



WINDOWS

BEYOND  CONVENTION  
TOWARDS CONNECTION

Jordan Zanier

Strengthening connectivity in situations of mandated physical isolation.

Windows:  
Beyond Convention Towards Connection

**JORDAN L. ZANIER** | Graduate Thesis Candidate  
University of Detroit Mercy School of Architecture

ARCH 5100-5200 | Master Thesis Studio  
ARCH 5110-5210 | Master Thesis Supplement  
Fall 2020 - Winter 2020

Studio Advisor: Wladyslaw Fuchs,  
External Advisor: Jason Grossi

*This book is dedicated to all those who supported me  
as I walked the winding path of this long,  
conceptual journey*



**00 Preface**  
..... PGS. 08 - 15

Abstract  
Thesis Statement  
Introduction

**01 Windows are  
Critical for our Health  
& Well Being**  
..... PGS. 16 - 95

**SECTION 01**  
Building Code for Windows  
  
**SECTION 02**  
Psychology of Windows

**02 Connectivity &  
Understanding the  
Origins of Windows**  
..... PGS. 96 - 109

**SECTION 01**  
What is Connectivity?  
  
**SECTION 02**  
Window Etymology

**Table of  
Contents**

**03 What can Windows  
Encompass & how they  
Provide Connectivity**  
..... PGS. 110 - 151

**SECTION 01**  
Phenomenology of Windows  
  
**SECTION 02**  
Windows as a Threshold

**04 Poetic Designs for  
Windows that provide  
Connectivity**  
..... PGS. 152 - 171

**POETIC DESIGN 1**  
Subtle Approach  
  
**POETIC DESIGN 2**  
Complex Approach  
  
**POETIC DESIGN 3**  
Hypothetical Approach

**05 References**  
..... PGS. 172 - 191

References  
List of Figures  
Appendices

# 00 Preface - Abstract, Thesis Statement, Introduction

<b>Section 5.</b>	Abstract .....	10 - 11
	Thesis Statement .....	12 - 13
	<b>Introduction .....</b>	<b>14 - 15</b>

## Abstract

---

With the situations of mandated physical isolation, such as the Covid-19 Pandemic, variations of connectivity are weakened as well as the mental health of the humans who experience them. This results from being confined to a space with uncertainty as to when normality will resume. In these scenarios, windows can offer some sense of connectivity to the larger external world.

There is a unique opportunity to try to redefine the window, with the purpose of providing connectivity where it has been severely diminished. Before this can occur, it is important to first prove that Windows are Critical for our Health & Well Being, as seen in their implementation in building codes as well as their role(s) in psychology, to establish a grounds for the investigation. Although this may be proven, this is only in regards to a conventional window, or a conventional perception. To better understand how windows can be redefined to serve their new connective role, they need to be fully examined in all of their capacities with analysis of What can Windows Encompass & how they can Provide Connectivity. Looking to the areas of Phenomenology as well as the window as a threshold, will enrich the perceptions of what windows are comprised of fundamentally, and how they affect things around them.

As both an accumulation and application of the research conducted, three Poetic Designs will be proposed, for a subtle, complex, and hypothetical approach in redefining what windows are as well as how they can provide connectivity when they are greatly needed. This is with the lens of prescribing powerful thinking to invoke a deeper level of conceptual thought.

# Thesis Statement

Concise Version

In situations of mandated physical isolation forms of Connectivity are diminished, as is our health.

Windows can be looked upon as being the architectural essence of Connectivity, yet they can also exist as a element of separation.

In situations of **mandated physical isolation** forms of **Connectivity** are diminished, as is our health.

**Windows** can be looked upon as being the **architectural essence** of Connectivity, yet they can also exist as a element of separation.

## Connectivity

The ways one can experience forms of connections, beyond the confines of their associated isolation.

## Windows

Including other versions of the term/perception: conventional, phenomenological, as well as threshold.

## Mandated Physical Isolation

The government mandates that people must stay home for their safety. (Example Covid 19 Lockdown)

## Architectural Essence

The "Architectural "Version" of connectivity, meaning windows are able to emanate qualities of connectivity.

# Expanded Version

When one exists in situations of mandated physical isolation, such as the current context of being in lockdown to slow the spread of the Covid-19 pandemic, forms of connectivity, as well as the health of people can be severely weakened. With isolation, the sense of being rooted in the same place can be frustrating, but windows make being stuck in my home a little bit easier.

A window can be significant for multiple reasons: In Building Codes, windows must be present in a building for health and safety-related purposes, while Psychologically it can affect one's productivity as well as mental health within a space. In its basic etymology, windows are associated with the eye, and this correlation can already begin to suggest ways they can improve certain forms of connectivity; ones that are limited due to mandated physical isolation.

Asking what a window is, is a difficult question to answer beyond the conventional perception, but with careful analysis of Phenomenology, as well as attributing the window as a threshold between environments, will help to expand what the window can encompass. Under Phenomenology, the fundamental characteristics of a window reveal what constitutes it, while the study of the window as a threshold illustrates the windows ability to divide, unify and blur environments.

With mandated physical isolation, variations of connectivity are reduced, but this creates the opportunity to redefine windows to serve a new role to provide connectivity. This thesis a theoretical journey that hopes to inspire new thinking for the future of the field of architecture.

## Conventional Perception

Also can be referred to as the conventional window, it is a specific perception of the window that is also the most commonly perceived version of it.



## Introduction

This investigation unveils a relevant issue that is occurring within the confines of homes around the world, as people are being isolated due to situations of mandated physical isolation. It is the danger associated to the weakening of forms of connectivity, which can cause severely negative psychological effects as well as a depreciation of one's quality of life. Research exists surrounding how isolation can cause associated effects, but it does not necessarily provide a solution from an architectural standpoint. Humans live with windows in their homes in the day-to-day, yet they do not realize that there is a humble, but powerful ability associated to them, something that will be heightened with events like the Covid-19 pandemic, when people have to remain in their homes. These situations go on for an indefinite amount of time and with a frightening uncertainty of what is going on as well as how the world will move forward. All of these aspects can cause a mental darkness for people, and this is not to be taken lightly for it can be severely damaging to individuals, now and long after the pandemic is gone. The current research is lacking, as it may suggest the negative effects of isolation, and the positive effects for having windows, but the connection of the two is non-existent.



# 01 Windows are Critical for our Health & Well Being

**Section I.**  
See Appendix A.

To begin to analyze how windows can become an essence of connectivity, it is important to first ground the investigation by suggesting that windows are critical for our health and well being, and that it has the potential to become this connective essence. Proving this argument will require answering questions surrounding the importance of windows existing in buildings, as well as what it provides for humans. Some initial statements can be made regarding these questions which derive from the common knowledge of having windows. The Window in its conventional form can provide Natural Light, Natural Ventilation, and Access to Views. Natural Light allows buildings to be illuminated without the need for artificial lighting, and it signals the passage of time. Natural Ventilation helps to bring in fresh air while cycling out old, stale air. Having Access to Views allows one to see outside of their home including when one is stuck in their homes - whether it being because of bad weather or even mandated physical isolation. From this basic idea of windows with the ways one can experience it in the day-to-day, (i.e. without extensive investigation), the window already can appear to provide benefits for one's health and well being. From further investigation more layers to this idea can be unearthed.

# Windows are Critical for our Health & Well Being

## Building Code For Windows PGs. 18 - 49

Looking at the minimum existences of windows to achieve specific purposes as stated in various Building Codes.



## Psychology of Windows PGs. 50 - 95

Looking at the various associated effects of lockdown/ having windows in general context as well as using a survey to form correlations on the basis of Psychology.



EXIT

## Table of Contents Building Code for Windows

Introduction .....	20 - 21
Minimum Existence .....	22 - 23
Analysis of Codes .....	24 - 43
Visual Analysis of Codes .....	44 - 45
What about Views? .....	46 - 47
Conclusion .....	48 - 49

<b>Fig. 1.0</b> - Building Codes Analyzed	21	<b>Fig. 1.9</b> - Enforcing Views in Code	47
<b>Fig. 1.1</b> - Minimum Existence	22	<b>Fig. 1.10</b> - Light, Breeze, Escape	49
<b>Fig. 1.2</b> - M.E. Concept	23		
<b>Fig. 1.3</b> - Visual Analysis of Building Codes 1	28	<b>Table 1.0</b> - ME   Natural Light	26
<b>Fig. 1.4</b> - Visual Analysis of Building Codes 2	34	<b>Table 1.1</b> - ME   Natural Ventilation	32
<b>Fig. 1.5</b> - Visual Analysis of Building Codes 3	40	<b>Table 1.2</b> - ME   Emergency Exit	38
<b>Fig. 1.6</b> - Window's Provision of M.E's	42	<b>Table 1.3</b> - Other Related Information	47
<b>Fig. 1.7</b> - Minimum Existences Found	43		
<b>Fig. 1.8</b> - Visual Analysis Structure	44		

# Building Code for Windows

## Introduction

This introduction for the Building Code for Windows section will explain what it encompasses, as well as its relevance/association to the larger argument and investigation.

### Scope

To prove that windows are critical for our health and well being, one can analyze building codes to find an objective, legal perspective. This is due to the fact that these documents were first created and are continuously revised today, with the main intention of maintaining the health, safety and welfare of a buildings' inhabitants. Building codes are associated to the field of construction law, and they provide procedures as well as regulations for ensuring the acceptable, minimum standard of construction. The Investigation will require understanding where windows are found in regards to this minimum standard.

### Methods

With analyzing how windows are critical to our health/well being through various building codes, it is important to look at multiple examples and sift through them with a guiding concept. Eight codes from different parts of the world were chosen for additional perspectives. Some of these are North American and with the differing levels of Municipal, State and National, while the other three are European. Analysis of these codes will be guided through the concept of Minimum Existences, (this is explained more in depth on the next set of pages), and more specifically their association with windows. This concept will help to identify the potential main reasons why they need to exist. The findings of this area of research will be organized with associated charts, and the knowledge surrounding them will be represented and challenged with visual analyses.

### Assumptions and Limitations

There are many building codes that exist across the globe, and as such an inherent limitation is the fact of not considering all of them as they could offer additional interpretations. Specifically this section looks at examples of North American and European building codes, but does not consider other potential continents. As it will be seen with the analysis, there are distinct patterns related to where windows stand in construction law, which most likely would be reinforced with additional sources. It should also be mentioned that various traditions surrounding windows may unknowingly impact the interpretations of building codes. As such this section will assume that this can occur, and try to look for objective findings.

### Relevance to the Larger Argument

*Windows are critical for our health and well being.*

If evidence can be found in building codes that windows must exist to achieve specific purposes, then this means that they are relevant to construction law. This in itself is important because it suggests that the existence of windows is intentional and legally mandated. With building codes being first created and continually revised today for the purposes of keeping inhabitants healthy and safe within buildings, it can also be said that windows are necessary components for the well being of humans. This directly suggests that by mandated law windows are critical for our health and well being.

### Relevance to the Overall Investigation

Proving that by law windows are critical for our health and well being grounds further investigation into how they can become an architectural essence of connectivity.

## NORTH AMERICA/INTERNATIONAL

UNITED STATES	Ann Arbor Municode 2013
UNITED STATES	Michigan Building Code 2015
*INT.  Drafted by the International Coding Council (ICC), but applied to certain countries.	International Building Code 2018
	International Residential Code 2018
CANADA	National Building Code of Canada 2015

## EUROPE

ENGLAND	The Building Regulations 2010
POLAND	Polish Construction Law
SCOTLAND	Scottish Building Standards 2016

Fig 1.0 - Building Codes Analyzed

Building codes were selected with five examples from North America and three examples from countries in Europe.

## Minimum Existence

**B**uilding codes provide instructions on how to legally construct a building for a specified location, and as such they are regularly consulted with. One method for proving that Windows are critical for our health and well being is to analyze where windows are situated in these codes and for what purposes.

