Project Deliverable E

Project Plan and Cost Estimate

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

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1.0 – Introduction

In this deliverable, our objective was to create a detailed list of all the components in our concept design along with the estimated cost for each part. The conceptual design takes place in a city, the city contains all kinds of objects that provokes fear and concern in the user. The user will move around in the environment and experience all they can.

2.0 – Detailed Design Drawing
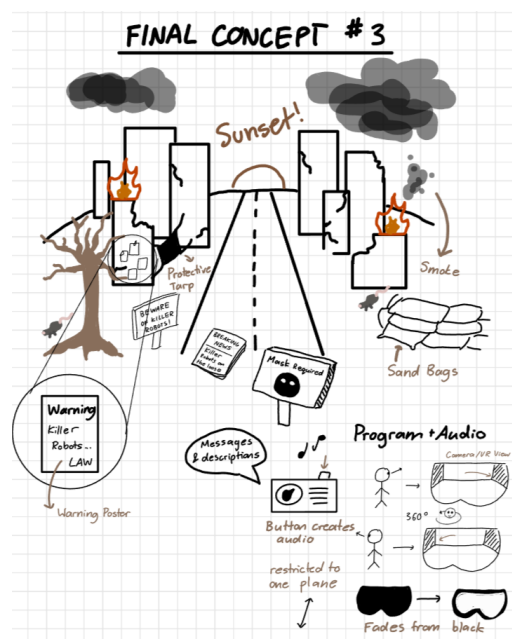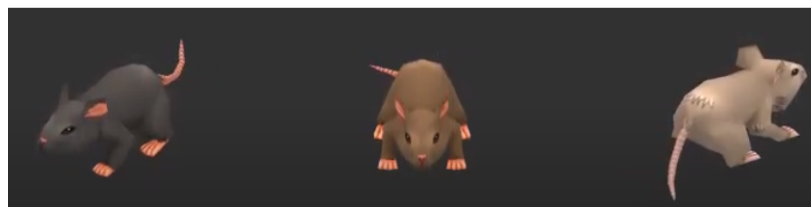

System Part/Concept Drawing	Detailed Design

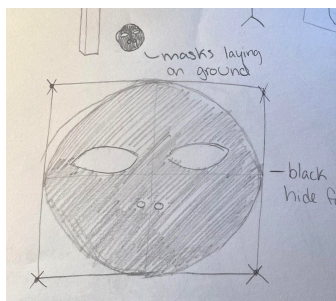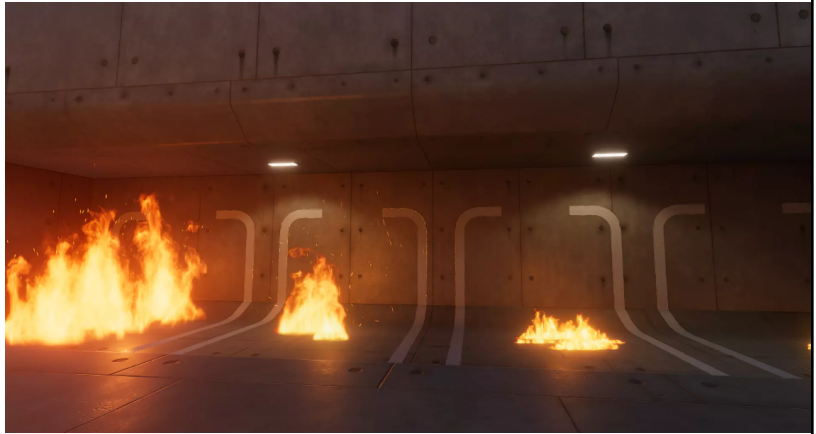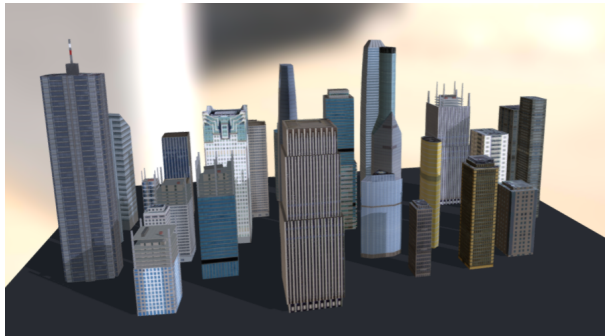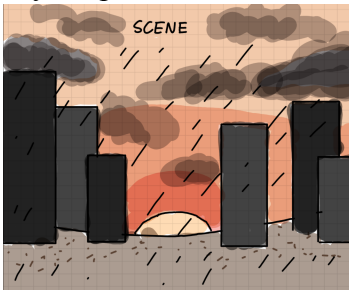|	
Newspaper:	
Dead tree:	 https://assetstore.unity.com/packages/3d/vegetation/trees/3d-dead-tree-pack-155778
Rat:	 https://assetstore.unity.com/packages/3d/characters/animals/mammals/low-poy-hand-painted-rat-94612
Mask:	Will be designed on CAD by Jeanine Reference Photo:

