

**EXPLORING PUBLIC TOILET DESIGN IN WESTERN CULTURE:  
CHALLENGES AND RESPONSES FOR THE TWENTY-FIRST CENTURY**

by

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A Practicum submitted to the Faculty of Graduate Studies of

The University of Manitoba

In partial fulfillment of the requirements of the degree of

MASTER OF INTERIOR DESIGN

Department of Interior Design,

Faculty of Architecture

University of Manitoba,

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# ABSTRACT

Public toilets are the missing link in Western Culture and are the last spaces in architectural projects that are planned, designed, and budgeted, perhaps because they are viewed as unsafe, unhygienic, dirty, stinky, and lacking. This practicum applies theories of disease, toilet privileging, gender-segregation and boundaries articulated by Clara Greed, Barbara Penner and Kathryn Anthony, among others. The project investigates sites at Osborne Station, Pan Am Pool and St. Vital Centre located in Winnipeg, Manitoba. The proposed Osborne Station public toilets are designed to meet the needs of a variety of transit users. The Pan Am Pool requires various zones to meet the requirements for women, families and unisex spaces. The St. Vital Centre public toilets are designed as a place to visit where gender boundaries are blurred unconventionally. The zones blend spatial areas that range from gender-segregated to those that are openly accessible to everyone. This practicum project proposes models for improving the design of public toilets through education and by implementing alternative regulations that should be considered for inclusion into the National Building Code of Canada.



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# PROLOGUE

Inspiration for this project came from several different events taken from my personal life and professional experiences. First, I lived at the Ontario Crippled Children's Center in Toronto, Ontario, in 1975, where I was treated by doctors, attended school, played sports, ate, and slept. I was surrounded by children with all types of disabilities. The children did everything they could to travel around the centre: they skateboarded, used wheelchairs, canes, braces, or anything they made to move from their rooms to school and recreation while screaming for joy, as all children do. At that time, all the toilets at the Ontario Crippled Children's Center were considered wheelchair accessible. I heard about children who had broken their arms after getting them stuck between the grab bars and wall while using the toilets. The centre was an inclusive space where we all used the same facilities: school rooms, gym, cafeteria, hallways, pool, changing area, and sleeping rooms.

I have experienced being in a wheelchair for six weeks for medical reasons and got stuck in a wheelchair stall in the women's washroom at the Toronto International Airport. And in 2002, I developed a serious form of prolapsed disk protrusion in my lower spine called cauda equine syndrome that caused nerve damage within my body. My disability is hidden, except when I use a cane. I have experienced difficulty trying to find a washroom nearby that I can easily access upon entering a building that is not paralyzing and an exhausting experience.

In my professional life, as an interior designer, working in Toronto and Halifax, I have heard many excuses for not including barrier-free toilets or a sufficient number of them in a design project. Some clients claimed that barrier-free washrooms cost too much, or that they had

no disabled clients. On the positive side, in Nova Scotia, I was involved in designing a 30,000 square foot office and warehouse facility for a natural gas company that won the Thibault Award for barrier-free design in 2000.

Other inspirations for this project came from nature, Canadian Broadcast Corporation Radio One programming on public toilets, artwork by Alex Schweder, public toilet historical writing by Barbara Penner, and finally, urban planner Clara Greed's passion to create functional and safe public toilets. This diverse selection of experiences, interests and inspirations has encouraged my passion for making improvements to public toilets in all types of settings.



# CHAPTER 1. INTRODUCTION

This is an interior design practicum project for the University of Manitoba. The purpose of this practicum project, *Exploring Public Toilet Design in Western Culture: Challenges and Responses for the Twenty-First Century*, is to explore strategies for ensuring that inclusive and accessible public toilet designs can be created. I am committed to inclusive and accessible design in the built environment. As an interior designer, my goal and passion have always been to create inclusive spaces for everyone. I also have been involved with accessibility through friends, family, my work as an interior designer, and in my personal life. Many people experience accessibility issues such as having a broken leg or cancer, being transgendered, or caring for aging parents and/or young children.

The photos that I have taken of images from nature can be seen throughout this document because it informs the design by illustrating how moisture responds to the waxy surfaces of the flowers and leaves, allowing water droplets to drip off the plant to prevent mold from growing. These images represent the non-porous materials and finishes selected for each site. The flower petals similarly represent transparency. For example, the transparency of the flower on page one hundred and twenty-two informs the sites by inspiring me to include transparency to provide safety for individuals using public toilets. Furthermore, the nature images for each site represent the colours and palettes selected for them.

## **BIASES & LIMITATIONS**

It is important to state from the beginning that I have been practicing interior design since 1984. Over the years, I have developed some biases from having to deal with previous clients who put their own desires above providing essential rudimentary needs and requirements for individuals, instead of finding positive solutions to create sustainable and safe public toilets. As noted in the prologue, I am also a person with hidden disabilities so the lack of accessibility I have encountered in the environment as well as the frequency with which I have experienced discrimination as a disabled woman have caused me to assume that proposals made to improve public toilet environments will be met with resistance outside of a community of advocates for the disabled. The new designs I am proposing are therefore intended to demonstrate optimum rather than minimum environments in order to appeal as broadly as possible to the general population.

## **RESEARCH METHODOLOGY**

The process of developing the public toilets was analysed using theory, literature, precedents, and historical data. Explorations of the sites were conducted through visual observation, physical field survey, and photographic studies. This analysis was done in order to understand the relationship between the sites, existing buildings and surrounding urban environment. The precedents provide design principles, graphics, and conceptions to inform the three sites.

The research methodology utilized in this practicum was literary investigation and analyses. The analysis of literature was used to build theoretical complexity. The areas of research were potty privileging, gender geography, and society's reaction to bodily waste. The completed research was then divided into the three themes of "toilet privileging," "invisible and physical boundaries," and "controlling disease and dirt."

## **CHAPTER SUMMARIES**

### CHAPTER 1

Chapter 1 introduces the practicum topic and gives an outline of research and methodology of the project. It outlines how the practicum objectives, benefits and purpose of project will inform the interior design industry and create better design of public toilets.

### CHAPTER 2

Chapter 2 explores the history of public toilets and provides an overview of the theories, influences, and ideas about their design development and the emergence of an understanding of the concept of hygiene. I examine the ideas from urban planner Clara Greed and the theorists such as Sheila L. Cavanagh, Barbara Penner, Kathy Anthony and Meghan Dufresne. The social aspects of public toilet spaces are examined from the period of time when toilet privileging was the norm to the era when legislation guaranteeing the reform of public toilets was introduced. Toilet privileging recognizes the discrimination that exists in the number of toilets provided for women verses men in

our Western society. Similarly public toilets are especially lacking for women, the transgendered, and families. The physical and invisible boundaries within and around public toilet spaces are surveyed and solutions for breaking down these boundaries and allowing everyone to use the washroom without fear of discrimination especially with regard to gender are considered. Public toilet zones need to change to conform with shifting Western ideas and our present understanding of disease.

### CHAPTER 3

I have selected five successful, functional and constructed precedents that influence the proposed public toilet sites. The precedents are Hasuikabori designed by, Akira Watanabe Architect and Associates + Masahiro Ikeda Co., Ltd; Westbourne Grove Public Toilets, architects CZWG; POINTWC designer Nina Virus, Studio5491; Chimo Aquatic and Fitness Centre, architects Hughes Condon Marler Architects, Samuel Brighthouse Elementary School, architects Perkins + Will. From the investigation of these thriving designs, ideas are incorporated into my three proposed sites.

### CHAPTER 4

This chapter presents contextual studies of the multi-setting public toilet sites at Osborne Station, Pan Am Pool, and St. Vital Centre: three sites located in Winnipeg, Manitoba. The Osborne Station is a rapid transit bus that travels directly to downtown Winnipeg, returns back through Osborne Station and the Fort Rouge Rails. Eventually, rapid transit will extend directly to the University of Manitoba with a

corresponding higher number of transit users. Pan Am Pool is known nationally and internationally for aqua training and events such as swimming, synchronized swimming, water polo and diving. The facility is the only recognized international standard pool between Calgary, Alberta and Toronto, Ontario. St. Vital Centre is a shopping mall that opened in 1979. It has 160 stores and is located in south Winnipeg. This chapter contains the design programme, design adjacency matrix, and an outline of the spatial relationships needed for each site. There are interior and exterior photos of the surrounding sites. The three design proposals, including floor plans, reflected ceiling plans, finishes, renderings, and elevations, are articulated here. And lastly, considerations for future research and the next possible steps of the public toilets project are suggested.

## APPENDIX

The appendix reviews the requirements in Section 3 of the National Building Code of Canada and cubicle conditions required for children. Finally interior design considerations when designing for various users, places, environments, design conditions and design solutions.

## 1.2 PRACTICUM OBJECTIVES

The purpose of this practicum is to view public toilets<sup>1</sup> in a different light by addressing toilet privileging, the role of invisible and physical boundaries, and controlling disease and dirt. "Toilet Privileging" is a term used when there is discrimination against parts of our society, either a group or an individual using a public toilet.<sup>2</sup> This relates particularly to women, class, gender, and people's levels of ability. This project will address society's reaction to bodily waste in order to create inclusive, easy to clean, sustainable public washrooms with low-cost interior finishes and materials that help to prevent vandalism. I propose to design interiors that provide dignity, health, and respect for everyone. For this interior design practicum, I have designed three proposed sites: St. Vital Centre, the Pan Am Pool, and the new Osborne Station in Winnipeg, Manitoba.

The designs will explore better ways to develop inclusive public lavatories, recognizing that the design of public toilet spaces must be given as much importance and receive the same critical analysis as the overall design of any interior. As a designer with many years of experience, I have observed that public lavatories are often the last areas planned and that they are allocated only a small budget. Some builders and clients want to give little or no space, or budget a minimum amount to planning public toilets. These limitations contribute to the fact that the majority of public toilets are poorly designed, poorly maintained, and neglected.

## **BENEFITS OF PROJECT**

The benefits of this project are to give people options for designed environments with improved basic sanitation that will, in turn lead to a decrease public urination, defecation and disease, and will provide safe and clean water in public toilets. Strategies for approaching acceptable public toilet design in the twenty-first century are to provide accommodations for a diverse range of individuals that includes the transgendered, the physically disabled, people with medical conditions, the aging population, parents, families, children, and infants. These strategies also make spaces available for strollers, wheelchairs, luggage, and clothing. Canada is a multi-cultural country that requires private squat toilets and sinks for religious, cultural, and cleansing purposes in order to meet the true needs of its citizens.

Public toilet design for the twenty-first century necessitates only one main entrance for everyone to enter, in order to eliminate gender segregation. At the main entry of public washrooms, an attendant should be provided for security and maintenance and all public toilets should include a twenty-four-hour unisex universal/barrier-free private toilet. Located past the entry of the public washrooms, there should be unisex universal toilet zones for families and transgendered individuals. Child-sized toilets and private infant change areas with soap, clean water, and bins for used diapers should be provided. A private, clean breastfeeding zone is desirable, with an optional separate, external breastfeeding area located elsewhere within the building. Separate women's and men's zones are vital to provide privacy in cubicles and urinals. For better hygiene, sink zones are essential at the main entrance, exit, men's and women's areas, and unisex zones.

## PROJECT CONTRIBUTION TO INTERIOR DESIGN PROFESSION & LEARNING OBJECTIVES

Presently, there is a lack of written information about public toilets beyond their aesthetic statements and environmental efficiencies. Clara Greed is the leading researcher on public toilets, with her book *Inclusive Urban Design: Public Toilets*. Other books are:

- *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination*, by Sheila L. Cavanagh
- *Public Restrooms and the Politics of Sharing Toilet*, edited by Harvey Molotch and Laura Noren
- *Ladies and Gents: Public Toilets and Gender*, edited by Olga Gershenson and Barbara Penner

Beyond these books, there is little current published information on public toilets. This practicum will contribute to the interior design body of knowledge by looking at better ways to design public washrooms, recognizing that the public toilet space design must be accorded as much importance and critical analysis as the overall design of any interior.

## PURPOSE

Body waste is a reality. Walking and biking paths, as well as public transit systems, are being planned for our cities, but planning for public toilets is inadequate in urban development. There are concerns about safety, drugs, crime, sexual encounters, violence, graffiti, hygiene, and the cost of operating public toilets. As a result, there is a dearth of public toilets within Winnipeg and throughout Canada. Public lavatories are a subject people do not like to discuss, and they are the last public segregated space in Western culture.<sup>3</sup> The purpose of this project is to recognize and respond to the lack of public toilets, to design better toilets, and to give individuals choices. The designs will

create functional, easy- to-use, safe, hygienic, economical, and beautiful public toilets that will also to provide respect and dignity in keeping with individuals' basic human needs.



---

## ENDNOTES

<sup>1</sup> For the purposes of this practicum, public toilets are defined as:

Public toilets here are defined as both the traditional “on-street” public toilets (run by the local authority) and “off-street” toilets (run by private-sector providers) to which the general public has right of access (e.g., in shopping malls and railway stations).

Clara Greed, “The Role of the Public Toilet in Civic Life” in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 36(Philadelphia: Temple University Press, 2009); BTA, *Better Public Toilets: A Providers’ Guide to the Provision and Management of “Away from Home” Toilets*, (Winchester: British Toilet Association, 2001).

<sup>2</sup> Anthony and Dufresne, “Potty Privileging in Perspective Design” in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 48 (Philadelphia: Temple University Press, 2009).

<sup>3</sup> Olga Gershenson and Barbara Penner, Introduction: The Private Life of Public Conveniences in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 9 (BTA 2001)(Philadelphia: Temple University Press, 2009).

## **CHAPTER 2 . LITERATURE REVIEW**

## 2.1 THE HISTORY OF PUBLIC TOILETS AND SEWAGE

By studying the history of public toilets and sewage, we begin to value the need for better toilet systems. Public toilets need to be seen as an integral part of a city's architecture.<sup>1</sup> In addition to being inclusive and accessible, the design must reflect the urban environment.<sup>2</sup> Instead of being demolished or closed, old public toilets need to be renewed and revitalized to meet current needs. These renewed facilities must serve the aging population, women, children, families, and transgender individuals.

In this section, I will briefly discuss the beginning of water drainage, sewers, and public latrines in the Roman Empire and Pompeii and during the Middle Ages, when open urination and defecation were the norm, and when the streets and rivers were constantly clogged with sewage. I will also discuss the nineteenth century, which saw the emergence of modesty and hygiene, and the return of underground sewage and drainage. Next, I will outline the development of the first modern toilet and the building of underground sewage systems throughout the twentieth century, including trends that saw increasing closure of public toilets due to cost, vandalism, drugs, prostitution, sex, and violence. Even the most recently constructed public toilets are not well designed or managed. Also, the trend to reduce the number of public toilets today in Canada, the United States, and Great Britain is creating conditions that existed in previous eras.<sup>3</sup>

## THE ROMAN EMPIRE AND POMPEII

Although domestic toilets existed, public toilets were not evident in civilizations that preceded the Roman Empire.<sup>4</sup> In the Roman Empire, public latrines were part of the urban landscape and were not gender-segregated spaces; nevertheless, damaged evidence of male frescos can be found on the walls of some ruins. The latrine entrances were off the main street, and the latrines were visited regularly. There were no divisions of space, as they are today, so people sat close together on the marble slabs.<sup>5</sup> Clara Greed, urban planner, believes that Cloacina, a Roman goddess believed to have ruled over the sewer drains, would find it perplexing to know that individuals today want concealment from one another while visiting the toilet. Also, Zena Kamash, a research assistant in European archaeology, questions the visual privacy of individuals because if the latrine was dark, you could only see the shadow of the person next to you. Similarly, Kamash questions whether ancient latrine spaces were open to allow air ventilation to ensure easy movement within the space.<sup>6</sup>

The latrines were designed such that three walls of the room were dedicated for seating on an open hole, with seating room for approximately 12 to 15 people. Individuals sat on keyhole-shaped openings in white marble slabs or wooden seats that were open below to eliminate waste into a gutter water sewer system, see figure 1.<sup>7</sup> The drains below carried fresh water to clean the gutter, which was made deeper as more seats were installed. In front of the seating area on the floor was a 10 cm gutter running with fresh water. It is thought that a sponge on a stick (communal toilet paper) was rinsed in this gutter.<sup>8</sup> The walls were white marble, usually with a small fountain in the corner. These latrines reached their height of popularity in the second century AD, just when public buildings and aqueducts were



Figure 1.  
15

constructed. Latrines were located close to bathhouses for easy access to the city's aqueducts, which provided water to fountains, sinks, and drains located under the slabs of marble.<sup>9</sup>

Kamash discusses the possible noises, acoustics, running water sounds, nakedness, and odors in latrines. Because there were no stench traps found in the remains it is concluded that the latrines would have been foul smelling. Stench or air traps do not allow foul gases or smells to return into the built environment. The sounds of water, human bodily noises and the running water below in the sewers would have reflected off the hard marble surfaces. Kamash also describes the uncomfortable feeling of sitting on a white marble slab. The latrines were dank; therefore the slabs would have fluids from previous users deposited on the slabs.<sup>10</sup>

Katherine Ashenburg, author, educator and lecturer, writes that during the Roman Empire, bathing at bathhouse was socially acceptable.<sup>11</sup> The baths were vast public buildings that commonly housed libraries, places of business, and places to make oneself beautiful. Also, the baths were frequented by Romans who did not have running water or toilets in their homes. Baths were places where all the senses were used in a tactile environment, where one could smell perfume, eat food, and enjoy viewing the frescos on the marble walls.<sup>12</sup>

Hobson discusses some of the Romans' hygiene practices such as ridding infested clothing of lice. Windows in some domestic single-user latrines provided air ventilation. Similarly, to mask foul odors, flowers or sweet-smelling herbs were placed in the latrines. Roman men

openly urinated in the streets.<sup>13</sup> Smells were stronger from urine and defecation in the summer because of the humid weather and poor air circulation. As a result, cesspits were used to contain the smells under the sidewalk. A cesspit is a sunken basin that receives waste from a toilet or a kitchen allows fluid to leave, while leaving the solid waste behind. In homes, these cesspits had just a wooden cover that allowed the odor to drift out of containment.<sup>14</sup>

On August 24, AD 79, the city of Pompeii was buried under five meters of volcanic matter from Mount Vesuvius. The volcanic matter preserved the town as it was left on that day nearly 2000 years ago.<sup>15</sup> Archeological excavations have since shown that there were no underground sewer systems connected to domestic homes in Pompeii. Domestic toilets were located near the kitchen or servant areas on the second floor, with only a small window for air circulation. Waste from the home drained into a cesspit that emptied below walkways in the roads. Other cesspits were located deep in the home, where the kitchens and latrines were located. Public block latrines were found in commercial settings such as bars, shops, and baths. The toilet blocks were well decorated with extravagant mosaic floors, fountains, and white marble walls. The toilets were side by side on long marble slabs, away from the street, with a water sewer system below.<sup>16</sup> Along the streets of Pompeii, there were also small individual latrines used by women. In addition to a bath house, there were also bath latrines, which featured toilets with many seats lined up side by side with no division of spaces.<sup>17</sup>

The fall of the Roman Empire, Christianity, and the Black Plague ended the popularity of Roman baths. In the Middle Ages, water came to be seen as the source of disease and death. People were afraid of water and hygiene, and they saw no connection between the lack of cleanliness and disease.<sup>18</sup> In fact personal and social hygiene were not practised again until the mid-nineteenth century.<sup>19</sup>

Northern European practices related to toilets differed as they were directly related to the location of rivers and other waterways. For instance, in London, England, there were public communal toilets situated above major waterways during the medieval ages.<sup>20</sup> People used communal bath houses located over rivers, where they defecated into increasingly polluted river systems. A number of modest public latrines accommodated up to thirteen people, while other much larger facilities such as one on Greenwich Street called Whittington's Longhouse (named after the Mayor in 1480) could accommodate up to eighty-four persons at once. Rivers such as the River Fleet in London were known to become clogged with sewage, and Parliament knew the Thames River by its rancid smell.<sup>21</sup> There was an abundance of accessible communal toilets.<sup>22</sup> Communal public toilets existed in Europe and the U.K. until 1739, when a Paris restaurant introduced the first segregated male and female washrooms.<sup>23</sup> While men's urinals were located in public toilets throughout that city, there were few facilities for women, who were expected to spend their time at home.<sup>24</sup>

This lack of public washrooms prompted women to carry compact female urinettes that were made of glass, rawhide, or porcelain.<sup>25</sup> Also, they were taught to 'hold and control' their bladder and bowels.<sup>26</sup> Eventually, in the 19<sup>th</sup> century, women's public toilets were made available

in order to bring shopping business into the city. Despite the fact that public washrooms were available, men and women continued to urinate in the streets. Cities continued to be overwhelmed with waste and all of the hygiene, health and environmental consequences caused by its presence. In domestic homes, chamber pots were emptied from windows to the streets below.<sup>27</sup> This practice necessitated the construction of overhangs to protect the people walking in the streets.

## **THE NINETEENTH CENTURY**

During the Industrial Revolution, in London, England and Paris, France, there were serious problems associated with managing increasing amounts of human waste. In domestic homes, waste was collected in the yard and sewage piled up outside homes and in gardens, generating more cesspools.<sup>28</sup> Upper-class homes had trap doors that stored human waste underground for the so-called night men to collect each evening. This waste was called 'night soil', and was sold as agricultural fertilizer for profit. In some colonial cities, night soil was still being collected after World War II. At this time, there was not only a fear of disease, but also a fear of death from this sewage, resulting in attempts made to manage it. Women, men, and children sometimes fell into the cesspits or through rotted floors, suffocating in their sewage. Plumbers also died while trying to design the water flush mechanisms for water closets.<sup>29</sup>

After the mid-nineteenth century, the Industrial Revolution generated overpopulation in the cities, turning the streets and rivers in and around them into cesspools of sewage, foul odors, and undrinkable water. Cities desperately needed sewage systems.<sup>30</sup> By the summer of

1858, the English Parliament was shut down because of the sewage odour from the Thames River. As a result of this closure, drastic measures were taken to design and build underground sewer systems. France followed suite in the 19<sup>th</sup> century by designing sewers under the streets of Paris.<sup>31</sup>

The unclean drinking water that resulted from a lack of sewage control brought serious cholera outbreaks and other deadly infections to European cities.<sup>32</sup> The threat of disease, especially cholera, pushed sanitation issues to the forefront to rid Europe's city streets and cesspits of human waste.<sup>33</sup> This underground sewer movement changed the ways in which city planning regulators intervened. During this time, sanitary engineer Joseph Bazalgette developed an underground sewage system in London, England, and the Metropolitan Water Act of 1872 determined a water-based sewer system. Urban councils were elected to collect taxes in order to improve the drainage and sewage system needed for disease control, and wider back alleyways were constructed to allow for air ventilation and night soil collection. In addition, well-known architects began designing lavish fixtures, fittings, and public toilets built from premium stone.<sup>34</sup> As part of the Industrial Revolution, flushing toilets also represented advancements in science and technology. Also, during the 1850's in the United States, underground public water systems were being built in Philadelphia, New York, Boston and Chicago. By the 1870's, New York City had started building an underground sewer system. Consequently, death rates began to fall because of greater access to the sewer systems and clean water.<sup>35</sup>

The Victorian era brought changes to the social culture of Britain in the areas of hygiene and modesty. Germ theory, brought forth near the end of this period, provided evidence that disease did not result from foul air, but from pathogen bacteria.<sup>36</sup> The city planners and sanitary engineers established gender-segregated public toilets because they finally understood the relationship between water, sewage and disease. This transformation in sanitation was tied to gender, privacy, and divided spaces. Because the Victorian Era had strict modesty regulations, spaces were divided into politely named places labeled 'Ladies' and 'Gentlemen.'<sup>37</sup> Within these spaces came more divisions, with privacy for individuals in the form of stalls or cubicles.

## **THE EVOLUTION OF MODERN PUBLIC TOILETS**

In 1596, the first flushing toilet was invented by John Harrington, who was well ahead of his time.<sup>38</sup> It wasn't until two hundred years later that water flush toilets with water drainage sewer systems finally arrived. The arrival of early nineteenth-century urban improvements began to change the urban landscape. Between 1790 and the 1820's, as well as beautifying cities with exterior lights to illuminate the streets and boulevards, city planners initiated the building of public waterworks in Philadelphia, United States (US), and London, England.

The Victorian Age brought improved sanitation standards and toilet technology. George Jennings, a British designer and producer of toilets, provided the first flushing public toilets at the Crystal Palace Exhibition in 1851. The 1872 Act provided Sir Thomas Crapper with a government-approved, water-based toilet upon which he based his toilet manufacturing company.<sup>39</sup> The sewage system was unable to cope

with the overload, however, leading to the construction of more underground sewers. To celebrate the opening of the Paris sewers, pay toilets were provided for the public at the 1898 Great Exposition, causing long line-ups.<sup>40</sup>

After the introduction of flushing toilets and the new underground sewers, Victorian decorative public toilets became popular. These public toilets also became known as a place for such activities as sexual rendezvous. The authorities changed the public toilets to simple white facilities to discourage such activities, and in doing so, they created a cleaner and more cost-effective environment similar to that of hospitals. The surfaces of these newly manufactured fixtures for bathrooms changed from soft, warm, decorated designs to hard, cold, white surfaces. Likewise, materials used as finishes for washroom surfaces shifted from decorative dark wood, which is very porous, to hard surfaces such as white porcelain-enamelled fixtures.<sup>41</sup> Wood absorbed moisture - producing bacteria, whereas white vitreous china does not. However, china does show dirt, dust, urine and feces immediately and provided a much more accurate sense of the hygiene level of the toilet. Fortunately, white porcelain surfaces are easy to wash, complying with the concern for cleanliness that began at the end nineteenth century.<sup>42</sup>

The original water tanks for toilets were made of wood and located high up on a wall. They were lined with sheet metal that eventually rusted and leaked.<sup>43</sup> Significant changes were made to the design of flush toilets after the 1920's in America. As technology changed, the tanks were lowered from the upper walls to the back of the toilet and were made of porcelain enameled cast-iron or vitreous china. In the early

1920's, the water tank appeared at the back of the oval bowl, creating the one piece modern toilet. In addition, the toilet bowl changed from a circle to an oval, and water-flush technology changed to siphon-jet. With the siphon-jet, centrifugal force produced enough power to fully empty the toilet bowl.<sup>44</sup>

In 1936, Britain still required payment for the use of all public toilets except urinals.<sup>45</sup> In other words, women always had to pay to use the toilet while men did not. To control payment, the city used turnstiles up until the 1950's. At this time, they became illegal because these physical barriers limited access to public toilets by wheelchairs, strollers, and larger-sized individuals could not get through them. Also, others were not strong enough to push through the turnstiles and were therefore unable to use the facilities. Furthermore, children did not always carry money with them to use the facilities.<sup>46</sup>

After World War II concrete and glass block were used to build public toilets.<sup>47</sup> These materials were used to create practical and economic public toilets. The facilities were built under bridges or hidden by trees and bushes, and were accessible only by stairs. Due to neglect, these facilities became grey, rusted, and stained with urine and fecal matter. Consequently, the washrooms were seldom used, leading to increased vandalism, drug trafficking, violence, assault, sexual encounters, and sexual assaults at these facilities. Because they were not being monitored or maintained, they became unsafe, unhygienic, and unappealing, causing them to be closed.

In the 1970's, more public toilets were closed by the Thatcher government. During the Year 2000 celebrations, the majority of public toilets were closed in downtown London. Private companies and organizations such as The Institute of Waste Management (IWM), engineers, and tourism documented the closing of public toilets for their archives.<sup>48</sup> The London Assembly estimated that in 2006 40% of London's public toilets had closed since 1999.<sup>49</sup> On February 15, 2011, CBC (Canadian Broadcasting Corporation), Radio One, *As It Happens* covered the story of seventeen Manchester public toilets that were closed by the city.<sup>50</sup> Britain's Toilet Association (BTA), which was formed in 1996 to improve public toilets, stated that this was only the beginning of more closures to come.<sup>51</sup> As a result, the London 2012 Olympics will provide fewer public toilets to serve the public. Also, due to the closure of public toilets, there is now a problem in London with males urinating on lawns, gardens, back streets and in retail doorways in London today. According to researcher Clara Greed, this shortage of public toilets is unacceptable; as a twenty-four-hour inclusive city, London requires restrooms that are always open to the public.<sup>52</sup>

Another concern is that the neglect of London's sewer system resulted in waterborne diseases not seen since the nineteenth century among London's population. In 1997, the Royal Society of Chemistry in London reported that the decaying underground sewer structure was the cause of *Cryptosporidium parvum* (diarrhoea). Similarly, in the United States and Europe, flushing toilets, and sewer systems, both of which, use large quantities of water, have not been updated or redesigned in the last century.

## TOILET AND SEWAGE TECHNOLOGY IN THE TWENTY-FIRST CENTURY

There are new toilet technologies developing in the twenty-first century due to concern over the global shortage of fresh, clean water.

Because water has become a commodity, Western toilets are being designed to reduce water consumption. Older model standard toilets consume between 4 to 8 gallons of water per flush (gpf), The United States government became concerned about this over-consumption of clean water.<sup>53</sup> As a result in 1994, the Energy Policy Act (EPA) brought in legislation limiting the maximum toilet flush to 1.6 gpf. Although high-efficiency toilets save 30% water, initially there were problems with solid waste not flushing at 1.6 gpf. TOTO, a Japanese manufacturer, increased the flush valve from 2" to 3", thus improving the flow of water and decreasing blockage. Also, the dual-flush toilet became popular at this time because it gives 1.6 gpf for solid waste and .8 to 1.1 gpf for fluid and toilet paper.<sup>54</sup>

Another recent invention is the electronic motion sensor toilet, which flushes when it detects the motion of users leaving the toilet.

However, this technology can waste water by mis-reading the signal and flushing unexpectedly. Composting toilets use no water, but are not popular because of potential odors and the need for ongoing maintenance. These toilets are most suitable for parks, septic systems, and rest stations. Composting toilets produce odorless fertilizer that is used for green roofs, landscaping and fertilizer. For instance, a composting toilet is installed and used at the Mountain Equipment Co-op in downtown Winnipeg, Manitoba and it provides fertilizer for local green spaces.

Urinals have different flow rates, ranging from 1.09 gpf to 0 gpf for those that are waterless. The porcelain or acrylic waterless urinals use a replaceable cartilage that creates a liquid seal that is lighter than urine. The urine passes through the cartilage and flows into the sewage pipe. Another new technology improving water usage and hygiene in public washrooms is aerated faucets. These can be automated, with touch-less controls that use less water and are more hygienic.<sup>55</sup>

Beyond the incorporation of these new types of equipment in public toilets, water can also be conserved by using technology to save waste water (grey water or black water), and sewage that can be treated by living machines within a building. Living machines clean the water through a wetlands ecosystem process that exists as planters and landscape elements inside and outside of buildings. The water that is recycled using such a process can be re-used for flushing toilets, for irrigating plants and gardens, in fountains, and as part of cooling towers.<sup>56</sup>

Western culture needs to learn from the past to help meet current requirements. Public toilets are in decline. Clara Greed believes that because of lack of public toilets and the decay of sewer systems, cholera, typhoid and other diseases will reappear, as they did in the nineteenth century.<sup>57</sup> Will our streets and rivers become clogged with sewage as they did in the Middle Ages because of the dearth of public toilets in our urban environment? Eventually, the cost of not having public toilets will manifest itself in maintenance costs, the influence on surrounding businesses, and the loss of people's dignity.

## 2.2 HISTORY OF THE SOCIAL ASPECT OF PUBLIC TOILETS

### COMMUNAL TO GENDER-SEGREGATED PUBLIC TOILETS

To understand today's lack of public toilets for women and the issues surrounding gender segregation in toilets, it is necessary to consider the historic development of these facilities. In the mid-eighteenth century in Western Europe, views about whether public toilets should be communal and mixed-gender facilities or gender-segregated ones began to change.<sup>58</sup> Starting at this time, public toilet designs in London and Paris also separated individuals by caste and sexual orientation.<sup>59</sup> In the same period, the Industrial Revolution introduced manufacturing technologies that changed not only the economy, but also the social and cultural structure of Western Europe. Newly developed machinery changed all aspects of life from architecture, transportation, technology, to agriculture by attracting vast numbers of people into cities, where factories were built, and by employing lower class men, women, and children. These factories produced objects such as textiles, kitchen appliances, fixtures, and even toilets. Mass production changed every part of daily life for the lower-class men, women, and children who worked together in factories. These economic changes reinforced the division and separation of domains between members of different social classes.<sup>60</sup>

Despite the fact that women and children were increasingly in the public realm the nineteenth century, public washrooms were built mostly for men, and women were discouraged from using them. In September, 1900, the 'respectable community' of Camden Town, England, greatly opposed a proposal to the Vestrymen at the London Vestry of St. Pancras to build the Parker Street lavatory for women at the busy

intersection of Camden and High Street.<sup>61</sup> This opposition stemmed from a patriarchal desire to protect women from disease. Patriarchal society dictated that respectable women should remain in private domestic spaces. English Victorian society at that time viewed women in their domestic space as an attempt to limit them spatially and to establish social control over them by men.<sup>62</sup> Legislators also believed that a woman's place was in the home, and limiting access to public washrooms assisted to restrict women's movement in the public sphere.<sup>63</sup>

Certain assumptions were made about Victorian women who used public washrooms. Because decent Victorian women were not to be seen in public and were not admitted to many amenities in public spaces, a woman in public was seen as a threat to patriarchal authority because she represented an erotic quest, and was labeled a *femme fatale*,<sup>64</sup> 'luring,' or 'fallen.'<sup>65</sup> Furthermore, if a Victorian woman was seen using a public restroom, it was assumed she was a prostitute, as a restroom for women had the potential of a mingling of caste and was seen as morally incorrect.<sup>66</sup>

## TOILET DESIGN FOR WOMEN

Victorian women's bodies required concealment and discreetness according to the social mores of the time.<sup>67</sup> In fact, it was a violation to a Victorian woman for any part of her body to be seen while using the washroom or engaging in any intimate activity. For this reason, the design of the washroom stall evolved to require full doors and floor-to-ceiling partitions at this time to further separate women so that the female body was never in view. Furthermore, all facilities were built underground without windows, making women feel unwanted, morally

demoralized, and unsafe. The severe philosophy of gender inferiority and separation espoused by patriarchal authority during the nineteenth century demanded both the visual concealment of the female body in public spaces and spatial segregation.<sup>68</sup>

In 1879 England, James Stevenson proposed that women's washrooms also be split into two spaces according to class.<sup>69</sup> This proposal separated classes of women to avoid mingling between upper-class women and workers such as flower-girls and prostitutes. One segregated lavatory would have a separate entrance, would charge upper class women a fee for comforts, and feature elaborate designs. The second public toilet, intended for working-class women would be free and would provide only the bare essentials. Although favored by some, this plan of separating women's washrooms by class was never actually realized.

### **SEPARATE SPHERE IDEOLOGIES**

Even though differences between men and women had been studied for a long time, it was not until the late 1800's that science proved that men and women have different toileting needs. The new social sciences such as Anthropology, Psychology, and Sociology supported scientific proof that men and women were different in body structure, function, and nature.<sup>70</sup> These sciences added weight to the separate-spheres ideology that recommended that women be restricted to domestic spaces.<sup>71</sup> Also, men and women were defined in public by their social roles and decorum. The separate-spheres ideology reinforced the patriarchal ideology of separating men and women in public toilets

to protect mothers, wives, sisters, and children from disease and death due to exposure to members of the lower class such as prostitutes, criminals, and transient individuals.<sup>72</sup>

Understanding the geography of sex-segregation and separate-spheres ideology of the late nineteenth century can help interior designers and architects create more approachable and inclusive architectural spaces today.<sup>73</sup> City planners and architects began designing separate public architectural spaces for women after 1850, when society became more apprehensive and anxious because women began to be more commonly found in the public realm. Public spaces and washrooms became gender segregated because planners and architects believed and wanted to protect their wives, mothers, grandmothers, and sisters from dying of disease. Similarly, the authorities did not want classes mingling together. As a result, interiors of the women's public spaces began as a mirror image of the private domestic rooms.<sup>74</sup> These decorative public spaces for women were built separate and far from public spaces for men.<sup>75</sup> For example, legislators in the United States decided that women needed to be separated from men in public spaces such as retail stores, libraries, and on trains. As a result, the ladies' railroad car was located at the end of the train, furthest from the engine, to protect women from train crashes and men, and to provide ladies with 'fresher air'. Ladies' reading rooms in libraries were stocked only with fashion and domestic journals and books. Furnished reading rooms usually had a fireplace, furniture, broadloom carpet, and curtains that mirrored domestic tastes. Also, the women's washrooms were in separate, inconspicuous spaces that were not seen from other places in the library.<sup>76</sup>

Despite the limited creation of gendered public spaces, Victorian women were still largely restricted in their movements. If a female were to venture from her home to shop, it would be very difficult for her to find a public toilet. Consequently, women could only shop for short periods of time before returning home.<sup>77</sup> In addition, if a woman travelled by private carriage to a retail shop, she often stored a chamber-pot in the carriage, should she need to eliminate. Women without a carriage had to use the back alleys, where modesty signs were erected. Because women's long skirts reached the ground and their undergarments opened at the crotch, it was possible for them to relieve themselves while still maintaining privacy. By the 1860's, retail stores and restaurants in London, England, began to provide women with public toilets to attract and increase business.<sup>78</sup> These facilities were aimed at paying patrons, however, and not at employed women walking to and from work.

The accommodation of women's leisure in public was not the only reason to build public washrooms for them. The combination of the growth of the Industrial Revolution, which resulted in more women working in cities than ever before, in combination with fears of the spread of disease, led to an increased presence of segregated washrooms.<sup>79</sup> In the United States, as early as 1852, factories developed health and safety legislation for the supposed protection of women's delicate procreative bodies. By 1870, factory health and sanitation laws were regulated because sewers were developed, bringing plumbing and city water indoors. Gender-segregated public toilets began with women working in factories beside men. Lawmakers decided women required separate washrooms from the male toilets in the factories because, in

addition to concerns about concealment, there was fear that all men were sexual predators and that women's bodies needed protection.<sup>80</sup> Consequently, gender-segregated washroom laws came into effect for factory workers.<sup>81</sup>

### **GENDERED SPACE AND THE TOILET**

From the beginning of these modern public washroom spaces, women's toilets were smaller than men's. The proposed 1898 public lavatory floor plan, located in Bristol, United Kingdom, designed by the architect R. Stephen Ayling, demonstrated less space and fewer toilets for women.<sup>82</sup> The facility had four cubicles with a toilet, three urinettes, one sink, and an attendant. Urinettes are urinals designed for women.<sup>83</sup> Unlike women's facilities, gentlemen's washrooms were easier to find and access. Their facilities were lavish, with many urinals and toilets. For example, the men had seven cubicles with toilets, fifteen urinals, with two sinks in the center, and an attendant. Also, men did not pay to use the urinals and only paid a penny to use the toilet. Nevertheless, there were so many toilets available that men's public lavatories were profitable. For this reason, even more toilets and urinals were provided for men than for women.<sup>84</sup>

Gender-segregation of public washrooms still continues today. In 1887, the first segregated public toilet in Massachusetts was legislated for women factory workers to have separate public toilets from the men's washrooms.<sup>85</sup> During the 1950's in the United States, the Civil Rights Movement led to the Civil Rights Act in 1964. This act was to stop discrimination of African-Americans, women, and persons with disabilities. Voting rights for women in the U.S. and Canada began in the early twentieth century. Feminism began in 1960's in the U.S., which continued and encouraged social equality for women. Gendered public toilets are still seen today in shopping centers such as St. Vital Center and

recreational facilities such as the Pan Am Pool.

In conclusion, the separate sphere ideology and disease reinforced the need for gender-segregated spaces. In the Victorian times, women were separated; they were divided by class, social roles and decorum. Public toilets became gender-segregated spaces to protect women and children from sickness. Women's washrooms were separated from the men's to give them privacy and the space they required. Their washrooms cost money to use, and were small and difficult to find.

### **2.3 HISTORY OF CONTROLLING DISEASE AND DIRT**

Modern gender-segregated public toilets were developed because of people's fear of contagious diseases and an increase in the number of women working in factories.<sup>86</sup> As the Industrial Revolution evolved in the nineteenth century, the high rate of deaths from disease in Europe concerned urban planners in London, England and Paris, France. These planners regulated public toilets designed in the mid-nineteenth century, dividing and partitioning their public space for health and safety reasons. During the Industrial Revolution, sewer systems and clean water were desperately needed, and were interwoven with what Elizabeth Wilson, urban theorist, describes as "cleanliness, disorder and filth."<sup>87</sup> But today, these bases for gender-segregated public toilets no longer exist. Societies in North America, Britain, and Europe have relatively clean water and adequate underground sewers to prevent most diseases. In this section, I will discuss the diseases caused by a

lack of sanitation in the past and their influence on the development of public toilet spaces as an approach to preventing disease and high mortality rates.

In the fourteenth century, the Bubonic Plague, or "The Black Death", killed twenty-five million Europeans.<sup>88</sup> As a result, society feared bathhouses that had public toilets because authorities told them that the warm water opened the pores of their skin and allowed disease to enter their bodies. Consequently, bath facilities were shut down. Individuals did not realize that the bubonic plague was carried by fleas on rats and transferred to individuals regardless of their use of public bathhouses. For this reason people stopped bathing regularly until the mid-eighteenth century because bathing was understood to impair one's well-being.<sup>89</sup>

Despite Europeans' continuing refusal to bathe, the plague, typhus, and cholera were never eradicated, leading to increasing numbers of deaths in Europe.<sup>90</sup> England experienced a high number of deaths from disease in 1833 and again in 1848. The Victorians believed that disease was caused by immoral standards, over-crowding, poverty, and slum living. However, by the mid-nineteenth century, a number of scientists were beginning to discover bacteria that caused disease.<sup>91</sup> For example, science demonstrated that rotten food, drinking water contaminated with sewage, or open cesspools caused vibrio cholera, an intestinal infection,<sup>92</sup> and Louis Pasteur and Joseph Lister discovered an aspect of germ theory in the 1880's that confirmed the presence of certain waterborne diseases. In 1882, German

microbiologist, Robert Koch discovered the tubercle bacillus, originally believed to be a water-borne disease.<sup>93</sup> These scientists' 'germ theories' began a movement that supported the provision of clean water and the construction of underground sewers.

Siegfried Giedion encouraged bathing as a way to revitalize oneself and as a remedy for disease. Cleaning one's self was not seen as a trend until science confirmed the benefits of washing the body to prevent disease. In the early 1800's, members of upper class society began to clean themselves for the sake of appearances. By the end of the nineteenth century, people were encouraged to wash themselves as part of the public health movement.<sup>94</sup>

One of the most serious diseases at this time was tuberculosis. Architects decided that the key to curing and preventing tuberculosis was to change the characteristics of buildings to allow more natural light and fresh air to enter them. Around 1880, the medical profession said that to become healthy, the lungs required well-ventilated spaces and natural light. Tubercle bacillus patients slept in tents, lived in cottages in rural areas, or used verandas as sleeping porches in order to be healed by 'fresh air'.<sup>95</sup> Despite these practices, germ theory ultimately proved that bacteria, called *Mycobacterium tuberculosis*, initiated tuberculosis (TB) not stagnant air. They demonstrated that this particular bacterium was spread through the air and must be treated immediately, or serious illness or death may occur.<sup>96</sup>

## HISTORY OF DESIGN: PARTITIONING AND POLICING

Sheila Cavanagh, sociologist, writes

The ultimate fears of the early-modern era were those of disease, contagion, and death – all of which were managed by order, quarantine, and partition. Gendered toilet designs of today are rooted in the ways Londoners and Parisians managed disease, what Foucault calls the 'great confinement'.<sup>97</sup>

The original public toilets were gender segregated in order to divide men from women and to divide the members of different classes to prevent the spread of disease. The plague affected all classes, but by the nineteenth century, the working-class had higher mortality rates from diseases such as typhus, typhoid and tuberculosis (TB).<sup>98</sup> City planners and policymakers felt they were protecting their families from disease by recommending gender-segregated public toilets despite the lack of hard evidence in favour of their belief.<sup>99</sup>

Overpopulation occurred in cities such as London and Paris in the nineteenth century as an increasing number of workers moved to cities from the country to work in the increasing number of industrial jobs. The working class were seen as a 'moral cesspool', referred to as sewage, and the middle-class wanted to get rid of the 'moral filth.' The bourgeoisie tried to regulate every aspect of working class life from compliance to rules requiring rest on the Sabbath day to regulations that restricted alcohol and sexual relations outside of marriage. Also, prostitution was seen as a 'great social evil' and after 1816, prostitutes had to be registered as part of city authority's efforts to control individuals.<sup>100</sup> Publications were similarly regulated by the Society for the Suppression of Vice in 1802. As a result, Parisians who were poor, unemployed, or criminal or mentally ill were all placed together in an institution. Michel Foucault, French historian and philosopher,

book *Discipline and Punish: the Birth of the Prison* references J.J. Von Wallhausen, the director of *Schola Militaris* in Holland in 1616, who promoted the use of observation, controlled behaviour, and correction to discipline and train individuals to be acceptable members of society. Approaches to confinement were reinforced through specific spatial layouts for the interiors of institutions such as prisons and hospitals. For instance, in 1750, an educational institution, the *L'Ecole Militaire* in Paris, was designed by the architect Ange-Jacques Gabriel to observe and control students. For this reason, the interior was designed so that all students' could be viewed at all times including when they were sleeping, studying, and using the toilet. The lavatories had half-doors so that students' heads and feet so that sexual encounters between them could be prevented. Everything that occurred in the building was recorded in order to control and correct people's poor behaviour.<sup>101</sup> More moderate versions of these extreme ideas eventually worked their way into modern European society.

## THE EVOLUTION OF MODERN ARCHITECTURE

In her book, *Domesticity at War*, Beatriz Colomina, architectural historian and theorist, discusses how the medical profession, marketing, and journalists in Europe and the United States promoted the idea that germs originated in domestic homes.<sup>102</sup> Colomina argues that advertisers misled individuals by impersonating the medical profession to promote cleanliness through the use of cleaning products that they claimed could also prevent disease. This was an extension of links made between hygiene and cleanliness in hospital environments. This trend resulted in the mass consumption of manufactured household goods such as toilets, sinks, washing machines, and refrigerators to ensure modern germ-free washrooms and kitchens. By the 1940's, the majority of homes in the United States had electricity, appliances, improved water treatment, public sewage, showers, and bathtubs.<sup>103</sup>

As a consequence of their growing obsession with hygiene and germs, the medical profession and marketing companies both encouraged households to modernize their homes to prevent disease by cleaning the floors and walls, opening windows, and replacing old furniture with new to create modern dust-free spaces.<sup>104</sup> The early twentieth century saw preferences develop for modern interiors free of heavy drapery, clutter, and decorative ornaments.<sup>105</sup> The interiors of modern buildings featured smooth and easy to clean surfaces with white walls.<sup>106</sup> Walls were painted white to represent the hygiene associated with modern infirmaries. White walls showed the presence of filth and therefore dirt could be seen instantly. Other features of modern architecture included fitness areas, roof-top patios, and sleeping verandas. Balconies and garden patios were encouraged for sunbathing and for breathing fresh air to prevent tuberculosis. Buildings were also raised off the ground with columns out of fear that the dampness and darkness of basements would also cause tuberculosis. In short, modern architecture responded to the fear of disease and to the desire for healthy living.<sup>107</sup> Although not typical of the average houses in North America and Europe in this era, some examples of modern architecture from this time period are Le Corbusier's *Villa Savoye* in Poissy, France (1929-1931) and Richard Neutra's, Austrian architect, Dr. Lovell's "Health" House, Los Angeles California (1927-1929).<sup>108</sup> Both homes have flat roofs, white concrete structures, pillars to the second floor, and large glass windows with steel frames. The living area in the *Villa Savoye* is raised on thin columns to the second floor with an interior ramp, circular staircase, and large open space with vast glass sliding doors to the roofless patio a common feature in Le Corbusier's architecture. <sup>109</sup>

During the 1920's, architect, urban planner and theorist, Le Corbusier, designed for large numbers of people who lived close together. To encourage healthier living conditions, he provided spaces between the buildings so that individuals would "live with light, air and foliage."<sup>110</sup> An example of Le Corbusier's design theory put into action can be seen in *Unites d'Habitation* in Marseilles. The apartment building had two-storey studio apartments with fifteen-foot glass windows offering views of the Mediterranean or mountains. The buildings were raised off the ground with large white concrete pylons, similar to the trees that surrounded the building. The apartment complex had retail stores, restaurants, roof top patios, and a fitness area.<sup>111</sup> Le Corbusier's design gave the working class space, natural light, excellent views and easy access to conveniences.