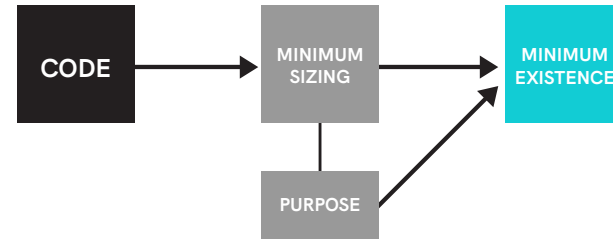
It is because Building Codes are forms of documentation that are associated with construction law, that any evidence to suggest windows must exist within them is fortified by a sense of legality. The investigation will be delving into building codes for evidence of Minimum Existences (ME) for Windows, and it is this concept that is key to proving that they are critical for our health and well being. The following definition is provided:

### Minimum Existence

*The presence of a building code/a set of building codes which state a minimum sizing of windows to achieve a specific purpose, and do not have stated situations/conditions whereby the minimum sizing or overall existence of a window can be entirely bypassed.*

To further explain this concept, a minimum existence seeks to show that building codes state windows must exist and to achieve specific purposes. This typically translates in building codes with specific regulations which state that: "windows must be a minimum size under this stated section", (the section oftentimes is the associated purpose of the window's existence). If these are found and the code does not provide exceptions which would completely override the need for a window, then it can be concluded that the window must exist. The reason is associated to a purpose and having evidence of both the fact that windows must/must not exist in the building

Fig 1.1 - Minimum Existence



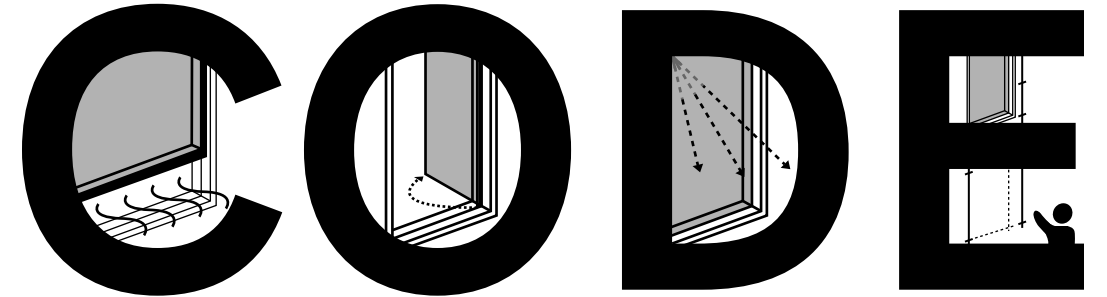
This is a conceptual explanation of Minimum Existences resulting from the provision of minimum sizing in codes for an associated purpose.

codes and for what purposes they must achieve, will help to suggest why the window is critical for our health and well being. As mentioned before, building codes are created and revised with the intention of keeping building inhabitants safe and healthy. Being that they are also relevant to construction law, the overall argument of windows being critical for our health and well being will also be legally reinforced.

### Important Considerations

Eight building codes were chosen for investigation, with the main hope of inciting comparison. It should be noted that building codes go through continual as well as minor revisions, as opposed to complete volume changes.

It is also important to note that for these types of documents, windows are referenced under a conventional perception. This will be covered in greater detail at the end of the overall section, but having a specific type of window be used in the code allows it to remain objective. As it will be seen, this becomes an important limitation to the larger argument, and will guide future research.



## Section 1



### Sub-Section 1.1

Building Code requires a minimum window of X height by X width to provide adequate amount of X.

#### MINIMUM EXISTENCE

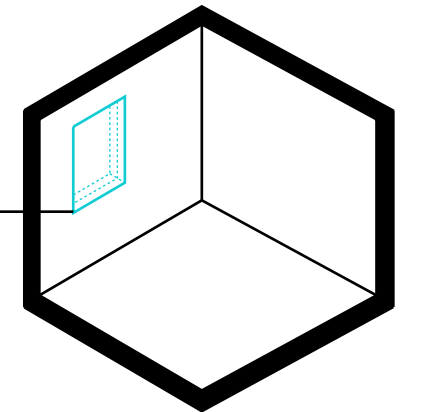


Fig 1.2 - M.E. Concept

This Diagram illustrates how Windows are situated in Building Codes, satisfying the parameters of suggesting a M.E.

## Analysis of Codes

This segment of the investigation will be organized by the minimum existences that were found after analysis, and will consist of two main parts. First, comparisons will be made for the different approaches/supplemental information related to the minimum existences, followed by a concluding portion that will state the final M.E. values for each relative code (as seen in **Tables 1.0, 1.1, and 1.2** with the highlighted boxes).

### Natural Light

See **Table 1.0** for specific Sub-Codes



Of the building codes analyzed, the ones that include the minimum existence of windows for the main purpose of Natural Light are: the Ann Arbor Municode, Michigan Building Code, International Building Code and International Residential Code (IBC/IRC) as well as the Polish Construction Law.

Natural Light looks at defining windows through its ability to allow light from the Sun to penetrate into the rooms/spaces of the building.

The Scottish Building Standards has a more considerate view on the M.E, stating: "Every building must be designed and constructed in such a way that natural lighting is provided to ensure that the health of the occupants is not threatened"<sup>8.1</sup>. Out of all the building codes analyzed, Scotland's is the only one to emphasize the idea that the health of inhabitants as well as their ability to carry out activities conveniently/safely is affected by their access to natural light with windows, such that taking this away in turn threatens this. The Polish Construction Law does also mention how natural light codes should consider general health as

well as some various safety guidelines as a basic form of consideration, but this is relatively more conservative when it is compared to the Scottish Building Standards' version.

An element that could be found in all of the codes in this section, was a statement suggesting that the minimum sizing of windows - for natural light purposes is something that is specifically applied to habitable spaces (also worded as "rooms for human habitation or occupancy"). This is logical as rooms not intended to be inhabited such as: closets, elevators, bathrooms and kitchens, (mentioned in both the Ann Arbor Municode and Scottish Building Standards), do not require natural light illumination. This can further be seen translated in typical commercial building design in which these types of programs are commonly clustered together to form service cores.

Although all of the building codes stated that the applicability of these laws is to habitable spaces, the Michigan Building Code, IBC, IRC and Polish Construction Law also mentioned that artificial lighting may be needed in certain spaces where a specified amount of light is required<sup>7.1</sup>. This point itself is not as important as what it leads to, as the International Residential Code and the Polish Construction Law were the only building codes which stated certain applicable situations where artificial light could be utilized instead of natural light (that is provided by windows). The International Residential Code states that as long as the said space meets criteria such that it does not require an emergency exit window or natural ventilation (ex: fresh air intake with mechanical ventilation) - [Exception 1], it can use artificial lig-

ht if it provides six footcandles (65 lux) of light- [Exception 2]<sup>5.1</sup>. This is an important point(s) as these code exceptions mention that to not adhere to the minimum existence of a window for daylight, is only possible if the space is allowed to also bypass the other two M.E's that were discovered: Natural Ventilation and Emergency Exit). Similarly with the Polish Construction Law, the laws of having a window for natural light can be exempted if daylight is not necessary or indicated, or the building is an underground facility. For this kind of situation, one must acquire approval from a "competent state provincial health inspector, issued in agreement with the competent district labour inspector". With this scenario the ability to not have a window for natural light is a lot harder to achieve, and the code's aggressive stance against it shows this.

Conventionally, Windows help to provide natural light with a translucent/transparent area of glass (also known as the glazing of a window), which allows sunlight to travel through the element and into the building. Besides natural light entering the space, heat and ultraviolet radiation can also transmit through. These two aspects were not mentioned in the building codes relative to being a minimum existence of the window, and as such can be thought of as byproducts. However, it is important to understand that they exist alongside Natural Light, as they can be used intentionally in design - moreso the heat aspect to passively warm spaces. The component of glazing serves as a basis for the minimum sizing, as the building codes quantify the minimum existence of a window - for the purpose of Natural Light - through the provision of a minimum glazing area.

The following are the minimum glazing areas as stated by each of the codes, and grouped in situations where they have the same values:

---

*The Ann Arbor Municode, Michigan Building Code, International Building Code, and the International Residential Code all state that the minimum glazing area is to be **8% of the floor area**.*

*The Polish Construction Law states the minimum glazing area shall be **1:8 of floor area, and 1:12 into other spaces** which respectively translates to approximately **12.5% or 8.3%**.*

*The Scottish Building Standards states the minimum glazing area should be **1/15th of the floor area**, which translates to approximately **6.67%**.*

---

See **Table 1.0** - Highlighted Boxes for M.E.

#### Ref. 7 - Polish Construction Law

7.1 CHAPTER III - Buildings and premises - Chapter 2. Lighting and Sunlight - Ad 1 - par 57 [Suitable daylight]

#### Ref. 8 - Scottish Building Standards 2016

8.1 3. Environment - 3.16 Natural Lighting - Mandatory Standard 3.16

#### Ref. 7 - Polish Construction Law

7.1 CHAPTER III - Buildings and premises - Chapter 2. Lighting and Sunlight - Ad 1 - par 57 [Suitable daylight]

7.2 CHAPTER III - Buildings and premises - Chapter 2. Lighting and Sunlight - Par. 58 [Lighting only with artificial light]

#### Ref. 5 - International Residential Code 2018

5.1 CHAPTER 3 - BUILDING PLANNING - R303 - Light, Ventilation & Heating - R303.1 Habitable Rooms - Exception 1,2

Table 1.0 - ME | Natural Light

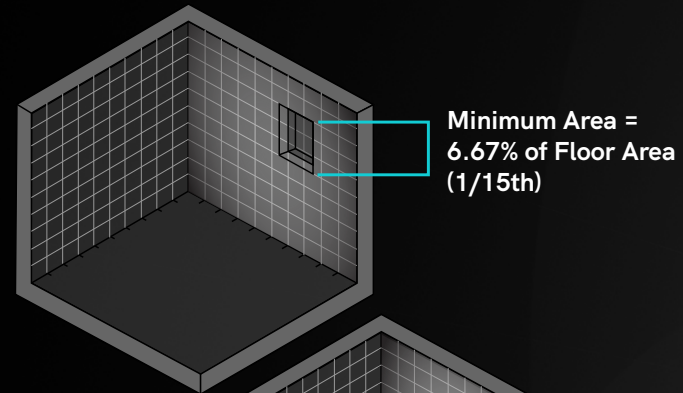
BUILDING CODE	Ann Arbor Municode 2013	Michigan Building Code 2015	International Building Code 2018		International Residential Code 2018	National Building Code of Canada 2015	Polish Construction Law	Scottish Building Standards 2016
MINIMUM GLAZING AREA	CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation Point 1.	CHAPTER 12-INTERIOR ENVIRONMENT Section 1205 - Lighting 1205.2 Natural Light	CHAPTER 12-INTERIOR ENVIRONMENT Section 1204 - Lighting 1204.2 Natural Light		CHAPTER 3 - BUILDING PLANNING R303 - Light, Ventilation & Heating R303.1 Habitable Rooms		CHAPTER III - Buildings and premises Chapter 2. Lighting and Sunlight Ad 1 - par 57 [Suitable daylight] Point 2.	3. Environment 3.16 Natural Lighting 3.16.1 Natural lighting provision
	Minimum = 8% of the floor area	Minimum = 8% of the floor area	Minimum = 8% of the floor area		Minimum = 8% of the floor area		Minimum = 1:8 of floor area, 1:12 into other spaces (12.5% or 8.3%)	Minimum = 1/15th of the floor area (6.67%)
Stated Natural Light Codes are applied to Habitable Spaces	CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation	CHAPTER 12-INTERIOR ENVIRONMENT Section 1205 - Lighting 1205.1 General	CHAPTER 12-INTERIOR ENVIRONMENT Section 1204 - Lighting 1204.1 General		CHAPTER 3 - BUILDING PLANNING R303 - Light, Ventilation & Heating R303.1 Habitable Rooms		CHAPTER II-Development & development of a building plot Chapter 1. Location of the building Ad 2 - par. 13 [Natural room lighting]  CHAPTER III - Buildings and premises Chapter 2. Lighting and Sunlight Ad 1 - par 57 [Suitable daylight]	3. Environment 3.16 Natural Lighting 3.16 Mandatory Standard Standard 3.16 3.16.0 Introduction
Mentions Health/Safety attributed to Natural Light with windows							CHAPTER III - Buildings and premises Chapter 2. Lighting and Sunlight Ad 1 - par 57 [Suitable daylight]	3. Environment 3.16 Natural Lighting Mandatory Standard 3.16
Stated Codes are limited to Dwellings and/or Residential Projects	CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation				Applicability of the International Residential Code			3. Environment 3.16 Natural Lighting Mandatory Standard 3.16
Adjoining Spaces receiving Natural Light		CHAPTER 12-INTERIOR ENVIRONMENT Section 1205 - Lighting 1205.2 Natural Light 1205.2.1 Adjoining Spaces	CHAPTER 12-INTERIOR ENVIRONMENT Section 1204 - Lighting 1204.2 Natural Light 1204.2.1 Adjoining Spaces		CHAPTER 3 - BUILDING PLANNING R303 - Light, Ventilation & Heating R303.2 Adjoining Rooms	DIVISION B - ACCEPTABLE SOLUTIONS Notes to Part 9 Housing and Small Buildings A-9.5.1.2. Combination Rooms.	CHAPTER III - Buildings and premises Chapter 2. Lighting and Sunlight Ad 1 - par 57 [Suitable daylight] Point 2.	3. Environment 3.16 Natural Lighting 3.16 Mandatory Standard Standard 3.16 3.16.3 Extensions
Specific areas can have artificial light instead		CHAPTER 12-INTERIOR ENVIRONMENT Section 1205 - Lighting 1205.3 Artificial Light	CHAPTER 12-INTERIOR ENVIRONMENT Section 1204 - Lighting 1204.3 Artificial Light		CHAPTER 3 - BUILDING PLANNING R303 - Light, Ventilation & Heating R303.1 Habitable Rooms Exception 2		CHAPTER III - Buildings and premises Chapter 2. Lighting and Sunlight Par. 58 [Lighting only with artificial light]	
Stated Sunshine Hours								CHAPTER III - Buildings and premises Chapter 2. Lighting and Sunlight Ad 3: par. 60 [Minimum room sunshine]