Fire/smoke:	https://assetstore.unity.com/packages/vfx/particles/particle-pack-127325#reviews
Skyscrapers:	https://assetstore.unity.com/packages/3d/environments/urban/skyscrapers-2061

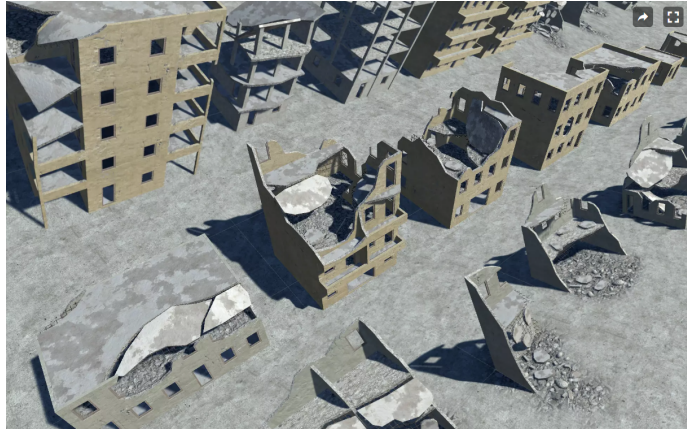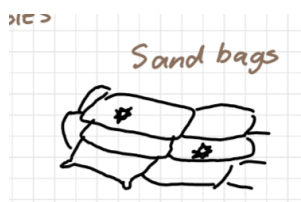|	
Broken Skyscrapers:	https://assetstore.unity.com/packages/3d/environments/urban/low-poly-destroyed-buildings-253524
Sign:	https://assetstore.unity.com/packages/3d/environments/urban/old-billboard-126893 Contents of poster will be designed by Kwab
Sandbags:	https://assetstore.unity.com/packages/3d/props/exterior/sandbags-defense-pbr-96746
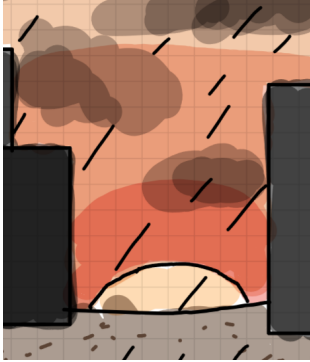
Skyline/weather/Cloudy sunset sky 	
Poster: 	To be designed by: Rohan Example:
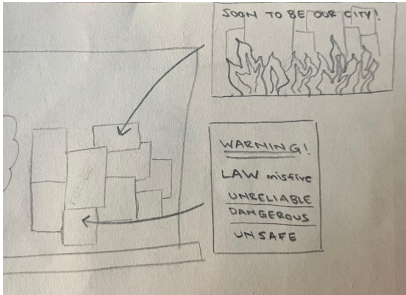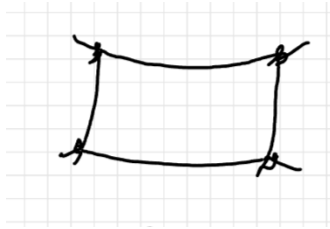
Protective Tarp:	[Bush-Craft Extension Pack | 3D Tools | Unity Asset Store](#)
Adapted housing:	https://assetstore.unity.com/packages/3d/environments/medieval-desert-tents-120490
Bomb Noises: Subsystem: Audio — Exp in	https://assetstore.unity.com/packages/audio/sound-fx/kaboom-sounds-sound-effects-217261
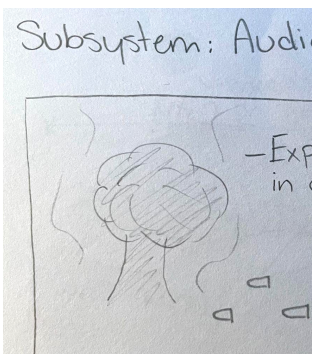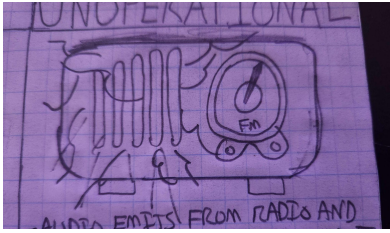
Radio Broadcast: 	 https://assetstore.unity.com/packages/3d/props/radio-230712
Street lights/traffic lights	 https://assetstore.unity.com/packages/3d/environments/urban/ modular-lowpoly-streets-free-192094