In contrast, Le Corbusier's book *The Radiant City* of 1935 referred to the interior of the home as the 'lung' of the building. With the advent of air-conditioning in the U.S. during the 1950's (advertised as the 'lung' in a home) there were multiple ways of controlling the interior air.<sup>112</sup> It was thought that having interior air continually distributed through filters provided a germ-free interior environment.<sup>113</sup> These early architectural experiments predicted the architectural conditions found toward the end of the twentieth century. Many buildings designed since the 1970's have been built of steel and glass, with environments increasingly sealed off from the outdoors. These controlled interior atmospheres have mechanical ventilation, filtered air, heating, and air conditioning.<sup>114</sup> These systems prevent the circulation of fresh air and the removal of the toxins that build up in the interior environment. Because people occupy interiors 90% of their time, 23% of the occupants

are affected by sick building syndrome (SBS), which can include symptoms that range from feeling uncomfortable to severe respiratory problems.<sup>115</sup>

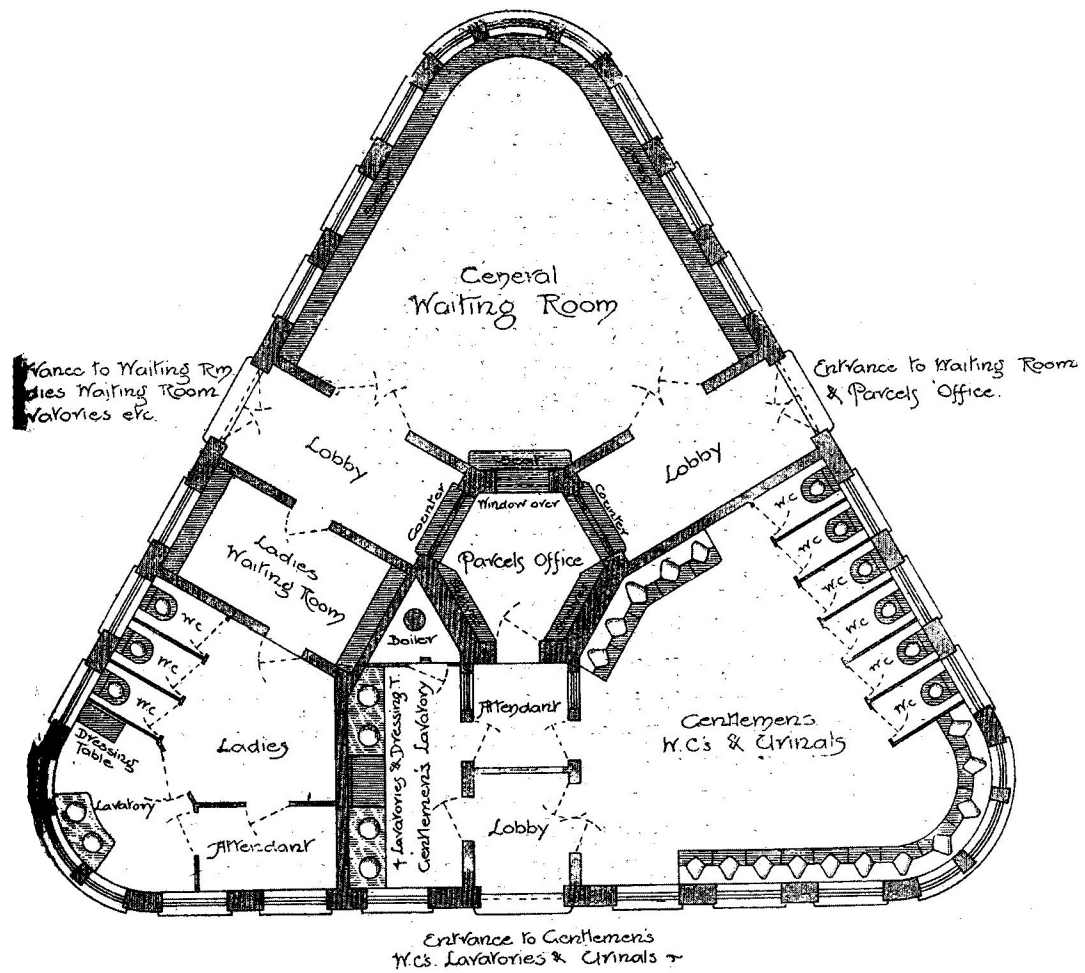
Microorganisms are invisible to the human eye and live in the atmosphere. Some microorganisms are good for us, while others are pathogens. Additionally, microorganisms travel by air through cracks, on people, and through ventilation systems. Jessica Green, an engineer and biodiversity scientist, states that it is common for mechanically ventilated air to contain human microorganisms. Therefore, humans who spend time in enclosed environments are actually breathing each other's skin. By bringing fresh outdoor air into the interior of the building, these shared microorganisms, along with harmful bacteria, can be reduced, thus creating a healthy environment in which to live and work.<sup>116</sup>

What does all of this have to do with public toilets? Toilets are places where fluids and solids are excreted, where people undress and wash themselves, and where odors accumulate, public toilet spaces become concentrated sites of exposure to potential contamination, and exchange. As such, improving the hygiene of toilets should include good ventilation with fresh outdoor air and natural light in order for spaces to be successful and sustainable.

## THE ILLUSION OF HYGIENE IN PUBLIC TOILETS

The water closets and urinals of the Victorian Era were colourful, decorative and often designed with circular floor plans for instance the 1898, *Waiting Rooms and Convenience* located in Bristol, England designed by the architect R. Stephen Ayling, see figure 2.<sup>117</sup> Victorian public toilets had vibrant ornamental interior designs that visually alluded to images of leisure and sex through their decadence. As a result, public washrooms of the Victorian era came to be viewed not as sanitary environments but as potentially sinful places. To counteract this perception, public washrooms design evolved to become unornamented and simple white facilities. The challenge in this, of course, is that whiteness is difficult to maintain in the public realm as a symbol of cleanliness and purity.<sup>118</sup>

Architects and writers of the post-Victorian Era promoted sterile kitchen and bathroom spaces to encourage a healthy way of life.<sup>119</sup> As a result, sanitary, non-porous products were designed so that the modern bathroom could be cleaned easily.<sup>120</sup> The majority of plumbing fixtures and surfaces in public toilets were either icy white or glossy porcelain that was easy to clean and appeared to be hygienic. Sheila Cavanagh describes plumbing fixtures as white, sculpted, curved surfaces that create a false sense of an environment with no bacteria and no previous users.<sup>121</sup> Seeing their reflection in a gleaming white basin gave occupants a heightened sense of freedom from disease.<sup>122</sup> Other products associated with hygiene, such as deodorants, toilet paper and toothpaste were also white, in part because of the association of white with cleanliness.<sup>123</sup> Additionally, whiteness has historically represented purity, virginity, and “gender integrity



PLAY

Figure: 2.  
42

Feminist and queer theory has been used by scholars to suggest that colonialism and imperialism influenced the design of the Western white porcelain toilet.<sup>124</sup> Cavanagh's interpretation of Western toilets based on queer theory and cultural and social geography, such as Viviane K. Namaste, Susan Stryker, Owen J. Dwyer and John Paul Jones III, includes propositions that the Western toilet was initially designed to reflect aspects of the colonial male physique as accepted within the patriarchal society of the nineteenth century. Cavanagh refers to the architect, Alexander Kira to further suggest that the white shiny porcelain urinals so common throughout the twentieth century are similar in shape to a vagina, while white toilets are shaped like an anus.<sup>125</sup> Despite the illusion of purity given by the white porcelain or the shape, toilets will still show traces of elimination from another person that questions the hygiene of others.

In summary, illness and disease were widespread during the Industrial Revolution because of the masses of people moving into the cities for work. The internal structure of cities could not support the vast amount of sewage. With the discovery of the germ theory, bacteria and disease were beginning to be understood and hygiene started to be promoted. This led to the creation of modern architecture that provided better living, better health and sustainable spaces. By the 1940's, homes in Western culture had modern conveniences and manufacturers produced white products to give the illusion of cleanliness. Even today there are products such as white toilets, sinks, and toilet paper, similar in design to those of the Victorian period.

## 2.4 TOILET PRIVILEGING & INVISIBLE BOUNDARIES

After examining the history of the physical environment of public toilets, it is also important to consider the history of the social norms and rules, as well as the legal legislation, currently developing, that has evolved around the placement and use of public toilet facilities. Women are frequently seen standing in long line-ups waiting for a public toilet. It is challenging for transgendered individuals to locate a unisex public toilet for their safe use, and the homeless often have a hard time finding public toilets they are allowed to access, see figures 3 and 4.<sup>126</sup>

Kathryn H. Anthony, American architecture professor and Meghan Dufresne, an interior designer and writer looking “for a new language to identify yet another “problem with no name,”<sup>127</sup> call this type of discrimination, “potty privileging.”<sup>128</sup>

I do not support the label “potty privileging” because the term ‘potty’ refers to the infantile term often used when toilet training children.

Because “potty privileging” refers to the lack of public toilets for gender and family rather than toilet training or children, I argue that “toilet privileging” is a better term to use. As such, I will be using this term throughout the rest of my document.<sup>129</sup> In this section I will describe the circumstances that have created discrimination against women, the transgendered, and the disabled by limiting access to public toilets.

Gender discrimination is evident in workplaces, convention centers, stadiums, and theatres.<sup>130</sup> Women’s public toilet design is overlooked, and an inadequate amount of space is generally assigned to this purpose.<sup>131</sup> In addition, women are not provided with an adequate number of toilet stalls in public buildings, thus creating long line ups, see figure 5.<sup>132</sup>



Figure 3.



Figure: 4  
46



Figure 5.  
47

Some women's public toilets are farther away from public spaces -- sometimes even on a different level -- so they can be more difficult to find than men's. These are essentially 'missing' facilities for women. Women are forced to 'hold it' or find a private space where they can eliminate without being arrested.<sup>133</sup> Toilet privileging can also refer to the problem of providing insufficient supplies, such as soap, clean water, cubicles for privacy, cubical doors wide enough to accommodate women with strollers, clean baby change areas, and facilities designed for all sizes of people.<sup>134</sup> These negative situations currently affect more women than men, but they represent only some of the issues of toilet privileging.

The goal of eliminating toilet privileging is to provide everyone access to a toilet and dignity. Design solutions, such as mobile walls, double space for women, and a unisex zone when first entering the public, do decrease toilet privileging. At conference centers mobile partitions are being placed between men and women's segregated public toilets to make the space larger or smaller according to the gender of the people attending a particular conference. Clara Greed, urban planner, developed the floor plan for an ideal unisex entrance.

To sum up, at the centre of toilet privileging is gender discrimination, which is revealed by a lacking number of toilets provided for women and can cause medical difficulties that put more strain on our medical system. Similarly, there are no toilets for families, children and the transgendered. Among the problems caused by toilet privileging is the creation of unsafe environments. By providing more toilets to women, the elderly, families, children and the transgendered, everyone is accorded dignity and respect.

## 2.5 'POTTY PARITY' LEGISLATION

In the United States, the 'Potty Parity' Law was introduced in 1989 to provide an equal number of toilets for men and women.<sup>135</sup> The State of Wisconsin defines toilet parity as "*equal speed of access for women and men.*"<sup>136</sup> Architect, Alexander Kira in his study *The Bathroom*, 1977 and Sandra K. Rawls, researcher, in her study *Restroom Usage in Selected Public Buildings and Facilities: A Comparison of Females and Males* demonstrate that women take longer to urinate than men. In 1994, United States legislation gave double the number of toilets to women than men at large event facilities such as theatres and stadiums, finally creating a situation where women did not have to wait to use the facilities. Potty parity can now be seen at malls, fitness and athletic centers, libraries, theatres, cinemas, convention centers and stadiums.<sup>137</sup>

The process of legislating toilet parity revealed inequities that existed in the legislative buildings themselves. In the United States, where most such buildings date to the nineteenth century, the Committee on Oversight and Government Reform in the U.S. House of Representatives presented *H.R. 4869, the Restroom Gender Parity in Federal Buildings Act*, on May 12, 2010.<sup>138</sup> Dr. Kathryn H. Anthony, Sharon Pratt (the previous Mayor of Washington D.C.), and Robert A. Peck (Public Building Service, U.S. General Services Administration) presented the bill. The purpose of the hearing was to hear to arguments for providing gender parity (in restrooms) in United States federal buildings.<sup>139</sup> Peck admitted he did not realize there was a problem until he was advised of the lack of women's washrooms in the federal

government buildings. As a result of such situations, some individuals are trying to change access to women's washrooms. When the numbers of female legislators are quite high, they sometimes have to resort to using the public toilets for visitors that are located far from the House. The case of a male legislator who had to wait for his wife at a concert hall also brought attention to the issue of toilet parity.<sup>140</sup> The House of Representatives decided that no studies were required because of Dr. Kathryn H. Anthony's writings on "potty parity."<sup>141</sup> It is recognized that women do not have equivalent access to public toilets in federal buildings in the United States. Because federal buildings are places of work, education, and physical fitness, it was concluded that they should provide the same number of washrooms for women as there are for men. Up until 2006, only twenty-one states had addressed washroom gender parity.<sup>142</sup>

*Bill H.R. 4869, Restroom Gender Parity in the Federal Buildings Act*, was presented as the solution to this problem. It states that the number of toilets for women will be equivalent to, or surpass, the quantity of male lavatories and urinals. Unfortunately, after two years, the law has yet to be passed.<sup>143</sup> Even if the bill is passed, it will apply only to new construction or to large remodelling projects.<sup>144</sup> Therefore, while the House of Representatives does recognize that there is a problem for women, it has not been resolved. Furthermore, the issues of health and safety in washrooms for the transgendered and children have yet to be addressed.<sup>145</sup>

In Canada, the Canadian Broadcast Corporation (CBC) reported on February 10, 2011, that Bill C-389 would give equal rights to the transgendered by adding to the Canadian Human Rights Act and Criminal Code that was passed by the House of Commons.<sup>146</sup> However,

the Conservative senate stalled Bill C-389; then an election interrupted the process of its consideration. A new majority Conservative government was elected on May 2, 2011, perhaps delaying its passage. Currently, Billy Siksay, former British Columbia New Democrat MP, has led the Bill to the House of Commons.<sup>147</sup> Although the Bill went by the wayside in the Senate, it has since been revived as C-279 by MP Randall Garrison of Esquimalt-Juan de Fuca, the New Democratic Party of Canada (NDP), Gay, Lesbian, Bisexual, Transsexual, Two-Spirit, and Queer (GLBTTO) Rights Critic.

From my research, I have determined that these legislative efforts have not done enough to ensure that there are now sufficient public toilets; little is discussed in the literature about the problem of toilet privileging discrimination and the serious medical problems that result from holding urine for too long. Greed, Anthony, and Dufresne have written about 'potty parity' and all agree that the lack of toilets is at the heart of the issue. In her book, *Inclusive Urban Design: Public Toilets*, Greed recommends that women be provided with twice as many cubicles in public toilets as men instead of an equal number.<sup>148</sup> Thus, parity is the goal for the provision of public toilets, not equality. Toilet parity provides better access for women by providing an equal number of toilets or more than males have, including all cubicles and urinals. Parity factors in concerns about health, hygiene, safety, and the need to provide public toilets for males and females with all types of sexual orientation, as well as for family groups that include children and the elderly. Parity legislation also needs to include accommodations for the health and safety for men and women.<sup>149</sup> Toilet parity guarantees cubicles for privacy and doors and locks for safety, in addition to an adequate number of toilets.<sup>150</sup>

It is well established that women require more toilets than men because the processes required for females to use them are lengthier and the frequency of use is greater.<sup>151</sup> Women take more time because they have to enter a cubicle, squeeze in between the cubical door and toilet to make a three-point turn to lock the door, and then remove clothing as required. Women take longer to urinate, as proven by Sandra K. Rawls, researcher, and Alexander Kira, professor of architecture. Rawls' research in 1988 included an analysis of the time to enter, urinate, wash, and dry hands and exit the public toilets. Her research included 230 males and 234 females at four dissimilar facilities: an airport, a rest stop on an expressway, a stadium, and an exhibition. The results concluded that women take three minutes, whereas men take just over one and half minutes.<sup>152</sup> Kira's research in 1966 included only 14 people and considered only urination times.<sup>153</sup> The eight men studied took, on average, half a minute to urinate, while the six women studied averaged a minute and half.<sup>154</sup> Both researchers concluded that women take triple the time to use the washroom than men due to biological differences, cubicle design, and social factors such as socializing in public toilets, whereas men do not speak or look at each other while they are in the washroom.

Both men and women are caregivers, but women are more typically guardians.<sup>155</sup> They are often accompanied by children and babies in public. For this reason, child toilets and changing tables are required in women's public washrooms. There should also be an 'activity zone' or added space between the opening of the stall door and the front of the toilet seat for a child or adult, so that an adult can assist a child. Also, a baby-changing table requires a sink, soap, clean water, and a proper disposal bin for used diapers. Equally important is a private,

clean, comfortable breastfeeding area for mothers. For these reasons, gender-neutral, unisex, or family-friendly washrooms are required for infants, children, opposite sex caregivers or parents, married couples, transgendered individuals, and medical assistants.

The British Toilet Association (BTA) recommends that large retail malls, theatres, and concert halls have twice as many women's public toilets as male cubicles and urinals combined to ensure that women avoid long lines and wait times.<sup>156</sup> Standing in line to use a washroom is uncomfortable; it can often create anxiety, and may cause future medical problems, see figure 5. Likewise, an individual can become dehydrated by purposely not drinking liquids in order to avoid using a public toilet. Furthermore, holding urine can cause cystitis, bladder infections, and other serious medical conditions.<sup>157</sup> Pregnant women urinate more frequently, and waiting in line may cause medical problems such as urinary tract infections that may affect the health of the baby. Finally, delaying defecation may cause costiveness (constipation), diverticula (intestinal pain), and hemorrhoids.<sup>158</sup>

In conclusion, Potty Parity legislation in the United States has been initiated to increase the number of toilets for women. Canada is working on bill C-279 for equal rights for LGBTI individuals; which includes legislation regarding public toilets. Not having public toilets for everyone will increase costs to our Canadian medical system in the future.

## 2.6 INVISIBLE AND PHYSICAL BOUNDARIES IN PUBLIC TOILETS

### GENDER - INVISIBLE BOUNDARIES

The area of theory known as gender geography examines how genders relate in the built architectural environment in space and place, public and private, and how gender affects interactions within the environment and society.<sup>159</sup> In this section, I examine gender geography as it pertains to public toilets through invisible and physical boundaries in public-built environments. According to archeologist Donald Saunders, our bodies constantly encounter invisible and physical boundaries in architecture.<sup>160</sup> Our bodies react to interior architecture, especially when encountering an invisible or a physical boundary. Toilets present both types of boundaries. Invisible boundaries in public toilets include non-physical concepts, such as gender, class, feelings of modesty, the performance of function, and implied spatial boundaries. Gender determines how these boundaries affect us. For instance, architect and artist Alex Schweder argues when an individual encounters a gendered symbol on a bathroom door, that person is asked to make a decision about gender upon entering the public toilet.<sup>161</sup> Opposition to the chosen gender may come from a person in the public toilet. Parents of an opposite-gender child may decide to take their youngster over the conflicting invisible boundary of the gendered public lavatory.<sup>162</sup> Barbara Penner, historian, and Olga Gershenson, scholar of Judaic and Near Eastern topics, suggest that because not everyone experiences the public washroom space in the same way, it is important to remember to accommodate as broad a range of persons as possible.<sup>163</sup>

Men and women treat the public toilet space in different ways. For example, women's public toilets are social zones, whereas men keep to themselves in a public washroom. Because women have different biological needs, they often use the public toilets several times a day. Women use a public toilet as a place to eliminate, to wash, to change diapers, to empty a colostomy bag, to test their blood and inject insulin, to tend to the requirements of menstruation, or to take prescription drugs. Women's lavatories are very much a social public space, where women often stand in a line and chat. They also beautify themselves in front of other women.<sup>164</sup> The public toilet of today is a space that segregates, separates, divides, but also brings together strangers from all classes of society. Similarly, it is a place composed of different notions of politics and behaviors.<sup>165</sup> Women of all classes, races, and abilities come together for common needs. Women need an area for caregiving to babies and children, and an area to breastfeed publically or privately. As such, women have adapted the public washroom to accommodate their needs; for them, it has become a multi-purpose space with many zones.<sup>166</sup>

Male lavatories separate the masculine spaces with urinals and cubicles that divide the need to excrete fluids and solids.<sup>167</sup> These separate spaces divide the public and private, the penis and anus, the observed and the hidden, the accepted and the illicit.<sup>168</sup> Therefore, men's washrooms are full of social rules. Men do not make eye contact or communicate verbally with each other at the urinals or sinks; unlike women, they do not communicate verbally with each other when they are in the cubicles. Because urinals are generally lined up on a wall, side by side, men do not have as much privacy as women. Also, although men with incontinence sometimes use cubicles to change a urine

pad, male cubicles have no sanitary bins to hygienically dispose of them, so they must carry them into the more public zone of the washroom.

Greed states that more women than men occupy aspects of the public realm that are challenging in terms of providing appropriate public toilets.<sup>169</sup> For instance, Greed is concerned about the lack of facilities for women and the elderly who take public transportation in London, England.<sup>170</sup> Women who take the bus or subway to work often deal with unpredictable weather such as cold wind while waiting for their public transportation to arrive.<sup>171</sup> During the day, women who use public transportation also require amenities such as public toilets and shops where personal care items can be purchased.<sup>172</sup> They often take their children to daycare or school before they arrive at their workplace or destination, but they are not provided with appropriate baby-change tables or children's toilets in public facilities. Many women are also caretakers of infants, children, the elderly, and patients. While more women face these challenges, men who are caretakers of infants and children are also not provided with facilities for changing diapers or helping children of both sexes in public toilets. More women than men are faced with this challenge, however.<sup>173</sup>

A gendered symbol at the entrance of a public toilet space creates invisible boundaries and restricts members of today's changing society. The parent or caretaker of a child or an adult of the opposite sex is required to remain outside the washroom entrance while the individual uses the public toilet alone. Some parents and caretakers do take their child of the opposite sex into a gendered segregated space. An example of the problem that this situation can create can be seen at Winnipeg's Pan Am Pool, where caretakers are forced to bring older

children of the opposite sex (over seven years of age) into gender-specific change rooms and washroom facilities. While aware of the discomfort this situation can create, the management of this facility has no current plan to add a family washroom or a change room for opposite sex caretakers. As a frequent user of the Pan Am pool, I have made written complaints to change the special needs area for parents and caretakers of opposite sex children.

The preferred solution to the problem described in the previous paragraphs is the creation of family-friendly public toilets that provide space for persons with caretakers of the opposite sex. Such a design solution creates a safe environment for parents, transgender individuals, married couples, and a medical caregiver assisting a client. Community care workers may need to help someone of the opposite sex in a public washroom, as do mothers with their sons, fathers with their daughters or married people with their spouses. A family zone that is gender-neutral also provides a safe place for transgendered individuals.<sup>174</sup> In short, unisex zones in public restrooms are essential for everyone.

### **PHYSICAL BOUNDARIES – SPACE AND SAFETY IMPLICATIONS**

People are also prevented from using public toilet facilities because of physical boundaries. Such boundaries are walls, fixtures, and cubicles. A major problem is the design of the cubicle, which is routinely built too small, creating a physical boundary for caretakers of children, the elderly, or the disabled. The major spatial limit of a too-small space is that it prevents the person entering the cubicle from

making a comfortable three-point turn in front of the toilet without rubbing against either the edge of the door or the rim of the toilet.<sup>175</sup> This brushing against the toilet or the stall components creates a potentially harmful transfer of bacteria to the toilet user. Normal cubicle doors open inward, leaving women little space to make their three-point turn in order to sit on the toilet seat. Also, an individual must close the door, lock it, and sit down. Many times, I have experienced my calf touching the front rim of the toilet, or the edge of the door rubbing against the front of my body as I entered and closed the cubical door. Greed recommends a cubicle design called an activity zone that includes an additional space in front of the toilet with a nine-to eighteen- inch (250 - 450 mm) diameter so that the door and rim of the toilet never connect.<sup>176</sup> This design allows space in front of the toilet for turning, accommodating a small child or luggage; wider doors for double strollers; and a shelf, grab bars, or a sink. This space also has room for shopping bags, and it is more hygienic.<sup>177</sup> Greed therefore recommends a minimum cubical size of 81"L (2050 mm) x 44"W (1110 mm), equaling 25 square feet, with a cubical door that swings outward, see figure 17. <sup>178</sup> Based on these specifications, the minimum size of a cubical in the proposed St. Vital Centre public washrooms is designed to meet her recommendation.

In the case of young children, caretakers usually cannot bring strollers into a cubical because it is too small. In this case, individuals may choose to use the end cubical so that the door can be left open to allow them to watch an infant in the stroller while using the toilet. Also, an individual may bring a baby into the cubical and lay the infant on the floor, but if the parent has more than one child or infant, additional children would not be able to enter the cubicle. Predictably, the highest numbers of pathogen bacteria are found in the area located in front

of the toilet on the floor so it is the worst possible place for a baby.<sup>179</sup> Further, parents who have strollers with babies are also usually loaded down with diaper bags, personal belongings, hand baggage, and shopping bags.<sup>180</sup> All of these types of belongings necessitate extra spatial requirements.

Not everyone with a disability is in a wheelchair or uses a device to aid mobility. The elderly or an individual with a temporary disability such as a hip or knee replacement likewise may require the use of a 3'-0" wide cubical with grab bars on either side. Presently, there are no standards or legal requirements for providing cubicles that meet the needs of those with hidden or temporary disabilities.

The safety of public toilets can be enhanced by having a single door into a unisex area that divides it into men's and women's segregated spaces. Sinks and all garbage containers need to be located in the unisex area outside the segregated spaces or stalls for men and women. Surveillance can be carried out by the community, a security company, and/or a web camera. Public toilets can be located in busy public zones with small businesses, shops, kiosks, bus stops, and parking stations. Signage needs to be large and readable, indicating the hours of operation and a number to call for maintenance and security. Public toilet surfaces need to be easy to clean, as well as vandal- and graffiti-proof. Everyone desires a clean, safe, place of dignity.

The proposed Osborne Station public toilet site is an excellent example of locating a public lavatory at street level, at the front entrance of the Osborne Station off Osborne Street and Jessie Avenue. These public washrooms are accessible to everyone. On location, there is a retail store selling bathroom conveniences, plumbing, and fixtures; it also doubles as demonstration space in the unisex private rooms. Public sinks and garbage bins are located outside the unisex and family rooms to improve hygiene, reduce line-ups and provide safety for all. The main corridor is well lit and transparent to the street.

To summarize, invisible boundaries such as gender symbols and gender discrimination stop individuals from using toilets. Physical boundaries become a concern when there is not enough room to maneuver or get into a stall because people are forced to rub against surfaces that can result in the transmission of harmful bacteria. Usage of public toilets is increased by providing better safety measures and changing the design. Locating public toilets in busy areas increases property values and attracts small businesses, which in turn boosts the economy.

## **2.7 SOCIAL CLASS**

Having to pay to use public toilets and not being able to use them because they are closed, are two examples of discrimination against certain classes of people. As a result, these people are forced to use socially inappropriate places to relieve themselves. Such practices create unhygienic, unpleasant public spaces that discourage public use.

People such as the homeless, prostitutes, and the mentally ill have little access to public toilets for shelter, cleaning, privacy, and dignity because these facilities are reserved in most cases for paying patrons in business establishments, or they are not open all the time. Downtown Winnipeg exemplifies this circumstance because the City Centre and most other public buildings such as the library close and lock down after 6pm. Furthermore, washrooms in doctors' offices, stores, or restaurants are only available to patients or paying patrons. Anthropologist Rae Bridgman addressed this situation in Winnipeg in her article "*Human Dignity on Main Street: Public Toilets in Canada.*" Her article documents the conditions of two portable toilets at the corner of Main Street and Higgins Avenue in Winnipeg in the summer of 2008.<sup>181</sup> In October of 2007, Bridgman and her partner were on their way to their architectural offices at 678 Main Street, when they detected the smell of urine and defecation at their office entrance. They then sent a letter to the Mayor noting that the only private places to relieve oneself in downtown Winnipeg were the stairwells to the underground, alleyways, roads, construction sites, and door entrances.<sup>182</sup> They requested permanent public toilets in the area of their office, and when they received no response, two portable toilets were installed at their expense. Although the toilets were well used, they were removed in two weeks because the city determined that there was no permit.<sup>183</sup> The City of Winnipeg deemed that public toilets in that location were unpleasant, and after considerable discussion, the toilets were moved near the Salvation Army Booth Centre Shelter, now closed, located in the core of Winnipeg but away from Main Street, forcing Winnipeg's homeless to once again use alleyways, stairways, and garage roofs as their public toilets, see figure .<sup>184</sup>

Economic- and class-based restrictions extend beyond the homeless to affect persons with homes but limited incomes. Victorian women in England did not use public lavatories because of modesty issues, the fear of using the facility, and the cost of using the toilet.<sup>185</sup> Women have paid to use a toilet for over 150 years in England and France, while men use urinals for free. In California, while urinals were free, women paid to use toilets until the California Secretary of State, March Fong Eu, destroyed a latrine in front of the California State Capitol in 1974 to demonstrate the need to ban pay toilets for women.<sup>186</sup> New York State made paid public toilets illegal for women in 1975 because they were discriminatory, and the rest of the U.S. followed suit that year. As a result, California was the first to ban women's pay toilets in 1975 through toilet parity legislation prohibiting pay toilets for women.<sup>187</sup>

To conclude, providing public toilets for all classes would prevent socially unacceptable toileting. Clean city sidewalks and streets give dignity to the community and increase business in neighborhoods.

## **2.8 SEXUAL ORIENTATION**

Gender-neutral public toilets represent a new trend in spatial and social structures being developed in Western society.<sup>188</sup> Currently, it is estimated from studies by Gary J. Gates, demographer, that in the United States, 1.7% of the adult population is homosexual. Previous studies by Dr. Alfred C. Kinsey, sexual researcher, showed results of 3 to 5%, and .3% are transgendered individuals.<sup>189</sup> Although this is a small percentage of the general population, the goal of eliminating toilet privileging is to ensure that all people can find a public washroom

when they need one. However, transgendered individuals are an overlooked part of the population who are not often accommodated in public toilets; persons who identify as transgendered have a difficult time locating unisex or family public toilets in urban areas. Some transgendered persons feel uncomfortable if there is a line-up outside public toilets, where people have time to judge and police the public space.<sup>190</sup> On the other hand, others find it a time to confront the situation by forcing the public to become more comfortable with the transgendered. When standing in line-ups for women's washrooms, transgendered persons sometimes adjust their voice to be higher, alter their clothing by adding jewelry, modify posture and try to blend into the environment.<sup>191</sup> Like persons who cannot afford to pay to use toilets or disabled persons who cannot fit into toilet stalls, some transgendered individuals organize their day around using the washroom, or they may just "hold it" until they return home at the end of the day.<sup>192</sup>

Gender segregation between men and women creates invisible boundaries, especially for transgendered individuals. For example, an invisible boundary occurs when a transgendered individual encounters a universal gender symbol of a man or woman at a public toilet entrance.<sup>193</sup> Depending on the gender symbol selected upon entering the gendered washroom space, this individual is committing to an identity that is either male or female.<sup>194</sup> It is presumed that, when entering a public toilet, one is biologically male or female.<sup>195</sup> As a consequence of making a gender choice, a transgendered person indicates his/her gender when entering the space. For this reason, gender-segregated public toilets create anxiety for individuals who do not consider themselves exclusively male or female. Gender-segregated toilets remind us of what we look like, but individuals may identify themselves as intersexed, transsexual (transgendered), or

genderism. Kath Browne, a geographer, uses the term genderism to describe individuals who are physically misidentified by their gender, such as women who are misread as men.<sup>196</sup> Genderism occurs when an individual enters the segregated space of a washroom, but their body fails the 'gender test'. Police in some locations have even been known to throw individuals out of washrooms where their gender was questioned or mistaken.

Biological sex is not always indicative of whether a person considers himself or herself to be masculine or feminine. Some people may prefer to dress in drag; these gender-variant individuals do not match the standard gender definitions commonly used in contemporary society. Accordingly, if a person fails the 'gender test' or is accused of using the wrong washroom, violence may occur against that individual.<sup>197</sup>

### **SAFETY FOR ALL INTENDED USERS**

Safety is an issue for all people in public toilets. History has shown there are safety concerns with gender; and especially for women, lesbians, queers, and gay, bisexual, butch or transgendered individuals (LGBTI).<sup>198</sup> There is a perception of an invisible dome covering the segregated public space; as such, entering a gender-segregated public toilet can give a false sense of security.<sup>199</sup> Even today, some public toilets in malls or parks are located down a long dark hallway or a pathway surrounded by trees and bushes hidden away from the public.<sup>200</sup> These private spaces are located in public spaces that are out of the public's view. Public toilets located out of sight make some women feel uncomfortable. They may fear sexual assault or physical violence from a man or a group of men.<sup>201</sup> In addition, criminals are known to hide

in public washrooms.<sup>202</sup> Similarly, men's washrooms have numerous safety issues; for example, the fact that a male's back is exposed to the entrance while using a urinal makes him easy to victimize.<sup>203</sup> In addition, men's washrooms are known for being places of crime, drug trafficking, and drug use.<sup>204</sup>

More seriously, LGBTI may be afraid of verbal or physical abuse, violence, or death when using public toilets.<sup>205</sup> Accordingly, in some cases, people who are LGBTI fear entering segregated public toilets. Unfortunately, there is usually silence surrounding cases of violence against LGBTI persons in public toilets, and assaults often go unreported.<sup>206</sup> Furthermore, people often view LGBTI individuals as a threat to children, causing fear that the child maybe assaulted, molested, or sexually assaulted.<sup>207</sup> However, Sheila Cavanagh, a researcher of sociology and sexuality, argues that child abuse does not usually happen in public spaces used by gay or transgendered persons; in fact, LGBTI persons are not a threat to children.<sup>208</sup>

Finally, people can experience difficulties using public toilets because of their sexual orientation. Greed suggests having a unisex area near the public toilet entrance to create more pedestrian traffic and help with safety issues. I have used this idea in my design for the St. Vital Centre site.

## 2.9 HEALTH CONCERNS

The most common terminology used to describe wheelchair accessibility is 'disabled' or 'barrier-free' instead of 'accessible' toilets.<sup>209</sup> In Canada, the design standard for those with physical or sensory disabilities is referred to as barrier-free design. However, this term may not resonate with a broad range of the population. Accessibly designed spaces are inclusive spaces that can be easily used by all; they also meet the criteria for national and provincial design standards. Nonetheless, the disabled who require a different kind of accessible and inclusive public toilet represent a large part of the population that is being missed.<sup>210</sup> For example, there are persons with hidden illnesses, medical issues, and disabilities that include cancer, urinary incontinence, bladder infections, and hip replacements.

The frequent need to urinate is a serious but invisible medical problem that impacts the number and location of washrooms more than the physical layout of the space. Bladder leash is the term Greed uses to describe a form of incontinence that restricts a person's movement within the urban environment and their journey within the city.<sup>211</sup> This condition restricts people to their home, making them virtual prisoners because they must always have a washroom close by. For instance, a 70-year-old friend who accompanied me to the movies was concerned that she would need to go to the washroom during a movie we attended. Although she ordered no drink or food from food stand, she immediately needed to use the washroom after the movie. However, there was a long line-up and she could not wait, so she ran to the department store down the mall to use the washroom. Incidentally, we noticed that there was no line-up at the men's washroom.

All of these physical disabilities and medical conditions are more prevalent among the elderly. The aging population is increasing, resulting in a growing need for more accessible public toilets for both men and women. The number of people sixty years of age and older will surpass the number of persons younger than sixty for the first time by 2050.<sup>212</sup> People may be living longer, but they experience reduced sensory and cognitive abilities, declining physical health, and reduced movement and agility as they age. Baby boomers grew up during the 1950's and 1960's in a time of transformation, social change and justice. Today, they continue to raise issues in support of the needed changes in our society's architectural environment.<sup>213</sup>

#### **VIEWS ON CLEANLINESS AND HYGIENE**

In her work on the history of sanitation, gender, and cultural studies, theorist Ruth Barcan refers to sociologist Norbert Elias' suggestion that social values and etiquette have a direct connection to attitudes toward hygiene in society.<sup>214</sup> Elias, a social historian who researches sixteenth century manners, suggests that fears about hygiene and contamination often come from not understanding basics such as sanitation. For this reason, books on etiquette were written to educate society about hygiene and social control. Some of these covered subjects such as bodily functions, including blowing one's nose, flatus, elimination, and issues related to bodily fluids and the consumption of food.<sup>215</sup> As a consequence of living in an increasingly controlled society, the smells and sounds of these bodily functions threaten the conduct of social interactions by making people feel uneasy in public areas.<sup>216</sup>

By the nineteenth century, the physical realities of defecation and menstruation were increasingly considered 'dirty,' as they still are somewhat today.<sup>217</sup> Today, North Americans may be more educated about their bodies than they were a century ago, but they are still not as open or as comfortable as medieval society was in regard to the body's functions.<sup>218</sup> Because a public toilet is a place of bodily elimination, public toilets are spaces that we share with strangers where bodily fluids are exposed and surfaces are soiled.<sup>219</sup> As such, no matter how clean a public toilet is, it will always be viewed as a place that is dirty, unhygienic, and unsafe. In today's culture, a body that is slim, physically fit, clean-shaven, and unscented is considered hygienic.<sup>220</sup> When our bodies do not fit this image, society rejects them and more fear is generated concerning hygiene.<sup>221</sup> Cultural attitudes toward the body, gender, hygiene, and privacy also influence one's experience in a public toilet space. The attitude that defecation is an unsanitary act is strong throughout contemporary Western society. Therefore, urine and faeces left behind by a previous user in a public toilet disturb an occupant's sense of values.<sup>222</sup> Although urine is considered to be an 'ungendered' substance, "disgust with urine is often about a perceived encroachment upon the border between inside and outside, private and public, self and other, masculine and feminine, white and non-white."<sup>223</sup> Bodily fluids represent disarray and threaten the boundary of the body. As a consequence, users of public toilets may question the hygiene of previous users and feel violated, see figure 6.<sup>224</sup> The fluid left behind by a previous user leaves individuals uncomfortable and creates another invisible boundary. The public perceives that a public toilet is not a sealed environment and that it is, therefore, a "dirty" place exacerbated by poor maintenance.



Figure 6  
69

Negativity toward the threat of exposure to the excrement of others is compounded by the fact that Western women require contact with the toilet seat when urinating or defecating.<sup>225</sup> As a consequence, some women choose to hover over a toilet seat to avoid touching it because of the previous user's urine that is left behind, or because of cultural or religious beliefs. Others cannot hover because they are physically unable to do so. In some cases, hovering over a toilet can cause medical difficulties such as urine retention when the bladder does not fully empty, potentially causing incontinence.<sup>226</sup> Germ transfer also occurs when the user does not wash her or his hands with hot water and soap. It is believed that the majority of men tend not to wash their hands after using the washroom.<sup>227</sup> By not washing their hands, they transfer bacteria to other objects in the washroom, such as door levers, locks, and the toilet roll holder. Also, these germs are transferred outside the washroom to cash, everyday objects, and apparel, or by shaking another person's hand.<sup>228</sup> For these reasons, organizations such as the College of Registered Nurses in Manitoba have recently launched a campaign to "wash your hands" after you use the washroom because evidence shows that one in three people do not.<sup>229</sup>

In conclusion, while much has changed in terms of improvements to health care and our understanding of how diseases occur, a lot has remained the same regarding perceptions of public toilets as physical spaces. Social mores related to going to the bathroom may be more casual, but this act is still carried out in private, for the most part. Similarly, the physical layout of contemporary public toilet spaces has not really changed too much in the last one hundred years, as divided space in the floor plan and white porcelain fixtures are still common.

Finally, while architects and interior designers try to design hygienic, safe, and inclusive spaces, many groups or individuals are still not considered in their design analysis or programming. It is indeed a challenge for an experienced designer to design an inclusive space that meets everyone's needs.

## 2.10 INTERNATIONAL ORGANIZATIONS ON SANITATION

Several international organizations are working to draw attention to the lack of sanitation in many parts of the world. The United Nations Water General Assembly announced that access to clean water and sanitation is a human right. Sanitary public toilets are as basic a human need as food, shelter, and clothing. Nevertheless, the World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), Canadian Toilet Organization (CTO), the German Toilet Organization (GTO), and the United Nations (UN) all report that an estimated 2.6 billion persons worldwide do not have hygienic public toilets.<sup>230</sup> This means that globally, two out of every five people are without hygienic toilets.<sup>231</sup> UNICEF and the United Nation estimate that 5,000 children under the age of five die each day because of cholera and diarrhoea, diseases caused by a lack of sanitation. The World Toilet Organization (WTO) in Singapore, founded in 2000, focuses on one of the largest problems worldwide: sanitation. Lack of hygiene affects forty percent of the world's population. The WTO says sanitation plays a part in ending poverty and gender parity, and in allowing children to stay in school. The WTO's mission is to advance sanitation universally by creating new tools, education programs, and local sustainability. The WTO started "World Toilet Day" (November 19<sup>th</sup>), the World Toilet Summit, and the World Toilet College, which provides education on innovative toilet design. The SaniShop has also been established to design and manufacture affordable toilets.<sup>232</sup>

In summary, international sanitation organizations recognize that public toilet issues result in health problems. Organizations are being formed to shed light on the subject, and it is hoped that they will help to resolve these problems and aid in preventing diseases that are so easily cured today.

## 2.11 CURRENT INTERNATIONAL APPROACHES

Different initiatives are currently being taken worldwide concerning sanitation. A few countries have solved their public toilet issues and have made the provision of public toilets a priority. In contrast, other countries provide very little sanitation for their citizens. As a result, international sanitation organizations have been developed to educate and provide information to leaders, engineers, architects, designers and individuals around the world. Thanks to these organizations, better legislation regarding sanitation is being developed.

Several countries are more advanced when it comes to public toilet design. Japan and the Far East are known for public toilet design advancement and progress, just as they are known for their design of technology and airport design.<sup>233</sup> Individuals consider it an honor and a luxury to be employed by the public toilet department in Japan.<sup>234</sup> This country has solved the issue of toilet parity by using moveable walls to easily adjust the number of male or female gender divisions. In this way, there are no line-ups for the women's or men's washrooms.<sup>235</sup> In contrast to North American toilets, Japanese toilets are well furnished, and attendants are respected by the public.<sup>236</sup> Zurich, Switzerland,

has ninety-three public toilets, with ten automatic public toilets and four attendants to maintain these facilities.<sup>237</sup> Australia already has a well-developed public toilet system; to find a location or to check the accessibility of public toilets, people simply go to the internet for information. Melbourne, Australia, is planning to bring in fifteen more public toilets for its residents and tourists by 2013. Adelaide, Australia, has over twenty public toilets that are open twenty-four hours a day. These cities are all around the size of Calgary, Alberta.<sup>238</sup>

One approach to solving the dilemma of accommodating everyone's needs for public washrooms is the "Away from Home Toilet" Accessibility Guide, developed in the United Kingdom. Greed, urban planner, and the British Toilet Association (BTA) both say that cities with insufficient public lavatories require 'away from home' public toilets for commuters in public spaces.<sup>239</sup> In the twenty-first century, the goal is to strive for accessible men's and women's public toilets that are decorative, elaborate, and colourful, in addition to being clean and safe. An 'away from home' toilet is a new label for public toilets designed to be used by everyone on their way to and from a destination. Groups such as parents with children or infants, grandparents, the elderly, and individuals with luggage would benefit from these toilets. As a means of addressing the growing need for more accessible toilets in the United Kingdom, *The Accessible Toilet Resource Guide* was developed and implemented by VivaCity 2020 (a research consortium) and the Engineering and Physical Sciences Research Council (EPSRC). EPSRC funds university projects and studies in engineering and physical sciences. VivaCity 2020 is a university-led study group that teaches those responsible for the creation of sustainable urban environments (SUE) to understand human actions. From the Disability Discrimination Act 1995 (DDA), studies were carried out on '*away from home*' public toilets to test the accessibility legislation. The intention

was to assess the 'Toilet Audit Tool' from the standpoint of changes that businesses had made to their public lavatories. The guidelines identify a well-designed, accessible public toilet with fifty design requirements. The investigation used the British Standard BS8300:2001 and Part M of the Building Regulations (2004) to gauge accessible toilets. Unfortunately, of the 101 accessible toilets sites inspected, not one passed the assessment. From the study, the researchers prepared 'The Accessible Toilet Resource Guide', written by Julienne Hanson, Jo-Anne Bichard, and Clara Greed in 2008.<sup>240</sup>

In 2008, architects in the U.K. were asked to reconsider the public lavatory as part of the celebration of the Royal Institute of British Architects' (RIBA) 175<sup>th</sup> anniversary.<sup>241</sup> RIBA is an association of professional architects in the United Kingdom who create better, more inclusive architecture for their society and surroundings.<sup>242</sup> One hundred years ago, the British were proud of their advanced sanitation system, but today, London's public toilets and sewer systems are crumbling away.<sup>243</sup> RIBA and Clara Greed report that public lavatories are not well designed and are neglected, thus creating unhygienic, damaged facilities and crime.<sup>244</sup> Dr. Bineswar Pathak, the author of *History of Toilets*, says, "Toilet is part of history of human hygiene which is a critical chapter in the history of human civilization and which cannot be isolated to be accorded unimportant position in history. Toilet is a critical link between order and disorder and between good and bad environment [*sic*]." <sup>245</sup> Accessible and inclusive public toilets need to be an integral part of the urban environment, and not behind bushes and long dark paths, where they are unsafe, unhygienic, and vandalized.

## UNITED KINGDOM LEGISLATION - DISABILITY DISCRIMINATION ACT 1995 (DDA)

A range of legislative efforts have affected the need for public toilets in the United Kingdom. Officials in the United Kingdom introduced the Disability Discrimination Act 1995 (DDA) to end discrimination against disabled individuals. DDA describes a disabled individual being as "someone who has a physical or mental impairment which has a substantial and long-term adverse effect on his or her ability to carry out normal day-to-day activities "<sup>246</sup>.

For three months, Grahame Whitfield conducted research for the study, *The Disability Discrimination Act: Analysis of Data from an Omnibus Survey*. His research demonstrated that 11.7 million people, or twenty percent of the adult population in the U.K., are covered under the Disability Discrimination Act (DDA).<sup>247</sup> The research found that certain everyday activities such as shopping, going to the movies, and dining in a restaurant are the most difficult for the disabled.<sup>248</sup> The research also looked at movement disorders among men and women.<sup>249</sup> Movement disorders occur when the body does not react or move correctly because of problems with the nervous system. The highest number of movement disorders affected lifting and carrying, impacting sixty percent of the population of the United Kingdom.<sup>250</sup> Fifty-one percent of individuals have mobility difficulties, forty-eight percent of the population experience problems with physical coordination and fourteen percent of the adult population is affected by incontinence.<sup>251</sup> People in these categories become prisoners in their own homes when such problems prevent them from going out.