# Visual Analysis

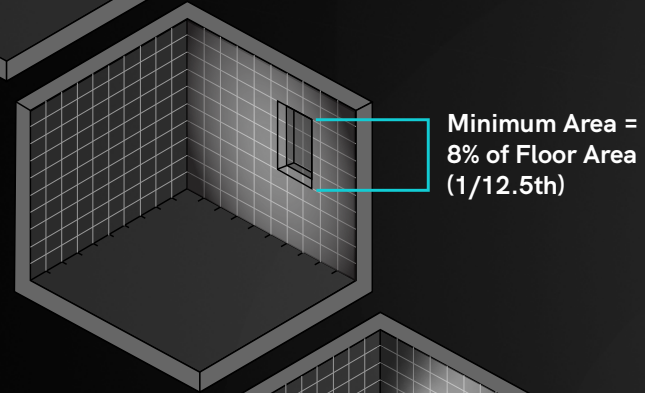
## Natural Light

Fig 1.3

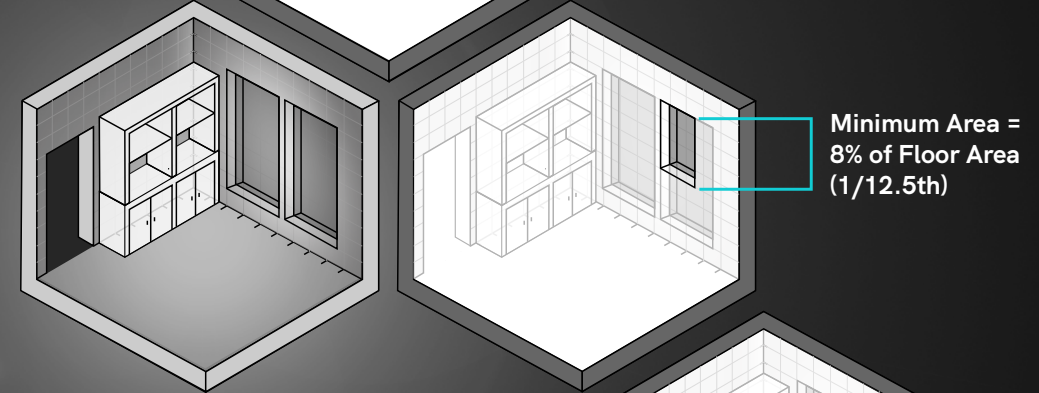
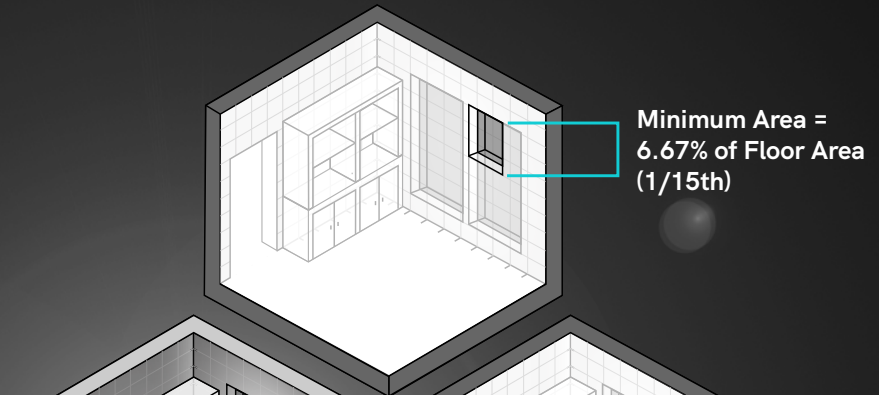
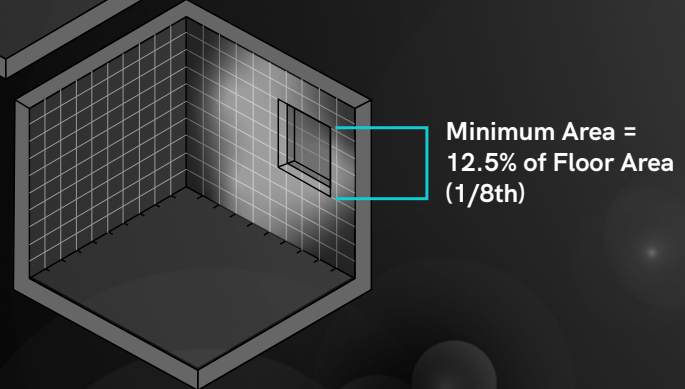
• Scottish Building Standards 2016



• Ann Arbor Municode 2013  
• Michigan Building Code 2015  
• International Building Code 2018  
• International Residential Code 2018

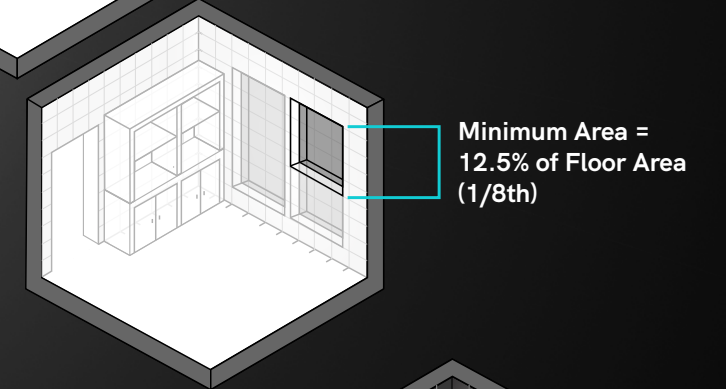


• Polish Construction Law



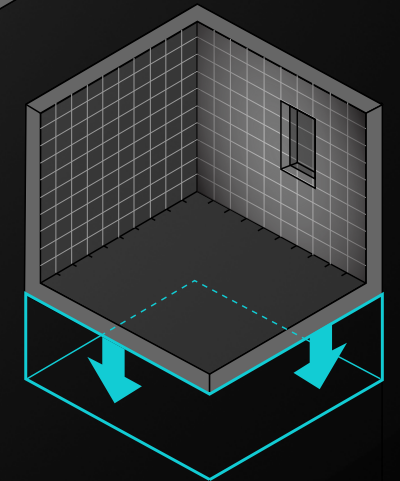
### WORK SPACE

- Greater Than 8% of Floor Area
- Reflected Natural Light



### CRITIQUE OF CODE

If the height were increased the code would not account for the now poor natural light quality, as the window still satisfies the 8% (6.67, 12.5%) of the floor area condition.



## Natural Ventilation

See **Table 1.1** for specific Sub-Codes



Of all the building codes that were analyzed, the ones that include the minimum existence of windows for the main purpose of Natural Ventilation are: the Ann Arbor Municode, Michigan Building Code, International Building Code, International Residential Code, the National Building Code of Canada, and Building Regulations from England.

Natural Ventilation considers the windows' ability to bring in outside oxygen for the purpose of circulation, as air inside a space can become old and stale, thus needing some fresh air to replace it. Conventionally, windows must be considered "operable" for this to happen, operable meaning that the glazed area can be moved in some manner to create an opening - a hole in the wall. The outside environment does the rest through pressure equalization. It is important to note that the codes which were not stated in this section, being the Polish Construction Law, and the Scottish Building Standards do mention aspects of Natural Ventilation, but they do not situate windows for providing natural ventilation as a minimum existence. What they do say about it is quite similar to what they said about the Minimum Existence for Natural Light, the Scottish Building Standards emphasizes the impact of natural ventilation on health by saying: "Ventilation of a dwelling is required to maintain air quality and so contribute to the health and comfort of the occupants" and that "lack of recognition of poor air quality has frequently resulted in occupants not being aware of the need to open ventilators or windows, particularly in bedrooms". With the Polish Constru-

ction Law, their stance towards ventilation is also quite similar to their perspective on natural light, as it states "Ventilation and air conditioning shall ensure the quality of the internal environment... complying with separate regulations and requirements of the Polish Ventilation Standards". It is a more conservative statement as it aligns the impact on health moreso with policies/standards.

After in-depth analysis of the codes, there were less general comparisons for natural ventilation but as a similarity to the Natural Light section, almost all of the codes in this section stated that windows existing to provide Natural Ventilation are to be applied to habitable spaces, the exception being the National Building Code of Canada. Additionally, it can be noted that the Ann Arbor Municode was the only code that stated specifically there is a need for insect screens on these windows to protect against insect infestation <sup>3.1</sup>. The idea of having a screen as an additional requirement of the window is interesting as screens - to a very small degree - can affect the level of permeability of the window, which in turn affects its ability to provide Natural Ventilation. Being a minimal effect, this does not cause issues but it is logically contradictory to the minimum existence.

Another potential, supplemental comparison exists with reference to the minimum sizing of the windows. On the basic end, there is the minimum sizing used for the purpose of natural ventilation and thus its associated minimum existence, but other purposes of sizing were mentioned due to the fact that these windows are typically operable. *It should be noted that these other potential methods for sizing minimum windows were spec-*

*ific to one type of code (at a time) and thus did not have enough adequate evidence to conclude them individually as minimum existences.*

The Building Regulations (England) and National Building Code of Canada both state that operable windows can be sized such that they prevent individuals falling out of the open window. They give guidelines to mitigate this but exiting through the window is always a potential outcome, sometimes as an intentional means of escape as will be seen in the Emergency Exit Section.

England's Building Regulations provides possible sizes of windows/sill height also for the purposes of being able to safely clean them <sup>1.1</sup>, while the National Building Code of Canada provides sizing options relative to the intention of preventing children from having access to them and potentially falling out <sup>2.1</sup>. It should also be noted that for this section of the investigation, looking at these minimum existences - or in other terms - analyzing these documents to find the code minimums, the National Building Code of Canada does mention a maximum glazing area which is dependant upon the amount of Wind Pressure, the type of situation, and the selected type of glazing unit <sup>2.2</sup>.

As mentioned previously, operable windows help provide natural ventilation as the glazing area of a window can be manually moved to create an opening. This component is used for quantifying the building codes' minimum sizing, as the codes in this section base the minimum existence of a window - for the purpose of Natural Ventilation - through the provision of a minimum glazing area, (as well as sometimes an angle of opening).

The following are the minimum glazing areas as stated by each of the codes, and grouped in situations where they have the same values:

---

*The Ann Arbor Municode, Michigan Building Code, International Building Code, and the International Residential Code states the minimum glazing area is to be **4% of the floor area.***

*The National Building Code of Canada provides a specified list (Full list in **Table 1.1**) that is based on the type of space, as well as if it is in a dwelling versus non-dwelling. For the overall purposes of the investigation, the baseline utilized was the one applied to dining rooms, living rooms, bedrooms, Kitchens, all combined rooms, dens, recreational rooms, and other Finished rooms in a dwelling, being **0.28 m<sup>2</sup> per room/combination of rooms.***

*The Building Regulations (England) state the minimum glazing area is to be **1/20th of the floor area of the room** - which translates to **5%** - for windows that **open 30° or more**, versus **1/10th of the floor area of the room** - which translates to **10%** - for windows that **open between 15° and 30°.***

---

See **Table 1.1** - Highlighted Boxes for M.E.

