Deliverable F

GNG1103A Group 11

November 9th, 2023

Abstract

This document covers Group 11's Prototype I, and the customer feedback associated with Client Meeting #3, to provide a tangible presentation and understanding of our creative vision. Simultaneously, a methodical procedure of gathering client input has yielded important insights that direct the iterative design process.

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1 Introduction

Throughout this document, we will discuss the detailed creation of Prototype I and the accompanying customer feedback for our project. Analysis of the prototype's essential components-particularly the choices made regarding its functioning and design-will be our main goal.

1.1 Document Outline

We will first cover Prototype I overview, then the customer feedback collection.

2 Prototype I Overview

For our first prototype, we elected to use CAD software to simulate various key camera angles and evaluate the total coverage of our building's proposed design. Throughout the client meetings, increased focus on corporate liability and safety of assets or individuals has been raised as important points. The shape and design of a building is a major factor regarding how difficult and expensive security measures will be, and so we chose to outline a summary of this aspect as early as possible. The data below allowed our team to isolate & identify:

- Security oversights or blind spots
- Locations where more security measures may be required.
- Awkward placement of rooms in relation to the central common space
- Key insights into how the building may begin to look from the first-person perspective of users, rather than the unrealistic view afforded to us by mere technical drawings.

2.1 Prototype Test Plan

The prototype includes the exterior loading dock against the building. The main objective is to test whether a ½ ton pick-up truck would be able to comfortably maneuver through it.

- A typical ½ ton pick-up truck has dimensions of about 20 feet in length, 7 feet in width, and a height of about 6 and a half feet.
    - Knowing this, we can set the height of the overhang of about 8 feet, the distance between the columns that support the overhang of about 10 feet, and the distance between the wall of the building to one of the columns supporting the overhang of about 23 feet.
    - A typical pick-up truck's turning diameter is about 12.5 feet, and the length being 23 feet and the distance between supporting columns being 10 feet, the truck would comfortably be able to maneuver through it.

- For the prototype we can use a 1:50 (in) where 1 inch of measurement represents 50 inches in real life.
    - According to this scale the dimension of the prototype of the loading dock would be 5.22 inches in length, 2.4 inches in width, and 1.92 inches in height.

This prototype would successfully be able to prove the comfortable maneuverability of a ½ ton pickup truck through the loading dock with the dimensions provided.

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (When)
2	To ensure the designed exterior overhang provides enough room for a standard ½ ton pick-up truck to maneuver.	The prototype will be a physical models printed to scale within the maker lab.	Observations will be recorded, and scaled dimensions will be adjusted to optimize available space according to client feedback.	Test duration: 1 hour Date: Tuesday, November 14th, 2023