Since the DDA was established, non-profit organizations such as the Commission for Architecture (CABE) and the Centre for Accessible Environments (CAE) have sprung up in the United Kingdom to assist designers, architects, and engineers. Educational classes and inclusive design manuals have also been introduced. These instruction manuals contain the technical information to help design inclusive spaces. The DDA gave businesses three time frames to make the necessary changes to their business premises.<sup>252</sup> The goal of Phase 1, 1996, was to treat disabled persons equally without discrimination. In the second phase, in 1999, businesses were to make minor changes to their workplaces, without causing them to go out of business, for disabled employees and patrons, such as larger signage for the visually impaired. By October, 2004, businesses were to have altered their physical space to overcome any physical barriers such as steps. In place of steps, places of commerce were to install ramps.<sup>253</sup> If a business chose to ignore these requirements or said that it had no disabled clients, this excuse would not be accepted by the courts. The BBC News indicates that businesses that have not complied could also lose customers because people would choose to frequent the businesses that altered their environments to accommodate disabled clients.<sup>254</sup>

#### **CENTRE FOR ACCESSIBLE ENVIRONMENTS (CAE) 2004: INCLUSIVE APPROACH DEALING WITH USER NEEDS**

The Centre for Accessible Environments (CAE) has been advising architects, designers, and engineers on how to design inclusive and accessible architectural spaces in the United Kingdom for over thirty years.<sup>255</sup> *The Good Loo Design Guide* (revised in 2004) was produced by CAE to assist designers in creating a barrier-free toilet unit and understanding technical information. The guide recommends that all users of a public toilet require concealment, well-being, and security.<sup>256</sup> Sarah Langton-Lockton, Chief Executive of CAE, believes that designers

do not understand technical specifications because they do not understand how a disabled person uses a washroom.<sup>257</sup> For example, architects and interior designers need to be aware that the toilet flush handle and hand dryers are sometimes out of reach for some individuals, particularly those in wheelchairs. It is sometimes difficult to avoid touching or brushing against the sanitary bin or toilet roll when maneuvering in a stall. Also, the numerous grab bars that are required can create barriers when using the toilet. Designers need to find creative solutions to accommodate disabled people, the aging population, and mothers with infants or children, all of whom may be unable to use the existing washrooms. The CABE recommends that designers understand the types of individuals who use the facility, the highest traffic times during the day, and the number of people who use the public toilets.<sup>258</sup>

#### **COMMISSION FOR ARCHITECTURE AND THE BUILT ENVIRONMENT (CABE), 2006**

The Commission for Architecture and the Built Environment (CABE), located in London, England, assists developers and architects to achieve innovative, well-designed, friendly, inclusive spaces for everyone.<sup>259</sup> Creating well-designed spaces brings down physical barriers and allows individuals the freedom to be independent and sustainable.<sup>260</sup> CABE has developed inclusive design principles for the building industry to assist developers, architects, urban planners, and surveyors.<sup>261</sup> The five principles that allow everyone access to any environment are as follows:

1. Place people at the heart of the design process.
2. Acknowledge diversity and differences.
3. Offer choices where a single design solution cannot accommodate all users.
4. Provide for flexibility in use.

5. Provide buildings and environments that are convenient and enjoyable for everyone to use.<sup>262</sup>

Inclusive design provides flexible, convenient, adaptable, and friendly spaces, while giving a return on investment by offering well-being, self-respect, and sustainability for users. People selecting public toilets are able to make educated, independent decisions without experiencing unnecessary exertion or exclusion.

Universal Design is a concept developed in the United States in 1997 that eliminates discrimination based on disabilities. Ron Mace, an architect and designer in the United States, defined universal design in the early 1990's by creating products or architectural environments for people of all ages and capabilities.<sup>263</sup> There are seven principles that define universal design: the product or architecture (interior and exterior) must be functional, simple to understand, easy to use, tangible, and flexible; it must communicate easily, and create a safe place in an appropriate environment.<sup>264</sup> These principles allow persons with disabilities to contribute to our society and be independent.<sup>265</sup>

#### **LEGISLATION - AMERICANS WITH DISABILITIES ACT (ADA), UNITED STATES 1990**

The Architectural Barriers Act (ABA), the first accessible design and construction legislation in the USA, was passed in 1968. This act was then linked to the policy of civil rights to create the Architectural and Transportation Barriers Compliance Board in 1973. This policy applied to federal government buildings, but not to public buildings.<sup>266</sup> Consequently, not all public toilets were accessible to everyone. Finally, the Americans with Disabilities Act of 1990 (ADA Public Law 101-336) included public toilets with barrier-free design for all American citizens in

the private sector and in federal government buildings. ADA is an extension of the Civil Rights Act of 1964, but it does not cover obtainability or the convenience of a public toilet, nor does it cover equivalent toilets for women and discrimination in public toilets based on sexual orientation.<sup>267</sup>

In contrast to the countries mentioned, India has a population of 900 million, and 600 million people still eliminate in the open every day.<sup>268</sup> Less than twenty percent of the population has flushing toilets, creating a serious hygiene concern. A toilet movement called the Sulabh International Social Service Organization, established by Beneshwar Pathak, has installed 700,000 twin-pit, pour flush toilets, which are called 'glamour rooms' to encourage use. Pour flush toilets are similar to Western toilets, except that water is poured into the toilet to flush the excrement. There is a fee for men to use these facilities but none for women and children.<sup>269</sup>

## 2.12 CANADA

Graeme Evans claims that the urban environment is determined by accessibility in architecture, street design, and the breathing space within the city.<sup>270</sup> In the article *Accessibility, Urban Design and the Whole Journey Environment*, Evans discusses accessibility in the urban environment from the time people leave their homes until they return.<sup>271</sup> Twenty-four-hour-friendly cities are being designed to inspire walking, biking, and public transit use.<sup>272</sup> However, there is a dearth of public toilets in cities to support the demand.<sup>273</sup> Clara Greed states that this is the missing connection to create "sustainable, accessible, healthy and inclusive cities"<sup>274</sup>.

There are two basic types of public toilets: 'on-street' and 'off-street'.<sup>275</sup> On-street public toilets are operated by the city and are located in parks, transit stations, and public buildings such as libraries.<sup>276</sup> Off-street public toilets are operated by the private-sector developers and are found in shopping centres, hotels, and commercial office buildings. While urban designers are designing spaces to encourage community involvement, some Canadian cities have removed public toilets from the urban environment. In other words, they have not provided for the basic needs of their citizens. For example, when Winnipeg Transit opened the Southwest Rapid Transit Corridor in Winnipeg, Manitoba from Queen Elizabeth Way (located near the Forks) through Osborne to The Fort Rouge Rails, Jubilee Avenue, and Pembina Highway on April 8, 2012,<sup>277</sup> no public toilets were built for public transit users on this route. All that was provided for the public was bus shelters.

Nationally, Canada has the Canada Human Rights Act to protect individuals with disabilities.<sup>278</sup> Canada first introduced *Building Standards for the Handicapped* as an addition to the 1965 National Building Code of Canada.<sup>279</sup> By 1975, the barrier-free model requirements still had no legal status, although they were included in the National Building Code of Canada. Finally, in 1985, Part 3.7 was introduced in Part 3 for barrier-free design, and new conditions were introduced into the National Building Code of Canada. Today, the National Building Code of Canada 2010 requires that provinces and municipalities have accessibility regulations for new construction and renovations.

Winnipeg, Manitoba established the 2010 City of Winnipeg: Accessibility Design Standards that apply to new construction and renovated sites that are rented or maintained by the City only. Winnipeg has brought higher standards to barrier-free design by mirroring the Americans

with Disabilities Act (ADA). ADA legislation protects people with physical disabilities, but regulations in Ontario and Nova Scotia ensure accessible accommodation and transportation solely for persons with disabilities.<sup>280</sup>

Bridgman concludes there is a dearth of public toilets in Vancouver, Calgary, Edmonton, and Toronto and that everyone needs a public toilet.<sup>281</sup> Public toilets that are located in high traffic areas in the city are usually monitored by paid employees who monitor the facilities and keep them safe and clean. Also, minimum payment is required to use the facilities, as advertising pays for the upkeep of the units.

Some of our Canadian cities have recognized the problem and are beginning to take action. Presently, Vancouver is providing automated public toilets under a 'street furniture' contract from two international companies, CBS Outdoor and JCDecaux North America.<sup>282</sup> Financed by advertising, the automatic toilet is a unit that provides twelve minutes of privacy before the door opens and the toilet is internally disinfected. Unfortunately, the on-street automatic toilets frequently do not work because of acts of vandalism such as damage to the doors, removal of wiring, or flushing objects such as clothing down the toilet. Even though the public toilets have been vandalized, they are still being installed on the streets. Also, because the SkyTrain, Vancouver's public transportation, has no public washrooms and provides toilets for staff only, the need for civic public toilets is great.<sup>283</sup>

In 2008, Calgary, Alberta, installed its first automatic public toilet in Tomkins Park.<sup>284</sup> The Exeloo East Company provides fortified, vandal-proof units and automatic, self-cleaning public toilets. Also, the doors open in a manner that is similar to an elevator, with the voice track of Star Trek. The units also provide diaper-changing space. These units have proven successful with more permanent stations being added in 2011.<sup>285</sup> The cost to operate each public toilet is \$40,000.00 annually and \$400.00 per month for the utilities. The City of Calgary says that the public toilets are not a solution to the problem of public urination; therefore, the stations have not been installed throughout the city.<sup>286</sup>

The City of Edmonton, Alberta, announced on May 13, 2010, that seven temporary toilets would be installed on Jasper Avenue until mid-October, 2010. This initiative was an effort to clean up the streets and create inclusive spaces for individuals and tourists.<sup>287</sup> Also, Whyte Avenue in Edmonton has permanent public toilets.<sup>288</sup> Tickets are required in order to use these stations. Since the date of this writing, there has been no further information provided by the City of Edmonton concerning the success of these public toilets.

Toronto installed its first automatic public toilet on the waterfront in 2010, with twenty more installed around high-traffic areas.<sup>289</sup> All the units are barrier-free and are automatically sanitized after each use. It costs twenty-five cents to use the public toilet, and security checks the units three times a day. The company operating the units is Astral Media Outdoor, which generates revenue from advertising on the stations.

Astral Media Outdoor provides all the 'street furniture' to the city of Toronto.<sup>290</sup>

As evidenced, the problem of providing adequate, accessible public toilets is beginning to be recognized by international organizations on sanitation and accessibility. The 'Away from Home' Guide in the United Kingdom demonstrates that progress has been made in designing accessible public facilities. Legislation and non-profit organizations have been established in the United Kingdom and the United States to introduce technical information that assists designers in creating spaces for everyone. While Japan celebrates its public toilets and is seen as the toilet leader in the world, Australia is a leader in sustainable public toilet technology.<sup>291</sup>

Compared to other parts of the world, Canada lacks on-street and off-street public toilets, sanitation, accessibility, and barrier-free standards. It lags behind in the design of public toilets for everyone, and it is not making public toilets a priority in the urban environment. Indeed, there is little support given by the federal government to make public toilets accessible to everyone. Isn't this an opportunity for Winnipeg to become a model of what could and should be done to improve the physical and social problems that surround the public toilet environment?

## ENDNOTES

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<sup>1</sup> Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 50.

<sup>2</sup> Greed, *Inclusive Urban Design*, 34.

<sup>3</sup> Clara Greed, "The Role of the Public Toilet in Civic Life," in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 37 (Philadelphia: Temple University Press, 2009).

<sup>4</sup> Zena Kamash, "Which Way to Look?: Exploring Latrine Use in the Roman World" in *Toilet: Public Restrooms and the Politics of Sharing*, ed. Harvey Molotch, and Laura Noren, 47 (New York and London: New York University Press, 2010); Clara Greed, *Inclusive Urban Design*, 32.

<sup>5</sup> Kamash, "Which Way to Look?," 52.

<sup>6</sup> Kamash, "Which Way to Look?;" 48; Greed, *Inclusive Urban Design*, 32; Kamash, *Which Way to Look?*, 52.

<sup>7</sup> Kamash, "Which Way to Look?," 49.

<sup>8</sup> Kamash, "Which Way to Look?," 50; Clara Greed, *Inclusive Urban Design*, 32.

<sup>9</sup> Kamash, "Which Way to Look?," 48.

<sup>10</sup> Kamash, "Which Way to Look?," 53.

<sup>11</sup> Katherine Ashenburg, *The Dirt on Clean: An Unsanitized History* (Toronto, Alfred A. Knoff Canada, 2007) 33.

<sup>12</sup> Ashenburg, *The Dirt on Clean*, 40.

<sup>13</sup> Barry Hobson, *Latrinae et Foricae: Toilets in the Roman World* (London: Gerald Duckworth & Co. Ltd., 2009) 105.

<sup>14</sup> Hobson, *Latrinae et Foricae*, 173; Hobson, *Latrinae et Foricae*, 113.

<sup>15</sup> Hobson, *Latrinae et Foricae*, 106.

<sup>16</sup> Clara Greed, *Inclusive Urban Design*, 32; Hobson, *Latrinae et Foricae*, 106.

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- <sup>17</sup> Clara Greed, *Inclusive Urban Design*, 32; Hobson, *Latrinae et Foricae*, 106; Hobson, *Latrinae et Foricae*, 57; Hobson, *Latrinae et Foricae*, 45; Hobson, *Latrinae et Foricae*, 46..
- <sup>18</sup> Ashenburg, *The Dirt on Clean*, 40; Ashenburg, *The Dirt on Clean*, 122.
- <sup>19</sup> Hobson, *Latrinae et Foricae*, 105.
- <sup>20</sup> Greed, *Inclusive Urban Design*, 33; Greed, *Inclusive Urban Design*, 34.
- <sup>21</sup> Hobson, *Latrinae et Foricae*, 113.
- <sup>22</sup> Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 33.
- <sup>23</sup> Bindeswar Pathak, "Binderwar Pathak, "History of Public Toilets," Sulabh International Museum of Toilets, <http://www.sulabhtoiletmuseum.org/pg02.htm> (accessed May 14, 2011); Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo and London: University of Toronto Press Incorporated, 2010) 28.
- <sup>24</sup> Bindeswar Pathak, "Binderwar Pathak, "History of Public Toilets," Sulabh International Museum of Toilets, <http://www.sulabhtoiletmuseum.org/pg02.htm> (accessed May 14, 2011).
- <sup>25</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo and London: University of Toronto Press Incorporated, 2010) 28.
- <sup>26</sup> Bindeswar Pathak, "Binderwar Pathak, "History of Public Toilets," Sulabh International Museum of Toilets, <http://www.sulabhtoiletmuseum.org/pg02.htm> (accessed May 14, 2011).
- <sup>27</sup> Cavanagh, *Queering Bathrooms*, 29; Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 34.
- <sup>28</sup> Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 37; Greed, *Inclusive Urban Design*, 36.
- <sup>29</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo and London: University of Toronto Press Incorporated, 2010) 41.
- <sup>30</sup> Elizabeth Wilson, *The Sphinx in the City: Urban Life, the Control of Disorder, and Women* (London: University of California Press, 1991) 37.

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<sup>31</sup> Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 39.

<sup>32</sup> Greed, *Inclusive Urban Design*, 37.

<sup>33</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo and London: University of Toronto Press Incorporated, 2010) 40.

<sup>34</sup> Greed, *Inclusive Urban Design*, 34; Greed, *Inclusive Urban Design*, 33; Greed, *Inclusive Urban Design*, 39; Greed, *Inclusive Urban Design*, 40.

<sup>35</sup> Ellen Lupton and J. Abbott Miller, *The Bathroom The Kitchen and the Aesthetics of Waste: A Process of Elimination* (Cambridge: Princeton Architectural Press 1992) 22-23.

<sup>36</sup> Lupton and Miller, *The Bathroom The Kitchen*, 19.

<sup>37</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo and London: University of Toronto Press Incorporated, 2010) 40.

<sup>38</sup> Bindeswar Pathak, "History of Public Toilets," Sulabh International Museum of Toilets, <http://www.sulabhtoiletmuseum.org/pg02.htm> (accessed May 14, 2011); Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 40.

<sup>39</sup> Greed, *Inclusive Urban Design*, 40; Alison Moore, "Colonial Visions of "Third World" Toilets: A Nineteenth-Century Discourse That Haunts Contemporary Tourism," in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 110 (Philadelphia: Temple University Press, 2009); Moore, *Colonial Visions of "Third World" Toilets*, 110; Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 42; Greed, *Inclusive Urban Design*, 42.

<sup>41</sup> Lupton and Miller, *The Bathroom The Kitchen*, 26.

<sup>42</sup> Lupton and Miller, *The Bathroom The Kitchen*, 3.

<sup>43</sup> Lupton and Miller, *The Bathroom The Kitchen*, 28.

<sup>44</sup> Lupton and Miller, *The Bathroom The Kitchen*, 28.

<sup>45</sup> Clara Greed, Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 52.

<sup>46</sup> Greed, *Inclusive Urban Design*, 52.

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<sup>47</sup> Greed, *Inclusive Urban Design*, 52; Greed, *Inclusive Urban Design*, 34.

<sup>48</sup> Greed, *Inclusive Urban Design*, 55.

<sup>49</sup> R. Stanwell-Smith, "Public toilets down the drain? Why privies are a public health concern." *Public Health* 124, 613-616 (2010): 615.

<sup>50</sup> Canadian Broadcast Corporation (CBC), "Manchester Public Toilets," Canadian Broadcast Corporation (CBC) <http://www.cbc.ca/asithappens/episode/2011/02/14/monday-february-15-2011/> (accessed October 3, 2011).

<sup>51</sup> Canadian Broadcast Corporation (CBC), "Manchester Public Toilets," Canadian Broadcast Corporation (CBC) <http://www.cbc.ca/asithappens/episode/2011/02/14/monday-february-15-2011/> (accessed October 3, 2011); British Toilet Association, "Campaigning for better public toilets for all," BTA British Toilet Association, <http://www.britloos.co.uk/> (accessed October 11, 2011).

<sup>52</sup> Greed, *Inclusive Urban Design*, 34.

<sup>53</sup> Penny Bonda and Katie Sosnowchik, *Sustainable Commercial Interiors* (Hoboken :John Wiley & Sons, Inc.) 70.

<sup>54</sup> Bonda and Sosnowchik, *Sustainable Commercial*, 72-73.

<sup>55</sup> Bonda and osnowchik, *Sustainable Commercial*, 75.

<sup>56</sup> Worrell Water Technologies & Living Machines, "Treating wastewater nature's way," Worrell Water Technologies & Living Machines, <http://www.livingmachines.com/> (accessed May 18, 2012).

<sup>57</sup> Greed, "The Role of the Public Toilet," 37.

<sup>58</sup> Greed, *Inclusive Urban Design*, 33; Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London" *Journal of Design History* Vol. 14 No. 1 (2001): 35.

<sup>59</sup>Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo, London: University of Toronto Press Incorporated, 2010) 61; Penner, *A World of Unmentionable Suffering*, Vol. 14 No. 1 (2001): 37.

<sup>60</sup>Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety," in *Toilet: Public Restrooms and Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 146 (New York and London: New York University Press, 2010); Catherine Clinton, *The Other Civil War* (New York: Hill and Wang, 1984), 18.

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<sup>61</sup>Penner, *A World of Unmentionable Suffering*, Vol. 14 No. 1, (2001): 35.

<sup>62</sup>Doreen Massey, *Space, Place, and Gender* (Minneapolis: University of Minnesota Press, 1994), 179.

<sup>63</sup>Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London, *Journal of Design History* Vol. 14 No. 1 (2001): 45; Barbara Penner, "A World of Unmentionable Suffering," in *Intimus: Interior Design Theory Reader*, ed. Mark Taylor and Julieanna Preston, 255 (West Sussex: John Wiley & Sons Ltd., 2008).

<sup>64</sup> Femme fatale means a 'dangerous' woman who can easily seduce a man.

<sup>65</sup>Andrew Brown-May and Peg Fraser, Gender, Respectability, and Public Convenience in Melbourne, Australia, 1859-1902," in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 77 (Philadelphia: Temple University Press, 2009); Elizabeth Wilson, *The Sphinx in the City* (London: University of California Press, 1991) 6; Barbara Penner, "A World of Unmentionable Suffering," in *Intimus: Interior Design Theory Reader*, ed. Mark Taylor and Julieanna Preston (West Sussex: John Wiley & Sons Ltd., 2008) 256; Judith Walkowitz, *City of Dreadful Delight: Narratives of Sexual Danger in Late Victorian London* (London: Virago Press, 1992).

6; Elizabeth Wilson, *The Sphinx in the City* (London: University of California Press, 1991) 6.

<sup>66</sup> Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London, *Journal of Design History* Vol. 14 No. 1 (2001): 45; Barbara Penner, "A World of Unmentionable Suffering," in *Intimus: Interior Design Theory Reader*, ed. Mark Taylor and Julieanna Preston (West Sussex: John Wiley & Sons Ltd., 2008) 255.

<sup>67</sup> Kogan, *Sex Separation*, 145; Kogan, *Sex Separation*, 159.

<sup>68</sup> Penner, *A World of Unmentionable Suffering*, 14:42; Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London" *Journal of Design History* Vol. 14 No. 1 (2001): 37.

<sup>69</sup> Penner, *A World of Unmentionable Suffering*, 14:42.

<sup>70</sup> Mary P. Ryan, *Women in Public: Between Banners and Ballots, 1825-1880* (Baltimore: Johns Hopkins University Press, 1990), 31-32; Kogan, *Sex Separation*, 149; Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, MA: Harvard University Press, 1989), 4.

<sup>71</sup>Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety," in *Toilet: Public Restrooms and Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 150 (New York and London: New York University Press, 2010); Donald H. Gjerdingen, "The Politics of the Coase Theorem and Its Relationship to Modern Legal Thought," *Buffalo Law Review* 35 (1986): 877.

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<sup>72</sup>Cavanagh, *Queering Bathrooms*, 135.

<sup>73</sup>Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety," in *Toilet: Public Restrooms and Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 164 (New York and London: New York University Press, 2010).

<sup>74</sup>Kogan, *Sex Separation*, 150.

<sup>75</sup> Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London," *Journal of Design History* Vol. 14 No. 1 (2001): 46.

<sup>76</sup> Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety," in *Toilet: Public Restrooms and Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 150 (New York and London: New York University Press, 2010); Kogan, *Sex Separation*, 151.

<sup>77</sup>Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London," *Journal of Design History* Vol. 14 No. 1 (2001): 38.

<sup>78</sup> Penner, *A World of Unmentionable Suffering*, Vol. 14 No. 1 (2001): 39.

<sup>79</sup> Kogan, *Sex Separation*, 146; Kogan, *Sex Separation*, 154.

<sup>80</sup> Kogan, *Sex Separation*, 151; Kogan, *Sex Separation*, 147.

<sup>81</sup>Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety," in *Toilet: Public Restrooms and Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 148 (New York and London: New York University Press, 2010).

<sup>82</sup> Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London" in *Journal of Design History* Vol. 14 No. 1 (2001): 43.

<sup>83</sup> Barbara Penner, "(Re) Designing the 'Unmentionable': Female Toilets in the Twentieth Century," in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 143 (Philadelphia: Temple University Press).

<sup>84</sup> Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003) 51; Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London" in *Journal of Design History* Vol. 14 No. 1 (2001): 43.

<sup>85</sup> Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety" in *Public Restrooms and the Politics of Sharing: Toilet*, ed. Harvey Molotch and Laura Noren, 145 (New York and London: New York University Press, 2010).

<sup>86</sup> Kogan, "Sex Separation," 145.

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<sup>87</sup> Elizabeth Wilson, *The Sphinx in the City: Urban Life, the Control of Disorder, and Women* (London: University of California Press, 1991) 37.

<sup>88</sup> Ashenburg, *The Dirt on Clean*, 91.

<sup>89</sup> Ashenburg, *The Dirt on Clean*, 94; Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press) 39; Ruth Barcan, "Dirty spaces: Separation, Concealment, and Shame in the Public Toilet" in *Toilet: Public Restrooms and the Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 27 (New York: New York University Press, 2010).

<sup>90</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo, London: University of Toronto Press Incorporated, 2010) 134.

<sup>91</sup> Ellen Lupton and J. Abbott Miller, *The Bathroom The Kitchen and the Aesthetics of Waste: A Process of Elimination* (New York: Princeton Architectural Press, 1992), 22; Lupton and Miller, *The Bathroom The Kitchen and the Aesthetics of Waste*, 3; Terry S. Kogan, "Sex Separation: The Cure-All for Victorian Social Anxiety," in *Toilet: Public Restrooms and Politics of Sharing*, ed. Harvey Molotch and Laura Noren, 149 (New York and London: New York University Press, 2010).

<sup>92</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo, London: University of Toronto Press Incorporated, 2010) 134.

<sup>93</sup> Colomina, *Domesticity*, 156.

<sup>94</sup> Lupton and Miller, *The Bathroom The Kitchen*, 26.

<sup>95</sup> Colomina, *Domesticity*, 156; Colomina, *Domesticity*, 161.

<sup>96</sup> The Canadian Lung Association, "Tuberculosis," The Canadian Lung Association, [http://www.lung.ca/diseases-maladies/tuberculosis-tuberculose/what-quoi/index\\_e.php](http://www.lung.ca/diseases-maladies/tuberculosis-tuberculose/what-quoi/index_e.php) (accessed July 23, 2011).

<sup>97</sup> Sheila L. Cavanagh, *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto, Buffalo, London: University of Toronto Press Incorporated, 2010) 134.

<sup>98</sup> Elizabeth Wilson, *The Sphinx in the City: Urban Life, the Control of Disorder, and Women* (Oxford: University of California Press, 1991) 22.

<sup>99</sup> Cavanagh, *Queering Bathrooms*, 135.

<sup>100</sup> Wilson, *The Sphinx in the City*, 50.

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<sup>101</sup> Michel Foucault, *Discipline & Punish: The Birth of the Prison* (New York: Vintage Books A Division of Random House, Inc., 1995), 170; Elizabeth Wilson, *The Sphinx in the City: Urban Life, the Control of Disorder, and Women* (London: University of California Press, 1991) 22; Foucault, *Discipline & Punish*, 172; Foucault, *Discipline & Punish*, 175.

<sup>102</sup> Colomina, *Domesticity*, 160; Lupton and Miller, *The Bathroom*, 20.

<sup>103</sup> Lupton and Miller, *The Bathroom*, 23.

<sup>104</sup> Colomina, *Domesticity*, 161.

<sup>105</sup> Colomina, *Domesticity*, 161.

<sup>106</sup> Colomina, *Domesticity*, 161.

<sup>107</sup> Colomina, *Domesticity*, 157; *Ibid.*, 161; Colomina, *Domesticity*, 156; *Ibid.* 163-164; *Ibid.*, 157; Colomina, *Domesticity*, 156.

<sup>108</sup> Sam Hunter and John Jacobus, *Modern Art: Second Edition, Painting/Sculpture/Architecture* (New York: Harry N. Abrams, 1985) 212.

<sup>109</sup> Hunter and Jacobus, *Modern Art*, 196-197; *Ibid.*, 156.

<sup>110</sup> F. Furneaux Jordan, "A Concise History of Western Architecture: with 432 Illustrations," (Great Britain: Thames and Hudson, 1969 reprinted 1979), 323.

<sup>111</sup> Jordan, "A Concise History," 323.

<sup>112</sup> Beatriz Colomina, *Domesticity at War* (Cambridge: The MIT Press, 2007), 156; Colomina, *Domesticity at War*, 231.

<sup>113</sup> Colomina, *Domesticity at War*, 157.

<sup>114</sup> Jessica Green, "Are we filtering the wrong microbes?" Ted Conferences L.L.C., [http://www.ted.com/talks/jessica\\_green\\_are\\_we\\_filtering\\_the\\_wrong\\_microbes.html?awesm=on.ted.com\\_Green&utm\\_campaign=&utm\\_medium=on.ted.com-static&utm\\_source=facebook.com&utm\\_content=awesm-bookmarklet](http://www.ted.com/talks/jessica_green_are_we_filtering_the_wrong_microbes.html?awesm=on.ted.com_Green&utm_campaign=&utm_medium=on.ted.com-static&utm_source=facebook.com&utm_content=awesm-bookmarklet) (accessed August 3, 2011).

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<sup>116</sup> Penny Bonda and Katie Sosnowchik, *Sustainable Commercial Interiors*, (New Jersey: John Wiley & Sons, 2007), 153.

<sup>117</sup> Cavanagh, *Queering Bathrooms*, 139; Barbara Penner, "A World of Unmentionable Suffering: Women's Public Conveniences in Victorian London" *Journal of Design History Vol. 14 No. 1* (2001): 47.

<sup>118</sup> Cavanagh, *Queering Bathrooms*, 139.

<sup>119</sup> Colomina, *Domesticity at War*, 163.

<sup>120</sup> Ellen Lupton and J. Abbott Miller, *The Bathroom The Kitchen and the Aesthetics of Waste: A Process of Elimination* (New York: Princeton architectural Press, 1992) 3.

<sup>121</sup> Cavanagh, *Queering Bathrooms*, 142.

<sup>122</sup> Cavanagh, *Queering Bathrooms*, 142; Cavanagh, *Queering Bathrooms*, 144.

<sup>123</sup> Colomina, *Domesticity at War*, 160.

<sup>124</sup> Cavanagh, *Queering Bathrooms*, 246 n9.

<sup>125</sup> Cavanagh, *Queering Bathrooms*, 11.

<sup>126</sup> Kathy Anthony and Meghan Dufresne, "Potty Privileging in Perspective Design" in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 49 (Philadelphia: Temple University Press, 2009).

<sup>127</sup> Anthony and Dufresne, "Potty Privileging," 49.

<sup>128</sup> Kathryn H. Anthony and Megan Dufresne, "Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms" in *Journal of Planning Literature* 21, 267 (2007): 267; Anthony and Dufresne, *Potty Parity in Perspective* 21: 268.

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<sup>129</sup> For example, my proposed redesign of the public washrooms at St. Vital Centre mall focuses on demonstrating design strategies that ensure the provision of the appropriate number of toilets for individuals or groups. The resulting designed environment does not reflect a condition of privilege; rather it is simply a condition of healthfulness, convenience and human comfort.

<sup>130</sup> Anthony and Dufresne, "Potty Privileging," 50.

<sup>131</sup> Anthony and Dufresne, "Potty Parity in Perspective," 271; Anthony and Dufresne, "Potty Privileging," 51.

<sup>132</sup> Anthony and Dufresne, "Potty Privileging," 48.

<sup>133</sup> Anthony and Dufresne, "Potty Parity in Perspective," 271; Anthony and Dufresne, "Potty Privileging," 51.

<sup>134</sup> Anthony and Dufresne, "Potty Privileging in Perspective," 51.

<sup>135</sup> Greed, *Inclusive Urban Design*, 68.

<sup>136</sup> Anthony and Dufresne, "'Potty Privileging' in Perspective," 57; Sarah A. Moore, "Facility Hostility? Sex Discrimination and Women's Restrooms in the Workplace" *Georgia Law Review* 36 (2002): 599-634.

<sup>137</sup> Anthony and Dufresne, "Potty Privileging," 51.

<sup>138</sup> House of Representatives, "H.R. 4869, The Restroom Gender Parity In Federal Buildings Act" Pt 2," You Tube, [http://www.youtube.com/watch?v=\\_uZAgzUqicU&feature=channel](http://www.youtube.com/watch?v=_uZAgzUqicU&feature=channel) (accessed July 31, 2011).

<sup>139</sup> Authenticated U.S. Government Information, *H.R. 4869, Restroom gender Parity in Federal Buildings Act* (Washington: U.S. Government Printing Office, 2011) 1.

<sup>140</sup> Anthony and Dufresne, "'potty privileging' in Perspective," 48.

<sup>141</sup> House of Representatives, "H.R. 4869, The Restroom Gender Parity In Federal Buildings Act" Pt 2," You Tube, [http://www.youtube.com/watch?v=\\_uZAgzUqicU&feature=channel](http://www.youtube.com/watch?v=_uZAgzUqicU&feature=channel) (accessed July 31, 2011).

<sup>142</sup> Authenticated U.S. Government Information, *H.R. 4869, Restroom gender Parity in Federal Buildings Act* (Washington: U.S. Government Printing Office, 2011) 2; Kathryn H. Anthony and Meghan Dufresne, "'potty privileging' in Perspective: Gender and Family Issues in Toilet Design" in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 56 (Philadelphia: Temple University Press, 2009).

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- <sup>143</sup> Authenticated U.S. Government Information, *H.R. 4869, Restroom gender Parity in Federal Buildings Act* (Washington: U.S. Government Printing Office, 2011) 4.
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- <sup>282</sup>Frank Luba, "Broken public toilets in Vancouver frustrate city planners," *The Province*, <http://www.theprovince.com/life/Broken+public+toilets+Vancouver+frustrate+city+planners+with+video/5461380/story.html> (accessed October 7, 2011).
- <sup>283</sup>Frank Luba, "Broken public toilets in Vancouver frustrate city planners," *The Province*, <http://www.theprovince.com/life/Broken+public+toilets+Vancouver+frustrate+city+planners+with+video/5461380/story.html> (accessed October 7, 2011).
- <sup>284</sup>Geoff Ghitter and Noel Keough, "Urban Living: On the topic of toilets, Public facilities and social sustainability," *Fast Forward Weekly*, <http://www.ffwdweekly.com/article/life-style/urban-living/on-the-topic-of-toilets-6903/> (accessed October 7, 2011).
- <sup>285</sup>Geoff Ghitter and Noel Keough, "Urban Living: Public toilets are...Setting the record straight," *Fast Forward Weekly*, <http://www.ffwdweekly.com/article/life-style/urban-living/public-toilets-are-8060/> (accessed October 7, 2011).
- <sup>286</sup>Geoff Ghitter and Noel Keough, "Urban Living: Public toilets are...Setting the record straight," *Fast Forward Weekly*, <http://www.ffwdweekly.com/article/life-style/urban-living/public-toilets-are-8060/> (accessed October 7, 2011).
- <sup>287</sup>City of Edmonton, "Public Toilets Coming to Jasper Avenue: Whyte Ave to get permanent washrooms," City of Edmonton, [http://www.edmonton.ca/city\\_government/news/public-toilets-coming-to-jaspe.aspx](http://www.edmonton.ca/city_government/news/public-toilets-coming-to-jaspe.aspx) (accessed October 6, 2011).
- <sup>288</sup>City of Edmonton, "Public Toilets Coming to Jasper Avenue: Whyte Ave to get permanent washrooms," City of Edmonton, [http://www.edmonton.ca/city\\_government/news/public-toilets-coming-to-jaspe.aspx](http://www.edmonton.ca/city_government/news/public-toilets-coming-to-jaspe.aspx) (accessed October 6, 2011).
- <sup>289</sup>CBC News, "Public pay toilet opens in Toronto," *CBC News* <http://www.cbc.ca/news/canada/toronto/story/2010/05/19/toronto-public-pay-toilet.html> (accessed October 9, 2011).

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<sup>290</sup>Canadian Broadcast Corporation, "Public pay toilet opens in Toronto," CBC News <http://www.cbc.ca/news/canada/toronto/story/2010/05/19/toronto-public-pay-toilet.html> (accessed October 9, 2011).

<sup>291</sup> Greed, "Creating a Nonsexist Restroom," 119; Greed, *Inclusive Public Toilets*, 68, 125, 127.

## **CHAPTER 3 . PRECEDENTS**

## JAPAN - HASUIKEBORI REST ROOM

<b>BUILDING:</b>	Hasuikebori Rest Room - 'Lotus Pond' <sup>1</sup>
<b>LOCATION:</b>	Chiyoda, Tokyo, Japan
<b>ARCHITECTS:</b>	Akira Watanabe Architect and Associates + Masahiro Ikeda Co., Ltd.
<b>CLIENT:</b>	Imperial Household Agency, Department of Works
<b>SITE AREA:</b>	719,994.00 m <sup>2</sup> (7, 749, 950 ft <sup>2</sup> )
<b>BUILDING AREA:</b>	63.92 m <sup>2</sup> (688 ft <sup>2</sup> )
<b>TOTAL FLOOR AREA:</b>	61.20m <sup>2</sup> (658 ft <sup>2</sup> )
<b>STRUCTURE:</b>	Reinforced concrete, roof: aluminum honeycomb; 1 storey
<b>PRINCIPAL USE:</b>	Restroom
<b>CONSTRUCTED:</b>	March, 2005
<b>GENDER:</b>	Men, Women, and one Unisex accessible unit <sup>2</sup>

The Hasuike Public Facility is located in the East Garden Park, Tokyo, Japan.<sup>3</sup> The East Garden Park surrounds the Imperial Palace, built during the Hasuikebori period. The palace is separated from the park by a lotus moat and the high stone walls of the Imperial Palace see figure 7. The Hasuike Public Facility is located beside the moat, within walking distance of the railroad station, see figure 11. The architect respected the history of the space and scale of the building within the park, and designed the building with a wide entrance both sides. Located midway down the building, the entrance slopes away from the moat giving the building a feeling of weightlessness and gracefulness. The colour and form of the building blend in with the natural surroundings, creating balance and harmony within the space.

The open space gives safety to the patrons because of the transparency of the building. The spatial attributes of the Hasuikebori public toilets allow easy access to the men's, women's, barrier-free and unisex facilities, see figure 8. The entrance is a common area with an accessible restroom. At the entrance to the building, from the moat, there is a division between the men's and women's facilities. On the left side is a short hallway turning into the men's washroom, and on the right is the women's washroom. Upon first entering the space, one sees two large picture windows: one has a view of the moat and one is on the other side at the end of the building, figure 9. This creates transparency and safety between the interior and exterior of the public washroom. The sinks that overlook the moat are sunk into concrete and have sensor faucets to control water consumption. The men's washroom has self-cleaning urinals with two private cubicles, and the women's washroom has four cubicles.



Figure 7

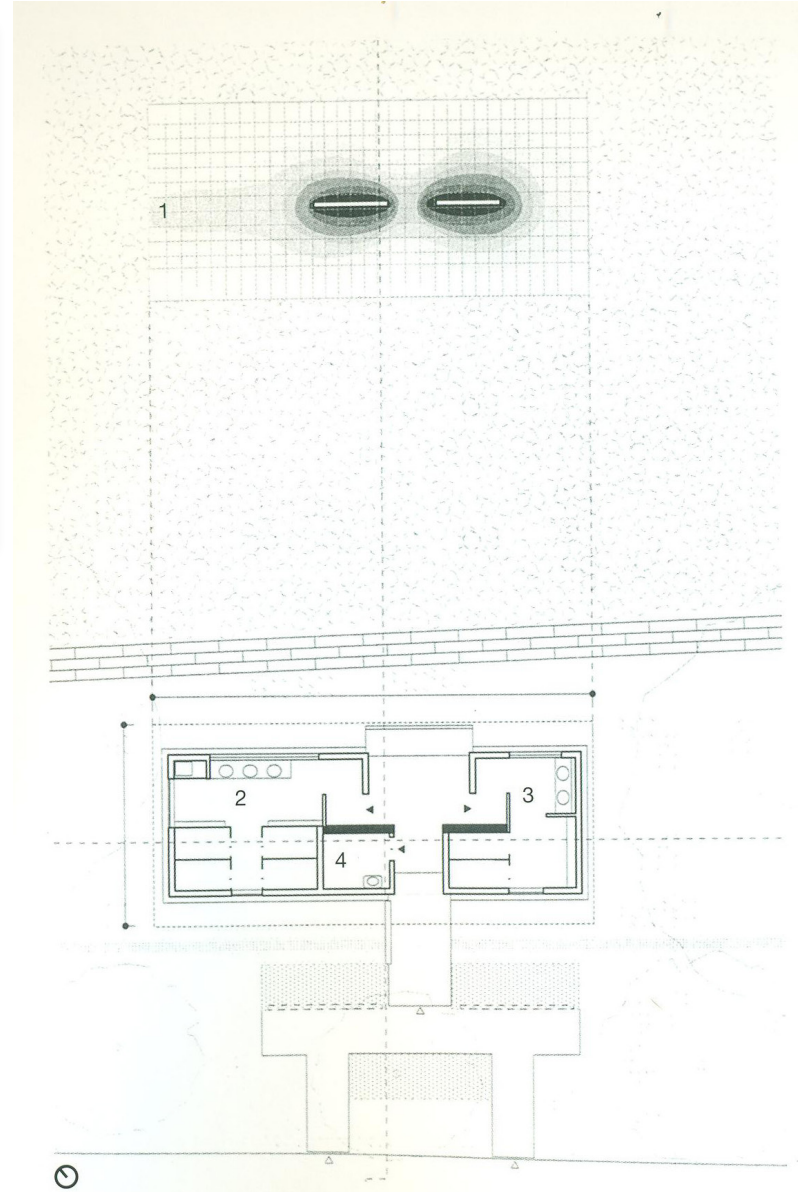


Figure 8

### 3 • HASUIKEBORI, TOKYO, JAPAN



Figure 9



Figure 10



Figure 11

The large glass windows, wide entrances, and openness of the building allow patrons to easily see into the building, and to enter and exit the facility quickly. The immense window creates transparency between the exterior and interior of the building and allows natural light to filter into the facility. The view from the sink overlooks the lotus moat. The countertops are dark granite, and the walls are dark wood and beige granite. The mirrored walls divide the wash area from the defined women and men spaces. The mirrors reflect nature from outside and provide safety for the patrons by giving them a greater awareness of their surroundings. Also, sound is able to travel outside the building because of the construction of the exterior, non-structural timber walls and louvered openings, figure 10.<sup>4</sup> The slatted exterior walls also allow for natural air to circulate throughout the building. The roof structure design is influenced from the shipping industry, and is reinforced by a single pillar bearing a flexible, lightweight, aluminum roof. Similarly, between the roof and the top of the walls are glass panels and openings for ventilation that allow natural light and fresh air to circulate within the building. The floors are dark tile, and sconce lights reflect off the aluminum ceiling to create softness within the structure. The manufacturer of the fixtures is TOTO, which supplies squatting toilets, self-cleaning urinals, and devices that mimic the sound of trickling water.<sup>5</sup>

The Osborne site has large windows to produce translucence between the inside and outside of the building and to provide safety. St. Vital Centre has some walls that are not all the way to the ceiling, allowing sound to travel on the other side of the walls, air to circulate, and natural light to filter into the building. Osborne Station, Pan Am Pool, and St. Vital Centre all use TOTO products for fixtures, urinals, and faucets.

DESIGN ELEMENTS	
SPACE	The space is an open concept. The walls are partial height for privacy, giving the feeling of safety.
LINE	The simple lines of the exterior of the building flow horizontally. The horizontal lines create a movement leading one into the building. The interior lines mirror the exterior.
FORM/SHAPE/MASS	The building shape flows into the surrounding environment, away from the lotus moat. The building has simple, delicate lines, and rectangular and square shapes.
TEXTURE	The slatted timber walls add warmth through colour and surface touch.
COLOUR	The interior cool colours of stainless steel, beige granite stone, and aluminum roofing add warmth to the rich, brown slatted timber exterior walls and tiled floors.
LIGHT	Natural light filters through the outsized windows and below the roof line, giving the space transparency and fluidity.
PATTERN	The repetitive patterns throughout the space are horizontal and vertical lines.

## POINTWC, PARIS, FRANCE

<b>BUILDING:</b>	POINTWC, <a href="http://www.pointwc.com">www.pointwc.com</a>
<b>DESIGNER:</b>	Nina Virus, Studio5491 (communications & graphics) <a href="http://www.studio5491.com">www.studio5491.com</a>
<b>LOCATION:</b>	Paris, France
<b>GENDER:</b>	Men, Women, and Accessible "cabin"
<b>PLACEMAKER:</b>	Attendant, gift and toiletries boutique
<b>MANUFACTURER:</b>	Washbasins, Urinals, toilets – Roca and Laufen
<b>CLIENT:</b>	Eric Salles / LETS

POINTWC is located in the busy fashion district of Champs-Elysees, Paris, France.<sup>6</sup> The idea began in London, England, with WC1, which has an entrance fee of 5 pounds (\$7.93 CAD). The entrance fee for POINTWC is 1 euro (\$1.28 CAD). The POINTWC restroom is the Paris boudoir of the twenty-first century, providing well-being, rest, hygiene, and toiletries for women, men, and children. The facility caters also to tourists and shopping customers.

The designer Nina Virus feels that work, home, holidays, and public spaces combine into one, with small private spaces such as the "cabins". The design of POINTWC is influenced by an Englishman's club, with the aesthetic of a twenty-first century interior. Pink and purple are the dominant colours throughout the main area, with dark walnut wood cabinets. The spatial design takes into consideration hygiene by

having no entrance doors to segregated men's and women's toilet spaces; there is only a full-height wall to divide the two gendered areas. The sinks are white, with single-control faucets, and all the lighting is artificial, with no natural light throughout the space.<sup>7</sup>

POINTWC features a long corridor entrance, with the lobby area opening into a larger space. After entering, patrons are greeted by an attendant in the reception area. The patrons are able to select from a variety of private units that are individualized, unique, and stylish. Each "cabin" is designed to meet the customer's private needs, with full-height walls and a toilet with a small, wall-hung sink. After clients experience the individual cabins, they can use the powder room, which is equipped with wellness, cosmetic, and hair products for their use.<sup>8</sup>

The attendant assists clients in trying out the variety of toiletries, sinks and faucets from the manufacturer, Roca-Laufen. The attendant is also responsible for cleaning each "cabin" after each use. The client is also able to purchase products from the boutique, such as patterned toilet paper, diapers, wallpaper, and diapers.<sup>9</sup>

DESIGN PRINCIPLES	
SCALE	The scale of the interior is balanced with the human scale.
PROPORTION	The proportions of the fixtures balance with the human scale.
BALANCE	The interior is symmetrical.
RHYTHM	Rhythm is created by the pink and mahogany tones throughout the

	main corridor.
EMPHASIS/FOCAL POINT	The focal points of the design are the individual designed cabins or private units. The emphasis is on the contrast between the main traffic spaces and the individual cabins. The cabins feel isolated from the rest of the interior space and urban life.
UNITY	The balance between the main traffic areas and cabins comes from the strong colours throughout the interior. The finishes, ambiance, and tone give the feeling of 'home away from home' mentioned by Clara Greed in her book <i>Inclusive Urban Design: Public Toilets</i> .
VARIETY	The variety of colours, materials, and brand fixtures offers surprises throughout the interior.
HARMONY	A simple contemporary theme balances the space through colour and materials.
ILLUSION OF SPACE	The use of glass, colour, and materials throughout the interior creates the effect of overlapping space.
ILLUSION OF MOTION	One main traffic corridor leads directly to the reception area, the attendant, and the individual, private wash closets.

## CZWB, WESTBOURNE GROVE PUBLIC TOILETS

<b>BUILDING:</b>	Public Lavatories
<b>LOCATION:</b>	238- 247 Westbourne Grove, Notting Hill, London, UK
<b>ARCHITECTS:</b>	Piers Gough, Guy Stansfeld, Anita Sen
<b>ARCHITECTURAL FIRM:</b>	CZWG
<b>CLIENT:</b>	Royal Borough of Kensington & Chelsea
<b>STRUCTURAL:</b>	Dewhurst MacFarlene
<b>MAIN CONTRACTOR:</b>	Mansell
<b>PRINCIPAL USE:</b>	Restroom
<b>CONSTRUCTED:</b>	July 1993
<b>GENDER:</b>	Men, Women, and one accessible unit
<b>ASSESSMENT:</b>	£190, 000 (\$301, 632.00 CAD)
<b>PLACEMAKER:</b>	with attendant and flower kiosk

A residential association reclaimed the paved, triangular area that separates two streets for the Westbourne Grove Public Lavatories, a large clock, benches, and trees.<sup>10</sup> This development has helped to increase property values in the area.<sup>11</sup> There are disabled, men's and women's lavatories, and a flower kiosk within the structure. The kiosk has an attendant who also looks after the washrooms. There is controversy concerning these public toilets because they are shut down on Sundays, and women are charged 20 pence (thirty cents CAD), whereas the men's facilities are free.<sup>12</sup> Adding the baby-change station also requires coins for its use. The interior hallway to the women's washroom is so narrow that it is difficult to get a walker down the entry.<sup>13</sup> The Osborne site has a public washroom, as well as a retail store similar to Westbourne Grove public toilets and POINTWC, Paris. The attendant at the retail store keeps the washrooms clean and provides a measure of security.