Ref. 8 - Scottish Building Standards 2016  
8.2 3. Environment - 3.14 Ventilation - 3.14.0 Introduction

Ref. 3 - Ann Arbor Municode 2013  
3.1 CHAPTER 105 - HOUSING CODE - 8:502 Minimum standards for light and ventilation - Point 5

Ref. 7 - Polish Construction Law  
7.3 CHAPTER IV - Technical equipment of buildings - Chapter 6. Ventilation and air conditioning - Par. 147 - [Ventilation & air conditioning]

Ref. 1 - The Building Regulations 2010  
1.1 APPROVED DOCUMENT N - Glazing - N4: Safe access for cleaning windows - 4.2 a.

Ref. 2 - National Building Code of Canada 2015  
2.1 DIVISION B - ACCEPTABLE SOLUTIONS - Notes to Part 9 Housing and Small Buildings - A-9.8.8.1.(4) Height of Window Sills above Floors or Ground

2.2 DIVISION B - ACCEPTABLE SOLUTIONS - Part 9 Housing and Small Buildings - Section 9.6. Glass - 9.6.1. General - 9.6.1.3. Structural Sufficiency of Glass - 9.6.1.3.-(Tables A - G)).



Table 1.1 - ME | Natural Ventilation

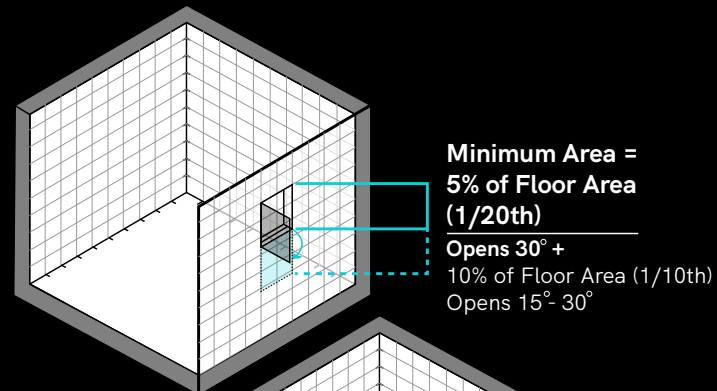
BUILDING CODE	Ann Arbor Municode 2013	Michigan Building Code 2015	International Building Code 2018		International Residential Code 2018	National Building Code of Canada 2015	The Building Regulations 2010
MINIMUM GLAZING AREA	CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation Point 2.	CHAPTER 12-INTERIOR ENVIRONMENT Section 1203 - Ventilation 1203.5 Natural Ventilation 1203.5.1 Ventilation Area Required	CHAPTER 12-INTERIOR ENVIRONMENT Section 1202 - Ventilation 1202.5 Natural Ventilation 1202.5.1 Ventilation Area Required		CHAPTER 3 - BUILDING PLANNING R303 - Light, Ventilation & Heating R303.1 Habitable Rooms	DIVISION B - ACCEPTABLE SOLUTIONS Part 9 Housing and Small Buildings Section 9.32. Ventilation 9.32.2. Non-Heating-Season Ventilation 9.32.2.1. Required Ventilation 9.32.2.2. Non-Heating-Season Natural Ventilation Table 9.32.2.2.	APPROVED DOCUMENT F Ventilation F1: Means of ventilation Appendix B: Purge Ventilation Windows
	Minimum = 1 window, sliding glass door, or skylight which can easily be opened, as well as other operable devices  4% of the habitable floor area of the room served	Minimum =  4% of the habitable floor area of the room served	Minimum =  4% of the habitable floor area of the room served		Minimum =  4% of the habitable floor area of the room served	Minimum = *See Next Cell for full Dwelling & Non-Dwelling List  Depends on type of room and if it is in Dwelling or not.	Within a Dwelling Unit  Bathrooms/Water-Closet Rooms 0.09 m <sup>2</sup>  Unfinished Basement Space 0.2% of the floor area  Dining Rooms, Living Rooms, Bedrooms, Kitchens, combined rooms, dens, Recreation rooms, and all other Finished rooms 0.28 m <sup>2</sup> per room/combination of rooms  Other than a Dwelling Unit  Bathrooms/Water-closet rooms 0.09 m <sup>2</sup> per water closet  Sleeping areas 0.14 m <sup>2</sup> per occupant  Laundry rooms, kitchens, recreation rooms 4% of the floor area  Corridors, storage rooms and other similar public rooms or spaces 2% of the floor area  Unfinished basement space not used on a shared basis 0.2% of the floor area
Maximum glazing area						DIVISION B - ACCEPTABLE SOLUTIONS Part 9 Housing and Small Buildings Section 9.6. Glass 9.6.1. General 9.6.1.3. Structural Sufficiency of Glass 9.6.1.3.-(Tables A - G)  Maximum = Determined by amount of Wind Pressure/situation	
Minimum Dimensions (Safe cleaning of windows)							APPROVED DOCUMENT N Glazing - safety in relation to impact, opening and cleaning N4: Safe access for cleaning windows 4.2 a.
Minimum can be collectively achieved by multiple openings							APPROVED DOCUMENT F Ventilation F1: Means of ventilation Appendix B: Purge Ventilation External doors
Height of Window Sills (Preventing children from falling out of openings)						DIVISION B - ACCEPTABLE SOLUTIONS Notes to Part 9 Housing and Small Buildings A-9.8.8.1.(4) Height of Window Sills above Floors or Ground	
Adjoining Spaces receiving Ventilation		CHAPTER 12-INTERIOR ENVIRONMENT Section 1203 - Ventilation 1203.5 Natural Ventilation 1203.5.1 Ventilation Area Required 1203.5.1.1 Adjoining Spaces					
Need for screens to protect against insects		CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation Point 5.					
Natural Ventilation Codes are applied to Habitable Spaces	CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation Point 2.	CHAPTER 12-INTERIOR ENVIRONMENT Section 1203 - Ventilation 1203.5 Natural Ventilation	CHAPTER 12-INTERIOR ENVIRONMENT Section 1202 - Ventilation 1202.5 Natural Ventilation		CHAPTER 3 - BUILDING PLANNING R303 - Light, Ventilation & Heating R303.1 Habitable Rooms		
Stated Codes are limited to Dwellings and/or Residential Projects	CHAPTER 105 - HOUSING CODE 8:502 Minimum standards for light and ventilation				Applicability of the International Residential Code	DIVISION B - ACCEPTABLE SOLUTIONS Table 9.32.2.2. See Above for Full Code Section Path	

# Visual Analysis

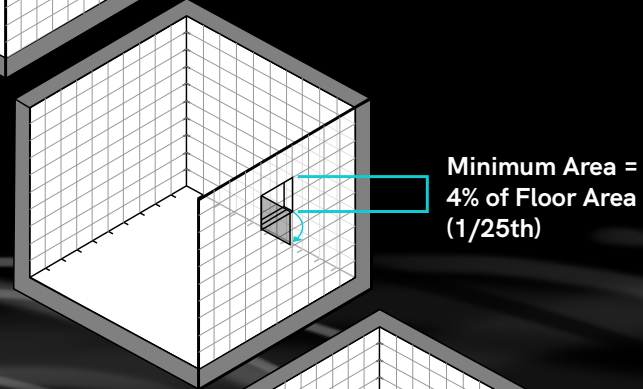
## Natural Ventilation

Fig 1.4

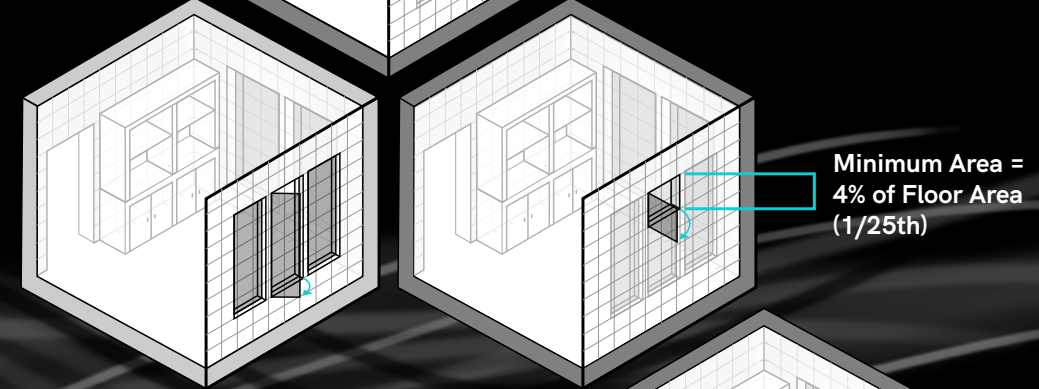
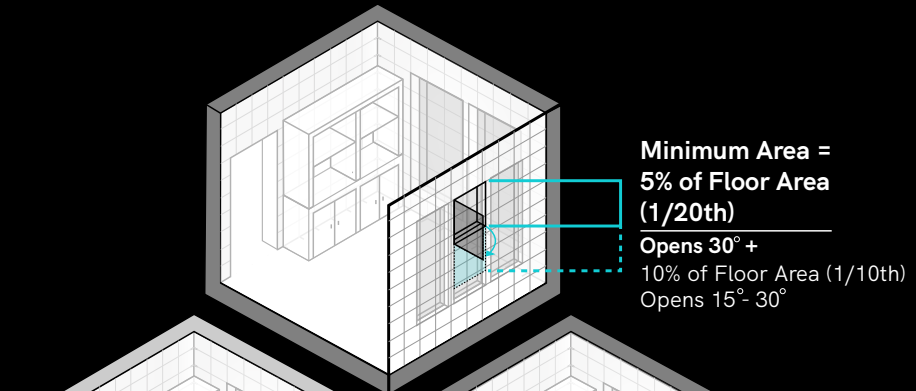
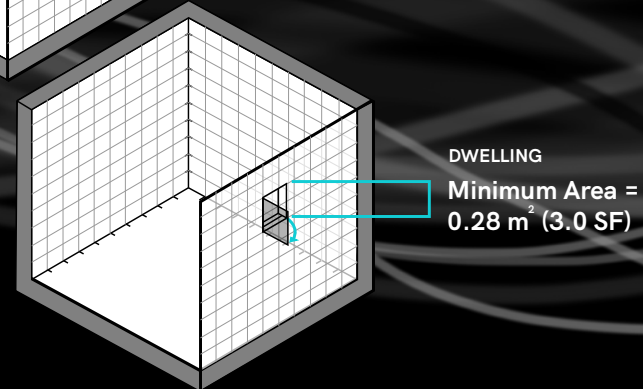
- The Building Regulations 2010



- Ann Arbor Municode 2013
- Michigan Building Code 2015
- International Building Code 2018
- International Residential Code 2018

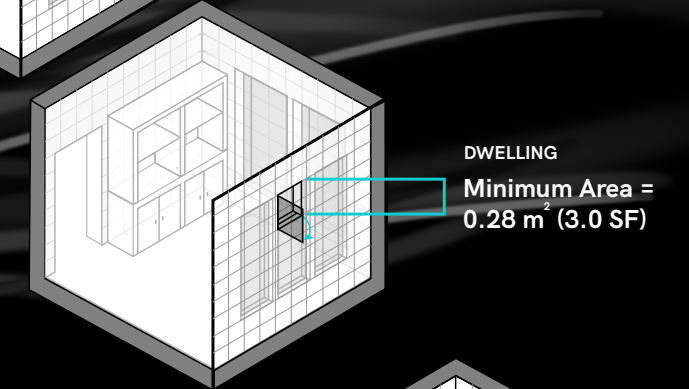


- National Building Code of Canada 2015



### MY WORK SPACE

- Greater Than
- 4% of Floor Area
- Opens Approx. 60°

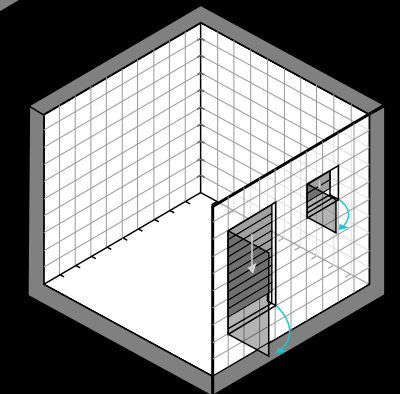


### CRITIQUE OF CODE

All Codes analyzed failed to mention unobstructed area for ventilation purposes, besides for Adjoining Rooms meaning air-tight blinds could be used to stop Natural Air.

