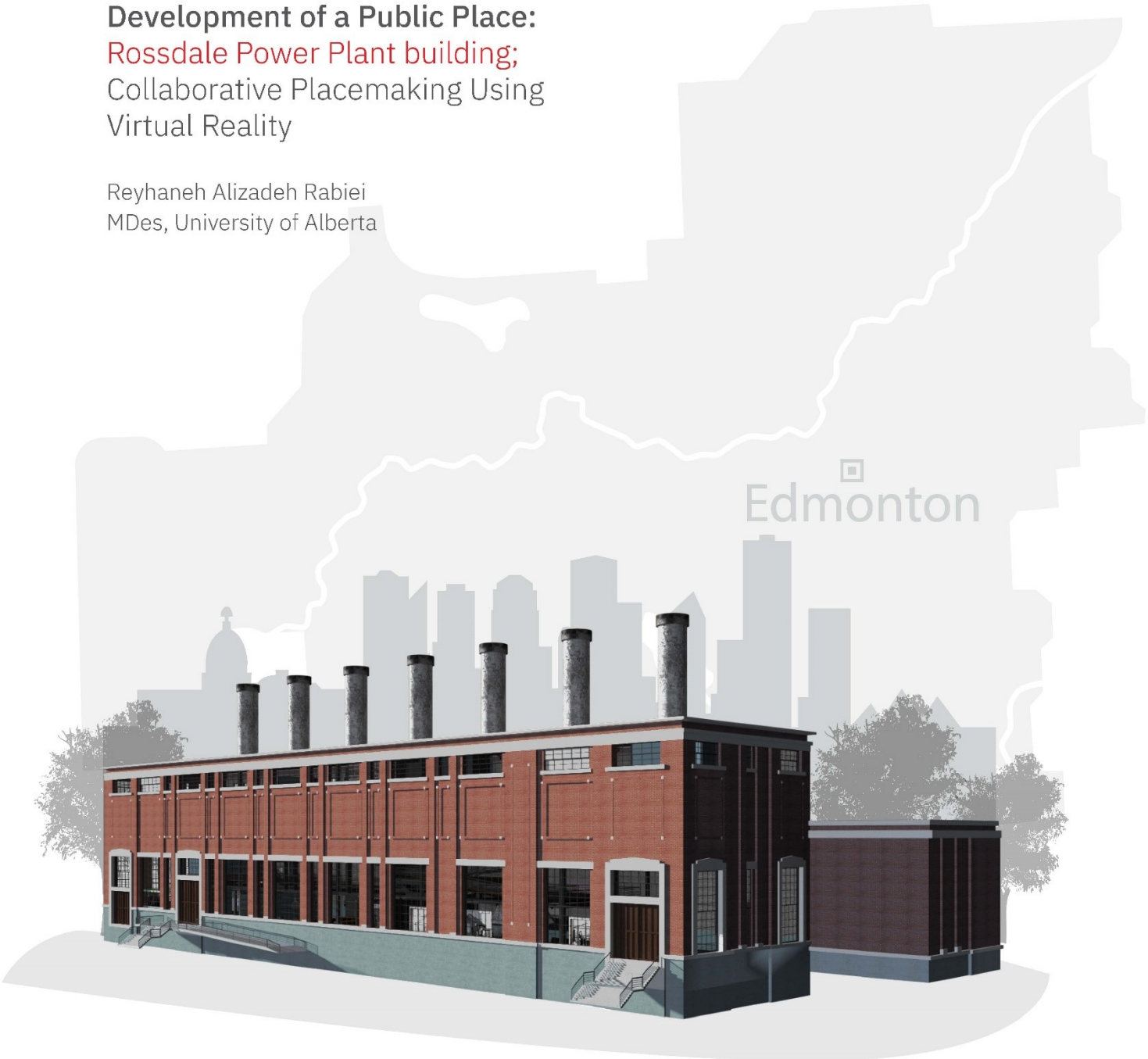
Development of a Public Place:
Rossdale Power Plant building;
Collaborative Placemaking Using Virtual Reality

Reyhaneh Alizadeh Rabiei
MDes, University of Alberta



Development of a Public Place: Rossdale Power Plant Building; Collaborative Placemaking Using Virtual Reality

by

Reyhaneh Alizadeh Rabiei

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Design
In
Industrial Design

Department of Art & Design
University of Alberta

Abstract

The River Crossing area in downtown Edmonton is evolving into a vibrant community and a unique place in the city. The ongoing redevelopment of west Rossdale plan involves a variety of projects including expanding land uses in residential, commercial and institutional concepts. The City of Edmonton's goal for these projects is to make a positive collective impact on the town and the neighborhood in order to make the Rossdale area a more vibrant and diverse community.

This thesis project focuses on the Rossdale Power Plant building that is recognized nationally as one of Canada's Historic Places. The Power Plant buildings were decommissioned eight years ago between 2011 and 2012 and the station no longer generates power. This thesis project's primary objective is to introduce Virtual Reality as a creative design method for bringing a new life to the Rossdale Power Plant.

This project aims to understand and acknowledge the challenges that the city encounters with the redevelopment of the Rossdale Power Plant building and define new opportunities to solve the possible problems and enhance the quality of engagement in this place. The research methodology will include taking a community-led design approach, conducting in-person surveys, utilizing VR as a creative design method for developing possible concepts and receiving feedback on the feasibility of those concepts. In this project, from the community perspective, the focus will be on the community's concerns for the Power Plant, and employment of their information, and ideas for conceptualizing activities in the early design phase.

The purpose of using Virtual Reality (VR) technology in this research is to connect the individuals with the stakeholders through an immersive virtual interaction in two separate stages. First, for developing the possible concepts and second for receiving feedback on those

concepts. The redesigned virtual environment in the second stage, communicates the design objectives and helps individuals better visualize the redefined space in the physical reality. Furthermore, the employment of this technology provides an excellent opportunity to improve the concepts and reduce costs before the physical alteration.

Keywords

Rossdale Area, Placemaking, Place Identity, Public Place, Community-led Design, Co-creation Design, Virtual Reality, Creative Design Method

Acknowledgement

The work in this thesis would not have been possible without the kind assistance and support of a very important group of people. I would like to express my gratitude to my supervisor, Prof. Tim Antoniuk, for introducing me to the topic, being supportive of my career goals and working actively to provide me with the protected academic time to pursue those goals. I am grateful to Prof. Robert Lederer, for his useful comments, remarks and engagement through the learning process of this master thesis.

Furthermore, I would like to thank the City of Edmonton for this honourable opportunity, the Rossdale project manager, Erik Backstrom, the Rossdale project planner, James Haney, the Rossdale Community League member, Councillor Scott McKeen, the DIALOG Architecture firm, Jeff DeBattista, Tai Zola, and Neil Kemp for all their guidance and support throughout the project. I am grateful to Dr. Pierre Boulanger for his generosity in lending me the VR equipment and giving me permission to use his VR Lab at the Computer Science Department. I would like to thank Ali Jahani for helping me with the technical, VR related questions. I would like to also thank the participants in my survey, who have willingly shared their precious time and valuable insights on the Rossdale Power Plant project.

I would like to thank my loved ones, especially my devoted, strong mother and my beloved sister and best friend, Elaheh for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and working on this thesis project. This accomplishment would not have been possible without them. Thank you.

Contents

Abstract ii
Acknowledgement iv
List of Tables vi
Table of Figures vii
1 Chapter One 1
1.1 Introduction 1
1.1.1 Background 1
1.1.2 Statement of Purpose 6
1.1.3 Statement of the Problem 8
1.1.4 Intended Outcome 11
1.2 Placemaking 12
1.2.1 Purpose 12
1.2.2 Great Public Place 13
1.3 Heritage-led Design 15
1.3.1 The Standards for Conservation of Historic Places in Canada: 15
1.3.2 The Guidelines for Conservation of Historic Places in Canada 16
1.3.3 Character-defining Elements 16
1.4 Community-led Design 18
1.5 Virtual Reality 19
2 Chapter Two 22
2.1 Design Approach 22
2.1.1 Background Analysis 22
2.1.2 Community-led Design Approach 23
2.1.3 Using Virtual Reality 24
2.2 Survey Data Analysis 30
2.2.1 First Virtual Reality Demonstration 30
2.2.2 Ideas Analysis and Execution 35
2.2.3 Gondola project in Edmonton 46
2.3 Second Virtual Reality Demonstration 47
3 Chapter Three 51
3.1 Purposed Ideas for the Future Phases 51
3.1.1 The Basement 51
3.1.2 The Switch House 54

3.1.3 The Turbine Hall 55
4 Conclusion 56
References 57
5 Appendices 60
5.1 Rossdale Power Plant Project Timeline 60
5.2 First Questionnaire and Data 61
5.3 Second Questionnaire and Data 70
5.4 Rossdale Power Plant floor plans 79
5.5 Virtual Reality Requirements 85
5.6 Ethics Application 86

List of Tables

Table 1-1 Quantifiable and unquantifiable features of a place. (Cilliers, 2015) 13
Table 2-1 Ethnographic data 29
Table 2-2 Values assigned to a public place. 31
Table 2-3The overall perception of the designed interior space 47
Table 2-4 The likelihood of visiting the redesigned Power Plant. 48
Table 2-5 The concepts participants wish to keep/have in the redesigned Power Plant 48
Table 5-1Age distribution – first survey 61
Table 5-2 Duration of the time participants lived in Edmonton – first survey 61
Table 5-3 Ethnographic Data 62
Table 5-4 Values assigned to a public place 62
Table 5-5 The occupational groups 63
Table 5-6 The perception of the participants towards the Rossdale Power Plant 63
Table 5-7 Participants expectations of the Power Plant's redevelopment 64
Table 5-8 The activities participants wish to have in the redesigned Power Plant 64
Table 5-9 65
Table 5-10 65
Table 5-11 66
Table 5-12 66
Table 5-13 Suggested materials for the Power Plant 67

Table 5-14 The interior styles suggested for the Power Plant 67
Table 5-15 Age distribution – second survey 70
Table 5-16 Duration of the time participants lived in Edmonton – second survey 70
Table 5-17 71
Table 5-18 71
Table 5-19 72
Table 5-20 72
Table 5-21 73
Table 5-22 73
Table 5-23 74
Table 5-24 74
Table 5-25 75
Table 5-26 75

Table of Figures

Figure 1-1 Aerial Photograph (Rossdale Generating Station, Repurposing 2011)..... 2
Figure 1-2 Rossdale Generation Site History Timeline. 1st page. (Alberta Register of Historic Places n.d.) 3
Figure 1-3 Rossdale Generation Site History Timeline. 2nd page. (Alberta Register of Historic Places n.d.) 4
Figure 1-4 Rossdale Generation Site History Timeline.3rd page. (Alberta Register of Historic Places n.d.) 5
Figure 1-5 Tate Modern in London (HISTORY OF TATE MODERN n.d.)..... 6
Figure 1-6 Boiler Hall: The constructed staircases are long and narrow with lower railings that create a hazardous situation. (photobucket n.d.)..... 9
Figure 1-7 Boiler Hall: The disordered distribution of the beams on the west wall (top image – mezzanine level – right) and (bottom image – left) with different sizes and shapes generates disorientated awareness of space. (photobucket n.d.)..... 10
Figure 1-8 Based on PPS, a place is great if it is accessible, comfortable and sociable and has purposeful activities. (Project for Public Places n.d.)..... 14

Figure 1-9 The coping, the belt-course and the long white pre-cast cornice around the walls that contain dates of each construction phases are considered as character-defining elements. (Revitalization n.d.) 17
Figure 1-10 The Virtual Reality escape rooms at Laser City Edmonton present an innovative experience in the escape room domain. In this photo, the users are physically in an empty room, while in the virtual world, they are exposed to an immersive virtual escape room (VR ESCAPE ROOMS n.d.) 19
Figure 2-1Preview of the 1st VR demo session. Rossdale Power Plant, the Boiler Hall interior with no detail. Exported from Unreal Engine. 24
Figure 2-2 Preview of the Rossdale Power Plant VR model exterior with the necessary details to match the physical structure. Exported from Unreal Engine. 26
Figure 2-3 The textures that were used in the second VR model for flooring. 26
Figure 2-4 Preview of the second VR demo model. The Boiler Hall. The image displays the main entrance lounge. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine. 27
Figure 2-5 Preview of the second VR demo model. The Boiler Hall. The image displays the gallery office on the second level. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine. 27
Figure 2-6 Preview of the second VR demo model. The Boiler Hall. The image displays the first level of the bar & Restaurant. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine. 28
Figure 2-7 Preview of the second VR demo model. The Boiler Hall. The image displays coffeeshop on the first level. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine. 28
Figure 2-8 The Classic Egg Chair designed by Arne Jacobson (left). The Eames DSW chair designed by Charles and Ray Eames (right). (Turbosquid n.d.) 29
Figure 2-9 Contemporary interior style 32
Figure 2-10 Industrial interior style 32
Figure 2-11 Rustic interior style 33
Figure 2-12 Modern interior style 33
Figure 2-13 Mid-century interior style 34

Figure 2-14 Traditional interior style....34
Figure 2-15 2016. SPACE Copenhagen converts warehouse into restaurant 108 for René Redzepi. November 23. https://www.designboom.com. 35
Figure 2-16 Club Vista Mare bar. (Club Vista Mare bar 2017)....36
Figure 2-17 TRUK Furniture, Osaka, Japan (Pinterest n.d.) 36
Figure 2-18 The space is airy and modern with a sleek industrial edge, its decor mixing rough and refined elements into a harmonious organic whole. (AN' Garden Cafe, A Green Industrial Oasis in Hanoi, Vietnam n.d.) 37
Figure 2-19 The striking steel-framed structure blurs the lines between indoors and outdoors through a clever interplay of wood, concrete, and glass. (AN' Garden Cafe, A Green Industrial Oasis in Hanoi, Vietnam n.d.) 38
Figure 2-20 Federal Center South Building 1202. (Rosenfield 2014)....38
Figure 2-21 Restaurant public dining level (up) - The venue (bottom)....39
Figure 2-22 The coffeeshop is an in-between semi-open space designed to create a peaceful and comfortable atmosphere. 40
Figure 2-23 The gallery office space on the second level. 41
Figure 2-24 The conference room/office space of the community hall with a private lounge. 42
Figure 2-25 The community hall lounge on the mezzanine level - the paintings are created by David York....43
Figure 2-26 The Forks Market Food Hall in Winnipeg. (Refurbishment in Architecture n.d.) 44
Figure 2-27 Granville Island Marketing Vancouver - (Oates 2011)....45
Figure 2-28 Boiler Hall east side windows were covered with brick during the construction of the High-pressure Power Plant on the east. Rossdale Power Plant tour. April 2019....46
Figure 3-1 Low-pressure Boiler Hall - Basement - Rossdale Power Plant tour April 2019....51
Figure 3-2 Mad Scientist Lab – (A/MAZE Guatemala Escape Room 4 n.d.)....52
Figure 3-3 Mirror maze - (Encounters Ocen City New Jersey n.d.)....52
Figure 3-4 Ruhr Museum, Germany. (Permanent Exhibition n.d.) 53
Figure 3-5 The Switch House (photobucket n.d.)....54
Figure 3-6 The Turbine Hall. (photobucket n.d.)....55

1 Chapter One

1.1 Introduction

1.1.1 Background

In April 2015, Edmonton City Council endorsed a new vision for the River Crossing area. Embracing its rich history, the River Crossing area is advancing throughout the years into a vigorous community in Edmonton (Alberta Culture and Community Spirit, Historic Resources Management Branch. n.d.). Based on the Spirit of Edmonton proposal by Lewis Cardinal and the Indigenous People's Arts and Culture Coalition (IPACC), *Edmonton was born at Rossdale Flats as a gathering place for Indigenous peoples 8,000 to 10,000 years before Europeans came*. The Rossdale area was recognized as "*pehonan*," or a waiting place, and a center of commercial and public gathering site at the time (Rossdale Regeneration n.d.).

This research focuses on the EPCOR Rossdale Generating Station site known as Rossdale Power Plant located at 10155 - 96 Avenue on the north bank of the North Saskatchewan River. The power station was decommissioned between 2011 and 2012 and no longer generates power. Followed by the decommissioning process, all non-historical generating buildings were removed. The remaining heritage buildings in the site include the Low-Pressure Plant and the two Pumphouses; this project mainly concentrates on the Low-Pressure Plant consisting of three adjacent buildings including the Switch house – administration building – on the east, the Turbine Hall in the middle and the Boiler Hall on the west. (Figure 1-1)

The Power Plant building was partially designed by architect Maxwell Dewar and was constructed between 1930-1958; the structure was planned to be extended over time. The architectural design of all parts follows the same pattern used in the first section of the building (Alberta Register of Historic Places n.d.). Employment of brick curtain walls, steel load-bearing skeleton, and concrete floors and foundation displays a novel structure that is unique in Edmonton (Alberta Register of Historic Places n.d.). The design style used in this building demonstrates the early-twentieth-century American industrial design in addition to the Art Deco style, which makes it an iconic element in the city skyline. Prior to 2010, this building was recognized nationally as one of Canada's historic sites by the Heritage Canada Foundation (Rossdale Regeneration n.d.). Throughout the years, this building has been linked with significant political, public and commercial events and was recognized as a source of public

pride (Alberta Register of Historic Places n.d.). Figure 1-2 to Figure 1-4 display the history timeline of Rossdale Generation Site from 1891 to 2015.

Figure 1-1 Aerial Photograph (Rossdale Generating Station, Repurposing 2011)

Figure 1-1 displays the Rossdale generating station in Feb 2011. Currently, the High-pressure Power Plant has been removed.

1. Low-pressure Power Plant - Switch House
2. Low-pressure Power Plant - Turbine Hall
3. Low-pressure Power Plant - Boiler Hall
4. High-pressure Power Plant
5. Pump House #1
6. Pump House #2
7. Switchyard
8. Traditional burial ground & Old Fort Edmonton cemetery
9. Administration Buildings

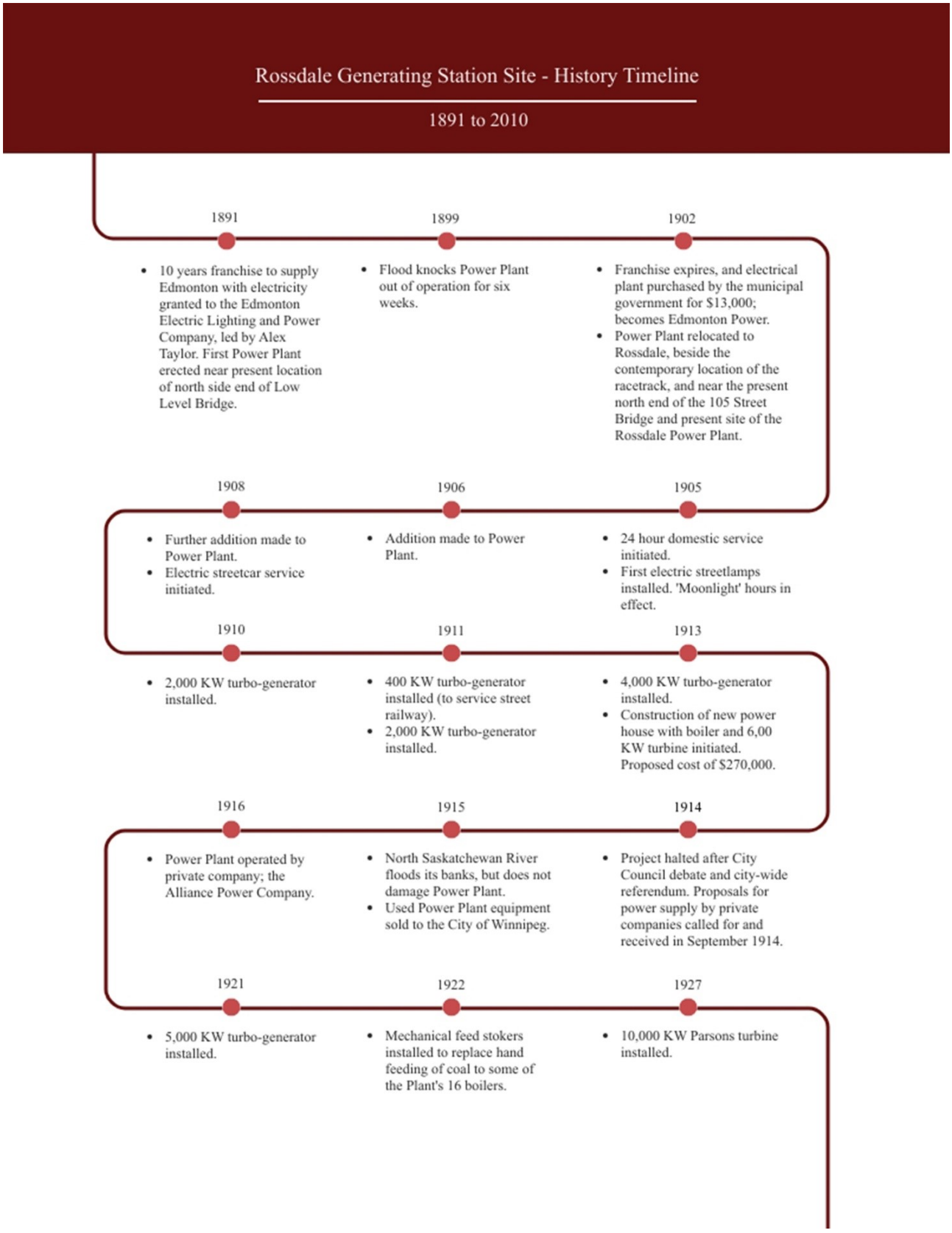


Figure 1-2 Rossdale Generation Site History Timeline. 1st page. (Alberta Register of Historic Places n.d.)

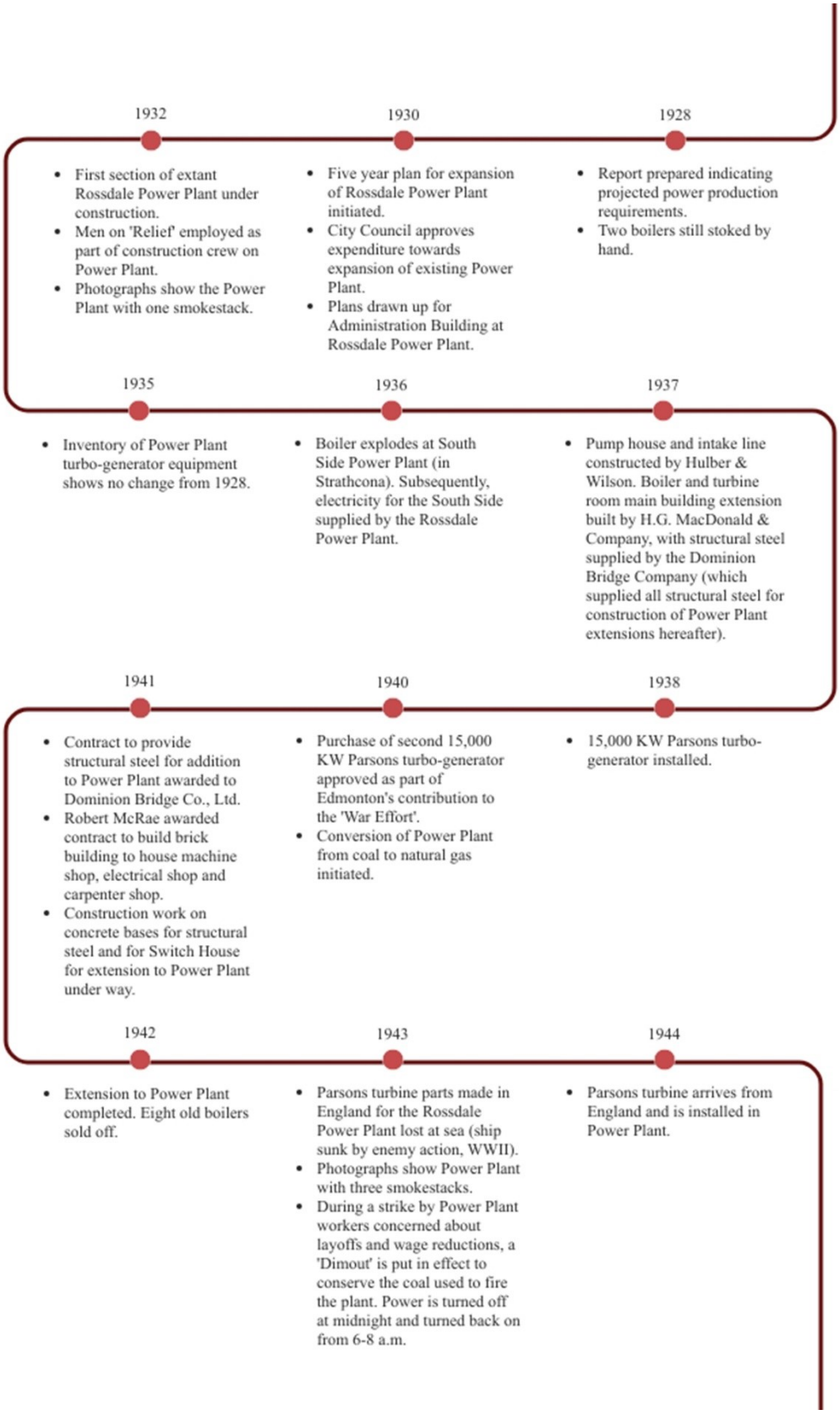


Figure 1-3 Rossdale Generation Site History Timeline. 2nd page. (Alberta Register of Historic Places n.d.)

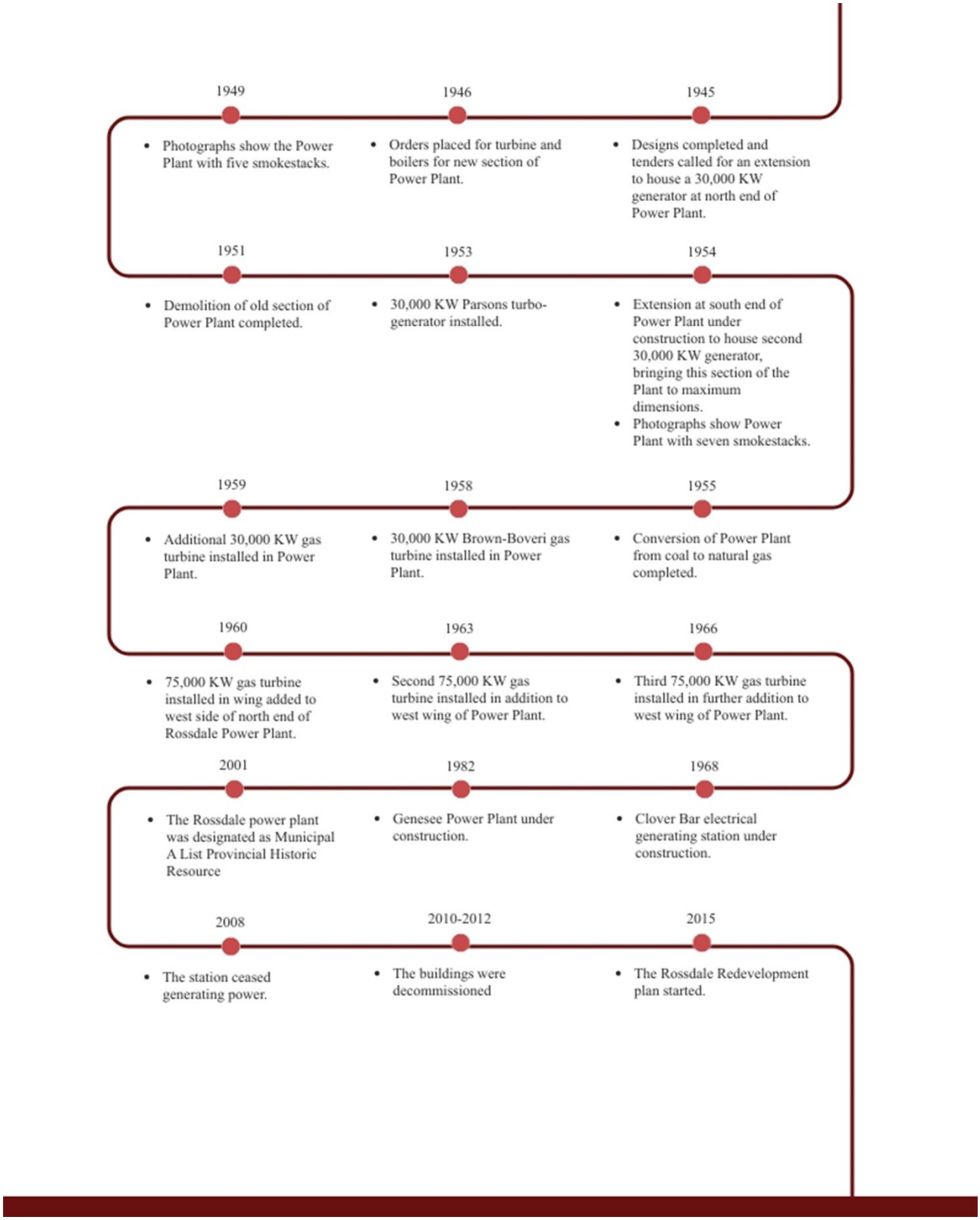


Figure 1-4 Rossdale Generation Site History Timeline.3rd page. (Alberta Register of Historic Places n.d.)

1.1.2 Statement of Purpose

Classified as Provincial Historic Resource in 2001, the Rossdale Power Plant building plays a significant role in Edmonton's past and future. The bright history laid in the background gives this building a lifelong purpose. The building being decommissioned, and all machinery removed leaves the space abandoned and not serving any real purpose. Regarding the heritage values that the building holds within itself, demands for a new pattern of use for this building arises. The historic values of the old industrial buildings that have been vacated have resulted in developing new functioning spaces around the world. A great example for it is the Tate Modern museum in London that its primary function was a Turbine Hall in the former Bankside Power Station. (Figure 1-5)

Figure 1-5 Tate Modern in London (HISTORY OF TATE MODERN n.d.)

The building's location on the north bank of the North Saskatchewan River makes it accessible from north to Downtown and from south to Whyte Avenue and this gives it a unique opportunity to be recognized as a public place that connects individuals from different parts of the city. To fulfill this purpose, this research focuses on defining new values and functions that enhance the quality of engagement in this area. The primary use of this space required an

industrial structure that is considered insecure for a public hangout space; the securing procedure is costly and expected to be a long-term process. This project employs Virtual Reality (VR) in order to reduce costs and save time in both the design process and the presentation of the proposed ideas.

The primary objectives to be accomplished throughout the project include:

- **Promoting the Rossdale Power Plant to a vibrant public place in the city.** The building has been vacant for almost a decade, which forfeits the significance of this historic structure in serving a valuable purpose. The geographical location of the building makes it a unique destination for a public hangout place. This project aims to highlight reliable outcomes that attract the public to spend time in this building.

- **Community's engagement in the design process.** This research concentrates on involving Edmontonians in the design process by taking a community-led design approach. The co-creation method used in the process highlights the needs the community has towards this space and deploys the information to conceptualize activities in the early design phase (Panke and Harth 2018). Furthermore, creation of a sense of belonging is achieved by a thorough analysis on the local communities to recreate the authentic culture through interactions individuals have with their surroundings and recognizing their past and future in a designated environment (Cilliers 2015).