DESIGN PRINCIPLES	
SCALE	The scale of the building mirrors the reclaimed, paved triangle where two streets separate.
PROPORTION	The lavatory building is balanced by the V-roof frosted glass canopy, and the platform's sharp end. There are also life-size gender graphic symbols on the doors, visual only when the washrooms are open. The dancing figures represent the Notting Hill Carnival.
BALANCE	The exterior is symmetrically balanced by the triangle design of the structure. The lavatories are located at the widest end of the building, with an accessible unit for the disabled on one side, and men's and women's washrooms on other side. The kiosk is located at the most

	severe point of the structure.
RHYTHM	Rhythm is created by the elongated, glazed teal, ceramic tile shape of the triangular structure, and by the curved V-roof that extends over the kiosk to protect the product and shelter the patrons.
EMPHASIS/FOCAL POINT	The focal point of the design is the exterior of the building, a large clock, a kiosk, and graphic symbols. The emphasis is on the contrast between the lavatories and the kiosk; the privacy of the public toilets is in contrast with the urban environment surrounding the structure.
UNITY	The balance is between the building, nature, and the reclaimed urban street.
VARIETY	The variety of colours and textures comes from the flower kiosk. Products are displayed outside and inside the small, partly surrounded glass space. The flower kiosk provides beauty, colour, and aroma.
HARMONY	The simple, quiet exterior of turquoise brick blends with the urban environment.
ILLUSION OF SPACE	The illusion of space is created by the contrast between the exterior and the interior of the building. The exterior of the building gives the illusion that three washrooms and a kiosk would not fit comfortably in this

	space, when it is a functional place.
ILLUSION OF MOTION	The illusion of motion runs along the exterior of the building from the plinth of the triangle to widest end. In contrast, the V-roof canopy is designed as an expanded fan that graduates to the wide end of the building.

### CHIMO AQUATIC AND FITNESS CENTRE, BRITISH COLUMBIA

**BUILDING:** Chimo Aquatic and Fitness Centre

**LOCATION:** Coquitlam, BC

**ARCHITECTURAL:** Hughes Condon Marler Architects

**GENDER:** Family, Men, Women & Accessible

**CONSTRUCTED:** 2008

**PLACEMAKER:** Aquatic Centre & Fitness Centre

**FLOOR SPACE:** 3,550 m<sup>2</sup> (38,211 ft<sup>2</sup>)

**AWARDS:** Lieutenant Governor of BC Awards for Architecture, Athletic Business Facility of Merit Award

**LEED:** Silver

Chimo Aquatic and Fitness Centre is a sustainable, accessible, and universal-design facility that promotes health and well-being within the community and family. The building was constructed on an existing parking lot to save the existing green landscape.<sup>14</sup> The entrance to the building was to be constructed as part of the street environment to maximize the interior space. The sports facility has a 6,800 square foot fitness, cardio, and weights room; a twenty-five-metre pool with six lanes, water spray features; a three-lane warm pool with handrails; and a steam and sauna room. Natural light filters into the building from the vast curtain wall. Rainwater is collected and used for the pool water, which is recycled to the flushing toilets and used to irrigate the landscape. The washrooms have dual-flush toilets and low-flow faucets.<sup>15</sup>

DESIGN PRINCIPLES	
SCALE	The family pool is open and balanced within the space.
PROPORTION	Lockers, wet areas such as washrooms, sinks, and change areas are equally proportioned and divided within the space allocated.
BALANCE	The family area is asymmetrically balanced and centered between the two pools, change areas, and fitness centre.

RHYTHM	The family area is centered between the fitness center and the pool change areas. Outside the change areas are hooks and benches to carry on the rhythm of the space of a family-oriented facility.
EMPHASIS/FOCAL POINT	The focal point is away from the family area to the vast windows enclosing the facility, with a view of tall trees and gardens. The pool is also transparent and visible from the outdoors. The windows allow natural light to illuminate the pool's interior.
UNITY	Unity comes from the exterior to the interior of the pool via the transparent glass windows.
VARIETY	The contrasts are between the the grey concrete walls and the natural light entering the facility and reflecting off the pool water. There are very few colours within the pool area. The patrons give the space its colour.
HARMONY	The main colour in the windows, blinds, and partitions is grey, with steel in the curtain wall. Green glass is used in the fitness centre, while the gendered change room walls are painted in blue tones to reflect the pool colour. In the central family area, there are dark blue lockers, light blue cubicles, and white sinks with bare concrete walls. The pool floor has beige ceramic tile.

ILLUSION OF SPACE	The pool gives the illusion that the space goes on forever because of the vast windows displaying the outdoor landscape of gardens and trees. The trees give the space the feeling of a large, painted canvas.
ILLUSION OF MOTION	The illusion of motion comes from the exterior landscape, combined with the activity of people enjoying the aquatic facilities.

### SAMUEL BRIGHOUSE ELEMENTARY SCHOOL, RICHMOND, BC

**BUILDING:** Samuel Brighthouse Elementary School<sup>16</sup>

**LOCATION:** Richmond, BC

**ARCHITECT:** Perkins + Will, Canada

**CONSTRUCTED:** October, 2011

**PLACE MAKER:** K-9 Elementary School

**ENROLLMENT:** 505 students

<b>NEIGHBORHOOD:</b>	single family
<b>FLOOR SPACE:</b>	50,590 ft <sup>2</sup> , 2 storey
<b>OWNER:</b>	School District No. 38
<b>TOTAL CONSTRUCTION COST:</b>	\$12.7 million CAD

Samuel Brighthouse Elementary School is a two storey building with teaching space, management offices, a library, a community space, and a renovated gym, see figure 12, 13 and 14. The locally-harvested wood includes mountain pine beetle wood that gives a blue tone.<sup>17</sup> I am implementing the shape of the roof of Brighthouse into my exterior curtain wall at the Pan Am Pool site. The public toilets and change room with the long corridor I have designed is a place to be a part of. Presently, the women's change rooms and public toilets are in a concrete space with no natural light or fresh air circulation. A long corridor leads to the family change room and public toilet area because the kiddie pool is located at the far end of the Pan Am Pool building. I needed to design a corridor that was interesting to children and that could be used for events. Also, the corridor provides a view across a large field, where there are trees and a community garden. Outside the family public toilet zone and at the far end of the corridor, there is a breast-feeding area with a view of the field.

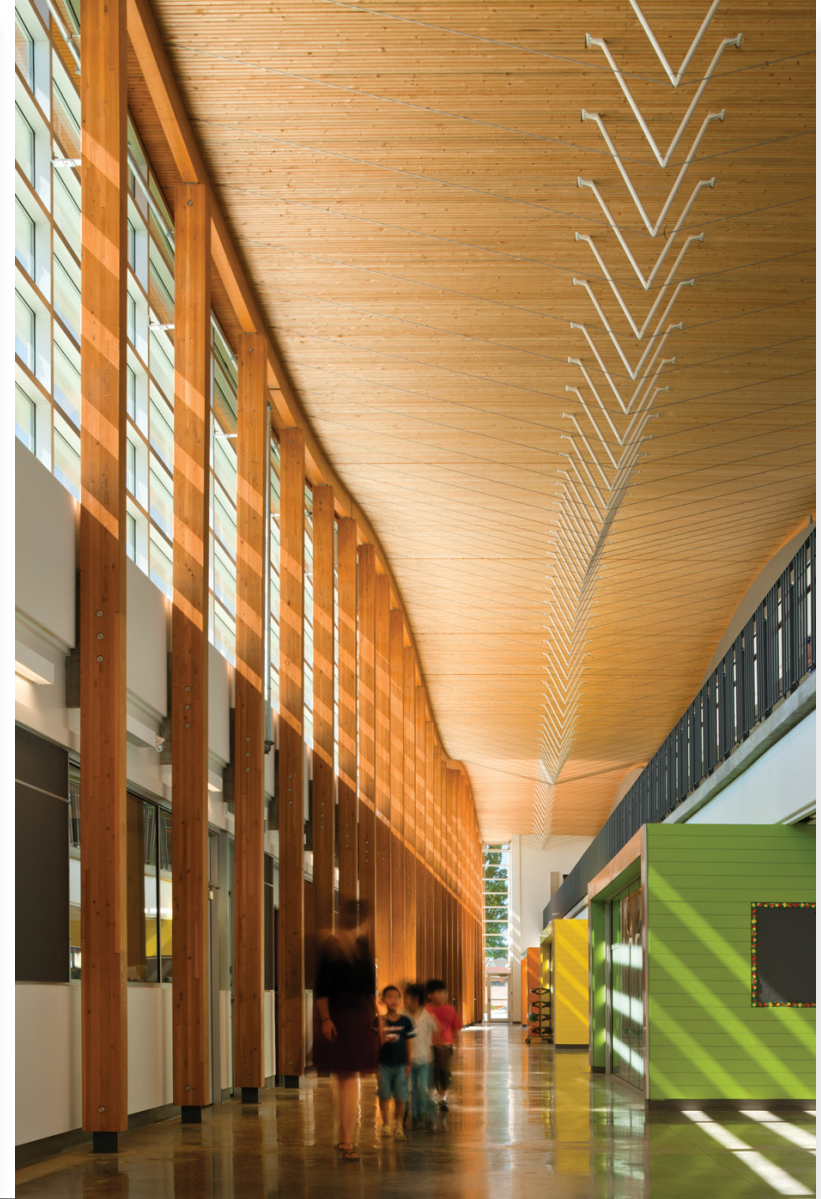


Figure 12 and 13.

### 3 • SAMUEL BRIGHOUSE ELEMENTARY SCHOOL



Figure 14.

DESIGN PRINCIPLES	
SCALE	The tall height of the long corridor is balanced by the accents of colour and a large curtain wall of windows with locally harvested wood beams and curved ceiling. The pendant lighting suspended in the corridor gives a feeling of space and scale.
PROPORTION	The proportion of the three-dimensional space is balanced with the height of the corridor, glass curtain wall, wood beams, and curved ceiling, with a polished, bare, concrete floor. Natural light bounces and is reflected within the space.
BALANCE	Asymmetrical balance comes from the various elements of wood post and beam structure; white pendant lighting; bare, grey, concrete; bright, primary-coloured units to represent rooms; and the curved ceiling.
RHYTHM	Rhythm is in the vast curved, wood ceiling stretching and repeating from each end of the building and corridor. Also, rhythm comes from the tall wooden columns reiterating down the long corridor, and the warm tone of the timber.
EMPHASIS/FOCAL POINT	The focal point is the rhythm of the long corridor with its repeating patterns and warm tones. The steel, v-shaped king-posts are an architecture feature of the building. The steel v-shape adds to the

	volume and beauty of the 2x4 wood slat ceiling.
UNITY	The various shapes, colours, and hard surfaces combine to create unity.
VARIETY	A variety of materials and finishes are used in the space. The locally harvest wood adds friendliness to the educational atmosphere.
HARMONY	A common form of thin, rectangular lines is used to create harmony in the space.
ILLUSION OF SPACE	The curved ceiling gives depth to the corridor.
ILLUSION OF MOTION	The curved wooden ceiling gives the illusion of space.

## ENDNOTES

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<sup>1</sup> The Japan Architect: JA, "Yearbook2005 Japanese Architectural Scene In 2005," The Japan Architect, <http://www.japan-architect.co.jp/english/2maga/ja/ja0060/mainfr.html> (accessed February 12, 2011); "Public", <http://www.awaas.net/index-public.html> (accessed February 21, 2011).

<sup>2</sup> The Japan Architect: JA, "Yearbook2005 Japanese Architectural Scene In 2005," The Japan Architect, <http://www.japan-architect.co.jp/english/2maga/ja/ja0060/mainfr.html> (accessed February 12, 2011); Akira Watanabe Architect & Associates, "Public", <http://www.awaas.net/index-public.html> (accessed February 21, 2011).

<sup>3</sup> Jennifer Hudson, *Restroom*, 21.

<sup>4</sup> Hudson, *Restroom*, 21.

<sup>5</sup> Hudson, *Restroom*, 18; Hudson, *Restroom: Contemporary design*, 21.

<sup>6</sup> Hudson, *Restroom*, 34-35.

<sup>7</sup> Hudson, *Restroom*, 34-35.

<sup>8</sup> POINTWC, "POINTWC Paris: My Private Luxury Shop," POINTWC, <http://translate.google.ca/translate?hl=en&sl=fr&tl=en&u=http%3A%2F%2Fwww.pointwc.com%2F> (accessed February 27, 2011).

<sup>9</sup> Hudson, *Restroom*, 35.

<sup>10</sup> Cristina del Valle Schuster, *Public Toilet Design: From Hotels, Bars, Restaurants, Civic Buildings and Business Worldwide* (Savigliano: A Firefly Book, 2005) 228-230.

<sup>11</sup> Greed, *Inclusive*, 186.

<sup>12</sup> Greed, *Inclusive*, 186.

<sup>13</sup> Greed, *Inclusive*, 186.

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<sup>14</sup> World Architecture News.com, "The Life Aquatic," World Architecture News.com  
[http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload\\_id=11761](http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload_id=11761) (accessed July 24, 2012).

<sup>15</sup> World Architecture News.com, "The Life Aquatic," World Architecture News.com  
[http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload\\_id=11761](http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload_id=11761) (accessed July 24, 2012).

<sup>16</sup> Architectural Digest, "Schools of the 21<sup>st</sup> Century: The Latest Thinking and Best Ideas on the Planning and Design of K-12 School Buildings," Architectural Digest, [http://archrecord.construction.com/projects/building\\_types\\_study/k-12/2012/Samuel-Brighthouse-Elementary-School.asp?bts=K12](http://archrecord.construction.com/projects/building_types_study/k-12/2012/Samuel-Brighthouse-Elementary-School.asp?bts=K12) (accessed June 19, 2012); Perkins + Will, Samuel Brighthouse Elementary School, Perkins + Will, <http://www.perkinswill.com/work/samuel-brighthouse-elementary-school.html> (accessed June 19, 2012).

<sup>17</sup> SABMag, "Samuel Brighthouse Elementary School: Student ideas help put sustainability on display," SABMag Sustainable Architecture & Building Magazine Issue Number 33, Jan/Feb (2012): 17-21.



Figure 15



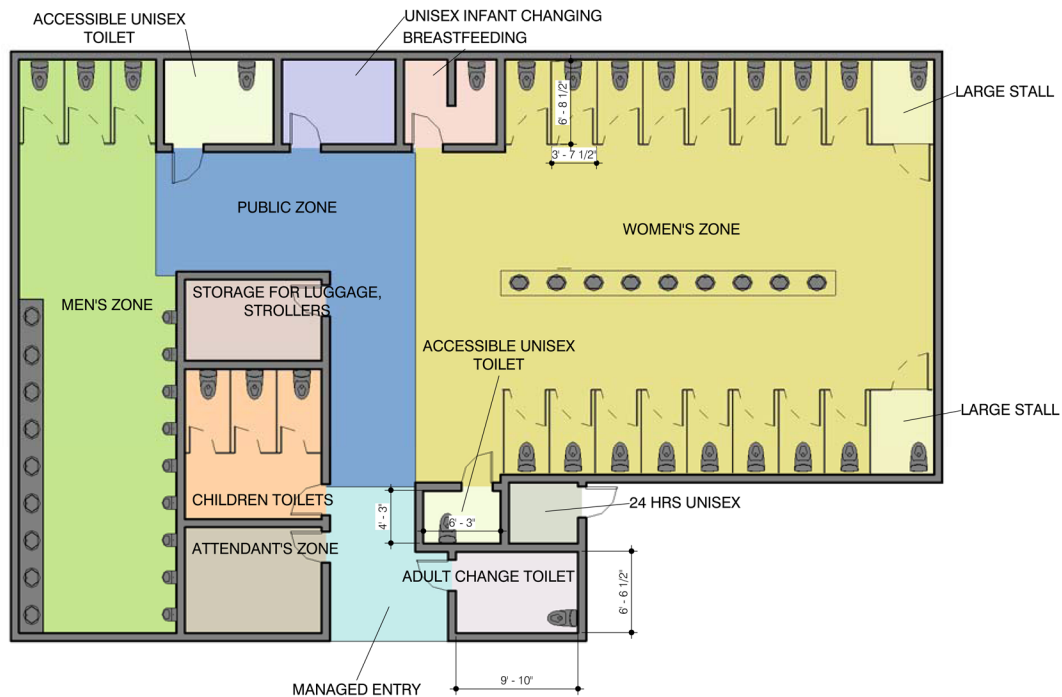
Figure 16:

## **4 . PROPOSED INTERIOR DESIGN PROJECT MULTI-SETTING PUBLIC TOILETS SITES DESIGN PROGRAMME**

## DESIGN DEVELOPMENT

The design development of public toilets began three years ago from the influences of Dr. Sheri Blake and Dr. Rae Bridgman at the University of Manitoba. From there I began my research through theory, literature, programming and precedents to meet the requirements of a variety of individual user needs. The goals are to design spaces that are comfortable, safe and clean. In stage one, the project was initiated by visiting all the existing sites, areas, and buildings, and documenting the experience through photography. By combining the site experience, theory, literature, occupancy load, and the Greed public toilets blue print, see figure 17 and 18. This is how the proposals began the design process for each site. Stage two began with sketching ideas for the sites and analyzing the adjacencies. Before returning to university in 2009 designing began with all initial ideas on the computer aid drafting and design (CAD) tool with no hand drawings of preliminary designs. Today, the experience of getting back to drawing on paper provided me with more of a history from which the design began. It interesting that the ideas used for one site were brought forward into other sites. For instance, the first sketches and ideas for St. Vital exterior were coloured glass to the exterior facade, and then proceeded to bring the coloured glass into the final design of the exterior Pan Am Pool main corridor to break up the space.

In the final stage of design development, the needs of the clients, details, finishes, and atmosphere become informed by theory and research. To create the atmosphere, the materials and finishes needed to be water proof, hygienic, easy to clean, resilient, and sustainable.



1 CLARA GREED LAVATORY BLUE PRINT  
 A1.1 1/8" = 1'-0"

**ZONE**

- 24 HRS UNISEX
- ACCESSIBLE UNISEX TOILET
- ADULT CHANGE TOILET
- ATTENDANT'S ZONE
- BREASTFEEDING
- CHILDREN TOILETS
- LARGE STALL
- MANAGED ENTRY
- MEN'S ZONE
- PUBLIC ZONE
- STORAGE FOR LUGGAGE, STROLLERS
- UNISEX INFANT CHANGING
- WOMEN'S ZONE

Figure 17.  
 134

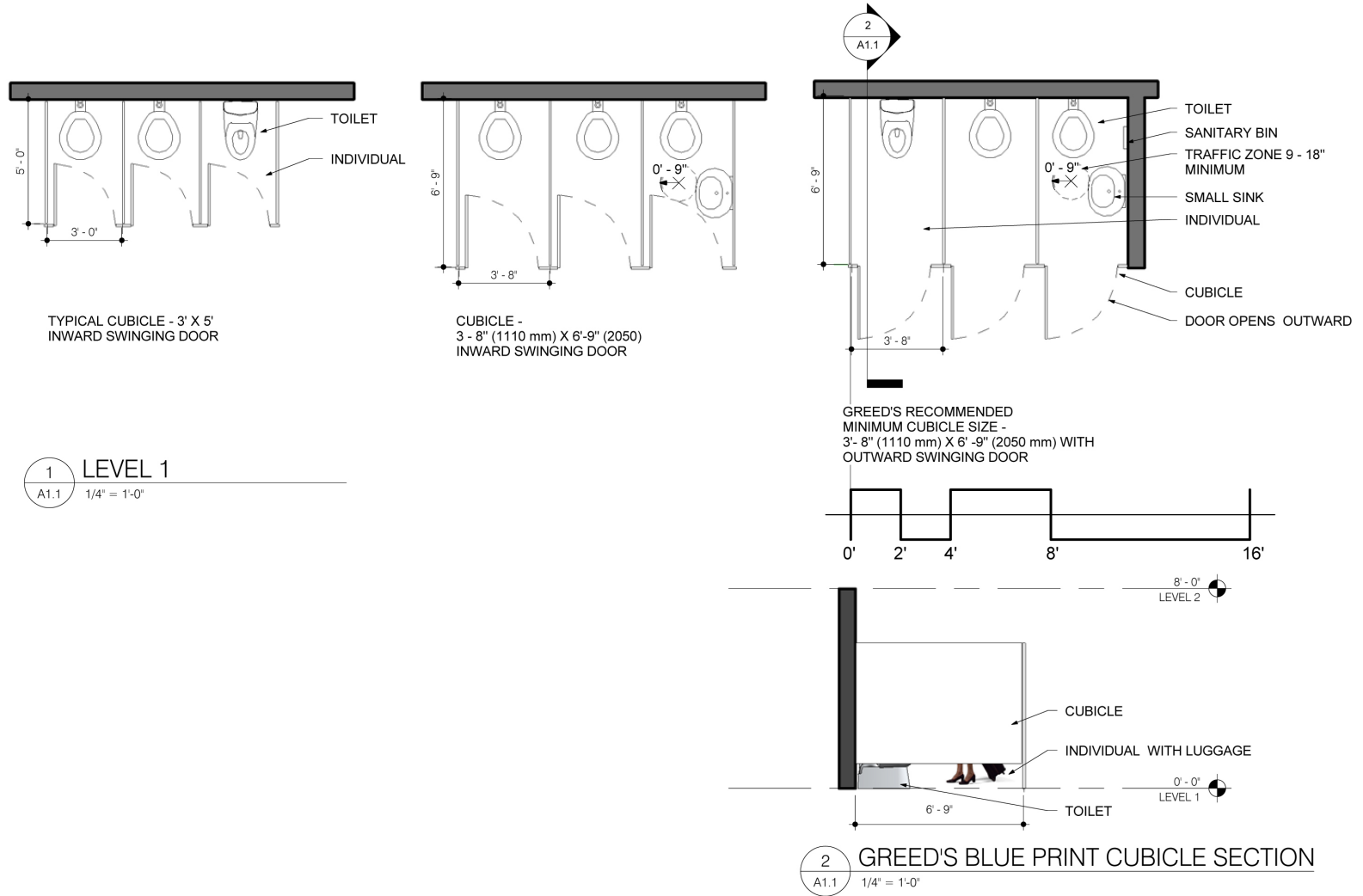


Figure 18.  
135

Also, all sites use the minimum cubicle size of 3'-8" x 6'-9", taken from the Greed blue print public toilet design. Some cubicles are designed with small sinks to provide more hygienic spaces for cleaning, or the space is left open for a small child, luggage, or shopping bags. Another area of concern for men, the transgendered, and women in washroom cubicles is the location of sanitary napkin disposals, toilet paper containers, and diaper disposal bins. The design of the larger cubical allows space between the toilet seat and cubical so that bacteria are not as easily transferred onto the thighs or outer legs of the user. Men use the cubicles to defecate and to change sanitary pads for incontinence or menstrual cycle if the individual is transgender. Presently, there are no safe disposal bins for men. Sanitary napkin disposals and toilet paper containers are added to every cubicle as outlined in the 2010 City of Winnipeg Accessibility Design Standards. Similarly separate garbage disposal bins are located at each baby change stations. All sites use the Dyson Air blade hand dryer, it is durable, it uses less energy, and cool clean air sucks the water from the user's hands to the outside of the building. Likewise, TOTO plumbing manufacturer was selected for each site because the manufacturer provides high quality, functional and environmentally friendly product design. All the toilets, urinals, bidets, fixtures and faucets are ADA approved, except the toilet in Unit 1 at Osborne Site is a universal design with low water consumption. Each site uses waste water from the sinks and collected rain water for the flush toilets.

The Osborne Station design is based on those of Point WC in Paris, France, and Westborne Grove Public Toilets, Britain. Starting in 2006, the creator of Point WC creator, Eric Salles, wanted to break the model of toilets. The public toilets shop offers luxury public toilets, original decorative accessories from coloured toilet paper, perfume, paint, and wallpaper to decorating services, and a web site offering products for

sale. There is a relaxed, upscale, comfortable atmosphere with a soft light environment. Likewise, the Westbourne Public Toilets provide a flower kiosk, and the reclaimed piece of the city street has brought life back into the area.

Presently, the Osborne Station is considered a large bus shelter; consequently, the City of Winnipeg's regulations and standards require no public toilets for the public transportation patrons. Proposed public toilets are designed at this station because it is the missing link: the public transportation provides services to the public such as security, bike lockers, a heated bus station in winter, well-lit premises, well-designed signage, a universal design for the physically and sensory disabled, but no public toilets.

The public toilet is located level with the existing sidewalk so that the space has easy to access and inclusive. The public toilet is designed with a retail store that is visible at the entrance. The retailer displays and sells the TOTO plumbing manufacturer products, plus accessories and other products such as toiletries. Each of the public toilet units displays useable fixtures so the client can try out the products. The retailer is an attendant who assists the clients, manages and cleans the facilities, and sells plumbing products. The attendant also provides security to the clients and the building to prevent violence and vandalism. Closed-circuit television (CCTV) also provides security. The non-gendered public toilet units are designed for families. Each unit has a urinal, toilet, sink, and faucet. The majority of units have child-height toilets, urinals, and sinks, as well as an infant changing station. The public toilet is influenced by Hasuikabori Restrooms in Tokyo, Japan, which provides a safe environment for patrons. As in the Hasuikabori design, awning windows are throughout the facility that can be opened

to circulate fresh air within the building. The frosted glass windows blur individuals using the facility providing privacy and security by transparency from the interior and exterior.

The Pan Am Pool, which was built in 1967, presently has a square footage for the women's change, shower, and washrooms 4,414 square feet (ft<sup>2</sup>). To bring this area up to current building code the minimum square footage required is 7,612 ft<sup>2</sup>. I began the design outside the existing building, where I extended the women's and family zone, which are connected with a long corridor, and added a private breastfeeding zone separate from the change and washroom areas. The family zone is located close to the Kiddie Pool.

From the existing floor plan of the building, I was able to investigate what was required to update the building. The building entrance has easy access from the sidewalk. The reception area was recently renovated, making the lobby fully accessible and inclusive. There is an existing washroom that is said to be barrier-free, but the barrier-free cubical is very small and does not allow a five-foot, 360 degree turn in the cubicle. Similarly, a special-needs area provided for the physically disabled is rarely used due to a lack of space; in fact, in one unit, there is a column right in the middle of the small room. The community care providers assisting children and adults do not use this area. This is because there is not enough space in the special-needs change room and in the washrooms for the children and adults. Furthermore, a private, accessible toilet in the gender-segregated shower area is presently used as storage because it is too small for anyone to use. If the space were accessible, there would only be enough room for a wheelchair to enter and back out of the small area. Lastly, the one diaper change area is also not used because it is located in a back corner with no access to clean water or to a proper diaper disposal. As a result,

many mothers and caregivers change their babies on the floor or on the benches that everyone uses. Family-friendly washrooms with child-size sinks are needed. Part of the problem with the building is that it has not been kept up to current building code standards to allow full accessibility to the building. From this initial research and analysis of the Pan Am pool began the design concept of dividing the present women's area into three zones: gender-neutral, women's and family zone. The gender-neutral zone is located at the entrance, similar to Greed's blue print design. To enter the family zone a long corridor was designed running along the women's zone outside the existing building, with coloured glass and a beautiful view of the large field. The curtain wall windows can be opened to allow fresh air into the building. This long corridor idea is designed after the Samuel Brighthouse Elementary School in Richmond, British Columbia. The corridor becomes a space for events, as well as a place that families can easily access and see their children easily. At the end of the corridor is a private breastfeeding area away from the change and washroom areas. This quiet zone has a view of the field, and a doorway to a patio allowing women or families to enjoy the outdoors.

The women's and family zones are enclosed in a frosted glass curtain wall so that there is transparency between the interior, corridor, and exterior surroundings. This design creates safety within the zones and spaces similar to the Hasuikabori Restrooms in Tokyo, Japan. The curtain wall has awning windows along the top of the wall to allow fresh air to circulate within the building. In the women's zone are the main public toilets. There are large, universal change rooms in accordance with the 2010 City of Winnipeg Accessibility Design Standards, with accessible lockers outside the rooms. There is stroller and cell phone storage at the front entry, and an access way to the family zone. The

family zone has child-height toilets, an infant change zone, and a universal toilet and change area with a urinal, change, and shower area. The different zones are designed to blur the invisible and physical boundaries between genders, abilities, and physical spaces.

The St. Vital Center public toilets are designed as an accessible place to visit and a space of invisible boundaries, even though there are private spaces for men and women. They are based on Greed's proposed blue print public toilet design in *Inclusive Urban Design: Public Toilets*. Greed's blue print public toilet design begins with a unisex front entrance centered between two separated toilet areas for men and women. Similarly, the main entrance to the St. Vital public toilets is open, with no doors, and it spans into a sink zone for everyone. Sink zones are placed throughout the facility to give users more opportunity to wash their hands. The entrance is an inclusive space with sinks, faucets with clean water, and soap. Past the sink zone down a central hall way, there are a non-gender and a family zone area located to the right. In this area, there are eight private, enclosed toilets; urinals; sinks; and an infant change area for an inclusive design and space. Greed requires a neutral meeting area between men and women's zones. This is seen in the St. Vital design, with a main corridor running down the center of the space. There is easy access on both sides of the corridor to meet up with family members.

Greed says women's toilet zones need to be located near the entry, so that women do not walk down a long corridor.<sup>1</sup> In the design proposal, on the left side of the corridor from the entrance are the women's public toilets, with sinks where women can socialize and groom themselves. Some of the walls in the women's zone are transparent, with slits and coloured glass, so that movement can be detected on

either side by passers-by or users, providing more safety. The women's space is 3219 ft<sup>2</sup> square feet, whereas the men's zone is 1148 ft<sup>2</sup>. The men's zone is located on the right-hand side of the main corridor. There are nine cubicles, one of which is barrier-free; twelve urinals; and one private, barrier-free room with a toilet, urinal and sink. The women's zone is more than double the size of the men's area to accommodate toilet privileging; it is over the limit required for the occupant load. The women's space has forty-two stalls, including two barrier-free cubicles, varying in size to meet the needs of the various users. The National Building Code of Canada 2010 only requires shopping mall developers to provide public toilets for retail employees; they are not required to provide facilities for shoppers due to the additional cost of adding toilets, sinks, plumbing and maintenance. Britain has the identical code requirement, which was brought in 2003.<sup>2</sup> Private zones for girls and boys with lower height toilets, urinals, and sinks are designed to give easier access. Wider cubical doors of three feet are provided to accommodate double strollers, and there is additional space in the cubicle for the care-giver. Beside the girls' and boys' washroom, there is the infant changing zone, which is separated from the women's zone. Presently at St. Vital Centre there are baby-changing units in the men's and women's washroom, but they are a distance from the sinks, water, and soap, except in the family room. Mothers, fathers, and caregivers find it difficult to locate a safe and hygienic place to change their infant's diaper.<sup>3</sup> Additionally, baby change tables are not required by the National Building Code of Canada to be included in public washroom design. Also, if there is a baby change table, some require assembly before use or are located in a difficult location and not near a sink. Mothers and caregivers usually have their hands full with a stroller, bags, and children. Also, baby change areas require a clean area by a sink, with sanitary water and soap. Baby change areas require medical containers to deposit used diapers.<sup>4 5</sup> Each change area has a separate bin for diaper disposal.

The breastfeeding area is located adjacent to the infant change zone, but in a private zone. Many mothers require a separate, comfortable, clean zone for breastfeeding privately in public spaces. The breastfeeding area does not need to be located near the washrooms; it can be in another part of the building away from the washrooms. Some individuals object to seeing mothers feeding infants in public zones, and a number of mothers feel uncomfortable about breastfeeding in public. In the proposed design, the breastfeeding zone is located along a frosted glass curtain wall to offer privacy and to allow natural light and fresh air to enter the space. There is also a door leading to a private patio area. In summary, additional zones have been added to St. Vital Centre's public toilets to provide improved facilities for parents, children and infants.

I am proposing to use a Living Machine® Systems, L3C, at the St. Vital site to reuse the waste water from the shopping centre instead of having this water flow into the sewer system. The average daily pedestrian traffic through the mall is 25,430. The sources of waste water are from the sinks, and dishwashers called greywater. Blackwater is from toilets and urinals. A preliminary average volume of water usage is around 15k to 25k gallons per day. This daily amount of waste water from St. Vital Centre is approximately what I use per year in my home. The sizing for a Living Machine® Systems, L3C is 150 ft<sup>2</sup> per 1,000 gallons, daily use. The wetland cells are constructed of concrete; they are on average 6'-0" to 7'-0" deep and are located outside the building. Concrete is the typical material for the construction of the wetland cells. According to the owner of Living Machine® Systems, L3C, with Manitoba's cold climate, the primary treatment tank does not need to be buried deep because the incoming waste water is warm and the insulation of the ground will keep the pumps and pipes from freezing.

The above-ground wetlands are the only concern in terms of climate. The wetlands can operate in cold climates, but if the temperature falls below zero for extended periods, the exterior building containing the cells must be enclosed and not a glass curtain wall.

The Living Machine® Systems, L3C, see figure 19 and 20, collects the waste water from the greywater and blackwater from the shopping center into a primary tank. The primary tank is located underground, where bacteria are introduced to begin the process of cleaning the waste water. The solids are re-collected and filtered. The next tank moves the waste water into the first wetland, where the waste water is recirculated. Next, the waste water flows through another tank, which is called the tidal flow wetland cells. The bacteria are fed the waste water that are in the concrete tanks. The engineered gravel covers the waste water, which is not apparent, or seen and odorless. There is no surface water associated with the system, which allows the concrete enclosed containers, called cells, to function without any odor. The bacteria live on the engineered gravel and the plant roots that sanitize the waste water as it flows through. The bacteria convert the pollutants to carbon dioxide, water, and nitrogen end products. Lastly, the waste water then flows through stage one and stage two tanks called a vertical flow wetland, located in the interior of the building where the tropical plants can be seen in the concrete tanks. After the water is disinfected, the water end product can be used for irrigation, toilet flushing, and non-potable purposes. As a final note, Living

# The NextGen Living Machine<sup>®</sup>

Advanced Ecological Water Treatment

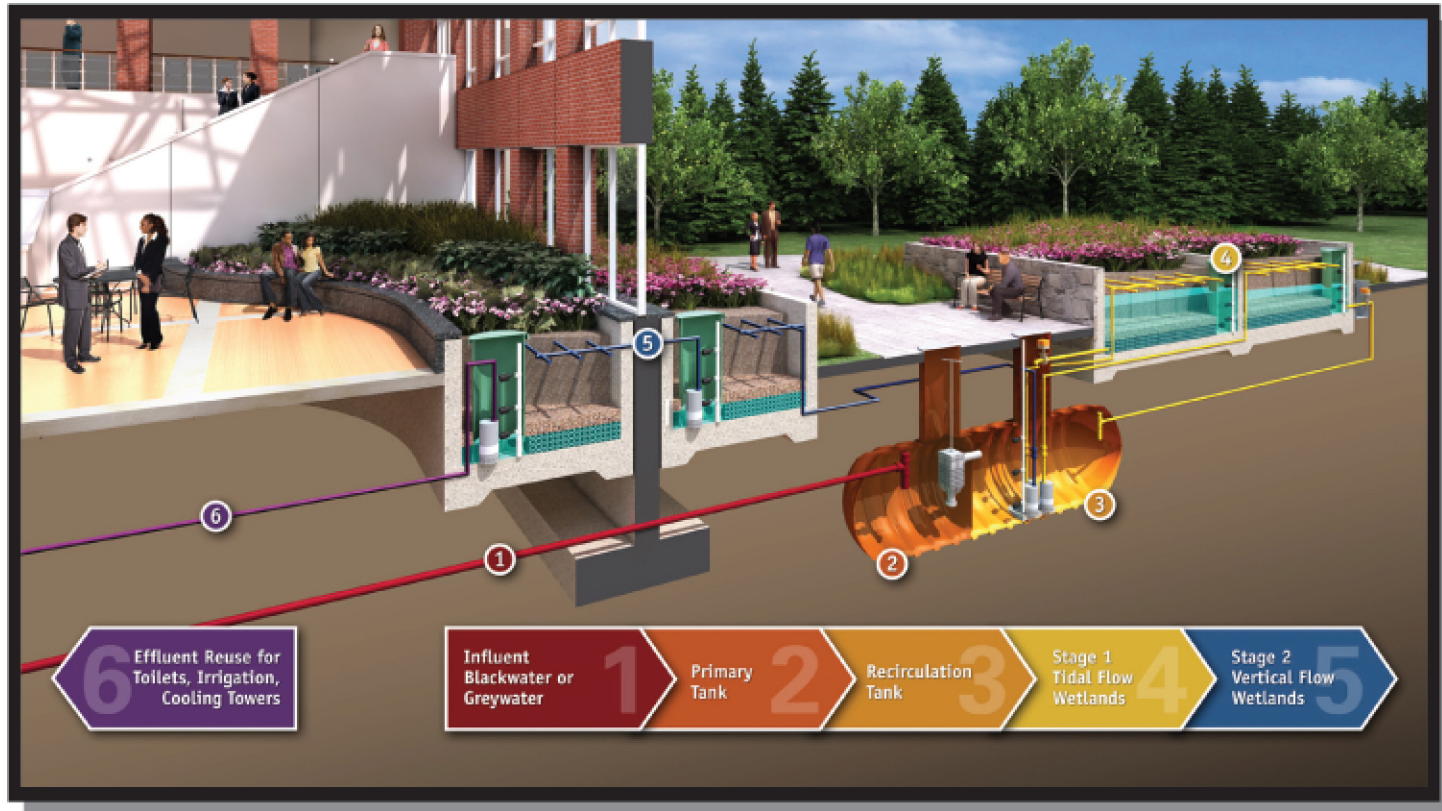


Figure 19.

- 1 Wastewater is collected from fixtures such as sinks and showers (greywater) and toilets (blackwater) and flows to the Primary Tank.
- 2 In the Primary Tank, coarse solids are retained and bacteria begin the treatment process. Wastewater flows forward through a filter.
- 3 Energy efficient pumps fill the Stage 1 wetlands with wastewater from the Recirculation Tank, which drains back to the tank at the end of a cycle.
- 4 Tidal Flow Wetland Cells are alternately filled and drained. Pollutants and oxygen are delivered to microorganisms living on the surfaces of the engineered gravel and plant roots. These microorganisms convert pollutants to carbon dioxide, water and nitrogen, which are benign end products. All flow is below the surface of the gravel so that wastewater is never visible and does not generate odors.
- 5 Most of the pollutants are removed in Stage 1. Wastewater is then pumped to Stage 2, the Vertical Flow Wetlands. As water trickles down through the engineered gravel and plant roots, remaining pollutants are removed.
- 6 Effluent from the Living Machine® system is very clean. After disinfection, water can be used for irrigation, toilet flushing and other non-potable uses.

\* Living Machine® systems incorporate the ecological treatment processes described here, however the components and layout will vary from project to project.

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Machine® Systems, L3C, would need to visit the site to determine the equipment needed for its operation. The diagram shown in this practicum is only a preliminary outline.

The first proposed site is Osborne Station, second is Pan Am Pool and lastly St. Vital Centre. Each proposed design project are illustrated by an existing floor plan, preliminary sketches, proposed floor plan, reflected ceiling plan, elevations, and renderings.

## **4 A. OSBORNE STATION**



Figure 21:

**4 A • OSBORNE STATION • SITE**

## 4 A.1 CLIENT & USER DESCRIPTION

The City of Winnipeg recently opened a portion of its new Rapid Transit corridor. Buses run on a separate road system following the CNR tracks from Queen Elizabeth and Stradbrook to Pembina and Jubilee. The proposed Osborne Station site is universal designed to support the various transit patrons. The site provides wayfinding such as detectable paving at the highest point of the stairs with yellow nosing on all treads, and a ramp with handrails for the physically and hidden disabled. The buses also have 'near-level boarding'. The site provides easy access by sidewalk or active transportation paths for pedestrians and bicyclists. The bus shelter offers accommodation for the various climate conditions of Winnipeg with heaters in the bus shelter. The transparency of the glass shelter provides safety for the transit users by allowing passengers to see out of the building and to be seen. Lighting and cameras also provide safety at the site for the passengers. There are electronic displays, bike lockers, garbage, recycling containers and lighting on site. The station is landscaped and has benches for transit users. <sup>6</sup>

## 4 A.2 SITE ANALYSIS

**STATION:** Osborne Station

**ADDRESS:** 290 Osborne & Jessie Ave., Winnipeg, MB

**ZONING:** Not available.

**ADDITIONAL ZONING:** Urban Infill Area - West End

**LAND AREA:** Not available.

**PROPERTY INFLUENCES:** Bus Route, Heavy Traffic, External Corner, Rail Line

**AREA:** Fort Rouge / South Osborne

**MAX. HEIGHT OF BUILDING:** Not available.

**PERMITTED USE FOR ZONING:** Not available.

## **4 A.3 BUILDING ANALYSIS**

The proposed Osborne Station public toilets are located at the Osborne Station Rapid Transit at the street corners of Osborne Street and Jessie Ave. The site is located in the neighborhood of South Osborne.

**SITE:** Osborne Station

**ADDRESS:** 290 Osborne Street, Winnipeg, MB

**BUILDING OWNER:** City of Winnipeg

**PROPERTY DESCRIPTION:** Public<sup>7</sup>

**YEAR CONSTRUCTED:** 2012

**SQUARE FOOTAGE:** Not Available.

**ARCHITECT:** gpp architecture

**ASSOCIATE ARCHITECT:** Friesen Tokar Architects + Landscape + Interior Designers

**ENGINEER:** Dillon Consulting

**URBAN DESIGNER:** McCowan Russell Group

**URBAN PLANNER:** Landmark Planning & Design Inc.

**BUILDING CONSTRUCTION:** Curtain Wall: Glass, Steel

**FLOORING:** Concrete

**CEILING:** Curtain Wall: Glass & Steel Construction

**LIGHTING:** Fluorescent Lighting Fixtures

**SIGNAGE:** Illuminated Station Signage

**MECHANICAL AIR SYSTEM:** Infrared Radiant Tube Heater Suspended Semi- Rigidly<sup>8</sup>

**OCCUPANT:** Transit Patrons



Figure 22: Map of Osborne Site.

LEGEND

- GAS STATION
- GROCERY STORE
- CAR WASH
- RESTAURANTS & CAFE
- BIKE RACK
- BUS STOP
- MEN & WOMEN EXISTING RESTROOMS FOR PATRONS
- RESIDENTIAL
- COMMERCIAL
- BUS EXPRESS ROUTE
- SITE - OSBORNE STATION
- CN RAIL

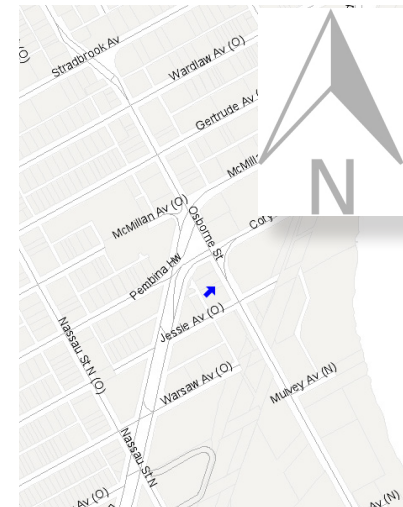


Figure 23: Map of Site.

**4 A .4 SITE: EXISTING PUBLIC TOILETS FOR PATRONS**



Figure 24.



Figure 25

## 4 A.5 SITE: PHOTOS



Figure 26

Figure 27





Figure 28

Figure 29.





Figure 30.



Figure 31



Figure 32 - Osborne signage.



Figure 33 - Interior of Osborne Station.



Figure 34.



Figure 35.



Figure 36



Figure 37



Figure 38.



Figure 39.

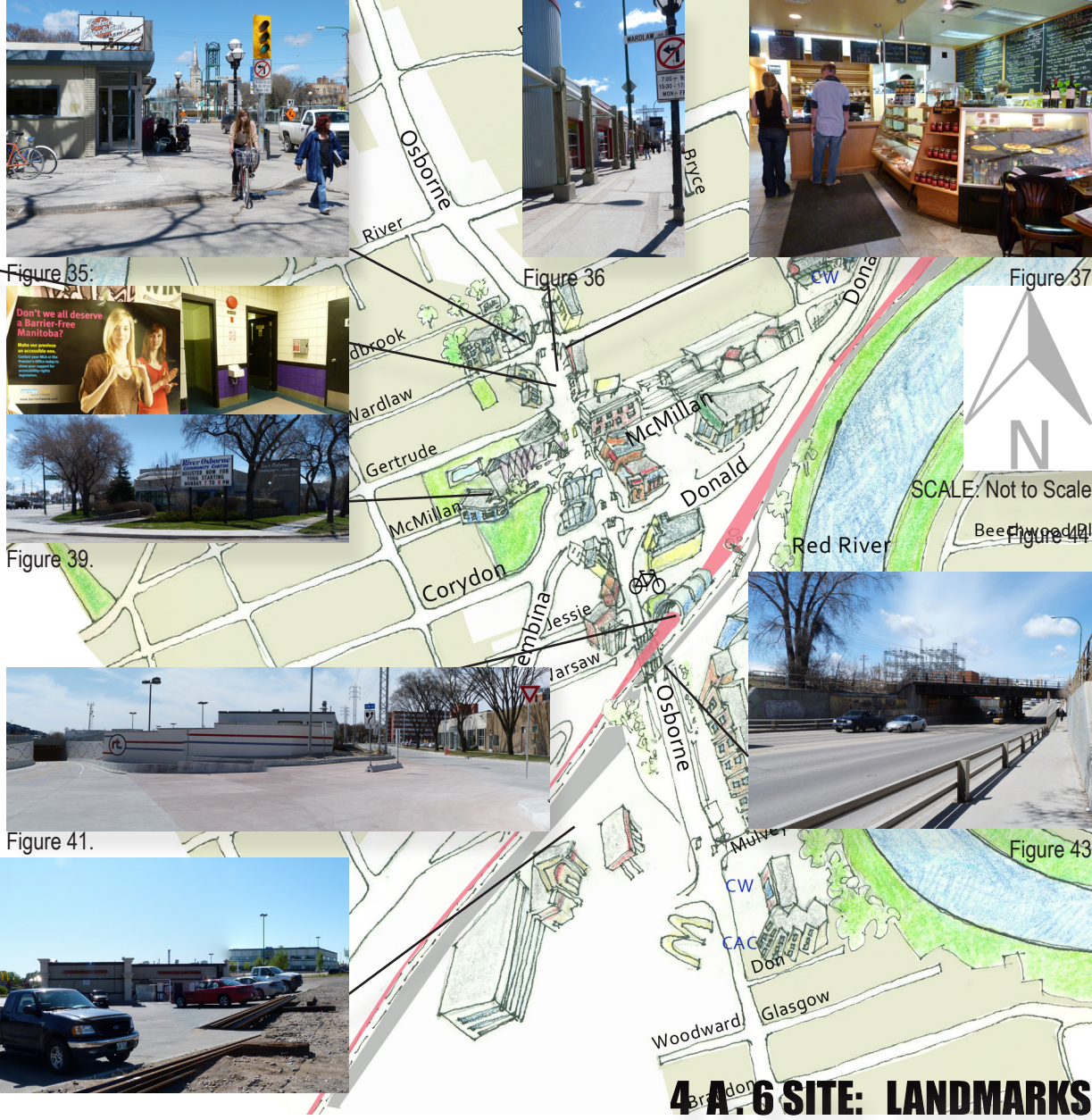


Figure 40



Figure 41.



Figure 43



Figure 42.

# 4 A. 6 SITE: LANDMARKS



Figure 45.



Figure 46.



Figure 46



Figure 46.



Figure 48.