### EXCEPTION

- National Building Code of Canada 2015
- The Building Regulations 2010



## Emergency Exits

See **Table 1.2** for specific Sub-Codes

**EXIT**

Of all of the Building Codes analyzed, the ones that include the minimum existence of windows for the main purpose of acting as an Emergency Exit are: the Ann Arbor Municode, the Michigan Building Code, International Building Code and International Residential Code, National Building Code of Canada, Building Regulations (England) and the Scottish Building Standards. (I.e. From the list of building codes, the Polish Construction Law was the only exception).

Emergency exit or emergency exit windows considers windows through their ability to act as a means of escape, and this is usually in the context of fire, as a building related reason. However, as an exit it is not limited to this situation alone as other scenarios that require escape can suffice as well. In most cases this is applied to a dwelling, with rooms such as bedrooms - that may be on a second or third floor - or basements - which can be partially underground - and need an additional emergency exit if the path out of the room (via doorway) is blocked by a fire. The main reason why Emergency Exit Windows are typically applied to solely residential contexts is nicely explained in the Building Regulations, which states: "With increasing height more complex provisions are needed because emergency egress through upper windows becomes increasingly hazardous"<sup>1,2</sup>. It is important to note that the building code that was not found in this section of the analysis being the Polish Construction Law, did mention some aspects of Emergency Exit, but they do not specifically situate windows that provide egress as an example of a minimum existence.

The Window acting as an Emergency Exit is similar to the last section of them providing Natural Ventilation, as they both achieve their minimum existences through the **Operability aspect of the window** (the fact that it can create a controlled opening). As such, the same examples mentioned in the last section - about codes stating additional purposes to minimally size the window based on its operability - also apply to this section as well, and thus will not be repeated. Instead another aspect which can be noted is an example of where the two minimum existences differ: the form of engagement the user has with the window when they open it. For Natural Ventilation, the user bears mostly a **Passive relationship** with the window's operability, as it is opened to allow outside air in, but after the initial opening the interaction between person and window ceases (until closing it later). In the case of opening the window to escape from the building in an emergency, the individual has an **Active relationship** with the window's operability, for it is opened to create a hole/void in the facade that the person immediately traverses through.

Similarly to the natural ventilation section, operable windows help provide a means of emergency egress with the glazing area of a window that can be manually moved to create an opening. It should be noted that traversal through an emergency exit window is not as seamless as a doorway. This is because the window is to be used for escape related purposes and as such, needs a minimum size to allow one to climb through it. This component is quantified in the minimum sizing, as the codes found in this section quantify the minimum existence of a window - for the purpose of being

an Emergency Exit - through the provision of minimum glazing area dimensions and a sill height. In some cases a minimum glazing area alone is mentioned and the code itself is modified when in a basement context.

The following are the minimum glazing areas as stated by each of the codes, and grouped in situations where they have the same values:

---

*The Ann Arbor Municode describes that the minimum glazing area shall have a **Height of 20"** by a **Width of 20"** (508 mm x 508 mm), with a **Sill Height of 54"** (1371 mm).*

Basement Context:

*The Minimum glazing area can reduce the above **Height to 16"** (406 mm) **OR** reduce the **Width to 14"** (356 mm), if the net clear opening area is at least **500 square inches (3.47 sq. ft | 0.32m<sup>2</sup>)**.*

*The Michigan Building Code, International Building Code, as well as the International Residential Code states the minimum glazing area shall have a **Height of 24"** by a **Width of 20"** (610 mm x 508 mm), and with a **Sill Height of 44"** (1118 mm).*

Additional Context:

*Minimum glazing area shall have a minimum net clear opening of **5.7 sq.ft (0.53 m<sup>2</sup>)**.*

*Grade floor openings shall have an area of that is at least **5 sq.ft (0.46 m<sup>2</sup>)**.*

*The National Building Code of Canada states the minimum glazing area shall have a **Height of 43"** by a **Width of 22"** (1100 mm x 550 mm), and a **Sill Height of 59"** (1500 mm).*

Additional Context:

*Minimum glazing area shall have an unobstructed opening of not less than **3.8 sq. ft (0.35 m<sup>2</sup>)** in an area with no dimension less than **380 mm**.*

*The Building Regulations from England as well as the Scottish Building Standards describe that the minimum glazing area shall have a **Height of 18"** by a **Width of 18"** (450 mm x 450 mm), with a **Sill Height of 43"** (1100 mm).*

Additional Context:

*Minimum glazing area shall have a minimum unobstructed openable area **3.5 sq. ft (0.33m<sup>2</sup>)**.*

---

See **Table 1.2** - Highlighted Boxes for M.E.

### Ref. 1 - The Building Regulations 2010

1.2 APPROVED DOCUMENT B - Dwellinghouses - B1: Means of warning and escape - Guidance - B1.i - Section 2: Means of escape - Introduction - 2.1

Table 1.2 - ME | Emergency Exit

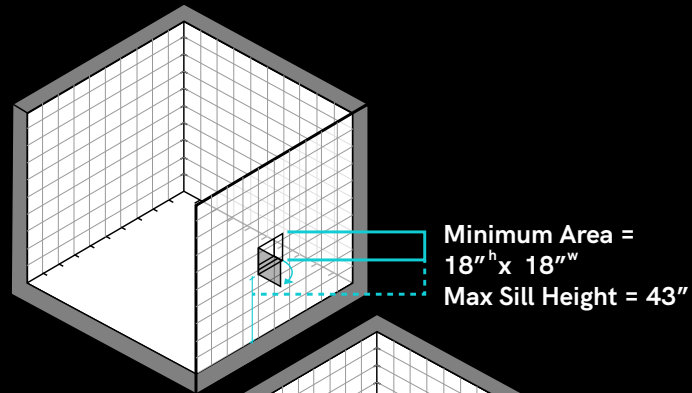
BUILDING CODE	Ann Arbor Municode 2013	Michigan Building Code 2015	International Building Code 2018		International Residential Code 2018	National Building Code of Canada 2015	The Building Regulations 2010	Scottish Building Standards 2016
MINIMUM GLAZING AREA	CHAPTER 105 - HOUSING CODE 8:502 Exits	CHAPTER 10 - MEANS OF EGRESS Section 1030 - Emergency Escape and Rescue 1030.1 General 1030.2 Minimum Size 1030.2.1 Minimum Dimensions	CHAPTER 10 - MEANS OF EGRESS Section 1030 - Emergency Escape and Rescue 1030.1 General 1030.1.1 Operational Constraints and opening control devices 1030.2 Minimum size 1030.2.1 Minimum dimensions 1030.3 Maximum height from floor		CHAPTER 3 - BUILDING PLANNING R310 - Emergency Escape and Rescue Openings R310.1 Emergency escape and rescue openings required R310.1.1 Operational constraints and opening control devices R310.2 Emergency escape and rescue openings R310.2.1 Minimum Opening Area	DIVISION B - ACCEPTABLE SOLUTIONS Part 3 - Fire Protection, Occupant Safety and Accessibility 3.4.7. Fire Escapes 3.4.7.3. Access to Fire Escapes Section 9.9. Means of Egress 9.9.10. Egress from Bedrooms 9.9.10.1. Egress Windows or Doors for Bedrooms 9.10.20. Firefighting 9.10.20.1. Windows or Access Panels Required	APPROVED DOCUMENT B Dwellinghouses B1: Means of warning and escape Guidance B1.i Section 2: Means of escape Introduction - 2.1 Provisions for escape from the ground storey - 2.3 Provisions for escape from upper floors not more than 4.5m above ground level - 2.4 General Provisions - 2.8 Emergency egress windows and external doors Basements - 2.13	2. Fire 2.9 Escape 2.9.0 Introduction 2.9.2 Escape within dwellings - options Table 2.3 - Escape within dwellings (Houses, Maisonettes) 2.9.3 Escape within dwellings - basement storeys 2.9.4 Escape within dwellings - escape windows
	Minimum Clear Opening = Height = 20" (508mm) Width = 20" (508mm)	Minimum Clear Opening = Height = 24" (610mm) Width = 20" (508mm)	Minimum Clear Opening = Height = 24" (610mm) Width = 20" (508mm)		Minimum Clear Opening = Height = 24" (610mm) Width = 20" (508mm)	Minimum Clear Opening = Height = 43" (1100mm) Width = 22" (550mm)	Minimum Clear Opening = Height = 18" (450mm) Width = 18" (450mm)	Minimum Clear Opening = Height = 18" (450mm) Width = 18" (450mm)
Maximum Sill Height	CHAPTER 105 - HOUSING CODE 8:502 Exits Point b.	CHAPTER 10 - MEANS OF EGRESS Section 1030 - Emergency Escape and Rescue 1030.3 Maximum Height From Floor	CHAPTER 10 - MEANS OF EGRESS Section 1030 - Emergency Escape and Rescue 1030.3 Maximum height from floor		CHAPTER 3 - BUILDING PLANNING R310 - Emergency Escape and Rescue Openings R310.2 Emergency escape and rescue openings R319.2.2 Window sill height	DIVISION B - ACCEPTABLE SOLUTIONS Notes to Part 9 Housing and Small Buildings A-9.9.10.1.(2) Window Height	APPROVED DOCUMENT B Dwellinghouses B1: Means of warning and escape Guidance B1.i Section 2: Means of escape General Provisions - 2.8 Emergency egress windows and external doors	2. Fire 2.9 Escape 2.9.4 Escape within dwellings - escape windows
	Maximum = 54" (1371 mm)	Maximum = 44" (1118 mm)	Maximum = 44" (1118 mm)		Maximum = 44" (1118 mm)	Maximum = 59" (1500 mm)	Maximum = 44" (1118 mm)	Maximum = 43" (1100 mm)
						"The Article does not set a maximum sill height for escape windows; it is therefore possible to install a window or skylight that satisfies the requirements of the Article but defeats the Article's intent by virtue of being so high that it cannot be reached for exit purposes. It is recommended that the sills of windows intended for use as emergency exits be not higher than 1.5 m above"		

# Visual Analysis

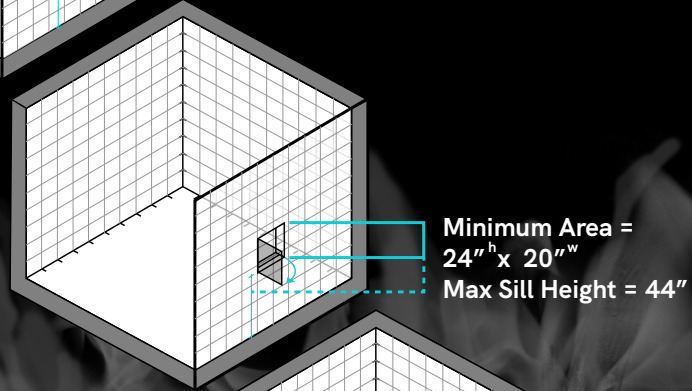
## Emergency Exit

Fig 1.5

- The Building Regulations 2010
- Scottish Building Standards 2016

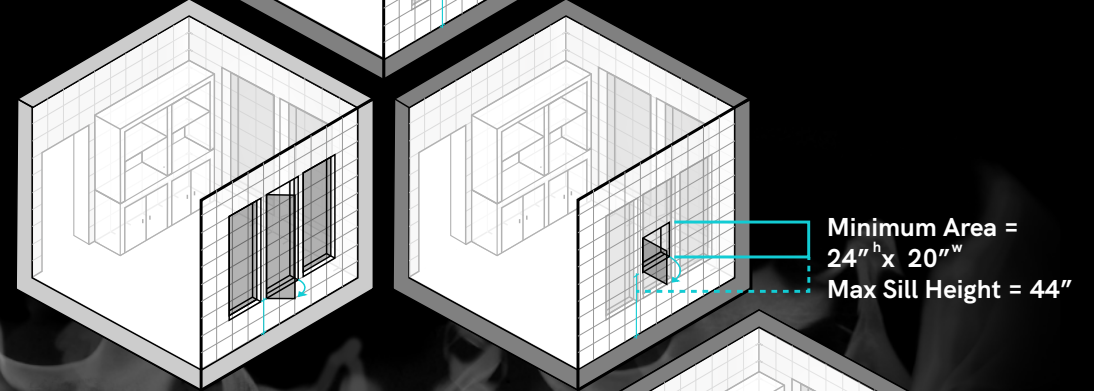
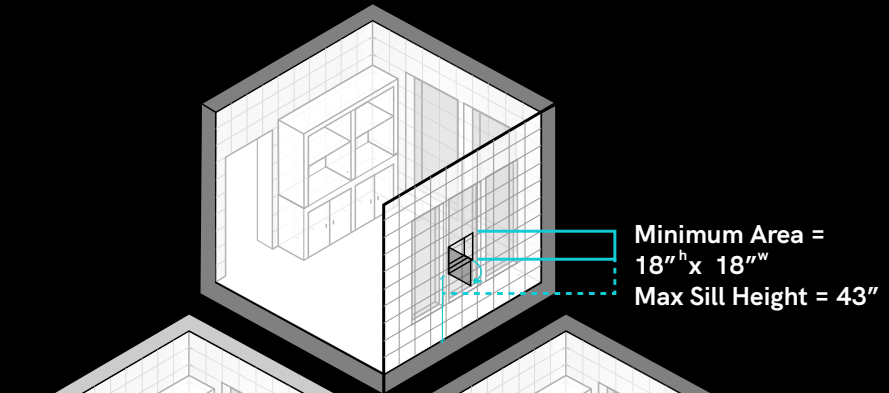
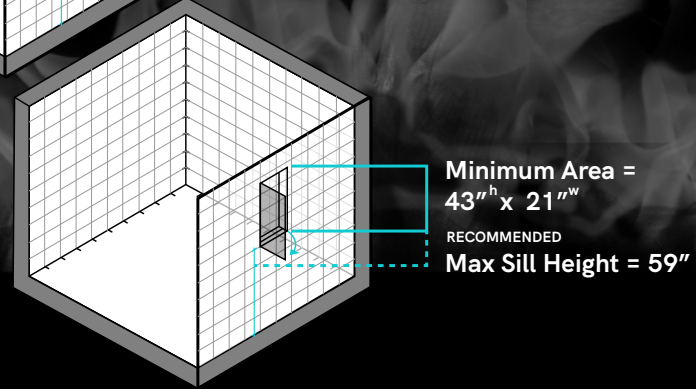