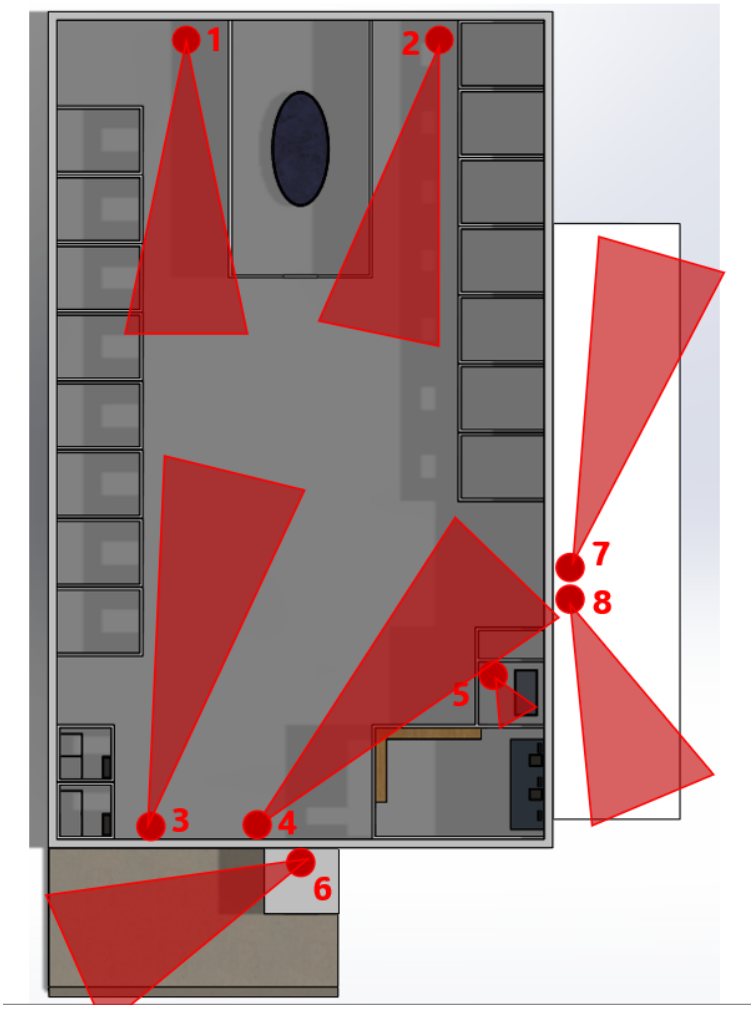
3 Prototype Test Result

3.1 Preface

A PDF / PowerPoint-style collage of screenshots and illustrations has been included *alongside* this deliverable in the submission on Brightspace, for a full in-depth view of the data collected during this prototype test plan, to avoid flooding this word document with large images. Key images have been copied to this document to provide a summary of the results, but we encourage you to look through the full dataset.

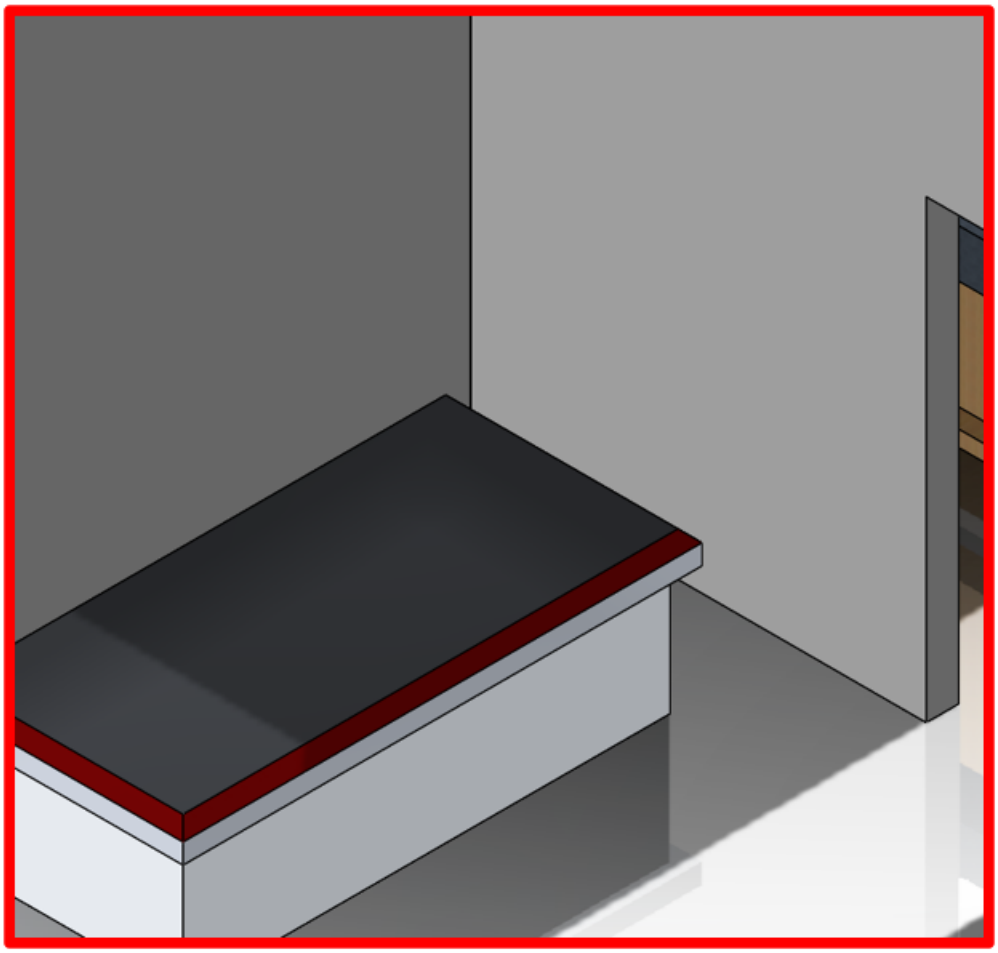
3.2 Camera Distribution Plan:

