appreciation of the proposed building design from clients.

Result

The results obtained from the analysis phase contribute crucial insights into the feasibility and effectiveness of the design. The 3D model serves as a dynamic tool for community engagement, allowing clients to visualize and comprehend the proposed design comprehensively. For instance, during the meetings, clients were able to give more detailed feedback and this fostered informed decision-making and alignment with the feedback.

Plan(Use Of Analytical Model)

Next, we verify dimensions and materials by using the analytical model on Autocad. AutoCAD has proven to be instrumental in creating an analytical model for a building design, ensuring precise adherence to client specifications. By leveraging AutoCAD's robust 3D modeling capabilities, we can accurately represent the proposed structure, including dimensions and material specifications. The software enables the creation of detailed virtual prototypes, allowing designers to scrutinize the building's geometry and confirm compliance with client-supplied dimensions. Albeit, the analytical model helped verify its feasibility keeping in view the budget and structure integrity

Analysis

Subsequently, the analysis phase involves the implementation of AutoCAD's analytical capabilities. Autocad allows for a detailed examination of the prototype, verifying the precision of dimensions and ensuring that the selected materials align with both cultural considerations and modern construction standards. AutoCAD's analytical model simulates real-world conditions, providing insights into structural integrity, material stress factors, and overall performance

Results

The results derived from the analytical model, generated through AutoCAD, play a pivotal role in the decision-making process. This data-driven approach aids in identifying and addressing potential issues related to dimensions and materials early in the design phase Through this analytical model, we can rigorously examine structural integrity, identify potential issues, and verify that the chosen materials align with the client's preferences as we get feedback on the dimensions. Therefore, a streamlined design process would be produced, which will improve accuracy and client satisfaction in the ultimate realization of the building project. Although we are still waiting for feedback from the last meeting, the prototype seems to have all aspects covered regarding dimensions.

Plans(mitigating risks)

Within the realm of building design, prioritizing risk mitigation is a vital goal during the prototyping phase. Building design projects encompass a spectrum of risks, spanning structural, functional, and budgetary considerations, among others. Therefore, AutoCAD/on shape facilitates the creation of detailed prototype plans, offering a precise representation of the indigenous research building's design. These plans encompass architectural intricacies, spatial arrangements, and material specifications. By visualizing the project in a digital space, potential design flaws and risks can be identified early on.

Analysis

The analytical capabilities of AutoCAD allow for a rigorous examination of the prototype. Through simulations and stress analyses such as such as seismic events, extreme weather conditions, or material stress factors. The software evaluates structural integrity, material compatibility, and potential vulnerabilities. This phase is instrumental in identifying and understanding risks related to factors such as load-bearing capacities, environmental considerations, and adherence to cultural design principles.

Result

The results obtained from the AutoCAD analysis provide actionable insights that contribute to risk mitigation strategies. By identifying potential issues before the physical construction begins, project stakeholders can implement targeted adjustments to address risks effectively. Whether it involves structural modifications, material substitutions, or environmental considerations, the analytical model in AutoCAD empowers decision-makers to make informed choices that minimize risks and enhance the project's overall resilience.
Ultimately, an analytical prototype serves as a strategic tool in enhancing the resilience and reliability of a building design, contributing to the overall success of the project by ensuring it aligns with safety standards and stands up to real-world challenges.

Section 5: Prototyping Plans 2

Test #	Objective	Desc. of prototype and basic test method	Desc. of what will be recorded, and how	Planned start date and plan duration
1	Validate the dimensions of the prototype (doors, ceiling height, etc).	A 3d model with annotated dimensions, compare dimensions to standard Ontario regulations.	How close the dimensions of the prototype are to standard dimensions.	Nov. 15th 2023.
2	Analyze critical subsystems. (heating, plumbing, electricity, foundation, framing).	Create benchmarking for each subsystem and declare which option is the most effective for the building.	Research options that can be applied to our building then use the 3d model dimension to verify feasibility and find price.	Nov 15th 2023
3	Increase the amount of natural lighting within the building	Create and add windows into the prototype to examine where natural light could be added	The number of windows will be recorded and how large they are. They are simple quantitative amounts that can be counted.	Nov 15th 2023

Wrike

file:///C:/Users/Owner/Downloads/A05-19%2015-11-2023%20(1).pdf

Makerrepo:

https://makerepo.com/Jcear024/1792.gng1103group-19building-design-project-

Password is gng1103