- Ann Arbor Municode 2013 (20"<sup>h</sup> x 20"<sup>w</sup>) / (508 mm x 508 mm)
- Max Sill Height = 54" (1371 mm)



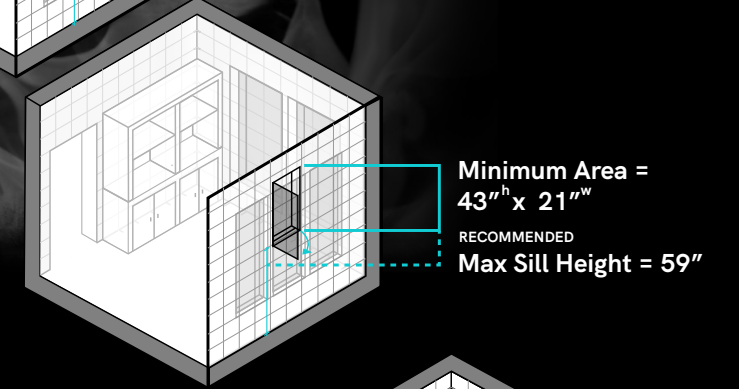
- Michigan Building Code 2015
- International Building Code 2018
- International Residential Code 2018

- National Building Code of Canada 2015



### MY WORK SPACE

- Approx. 72"<sup>h</sup> x 24"<sup>w</sup>
- (1836 mm x 610 mm)
- Sill Height = 24"
- (610 mm)

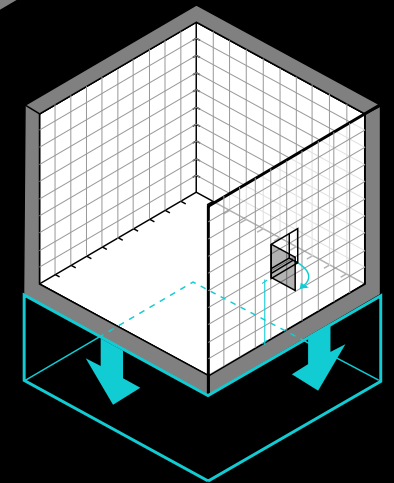


### INTENTION OF CODE

National Building Code of Canada 2015

DIVISION B | Notes to Part 9 | A-9.9.10.1.(2)

The code states that without a max sill height one could defeat the INTENT of the Code.



## Analysis of Codes - Main Findings

After analyzing all of the selected Building Codes for this area of the investigation, some potential conclusions can be made.

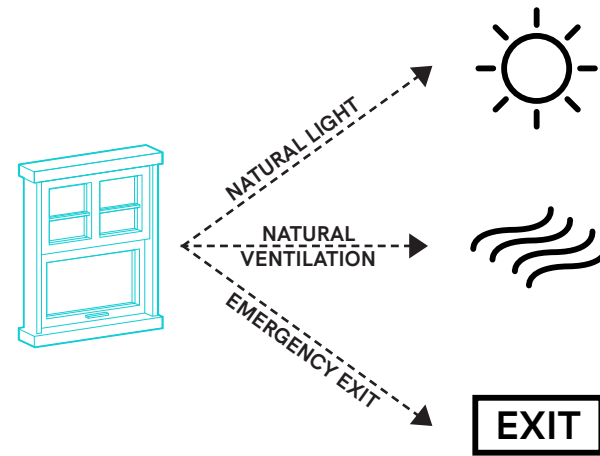
Firstly, there is the central idea that the building codes stated three qualified minimum existences for windows, these being: **Natural Light**, **Natural Ventilation**, as well as **Emergency Exit**. The fact that these are included in building codes means that the conventional perception of windows has relevancy to mandated construction law. As explained previously, this is because finding M.E's in the code suggests that there are specific purposes/situations for which windows *must* legally be present, (and thus they were added to these forms of construction documentation).

These minimum existences were specifically defined by the building codes through the provision of minimum sizes of windows needed to accomplish specified purposes. More specifically, this translated to stating the sizing to either be based on dimensions or by an area.

See **Fig 1.7** for specifics on which Building Codes stated which minimum existences.

At its face value, there are some important comparisons to be made about which codes state which minimum existences. In the North American section of building codes, all of them state the three M.E's found, except the National Building Code of Canada which did not mention the minimum existence of windows for the purpose of Natural Light. On the other end with the European codes, the results are more varied. The Building Regulations from England only stated one of the minimum

Fig 1.6 - Window's Provision of M.E's



existences, and this was natural ventilation. The Polish Construction Law also only mentioned one minimum existence, being Natural Light, and the Scottish Building Standards mentioned two existences: Natural Light and Emergency Exit.

As previously explained, it is important to note that although a particular building code(s) may/may not mention a minimum existence, this does not necessarily mean they feel that windows do not serve that purpose. As it was seen in many examples, the code(s) at question did not emphasize the aspect enough that it can be classified as a minimum existence, although brief statements were typically made surrounding that aspect.

In any case, it can be concluded that **according to construction law, windows must exist to provide natural light, natural ventilation and emergency exit to the inhabitants of a building.**

NORTH AMERICA/INTERNATIONAL				
UNITED STATES	Ann Arbor Municode 2013	X	X	X
UNITED STATES	Michigan Building Code 2015	X	X	X
*INT. <small>Drafted by the International Coding Council (ICC), but applied to certain countries.</small>	International Building Code 2018	X	X	X
	International Residential Code 2018	X	X	X
CANADA	National Building Code of Canada 2015		X	X

## EUROPE

ENGLAND	The Building Regulations 2010		X	
POLAND	Polish Construction Law	X		
SCOTLAND	Scottish Building Standards 2016	X		X

Fig 1.7 - Minimum Existences Found

Windows have a minimum existence for the purposes of providing Natural Light, Natural Ventilation, and Emergency Exit.

1. APPROVED DOCUMENTS (B, F, M, N). HM Government: *The Building Regulations 2010*, 2010  
 2. Canadian Commission on Building and Fire Codes. *National Building Code Of Canada 2015*. 14th ed., NRCA, 2015.  
 3. Ann Arbor Municode Library. *Library.municode.com*, 2013, [https://library.municode.com/mi/ann\\_arbor/codes/code\\_of\\_ordinances?nodeId=COANARMI](https://library.municode.com/mi/ann_arbor/codes/code_of_ordinances?nodeId=COANARMI)

4. International Building Code (IBC). *International Coding Council (ICC)*, 2018  
 5. International Residential Code (IRC). *International Coding Council (ICC)*, 2018.

6. Michigan Department of Licensing & Regulatory Affairs: Bureau Construction Codes. 2015 Michigan Building Code. International Code Council (ICC), 2017.  
 7. Polish Regulation Concerning Building Technical Requirements And Building Localization. Polish Ministry Of Infrastructure, 2002, [https://architektura.info/prawo/warunki\\_techiczne\\_budynki](https://architektura.info/prawo/warunki_techiczne_budynki).

8. Technical Handbook - Domestic. Scottish Building Standards 2016, 2016, <https://www2.gov.scot/resource/buildingstandards/2016Domestic/chunks/index.html>.

The three analyses - that were shown after the M.E charts - were created to visualize and extend the minimum existence findings from the codes. All of the compositions followed a similar format, where they are divided into three sections of different axonometric drawings for a chosen space/room. This room is the workspace of the author, which will be used here and in later parts of the investigation as well.

### Section 1

The first section shows, to scale, the size of the code minimums relative to a space that has a one hundred sq. ft floor area, and this is a significant point to make as many of the codes define the minimum glazing area relative to the floor area.

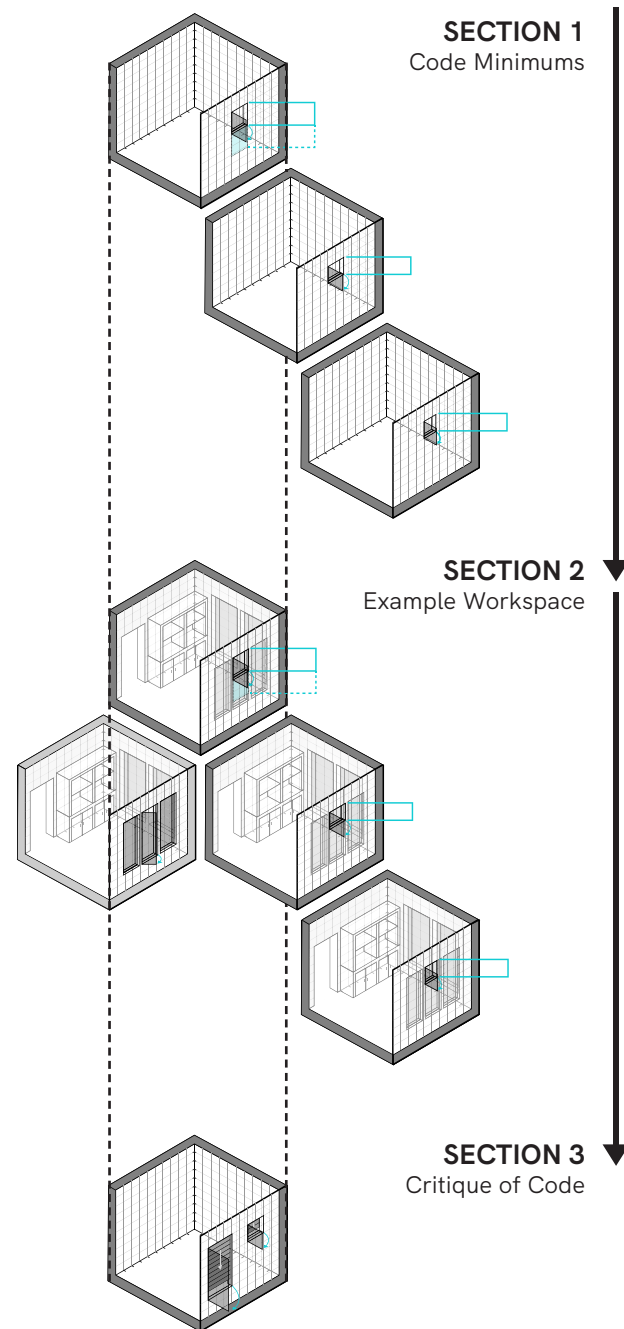
### Section 2

The second section features the example workspace followed by overlaying the code minimum sizes of windows overtop the ones in the example, and this is done to show the applicability of the minimums to an average scenario.

### Section 3

The final section is a critique of the code, which is an area to question if there may be loopholes in which one could legally defeat the intent of the code. This is done to both extend and challenge the code minimums, which in turn tests their applicability. By trying to defeat the intention of the building code, may also suggest how one can legally defeat the intention of the window as well. It may also suggest that objectivity has limitations.