A representation of the plan for camera placement and orientation.



Included in the PDF dataset submitted alongside this deliverable is a first person-perspective of each camera's view. Here is an example of one of them, camera #5, which watches over the storage room:

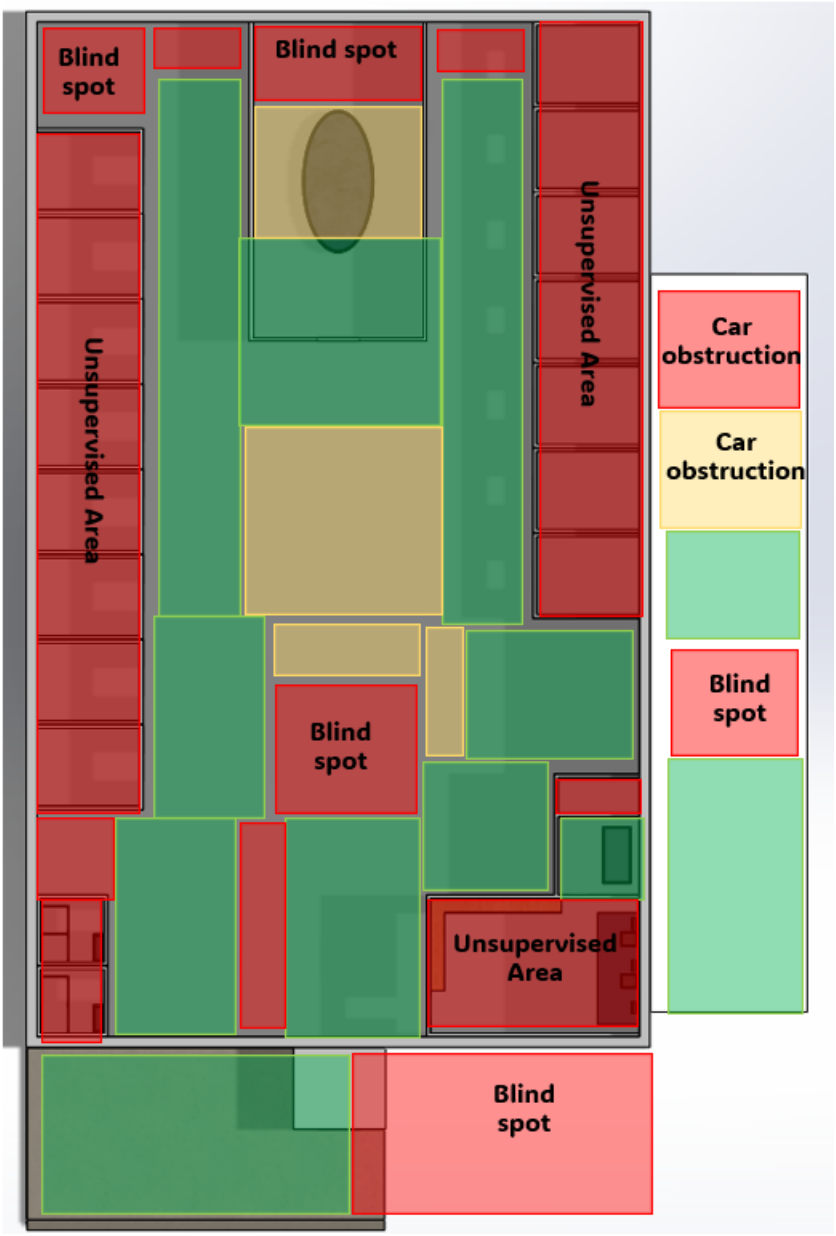
Camera Angle 5



3.3 Result Analysis

Finally, having gathered first-person-perspective data of each chosen coordinate within the building, an approximate heatmap has been formed, representing the coverage of each area in the building. Some zones are annotated to indicate the nature/reason of their colored-coded coverage level, with the legend included below the heatmap.

Heatmap:



Legend:

No Effective Coverage

Minimal Coverage

Acceptable Coverage

3.4 Prototype Analysis Conclusions

A quick look at the heatmap reveals that the central common space of the building lacks proper coverage: it is too distant from any given camera to be adequately supervised. This could be rectified using a 360-degree central camera; however, this may cause discomfort as people often respond negatively to the feeling of being watched, especially if the source of this feeling is a centerpiece of the building's common space. An alternative solution would be shrinking the building's footprint to allow for a smaller central common space, as it may be unnecessarily large.

Several zones are, as they should be, marked as unsupervised. These areas include the bathrooms, office interiors, and plant processing lab. Several unfortunate blind spots remain, however; the most notable instances of these are two blind spots in the covered parking spaces (one caused by awkward camera placement, another by car obstruction). The center of the common room has been discussed in the paragraph above, however there is also an inconvenient blind spot in the kitchen and in the meeting room.

It is possible the meeting room & kitchen should remain unsupervised spaces, like the plant processing lab, though this is ultimately a matter of preference for the client (safety vs. comfort).