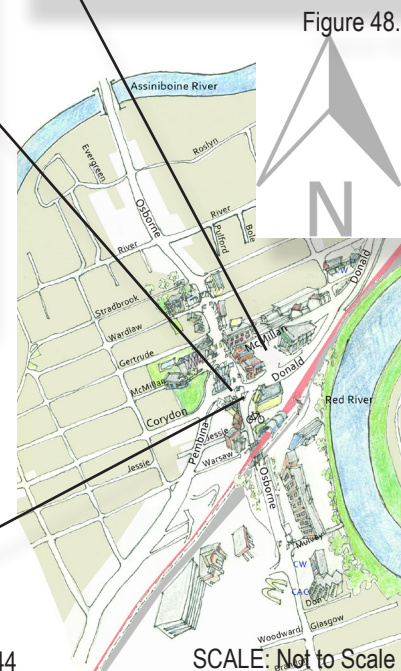


Figure 44

SCALE: Not to Scale

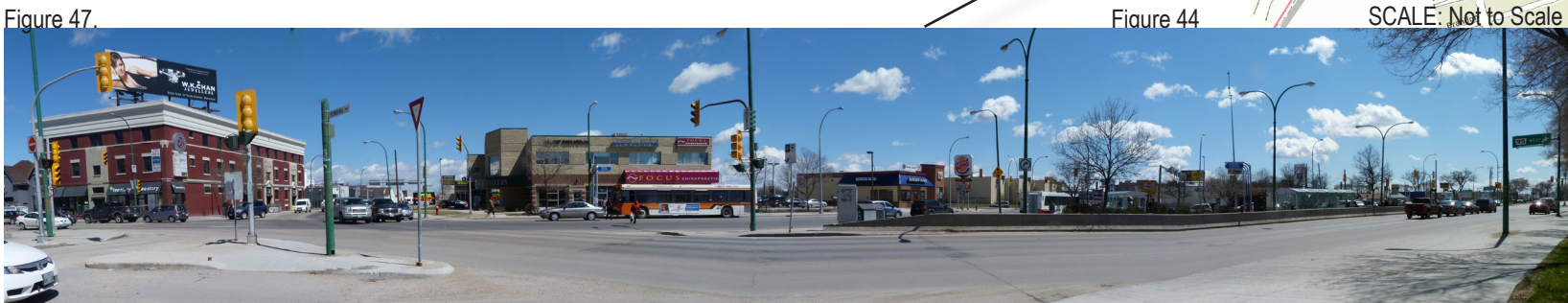


Figure 47.



Figure 49

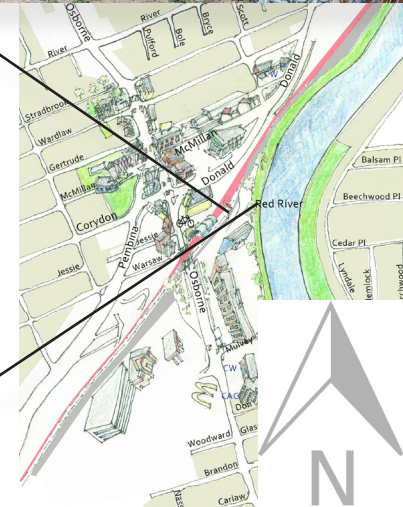


Figure 44: Map of Osborne site.

Figure 50





Figure 51.

Figure 53:

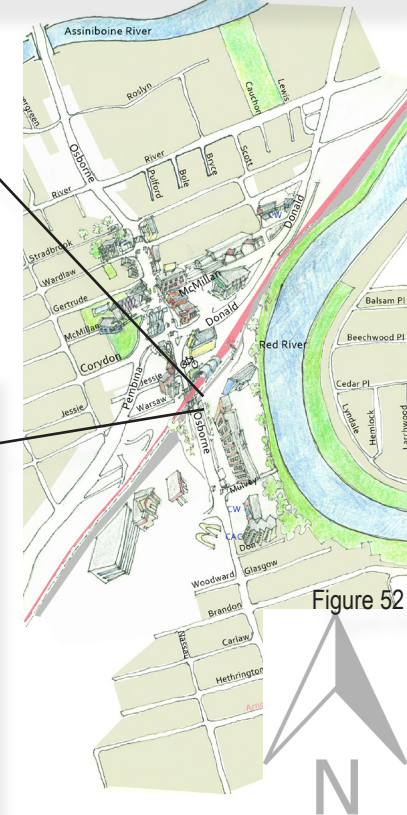


Figure 52

## 4 A.7-1 EXISTING OSBORNE STATION

LOCATION	CONSTRUCTED	TOTAL SQUARE FOOTAGE	MAJOR OCCUPANCY CLASSIFICATION
OSBORNE STATION	2012	1600	Group E Mercantile occupancies

## 4 A.7-2 REQUIRED

TOTAL SQUARE FOOTAGE	TOTAL OCCUPANTLOAD	UNIVERSAL OCCUPANT LOAD	REQUIRED UNIVERSAL STANDARD CUBICLE	UNIVERSAL ACCESSIBLE / UNISEX	TOILET PRIVILEGING
1600	16	0	0	1	2

The Osborne Station is built as a bus shelter and is not required to provide public toilets. If the City of Winnipeg wanted to put in a public toilet they only have to provide one universal public toilet.

## 4 A.7-3 OCCUPANT LOAD

GROUP E, FOR FAMILY & UNISEX PUBLIC TOILETS

USE	LOAD FACTOR	FLOOR AREA	NOT OCCUPIABLE	NET OCCUPANCY LOAD
RETAIL OUTLET / PUBLIC TOILETS	3.70 m <sup>2</sup> / 39.8 ft <sup>2</sup>	1600		32

(first storey)				
----------------	--	--	--	--

OSBORNE STATION – SPATIAL REQUIREMENTS

SQUARE FOOTAGE	ACCESSIBLE/ UNIVERSAL / UNISEX / FAMILY	SUB-TOTALSQUARE FOOTAGE	+20% TRAFFIC PATHS(square footage)	TOTALSQUARE FOOTAGE
UNISEX PRIVATE/INDIVIDUAL ACCESSIBLE CUBICLES (child & adult toilets & urinal with child toilet & child urinal) 10'-6" x 12'-10" min. = 135 ft <sup>2</sup> (City of Winnipeg 3.3.7.1) <sup>9</sup>	5 Private Units 675 ft <sup>2</sup>	675	135	810
Infant Changing Station (includes sink) 7'-6" x 5' min = 37.5 ft <sup>2</sup> +- <sup>10</sup>	5 Areas 187.5 ft <sup>2</sup>	187.5	37.5	225

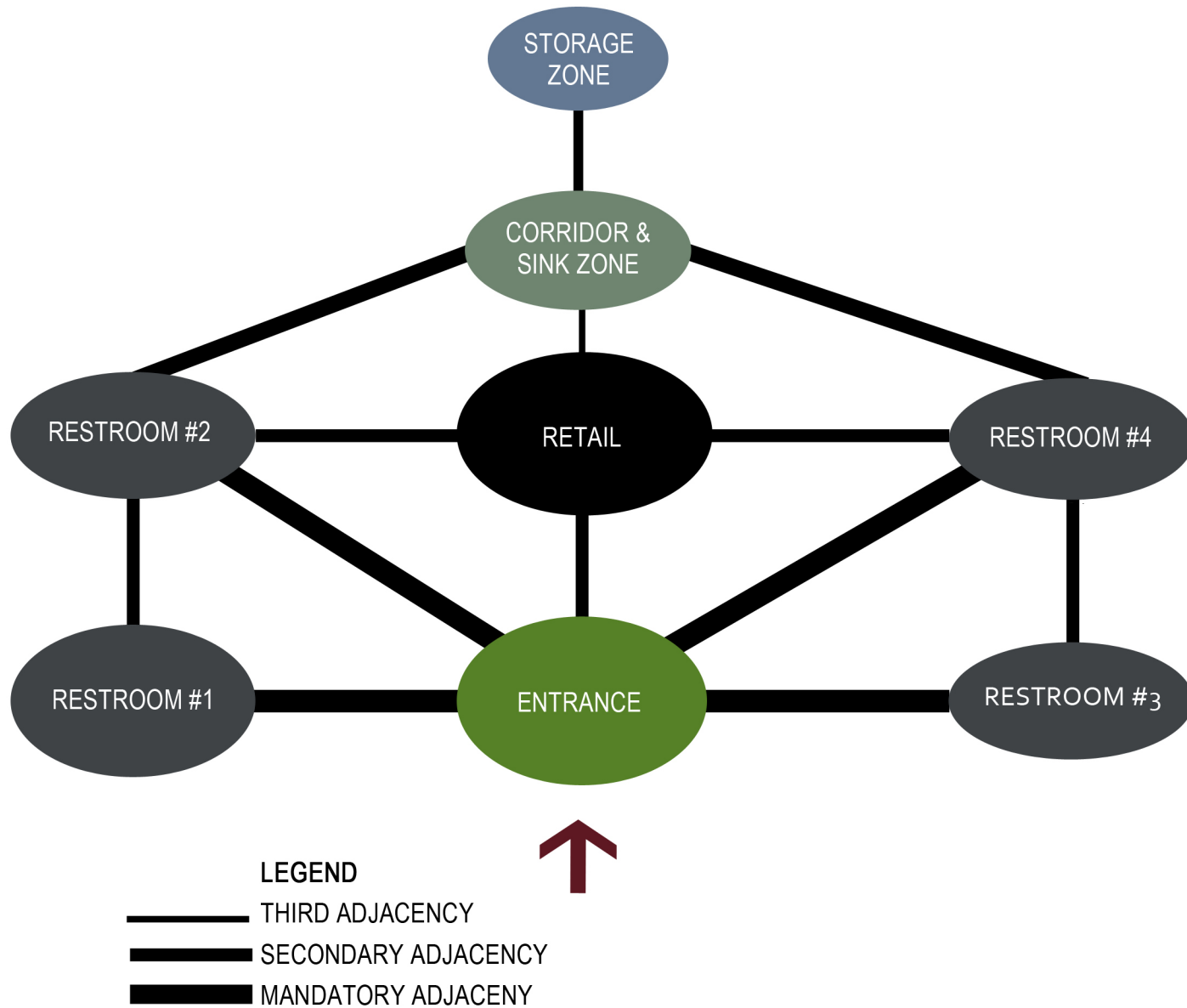


Figure 54.

**4 A.8 ADJACENCY : BUBBLE PLAN**

## **4 A.9 DESIGN: OSBORNE SITE**

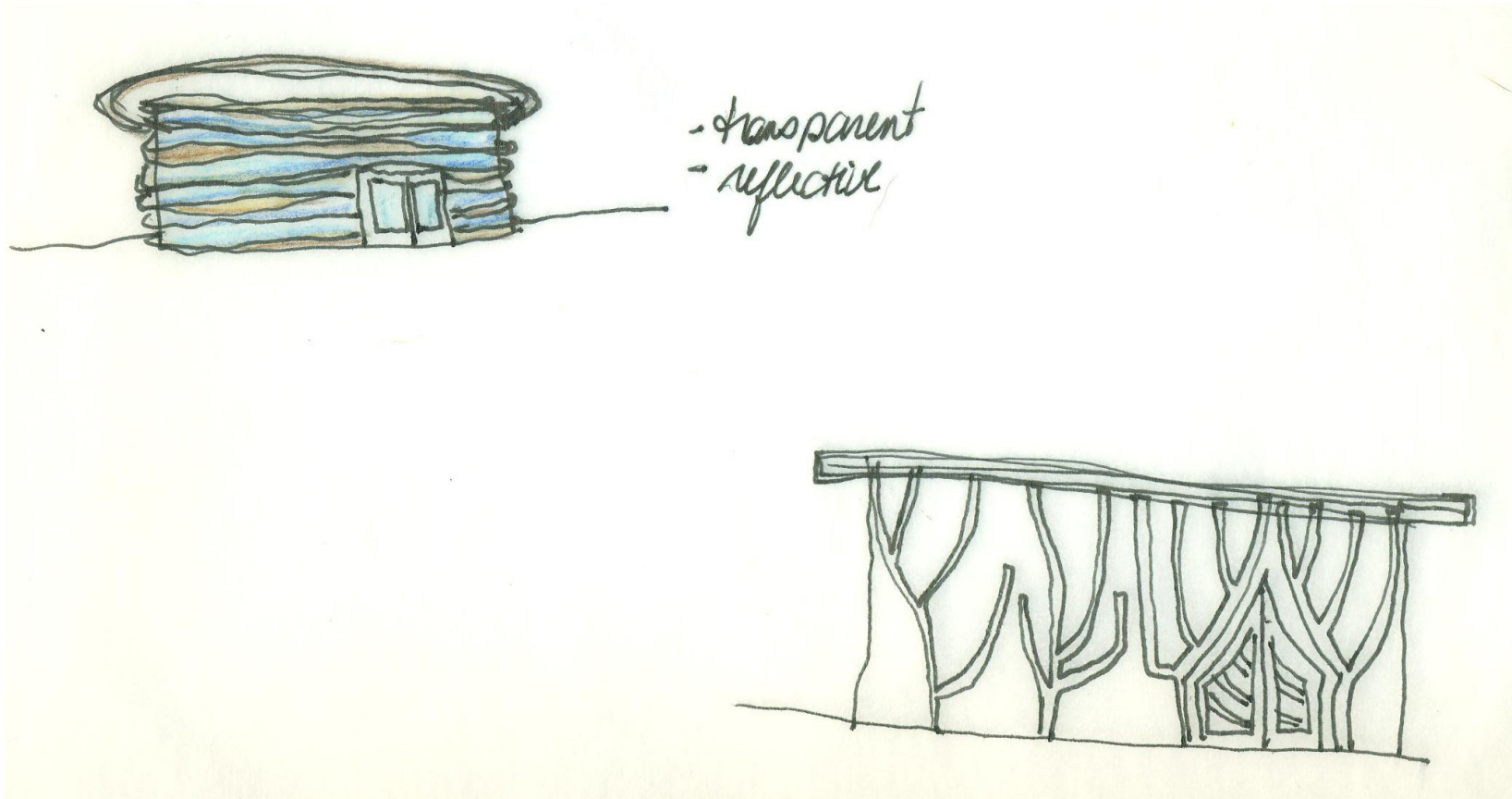


Figure 55.

## 4 A.9-1 PRELIMINARY SKETCHES

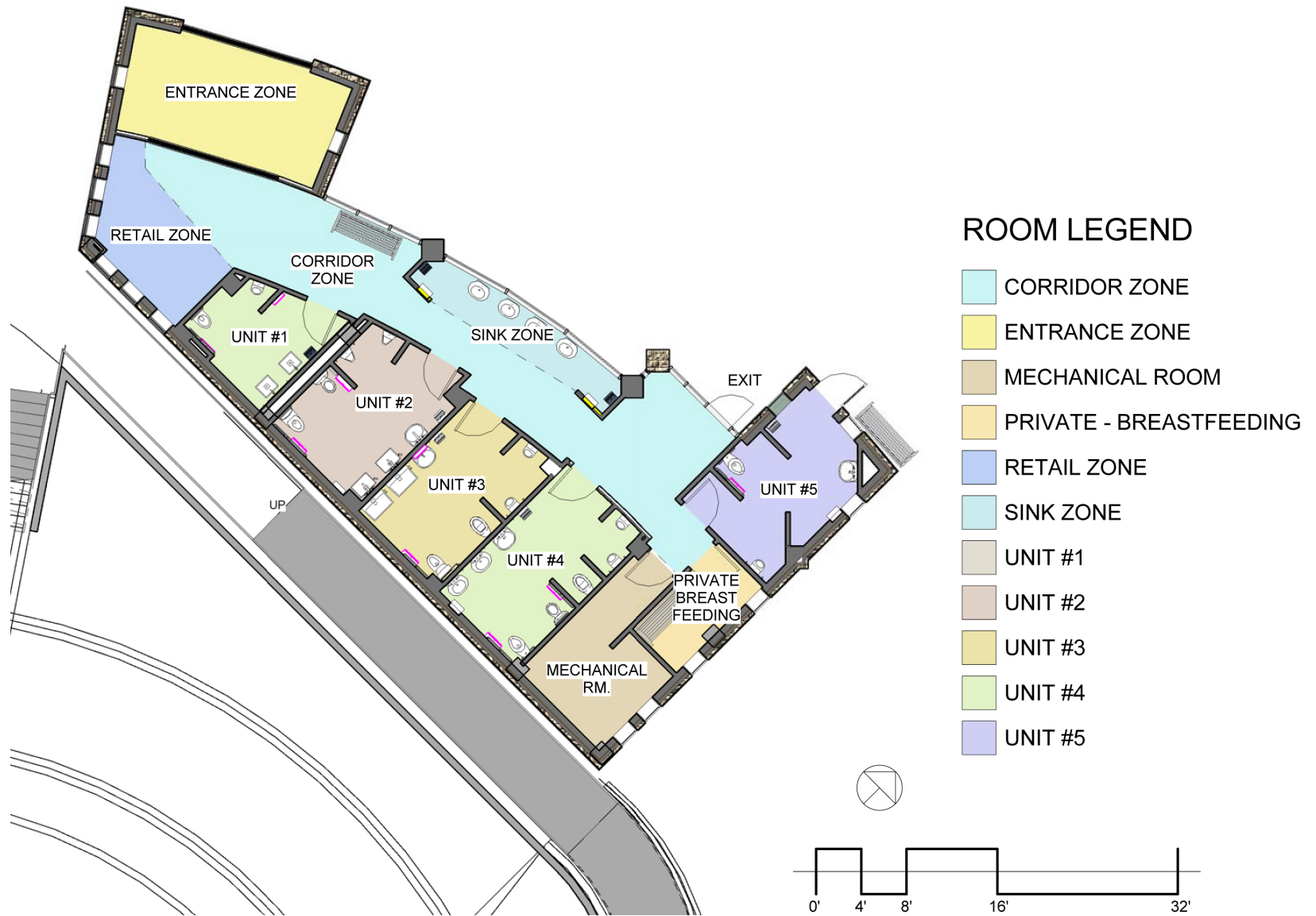


Figure 56.

**4 A . 9-2 FLOOR PLAN**



Figure 57.

**4 A . 9 - 3 EGRESS PLAN**

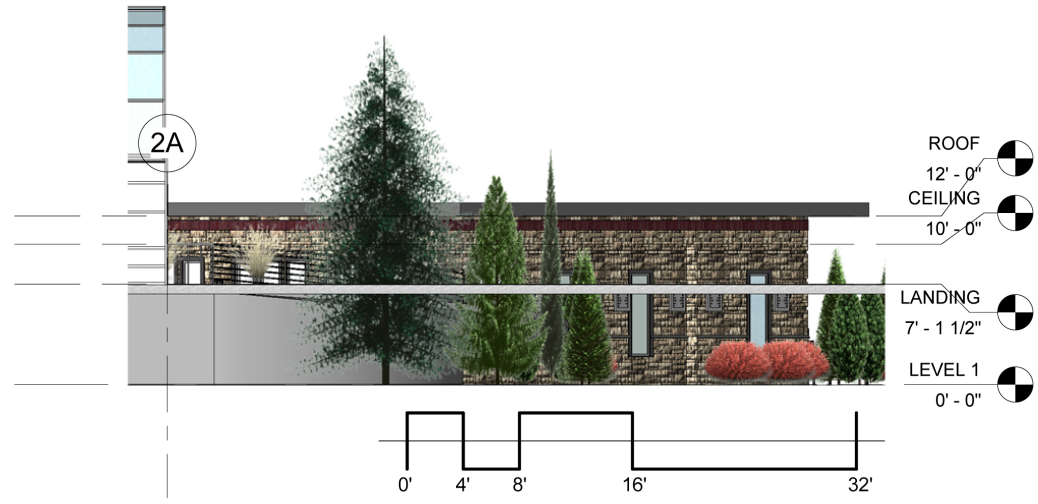


Figure 58.

**4 A . 9-4 REFLECTED CEILING PLAN**



1 NORTH  
1/8" = 1'-0"



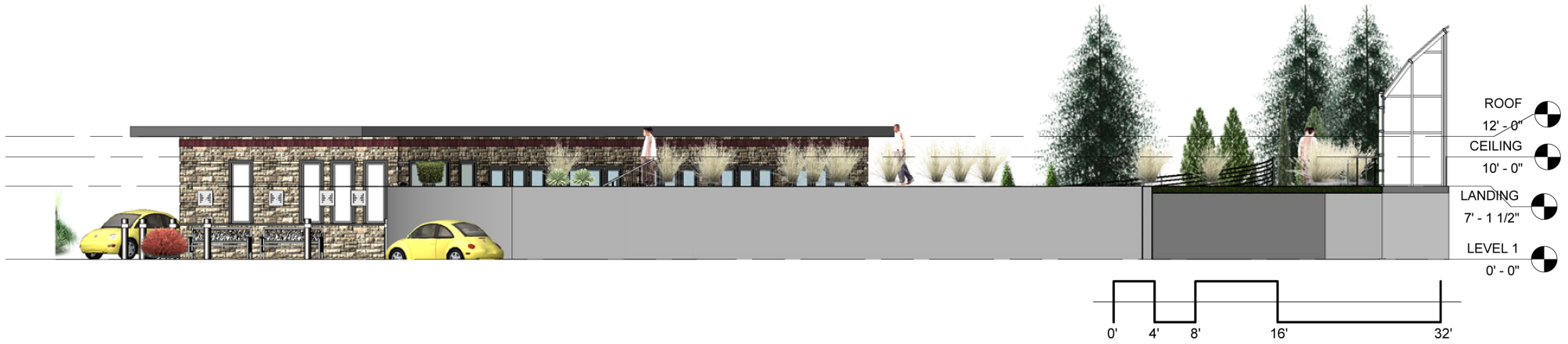
2 SOUTH  
1/8" = 1'-0"

**4 A . 9 - 5 ELEVATIONS**

Figure 59.



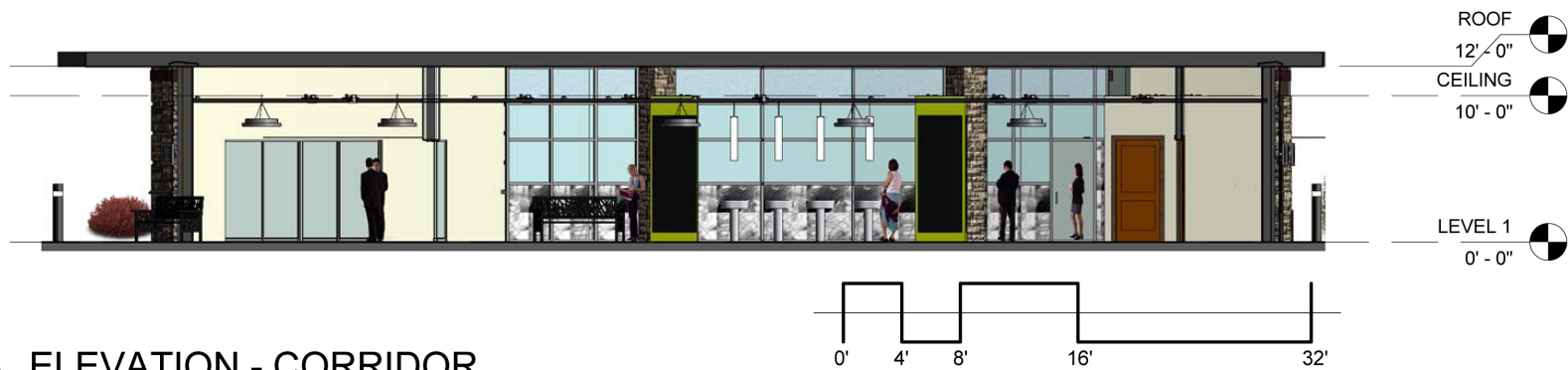
1 EAST  
1/8" = 1'-0"



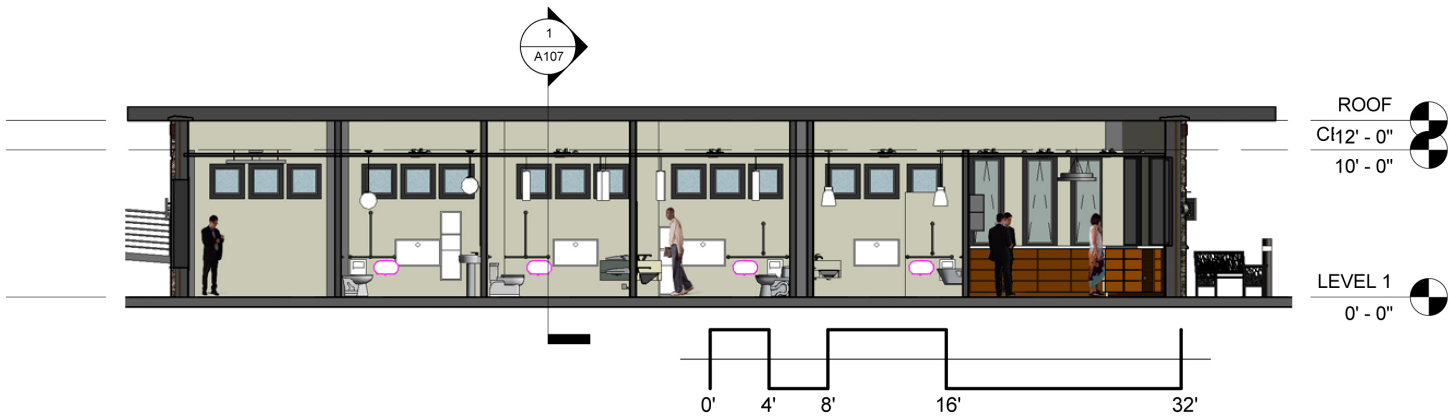
2 WEST  
1/8" = 1'-0"

Figure 60

**4 A . 9 - 5 ELEVATIONS**



1 ELEVATION - CORRIDOR  
1/8" = 1'-0"



2 ELEVATION - UNITS  
1/8" = 1'-0"

Figure 61



1 ELEVATION  
1/8" = 1'-0"

Figure 62



Figure 63.

## 4 A . 9 - 6 RENDERINGS



Figure 64.



## EXTERIOR RENDERINGS



Figure 65.

## **RETAIL STORE & CORRIDOR RENDERINGS**



Figure 66



## **CORRIDOR & SINK ZONE RENDERINGS**



Figure 67



Figure 68



Figure 69.



Figure 70.



Figure 71.

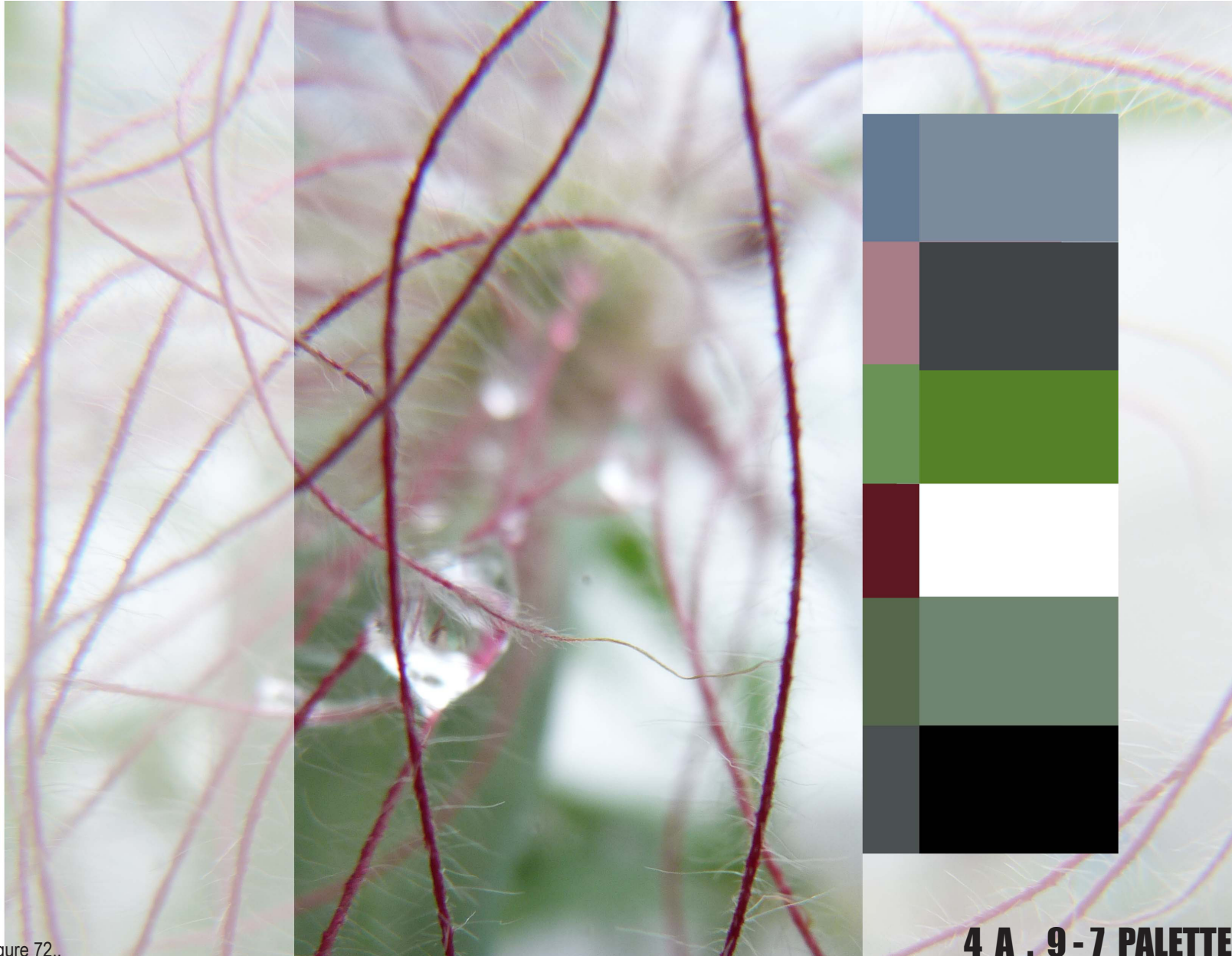


Figure 72.

**4 A . 9 - 7 PALETTE**

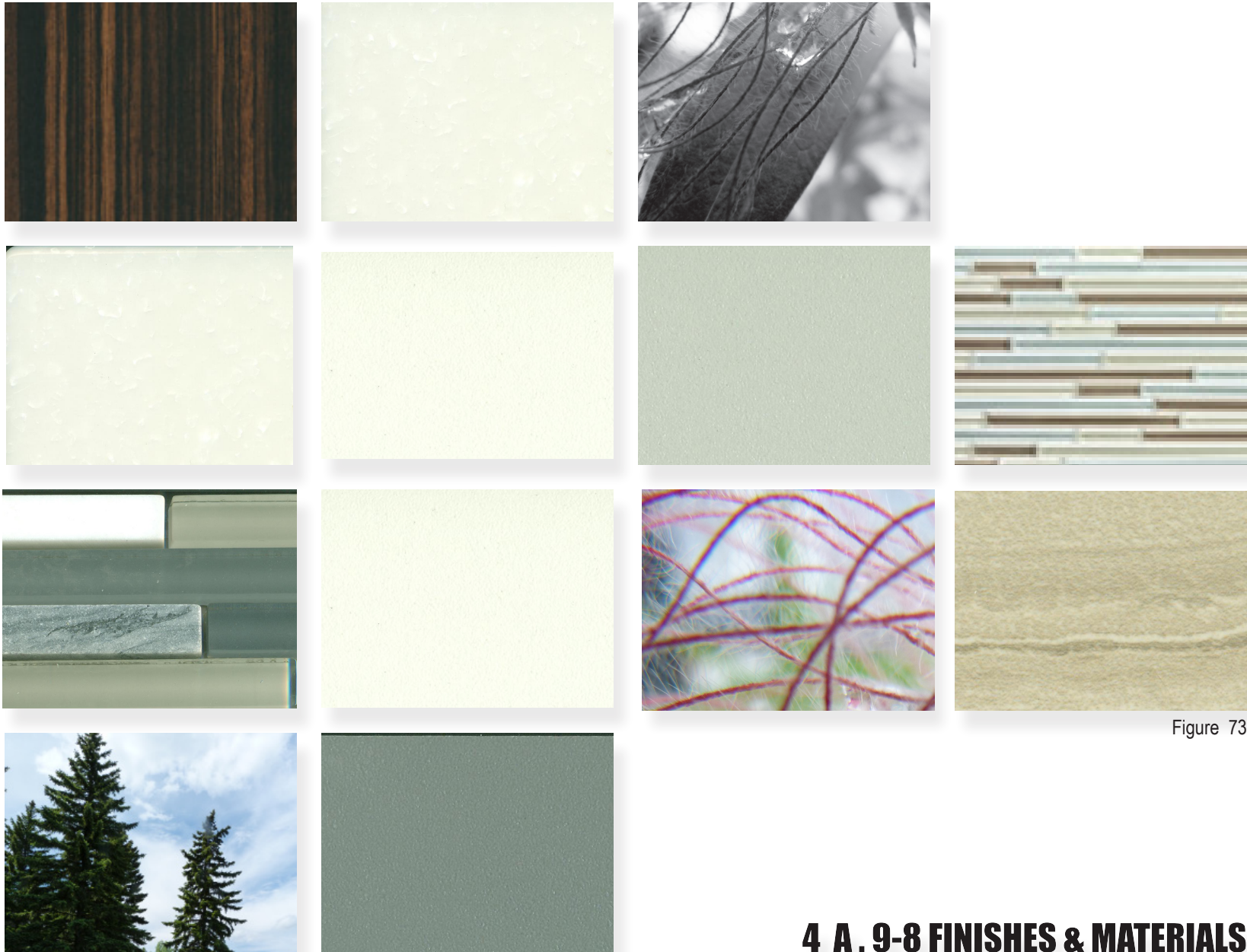


Figure 73

## 4 A . 9-8 FINISHES & MATERIALS



Figure 74

## **4 B. PAN AM POOL**



Figure 75.

## **4 B • PAN AM POOL • PROPOSED SITE**

## 4 B.1 CLIENT & USER DESCRIPTION

The Pan Am Pool was designed by Smith Carter Parkin in 1966 for the Pan American Games in 1967 and held again in 1999. The pool facility is the largest between Calgary, Alberta and Toronto, Ontario. The recreational facility continues today to host swimming meets, water polo, synchronized swimming and diving competitions. The Pan Am pool is open to the public. There is likewise a weight room, an aerobic studio, a dive training area and a walk / jog track on the site. The recreational facility provides water, land and fitness programs. Lastly, there is free parking on site.<sup>11</sup>

## 4 B.2 SITE ANALYSIS

The Pan Am Pool proposed site is located at 25 Poseidon in Winnipeg, Manitoba located in the Grant Park and Fort Rouge neighborhoods. The building is owned and maintained by the City of Winnipeg.

<b>ZONING:</b>	Pr1 – Parks & Recreation - Passive
<b>ZONING:</b>	PR3, Parks and Recreation - Regional/City-wide
<b>ADDITIONAL ZONING:</b>	PDO Airport Vicinity

**ADDITIONAL ZONING:** C2, Commercial - Community<sup>12</sup>

**ZONING:** Recreational Facility:  
2 - Eight lane, 50 m tank (Main Tank 22.9 m (25 yards) wide)  
1 - Kiddie Pool  
Track & 2 Weight Rooms  
Dive Tank

**SQUARE FOOTAGE:** 163,000

**FACILITY TYPE:** Indoor Pool

**LAND AREA:** 12.0 acres

**MAXIMUM HEIGHT OF BUILDING:** 2 stories

**PROPERTY INFLUENCES:** Bus Route, Bus Stop, Heavy Traffic<sup>13</sup>

## 4 B.3 BUILDING ANALYSIS

<b>BUILDING OWNER:/CLIENT:</b>	City of Winnipeg
<b>ADDRESS:</b>	25 Poseidon Bay, Winnipeg, MB, R3M 3E4
<b>ARCHITECT:</b>	Smith Carter Parkin
<b>YEAR CONSTRUCTED:</b>	1967
<b>RENOVATED:</b>	2005
<b>ARCHITECT &amp; INTERIOR DESIGNER:</b>	SYNYSHYN Architecture + Interior Design Inc.
<b>RENOVATION:</b>	Pan Am Pool MPR & Diving Training Room
<b>SQUARE FOOTAGE:</b>	160 m <sup>2</sup> (Construction Cost: \$150, 000.00)
<b>RECEPTION AREA RENOVATION:</b>	2010
<b>BUILDING CONSTRUCTION:</b>	Concrete, CMU
<b>FLOORING:</b>	Ceramic Tile, Concrete
<b>CEILING:</b>	Concrete, Steel Construction
<b>LIGHTING:</b>	Fluorescent
<b>MECHANICAL AIR SYSTEM:</b>	Forced Air (HVAC)
<b>OCCUPANT:</b>	Recreational

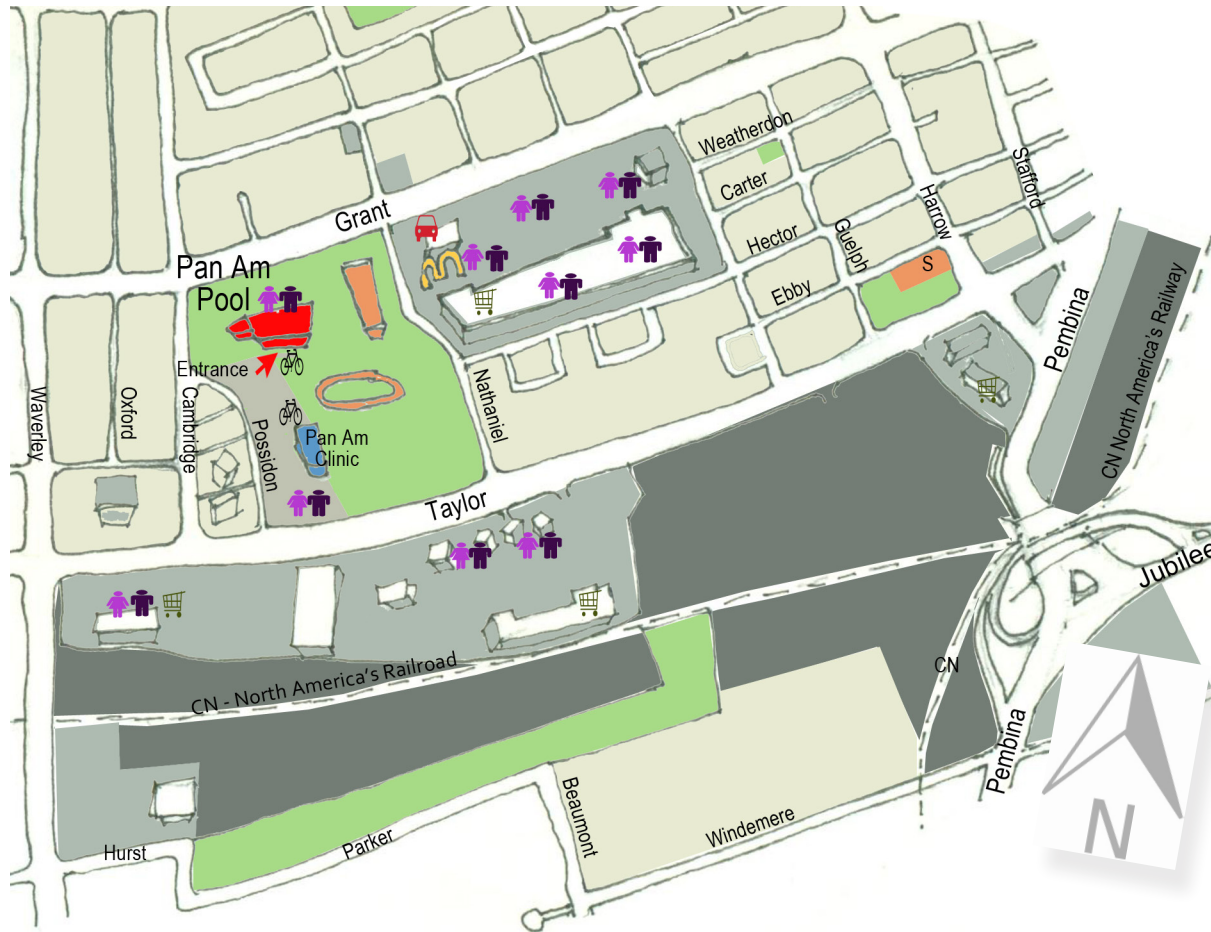


Figure 76.

- LEGEND
- GAS STATION
  - GROCERY STORE
  - BIKE RACK
  - MEN & WOMEN EXISTING RESTROOMS FOR PATRONS
  - RESIDENTIAL
  - GREENSPACE OR PARKS
  - COMMERCIAL
  - INDUSTRIAL
  - SITE - PAN AM POOL
  - CN NORTH AMERICAN'S RAILROAD
  - SCHOOL
  - MACDONALD'S

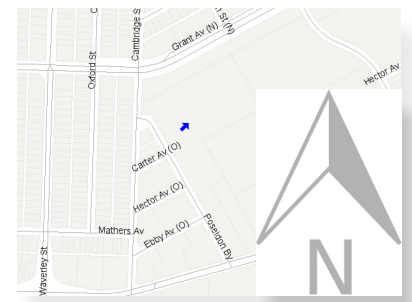


Figure 77

## 4 B . 4 SITE: EXISTING RESTROOMS FOR PATRONS



Figure 78.



Figure 79

**4 B .5 SITE: EXTERIOR PHOTOS**



Figure 80- Main Entrance Pan Am Pool.

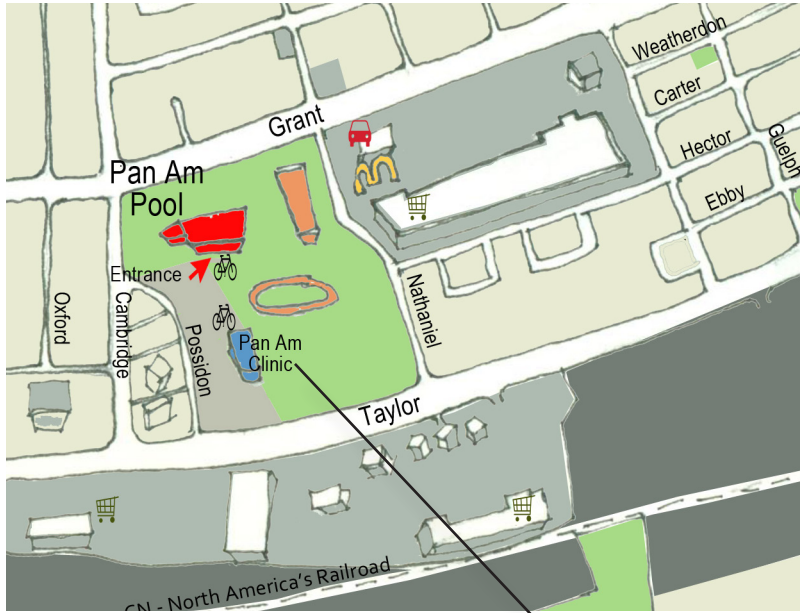


Figure 81

SCALE: Not to Scale (NTS)



Figure 82 - View of Pan Am Clinic from Taylor Ave..





Figure 83- View from under balcony to Grant Ave.



Figure 84 - View from balcony to Grant Ave.



Figure 85- View of Pan Am Pool from Grant Ave.



Figure 86 - Community Garden



Figure 87



SCALE: Not to Scale (NTS)



Figure 88- Existing Women's Grooming Zone,



Figure 89- Existing Washrooms. Photograph by Author.

## 4 B .6 SITE: INTERIOR PHOTOS



Figure 90- Women's Change Area..



Figure 91 - Women's Shower Area..



Figure 92- Existing Special Needs



Figure 93- Existing Barrier Free..



Figure 94- Grant Ave. & Cambridge.



Figure 95 - Grant Ave. & Nathaniel Street..

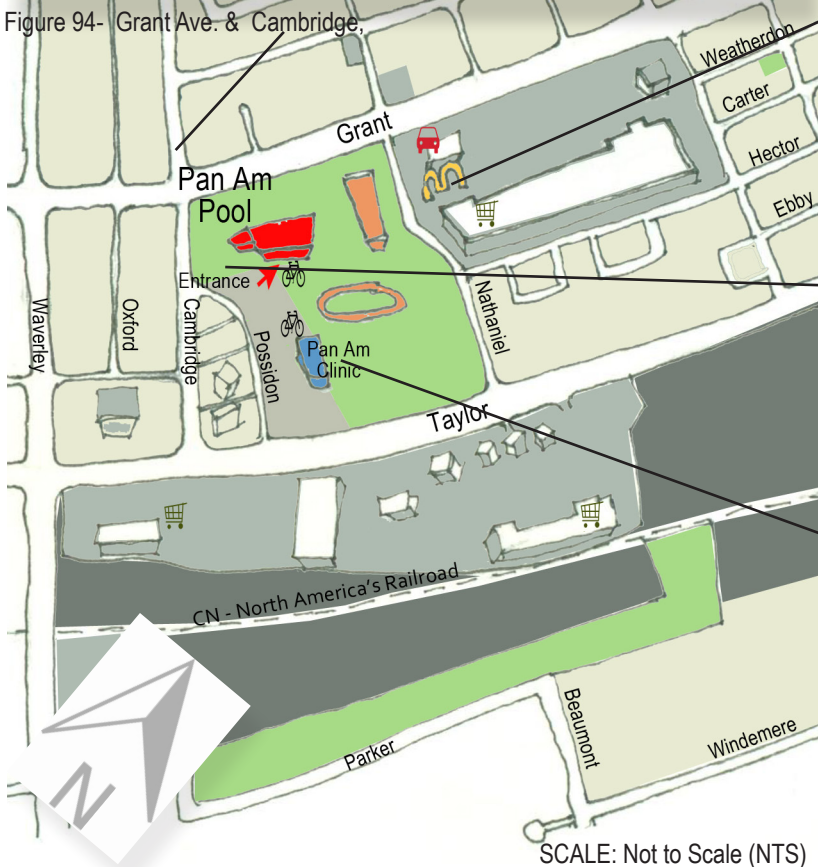


Figure 99 - Map.



Figure 96



Figure 97 - Main Entrance.



Figure 98 - Grant Park High School Field to Sobeys on Taylor Ave.