- **Employment of Virtual Reality in addressing the community's concerns.** Due to the unsafe structure of the building, the public's visit to the interior space is prohibited. For the individuals to view the space, a virtual reality application is designed to help them understand the interior space to address their concerns and suggestions. Moreover, implementing the possible scenarios in a virtual environment produces reliable information on costing and feasibility of the ideas before their execution in real life (Whyte 2003).

1.1.3 Statement of the Problem

- **The Power Plant has been vacant for almost a decade.** The Power Plant site occupies 16.97 hectares of land in Edmonton's river valley (Alberta Culture and Community Spirit, Historic Resources Management Branch. n.d.). The location and the heritage value of this site make it potentially a perfect destination for public use. However, the site has remained empty for nearly a decade resulting in uneconomic outcomes. Furthermore, portions of the building have been damaged through the functioning period and remain in that state, which creates an undesirable appearance. The significant location of the building and its visibility from various spots in the city increases the effect of its current state.

- **The building is structurally unsafe for public use.** The interior of the building has been entirely designed for industrial purposes. The Boiler Hall interior has an open space structure with almost 22 m/72 ft in height and 109 m/357 ft in length. The distance between the mezzanine level and the main floor is open and contains massive I-beams. The railing on the mezzanine level is lower than the standard height. Portions of the floor in the Boiler Hall are open to the below and covered with temporary wooden sheets. Moreover, the constructed staircases are long and narrow with lower railings that create a hazardous situation and brings discomfort for those with a fear of heights. (Figure 1-6)

  Additionally, the structure utilized in the staircases requires special shoes to secure a stable movement. On the other hand, removal of the High-pressure Power Plant on the west has reduced the Boiler Hall's west wall stability. Therefore, additional horizontal beams are required to maintain the west wall's balance.

Figure 1-6 Boiler Hall: The constructed staircases are long and narrow with lower railings that create a hazardous situation. (photobucket n.d.)

- **The building has a dilapidated interior and exterior.** The Power Plant is in poor condition through a continuous functioning period, hard use and lack of care. Furthermore, considering the construction start date, 1935, the structure inevitably has been exposed to the harsh climate of province of Alberta over the years. Followed by the decommissioning procedure, and remaining vacant, the building appearance has been neglected. The broken windows remain unfixed; the bricks on the inside and outside require cleaning. Additionally, the building's stabilizing structural requirements have given the interior space a chaotic appearance. The disordered distribution of the beams on the west wall and over the ceiling with different size and shapes generates disorientated awareness of space in the first glance. (Figure 1-7)

Figure 1-7 Boiler Hall: The disordered distribution of the beams on the west wall (top image – mezzanine level – right) and (bottom image – left) with different sizes and shapes generates disorientated awareness of space. (photobucket n.d.)

1.1.4 Intended Outcome

This project focuses on using Virtual Reality in both the design process and the presentation of the designed space. The intended outcome of this project is to introduce an innovative design approach that connects the community with the stakeholders through virtual reality. This approach assists the designer in visually discussing the wishes the end-users have for a public space. Utilizing VR in the design process provides an opportunity for the designer and the end-users to explore the space, measurement and the character of the place (Racz 2018). Therefore, the unique experience that Virtual Reality provides in the ideation phase and the evaluation of concepts at the end, makes this method a valuable tool in the process of design and execution. Employment of this process can reduce the design and construction time and produce valuable information on the cost of physical alterations. More importantly, this method connects the community with stakeholders in visually addressing their needs and wishes for the Rossdale Power Plant building; thus, the stakeholders can have a reliable conception of the beneficial ideas that are compatible with this space.

1.2 Placemaking

1.2.1 Purpose

Placemaking is the process of creating a public place that people intend to spend time in. In other words, placemaking concentrates on creating a sense of belonging towards a place in individuals (Timmermans, et al. 2013). *The Place-making process, when it is conducted with transparency and good faith from the bottom up, results in a place where the community feels ownership and engagement, and where design serves function* (PPS 2012). In other words, individuals tend to develop a sense of belonging in growing places in their city (Cilliers 2015). The sense of belonging is shaped by the past and future stories in a place.

Values assigned to a place depend on the stories people make in that place. Placemaking focuses on modifying the values within a place to give it different definitions and therefore generating new stories (Cilliers 2015). The made stories within a place define its value; these definitions are generated by feelings a place conveys. In this sense, a place is a feeling rather than a location. Placemaking aims to improve the quality of life by creating social connections between individuals through the potential stories the place can accommodate. Individuals tend to perceive a place with different perspectives; the different perceptions create different narrative values. These narrative values relate to the physical environment through the interaction individuals have with that environment (Timmermans, et al. 2013). The created values within an environment are interpreted as quantifiable and unquantifiable data (Cilliers 2015). Public places are represented with four aspects; their liveliness, the purpose they are serving, accessibility and appearance. These aspects each have measurable and unmeasurable quantifiable features. (Table 1-1)

In this research, placemaking refers to the modification of the Rossdale Power Plant into an active, vibrant environment that improves the quality of engagement through activities and various functions.

Features of a place	Unquantifiable	Quantifiable
Sociability	Diversity, stewardship, cooperation, neighbourliness, pride, friendliness, interaction, welcome feeling.	Number of people, social networks, volunteers, use in the evenings, street life.
Use and activities	Pleasure, active, vitality, special, genuine, usable, indigenous, sustainable.	Ownership of local businesses, land use, house prices, rents, shop sales.
Access and connections	Continuity, closeness, connectedness, readability, suitable for walking in, easy, accessible.	Traffic data, transport flows, through traffic, pedestrian activity, parking data.
Comfort and image	Safe, clean, 'green', suitable for walking in, suitable for sitting in, spiritual, charming, appealing, historic.	Crime statistics, health statistics, condition of the buildings, environmental data.

Source: Based on Baltimore City Department of Planning (2010:90), PlacemakingChicago (2012)

Table 1-1Quantifiable and unquantifiable features of a place. (Cilliers, 2015)

1.2.2Great Public Place

The design of a public place that meets all the necessary criteria follows specific standards that make a place "Great." Project for Public Places (PPS), a non-profit organization located in New York, USA, discusses four specific features that a public place needs to be considered "Great." (Project for Public Places n.d.) Based on PPS, a place is "Great" if it is **accessible**, **comfortable, sociable** and has **purposeful activities**.Figure 1-8 Based on PPS, a place is great if it is accessible, comfortable and sociable and has purposeful activities. (Figure 1-8) Accessibility for a public place refers to both the connections a place has to its surroundings, and the visibility of it from different parts of the city. The comfortable feature concerns the safety, cleanliness and availability of sitting spots in a place. In addition to the mentioned characters, gender-equality is also considered an essential factor in a place's comfort and reflection.

The sociable place allows individuals to interact with others by linking them with their community. This type of place provides a socialization opportunity. The more sociable a place is the more sense of belonging individuals feel in that place. Individuals tend to invite their friends and relatives to places they feel comfortable in. The sociable places concentrate on welcoming individuals from different age groups and ethnicity. The purposeful activities generally refer to the distribution of different activities in a place. A set of activities within a public place serves as a primary purpose for individuals to visit the place regularly.

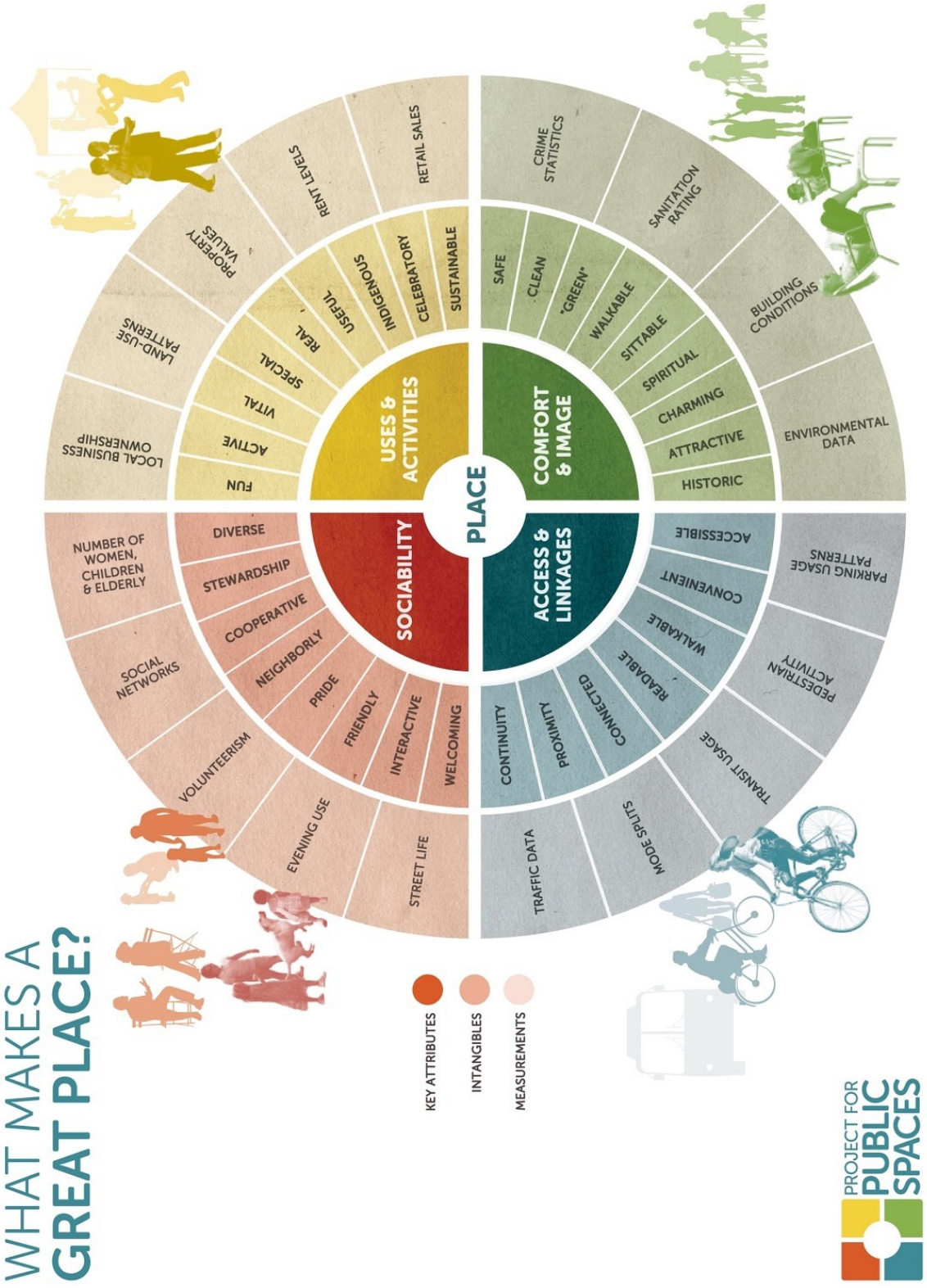


Figure 1-8 Based on PPS, a place is great if it is accessible, comfortable and sociable and has purposeful activities. (Project for Public Places n.d.)

1.3 Heritage-led Design

1.3.1 The Standards for Conservation of Historic Places in Canada:

According to the "Standards and Guidelines for the Conservation of Historic Places in Canada" document, historical sites/places go through an evaluation phase that assigns heritage value to them. Based on these values, the decisions on the conservation of these places are made. These values concern the aesthetic, historic, scientific, cultural, social and spiritual value of a place. The term conservation of a historic place refers to any procedures or methods that concern the protection of character-defined elements in a historic place to maintain its heritage value and extend its structural durability. This document presents 14 standards that need to be counted and applied to any conservation project (Standards and Guidlines for Historic Places in Canada 2010). According to the preliminary building assessments (Rossdale Generating Station, Repurposing 2011), the following standards are most compatible with the repurposing of the Rossdale Power Plant building:

- **Standard 1** - *(a) Conserve the heritage value of a historic place. (b) Do not remove, replace or substantially alter its intact or repairable character-defining elements. (c) Do not move a part of a historic place if its current location is a character-defining element.* (a) All formally recognized structures have a Statement of Significance document that highlights the character-defining elements. (b) All alterations to the character-defining elements must be minimized, and intervention should be applied only when necessary. (c) The spatial relationship should be kept intact as the entirety of the structure, and its surroundings are designated as the character-defining element.

- **Standard 10 -** *(a) Repair rather than replace character-defining elements. (b) Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements. (c) Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the historic place.* (a) The elements that are repairable must be kept and not replaced. (b) In cases that the element has been damaged or minimal parts of it are available, the element can be accurately reproduced. (c) When an element is destroyed and no longer exists, it can be replaced with a new element that is compatible with the old one entirely.

- **Standard 11 -** *(a) Conserve the heritage value and character-defining elements when creating any new additions to a historic place or any related new construction. (b) Make the new work physically and visually compatible with, subordinate to, and distinguishable from the historic place.* (a) All new elements added to the structure must not harm and alter its character-defining components. (b) The new addition must be physically and visually compatible with the historic structure; however, it must be distinguishable from the historic structure.

- **Standard 12** - *Create any new additions or related new construction so that the essential form and integrity of a historic place will not be impaired if the new work is removed in the future.* Any new additions must be removable without damaging the character-defining elements of the historic structure.

1.3.2 The Guidelines for Conservation of Historic Places in Canada

Based on the definitions outlined in the "Standards and Guidelines for the Conservation of Historic Places in Canada" document, the Rossdale Power Plant building is considered an archeological industrial site. According to this document, the remaining physical elements in the site that were utilized for industrial activities should be systematically studied to obtain a better understanding of its history to preserve the heritage value of the site in the repurposing process. The interdependence quality of the character-defining elements within the historic industrial site can be acknowledged by understanding the history of the remaining physical elements. *Conserving an industrial site involves not only preserving physical remains, but also recognizing the site's development phases by studying the physical remains and how they evoke the human activities that took place at the site* (Standards and Guidlines for Historic Places in Canada 2010).

1.3.3 Character-defining Elements

Rossdale Power Plant site includes components that are considered character-defining elements and have heritage value. Therefore, they must remain intact. The following is the list of the low-pressure Power Plant character-defining elements (Revitalization n.d.):

- Location; historical location on the riverbank
- Form; the structure consisting of three large, aligned building structures with different heights constructed adjacent and vertical to the river.

- Structure; the large openings of metal windows, the large interior space that depicts the industrial use of this building, masonry walls, reinforced concrete foundations, structural steel framing, use of pipe railings, steel and concrete stairs and seven roof smokestacks
- Design; the structure displays a combination of classical and contemporary industrial style.
- Decoration; the coping, the belt-course and the long white pre-cast cornice around the walls below the ceiling that contain dates of each construction phase (Figure **1-9**), the darker clinker brick on the exterior and the lighter, buff coloured brick on the interior

Figure 1-9 The coping, the belt-course and the long white pre-cast cornice around the walls that contain dates of each construction phases are considered as character-defining elements. (Revitalization n.d.)

1.4 Community-led Design

Placemaking focuses on creating a sense of belonging for a place in people. Individuals tend to develop ownership of a place when they are involved in the solution process. Furthermore, the developed solution affects the community directly; therefore, their engagement in the solution process becomes critical. The community-led design process combines the community's wisdom with the knowledge of a designer to develop a solution that benefits the community at large (Citizens' Institute on Rural Design n.d.). The community-led design takes a co-creation approach and involves users in the problem-solving process. Co-creation concerns the collaborative creativity that involves more than two individuals (B.-N. Sanders and Stappers 2008). In this process, the user becomes a team member and, in some cases, a co-designer (Foth 2017). Essentially, co-creation is the method in which both sides of the subject are gathered to form a mutual value. *Co-creation is the joint, collaborative, concurrent, peer-like process of producing a new value, both materially and symbolically* (Galvagno and Dalli 2014). (Foth 2017) argues various cases of co-creation in city-making process and indicates the term co-creation is modifying individual's role from users to creators and from end-users to active inspectors of development.

This research is taking a community-led design approach to involve residents of Edmonton in the design process and address their core objectives and wishes for the Rossdale Power Plant building. Unlike a typical large-scale project that the community is hardly involved in the decision-making and has limited knowledge on the limitations and opportunities of a project, the Rossdale Power Plant project focuses on involving the community in the design process. The individuals' involvement in this research occurs during the ideation and the implemented concepts evaluation phase. The insight obtained from the community is driven by the stories each participant makes during their habitation in Edmonton. Every participant has different stories and therefore, a different perspective on a place in the city. The main objective is to gather all the various data from the community and combine them to reach a reliable outcome. Moreover, this process demonstrates that individuals show more investment in the outcome when they are heard; thus, they discuss their needs, wishes and desire more directly and tend to investigate the project's progress later — utilizing this approach in design results in strong ownership of the outcome in the city's residents.

1.5 Virtual Reality

The phrase Virtual Reality was first used by Jaron Lanier founder of VPL Research; later in the mid-1970s, Myron Krueger named it Artificial Reality (Machover and Tice 1994). Virtual or artificial reality is a technology that connects the operation of complicated devices with incorporating data to generate an interactive awareness. The virtual environment that the user is engrossed in is an immersive reality that cuts the user's connection with their physical reality and affects their spatial awareness. The loss of connection with the physical world occurs through the change in the user's perception of space. In other words, the VR environment presents a different reality in an immersive display that separates the user from their physical reality. (Figure 1-10)

Figure 1-10 The Virtual Reality escape rooms at Laser City Edmonton present an innovative experience in the escape room domain. In this photo, the users are physically in an empty room, while in the virtual world, they are exposed to an immersive virtual escape room (VR ESCAPE ROOMS n.d.)

The feature that makes the experience feel real is the consistency in the displayed images in front of the user's eyes. The reality in the VR environment must be aligned with the user's physical reality; i.e. the user's height in VR must be the same as in the physical world for the user to accept the new reality. "*The "reality" must both react to the human participants in*

physically and perceptually appropriate ways and conform to their personal cognitive representations of the microworld in which they are engrossed." (Machover and Tice 1994) The consistency of the exposed data in the virtual world enhances the reality of the experience.

In Virtual Reality, users explore and interact with spatial data in real-time[1]. In the new modern world, Virtual Reality technology interests many fields; however, the pioneers anticipated architecture to be the primary use of this technology as it was presented as a great tool to create a walkthrough presentation of architecture models. (Brooks 1986). (Whyte, 2003) discusses three different approaches for utilizing Virtual Reality:

- "System Integration" - use of VR in the prototyping phase and simulating the process of construction and operation of the potential construction/manufacturing methods.
- "Customer Interface" - providing the customer with an opportunity to explore the space to better understand the design objectives and outcomes.
- "New Markets" - using VR as a marketing tool in the design of space

The quality of the displayed image in VR depends on the purpose the user is investigating; for construction professionals, the quality of interaction with space is more important than the quality of image they view while on the other hand, for non-construction professionals, the quality of the image and walking though the model become more important than their ability in interacting with space in the virtual world (Whyte 2003). In the virtual world, the stakeholders concentrate more on the interactivity of the presented space and explore the feasibility of the ideas in the physical world. The non-professionals mostly focus on the details and the quality of the space they are viewing. The Rossdale Power Plant project primarily focuses on using VR in the design process from ideation to receiving feedback from users; it also concentrates on building an application that delivers an understanding of the construction process in addition to costing and on the other hand presenting close-to-reality models inside the application to visualize the ideas better. Furthermore, Virtual Reality displays a realistic environment that gives the user an accurate understanding of the concepts within the construction (Racz 2018). Consequently, the retrieved data become a reliable source for implementing strategies. On the other hand, users tend to show emotional feedback on the presented ideas inside the VR; that is, they can perfectly visualize themselves within that environment; therefore, they give feedback on whether they wish to spend their time in that

[1] In computing, real-time refers to a system in which input data is processed within milliseconds so that it is available virtually immediately as feedback.

space in the future. This data helps the stakeholders to map potential beneficial plans for that space accurately. In the Rossdale Power Plant project, a basic real-scale white VR model of the Power Plant was made for individuals to obtain an understanding of the interior scale and lighting. The first VR session included demonstration of the interior space in the virtual world and developing concepts for that space (First Virtual Reality Demonstration). Visiting the place in VR opened the participants mind on the concepts they could fit in this place. The analysis initiated with evaluation of concepts from the Heritage perspective as conservation limitations contradicted number of concepts; however, some concepts were feasible if the structural requirements were met. Followed by the research, critical steps including analyzing the interior style and researching the popular public places were taken to provide the individuals with a close to reality virtual experience in the second VR demonstration (Ideas Analysis and Execution). The designed concepts were selected based on the obtained statistics from the first VR demonstration. In the second VR demonstration, participants explored the detailed VR model of the Rossdale Power Plant. During their exploration they made comments on the feasibility of the concepts and whether they find the redesigned space welcoming. This process will be discussed further in detail in Chapter 2.

2 Chapter Two

The Rossdale Power Plant redevelopment project started in September 2018 and was conducted in five research phases (**Rossdale Power Plant Project Timeline**). In addition to the information discussed in Chapter 1, some data will be further discussed in detail in Chapter 2. [2]

[2] **Please refer to (Appendices,**

1.1 First Questionnaire and Data) and (

This questionnaire is ANONYMOUS. The intended uses of this research are for thesis research and writing only as part of the principal investigator's graduate study. Participants will not be personally identified in any of these. All data will be kept confidential, with the Primary Investigator being the only person with access to the data.

1. How old are you?

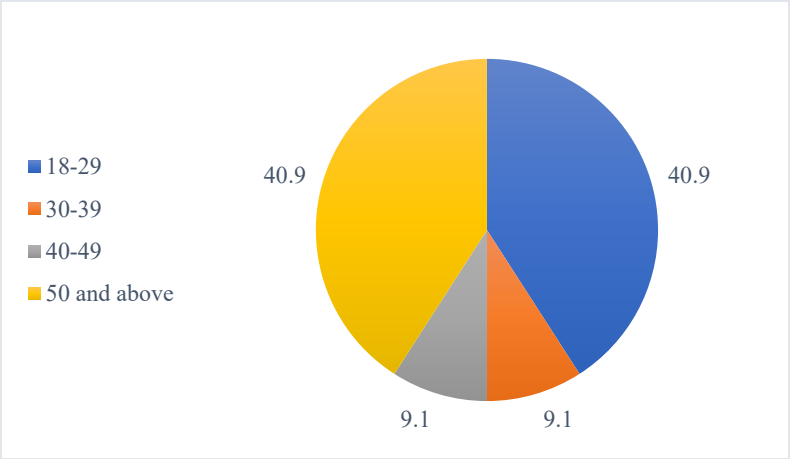


Table 5-1Age distribution – first survey

2. How long have you been living in Edmonton?

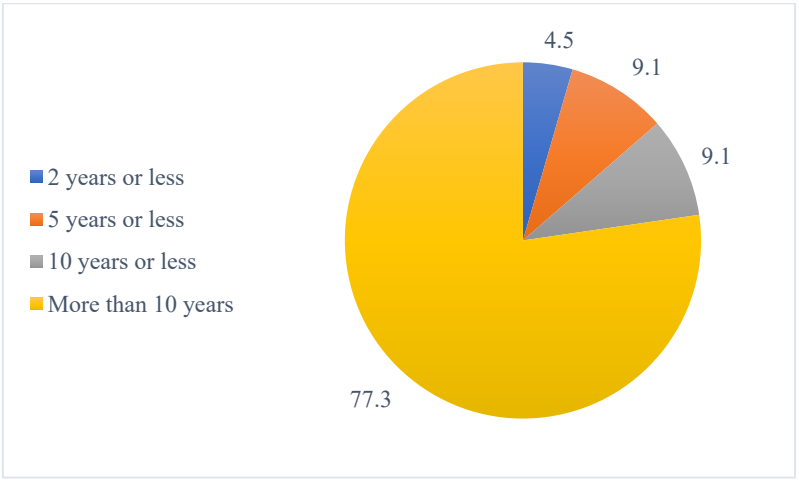


Table 5-2 Duration of the time participants lived in Edmonton – first survey

3. Which group your background falls into?

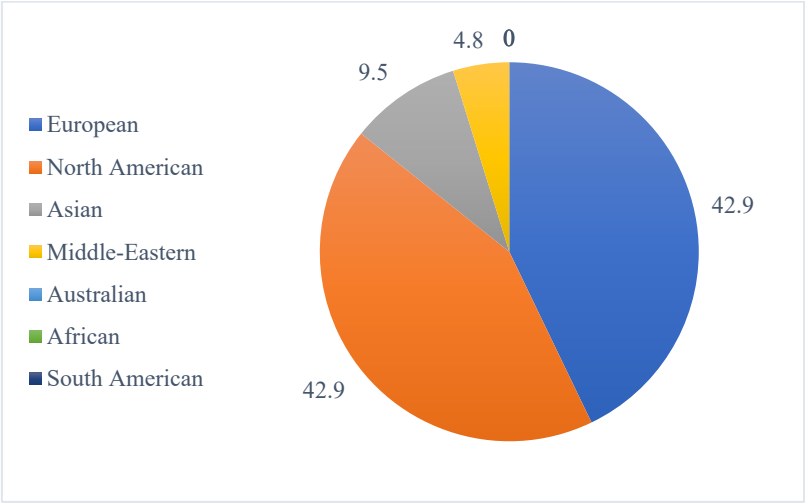


Table 5-3 Ethnographic Data

4. Which ones of the followings do you mark as a value that you wish to keep/add to a public place in the city of Edmonton?

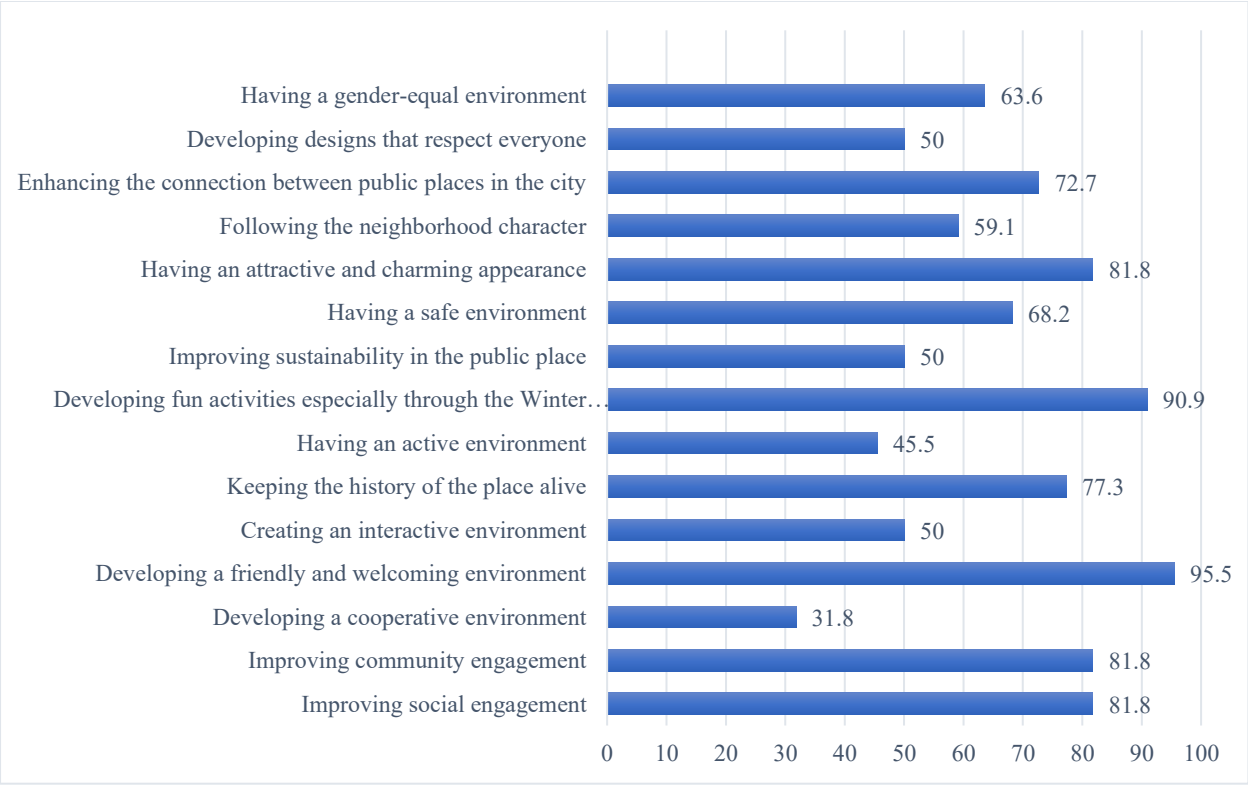


Table 5-4 Values assigned to a public place

5. If you are employed, what occupational group your career fits in? This question includes retired individuals, too.

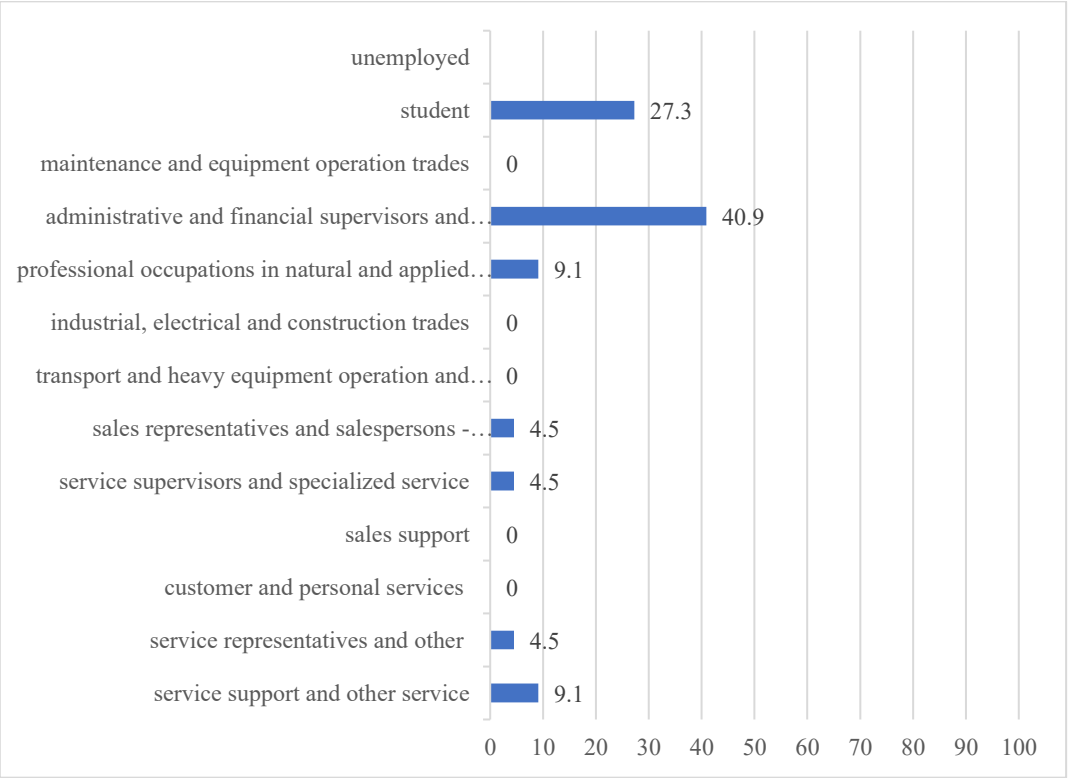


Table 5-5 The occupational groups

6. How do you feel about the Rossdale Power Plant building?

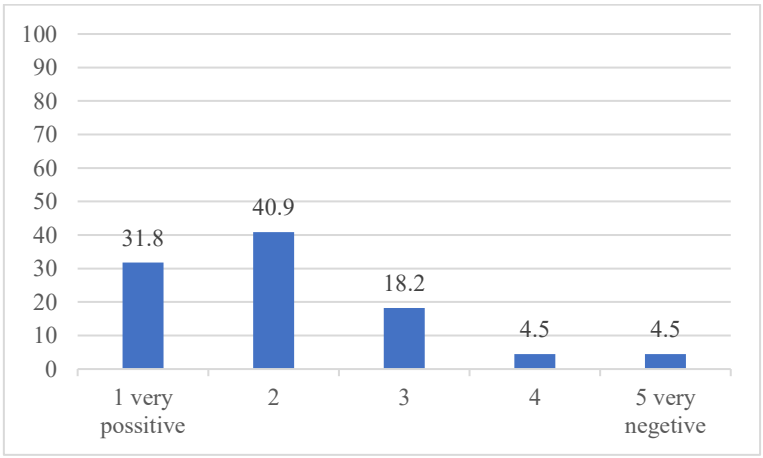


Table 5-6 The perception of the participants towards the Rossdale Power Plant

7. What results do you expect to see from the Rossdale Power Plant redevelopment plan?

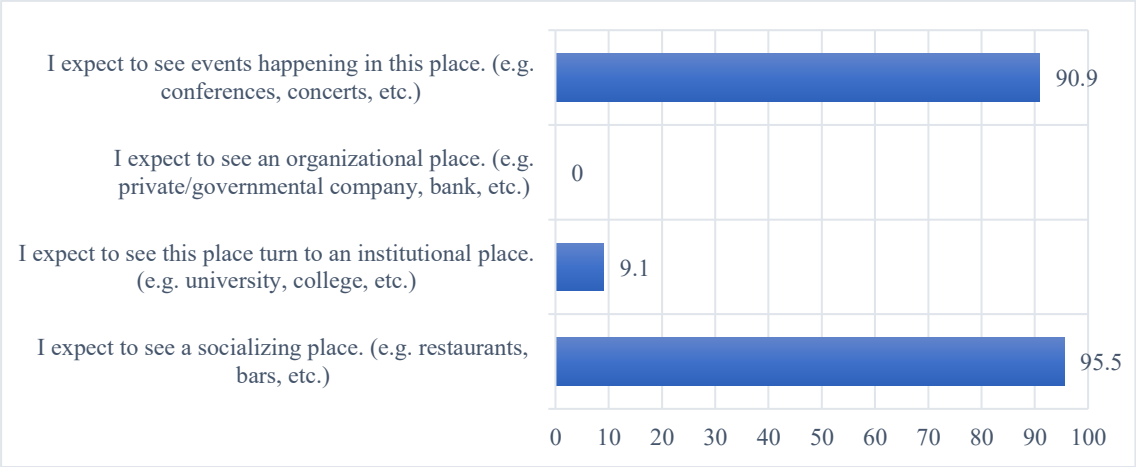


Table 5-7Participants expectations of the Power Plant's redevelopment

8. What activities do you wish to see in this place? If your expectation is not listed below, please, write it down below the "other" section.