Notably, the area surrounding the building lacks effective camera coverage, beyond the accessible parking space in the front, which could be a security vulnerability, especially if the client's desire for an "organic parking space surrounding the building" is to be fulfilled.

4 Customer Feedback Collection

4.1 Itemization of Client Meeting 2

According to the client's request from Meeting 2, these were the needs of our future designs:

Needs	Priority
Cost Efficiency	1
Covered space	1
Arched roof for snow	1
Solar Panels	3
Traditional Roof Design	1
Modern Materials Acceptable	2
Open, organic parking lot	1
Working Capacity 15	1
Community Capacity 50	1
Low pitched Roof acceptable	2
No rooftop access	1

4.2 Current Design Features:

-Arched roof with traditional Dutch gable design

-Covered space for trucks running along the length of the building

-Open parking lot

-Working capacity for 15 people

-Open space for up to 50 people

-No rooftop accesses

Our current design meets the client's needs except for cost efficiency. This is due to its total price of 2.2 million dollars.

Our current design would benefit from cost optimization by reducing the height of the walls and roof and adjusting the office spaces so that the building can be lesser in width.

4.3 What are other teams doing (That we might want)?

-Skylights

-Gender-neutral washrooms

-Group work area

-Gallery space to show culture and work the research station is doing.

-Space for a dehydrator?

4.4 Analysis of Alternative Concepts

The advantage of these concepts is that they are relatively easy to implement in our current design. The concepts of high priority are the group work areas and the gender-neutral washrooms, as these encourage cooperation with team members and inclusivity. The concepts of moderate priority are the gallery space and the skylights, as they are largely aesthetic in nature. The concept of lowest priority is the dehydrator system, as the client indicated that materials would arrive to the facility in a dried state.

5 Wrike Snapshot

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=6pXNVzBO6cdC2PtmGCTG1W8HI1Gb8Xod%7CIE2DSNZVHA2DELSTGIYA