## 4 B . 7 SITE: LANDMARKS

## SITE: PAN AM POOL

CONSTRUCTED	RENOVATED	TOTAL BUILDING AREA	EXISTING PUBLIC TOILET M2 (FT2)				REQUIRED FLOOR AREA (includes Unisex, Accessible, Family Spaces)	TOTAL NEW FLOOR AREA
			Women	Men	Special Needs	Staff M / W		
<b>1967</b>	2005 – Diving Training Room 2010 – Reception Area	163 000 ft <sup>2</sup> 9 825 m <sup>2</sup> (105 750 ft <sup>2</sup> ) (2006)	Women 1345 m <sup>2</sup> (4414 ft <sup>2</sup> )	Men 1173 m <sup>2</sup> (3847 ft <sup>2</sup> )	Special Needs 196 m <sup>2</sup> (642 ft <sup>2</sup> )	Staff M / W 115 m <sup>2</sup> (378 ft <sup>2</sup> ) / 121 m <sup>2</sup> (398 ft <sup>2</sup> )	Women & Family 7612 ft <sup>2</sup>	Women & Family 8 693 ft <sup>2</sup>

## 4 B.8-1 EXISTING

OCCUPANCY	TRAFFIC COUNT PER DAY		WOMEN'S EXISTING CUBICLES		SPECIAL NEEDS AREA		EXISTING FT2	
	INCLUDES MEN, WOMEN & CHILDREN	AVERAGE WOMEN	STANDARD CUBICLE	BARRIER-FREE CUBICLE	CHANGE ROOMS	SPECIAL NEEDS UNIVERSAL TOILET	EXISTING SPECIAL NEEDS AREA	WOMEN CHANGE, SHOWER & WASHROOMS
<b>Group A, Division 3</b>	1,144	572	7 in change area 5 in lobby	1 in lobby	4	1	642 ft <sup>2</sup>	4,414 ft <sup>2</sup>

## 4 B.8-2 REQUIRED PUBLIC TOILETS

OCCUPANCY	NBC 2010 MINIMUM NUMBER OF WATER CLOSETS STANDARD CUBICAL	TOILET PRIVILEGING MODEL CUBICAL	NBC 2010 REQUIRED WOMEN ACCESSIBLE / UNIVERSAL CUBICLES	TOILET PRIVILEGING UNISEX/ACCESSIBLE
<b>Group A, Division 3, WATER CLOSETS FOR AN ASSEMBLY</b>	14	28	2	4

NBC 2010 (National Building Code of Canada 2010)

## 4 B.8-3 OCCUPANT LOAD

GROUP A, DIVISION 3: FOR WOMEN & FAMILY CHANGE / SHOWER / WASHROOM AREA

USE	LOAD FACTOR	FLOOR AREA	NOT OCCUPIABLE	NET OCCUPANCY LOAD
<b>WOMEN'S CHANGE AREA/ WASHROOMS</b>	pool 9.3 m <sup>2</sup> / 100 ft <sup>2</sup> )	1, 624 m <sup>2</sup> / 4,999 ft <sup>2</sup>	Lockers & Columns 18 ft <sup>2</sup>	49
<b>PUBLIC CORRIDOR</b>	3.70 m <sup>2</sup> / 40 ft <sup>2</sup>	1, 267 m <sup>2</sup> / 4,107 ft <sup>2</sup>		103
<b>FAMILY CHANGE ROOM / STROLLER STORAGE / WASHROOMS</b>	9.3 m <sup>2</sup> / 100 ft <sup>2</sup>	1, 150 m <sup>2</sup> / 3694 ft <sup>2</sup>	Lockers & Columns 18 ft <sup>2</sup>	36
		TOTAL FLOOR AREA 12, 800 ft <sup>2</sup>		TOTAL NUMBER OF OCCUPANTS = 188

## 4 B.8-4 SPATIAL REQUIREMENTS

INDIVIDUAL USE & AREA	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE / UNISEX / FAMILY	SUB- TOTAL FT <sup>2</sup>	+20% TRAFFIC PATHS (ft <sup>2</sup> )	TOTAL SQUARE FOOTAGE (ft <sup>2</sup> )
<b>MODEL CUBICAL (Water Closet) 81" x 44" = 25 ft<sup>2</sup> approx. (with small sink or luggage/bags, touch less)<sup>14</sup></b>	28 cubicles 700 ft <sup>2</sup>	7 cubicles + 8 urinals (2/3) 175 ft <sup>2</sup>		875	175	<b>1050</b>
<b>STANDARD CUBICAL 5'x3' min. = 15 ft<sup>2</sup> <sup>15</sup></b>	28 cubicles 420 ft <sup>2</sup>	15 cubicles 225 ft <sup>2</sup>		645	129	<b>774</b>
<b>ACCESSIBLE CUBICLES 6'-1 1/2" x 8' min.= 49 ft<sup>2</sup></b>	2 cubicles 98 ft <sup>2</sup>	2 cubicles 98 ft <sup>2</sup>		196	39.2	<b>235.2</b>
<b>UNISEX/PRIVATE / INDIVIDUAL ACCESSIBLE CUBICLES 10'-6" x 12'-10" min. = 135 ft<sup>2</sup></b>			4 540 ft <sup>2</sup>	540	108	<b>648</b>
<b>LAVATORIES (sinks) 36.25" (30" min. clearance) x 54" (min. clearance)</b>	14 sinks x 13.59 ft <sup>2</sup> = 190.26 ft <sup>2</sup>	8 sinks x 13.59 ft <sup>2</sup> = 108.72 ft <sup>2</sup>		299	60	<b>359</b>

INDIVIDUAL USE & AREA	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE / UNISEX / FAMILY	SUB- TOTAL FT <sup>2</sup>	+20% TRAFFIC PATHS (ft <sup>2</sup> )	TOTAL SQUARE FOOTAGE (ft <sup>2</sup> )
INFANT CHANGING STATIONS (includes sink) 7'-6" x 5' min = 37.5 ft <sup>2</sup> +- <sup>16</sup>	2 75 ft <sup>2</sup>	2 75 ft <sup>2</sup>	4 150 ft <sup>2</sup>	300	60	<b>360</b>
URINALS - ADULT 36" x 54" = 13.5 ft <sup>2</sup> +- (Grab bars 30" either side of urinal) <sup>17</sup>		8 urinals 108 ft <sup>2</sup>		108	21.6	<b>129.6</b>
URINALS – CHILD – 13.5 ft <sup>2</sup>		5 67.5 ft <sup>2</sup>		67.5	13.5	<b>81</b>
FAMILY (CHILD & ADULT TOILETS) PRIVATE INDIVIDUAL 10'-6" X 12'-10" MIN. = 135 ft <sup>2</sup>	2 cubicles 270 ft <sup>2</sup>	2 cubicles 270 ft <sup>2</sup>	4 540	1080	216	<b>1296</b>
LAVATORIES FOR CHILDREN AGED 9-12 (3'X 6') 18 ft <sup>2</sup> <sup>18</sup>	11 (2/3 of women cubicles) 198 ft <sup>2</sup>	6 (2/3 of male cubicles) 108 ft <sup>2</sup>		306	61.2	<b>367.2</b>
SQUAT TOILET (ALATURKA OR KAKKOOS) 20.67" X 16.54" X 7.48" (525)	1 squat 15 ft <sup>2</sup>	1 squat 15 ft <sup>2</sup>		30	6	<b>36</b>

INDIVIDUAL USE & AREA	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE / UNISEX / FAMILY	SUB- TOTAL FT <sup>2</sup>	+20% TRAFFIC PATHS (ft <sup>2</sup> )	TOTAL SQUARE FOOTAGE (ft <sup>2</sup> )
mm x 420 mm x 190 mm)						
<b>EXISTING LOCKERS</b> 6.75 ft <sup>2</sup>	336 lockers 2 268 ft <sup>2</sup>	368 lockers 2 484 ft <sup>2</sup>		4752	950.4	<b>5702.4</b>
<b>ACCESSIBLE LOCKERS</b> 36+ A MIN. 10 ACCESSIBLE LOCKERS TO BE PROVIDED <sup>19</sup> 3'x4'6" depth – 13.5 ft <sup>2</sup> <sup>20</sup>	10 accessible lockers 135 ft <sup>2</sup>	10 accessible lockers 135 ft <sup>2</sup>		270	54	<b>324</b>
<b>ACCESSIBLE SHOWERS</b> 5'x 6' = 30 ft <sup>2</sup> min. (includes shower stall 36"x 60") <sup>21</sup>	4 120 ft <sup>2</sup>	4 120 ft <sup>2</sup>		240	48	<b>288</b>
<b>EXISTING SHOWERS</b>	36	36	0			
<b>SHOWERHEADS</b> 1 showerhead for every 10 dressing lockers	24		11			
<b>ACCESSIBLE CHANGING ROOM</b> 9'-1" X 8' (72.66 ft <sup>2</sup> ) <sup>22</sup>	2 145.32 ft <sup>2</sup>	2 145.32 ft <sup>2</sup>	4 Unisex 581.28 ft <sup>2</sup>	1162.56	232.512	<b>1395.07</b>

<b>INDIVIDUAL USE &amp; AREA</b>	<b>WOMEN (quantity &amp; ft<sup>2</sup>)</b>	<b>MEN (quantity &amp; ft<sup>2</sup>)</b>	<b>ACCESSIBLE / UNISEX / FAMILY</b>	<b>SUB- TOTAL FT<sup>2</sup></b>	<b>+20% TRAFFIC PATHS (ft<sup>2</sup>)</b>	<b>TOTAL SQUARE FOOTAGE (ft<sup>2</sup>)</b>
<b>WET TOILET AREA</b>	1		1			
<b>DRYING AREA (off shower area) with benches</b>	0		0			
<b>PRIVATE &amp; OPEN SHOWERS</b> Includes 2 barrier free showers	24		11			
<b>STAFF WASHROOMS / CHANGE ROOM / SHOWERS</b>	0		0			
<b>CELL PHONE AREA</b>	0		1			
<b>STROLLER STORAGE</b>	1		1			
<b>DRYING AREA</b>	1		1			

Note: Touch less – calf does not touch edge of cubical door and edge of toilet front.

<b>PAM AM POOL - FEMALE</b>	<b>Quantity</b>	<b>Square Footage</b>	<b>Sub-Total Square Footage</b>	<b>Traffic Path + 20 %</b>	<b>TOTAL SQUARE FOOTAGE</b>
Model Cubical (Water Closet)	28	25	700	140	840
Accessible Cubicles (Water Closet)	2	49	98	19.6	117.6
Private/Individual Accessible Cubicles	4	135	540	108	648
Family Toilet (Child & Adult)	4	135	540	108	648
Infant Changing Stations	4	37.5	150	30	180
Water Closets for children Ages 9-12 years	11	18	198	39.6	237.6
Lavatory (Sinks)	14	14	196	39.2	235.2
Squat Toilet	1	15	15	3	18
Existing Lockers	336	6.75	2268	453.6	2721.6
Accessible lockers +36, min. 10	10	13.5	135	27	162
Accessible Showers	4	100	400	80	480
Existing Showers	36	22.57	812.52	162.504	975.024
Accessible Changing Room	4	72.66	290.64	58.128	348.768
<b>TOTAL SQUARE FOOTAGE</b>					<b>7611.792</b>

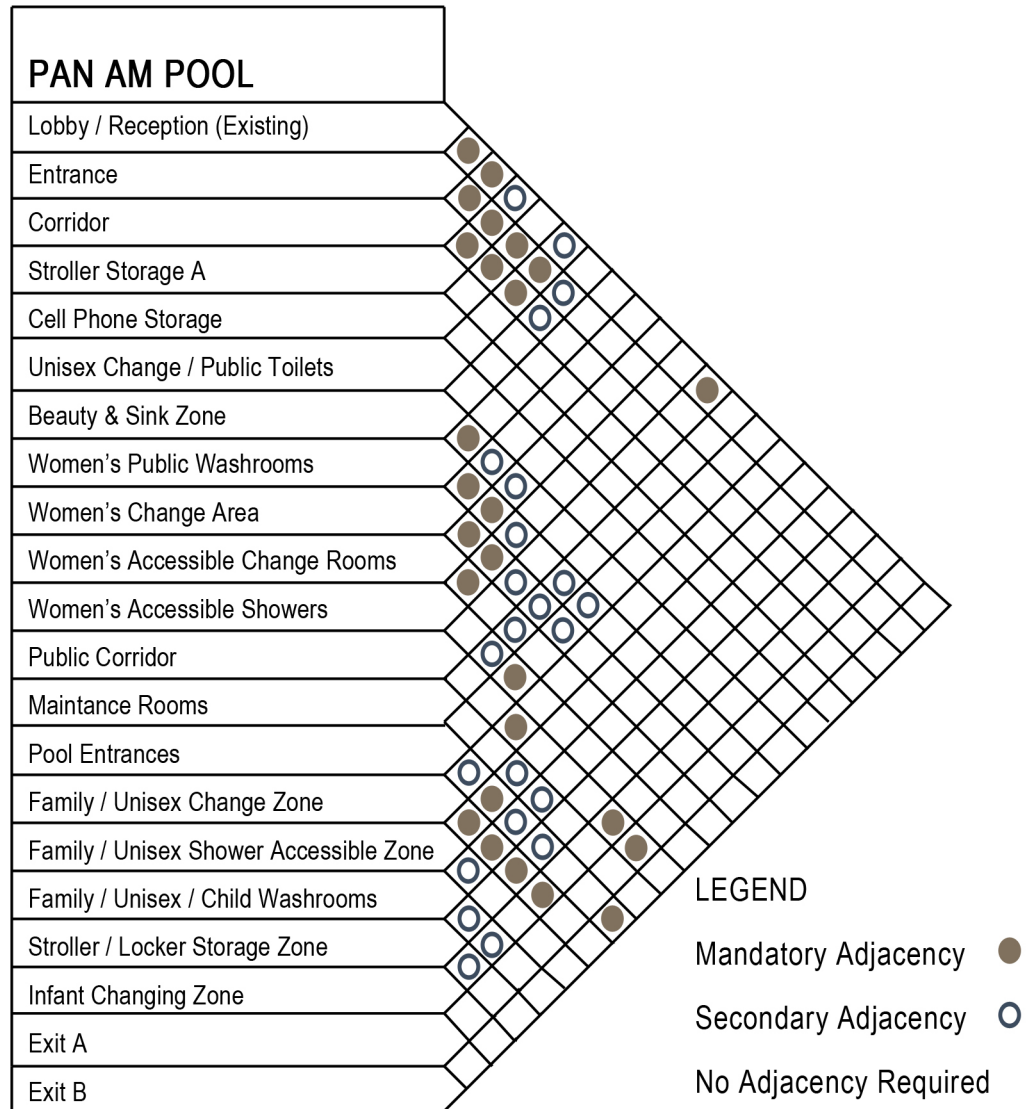


Figure 100.

## 4 B .9 FOLDED ADJACENCY



Figure 101

**4 B.10 - 1 PRELIMINARY SKETCHES**

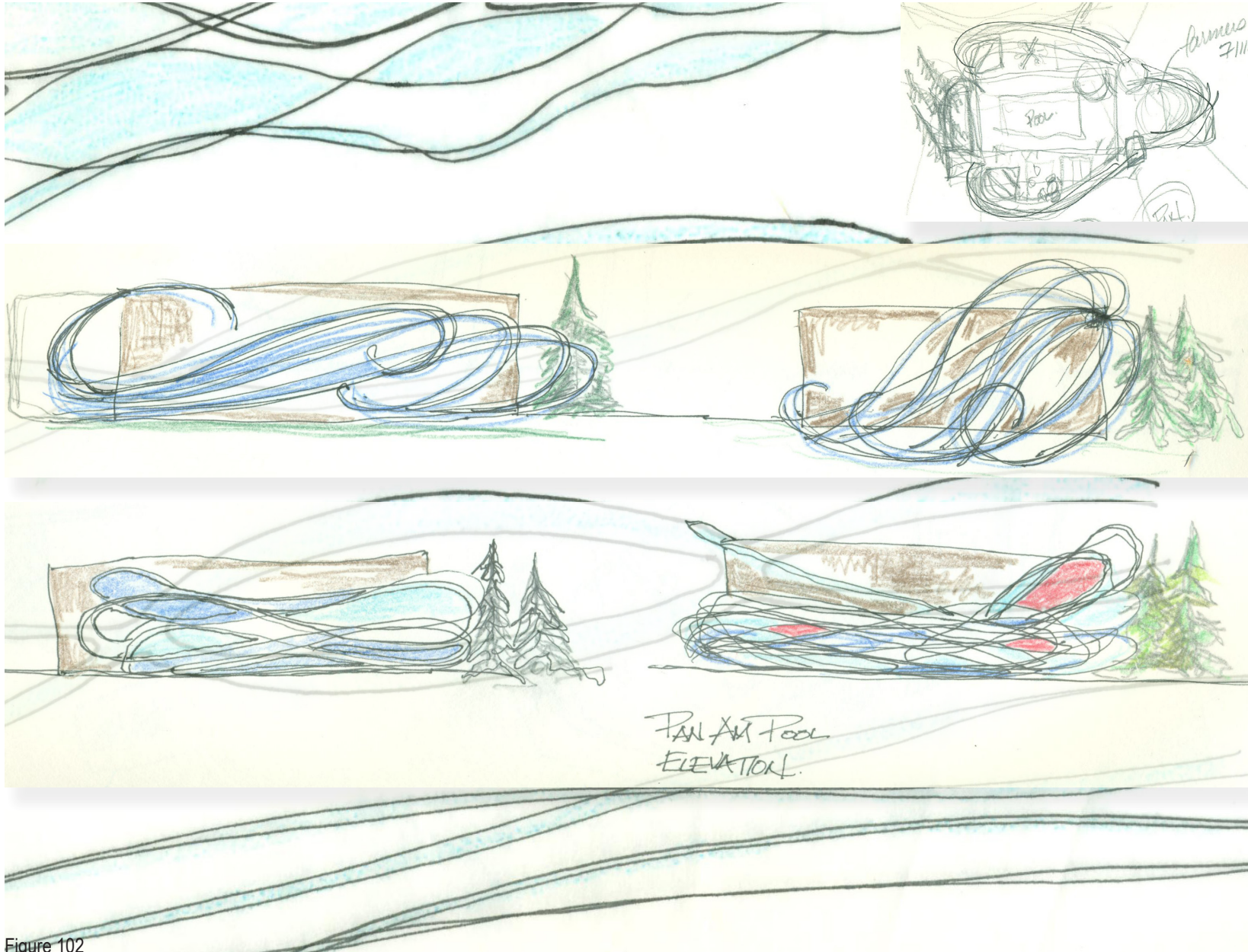


Figure 102



Figure 103 - Family Zone Preliminary Sketches.

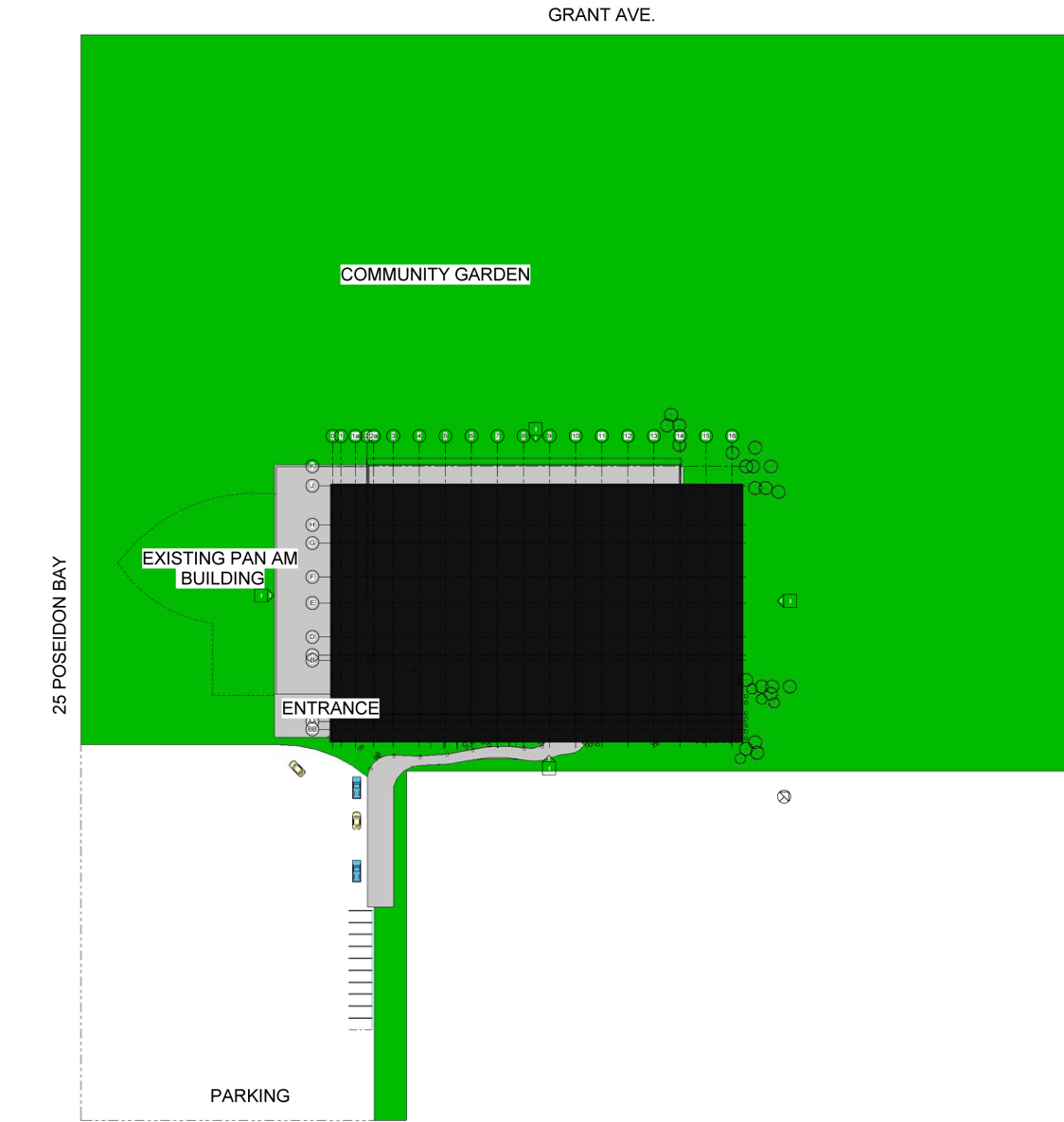


Figure 104 - Pan Am Site.

SCALE: Not to Scale

# 4 B.10 - 2 SITE PLAN

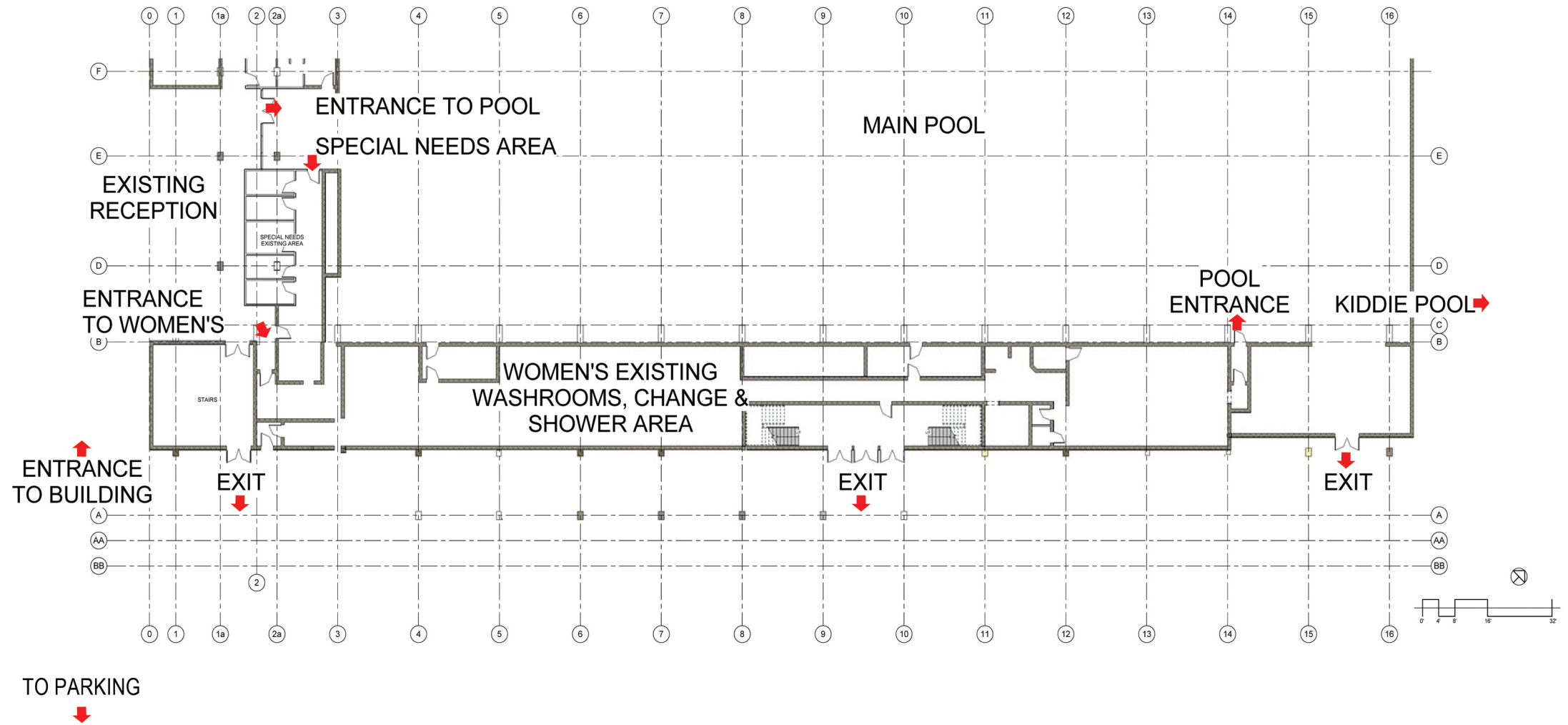


Figure 105.

**4 B.10-3 EXISTING FLOOR PLAN**



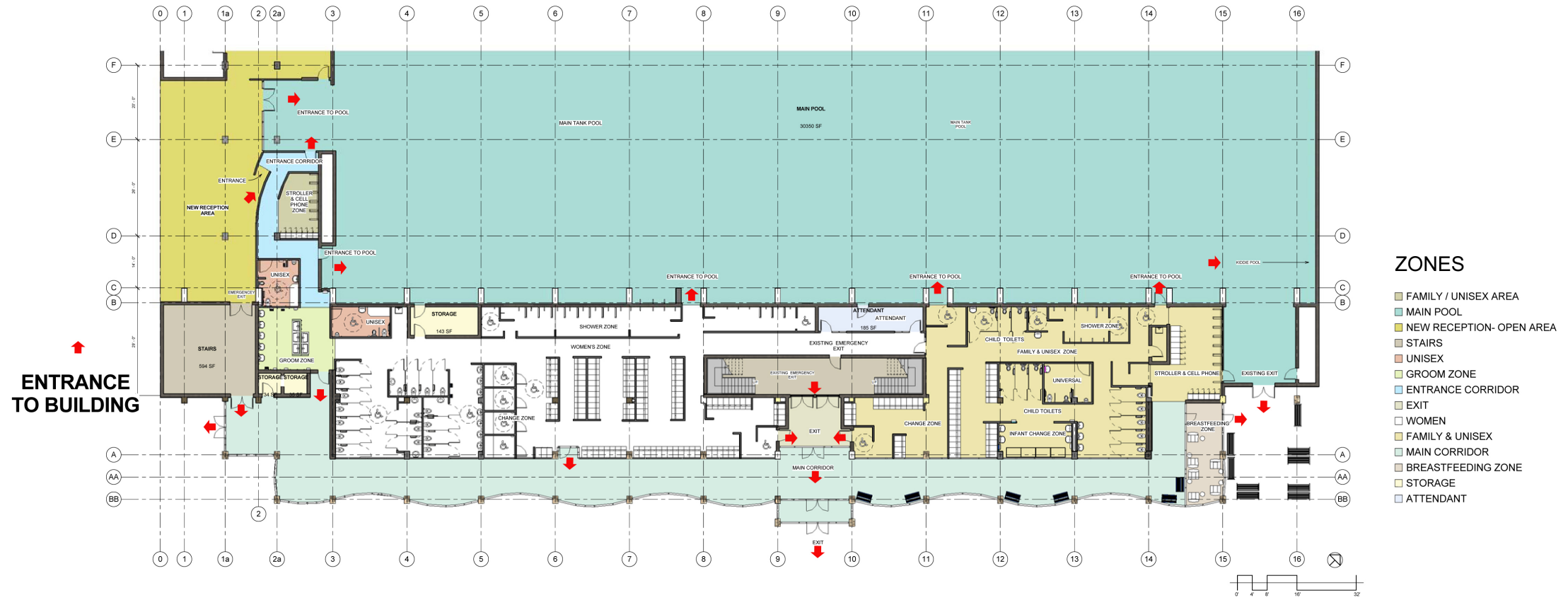


Figure 107

**4 B.10 -5 EGRESS PLAN**

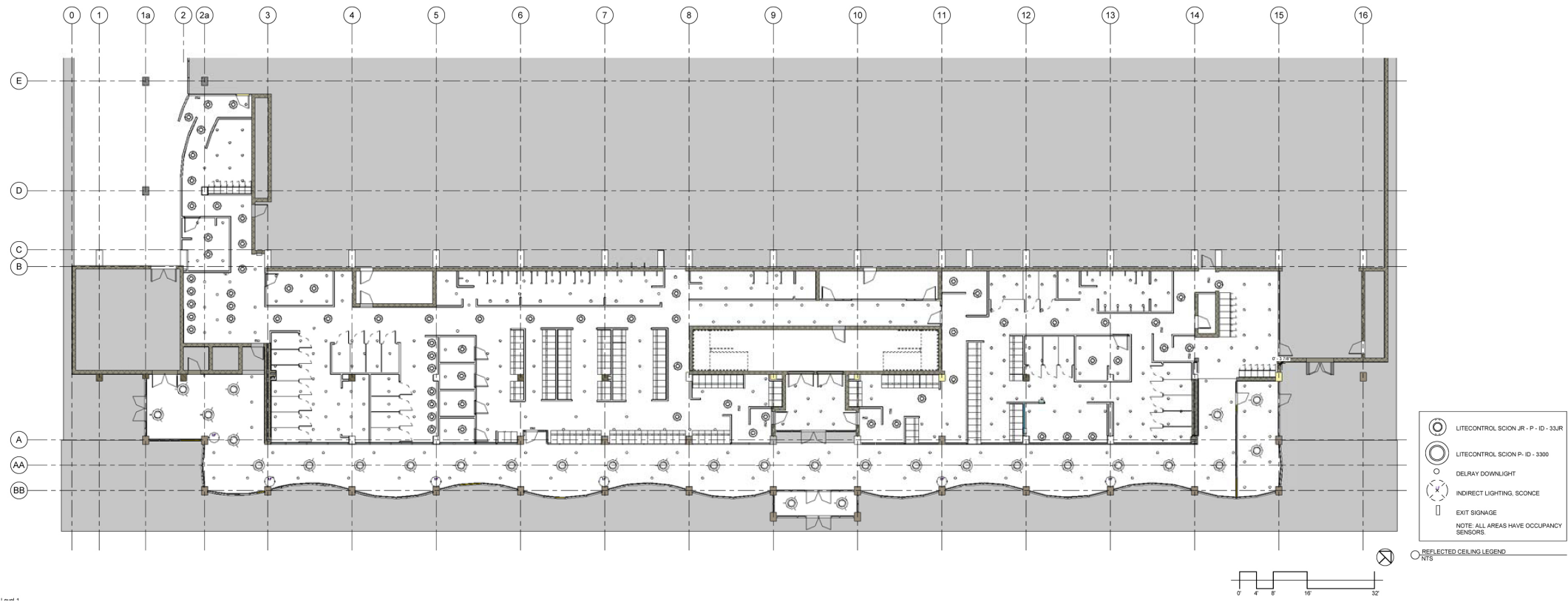


Figure 108

## 4 B.10-6 REFLECTED CEILING PLAN

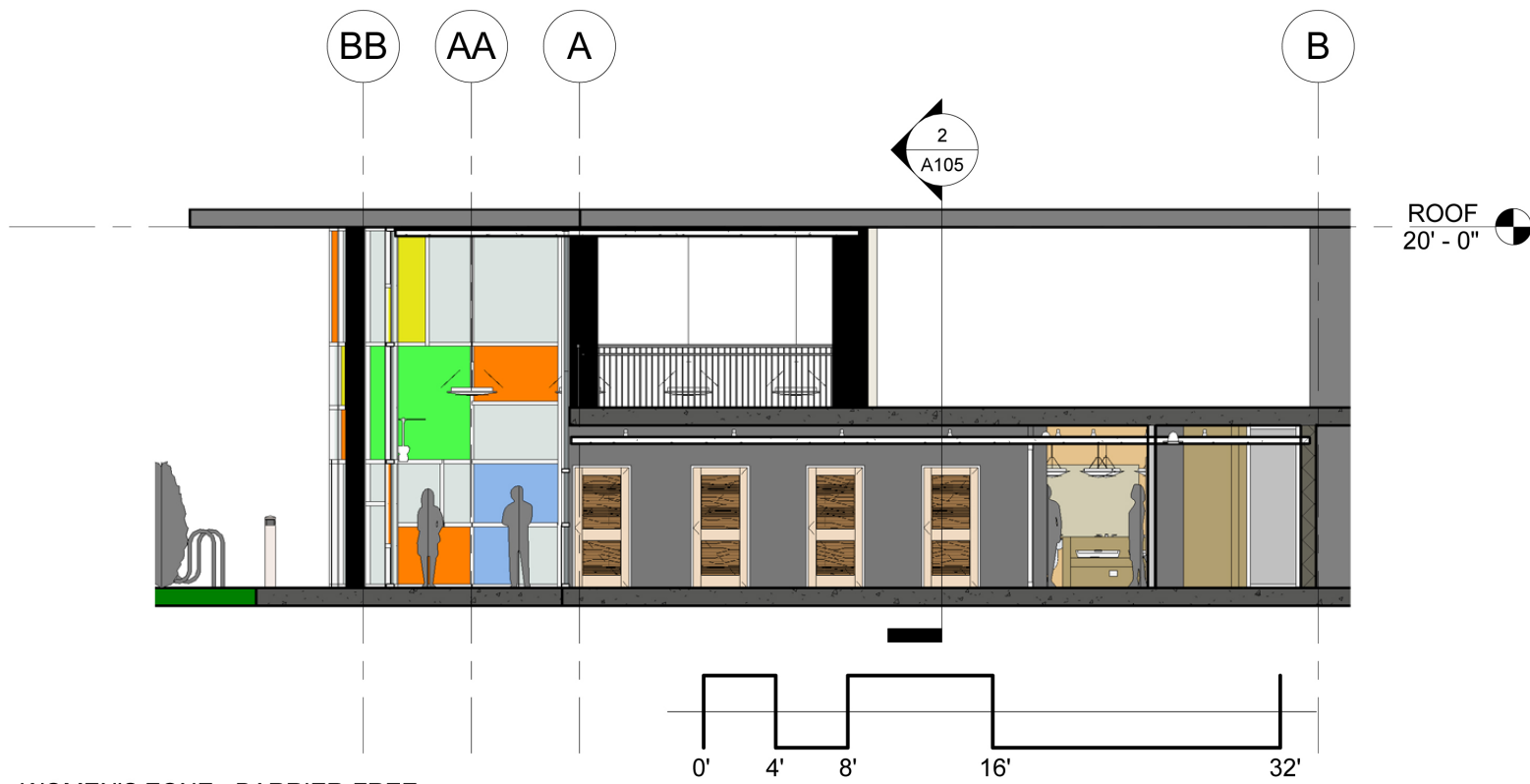


Figure 109.

**4 B.10-7 ELEVATION**



Figure 110.



1 WOMEN'S ZONE - BARRIER-FREE  
 CHANGE ROOMS  
 1/8" = 1'-0"

Figure 111 .

**4 B.10 - 7 ELEVATION**



Figure 112.



Figure 113.



**4 B . 10 - 8 RENDERINGS**



Figure 114.

## GROOMING ZONE



Figure 115.



Figure 116.



**WOMEN'S WASHROOMS & CHANGE ZONE**



Figure 117.

## **CORRIDOR TO FAMILY ZONE**



Figure 118.

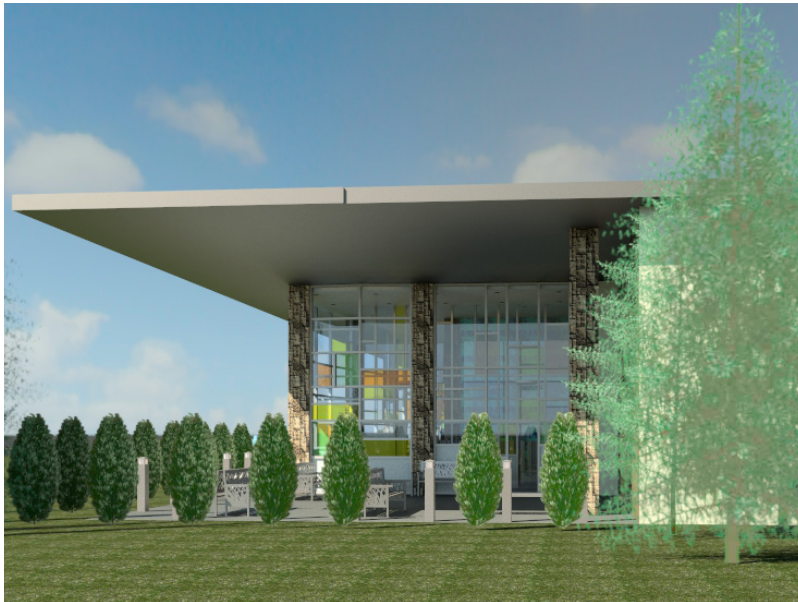


Figure 119

## BREASTFEEDING ZONE



Figure 120





Figure121

**4 B . 10 -9 PALETTE**



Figure 122

**4 B.10-10 FINISHES & MATERIALS**



Figure 123

## **4 C. ST. VITAL CENTRE**



Figure 124

## 4 C • ST. VITAL CENTRE

## 4 C.1 CLIENT & USER DESCRIPTION

St. Vital Center is an enclosed shopping mall with 160 stores. The shopping center is located in St. Vital neighborhood at the corner of St. Mary's Road and Bishop Grandin Blvd. (Route 165) in the south-east area of Winnipeg, Manitoba. The facility is managed by 20 VIC Management Inc., whose head office is in Toronto, Ontario. Average pedestrian traffic count per week is 178,000. The average sales productivity is \$513.00 per square foot per year.<sup>23</sup>

### ST. VITAL MARKET DEMOGRAPHIC PROFILE

PRIMARY:	240,805
SECONDARY:	215,000
HOUSEHOLDS:	107,100
PERSONS PER HOUSEHOLD:	2.2
AVERAGE HOUSEHOLD INCOME:	\$70,000

### CUSTOMER PROFILE

EDUCATION: UNIVERSITY / COLLEGE / TECHNICAL: 69%

PROFESSION:

WHITE COLLAR/PROFESSIONAL	11%
BUSINESS	21%
SALES / SERVICE	24%
BLUE COLLAR / TRADES	10% <sup>24</sup>

## **4 C.2 SITE ANALYSIS**

ZONING:	C4, Commercial - Regional
LAND AREA:	67.7 acres
PROPERTY USE CODE:	CMRRS - Regional Shop Centre
PROPERTY INFLUENCES:	External Corner, Bus Route, Bus Stop, Heavy Traffic <sup>25</sup>
OCCUPANT:	Retailers and Patrons

## **4 C.3 BUILDING ANALYSIS**

BUILDING OWNER:	Ontario Pension Board
MANAGED:	20 VIC Management Inc.

**ADDRESS:** ST.VITAL CENTRE, 86-1225 St. Mary's Road, Winnipeg, MB R2M 5E5

**ARCHITECT (RENOVATIONS):** MMC International Architects Ltd. & RDG Planning & Design:

**YEAR CONSTRUCTED:** 1979

**RENOVATED:** 1986, 1998 (500,000 ft<sup>2</sup>), 2012 (interior renovations presently occurring)

**GROSS LEASABLE:** 928,527 ft<sup>2</sup> (includes CIBC, Safeway store, Montana's, McDonald's, OLD Navy, & Earl's)

**MAIN RETAILERS:** Sears, The Bay, Wal-mart, London Drugs, Silvercity, Chapters & SportChek)

**PARKING SPACES AVAILABLE:** 4,661

**EXISTING PUBLIC TOILET:** Women 1228 ft<sup>2</sup>, Men 557 ft<sup>2</sup>, Family 428 ft<sup>2</sup>, Staff 386 ft<sup>2</sup>

**BUILDING CONSTRUCTION:** Concrete, Steel, Wood Beams in Food Court, Glass

**FLOORING:** Ceramic Tile, Concrete, Carpet Tile

**CEILING:** Glass, Steel, Natural Wood Beams, Gypsum Board, Paint

**LIGHTING:** Pot lighting, Natural light

**MECHANICAL AIR SYSTEM:** Forced Air (HVAC)

**GREEN PROGRAM:** 2009 BOMA BEST Certification, level three<sup>26</sup>

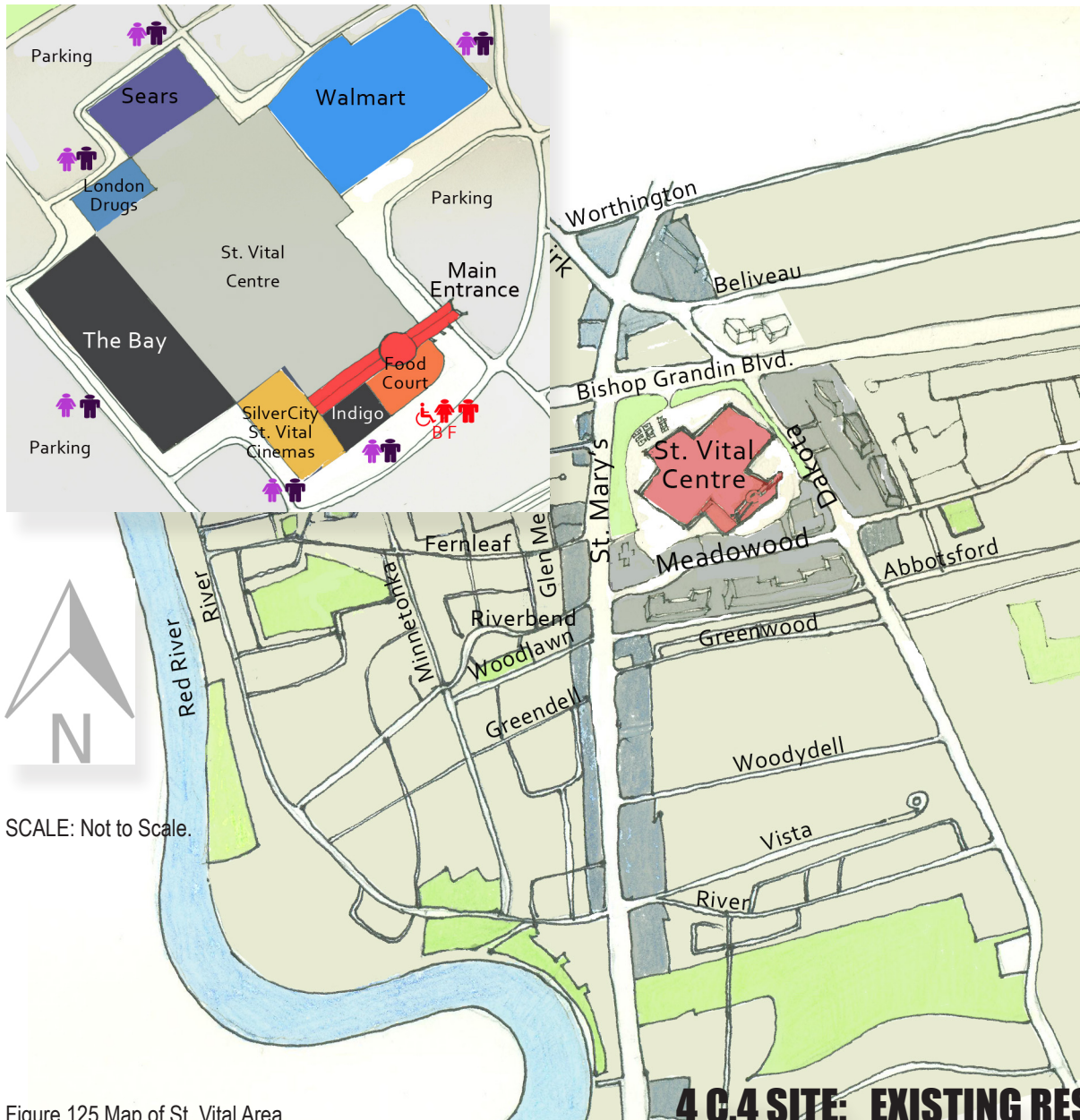


Figure 125 Map of St. Vital Area.

LEGEND

- FAMILY, MEN & WOMEN PUBLIC TOILETS
- BIKE RACK
- MEN & WOMEN EXISTING RESTROOMS FOR PATRONS
- RESIDENTIAL
- GREENSPACE OR PARKS
- COMMERCIAL
- SITE - ST. VITAL CENTRE
- PARKING

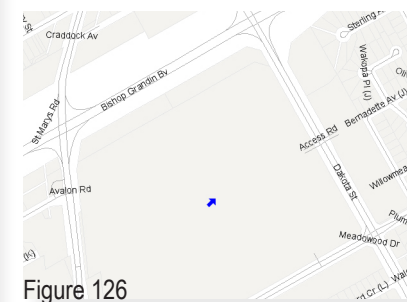


Figure 126

**4 C.4 SITE: EXISTING RESTROOMS FOR PATRONS**



Figure 127- Existing Family Zone.

## 4 C.5 SITE: INTERIOR PHOTOS



Figure 128- Existing Men's Washroom.



Figure 129 - Existing Women's Barrier-Free Cubicle.



Figure 130- Existing Women's Washroom.



Figure 131 - Food Court,



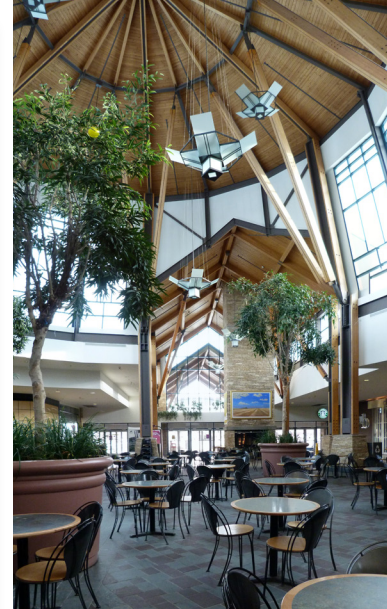


Figure 132 - Food Court,



Figure 133 - St. Vital Main Entrance.

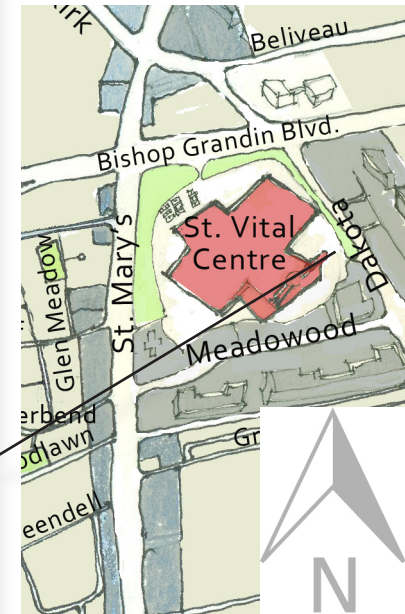


Figure 134 - Map St. Vital Site.

## 4 C.6 SITE: EXTERIOR PHOTOS



Figure 135- St. Vital Centre Site.

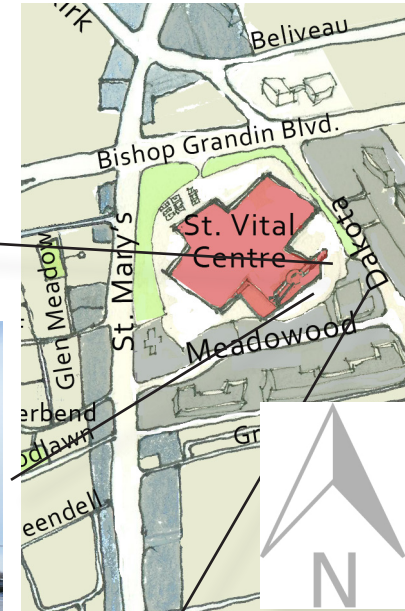


Figure 136





Figure 137 - Signage.



Figure 138- Bike Rack.



Figure 139 - Street Signage.



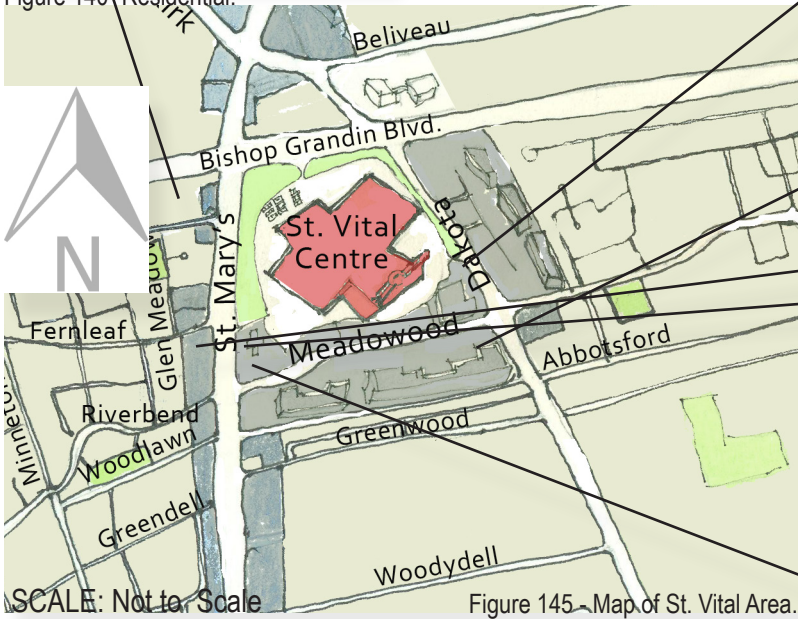
Figure 140 Residential.