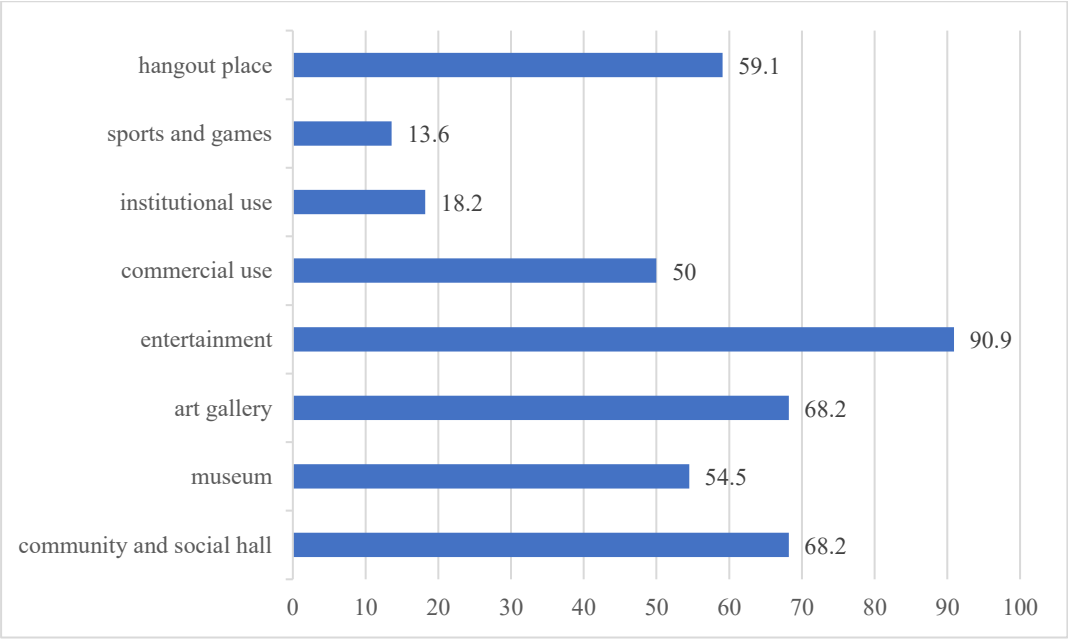


Table 5-8 The activities participants wish to have in the redesigned Power Plant

9. How would you rate your today's experience with the Virtual Reality?

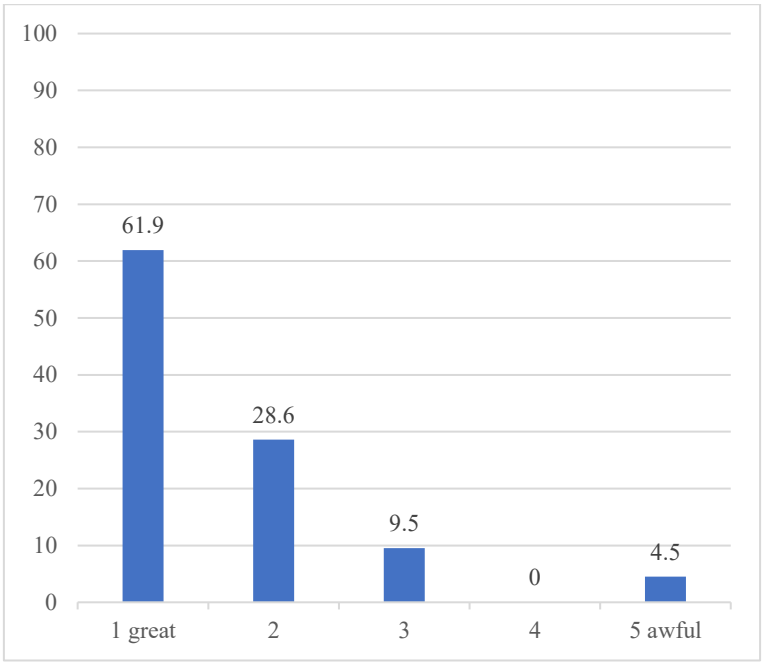


Table 5-9

10. How did you feel inside this space?

Table 5-10

11. What color temperature will make a place more comfortable for you?

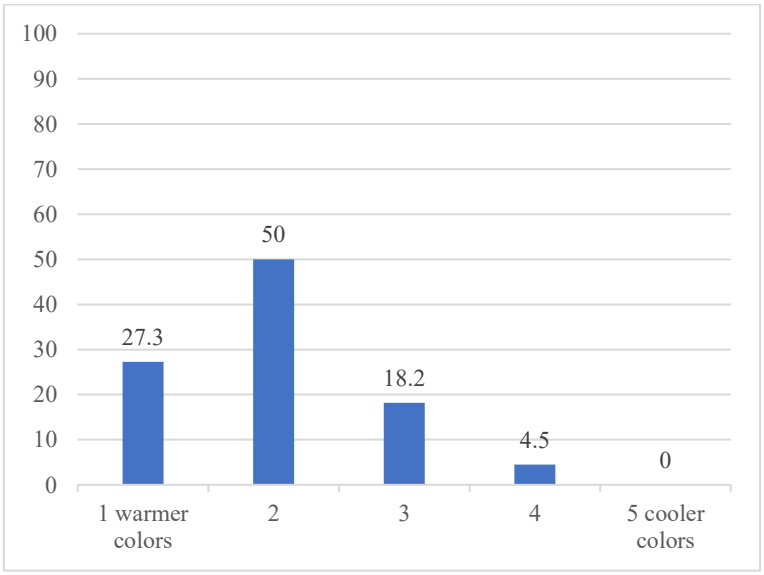


Table 5-11

12. Based on your background, and experiencing this space in the VR environment, which ones of the followings are close to your expectation of this space?

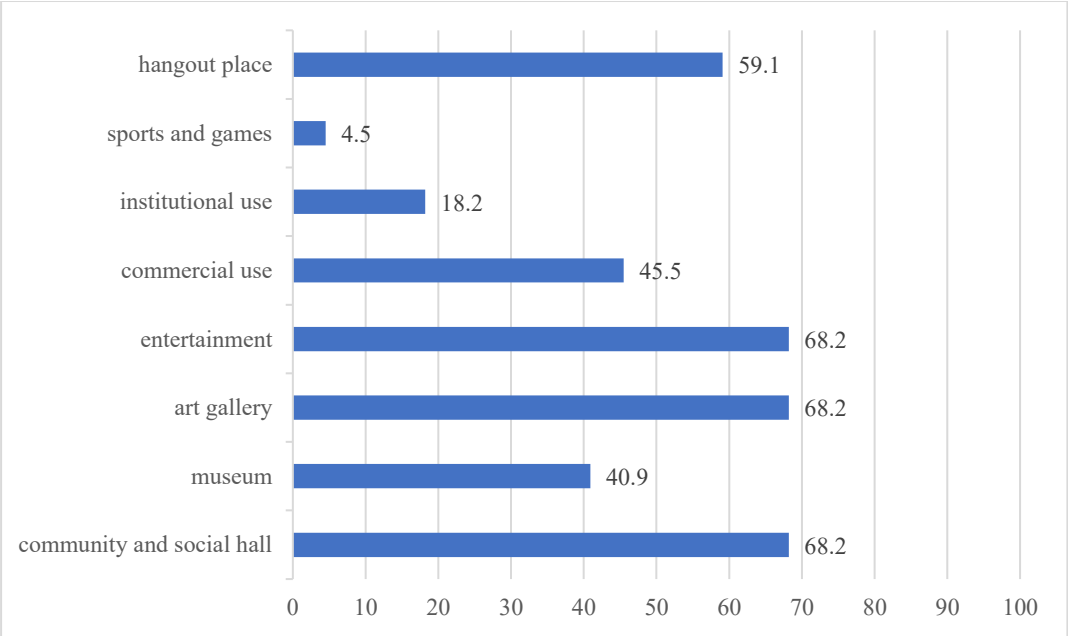


Table 5-12

13. What materials do you suggest that fits best with this environment?

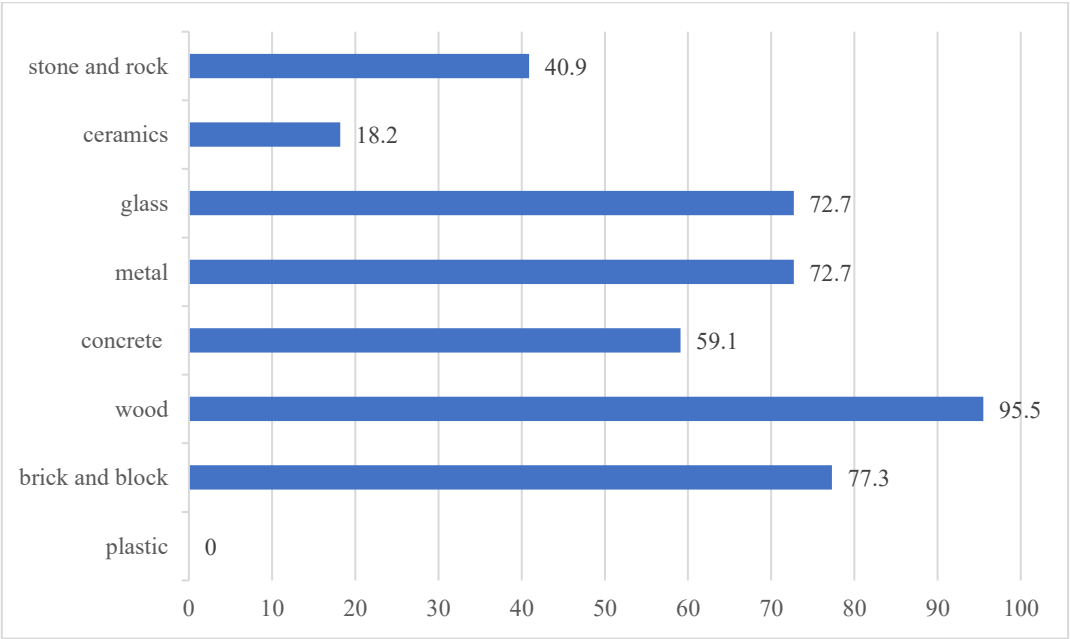


Table 5-13 Suggested materials for the Power Plant

14. What style do you prefer for the interior part of this building?

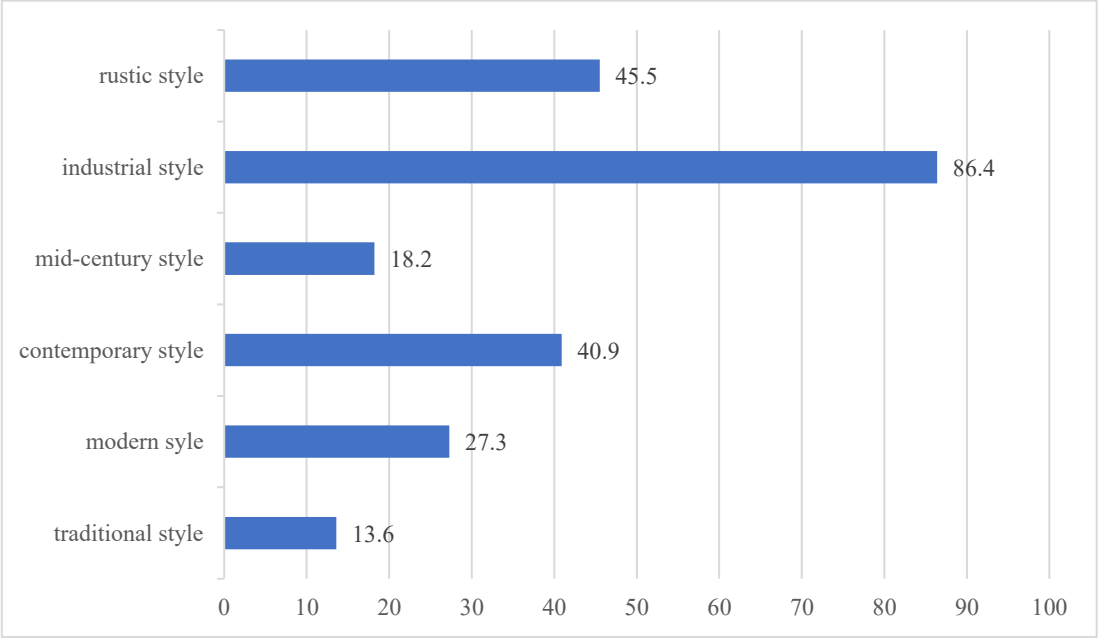


Table 5-14 The interior styles suggested for the Power Plant

15. If possible, please write down any other opinion/suggestion/recommendation you might have regarding the Rossdale Power Plant building below.

Participants aging 18-29:

Need to have access to the river.

Plaza area in between building & river would be great. First nations especially Papaschase Cree should be involved in developing the area and guide decision making

Keep all historical aspects; emphasize this through industrial/rustic design on the interior.

Make it a place for not just Edmontonians but also travellers/visitors."

I love the space and think that it would be an amazing public location for community and culture. But the only issue would be parking or closer public transportation. (Although, the ETS has a close bus-stop.)

Access to natural light should be maximized as much as possible.

Similar usage/goals as the Forks in Winnipeg - with commercial spaces limited to local products similar to the KAM gift shop, Alberta branded, and similar. Limited parking nearby to encourage active transportation. Even if it just means keeping parking lots 3+ minute walk from entrance.

Participants 50 and above:
Maybe something to lie in with the burial ground, John Walter history, and the aboriginal Art Park on the other side of the river. Reintroduce the old ferry to bring people across. I don't know if any of that works. I also love the idea of the Roman baths in the basement, keeping the warm, dim industrial feel.

Keep the historic aspect of the building.

Keeping the scale and openness of the space would be great. It's such a unique building.

The indigenous roots in Rossdale must be considered in any design of the space.

Granville Island Marketing Vancouver"

Participants 50 and above:
I would love to see Edmonton have a place to engage citizens/students in Aboriginal /Metis exhibit + activities + also to connect river activities if possible (voyage/canoe trips from Fort Ed to the Power Plant.)

Preserve the exterior and reopen the windows along the side of the building.

2.1 Design Approach

2.1.1 Background Analysis

The project was started by studying the history of the Rossdale Power Plant. According to the history of this site (Background), the Rossdale Power Plant building is considered as one of Edmonton's exceptional landmarks not only for its glorious history but for its visibility from different spots in the city. Interviews revealed that most residents of Edmonton are enthusiastic and considerate about this building and its future (First Virtual Reality Demonstration). In other words, Edmontonians have a sense of belonging for this magnificent structure and perceive it as their own. As mentioned in Chapter , the Rossdale Power Plant structure depicts a unique

---

> Participant aging 40-49:
> *New construction + design features should be kept to a minimum to avoid detracting from the industrial architecture of the space which creates its unique feel and are important elements of the building's heritage character.*
>
> Participant aging 30-39:
> *Connect it with a gondola!*

Second Questionnaire and Data) for all statistical data and survey questions.

architecture that identifies it as a rare and oldest sample of mid-twenties century industrial design in Alberta. *The plant is one of the oldest surviving examples of mid-twentieth century industrial design in Alberta; no other steel and brick buildings of this size and period remain in Edmonton* (Alberta Culture and Community Spirit, Historic Resources Management Branch. n.d.).

2.1.2 In 2001, the Rossdale power generation site was recognized as Provincial Historical Resource for its rich history and the significant impact it has on the Alberta province and city of Edmonton. In 2008 the power station ceased generating power. The three adjacent buildings later were decommissioned between 2011-2012 and have remained vacant for almost a decade since then. Considering the Power Plant's significant location in the River Valley area, the current state of the site has become uneconomic and requires strategic plans for future use. Furthermore, the Power Plant buildings require additional safety assessments for public use (Statement of Purpose

Classified as Provincial Historic Resource in 2001, the Rossdale Power Plant building plays a significant role in Edmonton's past and future. The bright history laid in the background gives this building a lifelong purpose. The building being decommissioned, and all machinery removed leaves the space abandoned and not serving any real purpose. Regarding the heritage values that the building holds within itself, demands for a new pattern of use for this building arises. The historic values of the old industrial buildings that have been vacated have resulted in developing new functioning spaces around the world. A great example for it is the Tate Modern museum in London that its primary function was a Turbine Hall in the former Bankside Power Station. (Figure 1-5)

Figure 1-5 Tate Modern in London

The building's location on the north bank of the North Saskatchewan River makes it accessible from north to Downtown and from south to Whyte Avenue and this gives it a unique opportunity to be recognized as a public place that connects individuals from different parts of the city. To fulfill this purpose, this research focuses on defining new values and functions that enhance the quality of engagement in this area. The primary use of this space required an industrial structure that is considered insecure for a public hangout space; the securing procedure is costly and expected to be a long-term process. This project employs Virtual Reality (VR) in order to reduce costs and save time in both the design process and the presentation of the proposed ideas.

The primary objectives to be accomplished throughout the project include:

- **Promoting the Rossdale Power Plant to a vibrant public place in the city.** The building has been vacant for almost a decade, which forfeits the significance of this historic structure in serving a valuable purpose. The geographical location of the building makes it a unique destination for a public hangout place. This project aims to highlight reliable outcomes that attract the public to spend time in this building.

- **Community's engagement in the design process.** This research concentrates on involving Edmontonians in the design process by taking a community-led design approach. The co-creation method used in the process highlights the needs the community has towards this space and deploys the information to conceptualize activities in the early design phase . Furthermore, creation of a sense of belonging is achieved by a thorough analysis on the local communities to recreate the authentic culture through interactions individuals have with their surroundings and recognizing their past and future in a designated environment .

- **Employment of Virtual Reality in addressing the community's concerns.** Due to the unsafe structure of the building, the public's visit to the interior space is prohibited. For the individuals to view the space, a virtual reality application is designed to help them understand the interior space to address their concerns and suggestions. Moreover, implementing the possible scenarios in a virtual environment produces reliable information on costing and feasibility of the ideas before their execution in real life .

Statement of the Problem).

2.1.3 Community-led Design Approach

As a main component of this project, community's involvement in problem solving, concept development and feedback phases was of highest priorities. As described in Chapter , connecting people with stakeholders was the main objective in taking this approach; therefore, for a reliable and beneficial outcome, community's engagement became necessary for the repurposing of Rossdale Power Plant site. The target age group assigned for this research was eighteen or above years old. All these individuals were considered end-users and included stakeholders, business owners, communities and clients of the potential businesses arranged for the structure. In January 2018, the first contact with the Rossdale Community League was made; the objective outlined in the meeting was to contact several individuals from different background and profession residing in Edmonton. In response to the Community League's invitation, twenty people expressed their interest in this project. As the project progressed and

the first VR demo was held, this number increased to forty-three individuals, and more people contacted to take part in the project. This approach indicated that people wish to be heard and taken seriously in the matters that concern city planning. Getting involved in the process, individuals tended to encourage their relatives, friends and colleagues to take part in the ideation phase of the Rossdale Power Plant project. The diversity in the participants produced comprehensive information on achieving mutually beneficial plans for this building (First Questionnaire and Data).

In the community-led design approach used in this research, classifying the participants by their age was necessary. According to (Williams, 1979) values that people have in their personal life affect their judgment and choices. These values impact the outcome each person is anticipating and differ by age— in the Rossdale Power Plant project the perspective that the younger participants described differed from the older aged participants. The ideation phase revealed that the younger participants were focused on having an affordable hangout space; while on the other hand, the individuals ageing over 40 were mainly concerned about promoting the rich history of this site (First Questionnaire and Data).

2.1.4 Using Virtual Reality[3]

Using Virtual reality for a collaborative placemaking as a core objective in this project was primarily to:

- **Visually connect the community's concerns with stakeholders.** This approach was a creative method in helping individuals to shape their ideas for the Rossdale Power Plant better. Moreover, understanding interior space was critical in formulating the ideas for a place in Rossdale Power Plant scale. As it is mentioned in the previous sections, the participants as unauthorized persons were prohibited from entering the Power Plant site; as a result, they had very limited knowledge on the room scale inside the Power Plant. Therefore, conceptualizing ideas for this space could become challenging for them. For resolving this matter, it was necessary to produce a Virtual Reality application to help the participants understand the space. The first developed Virtual Reality application included a basic white model of the building with no detail.

[3] Please refer to Virtual Reality Requirements for information on the VR system used in this project

Individuals were invited to take part in the first VR demonstration session; the VR demo helped the participants to have a general understanding of the scale and lighting of the Power Plant interior. (Figure 2-1) During the session, participants explained how different their perception of the interior space was. Knowing the dimension of the enormous open space of the Boiler Hall helped them in forming their ideas. The participants were likely to develop their ideas while they were inside the virtual reality as the immersive environment made it easier for them to visualize their thoughts.

Figure 2-1Preview of the 1st VR demo session. Rossdale Power Plant, the Boiler Hall interior with no detail. Exported from Unreal Engine.

- **Receive feedback from the community on the developed ideas and share it with the stakeholders for accurately planning the potential beneficial plans.** The next steps after ideation included prioritizing the concepts through the conservation standards, feasibility of physical execution, and the highest rate/demand. The second demo depicted the exact model of the Power Plant with the necessary details to match the physical structure. (Figure 2-2) The idea that the participants could explore through the model and observe the concepts they had formed in the first VR demo fascinated them. (Noted below)

  Participants aging 18- 29:

  Overall, a very positive experience. I support this kind of conceptualizing, as well as the visual choices that have been made in the walk through.

  I think there is some smart design work shown in this space and I think using VR to demonstrate it really helps people to "see" what the space could become.

During the session, inside the virtual model, participants enthusiastically discussed and judged the concepts. Visually exploring the ideas in an authentic scale and shape helped them to evaluate the concepts accurately. This evaluation included testing the interior design style, the distribution of the ideas in the space, the used materials, and their overall perception of the redesigned space. Some participants described the concepts overpriced, and some declared that if this place exists, they will surely spend their time there. (Noted below) These received responses can be valuable sources for the probability assessment of each concept in the real world. Following is some of the feedback from the second demo session.

Participant aging 50 or above:

> *People living in Rossdale will come here every day! This is exactly the kind of space we crave!*

Participant aging 18-29:

> *... my biggest concern is that while everything looks beautiful, it also looks very expensive; so, it might not feel welcoming to all type of people. It looks like a place where you need to be able to spend money at to belong or spend time there.*

Figure 2-2 Preview of the Rossdale Power Plant VR model exterior with the necessary details to match the physical structure. Exported from Unreal Engine.

- **Estimate the cost of changes in physical reality.** In the virtual world, six concepts have been placed inside the Boiler Hall. The materials used in these concepts are samples of the available materials in the market; in other words, the textures used in the model are images of those materials in the physical world. (Figure 2-3) Therefore, the redesigned space in the virtual world becomes a reliable cost estimation source for physical alterations. On the other hand, in the cost estimation process, the stakeholders have an option to modify the structures and materials in the virtual environment to reduce costs.

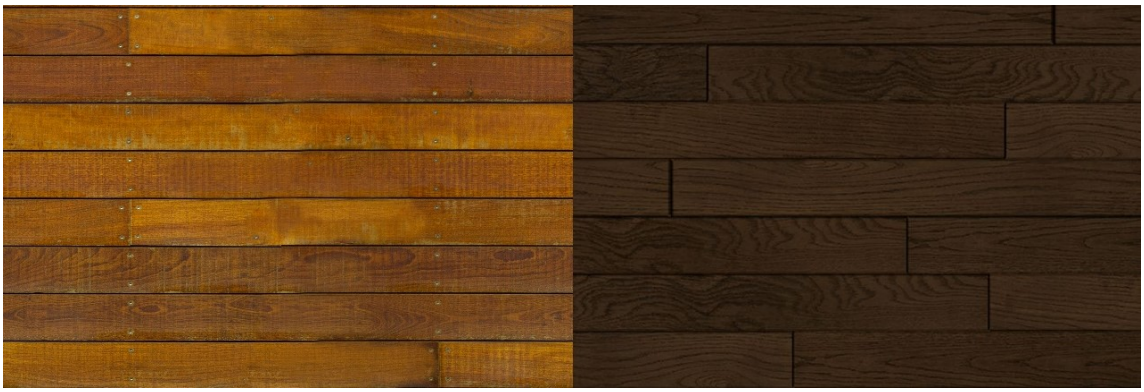


Figure 2-3 The textures that were used in the second VR model for flooring.

Figure 2-4 Preview of the second VR demo model. The Boiler Hall. The image displays the main entrance lounge. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine.

Figure 2-5 Preview of the second VR demo model. The Boiler Hall. The image displays the gallery office on the second level. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine.

Figure 2-6 Preview of the second VR demo model. The Boiler Hall. The image displays the first level of the bar & Restaurant. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine.

Figure 2-7 Preview of the second VR demo model. The Boiler Hall. The image displays coffeeshop on the first level. The details used in the model are close to reality so the participants could accurately imagine the place in the physical reality. Exported from Unreal Engine.

Figure 2-4 to Figure 2-7Figure 2-7 display the interior of the Boiler Hall in the second VR demonstration; as shown in the preview photos, the textures and furniture used in the model match the physical reality; thus, the experience becomes authentic and reliable.

Furthermore, since individuals tend to trust an environment that appears familiar to them; the project has utilized well-known furniture and close-to-reality textures to accomplish this purpose in the process. According to the first survey, overall 85.8% of the participants had European and North American background culture. (Table 2-1) The interior design style used in this project focused on the ethnographic data obtained form the first survey. Based on this information the combination of industrial, rustic and contemporary interior styles was studied to echo the largest culture group in this research. *E.g. the Egg chair* designed by Arne Jacobsen in 1958 was used in the coffeeshop interior, and *Eames DSW chair* designed by Charles & Ray Eames in 1950 was used in both coffeeshop and gallery office space interior to convey the latter half of the 20th century style in Europe. (Figure 2-8)

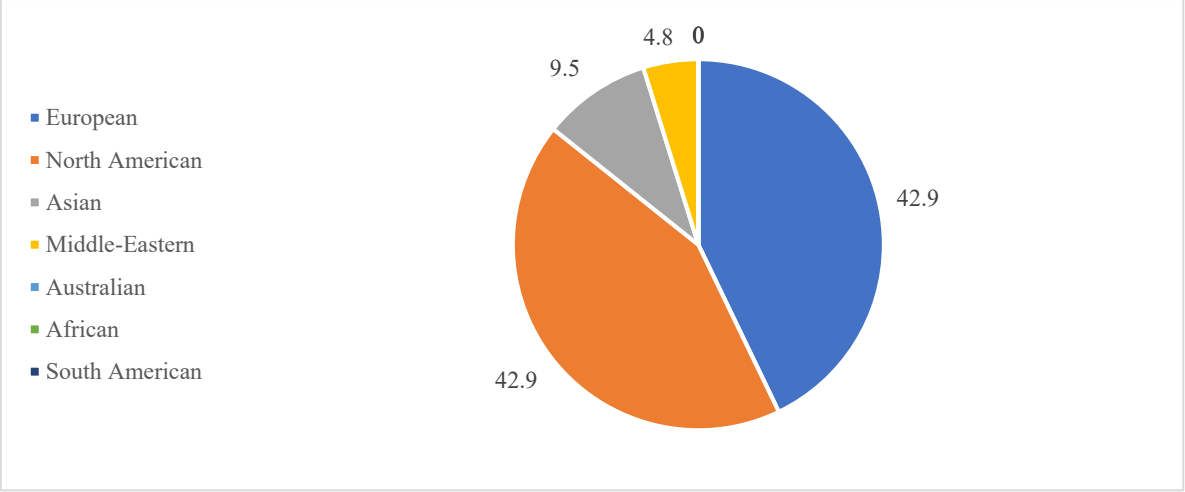


Table 2-1 Ethnographic data

Figure 2-8 The Classic Egg Chair designed by Arne Jacobson (left). The Eames DSW chair designed by Charles and Ray Eames (right). (Turbosquid n.d.)