3.0 – Budget

Bill of Materials		
Material	Cost ($)	Description
Newspaper	0	
Dead tree	10	
Rat	0	
Mask	0	
Fire/smoke	0	
Radio	0	
Skyscrapers	10	
Broken Skyscrapers	9.99	

Sign	0	
Sandbags	0	
Adapted Housing	0	
Skyline/weather/Cloudy sunset sky	0	
Poster	0	
Protective Tarp	0	
Bomb noises	9.99	
Total Cost ($):	39.98	

4.0 – List of Equipment

List of Equipment		
Material	Description	Type
VR Headset	To test VR	Software
Unity	To create VR	Software
OnShape	To create parts	Software
HeadPhones	To test VR sound	Hardware
VR Controllers	To test VR	Hardware
Phone	To record audio for the VR	Hardware

5.0 Project Risks and Contingency Plan

Significant Risks	Contingency Plan
Budget	Granted only a $50 or $100 budget we have to carefully select materials within the budget but also make sure that the VR is realistic enough. How we can do this: ● Design our own parts(using softwares e.g Onshape)

	● Use cheaper platforms to get asset(not unity asset store)
Technical Difficulties/compilation error	There might be compilation errors while trying to run the code or technical difficulties with the laptop while trying to play the VR. We can control this by: ● Writing the code in parts and making sure it runs. ● Playing the VR ● Test running the full experience with headphones and virtual reality headset.
Appropriation/Health	For our VR we have thought of adding explosion sounds, if this is done we plan putting trigger warning before the VR is started. This also applies to other things such as; flashing, fires and so on. The VR will be made appropriate for different cultures, ages and audiences. If there is anything that is not appropriate for a certain age, it will be added in the description of the VR.
Lack of User impact/interest	We want to make sure that anyone who uses VR will take away something from the experience. The users should be able to fully engage and learn something from the experience. ● Creating an aesthetic environment ● Provoke awareness through; posters, signs etc ● Use objects that users can sympathize with

6.0 – Prototyping Test Plan
6.1 – Plan & Objectives

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 duration of test

1	Determining if audio is properly activated by user interaction (radio).	Add different audios and play the Unity game to check if the audio is playing/can be heard by the user.	Results will be recorded as either "success," if audio is playing as intended, or "failure," if audio is not playing.	Testing should take approximately 5 mins to ensure all audios throughout the map are functioning well. However, depending on the number of failures, time to fix the issues may vary. Note: Audio from the Unity asset store must be added before the test can be performed. Date: Nov 12th To be done by: Rohan
2	Determining movement quality of assets (rats, fire, smoke, etc.).	Place the rats and fire in a unity game, go into gamemode, see if they function as anticipated.	Results will be recorded as either "success," if there are not any glitches or mishaps in the mobile props, or "failure," if props are not acting as they are intended to.	Testing should take approximately 5-10 mins to ensure all assets throughout the map are functioning well. However, depending on the number of failures, time to fix the issues may vary. Note: Assets from Unity asset store must be added before the test can be performed. Date: Nov 12th To be done by: Kwab and Rohan
3	Determining if the user can move properly (Ex. walking on the	Go into gamemode and test if the keys associated with movement actually	The result here will either be a success or a failure. Each key associated with movement will	Testing should take approximately 5-10 mins to ensure movement of the player throughout the map is functioning as intended.