Figure 141 - Gas Station on Site.



Figure 142- Mall on Meadowood.



SCALE: Not to Scale

Figure 145 - Map of St. Vital Area..



Figure 143- St. Mary's Road.  
Figure 146 - CIBC.



Figure 144- Church on St. Mary's Rd..



## 4 C.7 SITE: LANDMARKS

## SITE: ST. VITAL CENTRE

LOCATION	CONSTRUCTED	TOTAL SQUARE FOOTAGE	EXISTING PUBLIC TOILET SQUARE FOOTAGE				REQUIRED SQUARE FOOTAGE (includes Unisex, Accessible, family spaces)	
			WOMEN	MEN	Family	Staff	WOMEN	MEN
St. Vital Centre	1979 Renovated & Developed 1998	Gross Leasable Area 926, 310 (includes Sears, The Bay, Wal-Mart, London Drugs, SilverCity, Chapters & SportChek, CIBC, Safeway, Montana's, McDonald's, Old Navy and Earls. <sup>27</sup> )	1228	557	428	386	3241.2	2138.1

### 4 C.8-1 EXISTING ST. VITAL MALL PUBLIC TOILETS

MAJOR OCCUPANCY CLASSIFICATION	PEDESTRIAN TRAFFIC COUNT PER DAY	WOMEN COUNT PER DAY	MEN COUNT PER DAY	EXISTING WOMEN STANDARD CUBICAL	EXISTING WOMEN BARRIER-FREE CUBICLE	EXISTING MEN STANDARD CUBICLES & URINALS	EXISTING MEN BARRIER-FREE CUBICLES	EXISTING FAMILY	EXISTING FAMILY / UNISEX BARRIER-FREE
Group E Mercantile occupancies	25, 430	65% - 16 529.5	35% - 8 900.5	26	1	8 cubicles & 9 Urinals	1	1	1

### 4 C.8-2. REQUIRED – WOMEN

SQUARE FOOTAGE (excluded stores with existing washrooms)	TOTAL OCCUPANT LOAD	WOMEN OCCUPANT LOAD	REQUIRED WOMEN STANDARD CUBICLE	TOILET PRIVILEGING	REQUIRED WOMEN STANDARD CUBICLE + 50%	REQUIRED WOMEN ACCESSIBLE CUBICLES	TOILET PRIVILEGING
320,868	8,026 (39.8264 ft <sup>2</sup> , 3.7 m <sup>2</sup> )	4,013	26	52	39	2	4

If we were to calculate the average 65% of the daily pedestrian traffic count by 150, the number of toilets required for women would be 110. And men at 35% of the average daily pedestrian traffic divided by 300, would be 29 toilets (2/3 urinals).

### 4 C. 8-2 REQUIRED – MEN

SQUARE FOOTAGE (excluded stores with existing w/c)	TOTAL OCCUPANT LOAD	MEN OCCUPANT LOAD	REQUIRED MEN STANDARD CUBICLES & URINALS	REQUIRED MEN STANDARD CUBICLES & URINALS + 50%	REQUIRED MEN ACCESSIBLE CUBICLES
320,868	8,026 people (39.8264 ft <sup>2</sup> / 3.7 m <sup>2</sup> )	4,013	5 cubicles + 8 urinals (2/3 urinals)	20 (10 cubicles & 12 urinals)	2

## 4 C.8-3 OCCUPANT LOAD FOR PUBLIC TOILETS

GROUP E - FOR WOMEN, MEN, FAMILY & UNISEX PUBLIC TOILETS

USE	LOAD FACTOR	FLOOR AREA	NOT OCCUPIABLE	NET OCCUPANCY LOAD
<b>PUBLIC TOILETS (first storey)</b>	3.70 m <sup>2</sup> / 39.8 ft <sup>2</sup>	10, 394 ft <sup>2</sup>	504 ft <sup>2</sup>	248

## 4 C.8-3 OCCUPANT LOAD - GROUP E

USE	LOAD FACTOR	FLOOR AREA	APPROX. NOT OCCUPIABLE	NET OCCUPANCY LOAD
<b>MERCHANTILE</b>	3.70 m <sup>2</sup> / 39.8 ft <sup>2</sup>	320 868 ft <sup>2</sup> (excluded floor area, retail stores with washrooms)	1404 ft <sup>2</sup>	8,026

## 4 C.8-4 SPATIAL REQUIREMENTS

SQUARE FOOTAGE	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE/ UNISEX / FAMILY	SUB-TOTAL SQUARE FOOTAGE	+20% TRAFFIC PATHS (square footage)	TOTAL SQUARE FOOTAGE
MODEL CUBICAL (Water Closet) (Clara Greed) 81" x 44" = 25 ft <sup>2</sup> approx. (with small sink or luggage/bags, touch less) <sup>28</sup>	39 cubicles 975 ft <sup>2</sup>	8 cubicles (2/3 - 12 Urinals) 200 ft <sup>2</sup>		1175	235	1,410
STANDARD CUBICAL, 5'x3' min. = 15 Ft <sup>2</sup> <sup>29</sup>	39 cubicles 585 ft <sup>2</sup>	20 cubicles 300 ft <sup>2</sup>		885	177	1062
ACCESSIBLE CUBICLES, 6'-1 1/2" x 8' min.= 49 ft <sup>2</sup> , (City of Winnipeg, table 3.3.2.1.) <sup>30</sup>	2 cubicles 98 ft <sup>2</sup>	2 cubicles 98 ft <sup>2</sup>		196	39.2	235.2
LAVATORIES (SINKS), 36.25" (30" min. clearance) x 54" (min. clearance) (City of Winnipeg, 3.3.4)	20 sinks x 13.59 ft <sup>2</sup> = 272 ft <sup>2</sup>	10 sinks x 13.59 ft <sup>2</sup> = 136 ft <sup>2</sup>		408	81.6	489.6

SQUARE FOOTAGE	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE/ UNISEX / FAMILY	SUB-TOTAL SQUARE FOOTAGE	+20% TRAFFIC PATHS (square footage)	TOTAL SQUARE FOOTAGE
<sup>31</sup> , (3.7.2.3. Lavatories 1)						
UNISEX PRIVATE/INDIVIDUAL ACCESSIBLE CUBICLES (WATER CLOSETS) 10'-6" x 12'-10" min. = 135 ft <sup>2</sup> (City of Winnipeg 3.3.7.1 ) <sup>32</sup>			4 Private Units  540 ft <sup>2</sup>	540	108	648
INFANT CHANGING STATION (includes sink) 7'-6" x 5' min = 37.5 ft <sup>2</sup> +- <sup>33</sup>			4 Areas  150 ft <sup>2</sup>	150	30	180
URINALS (Adult) 36" x 54" = 13.5 ft <sup>2</sup> +-(Grab bars 30" either side of urinal) <sup>34</sup>		12 urinals  162 ft <sup>2</sup>		162	32.4	194.4
URINALS (Child) 13.5 ft <sup>2</sup> ,(2/3 of adult urinals)		7 child urinals  94.5 ft <sup>2</sup>		94.5	18.9	113.4

SQUARE FOOTAGE	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE/ UNISEX / FAMILY	SUB-TOTAL SQUARE FOOTAGE	+20% TRAFFIC PATHS (square footage)	TOTAL SQUARE FOOTAGE
FAMILY (child & adult toilets & urinal with child toilet & child urinal) Private Individual 10'-6" x 12'-10" min. = 135 ft <sup>2</sup> (Winnipeg 3.3.7.1) <sup>35</sup>	2 270	2 270		540	108	648
<b>WATER CLOSETS (cubicles) for children aged 9-12: 18 ft<sup>2</sup><sup>36</sup> (2/3 -3 age group of required total toilets)</b>	8 144	4 72		216	43.2	<b>259.2</b>
<b>Squat Toilet (Alaturka or Kakkoos) 20.67" x 16.54" x 7.48"D into flr. (525 mm x 420 mm x 190 mm)</b>	1 15 ft <sup>2</sup>	1 15 ft <sup>2</sup>		30	6.	<b>36</b>
<b>BREASTFEEDING AREA - 100 ft<sup>2</sup></b>	1 100			100	20	<b>120</b>
<b>LOUNGE AREA - 100 ft<sup>2</sup></b>	1			100	20	<b>120</b>

SQUARE FOOTAGE	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE/ UNISEX / FAMILY	SUB-TOTAL SQUARE FOOTAGE	+20% TRAFFIC PATHS (square footage)	TOTAL SQUARE FOOTAGE
	100					
PLAY AREA – 100 ft <sup>2</sup>	1 100			100	20	<b>120</b>
STAFF WASHROOMS	1					
STAFF UNISEX PRIVATE/INDIVIDUAL ACCESSIBLE CUBICLES 10'-6" x 12'-10" min. = 135 ft <sup>2</sup> (Winnipeg 3.3.7.1 ) <sup>37</sup>			Existing 3	284		
STAFF EXISTING LOCKERS 6.75 ft <sup>2</sup>						
STAFF - ACCESSIBLE LOCKERS ----- <sup>38</sup>						

SQUARE FOOTAGE	WOMEN (quantity & ft <sup>2</sup> )	MEN (quantity & ft <sup>2</sup> )	ACCESSIBLE/ UNISEX / FAMILY	SUB-TOTAL SQUARE FOOTAGE	+20% TRAFFIC PATHS (square footage)	TOTAL SQUARE FOOTAGE
3'x4'6" Depth – 13.5 ft <sup>2</sup> <sup>39</sup>						

Note: Touchless – calf does not touch edge of cubical door and edge of toilet front.

ST. VITAL CENTRE	Entrance	Lavatory (Sink) Zone	Women Zone	Men Zone	Family/Unisex Gender Neutral	Breastfeeding Zone	Infant (Baby) Change Area	Child Cubical Zone (9-12 years)	Child Urinal Zone (9-12 years)	Staff Washrooms	Administration Office	Maintenance Room	Lounge (Waiting) Area	Exit
Entrance		●	○		○					●	●			
Lavatory (Sink) Zone	●										○	○		
Women Zone	○	○		○	●	●	●	●	●			○		
Men Zone		○	○		○		○	●	●			○		
Family/Unisex Gender Neutral			●	●								○		
Breastfeeding Zone			●			●							○	○
Infant (Baby) Change Area			●			●		○	○					
Child Cubical Zone (9-12 years)			●	●		○	○		●					
Child Urinal Zone (9-12 years)			●	●		○	○	●						
Staff Washrooms											○			
Administration Office	●	●	○									●		
Maintenance Room			○	○	●									
Lounge (Waiting) Area						●								○
Exit													○	

LEGEND

- Mandatory Adjacency  ●
- Secondary Adjacency  ○
- No Adjacency Required

Figure 147.

**4 C. 9 ADJACENCY MATRIX**

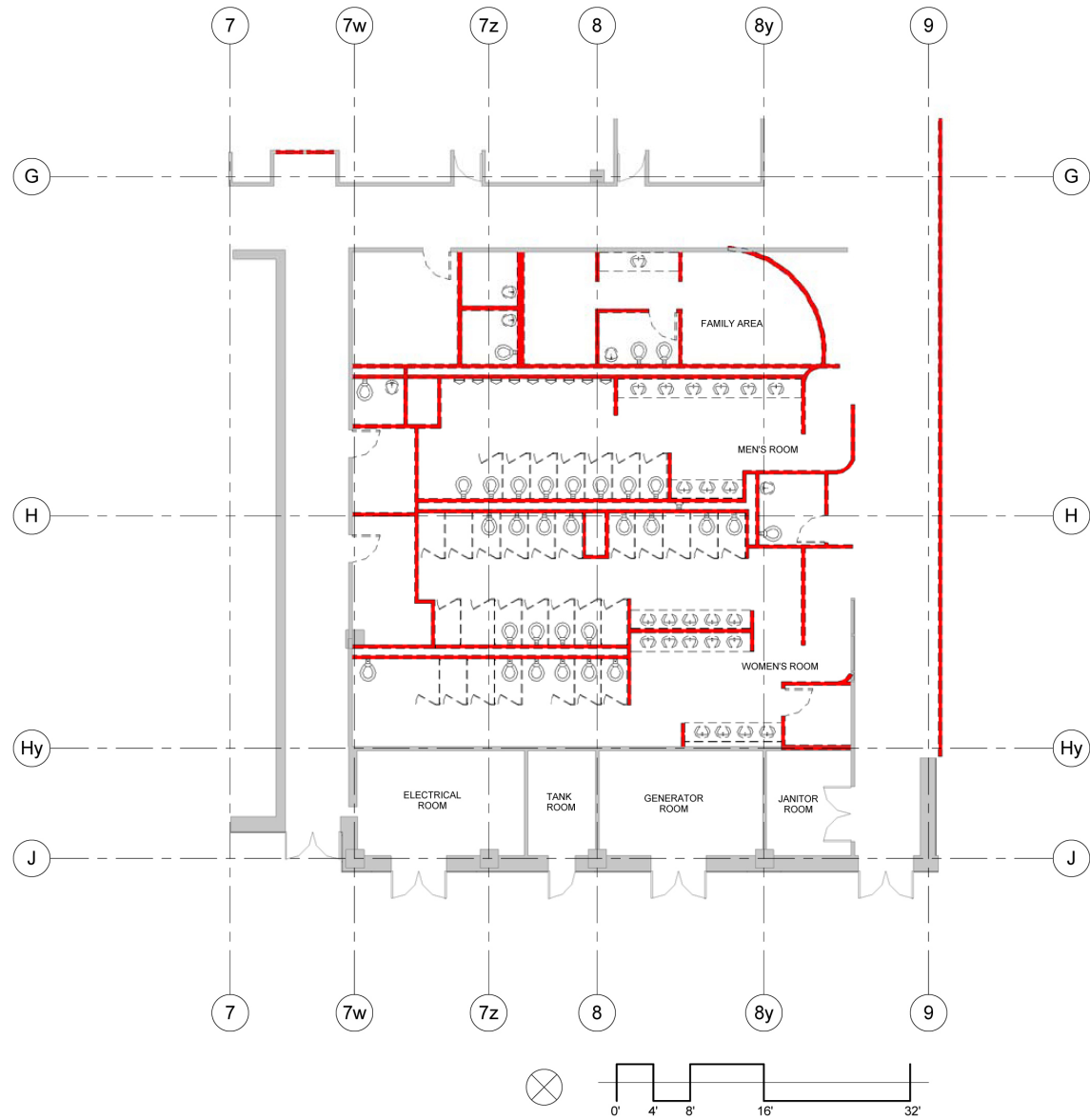


Figure 148

**4 C.10 -1 EXISTING FLOOR PLAN**

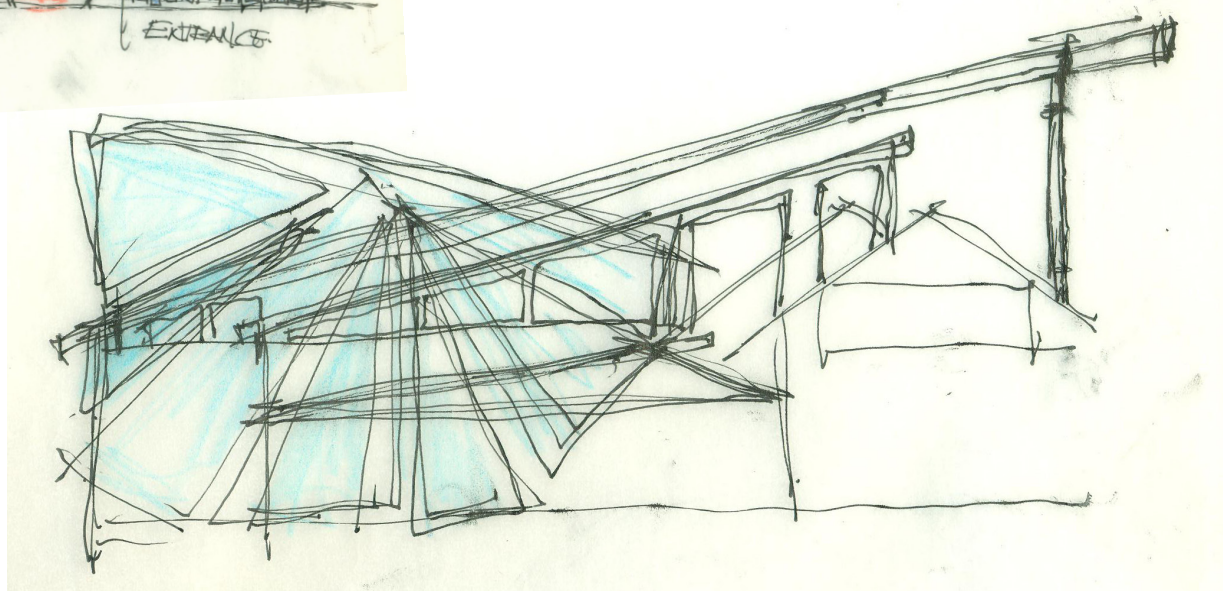
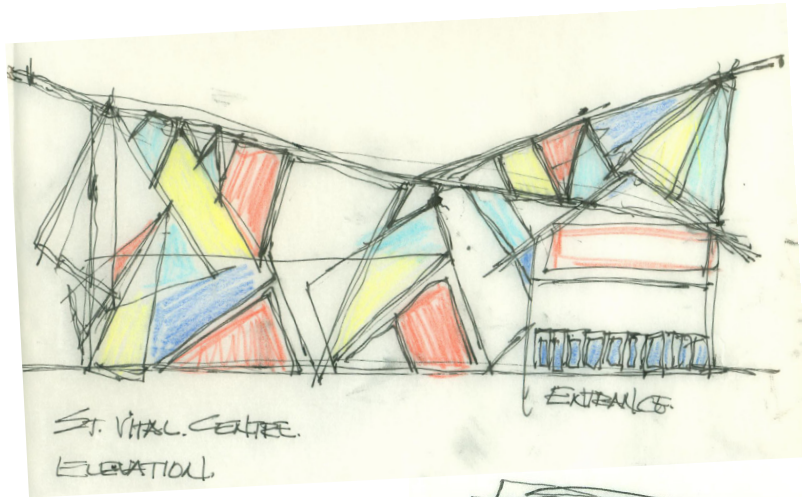


Figure 149

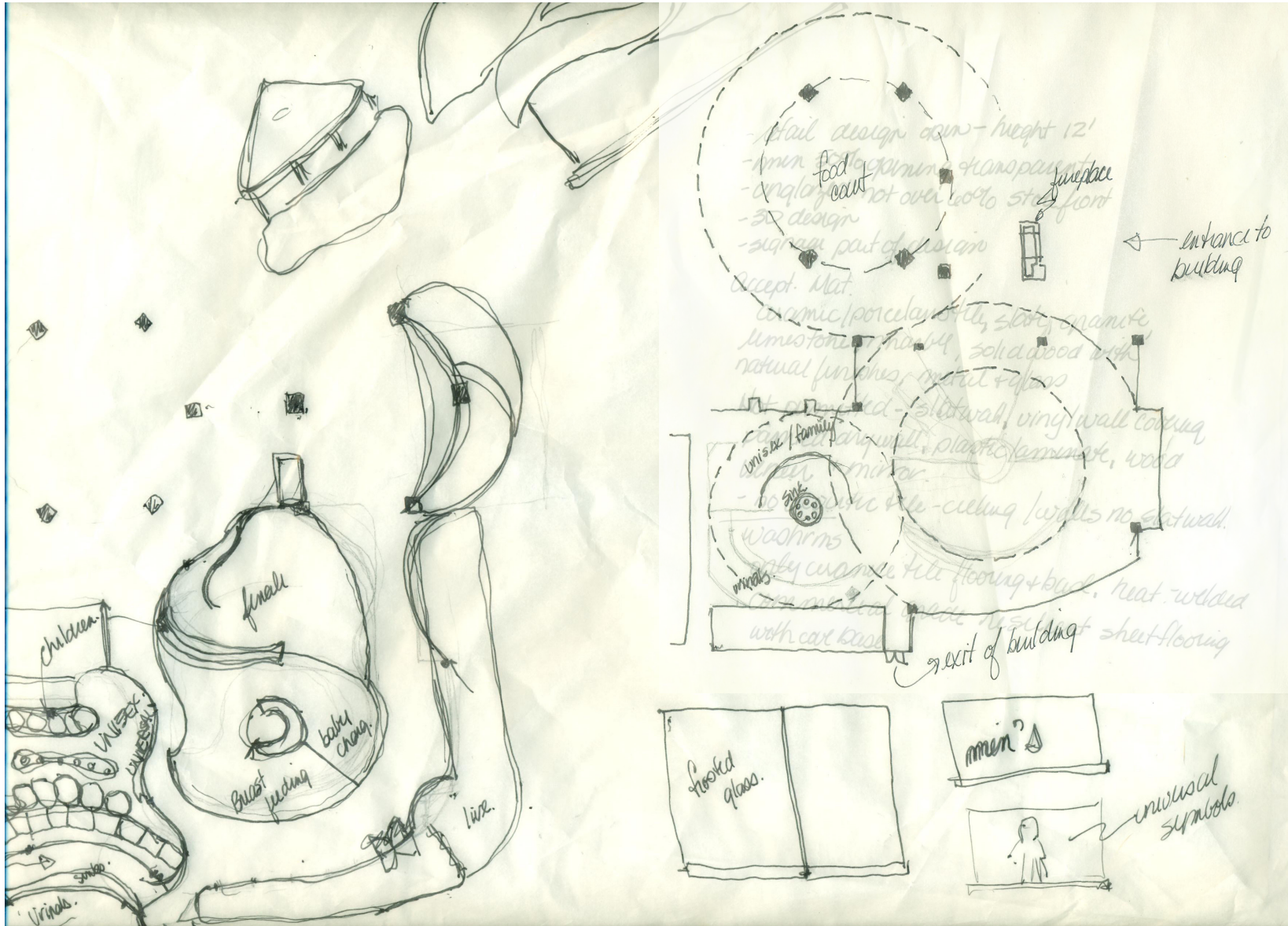


Figure 150  
255

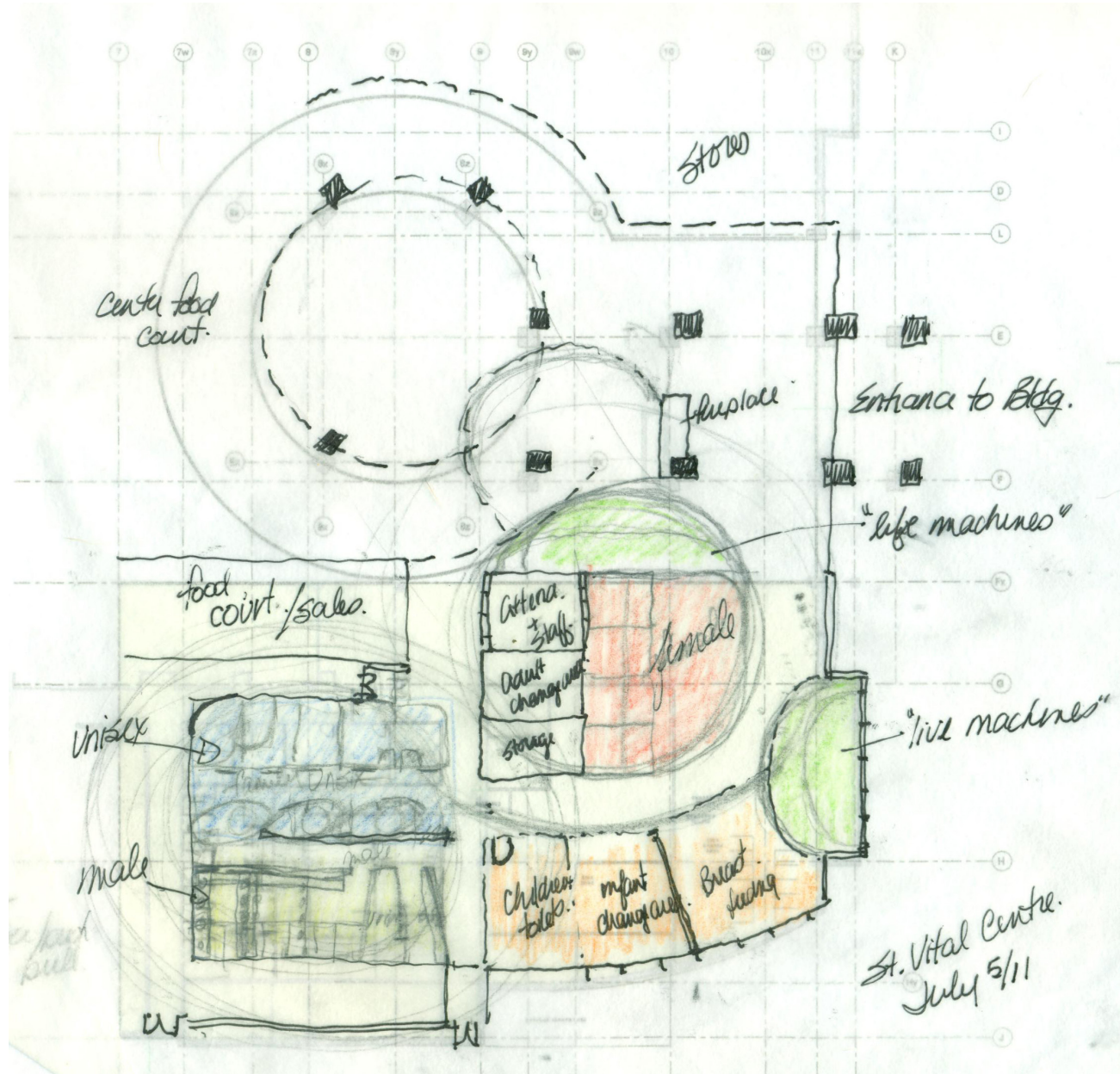


Figure 151  
256

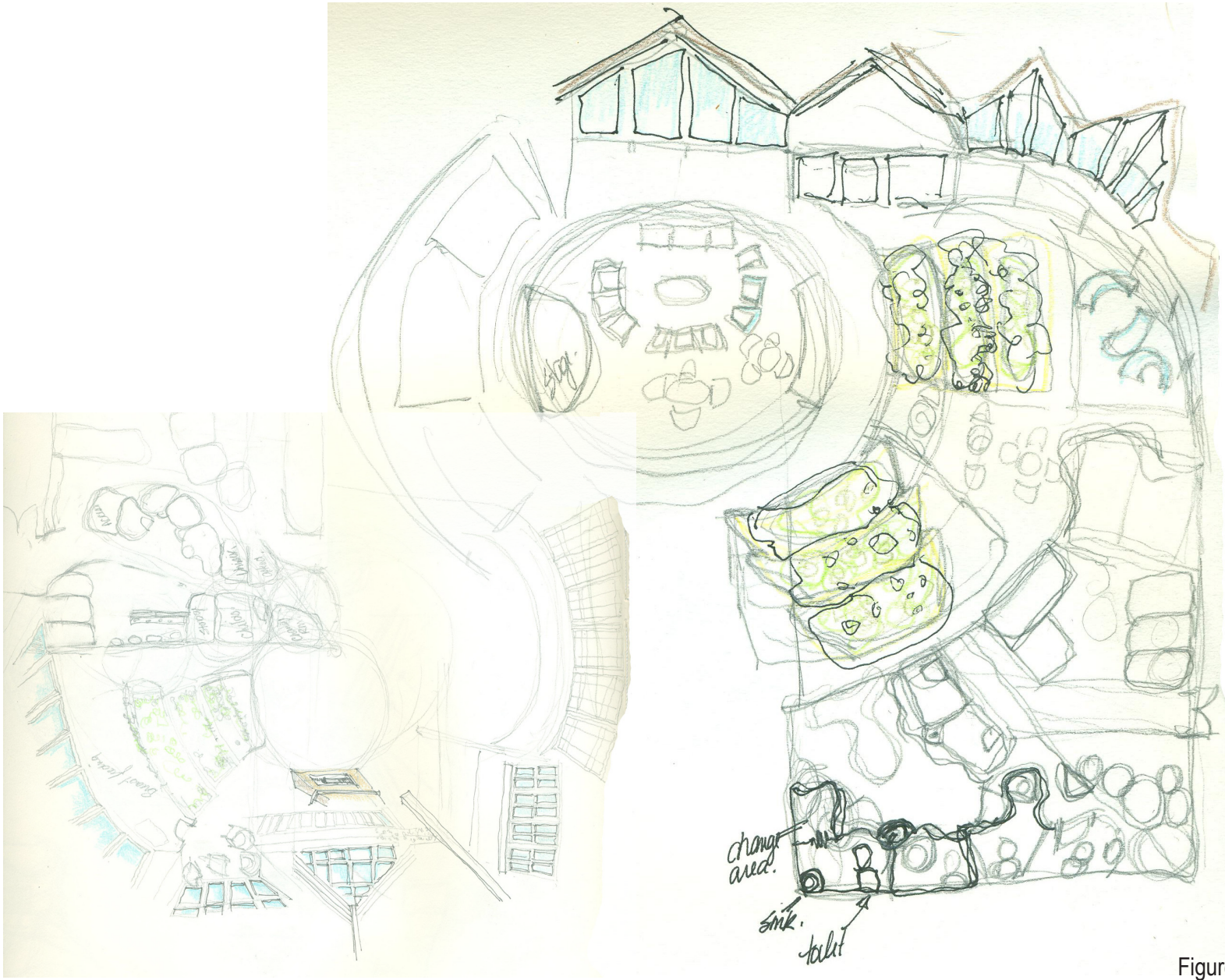


Figure 152  
257

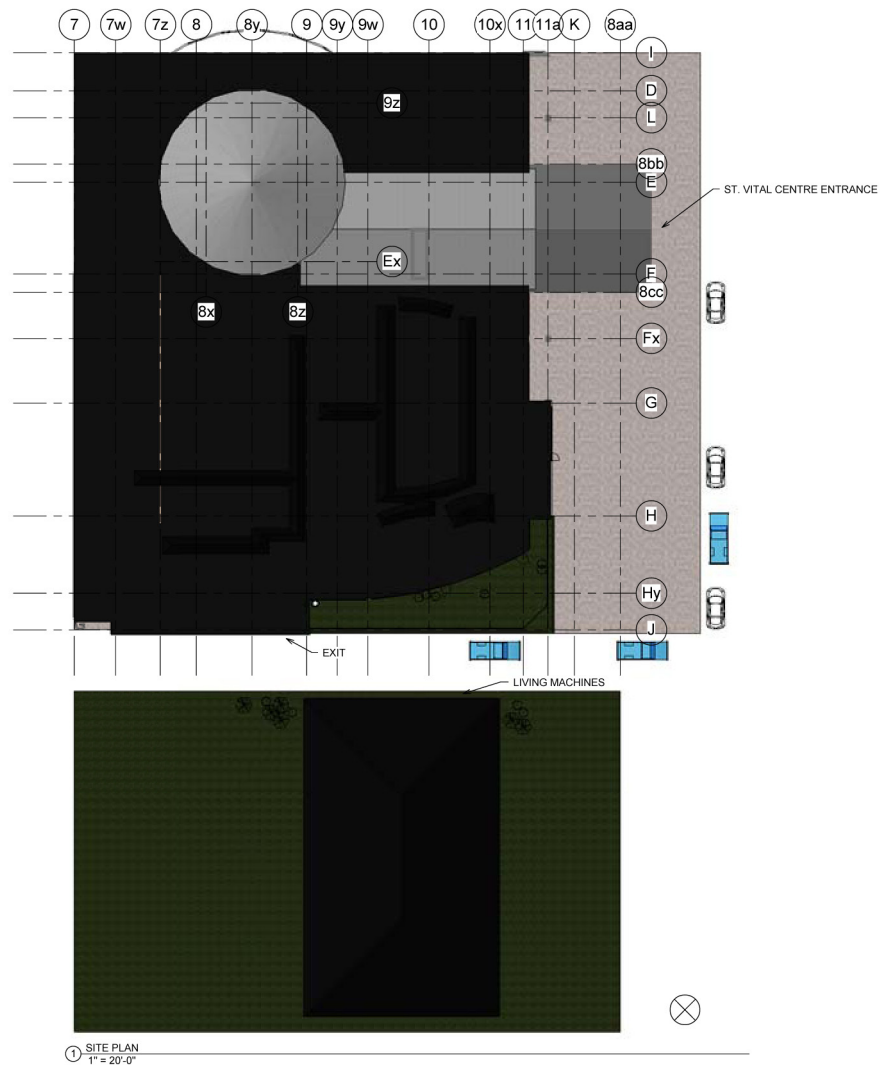


Figure 153

# 4 C.10-3 SITE PLAN

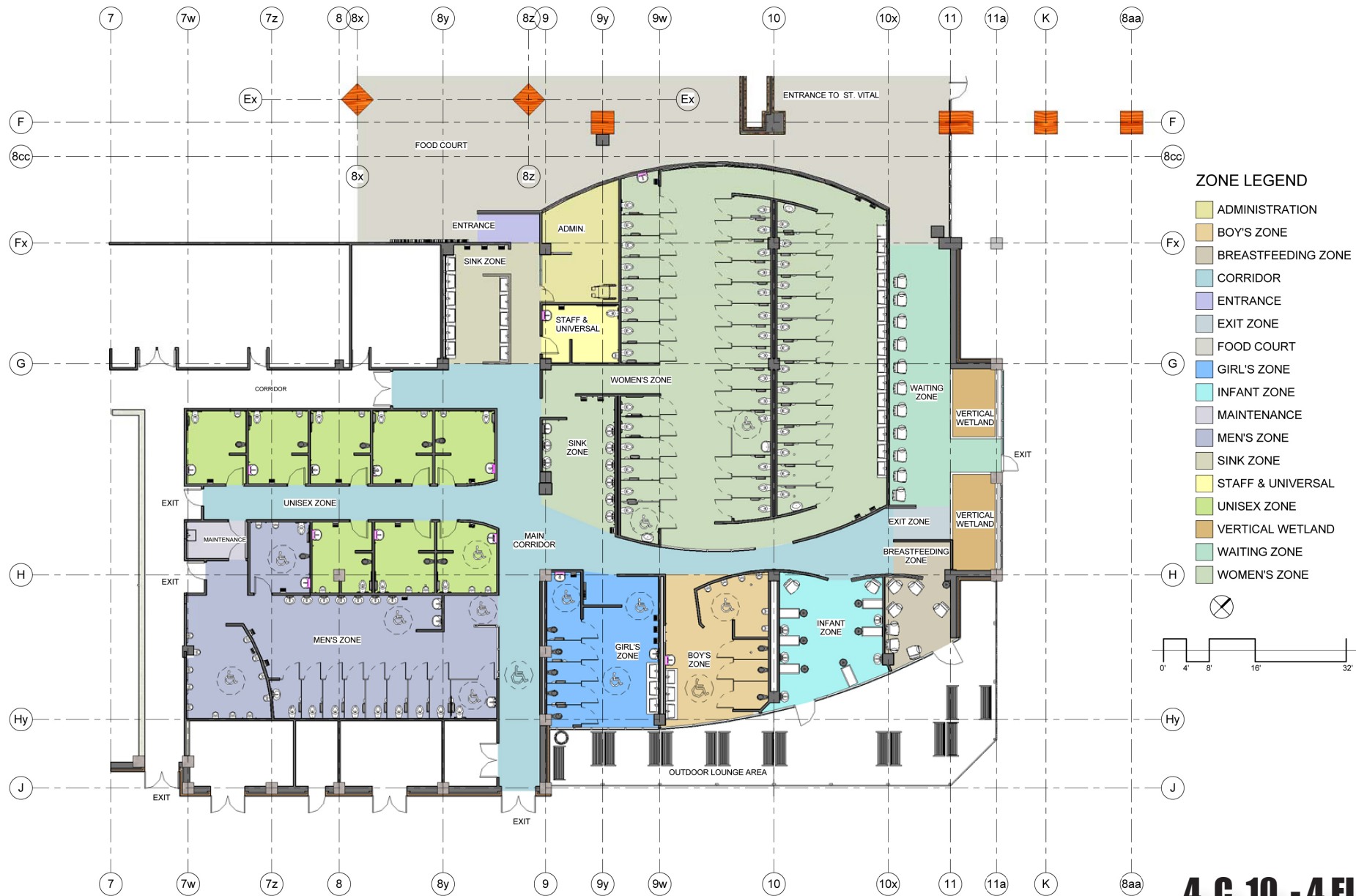


Figure 154.

**4 C.10 - 4 FLOOR PLAN**

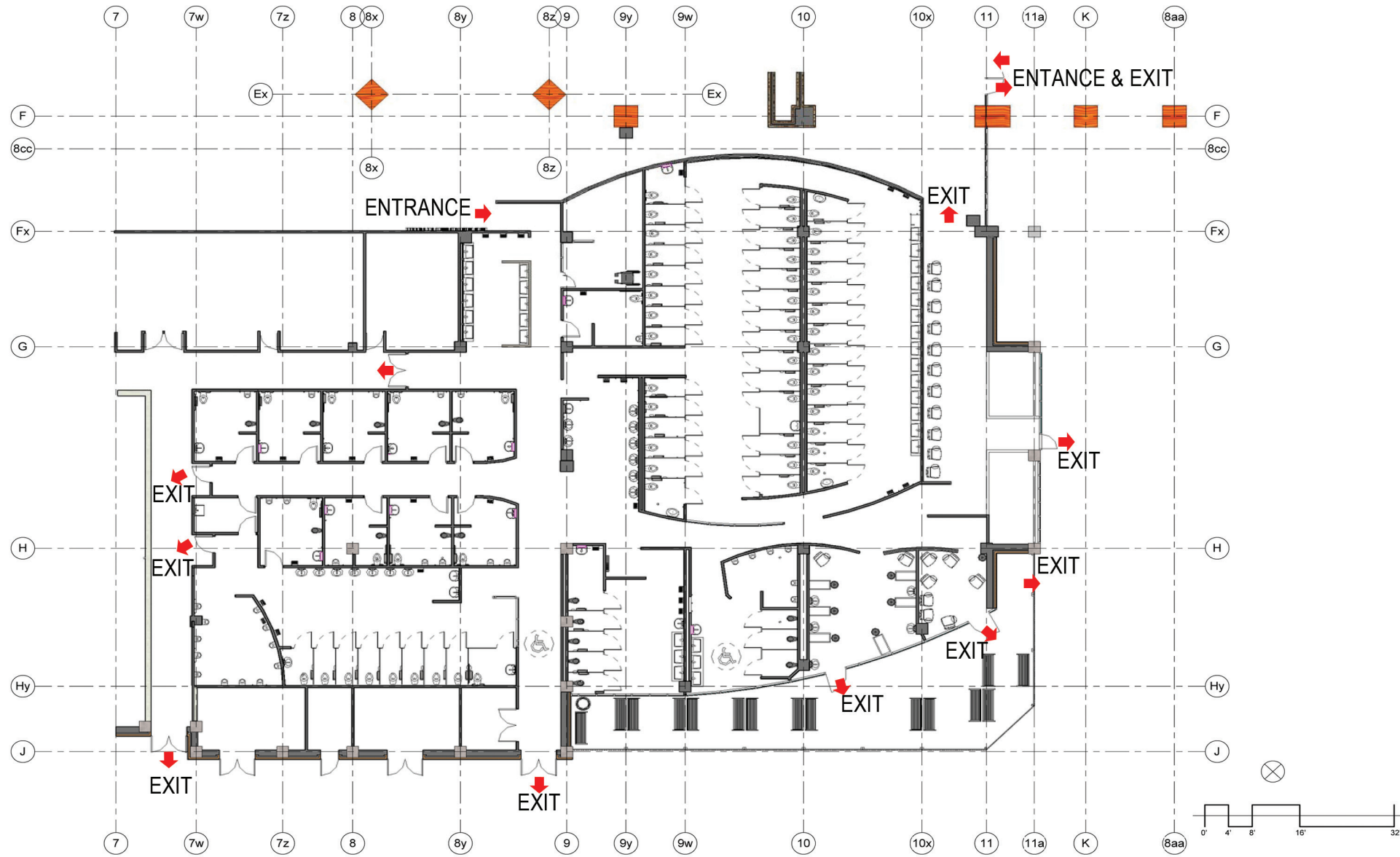


Figure 155.

**4 C.10-5 EGRESS PLAN**

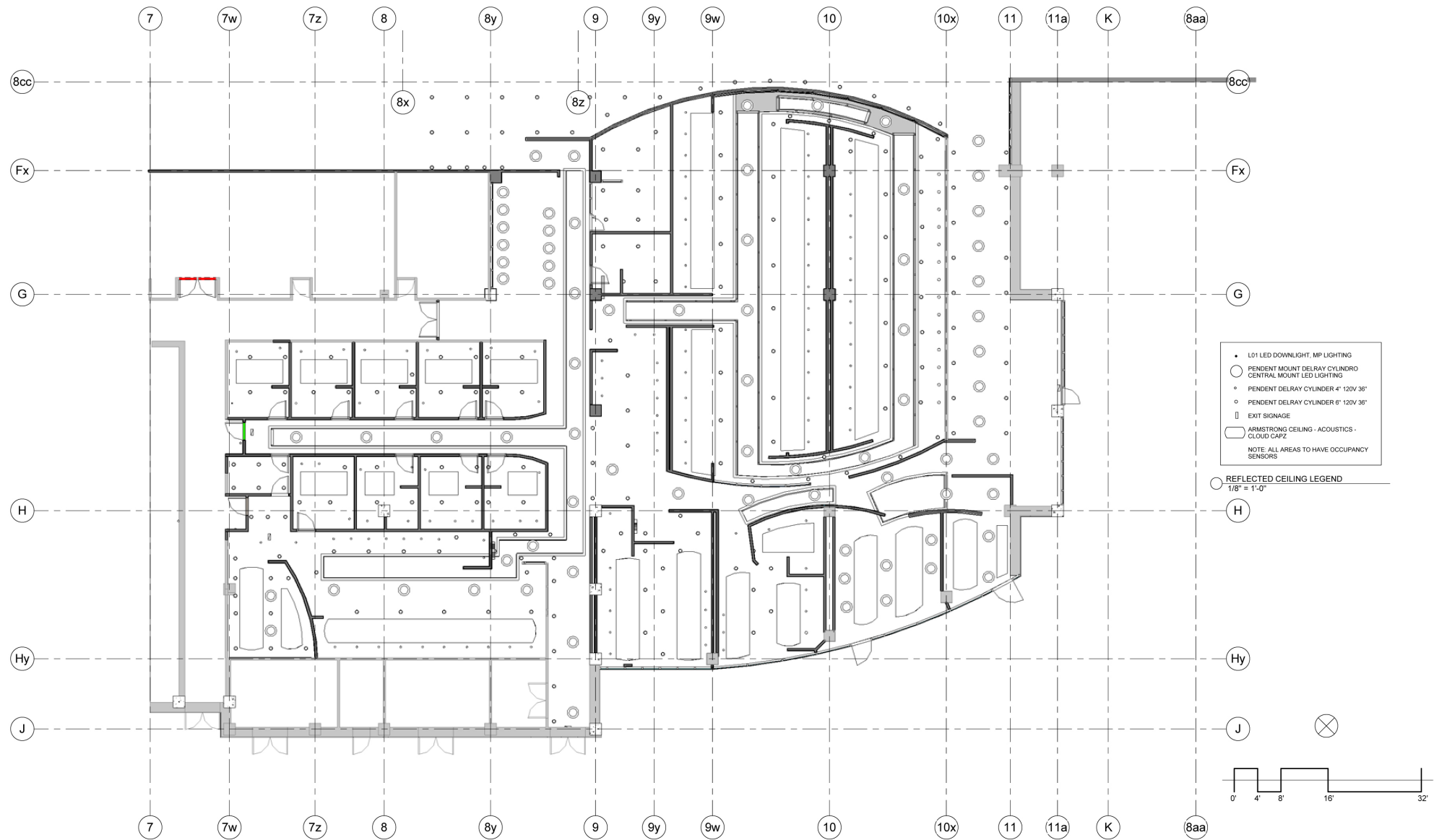


Figure 156.

**4 C.10 -6 REFLECTED CEILING PLAN**

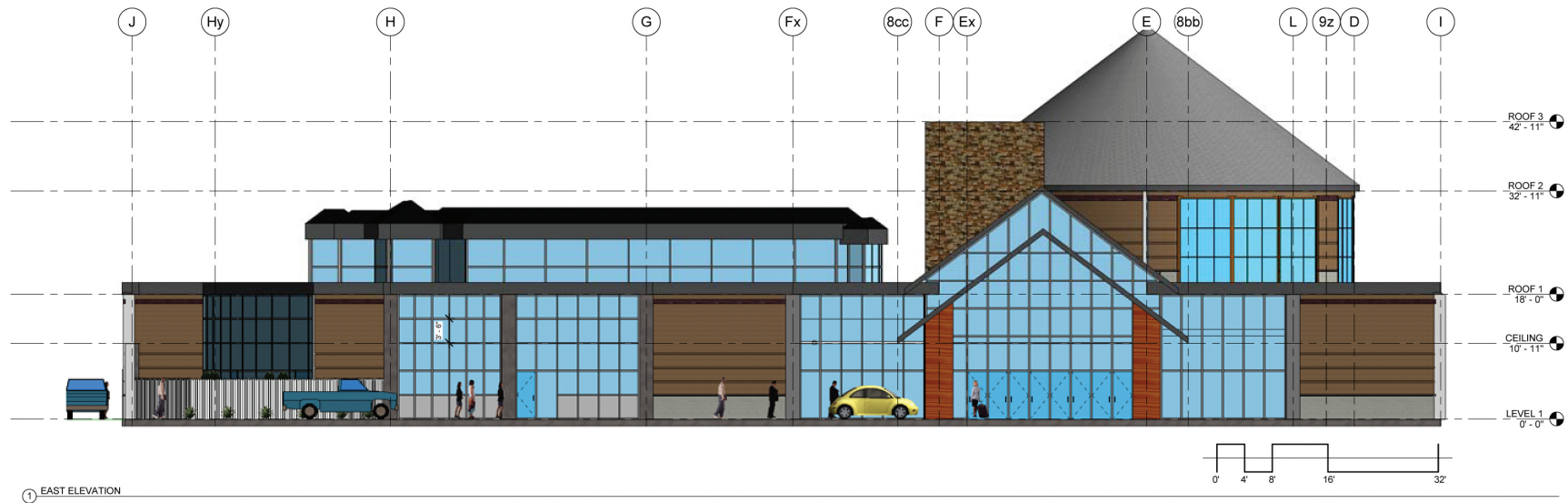


Figure 157.

## 4 C.10 -7 ELEVATIONS



Figure 158 - EAST TO WEST ELEVATION.

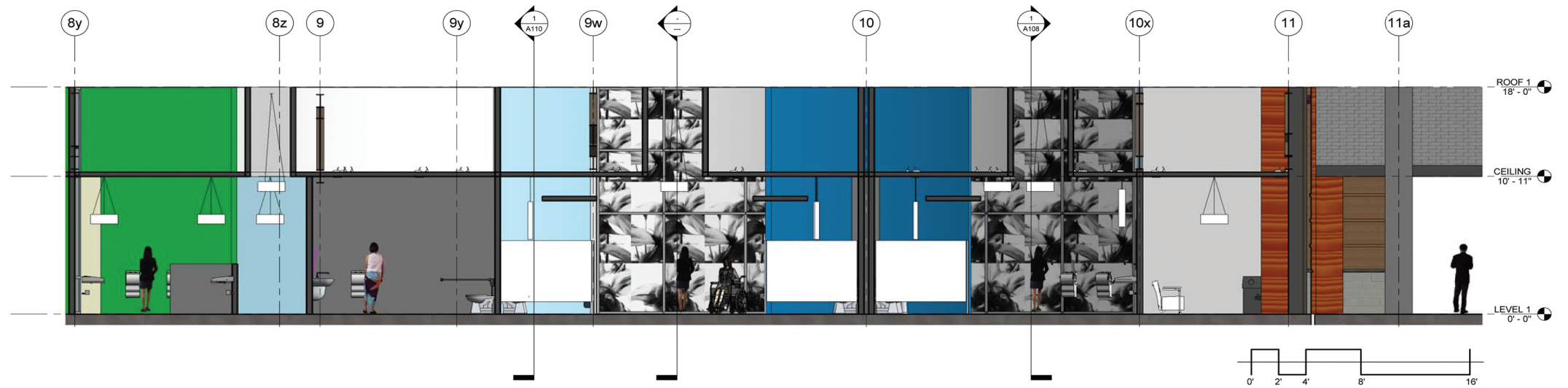


Figure 159- WEST TO EAST ELEVATION.