2.2 Survey Data Analysis

2.2.1 First Virtual Reality Demonstration4

As described in the previous section, the first VR demo included a basic white model of the Power Plant with no detail. The main objective was to portray the actual scale of the Boiler Hall's interior; therefore, the participants could have a better understanding of the interior space for generating ideas. In informal gatherings, individuals were asked to participate in a VR activity to address their wishes for the Rossdale Power Plant in the survey. The largest age

[4] Please refer to (Appendices, First Questionnaire and Data) for all statistical data and survey questions.

group attending the first session were "*18-29*" and "*50 and above*" individuals both with 40.9% rate. The participants were classified by the years they lived in Edmonton; as mentioned in the first Chapter, throughout years of living in a place individuals make stories that affect their perspective and wishes for that place, and their memories grow as values to them. Moreover, the longer a person lives in an environment, the more they feel connected and more experience a sense of belonging in that space; thus, they become more concerned about the future of that environment. In this research, 77.3% of the participants had lived in Edmonton for more than ten years.

Referring to the Great Public Places article discussed in Chapter 1, the participants were asked to mark the most valued qualities of a public place they wished to see in Edmonton. The question outlined fifteen critical characteristics of a public place; the following are the six highest-rated qualities that participants sought in a public place. (Table 2-2)

- 95.5% - Developing a friendly and welcoming environment
- 90.9% - Developing fun activities especially through the Winter season
- 81.8% - Having an attractive and charming appearance
- 81.8% - Improving community engagement
- 77.3% - Keeping the history of the place alive

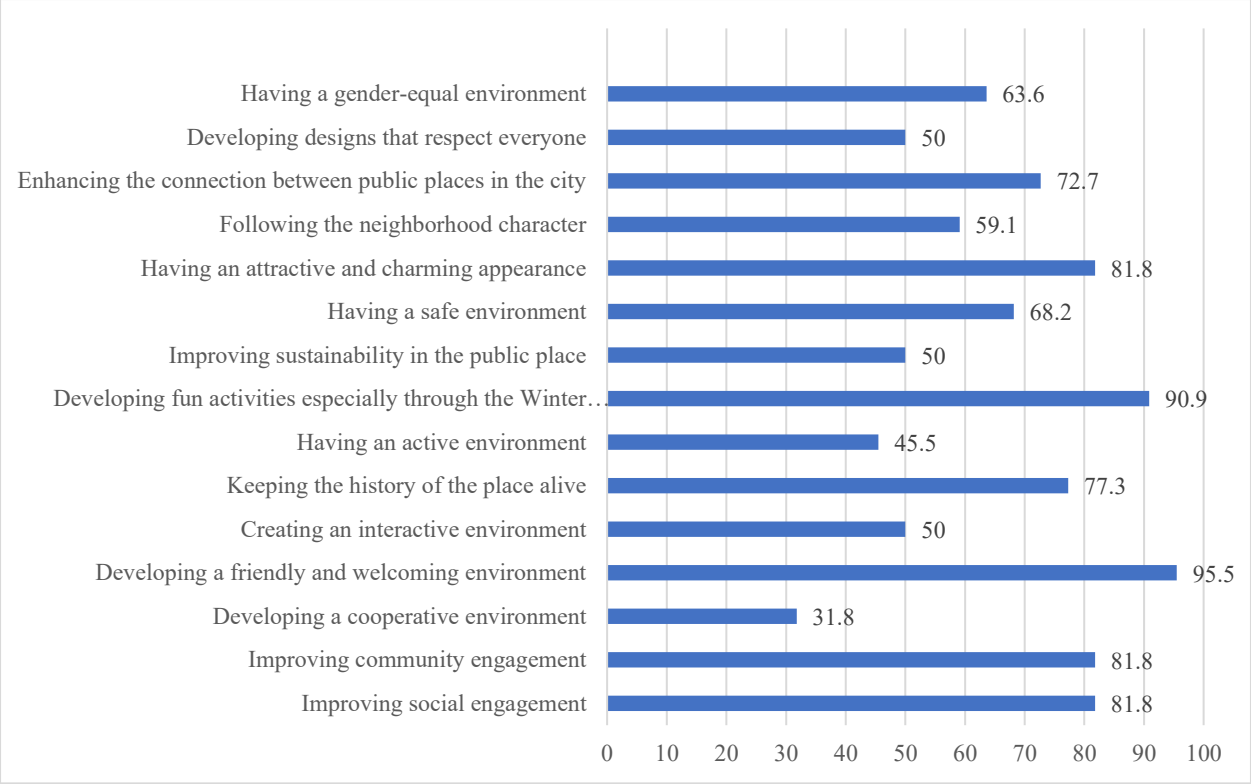


Table 2-2 Values assigned to a public place.

Question 8 asked the participants to mark the activities they anticipate for the Power Plant; *the entertainment* was the first highest rated with 90.9% and the *art gallery*, with 68.2% was the second. The individuals were encouraged to write their ideas at the end of this question; *the marketplace, theatre* and *music festivals* were among the "*other*" section.

Moving forward with the questionnaire, after exploring the Boiler Hall's interior in Virtual Reality, the participants were asked to choose the compatible concepts for this space. The following are the concepts with a high rate.

- 68.2% - community and social hall
- 68.2% - places with entertaining quality
- 68.2% - art gallery
- 68.2% - hangout place

In the "*other*" section, *upscale restaurant and bar, coffee shop, Café* and an *open market* were suggested. The high rated materials for the Power Plant were *wood* with 95.5% and *brick and concrete block* with 77.3%. *Metal* and *glass* were the third-rated materials with 72.7%.

One of the main questions in this survey outlined the most preferred interior design style for the Power Plant. For individuals to understand the styles, six mood boards were presented. The

mood boards included contemporary, industrial, rustic, modern, mid-century and traditional styles. (Figure 2-9 to Figure 2-14)

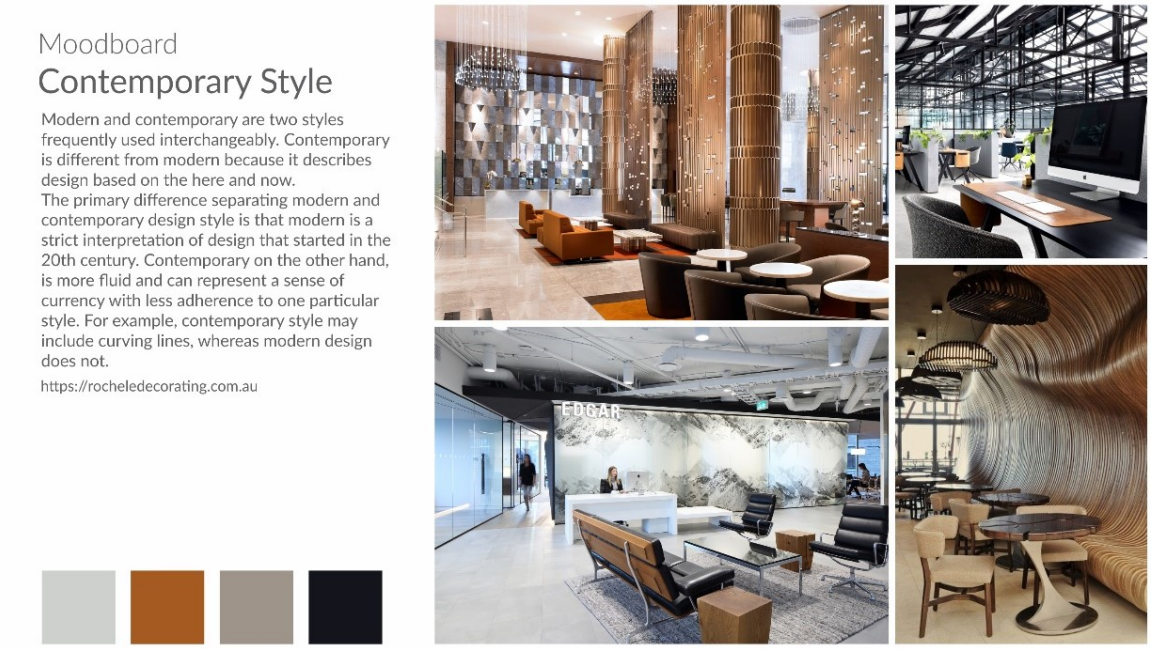


Figure 2-9 Contemporary interior style

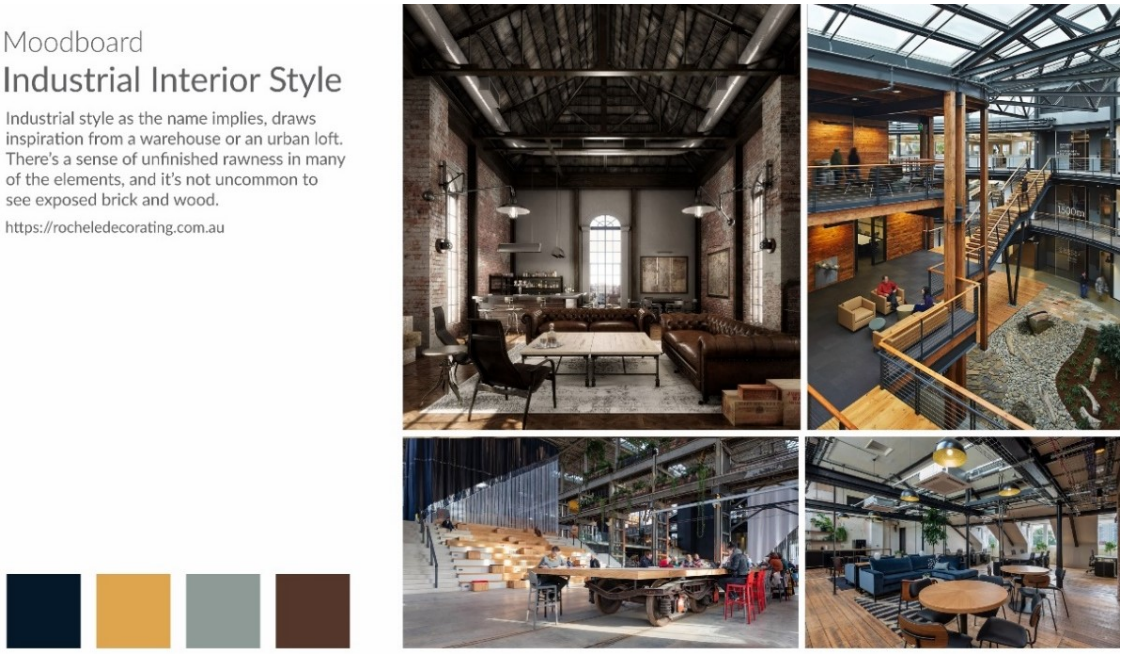


Figure 2-10 Industrial interior style

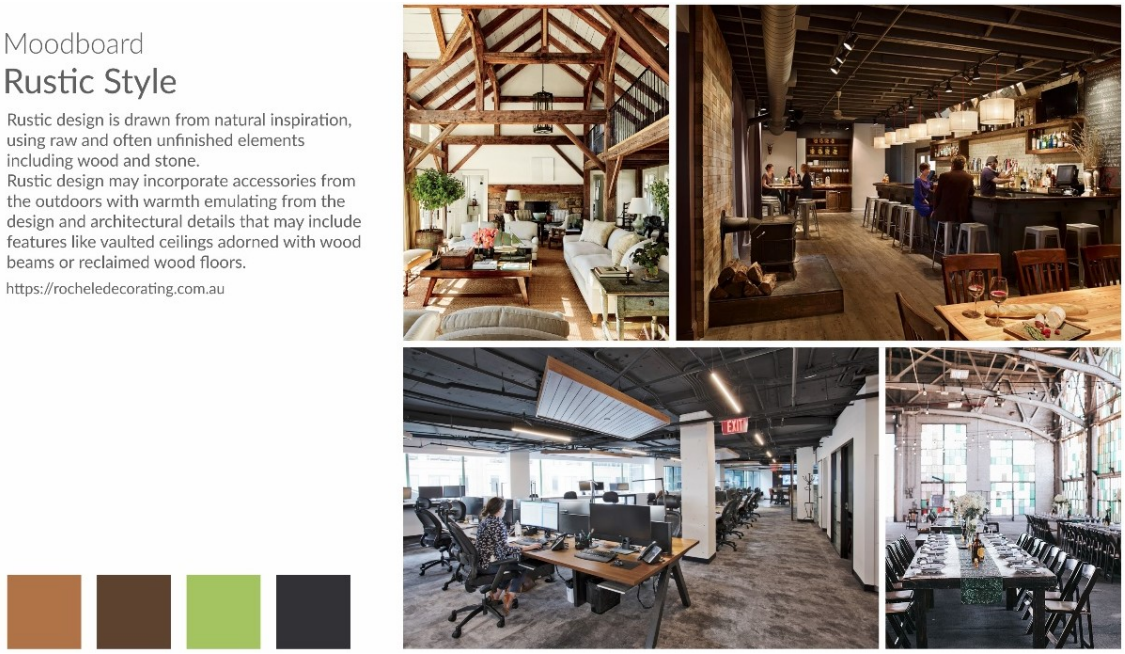


Figure 2-11 Rustic interior style

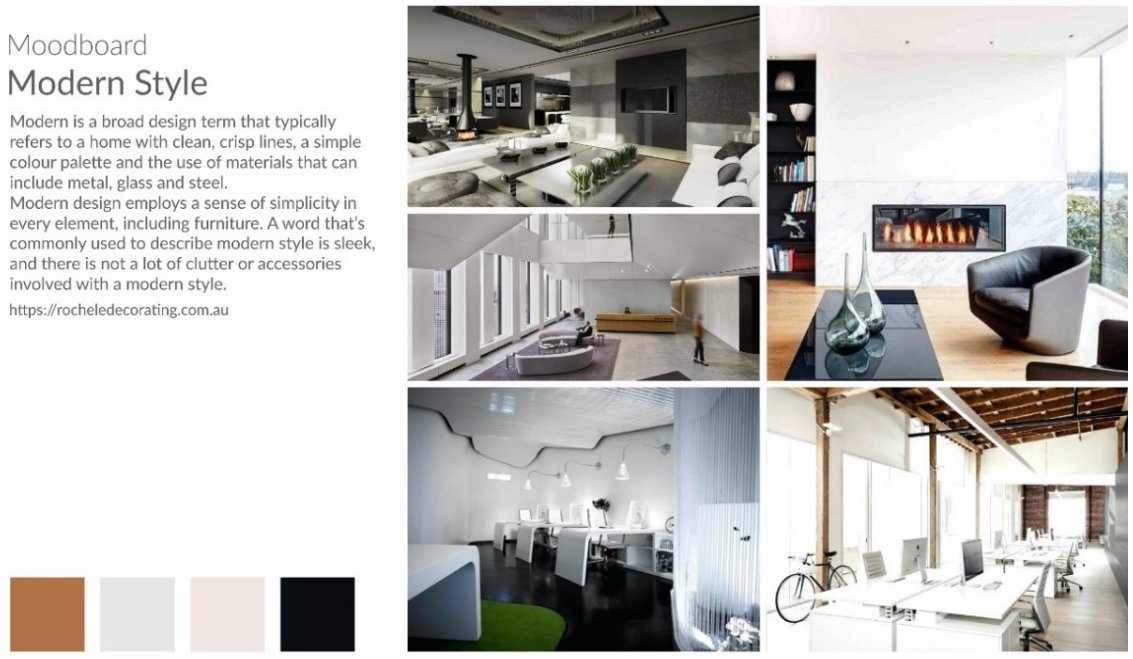


Figure 2-12 Modern interior style

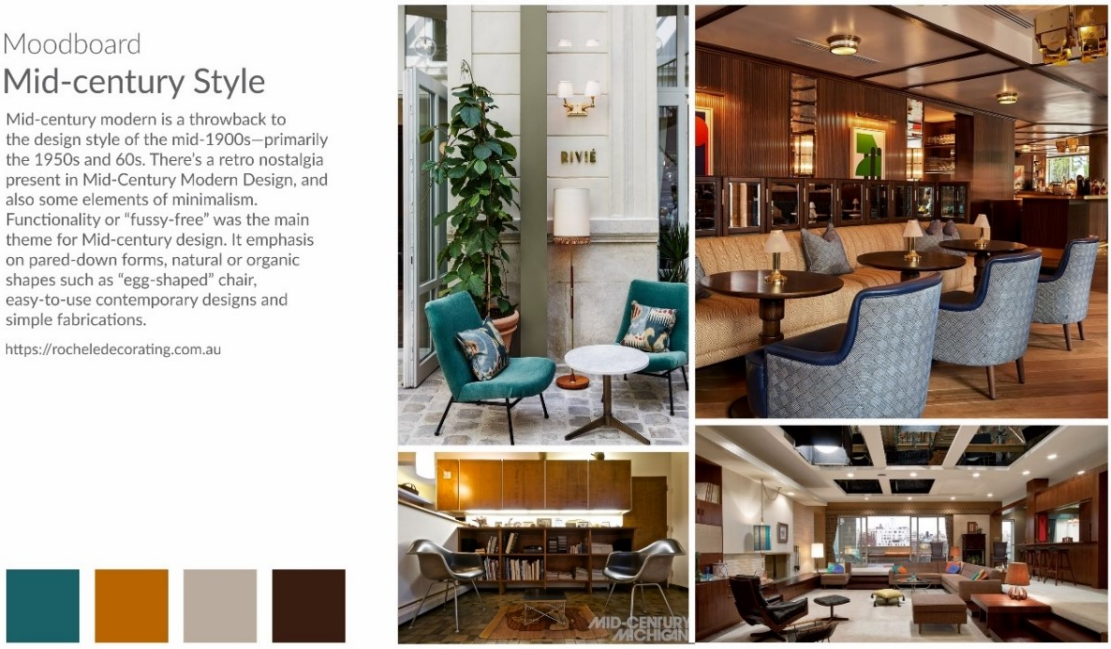


Figure 2-13 Mid-century interior style

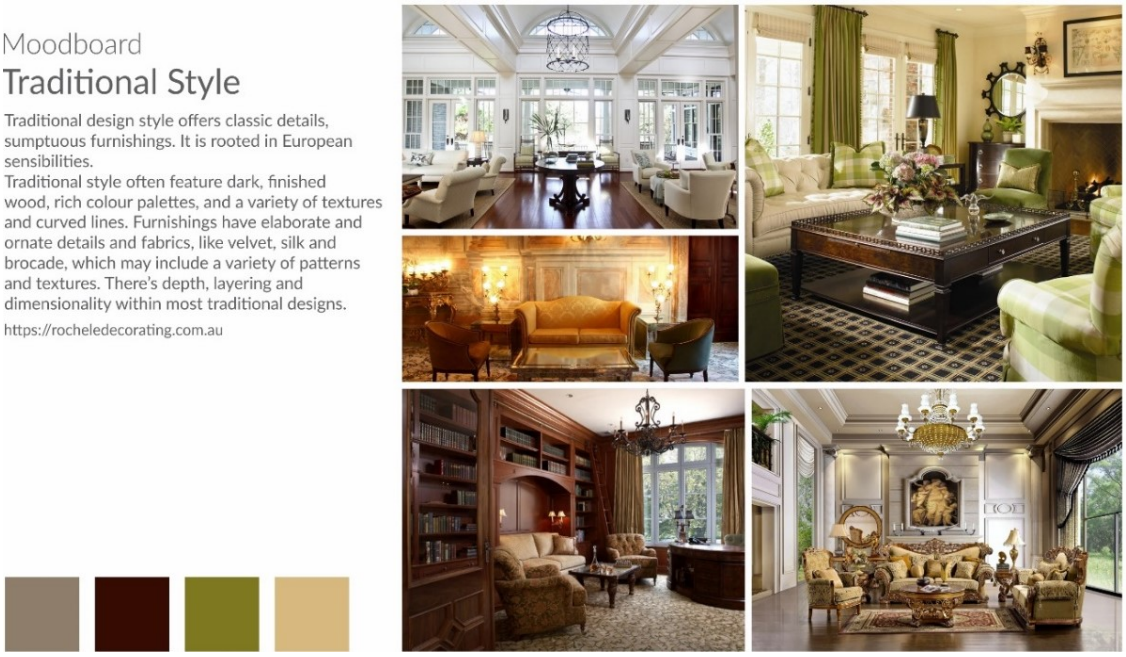


Figure 2-14 Traditional interior style

Out of these six styles, the *Industrial interior style* with 86.4%, the *Rustic style* with 45.5%, and the *contemporary style* with 40.9% were the highest-rated interior styles.

2.2.2 Ideas Analysis and Execution

The highest-rated concepts, as mentioned in the previous section, were a hangout space, the art gallery, community and social hall and the places that have an entertaining quality. A hangout space refers to an environment that has entertaining and socializing qualities and is visited frequently. In this project, the restaurant and a coffee shop apply to the hangout places category. These places are expected to serve many people and have an engaging environment. As mentioned in Chapter , public places to be considered as an active environment follow specific rules. (Great Public Place) Having a friendly atmosphere is one of these essential factors that need to be regarded when designing a hangout space.

As discussed in previous sections, the Rossdale Power Plant forms a great location to attract and connect individuals from different spots in the city. To fulfill this purpose, having a qualified active hangout place was considered essential in this project. Furthermore, as the industrial interior style was the highest rated[5] in the first demo session in addition to the industrial appearance of the building, utilizing this style for an adequate dynamic place in the Power Plant was noted. Figure 2-15 to Figure 2-20 display samples of the industrial style's characteristics that this project followed.

[5] **Please refer to (Appendices,** First Questionnaire and Data) for all statistical data and survey questions.

Figure 2-15 2016. SPACE Copenhagen converts warehouse into restaurant 108 for René Redzepi. November 23. https://www.designboom.com.

Figure 2-16 Club Vista Mare bar. (Club Vista Mare bar 2017)

Figure 2-17 TRUK Furniture, Osaka, Japan (Pinterest n.d.)

Figure 2-18 The space is airy and modern with a sleek industrial edge, its decor mixing rough and refined elements into a harmonious organic whole. (AN' Garden Cafe, A Green Industrial Oasis in Hanoi, Vietnam n.d.)

Figure 2-19 The striking steel-framed structure blurs the lines between indoors and outdoors through a clever interplay of wood, concrete, and glass. (AN' Garden Cafe, A Green Industrial Oasis in Hanoi, Vietnam n.d.)

Figure 2-20 Federal Center South Building 1202. (Rosenfield 2014)

2.2.2.1 The restaurant

The Boiler Hall has an enormous open space that allows a mid-floor structure for a restaurant space. The restaurant is located between mezzanine and the main level and occupies approximately 5812 (ft2) with three levels, including two public dining areas and one private venue for special occasions. For maintaining the openness of space, it was considered to have detached mid floors. The levels of the restaurant are connected by the south elevator and two ramps that revolve around the restaurant structure. The kitchen is located on the venue level and will be connected to the bottom levels by a "*dumbwaiter*"; the kitchen has two separate north and south doors to maintain the privacy of the venue. The venue with 260 persons capacity is divided into two areas by an in-between ramp or the movable partitions (suggested). (Figure 2-21) The divided venues can be joint or rented individually for smaller occasions.

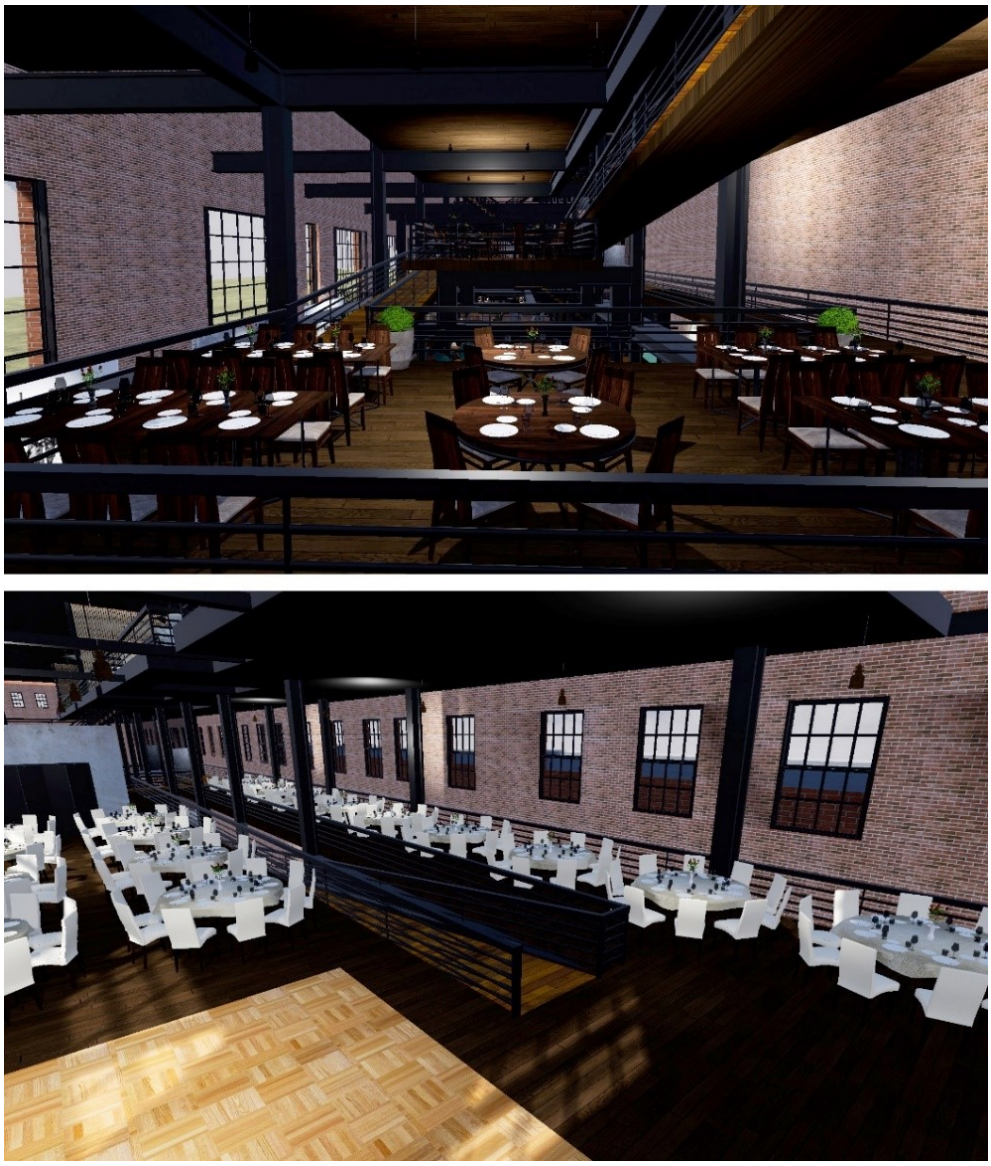


Figure 2-21 Restaurant public dining level (up) - The venue (bottom)

2.2.2.2 The coffeeshop

The coffee shop occupies approximately 619 (m^2)/ 6673 (ft2) and is located on the first floor between the museum and the entrance lounge. Two mid walls separate the coffee shop from its surrounding area. This space is designed to be an informal socializing space. Moreover, people visiting the gallery, or the museum can gather here for a coffee or refreshments. The combination of warm colours, wood and leather was essential for creating a peaceful, comfortable atmosphere. (Figure 2-22)

Figure 2-22 The coffeeshop is an in-between semi-open space designed to create a peaceful and comfortable atmosphere.

2.2.2.3 Surrounding

The main entrance located on the west opens to the east door, connecting the Boiler Hall to the Turbine Hall. Two elevators are located on the north and south of the building; visitors can use the elevators or the north and south staircases to access the uppers levels of the Boiler Hall. The railings with 100 cm/39.37 inches height are designed to maintain the safety of interior space. Two emergency Exits are located on the north and south of the Boiler Hall. The lighter color wood on the floor is designed to navigate the visitors around space in the Boiler Hall. (Figure 2-3)

2.2.2.4 Gallery Space

The gallery space located on the north of the Boiler Hall occupies approximately 619 (m^2)/ 6673 (ft2) and includes two levels; the gallery showroom on the main level and the gallery office/lounge on the second level. The connection between the levels is through the north elevator or the north staircase. The showroom can be rented for presentations and commercial purposes; e.g. *a high-end gift shop*. The gallery office space performs as a private meeting area or as a storage for the items displayed on the first level. The surrounding environment is open and separated from the outer area by mid walls and metal window frames. (Figure 2-23)

Figure 2-23 The gallery office space on the second level.

2.2.2.5 The Museum

The museum is located on the main floor on the south and occupies approximately 899 (m^2)/ 9687 (ft2). The suggestion for this space is an architectural museum showcasing the history of architecture in Alberta with smaller-scale structures. In the VR model, the pictures of suggested models are displayed. The training room is designated for the field trips from the schools and is located on the mezzanine level. For safety purposes, the training room is suggested to be separated from the outer area by metal-framed glass walls.

2.2.2.6 The Community Hall

The community hall located on the mezzanine level occupies approximately 270 (m2)/ 2906 (ft2) with a lounge and a private meeting/conference room on the south. For maintaining the privacy of the conference room, the metal-framed glass walls separate the space from the outer area. Creating a soundproof environment is a must for this space. It includes a private lounge for formal private meetings. The primary purpose of this place is creating a socializing cozy environment that benefits the communities. The office space/conference room can be rented to the stakeholders. (Figure 2-24) Decorations utilized for the community hall have an indigenous spirit to manifest the vibrant history of Alberta. (Figure 2-25) The lounge is separated from the outer space by a metal framed glass wall covered by blinds. For the future phases, it is suggested to focus more on bringing the indigenous culture into the Power Plant by involving the indigenous community in the design process.

Figure 2-24 The conference room/office space of the community hall with a private lounge.

Figure 2-25 The community hall lounge on the mezzanine level - the paintings are created by David York

At the end of the questionnaire, participants were asked to express their overall opinions;

Participants aging 18-29:

Need to have access to the river.

Plaza area in between building & river would be great. First nations especially Papaschase Cree should be involved in developing the area and guide decision making.

Keep all historical aspects; emphasize this through industrial/rustic design on the interior. Make it a place for not just Edmontonians but also travellers/visitors.

I love the space and think that it would be an amazing public location for community and culture. But the only issue would be parking or closer public transportation. (Although, the ETS has a close bus-stop.)

Access to natural light should be maximized as much as possible.

Similar usage/goals as the Forks in Winnipeg (Figure 2-26) *– with commercial spaces limited to local products similar to the KAM gift shop, Alberta branded, and similar. Limited parking nearby to encourage active transportation. Even if it just means keeping parking lots 3+ minute walk from entrance.*

Participants 50 and above:

Maybe something to lie in with the burial ground, John Walter history, and the aboriginal Art Park on the other side of the river. Reintroduce the old ferry to bring people across. I don't know if any of that works. I also love the idea of the Roman baths in the basement, keeping the warm, dim industrial feel.

Keep the historic aspect of the building.

Keeping the scale and openness of the space would be great. It's such a unique building.

The indigenous roots in Rossdale must be considered in any design of the space.