Fig 1.8 - Visual Analysis Structure



With **Natural Light**, after comparing the building code minimum sizes to the workspace example, it can be seen clearly for all minimum existences the fact that these are *minimums sizings* as imagining only having the baseline in a space seems qualitatively not enough.

For the critique of the Building Codes on Natural Light, there does exist a loophole. Of the building codes that were analyzed, not one stated a mandated sill height, which means that for this conceptual space which has a specified area, so long as the minimum area of the window is provided, then it is legal. So if one were to extend the height of the space tremendously and elevate the window it would still be legal. This is a concerning finding because doing this would defeat the main intention of the code, and more importantly the function of the window as well, for placing the window way too high means that natural light will not be able to filter down into the space.

With the M.E of **Natural Ventilation**, the code's minimum sizes compared to the workspace example illustrates that the baseline again appears to be quite small for the space, although it may still provide enough fresh air with continual usage over the passage of time.

A potential loophole in this analysis was found, but both the National Building Code of Canada 2015, as well as England's Building Regulations 2010 addresses it, while the other six codes do not. In this sense finding a way around the code is a little more difficult. The loophole arises in this section when some codes say "clear opening" as opposed to an "unobstructed area".

One could not put a wall inside the space that is right in front of the window, as this would turn it into an adjoining space, which all the codes address for ventilation, but there is discrepancy on if it is legal for placing something such as louvres or air tight blinds that could block the airflow.

For the M.E of **Emergency Exit**, comparing between code minimum sizes to the workspace example, the baseline again appears to be small for the space and for the purpose of escaping.

No potential loophole was found with this type of M.E as all of the building codes mentioned a maximum sill height - if they did not then the argument could be similar to the Natural Light section (where you could place the window too high to be accessed). However there was an interesting find related to seeking loopholes within one of the eight building codes.

An important aspect from a critiquing side is that a specific code found within the National Building Code of Canada, for Emergency Exit Windows, talks about the previously mentioned intention of building codes. It suggests that it is possible to, "install a window or skylight that satisfies the requirements of the Article but defeats the Article's intent by virtue of being so high that it cannot be reached for exit purposes" <sup>2,3</sup>. This is an interesting thing to find, in that for all of the building codes only one of them describes the same concept of defeating the codes' intent. It is most likely that all of the building codes are still aware of the idea to defeat the intent of the code, but it is questionable why it is not mentioned - at least in the situations where it could occur (sill height).

Ref. 2 - National Building Code of Canada 2015  
2.3 DIVISION B - ACCEPTABLE SOLUTIONS - Notes to Part 9  
Housing & Small Buildings - A-9.9.10.1.(2) - Window Height

## What about Views?

**V**iews are an important component of windows, as they are provided by the translucent or transparent glazing area of the window - an element that has been continually mentioned with this part of the investigation. Views are known for providing visibility to the exterior from inside and vice versa. Yet for being an important and widely known quality of windows, why is it that they were not mentioned as a Minimum Existence?

It should first be noted that buildings codes are associated with the legality of all aspects involved with constructing buildings - including windows - so for something to be included in these codes such as the element of views, requires a strong enough reason to be mandated with law. For example, comparing views to emergency exits (as a minimum existence) the latter can easily be understood for being situated in law, as it concerns the safety of individuals in a building. Where the distinction may be harder to discern is comparing the element of views with natural lighting and natural ventilation. The latter two M.E's are included in varying degrees in the different building codes, as it affects the health of the inhabitants as opposed to strictly safety (although health could be argued as method of safety for the residents). This is an especially important fact considering that natural light and natural ventilation can be technically replaced without the need for a window: light can be provided by artificial light, and outside air could be brought in with a fresh air intake system. This further reinforces the fact that for these two minimum existences, the need for windows are oriented towards the promotion of healthy inhabitants, but it still does not answer the central question at hand.

10. FindLaw's Team of Legal Writers and Editors. "Can my Neighbor Legally Block my View? - Findlaw". *Findlaw*, 2018, <https://www.findlaw.com/realestate/neighbors/can-my-neighbor-legally-block-my-view.html>.

One answer, based off the fact that minimum existences of windows were shown to be present in building codes, is to say that codes see windows as conventionally always being present in buildings, and as such views are provided whenever a window is constructed. Although this may be potentially true, a better answer would be to suggest that the reason is due to the fact that views are highly variable to building context, and the codes are supposed to provide objective guidelines/laws that can be quantifiable. As a result, views are not usually enforced - although in some cases they can be at the municipal level. One of the eight buildings codes that was selected was the Ann Arbor Municode, one such example of a municipal-level code.

*NOTE: Views were not enforced in this document.*

When the element of views is enforced, the technical term for the code that enforces it is called a View Ordinance. "In areas where property owners have scenic views, like cities and towns near the ocean, a view ordinance is often in place that may protect your view from any trees on neighboring properties that might block it" (Findlaw 2016). When it comes to trying to enforce views, there needs to be a significant reason(s) to do so, and due to the variance of views, is why they are not found in main building codes, as those documents can not prescribe a general directive.

For contexts that do not have view ordinances in place, there are still possible methods to enforce them. These include either drafting an easement which is a: "written contract granting a non possessory interest in another individual's land" (Fi-

11. FindLaw's Team of Legal Writers and Editors. "View Ordinances - Findlaw". *Findlaw*, 2016, <https://www.findlaw.com/realestate/neighbors/view-ordinances.html>.

BUILDING CODE	National Building Code of Canada 2015	Scottish Building Standards 2016
Any codes related to views and windows	DIVISION B - ACCEPTABLE SOLUTIONS Notes to Part 3 Fire Protection, Occupant Safety and Accessibility A3 - Application of Part 3 A-3.8.2.3. Access to Rooms and Facilities.	CHAPTER VII - Safety of use Par. 293. [Requirements for the placement of equipment and structures]
Stated that windows are a form sound insulator		3. Environment 3.14 Ventilation 3.14.0 Introduction
Stated that windows are a form of environmental separator	DIVISION B - ACCEPTABLE SOLUTIONS Notes to Part 5 Environmental Separation A-5 Environmental Separation A-5.1.4.1.(2) Materials, Components and Assemblies with Multiple Functions	

Table 1.3 - | Other Related Information

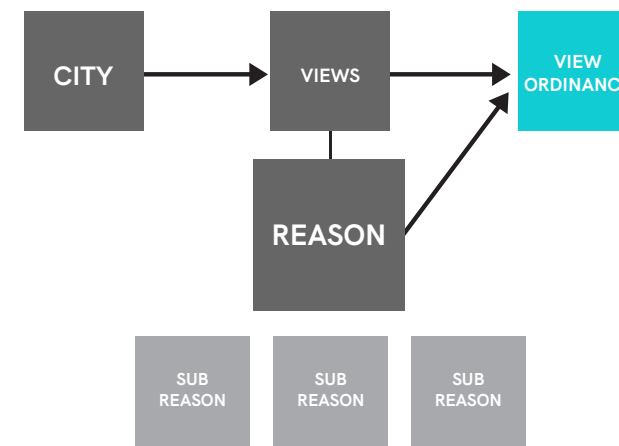
Table 1.3

This Table displays additional information from the Building Codes analyzed, stating other purposes or classifications of windows than the M.E's

Note:

*Not enough potential evidence was present to be able to fully classify these additional definitions as minimum existences for windows in this section.*

Fig 1.9 - Enforcing Views in Code



dlaw, 2016). take legal action if a neighbor(s) is maliciously or intentionally trying to block one's view. It should be noted that a land attorney may be required in these types of scenarios.

In summary: "if one constructs a lawful structure on his property that happens to block the view of his neighbor, there may be little that the neighbor can do to prevent this" (Edwards, 2018). This is why the aspect of views is not typically found in codes, and thus they are not a M.E for windows. This does not mean that windows should not provide views, or that views are not critical to the health of people, the main point is that they are a difficult element to regulate. Furthermore, even if codes did prescribe laws enforcing views, there could be a plethora of situations where the laws would be ineffective and inconsiderate.

2. Canadian Commission on Building and Fire Codes. *National Building Code Of Canada 2015*. 14th ed., National Research Council Canada, 2015.

8. Technical Handbook - Domestic. *Scottish Building Standards 2016*, 2016, <https://www2.gov.scot/resource/buildingstandards/2016Domestic/chunks/index.html>.

9. Edwards, Alistair. "PROPERTY: Construction Of Structure Blocking a Neighbor's View Not a Nuisance". *Nlrg.Com*, 2018, <https://www.nlrg.com/legal-content/the-lawletter/property-construction-of-structure-blocking-a-neighbors-view-not-a-nuisance>



## Conclusion

### A Reflection on the Section.

Looking at various Building Codes requires sifting through a plethora of information, which can be confusing at first, but when one is looking for something specific, the documents which unearth layers of complex and intertwining information. From the overall standpoint of proving that Windows are critical for our health and well being, looking through multiple forms of building codes is a logical starting point, but it can be difficult in terms of what needs to be pulled from the text to strengthen the argument. Deriving the Minimum Existence (M.E.) was a method to do this, as from a logical standpoint if a code mandates something must be a minimum size, while also not stating situations where one could get away with not having this element, then it must exist and because it achieves an intended purpose. Coupling this with the fact that the building codes are law, if Windows can be correlated to having to exist in them, then one can conclude that Windows contain legal grounding. This idea that building codes are created, as well as modified extensively/continually, all for the purpose of promoting the health and safety of people is a humble goal. So for windows to be situated in these texts bestows that same humble purpose.

With the investigation there was evidence of three minimum existences, which again mean Windows are important as they (by law) must exist to serve the purposes of: Providing Natural Light, Natural Ventilation, and acting as an Emergency Exit.

This section could have concluded there as this point is the main concluding part of the sub-area of research, and doing so would leave it a concise point, but also at a one-dimensional side.

Comparing the minimums and related information more in depth between all the building codes that were analyzed, allows for the enrichment of



knowledge surrounding how these M.E.'s are to be perceived. The fact that one code may choose a different type of wording compared to another is enough of a possibility that there is a different associated perception(s). Intriguing relationships were discovered, as some codes like the Michigan Building Code, International Building Residential Codes stated the same minimum sizing for minimum existences, suggesting possible inspiration from one document to the other, while other texts such as the Building Regulations and the Scottish Building Standards aligned at a single point only. This creates questions between building codes, including how they are generated, and why they prioritize certain elements.

The Visual Analyses also help to extend the research by being able to visualize what these code minimums really mean, as well as what lessons can be learnt from them. This also gave the ability to challenged them. Being able to visualize - to scale - the minimum sizing of windows allows one to see a conceptual size, but this is isolated in its



own conceptual space and thus lacking relativity. By looking comparatively with an example of a workspace, the idea of what these codes as minimums mean can be illustrated. This precedent was quite instrumental, as it demonstrated that although codes may be achieved on paper, the way one designs can impact the overall effectiveness of the window (past any sense of mandated law). From this the idea of thoughtfulness arose as something that should be utilized.

This section of the larger investigation helped to establish a basis for proving that there is an objective grounding for Windows to exist, as well as the fact that their existence is positively correlated to the health and safety of people. However, in this smaller area of the investigation, windows have been analyzed through a conventional representation. Windows can also have the potential to affect a person's psychological health as well, so to further ground that windows are critical for our health and well being, it is important to consider all aspects, quantitative and qualitative.

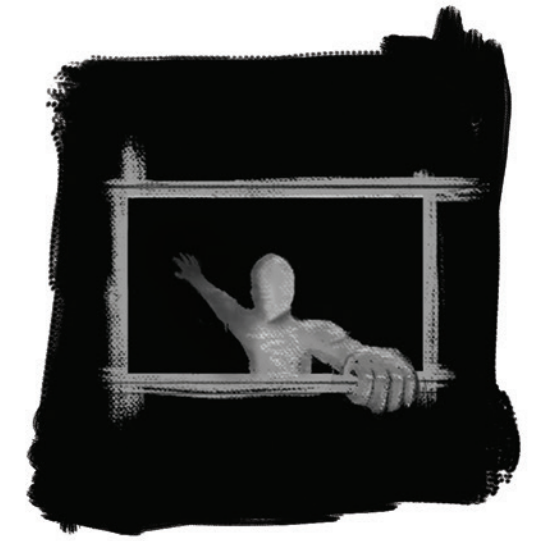


Fig 1.10 - (From left to right)  
Light, Breeze, Escape

The Minimum Existences are seen objectively, but there is a power to seeing them as also a dramatic expression.