	ground, not floating).	move the user where intended.	have to go through this trial.	However, depending on the number of failures, time to fix the issues may vary. Note: Script for movement of camera in Unity must be done prior to testing. Date: Nov 12th To be done by: Hannah
4	Determining if the user can look around with a 360° view.	Add the scripts and play the Unity game. Use the arrow keys to check if the 360° camera works.	Results will be recorded as either "success," if the 360° camera works as intended, or "failure," if it does not. If failure occurs, we will check the script for any errors.	Testing should take approximately 1 min to ensure the user is able to rotate 360°. However, depending on the number of failures, time to fix the issues may vary. Note: Script for movement of camera in Unity must be done prior to testing. Date: Nov 12th To be done by: Marho
5	Determining if all assets are compatible in a single VR environment	Place buildings/props/audio on the plane and play the Unity game. Search for any defects.	If any defects are found, the appropriate action will be taken (e.g replacing a glitching wall or removing a triggering/deafening audio).	Testing should take approximately 5 mins to ensure all assets in the game are compatible for VR gameplay. However, depending on the number of failures, time to fix the issues may vary. Date: Nov 12th To be done by: Jon
6	Determining if the combination of	Export the game and play the game.	If the game is not working as	Date of testing is dependent on Test ID 1, 2, 3, 4, and 5.

	assets will run properly by the computer	Check if the game is functional and if the user is able to interact/use all functions as intended.	intended, assess the issues through appropriate troubleshooting methods.	Estimated time to fix the issues is dependent on the specific issue. To be done prior to *7. Testing the user response (emotion)* and *8. Usability testing (functionality)*. To be done by: Jon and Kwabfg
7	Testing the user response (emotion)	Gather a set of testers who have varying qualities (ages, ethnicity, backgrounds), observe their emotions and reactions to the scene, ask them how they are feeling	Recorded while observing the users, notes will be taken per tester on a note app or on paper, results will be used to understand if the proper emotions were evoked (fear, sadness, desire to take action)	Approximately 10 minutes per user, total amount of time will depend on how many testers are willing and available. Ideally 5 testers will be used, so the testing will take approximately 1 hour total (can be done at the same time as testing *8. Usability testing (functionality)*). Note: 5 individuals must be selected prior to the test date. Test date will be determined based on availability of testers and completion of the prototype (sometime in the week of November 12). To be done by: Jeanine
8	Usability testing (functionality)	Gather a set of testers who have varying qualities (ages, ethnicity, backgrounds) observe how they	Recorded while observing the users, notes will be taken per tester on a note app or on paper, results will be used	Testing should take approximately 10 mins, per user, to ensure the user is comfortable with the gameplay and movement.

		move around in the simulation and what they interact with.	to understand if the users can easily move around, look around, if they interact with the desired assets.	Note: 5 individuals must be selected prior to the test date. Test date will be determined based on availability of testers and completion of the prototype (sometime in the week of November 12). To be done by: Jeanine and Marho

6.2 – Stopping Criteria

- Audio and volume of audio is acceptable to all group members and users from user responses.
- Assets are functioning collectively as intended (no glitches)
- User/Player is able to move and look around using controller/arrow keys.
- Game does not crash after exporting onto the computer and it is able to run as intended.

7.0 - Conclusion

In this document, a summary of our concepts/detailed drawings are illustrated through original designs and assets found from the Unity Asset Store. Many of these assets come with costs hence leading us to the budget table, which includes all the materials that will be used in this project and the cost associated with it. The total cost amounts to $74.97 CAD. Some equipment, listed in *4.0 – List of Equipment*, are required in order to run the game as intended. Risks and a contingency plan have been formulated in a table to summarize the warnings and unexpected scenarios followed by the respective steps needed to be taken regarding our projects. A prototyping plan, including 8 testing objectives, has been created to test our VR simulation to ensure it is functional and ready to be viewed/played. Once the game has been developed, stopping criteria, listed in *6.2 – Stopping Criteria*, have been put together to cease the development of that subsystem/area of the game as it has successfully reached its intended function/use.