Granville Island Marketing Vancouver (Figure 2-27)

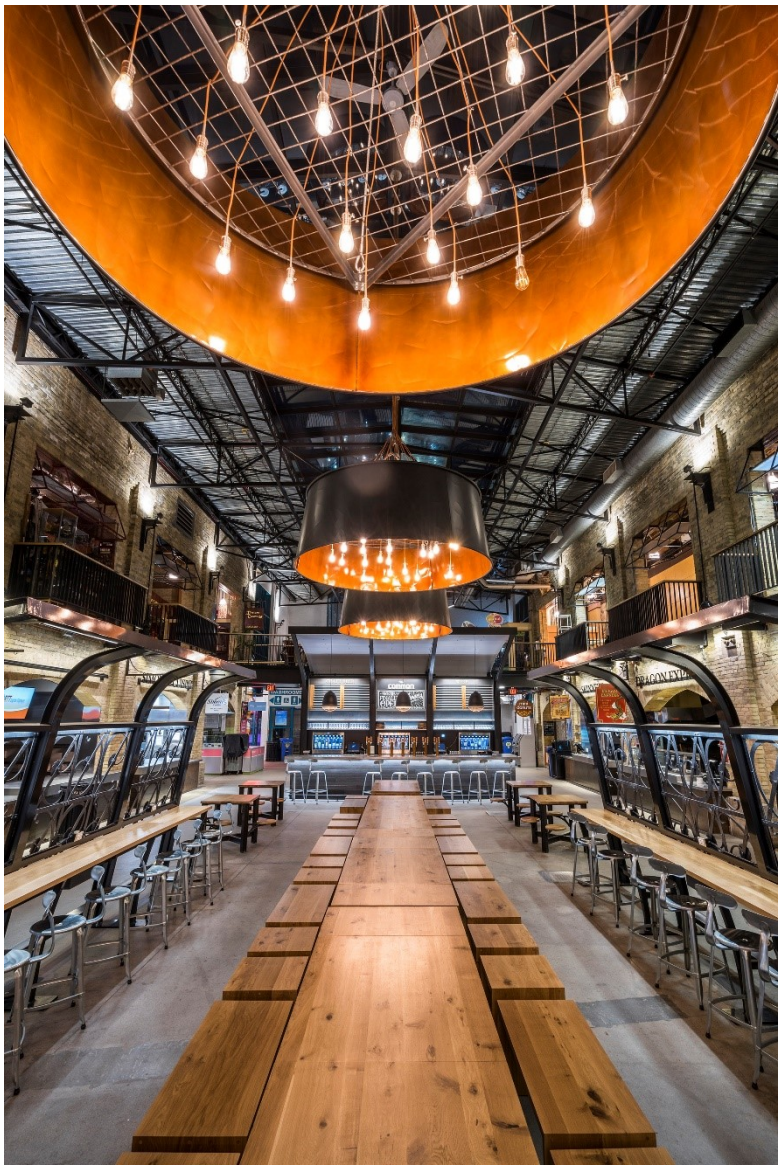


Figure 2-26 The Forks Market Food Hall in Winnipeg. (Refurbishment in Architecture n.d.)

Figure 2-27 Granville Island Marketing Vancouver - (Oates 2011)

Participants 50 and above:

I would love to see Edmonton have a place to engage citizens/students in Aboriginal /Metis exhibit + activities + also to connect river activities if possible (voyage/canoe trips from Fort Ed to the Power Plant.)

Preserve the exterior and reopen the windows along the side of the building.

2.2.3 The matter of reopening the west windows was discussed in the meeting with the Heritage Division; during the construction of the High-pressure Power Plant located on the west side of the current structure, most of the large windows on the west side of the Boiler Hall were covered with brick – the brick shade is different and visible from the inside. (Figure 2-28) After removal of the High-pressure Power Plant, the west wall no longer was supported by the adjacent wall; therefore, the additional beams were required to maintain its strength. (Statement of Purpose

Classified as Provincial Historic Resource in 2001, the Rossdale Power Plant building plays a significant role in Edmonton's past and future. The bright history laid in the background gives

this building a lifelong purpose. The building being decommissioned, and all machinery removed leaves the space abandoned and not serving any real purpose. Regarding the heritage values that the building holds within itself, demands for a new pattern of use for this building arises. The historic values of the old industrial buildings that have been vacated have resulted in developing new functioning spaces around the world. A great example for it is the Tate Modern museum in London that its primary function was a Turbine Hall in the former Bankside Power Station. (Figure 1-5)

Figure 1-5 Tate Modern in London

The building's location on the north bank of the North Saskatchewan River makes it accessible from north to Downtown and from south to Whyte Avenue and this gives it a unique opportunity to be recognized as a public place that connects individuals from different parts of the city. To fulfill this purpose, this research focuses on defining new values and functions that enhance the quality of engagement in this area. The primary use of this space required an industrial structure that is considered insecure for a public hangout space; the securing procedure is costly and expected to be a long-term process. This project employs Virtual

Reality (VR) in order to reduce costs and save time in both the design process and the presentation of the proposed ideas.

The primary objectives to be accomplished throughout the project include:

- **Promoting the Rossdale Power Plant to a vibrant public place in the city.** The building has been vacant for almost a decade, which forfeits the significance of this historic structure in serving a valuable purpose. The geographical location of the building makes it a unique destination for a public hangout place. This project aims to highlight reliable outcomes that attract the public to spend time in this building.
- **Community's engagement in the design process.** This research concentrates on involving Edmontonians in the design process by taking a community-led design approach. The co-creation method used in the process highlights the needs the community has towards this space and deploys the information to conceptualize activities in the early design phase . Furthermore, creation of a sense of belonging is achieved by a thorough analysis on the local communities to recreate the authentic culture through interactions individuals have with their surroundings and recognizing their past and future in a designated environment .
- **Employment of Virtual Reality in addressing the community's concerns.** Due to the unsafe structure of the building, the public's visit to the interior space is prohibited. For the individuals to view the space, a virtual reality application is designed to help them understand the interior space to address their concerns and suggestions. Moreover, implementing the possible scenarios in a virtual environment produces reliable information on costing and feasibility of the ideas before their execution in real life .

Statement of the Problem) On the other hand, removing the bricks from the windows might have affected the wall's balance; thus, they remained intact. Removing the bricks from the windows requires a full structural assessment to ensure the stability of the west wall. In the VR model, the bricks were removed to visualize the outcome of the physical alteration. With open windows, more natural light reaches the interior.

Figure 2-28 Boiler Hall east side windows were covered with brick during the construction of the High-pressure Power Plant on the east. Rossdale Power Plant tour. April 2019

Participant aging 40-49:

New construction + design features should be kept to a minimum to avoid detracting from the industrial architecture of the space which creates its unique feel and are important elements of the building's heritage character.

Participant aging 30-39:

Connect it with a gondola!

2.2.4 Gondola project in Edmonton

In 2018, the Gondola Over the North Saskatchewan River submitted by Gary and Amber Poliquin was announced as the winner of The Edmonton Project contest. This project aims to connect Whyte Ave, West Rossdale, and Downtown directly. The Gondola is planned to have three stations locating at the Shaw Conference Center on Jasper Avenue, nearby the RE/MAX baseball field on West Rossdale and near the Old Strathcona Farmers' Market on Gateway Boulevard.

2.3 Second Virtual Reality Demonstration[6]

On July 22nd and 23rd, thirty individuals participated in the second VR demonstration that included a detailed model of the Power Plant with an original scale. The purpose of this session was to receive feedback on the concepts presented in the VR model from the participants. Furthermore, visually displaying the ideas with the actual scale to obtain accurate information. The session took 40 to 35 minutes for every participants; they were asked to explore and teleport[7] around the place. The questions covered topics on the distribution of ideas, the access to interior sections, the concepts they wanted to keep in the physical alteration, and mostly their perception of the space. The largest age group was "*50 and above*" years old with 40.9%. The overall perception of the designed interior space was "*vibrant and alive*" with 90%, "*full of adventures*" with 63.3%, "*cozy and warm*" with 60%, and "*large and confusing*" with 10%. (**Error! Reference source not found.**

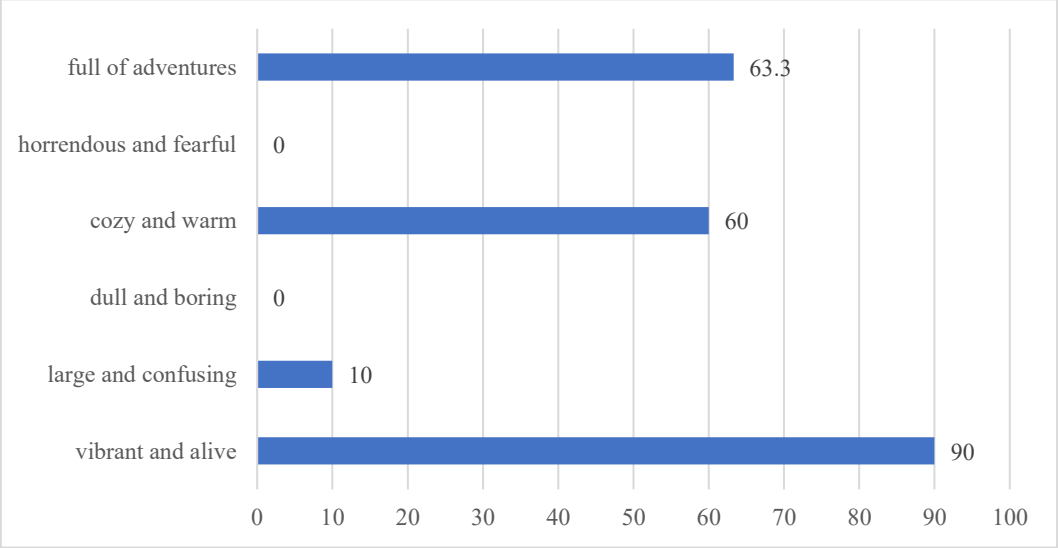


Table 2-3The overall perception of the designed interior space

The likelihood of visiting the redesigned Power Plant was 63%. (Table 2-3) This data presents a valuable source on the cost and feasibility of the concepts for future modification in this space. The most rated concepts were "*Restaurant and Bar*" with 96.7%. Table 2-5 displays the concepts the participants wish to keep/have in the redesigned Power Plant.

[6] Please refer to (Appendices, Second Questionnaire and Data) for all statistical data and survey questions.
[7] *Teleportation is a type of locomotion that allows the player to move around a VR environment with minimal discomfort. With teleportation, the player points the controller at a location they'd like to move to, then initiates the teleportation action, they are transitioned to that location via a rapid animation tuned to maintain player comfort* (Teleportation demo 2019).

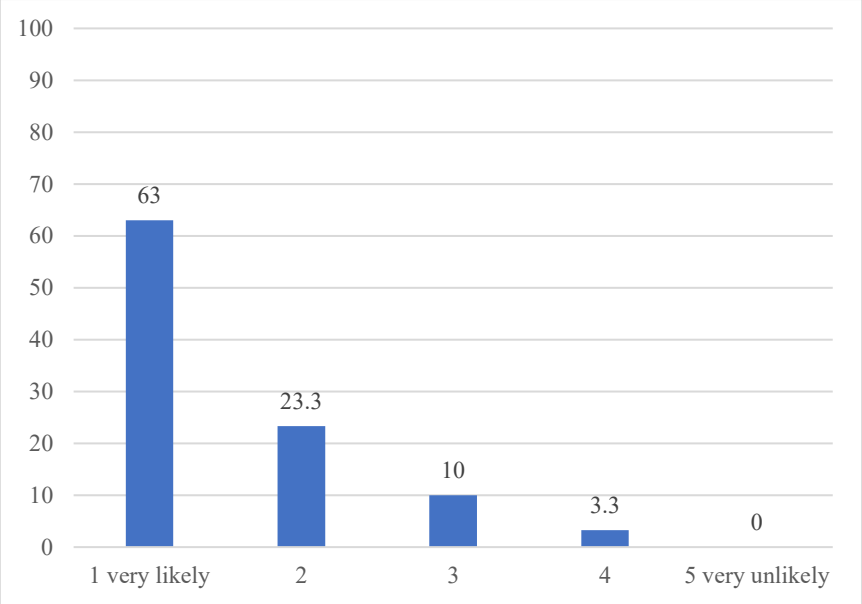


Table 2-4 The likelihood of visiting the redesigned Power Plant.

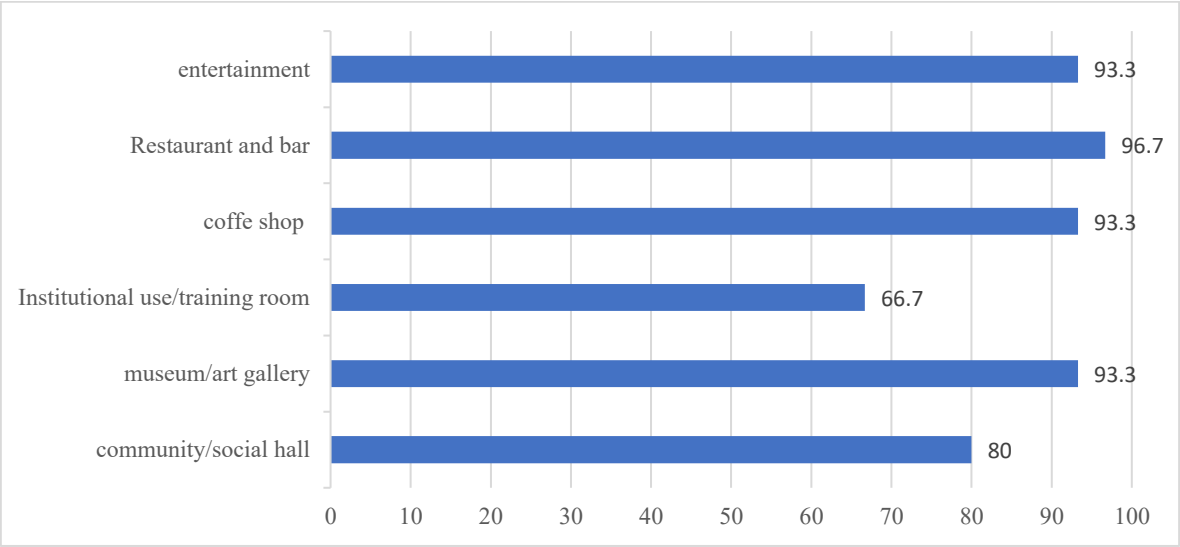


Table 2-5 The concepts participants wish to keep/have in the redesigned Power Plant

The following are the suggested alternatives for the concepts by the participants;

Participants aging 30-39:

Having a gift shop instead of the gallery space as a commercial use.

I'd prefer a kids playing area.

Brewery

Participant aging 40-49:

I'd like to see more retail and food/drink options.

The highest rate for the used materials was 93.1%, and for the industrial interior style was 96.6%. In general, 86.2% of participants were satisfied with their Virtual Reality experience; moreover, 100% of participants perceived the presented space "*comfortable, free and calm*." At the end of the questionnaire, participants were asked to express their overall opinions;

Participants aging 18-29:

The design is sophisticated, upper-class and luxurious. My biggest concern is that while everything looks beautiful, it also looks very expensive/posh so it might not feel welcoming to all types of people. It feels like a place where you need to be able to spend money to belong or spend time there.

Overall, a very positive experience. I support this kind of conceptualizing, as well as the visual choices that have been made in the walk through.

The design is very impressive and would be a key establishment in Edmonton! Well done!

I think there is some smart design work shown in this space and I think using VR to demonstrate it really helps people to "see" what the space could become.

Having a bus stop close to the Power Plant and parking lot can be helpful for commuting to the Power Plant.

Very well done! If possible, try different variations of bricks everywhere - shades/sizes/types of bonds. Try to play with more colors if you are intending to create an entertainment space.

I really liked the idea of using VR as it seems to be a powerful yet comfortable tool for industrial design.

More institution/student /etc. would be neat. A stage/venue for live music would be amazing.

Participants aging 30-39:

very fascinating designs/ideas

Size of the spaces are large, may be good to shrink and have more vendors/commercial uses.

Well done on the wheelchair ramps, all-gender washrooms, and elevators. (Yay inclusively!)

"Retail stores? Potentially take inspiration from Chicago buildings that have been converted from industrial. Potentially consult restaurant owners about set-up/configuration of the restaurant/seating.

The wood design was warm and nice.

Participants aging 40-49:

Would definitely like to see interesting shops, small restaurants/bars and fewer meeting spaces or rental spaces. More variety.

It is good to have large open areas as well as smaller, more intimate rooms + large areas.
Maybe a closed in area as an option if people don't want all open.
Without natural light might be very dark.
The openness makes it easy to orient.
Need to be aware of noise and privacy for renting spaces
Access to outside space would be nice, patio for coffee shop for example."

Participants 50 and above:

Bang ON! Very Good!
People living in Rossdale will come here everyday! This is exactly the kind of space we crave!
There should be a patio and outdoor version restaurant that allows dogs in as many families in Rossdale own dogs.

This is a beautiful, well-conceived version of the Rossdale Power Plant with effective and creative ideas for use.

The exposed brick and steel beams are great. The light from the windows makes the building - gives it atmosphere.

Get it done! It will be amazing.

Good luck! Love the design, worried about the cost and reality.

National center for indigenous art and culture

3 Chapter Three

3.1 Purposed Ideas for the Future Phases

3.1.1 The Basement

Moreover, the Rossdale Power Plant has an enormous basement with approximately 5 meters deep. The basement of the Boiler Hall and the Turbine Hall are interconnected. The basement has an uneven multi-level concrete floor with concrete non-insulated walls. (Figure 3-1) Regarding the building's location on the flood zone, the development of the basement requires strict safety and risk assessments.

Figure 3-1 Low-pressure Boiler Hall - Basement - Rossdale Power Plant tour April 2019

3.1.1.1 Escape Room and Maze

According to the obtained data, 93.3% of the participants wish to have entertainments in the Power Plant. (Table 2-5) The immense, obscure atmosphere of the basement can be suitable for Escape Room ideas to add an entertaining quality to the Rossdale Power Plant public place. (Figure 3-2) The maze also appears as a good entertainment idea for such an environment considering the uneven floors, various space dimensions and concrete structure of the basement. (Figure 3-3)

Figure 3-2 Mad Scientist Lab – (A/MAZE Guatemala Escape Room 4 n.d.)

Figure 3-3 Mirror maze - (Encounters Ocen City New Jersey n.d.)

Another recommendation for the Power Plant's basement can be an industrial concrete structured museum. Figure 3-4 demonstrates an excellent example of a concrete industrial style museum located in Ruhr, an urban area in North Rhine-Westphalia, Germany.

Figure 3-4 Ruhr Museum, Germany. (Permanent Exhibition n.d.)

3.1.2 The Switch House

The Switch House is located on the east and has a small-scale structure compared to the Boiler Hall and Turbine Hall. (Figure 3-5 The Switch House This structure served as an administrator and commanding building during the functioning period. The building contains large and small office spaces and connects to the Turbine Hall with an internal door – considering the described structure, and its primary function, the Switch House is recommended to be utilized as an administration office for the two public halls of the Power Plant. (Background)

Figure 3-5 The Switch House (photobucket n.d.)

3.1.3 The Turbine Hall

The Turbine Hall is the central building of the low-pressure Power Plant. The interior of this hall includes two levels, the main level with two internal doors to the Boiler Hall, and the basement. As mentioned earlier, the basement is interconnected between the halls. The main level with large open-to-down areas requires structural and safety assessment for any repurposing plans.

Figure 3-6 The Turbine Hall. (photobucket n.d.)

According to the surveys, having a local business in the Power Plant was among the number of participants' suggestion for the Power Plant; furthermore, hangout space was among the high-rated repurposing ideas in the first survey. (First Virtual Reality Demonstration) Therefore, it is recommended to use this space for local businesses/markets and small cafés.

4 Conclusion

In conclusion, this research focused on the refunctioning of the Rossdale Power Plant and giving it new values that encourage Edmontonians to spend their time in the repurposed Power Plant. The Rossdale Power Plant was decommissioned between 2011 and 2012 and has been vacant since then. The location of the Rossdale power generation site with a connection to downtown and Whyte Ave area make the site an excellent destination for public use. Furthermore, the significant rich history of the Power Plant and its unique architecture presents it as an iconic landmark in the city skyline.

This project mainly focused on accomplishing three core objectives; including promoting the Rossdale Power Plant to a vibrant public place in the city, involving the community in the design process, and introducing Virtual Reality as an innovative design method in connecting the community with the stakeholders in a large-scale design project. As mentioned earlier, the Power Plant remaining idle jeopardizes the economic potential of this site; for resolving this matter, this project has explored alternative concepts to give new values to this site and make it a vibrant location in the city. Moreover, including the community in this research was essential as they are the prospective users of this site; that said, Edmontonians including the stakeholders and future clients/customers of the repurposed services were included in this research. Utilizing Virtual Reality in this process happened in two separate stages, one to assist the individuals in understanding the Power Plant building's characteristics to develop reliable ideas, and second, for exploring the concepts and giving feedback. This process formed an innovative method in connecting people with the stakeholder and addressing their demands in the Rossdale Power Plant's future.

The research methodology included taking the community-led design approach, conducting in-person surveys, utilizing VR as a creative design method for developing possible concepts and receiving feedback on the feasibility of those concepts. The obtained data declared that high percentages of the participants preferred having a hangout place with entertaining quality in the Power Plant. Therefore, for the future phases, it is suggested to take steps further in involving a large number of individuals in this project to achieve an authentic result that improves the quality of engagement in the Rossdale power generation site. The next phases of this project will include developing new refunctioning alternatives through Virtual Reality and exploring possible solutions for the parking issue around the Rossdale Power Plant.

References

n.d. *A/MAZE Guatemala Escape Room 4.* https://amazeguatemala.com.

2017. *A/MAZE: ESCAPING THE ROOM.* September 22. https://www.victoriapark.org/blog/amaze-escaping-room.

n.d. *Alberta Culture and Community Spirit, Historic Resources Management Branch.* . www.edmontonmapsheritage.ca.

n.d. *Alberta Register of Historic Places* . www.hermis.alberta.ca/ARHP.

n.d. *AN' Garden Cafe, A Green Industrial Oasis in Hanoi, Vietnam.* https://veesko.com.

B.-N. Sanders, Elizabeth , and Pieter Jan Stappers. 2008. "Co-creation and the new landscapes of design." *Taylor & Francis* 5-18.

Brooks, F.P. 1986. "Walkthrough: A Dynamic Graphics System for Simulating Virtual Buildings." *1986 Workshop on Interactive 3D Graphics.* New York. 9-21.

Cilliers, E.J. 2015. "The Story Behind the Place: Creating Urban Spaces." *Applied Research Quality Life* . 589-598.

n.d. "Citizens' Institute on Rural Design." www.ruraldesign.org.

2017. *Club Vista Mare bar.* October 30. https://www.timeoutdubai.com.

n.d. *Encounters Ocen City New Jersey* . https://encountersmirrormaze.com/#mirror.

Foth, Marcus. 2017. "Participation, Co-Creation, and Public Space." *The Journal of Public Space* 21-36.

Galvagno, Marco, and Daniele Dalli. 2014. "Theory of value co-creation: a systematic literature review." *Emerald* 643-683.

n.d. *HISTORY OF TATE MODERN.* https://www.tate.org.uk/about-us/history-tate/history-tate-modern.

Machover, C., and S. Tice. 1994. "Virtual Reality." *IEEE Computer Graphics & Applications.* 15-16.

Machover, Carl, and Steve E. Tice. 1994. "Virtual Reality." *IEEE Computer Graphics & Applications* 15-16.

Oates, Greg. 2011. *Fab Foodie Tours in Granville Island, Vancouver.* September 9. https://www.prevuemeetings.com/experiences/food-drink/fab-foodie-tours-in-granville-island-vancouver/.

Panke, Stefanie, and Thilo Harth. 2018. "Design Thinking for Inclusive Community Design: (How) Does it Work?" *EdMedia: World Conference on Educational Media and Technology.* Amsterdam.

n.d. *Permanent Exhibition.* https://www.ruhrmuseum.de/en/permanent-exhibition/.

n.d. "photobucket." www.photobucket.com.

n.d. *Pinterest.* www.pinterest.ca.

PPS. 2012. "Project for Public Places." *Place-making and the future of cities* 35.

n.d. *Project for Public Places.* www.pps.org.

Racz, Anett. 2018. "VR Aided Architecture and Interior Design."

n.d. *Refurbishment in Architecture.* https://www.archdaily.com.

n.d. *Revitalization.* www.rossdaleregeneration.ca/our-vision/revitalization/.

Rosenfield, Karissa. 2014. *2014 U.S. Wood Design Award Winners.* March 29. https://www.archdaily.com.

2011. *Rossdale Generating Station, Repurposing.* Preliminary Building Assessment , Edmonton : Buildings Design and Construction Branch City of Edmonton.

n.d. *Rossdale Regeneration* . www.rossdaleregeneration.ca/rossdale-history.

2016. *SPACE copenhagen converts warehouse into restaurant 108 for rené redzepi.* November 23. https://www.designboom.com.

2010. "Standards and Guidlines for Historic Places in Canada." (A Federal, Provincial, and Territorial Collaboration) 21.

2019. *Teleportation demo.* www.developers.google.com/vr/elements/teleportation.

Timmermans, W., F. Van den Goorbergh, J. Slijkhuis, and E. J. Cilliers. 2013. "The Story behind the Place - Place-making and Storytelling." *Planning by Surprise.* Delf: Van Hall Larenstein Wageningen University of Applied Science.

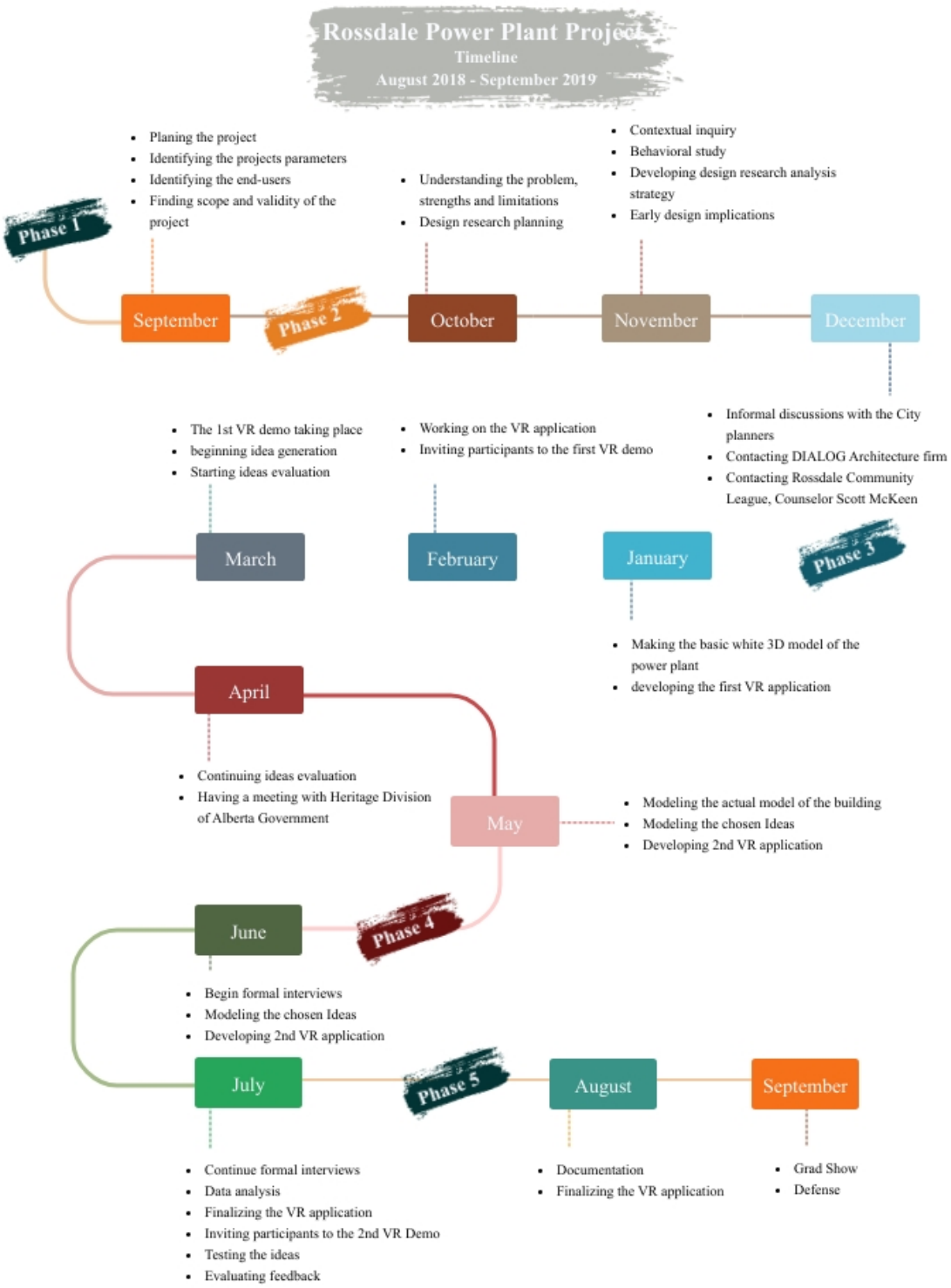
n.d. *Turbosquid.* www.turbosquid.com.

n.d. *VR ESCAPE ROOMS.* www.lasercity.ca/edmonton/vr-escape-rooms.

Whyte, Jennifer. 2003. "Industrial Applications of Virtual Reality in Architecture and Construction." *ITcon* .

5 Appendices

5.1 Rossdale Power Plant Project Timeline



5.2 First Questionnaire and Data

This questionnaire is ANONYMOUS. The intended uses of this research are for thesis research and writing only as part of the principal investigator's graduate study. Participants will not be personally identified in any of these. All data will be kept confidential, with the Primary Investigator being the only person with access to the data.

1. How old are you?

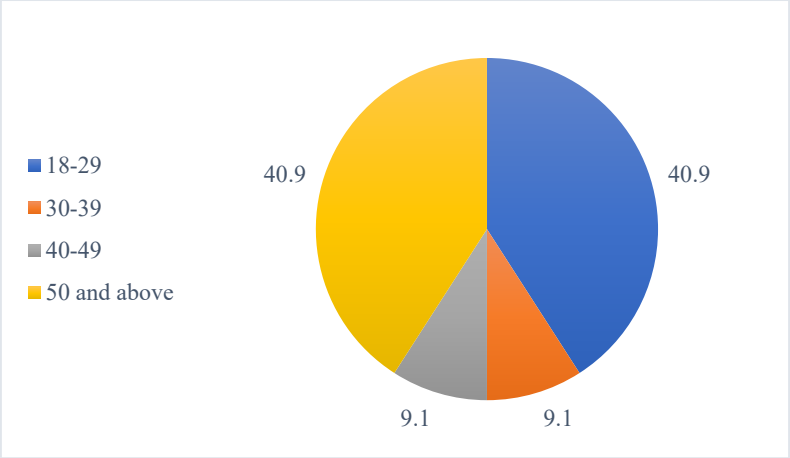


Table 5-1Age distribution – first survey

2. How long have you been living in Edmonton?

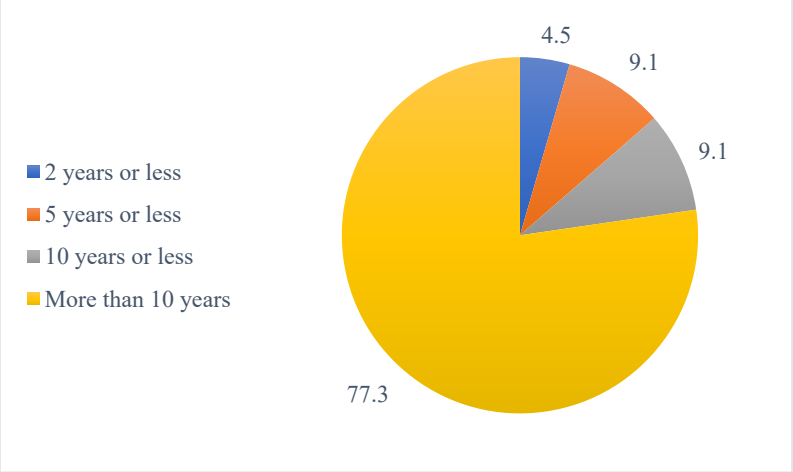


Table 5-2 Duration of the time participants lived in Edmonton – first survey

3. Which group your background falls into?

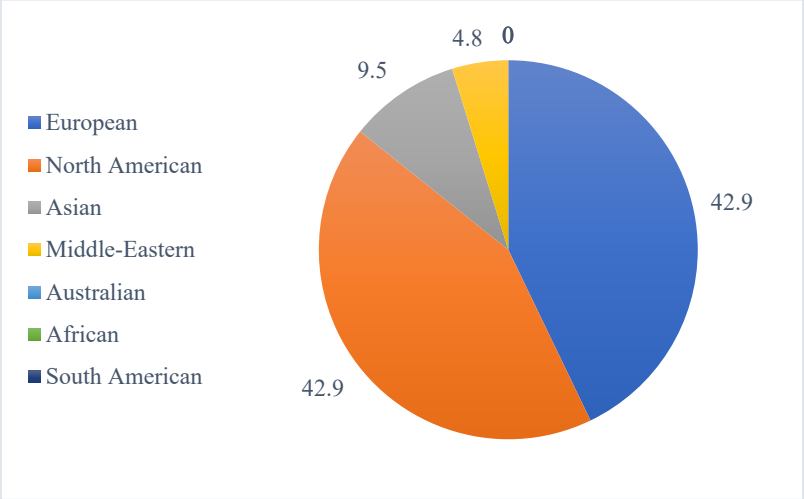


Table 5-3 Ethnographic Data

4. Which ones of the followings do you mark as a value that you wish to keep/add to a public place in the city of Edmonton?