Figure 160 - SOUTH TO NORTH ELEVATION.



Figure 161 - NORTH TO SOUTH ELEVATION



Figure 162 - SOUTH TO NORTH ELEVATION



Figure 163

**4 C.10-8 RENDERINGS**



Figure 164

Figure 165- Entrance





Figure 166



Figure 167



Figure 168



Figure 169- Girls Zone Entrance.

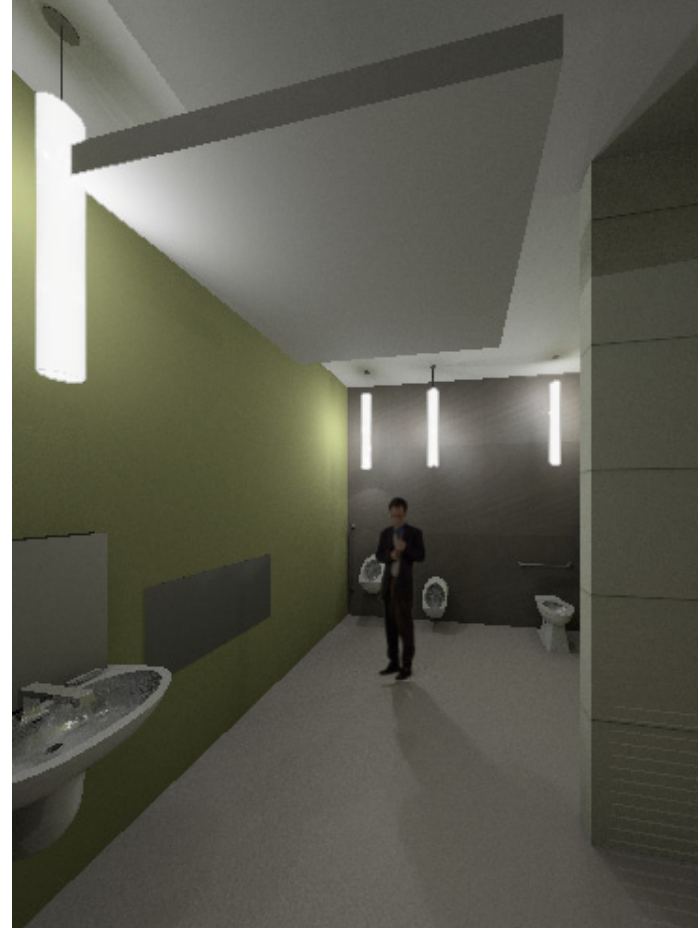


Figure 170 - Unisex Unit.



Figure 171

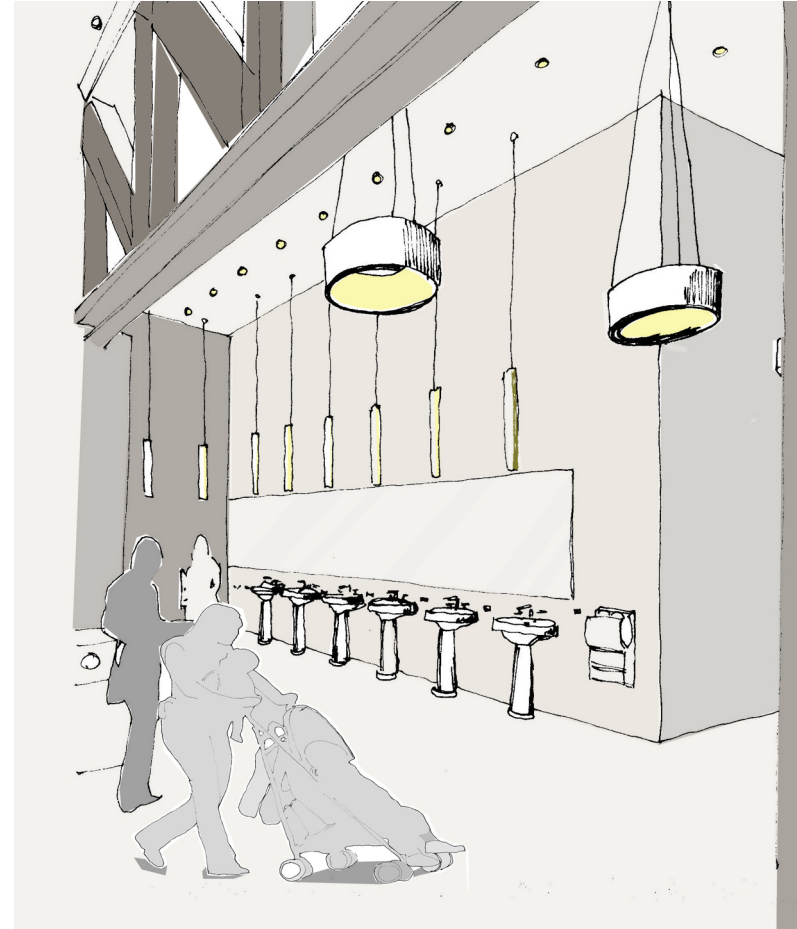


Figure 172 - Preliminary Sketch



Figure 173.



Figure 174



Figure 175



Figure 176



Figure 177

## INFANT CHANGE ZONE



Figure 178



Figure 179

## **BREASTFEEDING & WAITING ZONE**



Figure 180

## MEN'S ZONE



Figure 181

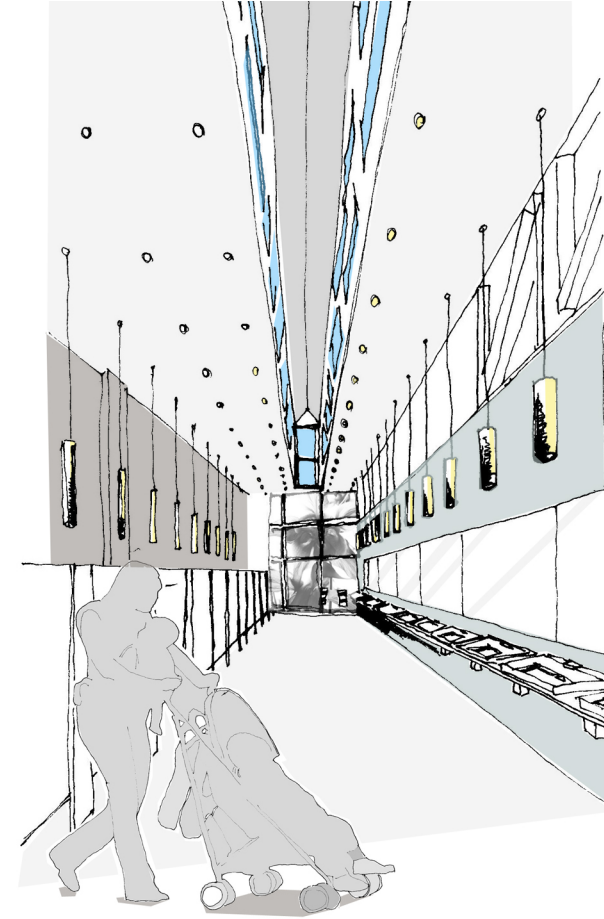


Figure 182

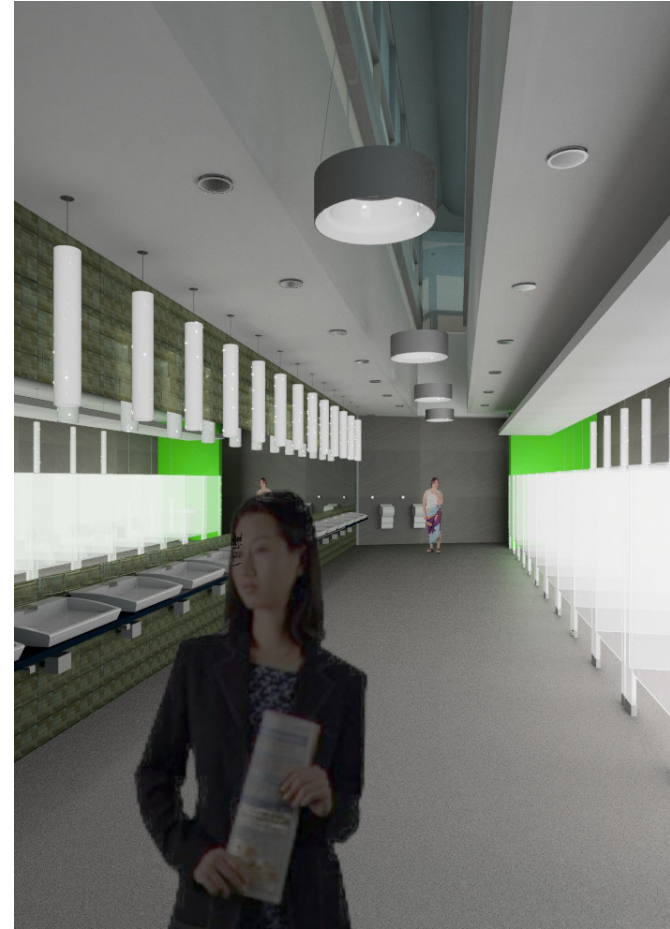


Figure 183



Figure 184

**4 C.10-9 PALETTE**

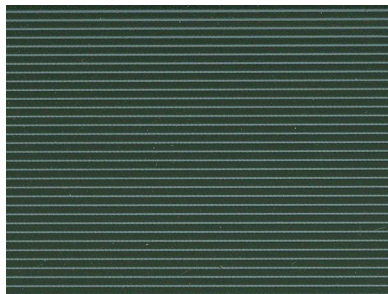
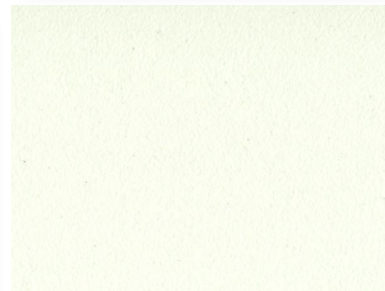
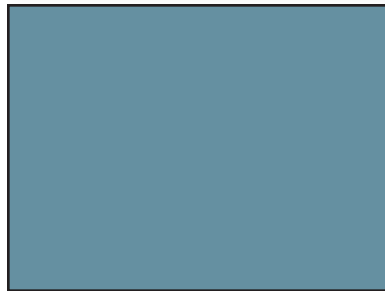
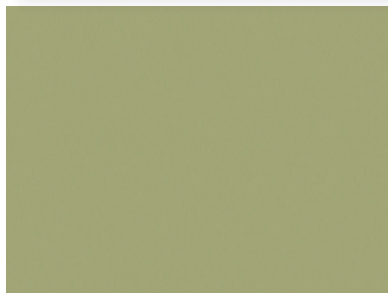


Figure 185.



## 4 C.10-10 FINISHES & MATERIALS



Figure 186..

## ENDNOTES

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<sup>1</sup>Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003), 198.

<sup>2</sup>Greed, *Inclusive Urban Design*, 58.

<sup>3</sup>Clara Greed, "The Role of the Public Toilet in Civic Life" in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 41(Philadelphia: Temple University Press, 2009).

<sup>4</sup>Clara Greed, "The Role of the Public Toilet in Civic Life" in *Ladies and Gents: Public Toilets and Gender*, ed. Olga Gershenson and Barbara Penner, 41(Philadelphia: Temple University Press, 2009).

<sup>5</sup>Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press, 2003), 89.

<sup>6</sup> City of Winnipeg, "Stations," City of Winnipeg, <http://winnipegtransit.com/en/southwest-transitway/stations> (accessed June 10, 2012).

<sup>7</sup> City of Winnipeg, "Property Information," City of Winnipeg, <http://cms00asa1.winnipeg.ca/PropertyInfo.jsp?rsn=246558&js=y> (accessed June 10, 2012).

<sup>8</sup> City of Winnipeg, "Stations," City of Winnipeg, <http://www.winnipegtransit.com/en/rapid-transit/stations/> (accessed June 7, 2012).

<sup>9</sup> Design Environments Inc., 2010 City of Winnipeg: Accessibility Design Standards (Winnipeg: City of Winnipeg), 160.

<sup>10</sup> Greed, *Inclusive Urban Design*, 205.

<sup>11</sup> City of Winnipeg, "Pan Am Pool," City of Winnipeg, [http://winnipeg.ca/cms/recreation/facilities/pools/indoor\\_pools/pan\\_am.stm](http://winnipeg.ca/cms/recreation/facilities/pools/indoor_pools/pan_am.stm) (accessed June 10, 2012).

<sup>12</sup> City of Winnipeg, "Address Information," City of Winnipeg, <http://cms00asa1.winnipeg.ca/AddressInfo.jsp?rsn=141829&js=y> (accessed June 07, 2012).

<sup>13</sup> City of Winnipeg, "2012 Assessment Roll (Market value as at Thursday, April 01, 2010)," City of Winnipeg, <http://cms00asa1.winnipeg.ca/AddressInfo.jsp?rsn=141829&js=y> (City of Winnipeg 2012) accessed June 07, 2012).

<sup>14</sup> Clara Greed, *Inclusive Urban Design: Public Toilets* (Oxford: Architectural Press), 210.

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- <sup>15</sup> Design Environments Inc., *2010 City of Winnipeg*, 146.
- <sup>16</sup> Design Environments Inc., *2010 City of Winnipeg*, 147; Greed, *Inclusive Urban Design*, 205.
- <sup>17</sup> Design Environments Inc., *2010 City of Winnipeg*, 155.
- <sup>18</sup> Greed, *Inclusive Urban Design*, 205.
- <sup>19</sup> Design Environments Inc., *2010 City of Winnipeg*, 145.
- <sup>20</sup> Design Environments Inc., *2010 City of Winnipeg*, 145.
- <sup>21</sup> Design Environments Inc., *2010 City of Winnipeg*, 162.
- <sup>22</sup> Design Environments Inc., *2010 City of Winnipeg*, 143.
- <sup>23</sup> 20 Vic Retail, "St. Vital Centre," 20 Vic Retail, <http://www.20vic.com/propertyPDFs/1112/st-vital-centre.pdf> (accessed June 10, 2012).
- <sup>24</sup> 20 Vic Retail, "St. Vital Centre," 20 Vic Retail, <http://www.20vic.com/propertyPDFs/1112/st-vital-centre.pdf> (accessed June 10, 2012).
- <sup>25</sup> City of Winnipeg, "Assessment & Taxation Department," City of Winnipeg, <http://www.winnipegassessment.com/asmtpub/english/propertydetails/CommercialDetails.aspx?RollNumber=8020955700&pgLang=EN&isRealtySearch=true> (accessed June 9, 2012).
- <sup>26</sup> St. Vital Centre, "Green with Love," St. Vital Centre, [http://www.stvitalcentre.com/about\\_us/green/](http://www.stvitalcentre.com/about_us/green/) (accessed June 9, 2012).
- <sup>27</sup> St. Vital Centre, "Tenant Info," St. Vital Centre, [http://www.stvitalcentre.com/tenant\\_info/](http://www.stvitalcentre.com/tenant_info/).
- <sup>28</sup> Greed, *Inclusive Urban Design*, 210.
- <sup>29</sup> Design Environments Inc., *2010 City of Winnipeg*, 146.
- <sup>30</sup> Design Environments Inc., *2010 City of Winnipeg*, 148.
- <sup>31</sup> Design Environments Inc., *2010 City of Winnipeg*, 152.

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<sup>32</sup> Design Environments Inc., 2010 City of Winnipeg: Accessibility Design Standards (Winnipeg: City of Winnipeg), 160.

<sup>33</sup> Greed, *Inclusive Urban Design*, 205.

<sup>34</sup> Design Environments Inc., 2010 City of Winnipeg, 155.

<sup>35</sup> Design Environments Inc., 2010 City of Winnipeg, 160.

<sup>36</sup> Greed, *Inclusive Urban Design*, 205.

<sup>37</sup> Design Environments Inc., 2010 City of Winnipeg, 160.

<sup>38</sup> Design Environments Inc., 2010 City of Winnipeg, 145.

<sup>39</sup> Design Environments Inc., 2010 City of Winnipeg, 145.

## **CHAPTER 5 . CONCLUSION**

The design process for this practicum project is an integration of the theory, research, programming, and an analysis of precedents to create a new vision for the potential of multi-setting public toilet sites. The design concepts consider the needs of the users, ideas, mapping, or charting of sites leading to environments that have been designed to engage people and provide for their well-being. The sites are located in Winnipeg's Osborne Station, Pan Am Pool, and St. Vital Shopping Centre. The goals of the public toilet design proposal are to reduce the problem of toilet privileging, to create hygienic spaces, to blur invisible and physical boundaries, and to design comfortable areas that everyone can use. This requires a shift in thinking about designing public toilets in Western culture.

The next steps to further the design development of the proposed sites include examining methods of better controlling and limiting water consumption and finding additional ways to improve my approaches to acoustics and signage. For instance, because the Osborne Station site requires a large amount of clean water for the sinks and the flushing toilets rely on greywater from the sinks and rainwater, more provision for the collection and storage of these non-fresh water sources needs to be provided. Further improvement to the design would include providing spaces for water tanks for the washrooms and the containers that collect rainwater. Additionally, to improve the designs in all sites, greater attention to the reflected ceiling plans need to be paid so that different lighting layers such as coves and other dropped planes can bring the lighting down closer to where it is needed and acoustical materials can be added to the spaces. The added advantage of lowering portions of the ceiling is that a more human-based scale is created for spaces that are sometimes quite long and narrow. Increasing the use of accent lights, daylight, and generally reducing the amount of general lighting would improve most of the spaces. To

improve the energy consumption of the spaces, sensors should be included that raise the lighting levels of the washrooms only when they are occupied and a switching plan should be provided to document how they are intended to work. Furthermore, all sites should undergo further review to ensure that egress requirements are being met, especially in consideration of the creation of dead-end corridors in the St. Vital mall project. All the proposed sites have hard surfaces that provide easy cleaning and durability and are waterproof to encourage cleanliness but sound would easily rebound off these materials. The St. Vital Centre project begins to propose how products such as Armstrong Cloud can provide acoustic control, but given the scale of those spaces, more needs to be done. Finally, the issue of using signage as a means of addressing problems related to the need for gender-neutral references and methods of addressing the sensory limitations experienced by some of the disabled population disabilities has not been fully satisfied in these proposed designs. Presently commercial signage = is gender specific, so some architects and designers are designing their own. For instance, the architect Amalgam and the designer Chapman Taylor have created more neutral and comprehensive signage for the retail store Marks & Spenser, which is located in Birmingham, UK, by using flat large visual colourful illustrations for family, infant, barrier-free, male and female designations at the entrance of the public washrooms. I question whether or not this signage can be read by the sensory disabled but otherwise support the direction these designers are going with the need for modify signage. There needs to be further study of creating gender symbols for public washrooms that support a variety of individuals' needs.

Issues of gender segregation, and toilet privileging are slow to change or adjust toilet designs in our shifting society. Family and non-gender-specific zones need to be integrated and blended into gender-segregated public toilets to increase the provision of health, safety and dignity. Women's public washrooms require more than double the number of toilets and amount of space than men's washrooms do. Toilet privileging requires better standards to be written into the building code and applied by designers and their clients. To improve hygiene and safety for children and infants in women's and men's lavatories, cubicles need to be a minimum of 3'-8" x 6'-9" so that there is no longer a need for them to come into contact with the surfaces of the cubicles, especially the floor. Our shifting society needs public toilets to acknowledge our growing diversity.

Although the designs proposed here are evidence-based, there is a limited amount of research on public washroom spaces in general. Future investigation is required to assess the actual patron usage in mercantile occupancy in order to determine the optimum number of toilets and other related spaces to accommodate public washroom needs in places like malls. Once this occurs, the findings should be factored into the building code. Presently, the 2010 National Building Code of Canada requires that washrooms in mercantile occupancies only be provided for the employees. Likewise, it is necessary to reconsider public toilet spaces in other types of facilities such as bus stops and other transportation-related spaces to ensure that the appropriate number and type of washrooms are always provided.

Future research is also necessary to determine the cost implications of making such improvements to public toilets because financing is still of great concern to potential clients. Creating convincing arguments that improvements are economically viable by conducting research on whether investing in washroom spaces is profitable needs to be done to enhance designers' ability to communicate with clients on this matter. Similarly, additional study is required to assess the actual needs and preferences of special needs' users of public toilet spaces such as transgendered individuals or breastfeeding mothers. There is inadequate information of what the transgender require in public washrooms. Sheila L. Cavanagh in her book *Queering Bathrooms* interviews the transgendered about their fears and the design of traditional public toilets, but she does not specifically address what is needed to make changes to restrooms. Similarly, as of today, there is limited data on women's preferences for the qualities of breastfeeding spaces they prefer, and whether or not they prefer to do this activity in the privacy of the washroom or in some other kind of alternative space. This needs to be determined for the benefit of interior designers who must develop such spaces. Further research on what spatial attributes breastfeeding women require for this zone such as whether or not a sink with clean water and soap and a play area for children would be desirable needs to be conducted. Also, optimum conditions for lighting, seating, and the accommodation of their bags and supplies need to be verified. Finally, research that verifies that an increased number of secure public toilets need to be built in busy urban centers to allow individuals to use public transportation and to bike and to walk without worrying about where to find a toilet needs to be conducted. The implementation of the findings of such studies could also have the advantage of decreasing public reliance on automobiles to navigate urban spaces quickly, and could also reduce instances of public urination that is a problem in cities that lack public toilets that are open to everyone and at all times of day.

Recently, the bill for The Human Rights Code Amendment Act was extended to protect individuals with social disadvantages or alternative gender identities from discrimination. The next step to stop discrimination in public toilets is to recommend that spaces in public toilets for families and the LGBT (lesbian, gay, bisexual and transgender) community be provided to the committee on the National Building Code of Canada. That also need to acknowledge that women's zone in our public toilets need to have a minimum of double the amount of toilets and area than the men's toilets and urinals have. Furthermore, the committee needs to address the hygiene concerns and lack of space in stalls by making the minimal cubical stall size 3'-8" x 6'-9". Education about future public toilet design is needed for architects and interior designers so that they begin to program restrooms at the beginning of their projects and so that they push to incorporate larger budgets for the design of restrooms.

Projects such as the three shown here are a step forward in the need to convince developers and builders of the economical benefits of designing better public toilets so that more people will feel free to leave their homes and support local businesses, I hope that projects such as this practicum are able to demonstrate the possibilities that positive changes to Canada's public toilets and especially to the City of Winnipeg and many social and economic levels. My passion for better public toilet design and accessibility has grown since the beginning this project and will continue.

## **APPENDIX A**

# BUILDING CODE REQUIREMENTS

## INTRODUCTION

The building code requirements are taken from the National Building Code of Canada 2010 Volume 2. The regulations are for occupancy, design, new construction, renovations, and the provision of, fire safety for all occupancies. The reference numbers used below are from the National Building Code of Canada, 2010, for easy reference and include only the sections that are related to the three sites. The building code requirement section reviews all three sites: Osborne Station, Pan Am Pool, and St. Vital Centre.

I begin with Section 3, which covers Section 3, 3.1.17. Occupant Load. The *major occupancy load* refers to the main *occupant* of the building, part of a building, or part of a floor or level. Next, Section 3.7.2 Sanitation Amenities, outlines mandatory barrier-free restrooms, the number of toilets for men and women, the number of urinals for men, and the number of sinks required for both men and women for the different major occupancies. Section 3.8 covers barrier-free design. Section 3.8.1. reviews the general design of barrier-free zones such as entrances and barrier-free paths of travel. Section 3.8.2 summarizes occupancy requirements for barrier-free zones. Section 3.8.3 encapsulates design standards such as accessible signage and doorways, cubicles, toilets, urinals, sinks, universal toilet rooms, and showers. The barrier-free guidelines are the minimum rules as they apply to persons with physical and sensory disabilities. Furthermore, the City of Winnipeg Accessibility Design Standards was used for all sites in section 3.2.7 for locker and storage units and 3.3 washroom facilities. These standards exceed the National Building Code of Canada in that they are more thorough and detailed.

## NATIONAL BUILDING CODE OF CANADA 2010 VOLUME 2, SECTION 3

### SITES AND MAJOR OCCUPANCY

The Pan Am Pool's major occupancy is Group A, Division 3: Indoor swimming pools, with or without bystander seating. The Osborne Station's and St. Vital Centre's major occupancy is Group E, Division, Mercantile occupancies. *Occupancy* is defined as the function or purpose of a building or floor that is to provide shelter for individuals, mammals or goods. *Occupant Load* refers to the number of people who will use the building. The means of egress from a building is determined by its occupancy. <sup>1</sup>

#### 3.1.17.1 OCCUPANT LOAD DETERMINATION

The occupant load is determined by a floor area or part of a floor area that has assembly occupancy, and has permanent seating.

#### INFANT CHANGE STATIONS 3.3.1.

1) An infant changing area will be located in single and multiple occupant washrooms in both men's and women's. In multiple occupant washrooms, the infant changing area will be located outside the cubicle.<sup>2</sup>

#### 3.7.2. SANITATION AMENITIES

##### 3.7.2.2. WATER CLOSETS

1) Water closets will be required for both men and women if the *occupant load* is equally divided between the genders, unless the proportion of one sex is determined to be more predominant in the building.

- 5) Urinals will replace two thirds of the number of water closets required for men; if there are only two water closets for men, one urinal can replace one of the toilets.
- 6) The number of water closets necessary for *assembly occupancies* will be determined according to Table 3.7.2.2.A.
- 13) *Mercantile Occupancy* has one toilet for every 300 men and one for every 150 women. <sup>3</sup>
- 15) In a *building* with a floor area more than 600 m<sup>2</sup> (6,458 ft<sup>2</sup>) and with one or more tenant suites for a *business* and *personal services occupancy* or *mercantile occupancy*, water closets will be accessible to the public when the *building* is in use.
- 16) The number of water closets for a tenant space of *mercantile* occupancy of no more than 500 m<sup>2</sup> (5,381 ft<sup>2</sup>) must be in agreement with Table 3.7.2.2.B., the total number of employees.

**TABLE 3.7.2.2.A. WATER CLOSETS FOR ASSEMBLY OCCUPANCY (PAN AM POOL)**

**Number of Persons of Each Sex: Over 400**

The minimum Number of Water Closets:

Men 7, + 1 for every additional increase of 200 men in excess of 400

Women: 13, + 1 for every additional increase of 100 women in excess of 400

**TABLE 3.7.2.2.B. WATER CLOSETS FOR A BUSINESS AND PERSONAL SERVICES OCCUPANCY**

**Number of Persons of Each Sex:**

50 +

Minimum Number of Water Closets for Each Sex:

3, + 1 for each additional increase of 50 individuals of each gender

### **3.7.2.3. LAVATORIES**

- 1) A lavatory (sink) will be required in an area enclosing one or two water closets or urinals, and one extra lavatory is to be provided for every additional two water closets or urinals.
- 3) Any ledge or protrusion above a sink will be located so that it will not harm an individual.
- 4) Sinks specified in Sentence (1), will have an automatic faucets or a lever handle that is not operated with a spring action.<sup>4</sup>

### **3.7.2.5. SAFETY GLASS**

- 1) Safety glass is mandatory in a shower or bathtub inclusion.

### **3.7.2.6. SURFACE PROTECTION**

- 1) From the top of a urinal, the wall and floor surfaces must have non-porous, resilient material no less than 900 mm (35 inches) from the urinal and wall.
- 2) Floor surfaces around the water closets must have non-porous and resilient material no less than 900 mm (35 inches) around the water closet.

### **3.7.2.7. FLOOR DRAIN**

- 1) A floor drain must be put in restrooms that have urinals with automatic flushing devices.

### **3.7.2.8. GRAB BAR INSTALLATION**

- 1) Grab bars mounted vertically and horizontally must hold a weight of not less than 1.3 kiloNewton (kN).

## **SECTION 3.8. BARRIER-FREE DESIGN**

*Barrier-free* design allows a building and all of its facilities to be accessible to those with physical and sensory disabilities.

### 3.8.1. OVERALL

#### 3.8.1.2. ENTRANCES

1) One half of the pedestrian entrances will be *barrier-free* and open from

- a) An exterior entrances that are level with the sidewalk, and/or
- b) A ramp that runs from the exterior sidewalk to the entrance of the building.

2) *Assembly occupancy, business, personal services occupancy or mercantile occupancy* situated on a level in a building must provide one *barrier-free* entrance and path of travel.

4) If , there is a barrier-free entry with more than one entranceway, only one doorway needs to meet the barrier-free requirements in Article 3.8.3.3.

#### 3.8.1.3. BARRIER-FREE PATH OF TRAVEL

1) Doorways must be unhindered and no less than 920 mm (36 inches) wide.

4) If the *barrier-free* path of travel is greater than 30 m (98' feet or 1176 inches) long, the corridor will not be less than 1500 mm (59 inches) wide, in lengths of 1500 mm (59 inches) with separations not greater than 30 m (98' feet or 1176 inches).

### 3.8.2. OCCUPANCY REQUIREMENTS

#### 3.8.2.3. BARRIER-FREE RESTROOMS

1) A washroom is required on a level where there is a barrier-free path of travel, except in a *suite* of a *residential occupancy* or a *suite* of *care occupancy*, other *barrier-free* restrooms must be located on same the same level or floor within 45m (147'-7"). A barrier-free washroom must conform to Article 3.8.3.8. to 3.8.3.12.

### **3.8.3. DESIGN STANDARDS**

#### **3.8.3.1. ACCESSIBILITY SIGNS**

- 1) A barrier-free entrance is to be indicated by an international symbol for accessibility.
- 2) A barrier-free washroom and shower (plus elevator or parking space) will be identified with an international symbol accessibility.
- 3) A washroom that is not barrier-free, but has a barrier-free path of travel, must indicate where a barrier-free washroom is located in the building.

#### **3.8.3.3. DOORWAYS AND DOORS**

- 1) When a door in a barrier-free path of travel is in the open position, it must have a clearance of 800 mm (31 inches).
- 10) With the exception of a door with a power door operator, a door in a barrier-free path of travel must have a clearance of not less than:
  - a) 600 mm (24 inches) clearance from the edge of the door opening, if the door swings toward the individual
  - b) 300 mm (12 inches) clearance from the edge of the door opening if the door swings away from the individual.
- 11) In a vestibule two doors in a barrier-free path of travel must have a clearance not less than 1200 mm (48 inches), plus the additional width of the door that swings into the path of travel.
- 13) In a rectangular area, the floor surface in a barrier-free path of travel must be level on each side of the door, refer to Sentence 3.8.3.3.(10).

### 3.8.3.8. WATER CLOSET STALLS

- 1) A washroom with one water closet stall or inclusion required by Article 3.8.2.3. must be a *barrier-free stall*
  - a) Not to be less than 1500 mm (60 inches) wide by 1500 mm (60 inches) deep
  - b) The door stall:
    - i. must have a handle / lock located inside the door, and must be able to be operated with a closed hand,
    - ii. must have entry clearance no be less than 800 mm (31 inches) wide
    - iii. must swing outward, unless there is enough space provided without interfering with a wheelchair
    - iv. must have a door pull not less than 140 mm (5.5 inches) long, located inside the door, with the midpoint no less than 200 mm (7.87 inches) but no more than 300 mm (11.8 inches) from the pivot side of the door. The door must be located no less than 900 mm (34 inches) and no more than 1 000 mm (39 inches), above the floor.
    - v. the door must have a door pull on the outside, close to the handle.
  - c) From the edge of the toilet fixture to the partition wall, there should be a clearance of 285 mm (11 inches) and with no more than 305 mm (12 inches)) on one side.
  - d) Grab bar specifications for stalls:
    - i. Grab bars are mounted horizontally on the partition wall beside the water closet (toilet) and extend not more than 450 mm (18 inches) in both directions from the farthest edge of the toilet.
    - ii. grab bars 600 mm (23.6 inches) in length are fixed on the partition horizontally behind the toilet and centered over the toilet bowl for those toilets that do not have a connected water tank .
    - iii. all grab bars around the toilet must be mounted no lower than 840 mm (33 inches) and no higher than 920 mm (36 inches) above the floor.
    - iv. the grab bars must withstand a weight of no less than 1.3 kiloNewton (kN), or .1325 tons, vertically and horizontally.
    - v. the diameter of the grab bars is to be no less than 30 mm (1.81 inches) and no more than 40 mm (1.57 inches).

- vi. the clearance of the grab bars from the partition wall is no to be less than 35 mm (1.37 inches) and not more than 45 mm (1.77 inches).
- e) A water closet stall is to have a coat hook fixed no higher than 1200 mm (47 inches) from the floor on the adjacent partition and jutting out no more than 50 mm (1.96 inches) from the partition.
- f) From the exterior cubicle surface to the surface of the in-swinging door, the clearance must be 1700 mm (67 inches). Also, the clearance from the exterior cubicle surface to any partition-mounted fixture will be 1400 mm (55 inches).

#### **3.8.3.9. WATER CLOSETS**

- 1) A *barrier-free* water closet for an adult individual with a physical disability will have the following specifications:
  - a) The toilet seat is no less than 400 mm (15.7 inches) and no more than 460 mm (18 inches) from the floor
  - b) Hand-operated or sensor operable flushing controls must be accessible to a wheelchair user.
  - c) A seat lid or back support.
  - d) A seat that is not spring-actuated.

#### **3.8.3.10. URINALS**

- 1) If a urinal is provided in a barrier-free washroom,
  - a) For a wall-fixed urinal, the bottom edge must be 488 mm (19 inches) to 512 mm (20 inches) from the floor.
  - b) A floor mounted urinal must be flush with the base edge and finished floor.
- 2) Urinal in part (1) must be
  - a) A urinal clearance centered with a width of 800 mm (31 inches).
  - b) No step in front of the urinal.

- c) A vertically mounted grab bar no less than 300 mm (11.8 inches) long, centered 1000 mm from floor surface, and located no more than 380 mm (14.9 inches) from center of the urinal.

### 3.8.3.11. LAVATORIES

1) Barrier-free washroom has a lavatory that

- a) The distance between the center line of lavatory to the side wall is no less than 460 mm (18 inches)
- b) The front edge of the lavatory height is no more than 865 mm (34 inches) from the surface of the floor
- c) Clearance below the sink between the floor and lavatory is no less than
  - i. 760 mm (29.9 inches) wide
  - ii. 735 mm (28.9 inches) high from the front edge to the floor,
  - iii. sink 205 mm (8 inches) back from front rim of the sink, a clearance of 685 mm (26.8 inches) to the floor
  - iv. waste pipes to be 230 mm (9 inches) high from the floor; from the front edge of the sink / countertop back to the waste pipes, there must be a clearance of 280 mm (11 inches); also a clearance from the front edge of the sink/countertop to back area of the waste pipes of 430 mm (16.9 inches)
- d) Pipes must be insulated to avoid scalding
- e) A soap dispenser must be positioned near the sinks, no more than 1200 mm (47.2 inches) above the floor, and accessible to persons in wheelchairs.
- f) Towel dispensers and/ or hand-dryers are to be positioned near sinks, no more than 1200 mm (47.2 inches) from floor surface and accessible to individuals in wheelchairs.

2) If a mirror is to be used in a *barrier-free* washroom, one mirror must conform to the following specifications:

- a) The bottom edge of the mirror is no more than 1000 mm from the floor, or

b) The mirror must slope vertically so that it can be used by an individual in a wheelchair easily.

### 3.8.3.12. UNIVERSAL TOILET ROOMS

1) A universal toilet room must have

- a) A *barrier-free* path of travel
- b) A door that can be locked from the inside of the room and unlocked from the outside in the event of an emergency
  - i. a latch-operated device operable with a closed hand, located no less than 900 mm (35 inches) and no more than 1000 mm (39 inches) from the floor.
  - ii. an external swinging door with a door pull 140 mm (5.5 inches), with the midpoint of the door no less than 200 mm (7.87 inches) and no more than 300 mm (11.8 inches) from the hinged side of door. The door pull height from the floor is to be between 900 mm (35 inches) and 1000 mm (39 inches).
  - iii. the closer for a outward swinging door is to be a spring or gravity hinge that closes the door automatically.
- c) Lavatory to meet Article 3.8.3.11.
- d) One water closet must conform with Article 3.8.3.9. with a clearance to the partitions of
  - i. one side to be no less than 285 mm (11.2 inches) and no more than 305 mm (12 inches)
  - ii. the opposite side no less than 875 mm (34.4 inches)
- e) Grab bars to meet Clause 3.8.3.8. (1)(d),
- f) There is to be no interior measurement less than 1700 mm (66.9 inches) within the universal toilet room.
- g) The coat hook to Clause 3.8.3.8 (1) (e) and a shelf no more than 1200 mm (47.2 inches) from the floor.
- h) A wheelchair will be able to back up beside the water closet in the area discussed in Subclause (d)(ii), and
- i) A wheelchair will be able to turn 360 degrees with a diameter no less than 1500 mm (59 inches).

### 3.8.3.13. SHOWERS

1) Showers to be specified in a building must have a minimum of one shower cubicle *barrier-free* in each set of showers. Excluded are *suite of care* occupancy or a *suite of residential occupancy*.<sup>5</sup>

- a) A shower stall must not be less than 1500 mm (59 inches) long and 900 mm (35.4 inches) wide.
- b) A shower entry must be an open, unobstructed area. The unobstructed area must not be less than 900 mm wide and 1 500 mm long. Only some fixtures may project into the area, as long as they do not interrupt the right of entry to the shower.
- c) The flooring façade must be slip-resistant.
- d) The bevelled edge of a shower is no more than 13 mm (.5 inches) higher than the finished floor.
- e) The seat is to be hinged but not a spring-loaded or fixed. It must meet the following specifications:
  - i. the seat must be no less than 450 mm (17.7 inches) wide and 400 mm (15.7 inches) long,
  - ii. the seat is to be fixed between 700 mm (27.5 inches) and 800 mm (31.4 inches) from the floor.
  - iii. the seat must hold a weight of 1.3 kN
- f) The horizontal grab bar must meet the specifications in Subclause 3.8.3.8 (1)(d)(iv), (d)(v) and (d) (vi):
  - i. the grab bar is no less than 900 mm (35 inches) long
  - ii. it must mount 700 mm (27.5 inches) to 800 mm (31 inches) above floor
  - iii. The horizontal grab bar is not to be less than 300 mm (11.8 inches) long. The grab bar is to be located on the opposite partition from the entry and adjacent to the seat.
- g) The shower controls are to be pressure-equalized or thermostatic-mixed valve with a lever handle that can be regulated with a closed hand from a seated position.
- h) A hand-held shower head with a bendable shower arm is to be no shorter than 1500 mm (59 inches), with a receptacle that can be easily grasped from a seated position.
- i) Soap containers must be fully recessed into the partition and easily grasped from a seated position.

### **3.3.9 SHOWER STALLS**

If shower cubicles are present only one half of the shower cubicles must fulfil 3.3.9 Shower Stalls requirements. If renovations are done and one half of the shower cubicles do not to conform to the regulations, only ten percent must meet these regulations to this section.<sup>6</sup>

## **APPENDIX B**

## SPECIFICATIONS OF WATER CLOSETS FOR CHILDREN

Dimension	Pre-K-K (ages 3-4)	Grades 1 <sup>st</sup> -3 <sup>rd</sup> (ages 5-8)	Grades 4-7 <sup>th</sup> (ages 9-12)
<b>Water closet centerline</b>	12" (305 mm)	12-15" (305-380 mm)	15-18" (380-455 mm)
<b>Toilet seat height</b>	11-12" (280-305 mm)	12-15" (305-380 mm)	15-17" (380-430 mm)
<b>Grab bar height</b>	18-20" (455-510 mm)	20-25" (510-635 mm)	25-27" (635-685 mm)
<b>Dispenser height</b>	14" (355 mm)	14-17" (355-430 mm)	17-19" (430-485 mm)

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## CHILDREN'S REACH RANGES FROM A WHEELCHAIR

Forward or Side Reach	Ages 3-4	Ages 5-8	Ages 9-12
<b>Max</b>	36" (915 mm)	40" (1,015 mm)	44" (1,120 mm)
<b>Min.</b>	20" (510 mm)	18" (455 mm)	16" (405 mm)

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## INTERIOR DESIGN CONSIDERATIONS

USERS	KEY LOCATION	CONDITIONS	DESIGN SPECIFICATIONS/DIM.	DESIGN RESULTS
<b>Women</b> <ul style="list-style-type: none"> <li>• Incontinent</li> <li>• disabled</li> <li>• caregivers,</li> <li>• the aging</li> </ul>	<ul style="list-style-type: none"> <li>• main bus stations and high traffic bus stops</li> </ul>	<ul style="list-style-type: none"> <li>• pregnancy</li> <li>• infant-changing</li> <li>• menstruation</li> <li>• discharge</li> </ul>	<ul style="list-style-type: none"> <li>• there are ten times more strollers than wheelchairs<sup>12</sup></li> <li>• require larger accessible stalls for strollers, especially in shopping centers<sup>13</sup></li> <li>• The size of a double stroller open 29.75 x 24.5 x 41.5</li> </ul>	<ul style="list-style-type: none"> <li>• social zones for talking, hair and fashion<sup>19</sup></li> <li>• stroller zone (smaller cubical for single)</li> </ul>

USERS	KEY LOCATION	CONDITIONS	DESIGN SPECIFICATIONS/DIM.	DESIGN RESULTS
<ul style="list-style-type: none"> <li>cleaning industry</li> <li>commuters with children<sup>9</sup></li> </ul>	<ul style="list-style-type: none"> <li>busy small businesses</li> <li>train stations<sup>10</sup></li> </ul>	<ul style="list-style-type: none"> <li>bladder infection</li> <li>illness</li> <li>birth &amp; death</li> <li>shelter, and</li> <li>assist children, aging &amp; disabled<sup>11</sup></li> </ul>	<p>in., folded 22 x 40.5 x 16.5 inches<sup>14</sup> and single stroller open 34x 28x12 in., folded 30 x 17 x 14 in.<sup>15</sup></p> <ul style="list-style-type: none"> <li>Women require the model cubical (81" x 44" = 25 ft<sup>2</sup>) to accommodate sanitary bins, a small sink or luggage (bag) area to improve hygiene. <sup>16</sup> The min. off 10 in. (250 mm) diameter to the maximum of 18 in. (450 mm) diameter between the edge of the cubical door open and the front edge of the toilet bowl. <sup>17</sup>This allows women to make a three point turn in the cubical without touch the edge of the door and edge of toilet.<sup>18</sup></li> </ul>	<p>stroller, larger cubical for double stroller)</p>
<p><b>MEN</b></p> <ul style="list-style-type: none"> <li>incontinent</li> <li>aging</li> <li>disabled</li> <li>childcare</li> </ul>		<p>incontinent</p>	<ul style="list-style-type: none"> <li>urine on the floor creates a slippery surface, the aging are concerned of falling<sup>20</sup></li> </ul>	
<p><b>CHILDREN</b></p>		<p>rubber safety strips on the edges of the cubical doors to protect children's small fingers<sup>21</sup></p>	<ul style="list-style-type: none"> <li>washrooms for children aged 9-12, (3'x 6') 18 ft<sup>2</sup> <sup>22</sup></li> </ul>	<p>Sinks &amp; dryers at child height</p>
<p><b>BREAST FEEDING</b></p>			<ul style="list-style-type: none"> <li>separate Area (Zones) from lavatories to prevent infections<sup>23</sup></li> </ul>	<p>Breast Feeding Zone</p>
<p><b>INFANT CHANGING STATIONS</b></p> <ul style="list-style-type: none"> <li>men</li> <li>women</li> <li>family</li> <li>unisex</li> </ul>	<ul style="list-style-type: none"> <li>shopping centers</li> </ul>		<ul style="list-style-type: none"> <li>a separate zone with a family setting within site<sup>24</sup></li> <li>provide infant changing stations in semi-private area in a unisex zone with more stations in the women's zone<sup>25</sup></li> <li>a minimum of one infant change station located in the zone with the baby changing depth 36 inches (900 mm)<sup>26</sup></li> <li>requires a sink, duplexes, chairs for mothers and baby seating.<sup>27</sup></li> </ul>	<p>Separate infant changing zone</p>

USERS	KEY LOCATION	CONDITIONS	DESIGN SPECIFICATIONS/DIM.	DESIGN RESULTS
<b>ACCESSIBLE</b>				
<b>SQUAT TOILETS</b>			<ul style="list-style-type: none"> <li>private washrooms with louvered doors, for air circulation, concealment and transparency for emergency.<sup>28</sup></li> </ul>	

## ENDNOTES

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- <sup>1</sup> National Research Council Canada, *National Building Code of Canada 2010 Volume 2* (Ottawa: National Research Council Canada), 3-146.
- <sup>2</sup> Design Environments Inc., 2010 City of Winnipeg: Accessibility Design Standards (Winnipeg: City of Winnipeg), 147.
- <sup>3</sup> National Research Council Canada, *National Building Code of Canada 2010 Volume 2* (Ottawa: National Research Council Canada), 3-146.
- <sup>4</sup> National Research Council Canada, *National Building Code of Canada 2010 Volume 2* (Ottawa: National Research Council Canada), 3-148.
- <sup>5</sup> National Research Council Canada, *National Building Code of Canada 2010 Volume 2* (Ottawa: National Research Council Canada), 3-156.
- <sup>6</sup> Design Environments Inc., 2010 City of Winnipeg: Accessibility Design Standards (Winnipeg: City of Winnipeg), 162.
- <sup>7</sup> MaryRose McGowan and Kelsey Kruse, *Interior Graphic Standards* (Hoboken: John Wiley & Sons, Inc., 2003), 17.
- <sup>8</sup> McGowan and Kruse, *Interior Graphic Standards*, 17.
- <sup>9</sup> Greed, *Inclusive Urban Design*, 141.
- <sup>10</sup> Greed, *Inclusive Urban Design*, 141.
- <sup>11</sup> Greed, *Inclusive Urban Design*, 97.
- <sup>12</sup> Greed, *Inclusive Urban Design*, 225.
- <sup>13</sup> Greed, *Inclusive Urban Design*, 225.
- <sup>14</sup> Guzzie + Guss, "G+G125 Hornby Stroller," Guzzie + Guss, <http://www.guzzieandguss.com/gg125-hornby-stroller-p-3429.html> (accessed June 24, 2011).
- <sup>15</sup> Guzzie + Guss, "Guzzie + Guss GUGU 102 Stroller," Guzzie + Guss, <http://www.guzzieandguss.com/guzzie-guss-gugu-stroller-p-3410.html> (accessed June 24, 2011).
- <sup>16</sup> Greed, *Inclusive Urban Design*, 209.

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<sup>17</sup> Greed, *Inclusive Urban Design*, 207.

<sup>18</sup> Greed, *Inclusive Urban Design*, 207.

<sup>19</sup> Greed, *Inclusive Urban Design*, 90.

<sup>20</sup> Greed, *Inclusive Urban Design*, 88.

<sup>21</sup> Greed, *Inclusive Urban Design*, 225.

<sup>22</sup> Greed, *Inclusive Urban Design*, 205.

<sup>23</sup> Greed, *Inclusive Urban Design*, 89.

<sup>24</sup> Greed, *Inclusive Urban Design*, 88.

<sup>25</sup> Greed, *Inclusive Urban Design*, 227.

<sup>26</sup> Greed, *Inclusive Urban Design*, 227.

<sup>27</sup> Greed, *Inclusive Urban Design*, 227.

<sup>28</sup> Greed, *Inclusive Urban Design*, 209.

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Figure 187.