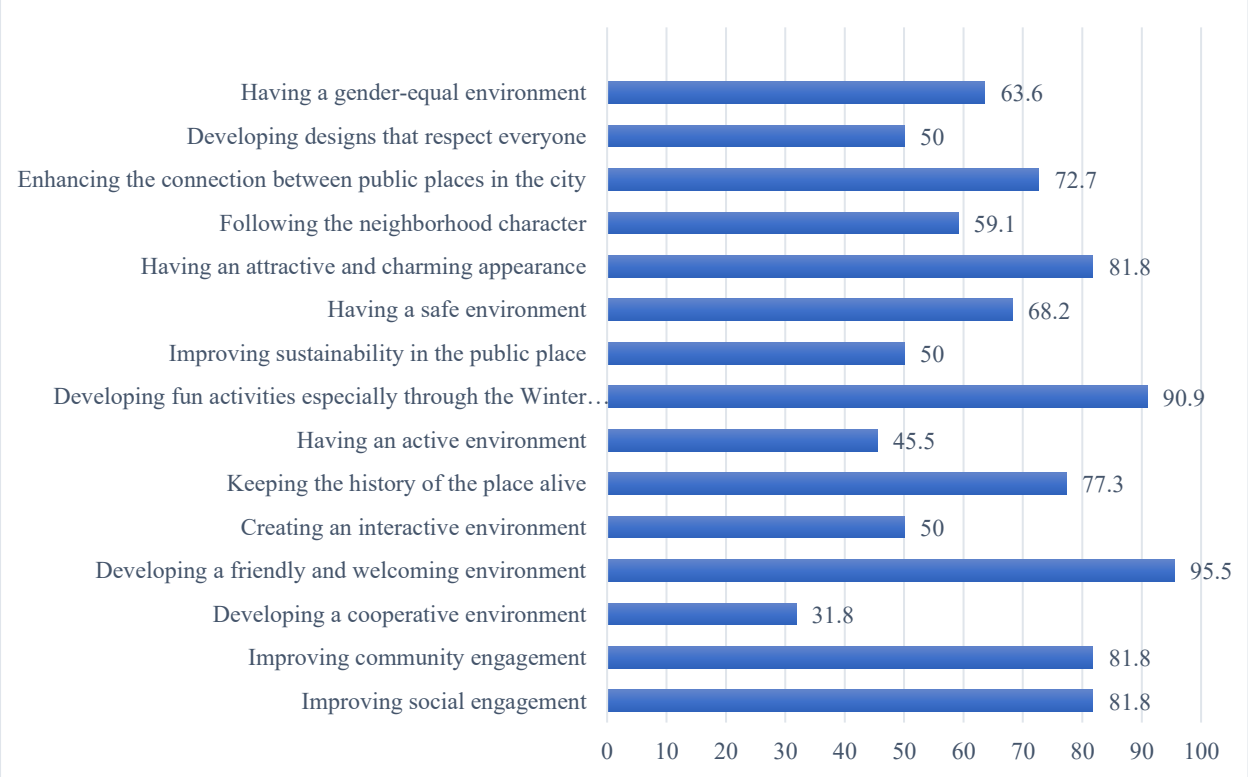


Table 5-4 Values assigned to a public place

5. If you are employed, what occupational group your career fits in? This question includes retired individuals, too.

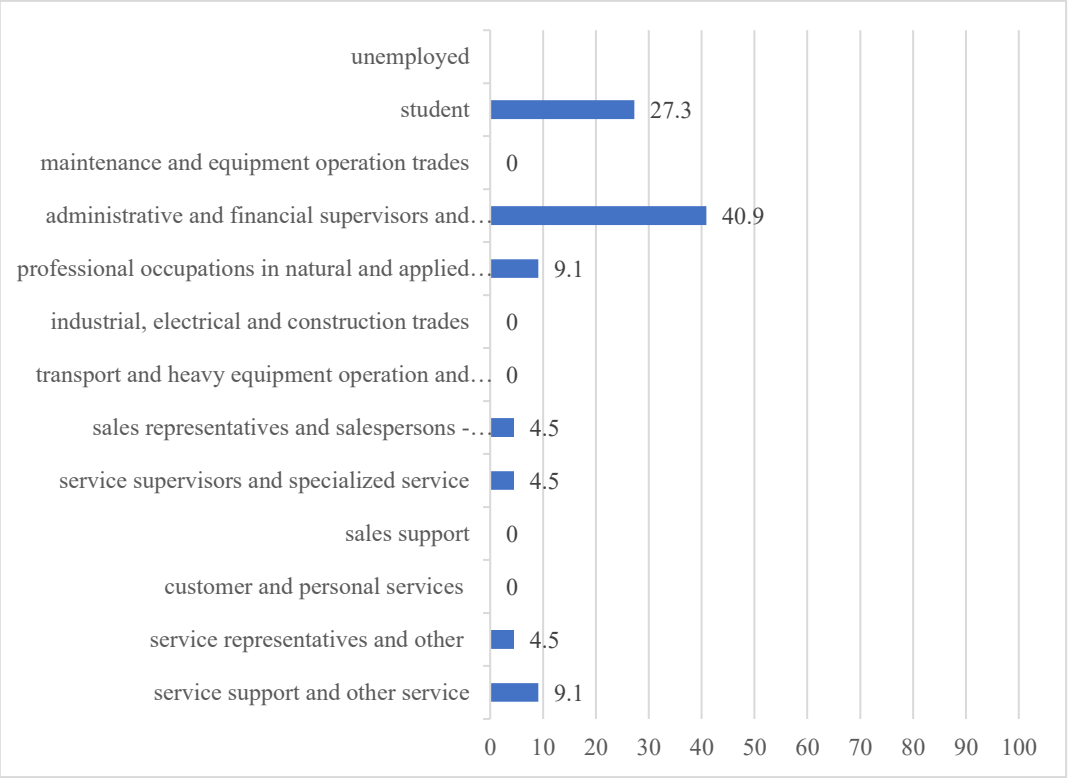


Table 5-5 The occupational groups

6. How do you feel about the Rossdale Power Plant building?

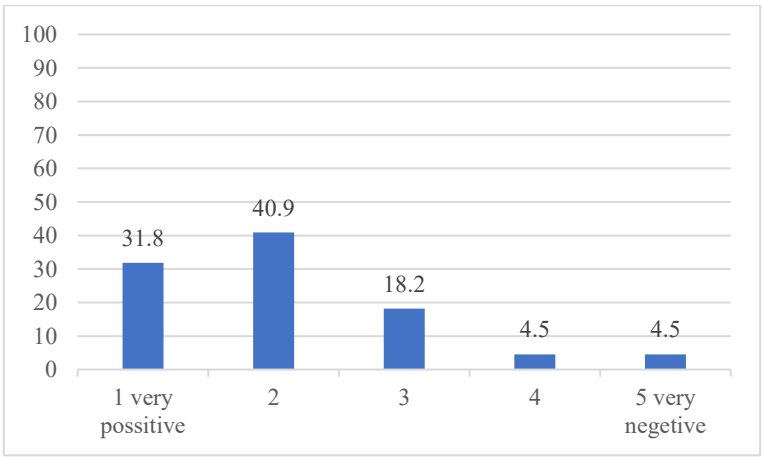


Table 5-6 The perception of the participants towards the Rossdale Power Plant

7. What results do you expect to see from the Rossdale Power Plant redevelopment plan?

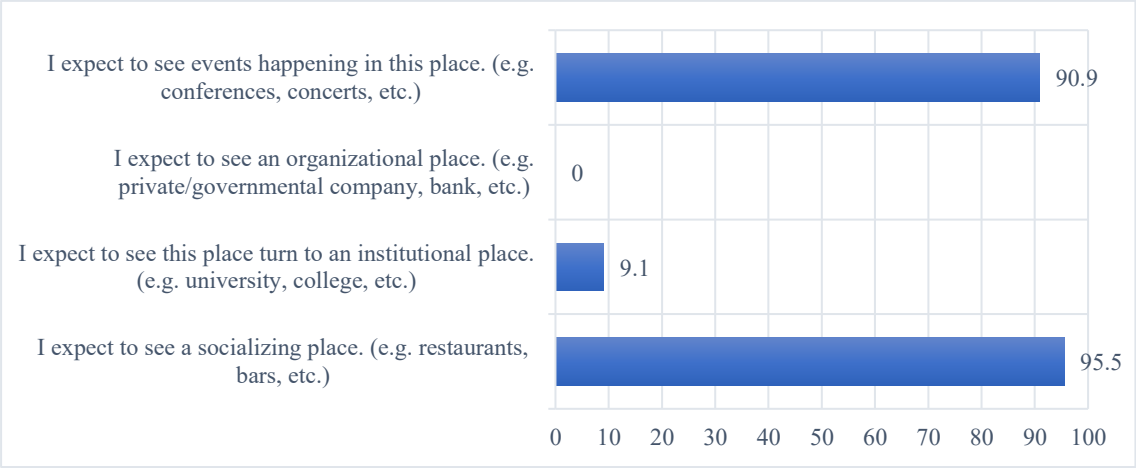


Table 5-7Participants expectations of the Power Plant's redevelopment

8. What activities do you wish to see in this place? If your expectation is not listed below, please, write it down below the "other" section.

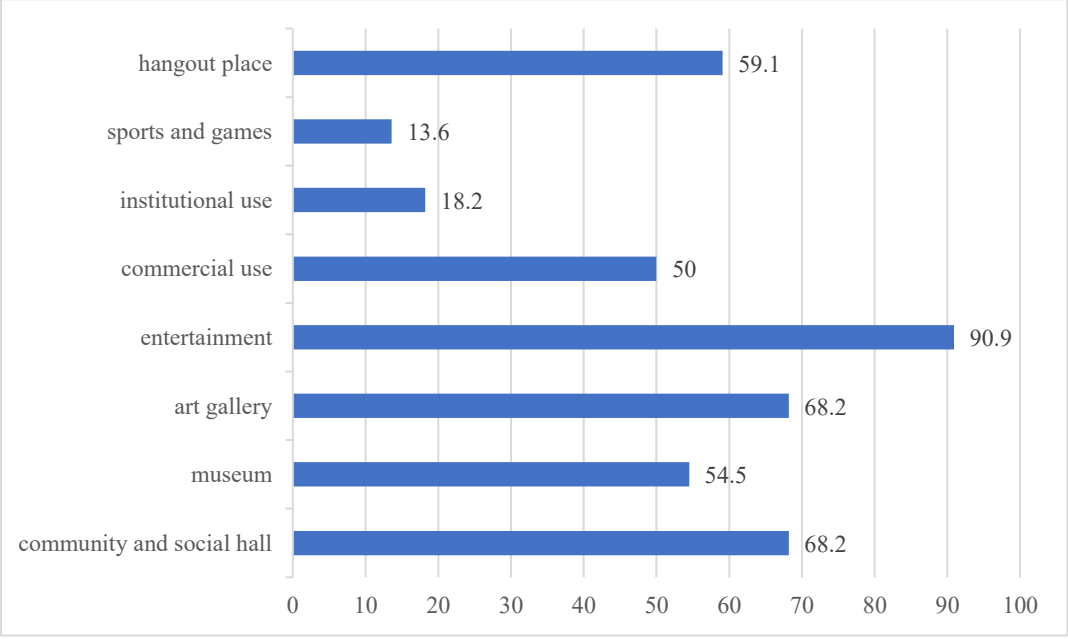


Table 5-8 The activities participants wish to have in the redesigned Power Plant

9. How would you rate your today's experience with the Virtual Reality?

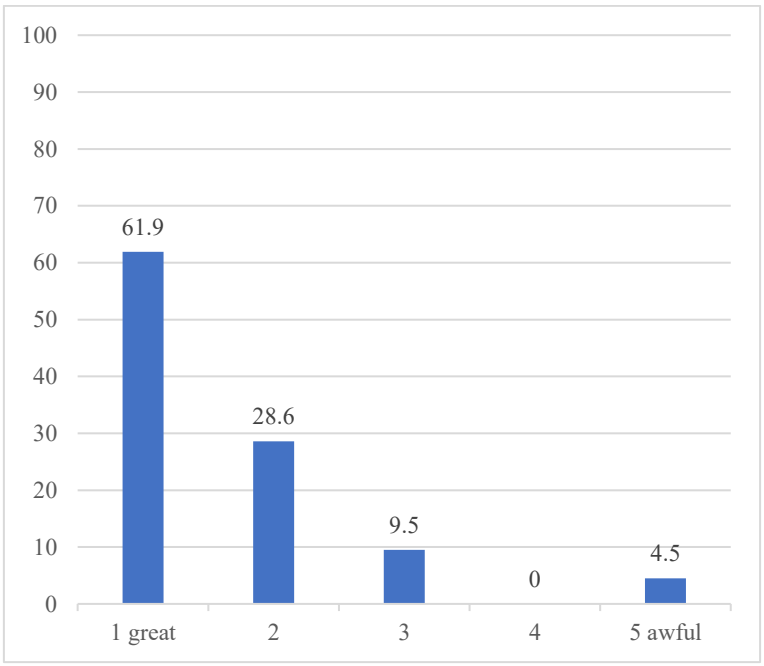


Table 5-9

10. How did you feel inside this space?

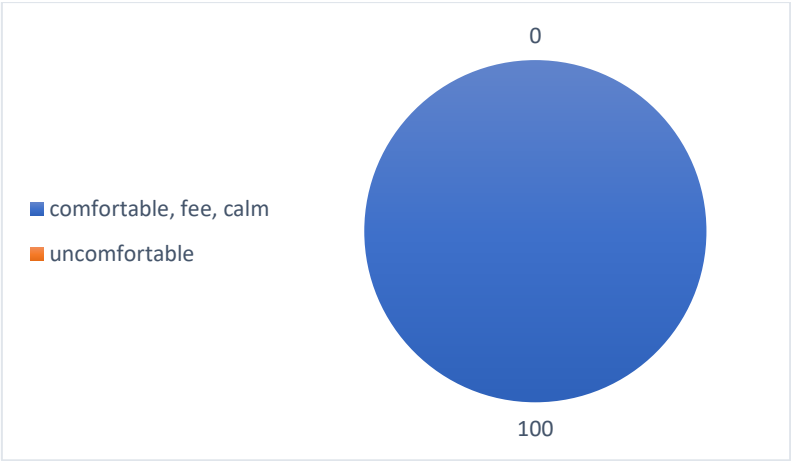


Table 5-10

11. What color temperature will make a place more comfortable for you?

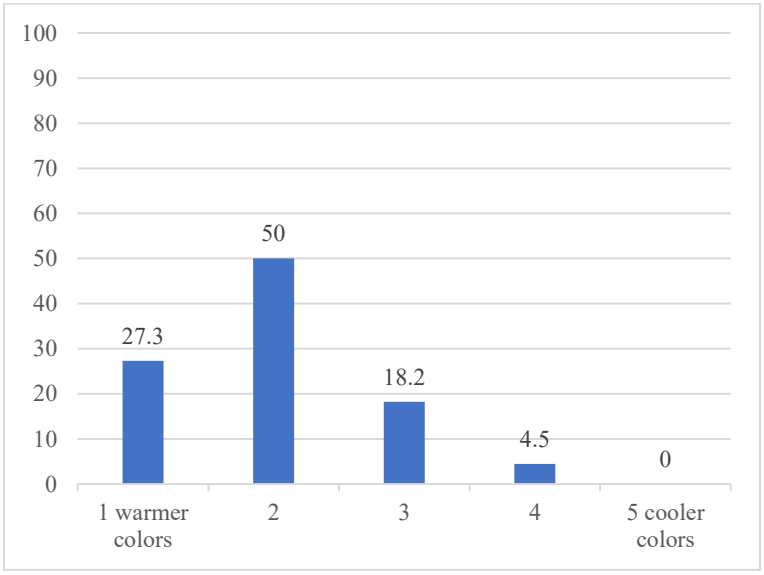


Table 5-11

12. Based on your background, and experiencing this space in the VR environment, which ones of the followings are close to your expectation of this space?

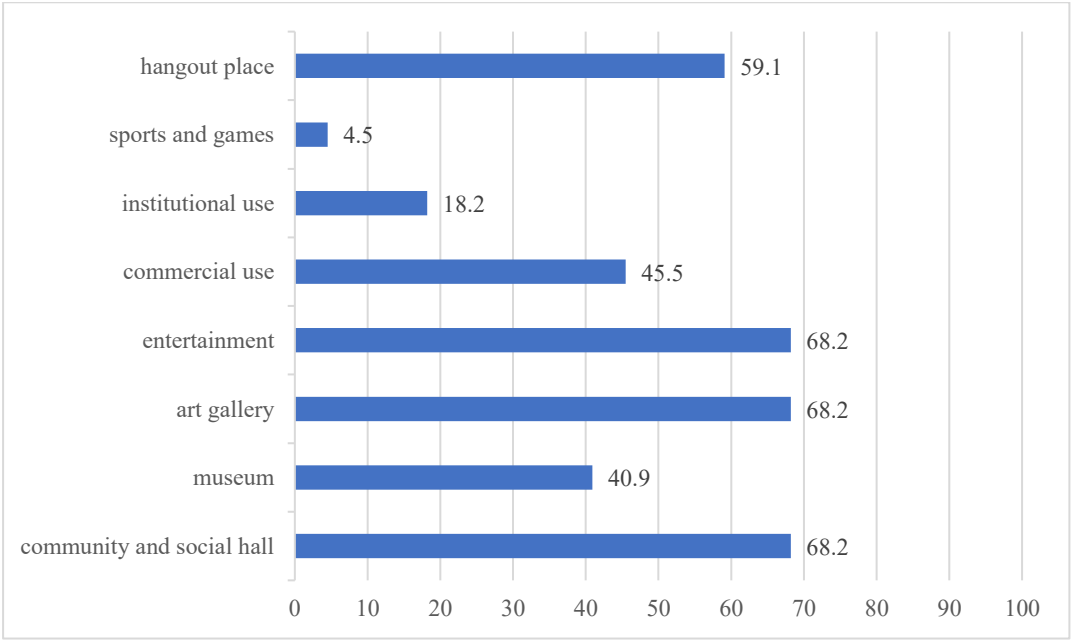


Table 5-12

13. What materials do you suggest that fits best with this environment?

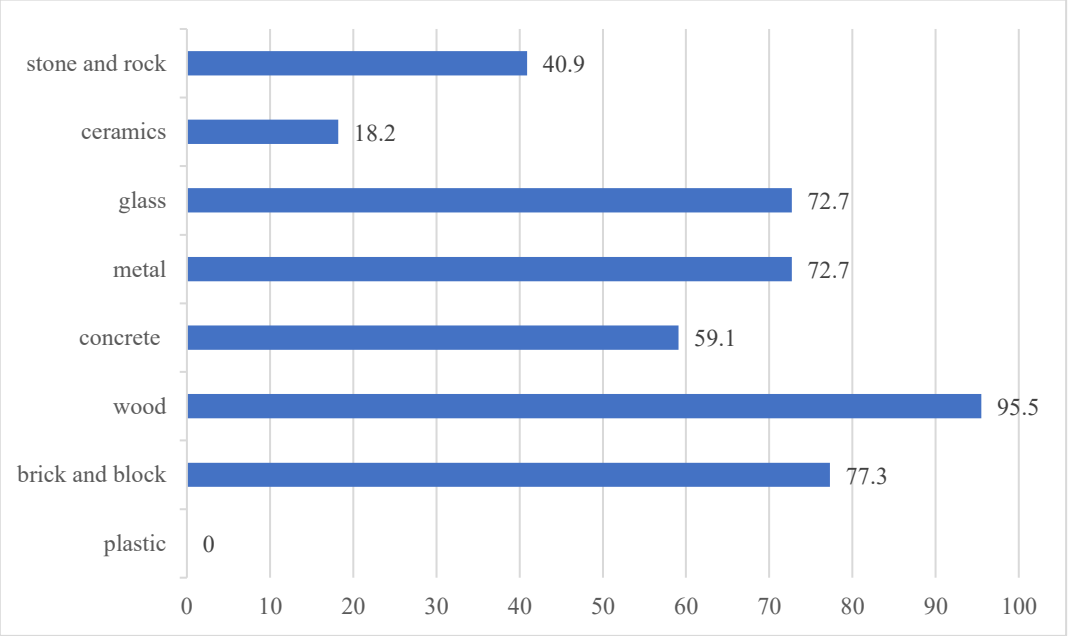


Table 5-13 Suggested materials for the Power Plant

14. What style do you prefer for the interior part of this building?

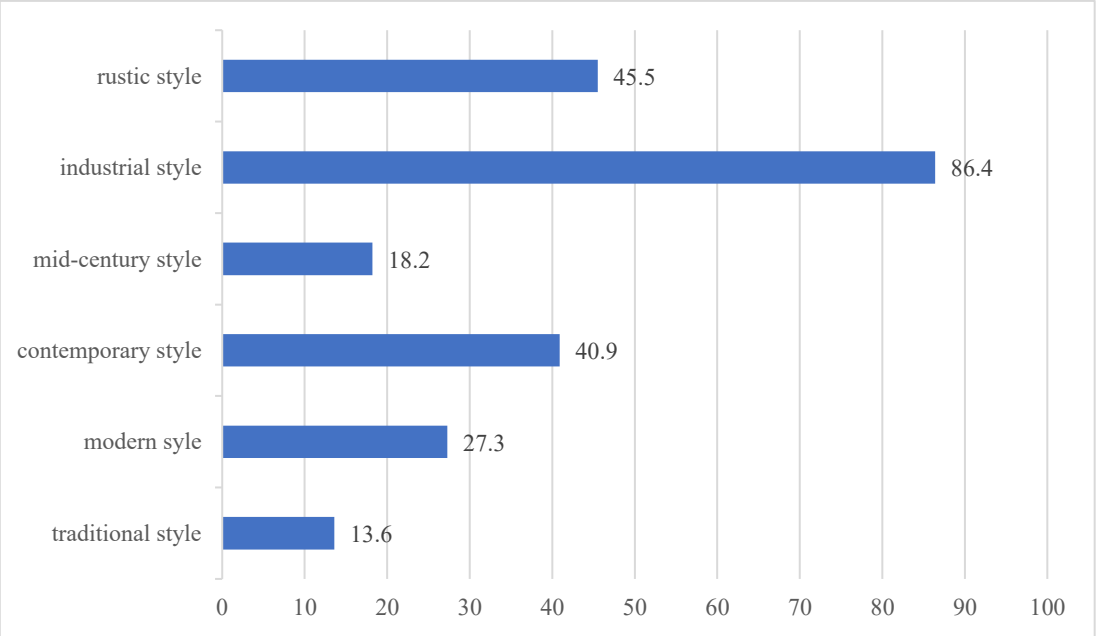


Table 5-14 The interior styles suggested for the Power Plant

15. If possible, please write down any other opinion/suggestion/recommendation you might have regarding the Rossdale Power Plant building below.

Participants aging 18-29:

Need to have access to the river.

Plaza area in between building & river would be great. First nations especially Papaschase Cree should be involved in developing the area and guide decision making

Keep all historical aspects; emphasize this through industrial/rustic design on the interior.

Make it a place for not just Edmontonians but also travellers/visitors."

I love the space and think that it would be an amazing public location for community and culture. But the only issue would be parking or closer public transportation. (Although, the ETS has a close bus-stop.)

Access to natural light should be maximized as much as possible.

Similar usage/goals as the Forks in Winnipeg - with commercial spaces limited to local products similar to the KAM gift shop, Alberta branded, and similar. Limited parking nearby to encourage active transportation. Even if it just means keeping parking lots 3+ minute walk from entrance.

Participants 50 and above:

Maybe something to lie in with the burial ground, John Walter history, and the aboriginal Art Park on the other side of the river. Reintroduce the old ferry to bring people across. I don't know if any of that works. I also love the idea of the Roman baths in the basement, keeping the warm, dim industrial feel.

Keep the historic aspect of the building.

Keeping the scale and openness of the space would be great. It's such a unique building.

The indigenous roots in Rossdale must be considered in any design of the space.

Granville Island Marketing Vancouver"

Participants 50 and above:
I would love to see Edmonton have a place to engage citizens/students in Aboriginal /Metis exhibit + activities + also to connect river activities if possible (voyage/canoe trips from Fort Ed to the Power Plant.)

Preserve the exterior and reopen the windows along the side of the building.

Participant aging 40-49:
New construction + design features should be kept to a minimum to avoid detracting from the industrial architecture of the space which creates its unique feel and are important elements of the building's heritage character.

Participant aging 30-39:
Connect it with a gondola!

5.3 Second Questionnaire and Data

This questionnaire is ANONYMOUS. The intended uses of this research are for thesis research and writing only as part of the principal investigator's graduate study. Participants will not be personally identified in any of these. All data will be kept confidential, with the Primary Investigator being the only person with access to the data.

1. How old are you?

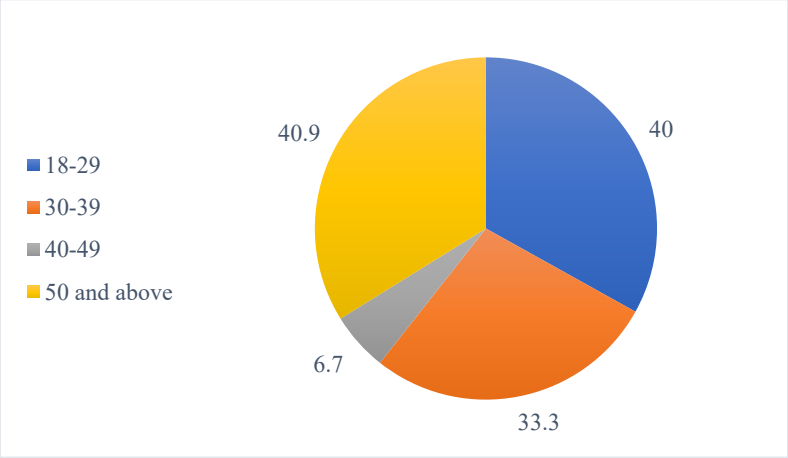


Table 5-15 Age distribution – second survey

2. How long have you been living in Edmonton?

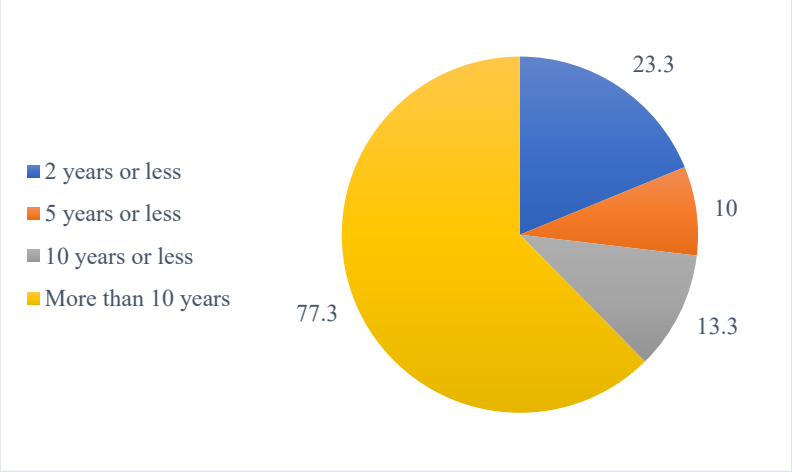


Table 5-16 Duration of the time participants lived in Edmonton – second survey

3. How did you feel inside this space?

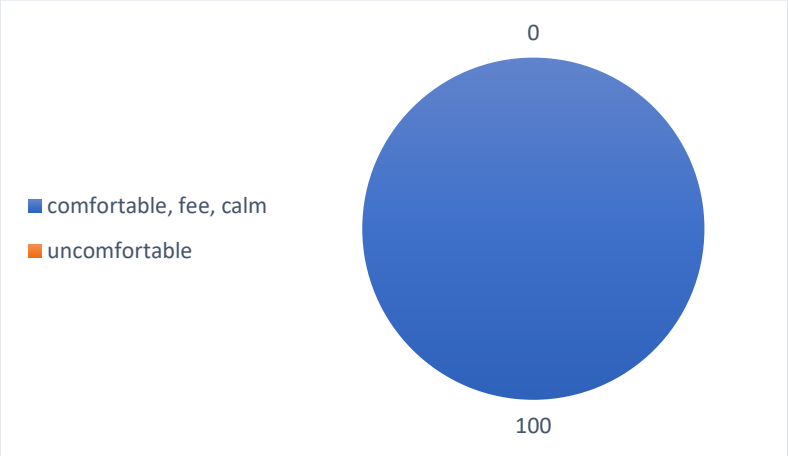


Table 5-17

4. How would you rate your today's experience with the Virtual Reality?

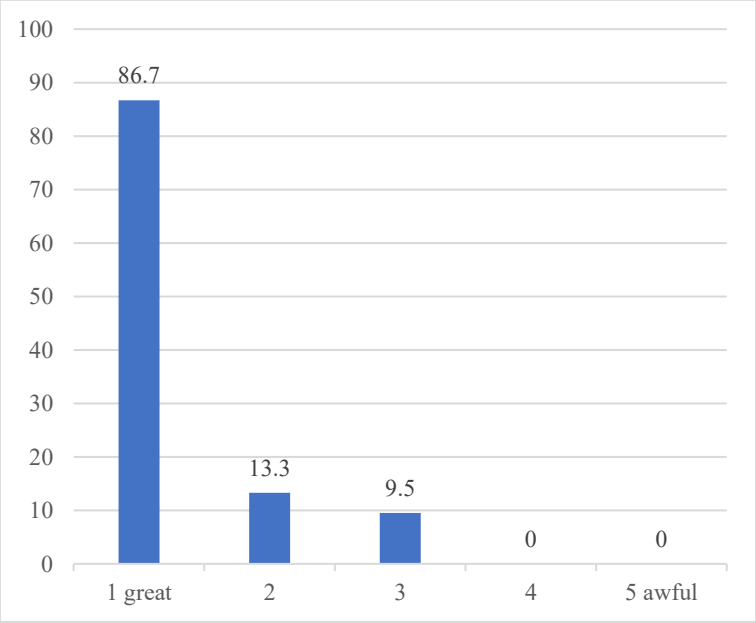


Table 5-18

5. How would you rate the distribution of ideas inside the space?

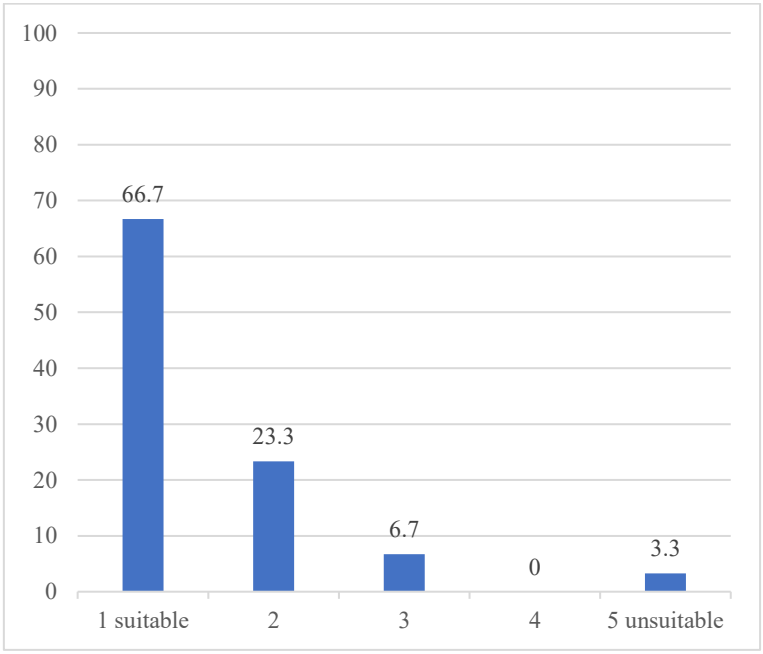


Table 5-19

6. How would you rate access to different parts of the interior environment?

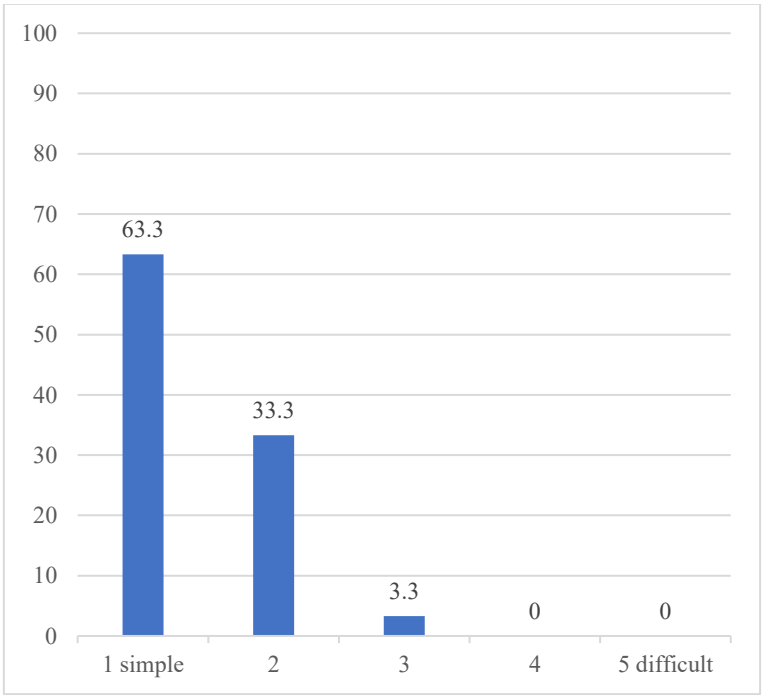


Table 5-20

7. How would you rate the color temperature used in the space?

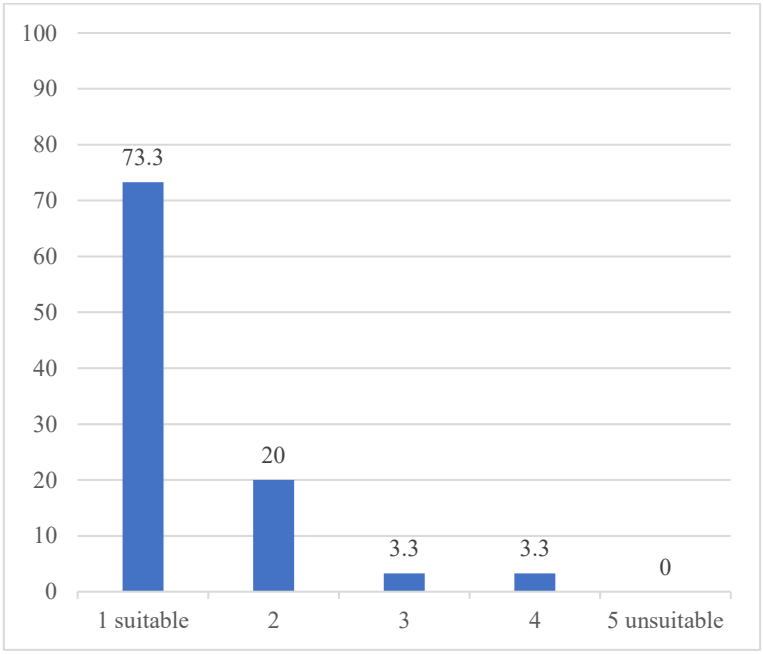


Table 5-21

8. How would you describe your perception of this space?

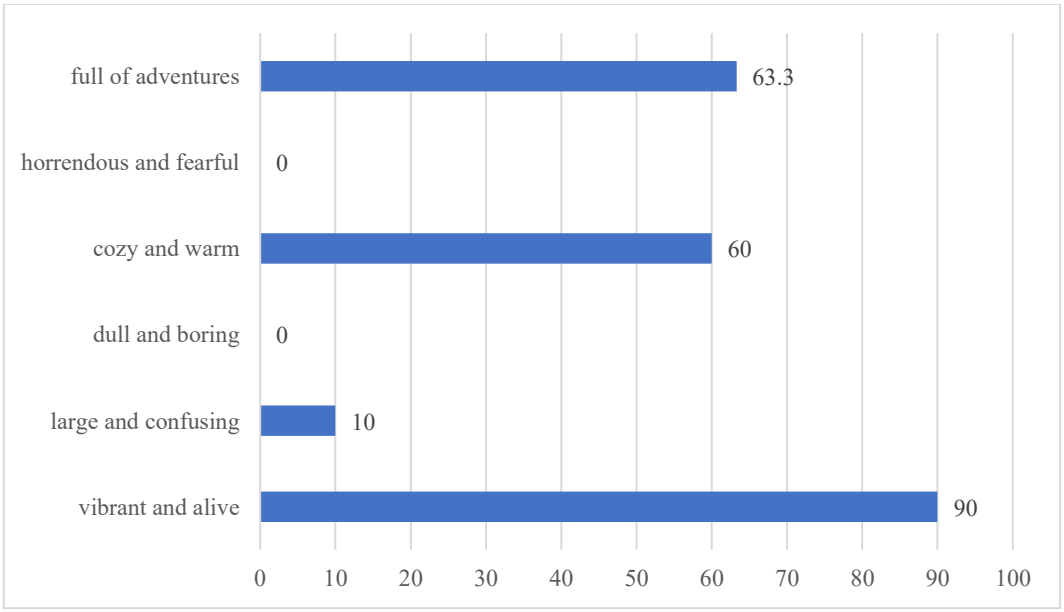


Table 5-22

9. How likely are you to hangout in this place?

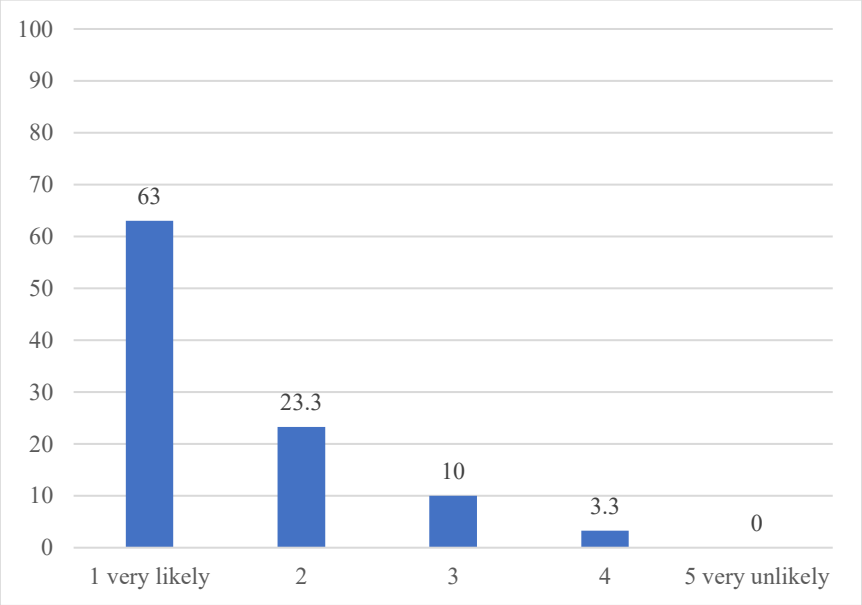


Table 5-23

10. After experiencing the implemented ideas in the VR environment, which ones of the followings you prefer to keep/have in this place?

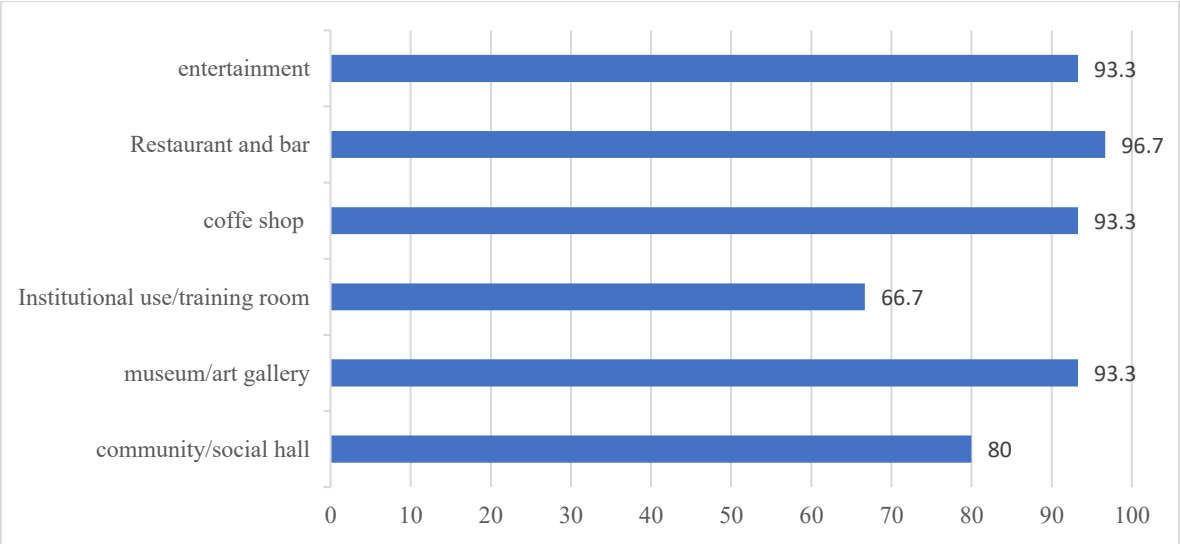


Table 5-24

11. How would you rate the materials used in this space?

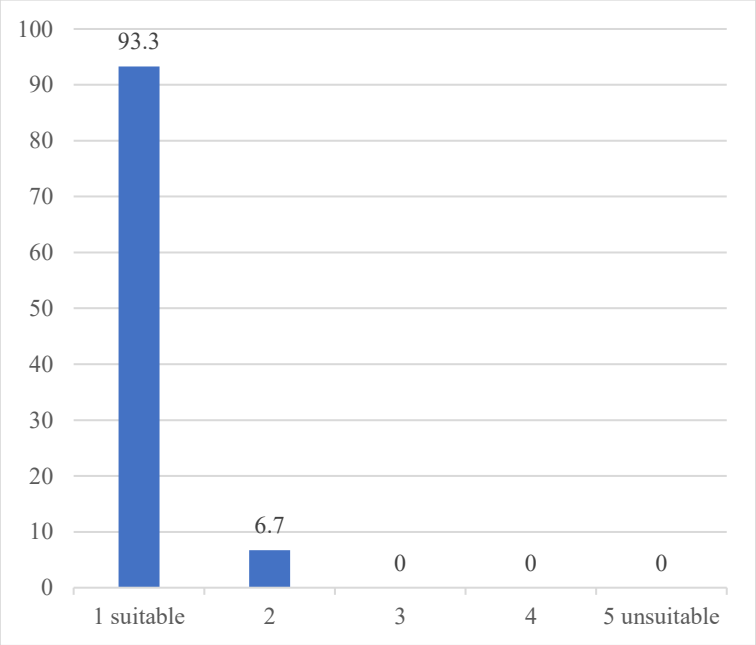


Table 5-25

12. How would you rate the interior design style used in this space?

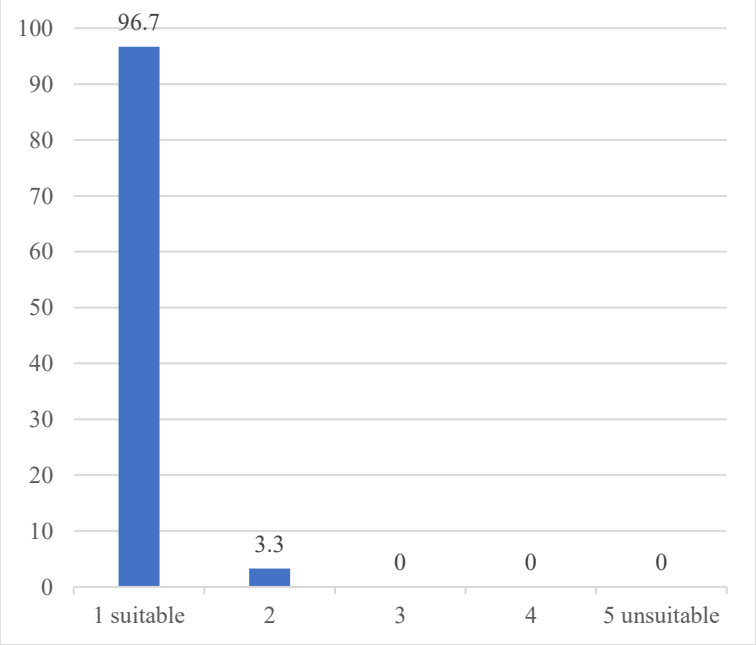


Table 5-26

13. If possible, please write down any other opinion/suggestion/recommendation you might have regarding the Rossdale Power Plant building below.

Participants aging 18-29:

The design is sophisticated, upper-class and luxurious. My biggest concern is that while everything looks beautiful, it also looks very expensive/posh so it might not feel welcoming to all types of people. It feels like a place where you need to be able to spend money to belong or spend time there.

Overall, a very positive experience. I support this kind of conceptualizing, as well as the visual choices that have been made in the walk through.

The design is very impressive and would be a key establishment in Edmonton! Well done!

I think there is some smart design work shown in this space and I think using VR to demonstrate it really helps people to "see" what the space could become.

Having a bus stop close to the Power Plant and parking lot can be helpful for commuting to the Power Plant.

Very well done! If possible, try different variations of bricks everywhere - shades/sizes/types of bonds. Try to play with more colors if you are intending to create an entertainment space.

I really liked the idea of using VR as it seems to be a powerful yet comfortable tool for industrial design.

More institution/student /etc. would be neat. A stage/venue for live music would be amazing.

Participants aging 30-39:

very fascinating designs/ideas

Size of the spaces are large, may be good to shrink and have more vendors/commercial uses.

Well done on the wheelchair ramps, all-gender washrooms, and elevators. (Yay inclusively!)

Retail stores? Potentially take inspiration from Chicago buildings that have been converted from industrial. Potentially consult restaurant owners about set-up/configuration of the restaurant/seating.

The wood design was warm and nice.

Having a gift shop instead of the gallery space as a commercial use.

I'd prefer a kids playing area

Brewery

Participants aging 40-49:

Would definitely like to see interesting shops, small restaurants/bars and fewer meeting spaces or rental spaces. More variety.

"It is good to have large open areas as well as smaller, more intimate rooms + large areas. Maybe a closed in area as an option if people don't want all open.
Without natural light might be very dark.
The openness makes it easy to orient.
Need to be aware of noise and privacy for renting spaces
Access to outside space would be nice, patio for coffee shop for example."

I'd like to see more retail and food/drink options.

Participants 50 and above:

Bang ON! Very Good!

People living in Rossdale will come here everyday! This is exactly the kind of space we crave!

There should be a patio and outdoor version restaurant that allows dogs in as many families in Rossdale own dogs."

“This is a beautiful, well-conceived version of the Rossdale Power Plant with effective and creative ideas for use.”

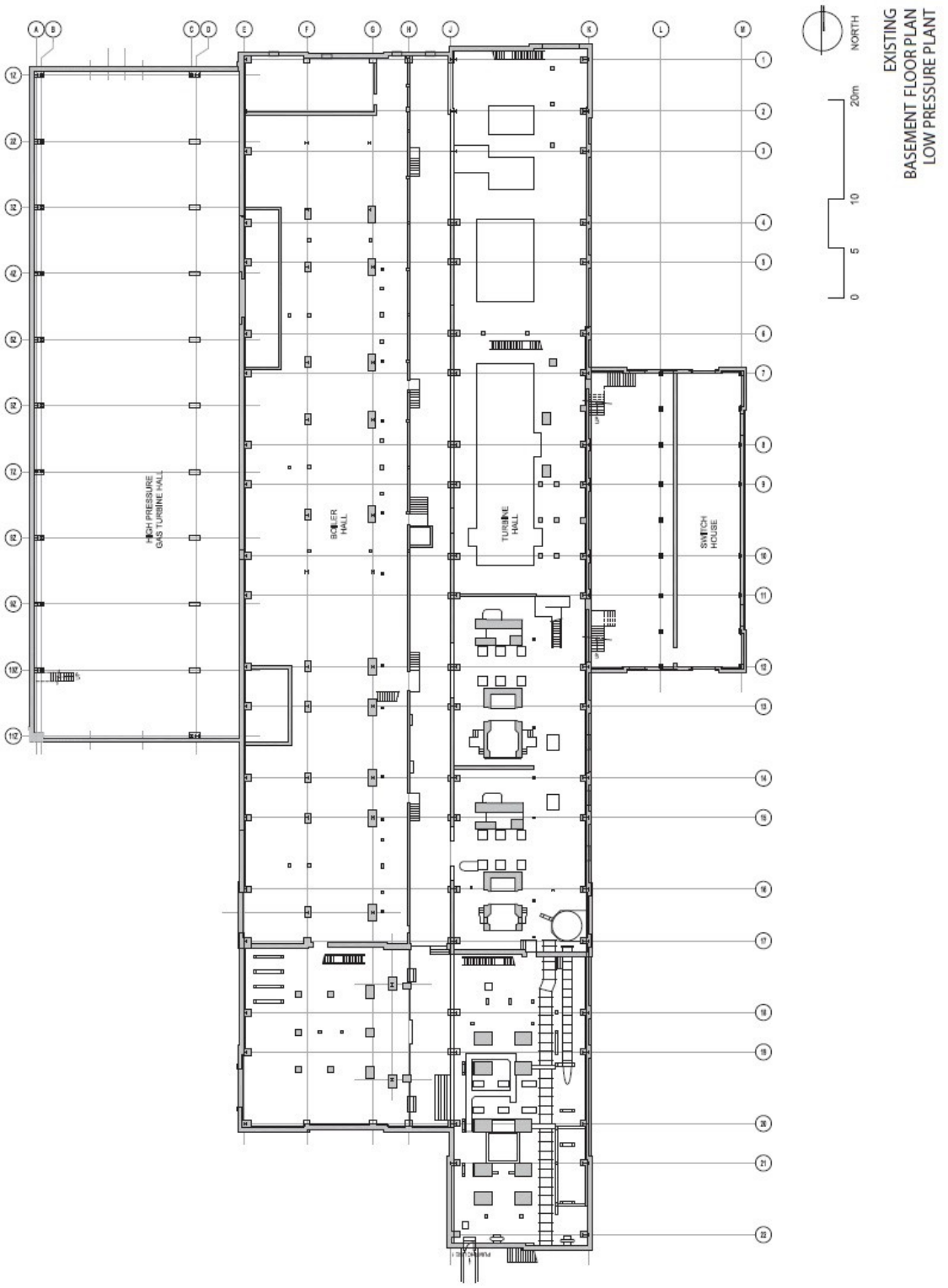
“The exposed brick and steel beams are great. The light from the windows makes the building - gives it atmosphere.”

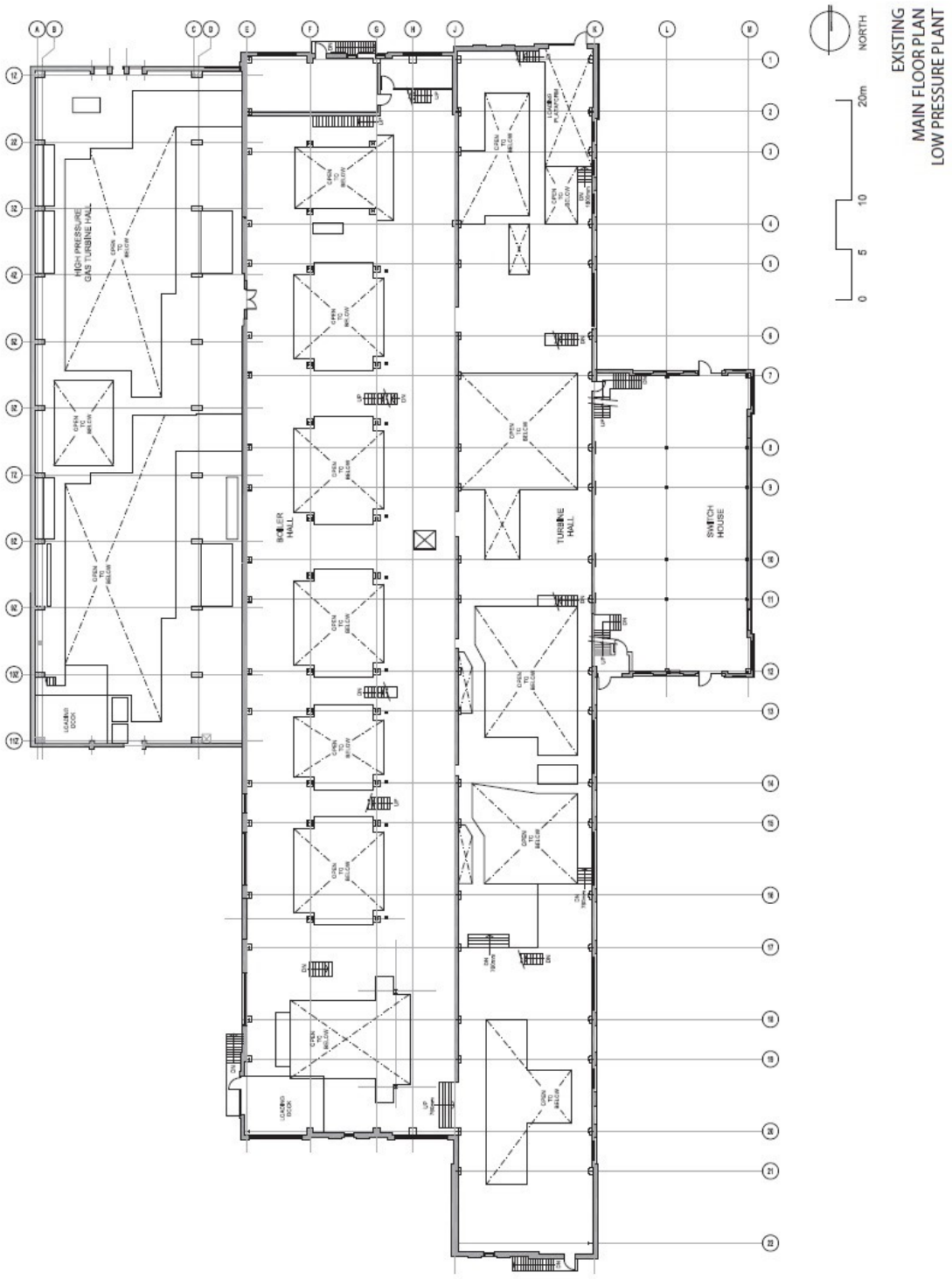
“Get it done! It will be amazing.”

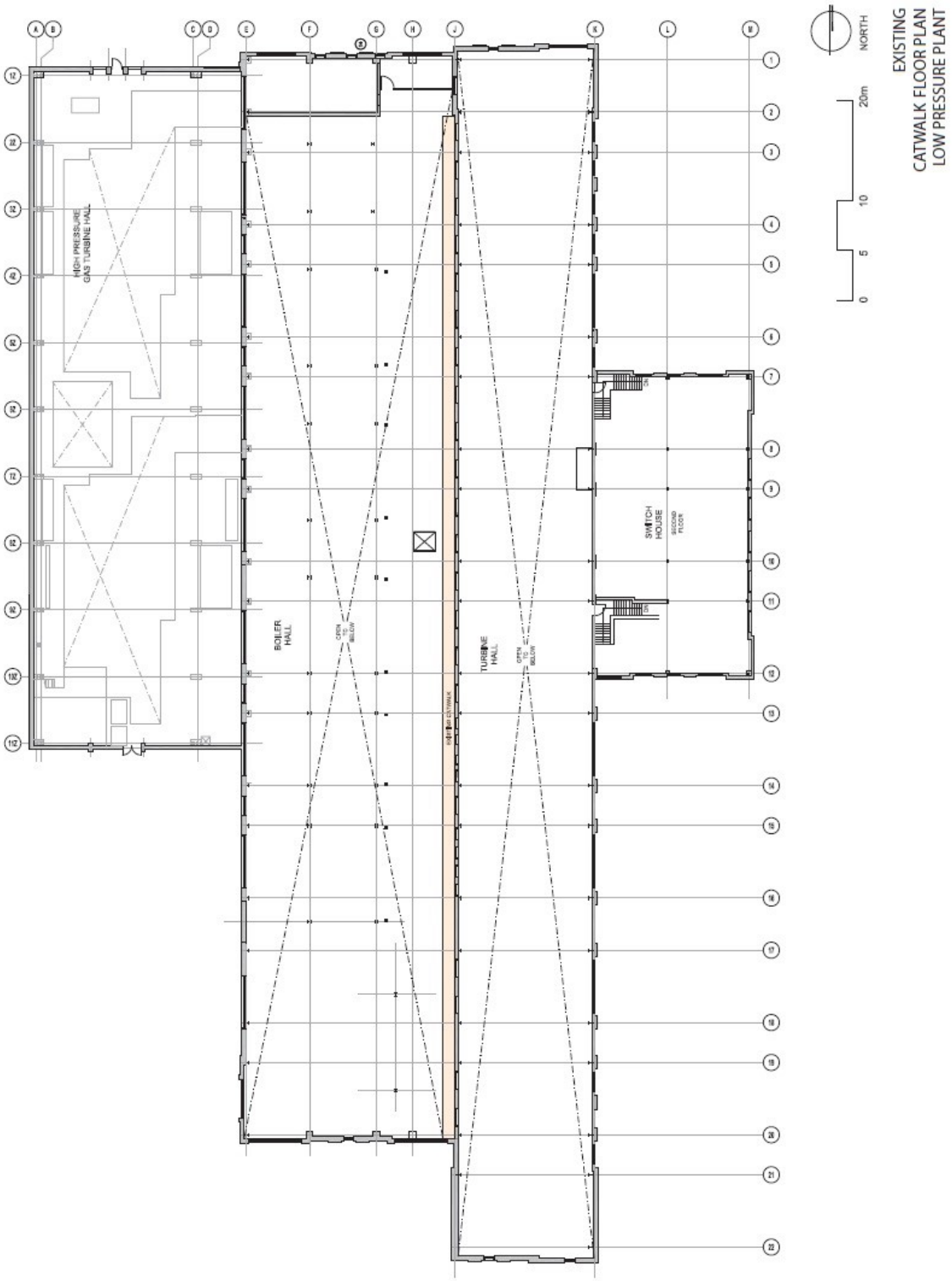
“Good luck! Love the design, worried about the cost and reality.”

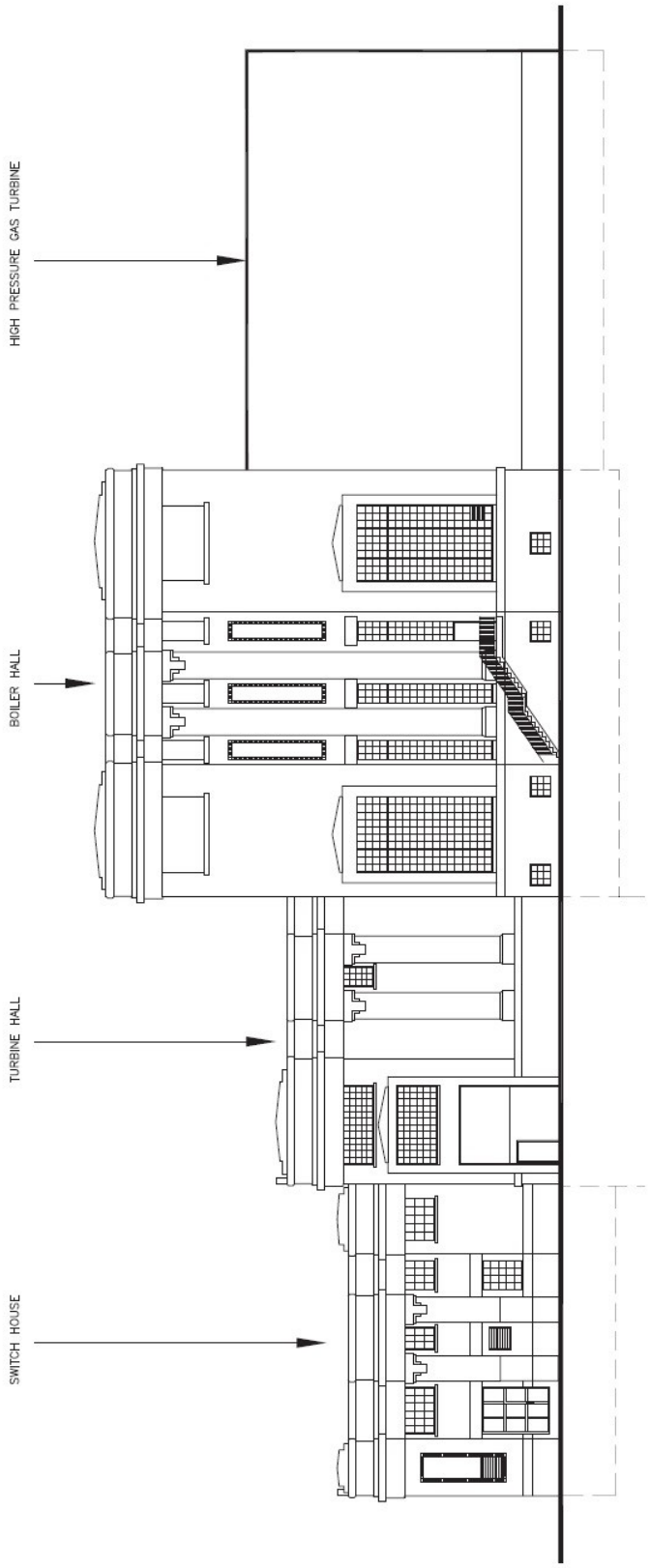
“National center for indigenous art and culture”

5.4 Rossdale Power Plant floor plans

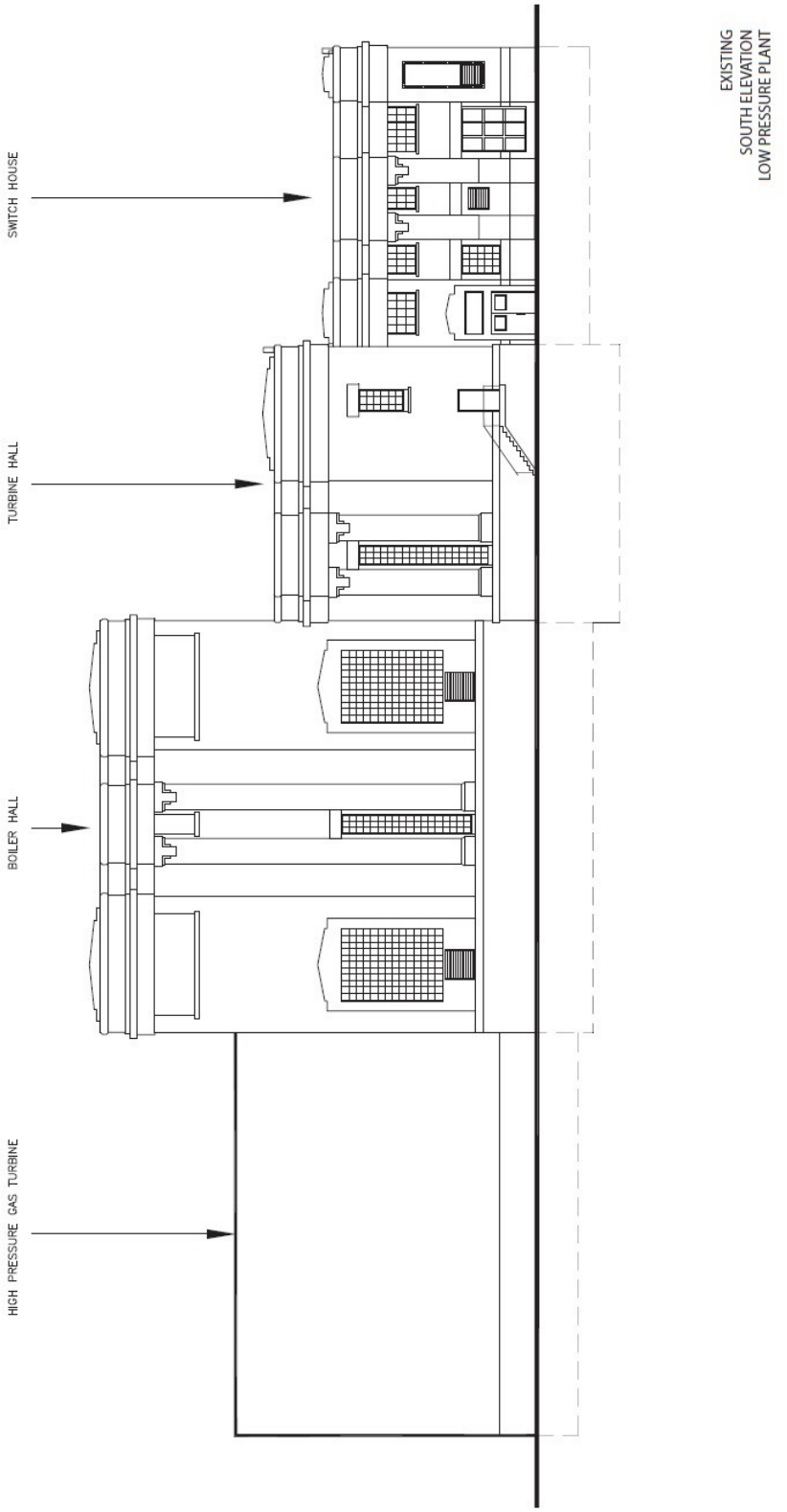

NORTH
0
5
10
20m
EXISTING
BASEMENT FLOOR PLAN
LOW PRESSURE PLANT
HIGH PRESSURE
GAS TURBINE HALL
BOILER
HALL
TURBINE
HALL
SWITCH
HOUSE


EXISTING
MAIN FLOOR PLAN
LOW PRESSURE PLANT
NORTH
0 5 10 20m
HIGH PRESSURE GAS TURBINE HALL
BOILER HALL
TURBINE HALL
SWITCH HOUSE
LOADING DOCK
OPEN TO BELOW
UP
DN


EXISTING
CATWALK FLOOR PLAN
LOW PRESSURE PLANT
NORTH
0
5
10
20m
HIGH PRESSURE
GAS TURBINE HALL
BOILER
HALL
OPEN
TO
BELOW
TURBINE
HALL
OPEN
TO
BELOW
SWITCH
HOUSE
SECOND
FLOOR
CATWALK



EXISTING
NORTH ELEVATION
LOW PRESSURE PLANT


EXISTING
SOUTH ELEVATION
LOW PRESSURE PLANT
SWITCH HOUSE
TURBINE HALL
BOILER HALL
HIGH PRESSURE GAS TURBINE

5.5 Virtual Reality Requirements

Information on the Virtual Reality system used in this project:

HTC Vive, Gamer version

Headset Spec:

Resolution: 1080 x 1200 pixels per eye (2160 x 1200 pixels combined)

Refresh rate: 90Hz

Field of view: 110 Degrees

Connections: HDMI, USB 2.0, stereo 3.5 mm headphone jack, power, Bluetooth

Sensors: SteamVR Tracking, G-sensor, Gyroscope, Proximity

Ergonomics: Eye relief with lens distance adjustment

Controller Specs:

Sensors: SteamVR Tracking (1.0)

Input: Multifunction trackpad, Grip buttons, Dual-stage trigger, System button, Menu button

Connections: Micro-USB charging port

5.6 Ethics Application

Date: Monday, August 12, 2019 9:04:58 PM

Print Close

1.1 Study Identification

*All questions marked by a red asterisk * are required fields. However, because the mandatory fields have been kept to a minimum, answering only the required fields may not be sufficient for the REB to review your application.*

Please answer all relevant questions that will reasonably help to describe your study or proposed research.

1.0 * **Short Study Title** *(restricted to 250 characters)*:
DEVELOPMENT OF A PUBLIC PLACE: QUALITATIVE RESEARCH ON THE ROSSDALE POWER PLANT BUILDING BASED ON PLACEMAKING DESIGN PROCESS BY EMPLOYING VIRTUAL REALITY TECHNOLOGY

2.0 * **Complete Study Title** *(can be exactly the same as short title)*:

DEVELOPMENT OF A PUBLIC PLACE: QUALITATIVE RESEARCH ON THE ROSSDALE POWER PLANT BUILDING BASED ON PLACEMAKING DESIGN PROCESS BY EMPLOYING VIRTUAL REALITY TECHNOLOGY

3.0 * **Select the appropriate Research Ethics Board** (*Detailed descriptions are available at http://www.reo.ualberta.ca/Human-Research-Ethics/Research-Ethics-Boards.aspx*):
Research Ethics Board 2

4.0 * **Is the proposed research:**
Unfunded

5.0 * **Name of local Principal Investigator:**
Reyhaneh Alizadeh Rabiei

6.0 * **Type of research/study:**
Graduate Student

7.0 **Investigator's Supervisor (required for applications from undergraduate students, graduate students, post-doctoral fellows and medical residents to REBs 1 & 2. HREB does not accept applications from student PIs):**

Timothy Antoniuk

8.0 **Study Coordinators or Research Assistants:** People listed here can edit this application and will receive all email notifications for the study:

Name	Employer

There are no items to display

9.0 **Co-Investigators:** People listed here can edit this application and will receive

email notifications *(Co-investigators who do not wish to receive email, should be added to the study email list team below instead of here).*
If your searched name does not come up when you type it in the box, the user does not have the Principal Investigator role in REMO. Click the following link for instructions on how to Request an Additional Role.

Name	Employer
There are no items to display	

10.0 **Study Team:** *(co-investigators, supervising team, and other study team members) - People listed here cannot view or edit this application and do not receive email notifications.*

Last Name	First Name	Organization	Role/Area of Responsibility	Phone	Email
There are no items to display					

1.5 Conflict of Interest

1.0 *** Are any of the investigators or their immediate family receiving any personal remuneration (including investigator payments and recruitment incentives but excluding trainee remuneration or graduate student stipends) from the funding of this study that is not accounted for in the study budget?**
○ ○Yes ◉ ◉**No**

2.0 *** Do any of investigators or their immediate family have any proprietary interests in the product under study or the outcome of the research including patents, trademarks, copyrights, and licensing agreements?**
○ ○Yes ◉ ◉**No**

3.0 *** Is there any compensation for this study that is affected by the study outcome?**
○ ○Yes ◉ ◉**No**

4.0 *** Do any of the investigators or their immediate family have equity interest in the sponsoring company? (This does not include Mutual Funds)**
○ ○Yes ◉ ◉**No**

5.0 *** Do any of the investigators or their immediate family receive payments of other sorts, from this sponsor (i.e. grants, compensation in the form of equipment or supplies, retainers for ongoing consultation and honoraria)?**
○ ○Yes ◉ ◉**No**

6.0 *** Are any of the investigators or their immediate family, members of the sponsor's Board of Directors, Scientific Advisory Panel or comparable body?**
○ ○Yes ◉ ◉**No**

7.0 *** Do you have any other relationship, financial or non-financial, that, if not disclosed, could be construed as a conflict of interest?**

○ ○Yes ⊙ ⊙**No**

Please explain if the answer to any of the above questions is Yes:

Important
If you answered YES to any of the questions above, you may be asked for more information.

1.6 Research Locations and Other Approvals

1.0 *** List the locations of the proposed research, including recruitment activities. Provide name of institution, facility or organization, town, or province as applicable**
The city of Edmonton, Rossdale Community League

2.0 *** Indicate if the study will use or access facilities, programmes, resources, staff, students, specimens, patients or their records, at any of the sites affiliated with the following** *(select all that apply):*
Not applicable

List all health care research sites/locations:

3.0 **Multi-Institution Review**

*** 3.1 Has this study already received approval from another REB?**

○ ○**Yes** ⊙ ⊙**No**

4.0 **If this application is closely linked to research previously approved by one of the University of Alberta REBs or has already received ethics approval from an external ethics review board***(s)*, **provide the study number, REB name or other identifying information. Attach any external REB application and approval letter in the Documentation Section – Other Documents.**

2.1 Study Objectives and Design

1.0 **Provide planned start and end date of human participant research.**

Start Date:
11/26/2018

End Date:
6/30/2019

2.0 * Provide a lay summary of your proposed research which would be understandable to general public

The redevelopment of west Rossdale plan in downtown Edmonton involves a variety of projects including expanding land uses in residential, commercial and institutional concepts. This project focuses on the Rossdale power plant building that is recognized nationally as one of Canada's Historic Places. The primary objective of this redevelopment is to bring a new life to the Rossdale power plant. The research will take the placemaking approach to define new functionalities for the power plant building and later in the process will use Virtual Reality technology in the ideation and the evaluation phase to test the feasibility of the ideas.

3.0 * Provide a full description of your research proposal outlining the following:

- **Purpose**
- **Hypothesis**
- **Justification**
- **Objectives**
- **Research Method/Procedures**
- **Plan for Data Analysis**

The City of Edmonton wants the River Crossing area in downtown Edmonton to evolve into a vibrant community and unique destination place in the city. The ongoing redevelopment of west Rossdale plan involves a variety of projects including expanding land uses to include residential, commercial and institutional concepts. The goal of these projects is to make a positive collective impact on Edmonton and the neighborhood in order to make the Rossdale area a more vibrant and diverse community.

This project focuses on the Rossdale power plant building that has been recognized nationally as Canada's Historic site. The buildings were decommissioned eight years ago between 2011 and 2012 and the station no longer generates power. The primary objective of this redevelopment is to bring a new life to the Rossdale power plant site. The research will take the placemaking approach to define new functions for the power plant building.

This project aims to understand and acknowledge the challenges that the city encounters with the redevelopment of the Rossdale Power Plant building and define new opportunities to solve the problems and enhance the quality of engagement on this site. During the spring semester of 2019, an initial in-person survey will be conducted to gain a better understanding of what individuals expect from the neighborhood. In this session, participants will take part in a Virtual Reality activity that includes a white basic model of the building to better understand the scaling and lighting inside the building when stating their ideas in the survey. The research methodology will include urban neighborhood analysis involving inspections of public variables such as

access, neighborhood character, use of land, socio-economic features, activities in public places and analyzing the recent changes applied to physical structures of the neighborhood. This project will take a community-led design approach to understand the community's concerns. By utilizing this information idea and conceptual plans for the activities of the site will be developed. I will be contacting the community league members and they will contact individuals to participate in an initial survey to point out their opinions. I will conduct another survey two months after the first one, where their ideas are imported in a Virtual Reality environment, they will again participate in a survey and VR activity to give their feedback on the imported ideas.

The first session including the in-person survey collection and a Virtual Reality activity will take place in spring 2019 semester, the approximate number of people is 40 individuals. The second session including the in-person survey collection and participating in a Virtual Reality activity will take place two months after the first one. The individuals voluntarily will participate in either or both of the sessions. The second session involves the previous participants and new individuals who might indicate their interest for participation prior to the second session. The participants in both sessions will experience the VR application and provide the principal investigator with feedback. In both sessions, the participants will be asked to put their filled surveys inside a box designated for this purpose in order to maintain the anonymity of the surveys.

The purpose of using Virtual Reality (VR) technology in this research is to provide the individuals including the Community, the City and the local inhabitants with an immersive interaction. This redefined environment (VR) will communicate the design objectives and help them better understand the redesigned River Crossing area. Employment of this technology provides an excellent opportunity to improve the ideas and reduce cost in the design process before executing them physically. The Unreal VR editor plus HAL Archviz Toolkit combines the functionalities of a presentation tool and the creativity of a design tool allowing the concepts to be modified within the VR environment.

4.0 Describe procedures, treatment, or activities that are above or in addition to standard practices in this study area *(eg. extra medical or health-related procedures, curriculum enhancements, extra follow-up, etc)*:
NA

5.0 If the proposed research is above minimal risk and is not funded via a competitive peer review grant or industry-sponsored clinical trial, the REB will require evidence of scientific review. Provide information about the review process and its results if appropriate.
NA

6.0 For clinical trials, describe any sub-studies associated with this Protocol.
NA

2.2 Research Methods and Procedures

Some research methods prompt specific ethical issues. The methods listed below have additional questions associated with them in this application. If your research does not involve any of the methods listed below, ensure that your proposed research is adequately described in Section 2.1: Study Objectives and Design or attach documents in the Documentation Section if necessary.

1.0 * **This study will involve the following***(select all that apply)*
Surveys and Questionnaires (including internet surveys)

NOTE 1: Select this ONLY if your application SOLELY involves a review of paper charts/electronic health records/administrative health data to answer the research question. If you are enrolling people into a study and need to collect data from their health records in addition to other interventions, then you SHOULD NOT select this box.

NOTE 2: Select this option if this research ONLY involves analysis of blood/tissue/specimens originally collected for another purpose but now being used to answer your research question. If you are enrolling people into the study to prospectively collect specimens to analyze you SHOULD NOT select this box.

2.9 Surveys and Questionnaires (including Online)

1.0 **How will the survey/questionnaire data be collected (i.e. collected in person, or if collected online, what survey program/software will be used etc.)?**
The survey data will be collected via the survey. The survey will be delivered on paper/in-person.

2.0 **Where will the data be stored once it's collected (i.e. will it be stored on the survey software provider servers, will it be downloaded to the PI's computer, other)?**
The data will be uploaded to the principal investigator's computer.

3.0 **Who will have access to the data?**
Only the principal investigator will have access to the data.

3.1 Risk Assessment

1.0 * **Provide your assessment of the risks that may be associated with this research:**
Minimal Risk - research in which the probability and magnitude of possible harms implied by participation is no greater than those encountered by participants in those aspects of their everyday life that relate to the research (TCPS2)

2.0 * **Select all that might apply:**

Description of Possible Physical Risks and Discomforts	
No	Participants might feel physical fatigue, e.g. sleep deprivation
No	Participants might feel physical stress, e.g. cardiovascular stress tests
Possibly	Participants might sustain injury, infection, and intervention side-effects or complications
No	The physical risks will be greater than those encountered by the participants in everyday life

Possible Psychological, Emotional, Social and Other Risks and Discomforts	
No	Participants might feel psychologically or emotionally stressed, demeaned, embarrassed, worried, anxious, scared or distressed, e.g. description of painful or traumatic events
No	Participants might feel psychological or mental fatigue, e.g intense concentration required
No	Participants might experience cultural or social risk, e.g. loss of privacy or status or damage to reputation
No	Participants might be exposed to economic or legal risk, for instance non-anonymized workplace surveys
No	The risks will be greater than those encountered by the participants in everyday life

3.0 * **Provide details of all the risks and discomforts associated with the research for which you indicated YES or POSSIBLY above.**
Virtual Reality in some cases might cause dizziness, disorientation, and nausea.

4.0 * **Describe how you will manage and minimize risks and discomforts, as well as mitigate harm:**
This risk has been mentioned in the consent form. To make sure the participants are aware of the fact, they are again informed of this risk before their participation. Participants have the right to withdraw from this activity before or anytime they experience such discomfort during the activity.

5.0 **Is there a possibility that your research procedures will lead to unexpected findings, adverse reactions, or similar results that may require follow-up** *(i.e. individuals disclose that they are upset or distressed during an interview/questionnaire, unanticipated findings on MRI, etc.)*?
○ ○Yes ◉ ◉**No**

6.0 **If you are using any tests in this study diagnostically, indicate the member(s) of the study team who will administer the**

measures/instruments:

Test Name	Test Administrator	Organization	Administrator's Qualification
There are no items to display			

7.0 If any research related procedures/tests could be interpreted diagnostically, will these be reported back to the participants and if so, how and by whom?
NA

3.2 Benefits Analysis

1.0 * Describe any potential benefits of the proposed research to the participants. If there are no benefits, state this explicitly:
There is no explicit benefit to the participants.

2.0 * Describe the scientific and/or scholarly benefits of the proposed research:
The proposed research will contribute to the existing redevelopment project of Rossdale neighboorhood in the city of Edmonton. Specific needs related to increasing the users quality of life will be identified, which is necessary for a strong connection to the research in Virtual Reality and its application in the design process. A greater understanding of these needs and experiences of the users will be achieved.

3.0 If this research involves risk to participants explain how the benefits outweigh the risks.
The redefined Virtual Reality environment communicates the design objectives and helps people better understand the redesigned space. Using this technology provides an excellent opportunity to improve the ideas and reduce cost in the design process before executing them physically. However, there is some potential for physical side effects including feeling dizziness, disorientation, and nausea from VR use in some participants. If participants experience these side effects or believe they might experience these they can withdraw from the activity. Participants are informed of these side effects written in the consent form and verbally before doing the activity.

4.1 Participant Information

1.0 * Will you be recruiting human participants *(i.e. enrolling people into the study, sending people online surveys to complete)***?**
◉ ◉**Yes** ○ ○No

1.1 Will participants be recruited or their data be collected from Alberta Health Services or Covenant Health or data custodian as defined in the Alberta Health Information Act?
○ ○Yes ◉ ◉**No**

4.2 Additional Participant Information

1.0 Describe the participants that will be included in this study. Outline ALL participants *(i.e. if you are enrolling healthy controls as well):*

The study will use the individuals residing in Edmonton.
There are no other criteria for the participants.

2.0 * Describe and justify the inclusion criteria for participants *(e.g. age range, health status, gender, etc.):*

Participants must be 18 and above and reside in Edmonton.

3.0 Describe and justify the exclusion criteria for participants:

This study is for individuals living in Edmonton. Non-residents of Edmonton will be excluded.

4.0 Participants

4.1 How many participants do you hope to recruit *(including controls, if applicable?)*
40
4.2 Of these, how many are controls, if applicable?
NA
4.3 If this is a multi-site study, how many participants do you anticipate will be enrolled in the entire study?

5.0 Justification for sample size:
For this research project, we need to gather specific data from the focus group/survey. The number provided is the number of participants needed for such a method.

4.4 Recruitment of Participants (non-Health)

1.0 Recruitment

1.1 How will you identify potential participants? Outline all of the means you will use to identify who may be eligible to be in the study *(i.e. response to advertising such as flyers, posters, ads in newspapers, websites, email, list serves, community organization referrals, etc.)*
Through my introduction to the Rossdale Community League, they will invite participants to complete the survey. Then the participants will contact me.

1.2 Once you have identified a list of potentially eligible participants,

indicate how the potential participants' names will be passed on to the researchers AND how will the potential participants be approached about the research.
For the in-person interviews and surveys, the individuals will be invited by the Rossdale Community, and the Community will provide them with my contact information, they will contact me for participating in the research and they have the option to participate in this study or not. There is no list of potential participant names for the researcher to choose from.

2.0 Pre-Existing Relationships

2.1 Will potential participants be recruited through pre-existing relationships with researchers *(e.g. Will an instructor recruit students from his classes, or a physician recruit patients from her practice? Other examples may be employees, acquaintances, own children or family members, etc.)*?
○ ○Yes ⊙ ⊙**No**

3.0 Will your study involve any of the following? *(select all that apply)*
None of the above

4.5 Informed Consent Determination

1.0 Describe who will provide informed consent for this study*(i.e. the participant, parent of child participant, substitute decision maker, no one will give consent – requesting a waiver)*
The participant

1.1 Waiver of Consent Requested
If you are asking for a waiver of participant consent, please justify the waiver or alteration and explain how the study meets all of the criteria for the waiver. Refer to Article 3.7 of TCPS2 and provide justification for requesting a Waiver of Consent for ALL criteria (a-e)
NA

1.2 Waiver of Consent in Individual Medical Emergency
If you are asking for a waiver or alteration of participant consent in individual medical emergencies, please justify the waiver or alteration and explain how the study meets ALL of the criteria outlined in Article 3.8 of TCPS2 (a-f).
NA

2.0 How will consent be obtained/documented? Select all that apply
Signed consent form

If you are not using a signed consent form, explain how the study

information will be provided to the participant and how consent will be obtained/documented. Provide details for EACH of the options selected above:

3.0 Will every participant have the capacity to give fully informed consent on his/her own behalf?
◉ ◉**Yes** ○ ○No

4.0 What assistance will be provided to participants or those consenting on their behalf, who may require additional assistance? *(e.g. non-English speakers, visually impaired, etc.)*
If someone reaches out stating they want to participate but need assistance we will provide whatever assistance is needed.

5.0 * If at any time a PARTICIPANT wishes to withdraw from the study or from certain parts of the study, describe when and how this can be done.
Participants may withdraw up to two weeks after the collection of the data without consequences.

6.0 Describe the circumstances and limitations of DATA withdrawal from the study, including the last point at which participant DATA can be withdrawn *(i.e. 2 weeks after transcription of interview notes)*
Participants may withdraw up to two weeks after the collection of the data without consequences. After two weeks the data will be compiled and used in the research. Extracting a participant's data from all the compiled data after this step will be so difficult and impossible.

7.0 Will this study involve any group(s) where non-participants are present? For example, classroom research might involve groups which include participants and non-participants.
○ ○Yes ◉ ◉**No**

5.1 Data Collection

1.0 * Will the researcher or study team be able to identify any of the participants at <u>any stage</u> of the study?
◉ ◉**Yes** ○ ○No

2.0 Primary/raw data collected will be *(check all that apply)*:
Indirectly identifying information - the information can reasonably be expected to identify an individual through a combination of indirect identifers (eg date of birth, place of residence, photo or unique personal characteristics, etc)

3.0 If this study involves secondary use of data, list all original sources:
NA

4.0 **In research where total anonymity and confidentiality is sought but cannot be guaranteed** *(eg. where participants talk in a group)* **how will confidentiality be achieved?**
All participation will take place individually and no participant will see the other one except for those who come in a group of two, e.g. family members or friends. The timing for each participant is scheduled with 5 minutes apart from the next participant. The sessions will be held in a computer lab with only the participant and the principal investigator in the room. The anonymity of the survey collection will be guaranteed by the participants placing their filled survey inside a designated box on the table next to them, the principal investigator will have no knowledge on who filled a certain survey form.

5.2 Data Identifiers

1.0 * **Personal Identifiers:** will you be collecting - at any time during the study, including recruitment - any of the following *(check all that apply)*:
Surname and First Name
Email Address
Age at time of data collection
Other

If OTHER, please describe:
Ethnicity

2.0 **Will you be collecting - at any time of the study, including recruitment of participants - any of the following** *(check all that apply)*:
There are no items to display

3.0 * **If you are collecting any of the above, provide a comprehensive rationale to explain why it is necessary to collect this information:**
To participate in the study (involving the virtual reality application), the participants will contact me via email. By contacting me, I have their email address and their names in order to arrange a time to work on the VR application. There is no need for the surname.

Reasons for asking age:
Answer to the age question will help the designer understand the followings:
1. What majority of people in a particular age group prefer what and what perception they have toward the power plant building or better said, if the perception and feeling they have about the building has a connection to their age. It cannot be a coincidence if the majority of the middle-aged group feel proud of this building while youth hates it for its old industrial facade.
2. What activities need to be considered for the place that fits perfectly with the most interested age group.

Reasons for asking ethnicity:
The background and culture shape and define the ideas and desires each individual has for a service or a product. The answer to this question will help

the designer to better understand the needs the users have regarding this building in order to accomplish a reliable result.

4.0 If identifying information will be removed at some point, when and how will this be done?

5.0 * Specify what identifiable information will be RETAINED once data collection is complete, and explain why retention is necessary. Include the retention of master lists that link participant identifiers with de-identified data:
The only identifiable information is the participants' name, email addresses, age, and ethnicity. Retention of their name and email address is necessary to contact the participants for inviting them to the in-person VR application session. After this session, there is no need for the retention of this information. Retention of the data on age and ethnicity is necessary only to use to develop the design ideas, these data as it is mentioned in section 3.0 will help me to shape the ideas as close as possible to user's desires.

6.0 If applicable, describe your plans to link the data in this study with data associated with other studies (e.g within a data repository) or with data belonging to another organization:
NA

5.3 Data Confidentiality and Privacy

1.0 * How will confidentiality of the data be maintained? Describe how the identity of participants will be protected both during and after research.
The participants will contact the principal investigator themselves in order to take part in the research, the investigator will send invitation emails using the Blind Carbon Copy (BCC) option. During the in-person VR demo sessions, no information regarding the participant's identity will be collected in the survey. The name and signature of the participants will be asked only for the consent form. The forms will be collected and held in a locked file cabinet in the investigator's office. After five years, all forms will be terminated.

2.0 How will the principal investigator ensure that all study personnel are aware of their responsibilities concerning participants' privacy and the confidentiality of their information?
NA

3.0

External Data Access

*** 3.1 Will identifiable data be transferred or made available to persons or agencies outside the research team?**
○ ○Yes ◉ ◉No

5.4 Data Storage, Retention, and Disposal

1.0 *** Describe how research data will be stored, e.g. digital files, hard copies, audio recordings, other. Specify the physical location and how it will be secured to protect confidentiality and privacy.** *(For example, study documents must be kept in a locked filing cabinet and computer files are encrypted, etc. Write N/A if not applicable to your research)*
Digital files (including notes) will be kept on an encrypted external hard drive. Hard copies will be locked in a filing cabinet in my office at the University.

2.0 *** University policy requires that you keep your data for a minimum of 5 years following completion of the study but there is no limit on data retention. Specify any plans for future use of the data. If the data will become part of a data repository or if this study involves the creation of a research database or registry for future research use, please provide details.** *(Write N/A if not applicable to your research)*
There is no future use planned for the data.

3.0
If you plan to destroy your data, describe when and how this will be done? Indicate your plans for the destruction of the identifiers at the earliest opportunity consistent with the conduct of the research and/or clinical needs:
I will retain digital files (including notes) on an encrypted external hard drive and hard copies in a locked filing cabinet at my place of residence following the completion of my studies at the University. After five years following the completion of my study, I will erase all digital data from the hard drive, and shred all hard copies using a paper shredder in order to destroy the data.

Documentation

Add documents in this section according to the headers. Use Item 11.0 "Other Documents" for any material not specifically mentioned below.

*Sample templates are available in the REMO Home Page in the **Forms and Templates**, or by clicking HERE.*

1.0 **Recruitment Materials:**

Document Name	Version	Date	Description
There are no items to display			

2.0 **Letter of Initial Contact:**

Document Name	Version	Date	Description
Letter of Initial Contact w Letterhead-Revised.pdf	0.02	5/27/2019 2:11 PM	

3.0
Informed Consent / Information Document(s):

3.1 What is the reading level of the Informed Consent Form(s):

3.2 Informed Consent Form(s)/Information Document(s):

Document Name	Version	Date	Description
Survey Informed Consent w Letterhead_Reyhaneh Alizadeh	0.07	6/26/2019 12:00 PM	

4.0 Assent Forms:

Document Name	Version	Date	Description
There are no items to display			

5.0 Questionnaires, Cover Letters, Surveys, Tests, Interview Scripts, etc.:

Document Name	Version	Date	Description
Questionnaire_Rossdale_Powerplant_1st Survey-Revised June 25th.pdf	0.04	6/26/2019 12:01 PM	
Questionnaire_Rossdale_Powerplant_2nd Survey-Revised June 25th.pdf	0.02	6/25/2019 11:56 AM	

6.0 Protocol/Research Proposal:

Document Name	Version	Date	Description
There are no items to display			

7.0 Investigator Brochures/Product Monographs:

Document Name	Version	Date	Description
There are no items to display			

8.0 Health Canada No Objection Letter *(NOL)*:

Document Name	Version	Date	Description
There are no items to display			

9.0 Confidentiality Agreement:

Document Name	Version	Date	Description
There are no items to display			

10.0 Conflict of Interest:

Document Name	Version	Date	Description
There are no items to display			

11.0 Other Documents:

For example, Study Budget, Course Outline, or other documents not mentioned above

Document Name	Version	Date	Description
There are no items to display			

Final Page

You have completed your ethics application! Click "Continue" to go to your study workspace.

This action will NOT SUBMIT the application for review.

Only the Study Investigator can submit an application to the REB by selecting the "SUBMIT STUDY" button in My Activities for this Study ID:Pro00086278.