# Windows are Critical for our Health & Well Being

## Building Code For Windows

PGs. 18 - 49

Looking at the minimum existences of windows to achieve specific purposes as stated in various Building Codes.



## Psychology of Windows

PGs. 50 - 95

Looking at the various associated effects of lockdown/ having windows in general context as well as using a survey to form correlations on the basis of Psychology.



EXIT

## Table of Contents

### Psychology of Windows

Introduction .....	52 - 53
General Psychology / Situations .....	54 - 61
Specific Psychology / Situations .....	62 - 83
Extremes of Windows .....	84 - 87
Visual Analysis for Psychology .....	88 - 91
Conclusion .....	92 - 93
<b>The Conventional Perception .....</b>	<b>94 - 95</b>

<b>Fig. 2.0 - Breaking down Psych. of Windows</b>	53	<b>Fig. 2.8 - Visual Analysis of Windows</b>	88
<b>Fig. 2.1 - Effects of Mandated Isolation</b>	56	<b>Fig. 2.9 - Extending the window's perception</b>	93
<b>Fig. 2.2 - Three Main Aspects of Windows</b>	61		
<b>Fig. 2.3 - The Need for a Survey</b>	63	<b>Table 2.0 - Research Question 1: Findings</b>	71
<b>Fig. 2.4 - Research Question 2: Findings</b>	77		
<b>Fig. 2.5 - Research Question 3: Findings</b>	82		
<b>Fig. 2.6 - White Torture</b>	85		
<b>Fig. 2.7 - The Farnsworth House</b>	87		

# Psychology of Windows

## Introduction

This introduction for the Psychology of Windows section shall explain what it encompasses, as well as its relevance/association to the larger argument and investigation.

### Scope

To continue to prove that windows are critical for our health and well being, it is important to analyze the psychological aspect. Delving into the field of Psychology can help to uncover why some actions or processes - which may seem innate or expressed without associated conscious thought - can objectively occur. As it will be investigated in this portion of the research, windows and mandated isolation both have the ability to give psychological or physical effects on individuals, along with the difficulty of tracing them back to these sources. This aspect is why psychology is being consulted with, to reveal hidden aspects of Windows and to fortify the larger argument.

### Methods

This section will be looking for the qualitative effects for a few main areas surrounding windows and mandated physical isolation, with the connections/correlations between these areas. This has been translated to separating general versus specific areas of knowledge, to ensure that each topic can be first analyzed on its own, before connecting them. In the General Area, the potential psychological effects of being in mandated isolation and for having windows will be analyzed; these subjects are under General as they remain conventionally more open-ended with regards to their associated context. In the Specific Area, the previous topics are combined and applied intentionally towards the investigation, looking at the potential psychological effects of having windows in mandated physical isolation. More specifically this will be investigated with a survey, as current

research examining the potential effects of windows within these specific contexts has not been extensively explored. Doing so will reinforce the larger argument that windows are critical for our health and well being.

### Assumptions and Limitations

The Psychology of Windows section bases its research upon a specific, conventional perception of a window, and this may limit the application of its findings. Additionally, because there is a lack of research surrounding how windows affect people in situations of mandated physical isolation, a survey was used. Although this survey received an acceptable amount of participants (114), further investigation could be conducted to provide more accurate results and conclusions.

### Relevance to the Larger Argument

*Windows are critical for our health and well being.*

If evidence can be found that windows positively affect people in situations of mandated physical isolation, then this reinforces the larger argument that windows - in the context of the investigation - are critical for our health and well being. This combined with the findings of the Building Code for Windows section, provides a strong argument - as well as adequate reason - for choosing windows to become an essence of connectivity.

### Relevance to the Overall Investigation

With windows now having solid reasons for being chosen to fulfill this connective role, this will help to guide the research that is to come as well as to provide an opportunity to redefine the element. The main way this will occur is based on the fact that both areas under this larger argument were limited to a conventional perception of windows, so seeking additional perceptions is logical.

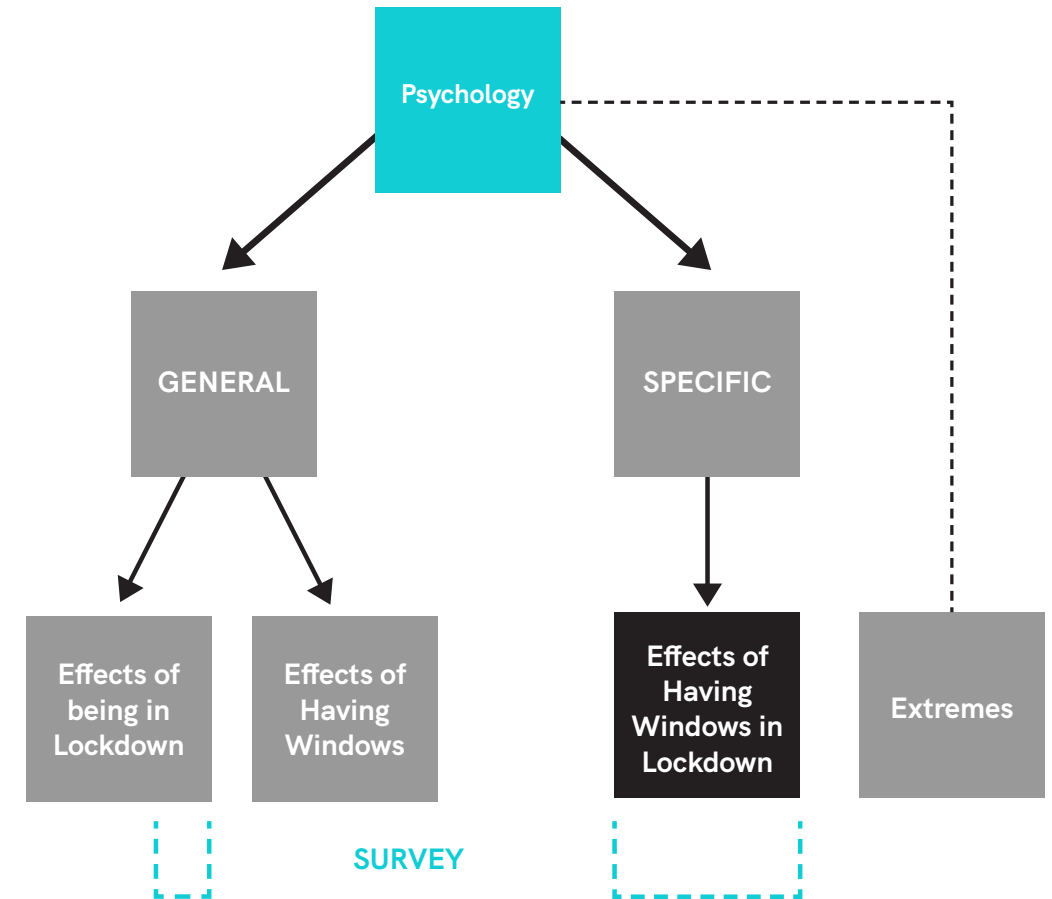


Fig 2.0 - Breaking down Psych. of Windows

Research exists for the effects of lockdown and windows separately, but there is a gap when connecting the two.

**T**his section utilized useful information from a source (published in February 2020), titled:

Statement of Citation

**“The psychological impact of quarantine and how to reduce it: rapid review of the evidence”**, written and edited by Samantha K Brooks, Rebecca K Webster, Louise E Smith, Lisa Woodland, Simon Wessely, Neil Greenberg, Gideon James Rubin.

This source summarized reviews of twenty four studies that focused on the psychological effects of being in quarantine for different sicknesses.

To adequately analyze the psychological effects of mandated physical isolation, it is important to first understand what quarantining and isolation mean. Quarantining is an action that typically involves: “separation and restriction of movement of people who have potentially been exposed to a contagious disease...reducing the risk of them infecting others” (Brooks, Samantha K. et al 912). While quarantining seems to be more of a pre-emptive measure, this is as opposed to Isolation, which is more specifically the separation of people who are diagnosed with the sickness, for the same purpose of trying to keep the sickness from spreading to others (912). For the investigation these terms are unified by the same main aspect:

### Mandated Physical Isolation

(Also referred to as “Lockdown”)

*The idea that because a contagious sickness exists, people are mandated by the government to stay at home, regardless if they have or have not contracted/been diagnosed with the sickness.*

### Why is it important to analyze the potential psychological effects of lockdown?

At the time of this writing, the Covid-19 pandemic was occurring which led to the virus - as well as extended, mandated physical isolation - to negatively affect the well being of people. To better encapsulate the feeling associated to this time, the author provides a monologue to describe the harms of mandated isolation:

*“The Covid-19 Pandemic forced us to quarantine, to isolate, and be disconnected from each other. In this loneliness, I experienced damage to the point that I realized my thoughts were not even my own, life seemed bleak and I could not separate my darkness from identity. How could have this happened? How do I free myself from this mental limbo? I was lucky to have my loved ones continually fight against my darkness, even when in my confusion it seemed that they must be against me. It took a while to break free and realize the actual me had been subdued under all this negativity, but I know I am not the only one who was damaged because of this isolation. The fact that mental health seemed to be overlooked initially due to the larger pandemic situation, is why the psychology of lockdown needs to be made aware of”*

- Jordan Zanier

Quarantining has a basis of good intentions, and individuals need to see that larger picture, but it is as equally important that as the health of patients with Covid-19 must be looked after, so too should be the people experiencing psychological

### Potential Psychological Effects:

- Depression
- Anxiety
- Stress
- Post-traumatic stress
- Distress
- Irritability
- Anxiety-induced Insomnia
- Stigmatization
- Suicide
- Social Detachment

### Potential Psychological Feelings:

- Emotional disturbance/exhaustion
- Low mood
- Anger
- Confusion
- Grief
- Numbness
- Boredom
- Frustration
- Loneliness
- Sense of being Trapped

The list of potential effects and feelings that can be experienced is quite numerous. Usually multiple effects and/or feelings can be experienced at the same time causing increasing distress.

damage because of isolating. This is a real cause for concern, which is to be uncovered in this area of the investigation.

With lockdown there is a conflict of health, between trying to keep people safe and healthy by keeping them at home in isolation, with the potential negative psychological effects of doing so for extended periods of time. In this sense questions arise, as how does one ethically balance the two? Should it be based off of Utilitarianism, with an approach of a net sum of good? These are difficult questions to answer, but what is important to understand is that there are issues that exist.

There are a plethora of psychological effects and feelings that can result from being isolated for extended periods of time. **Effects** are distinguished as quantifiable conditions or actions which may result from the isolation, while **Feelings** are more qualitative conditions that may also be present. It is important to document both sides, as in many cases a combination of effects and feelings may be experienced by the individual.

After analyzing the various potential psychological effects/feelings stated by the various studies in the article, a more concise list can be developed. (See left). It is important to note that the list is not necessarily a prescription of what will or will not happen under mandated physical isolation. In some situations people may be happy staying at home, but the purpose of this specific sub-section is to illustrate what can possibly occur, as found in studies that span over different contagion events. What can be concluded, is the idea that there is an associated risk to isolation.

13. Brooks, Samantha K. et al. “The Psychological Impact of Quarantine and How To Reduce It: Rapid Review Of The Evidence”. *SSRN Electronic Journal*, 2020. Elsevier BV, doi:10.2139/ssrn.3532534.

### What causes these effects/feelings?

Potential causes include, but are not limited to:

- Duration of Quarantine
- Fears of Contagion
- Frustration/Boredom
- Lack of Supplies
- Lack of Information
- Financial Situation
- Stigmatization

(Brooks, Samantha K. et al 916).

The **Duration of Quarantine** can cause these issues if it gets extended, or simply is a long period of time, as many of these effects/feelings will develop the longer the isolation period. **Fears of Contagion** is more variable on the sickness itself, as for example, one demographic may be more susceptible to it than others, and thus being fearful of the sickness. **Frustration/Boredom** results in the fact people are restricted to one building for a period of time, although this also is variable depending on if the individual can occupy themselves with things to do. In situations such as the Covid-19 pandemic, where people are stocking up on essential supplies - too much so at times - it can cause issues for others having a **Lack of Supplies** to protect themselves. **Lack of Information** causes people not understanding the situation to have a fear of the unknown, and continual uncertainty can lead to psychological issues. **Financial Situation** can be highly impactful, because if one is already uncertain about the pandemic and also how to provide for themselves or others, this can lead to a major amount of stress (See **Research Question 1**). **Stigmatization** can result from those who have contracted the virus then being alienated due to others fearing they can still contract it from them, increasing feelings of isolation.

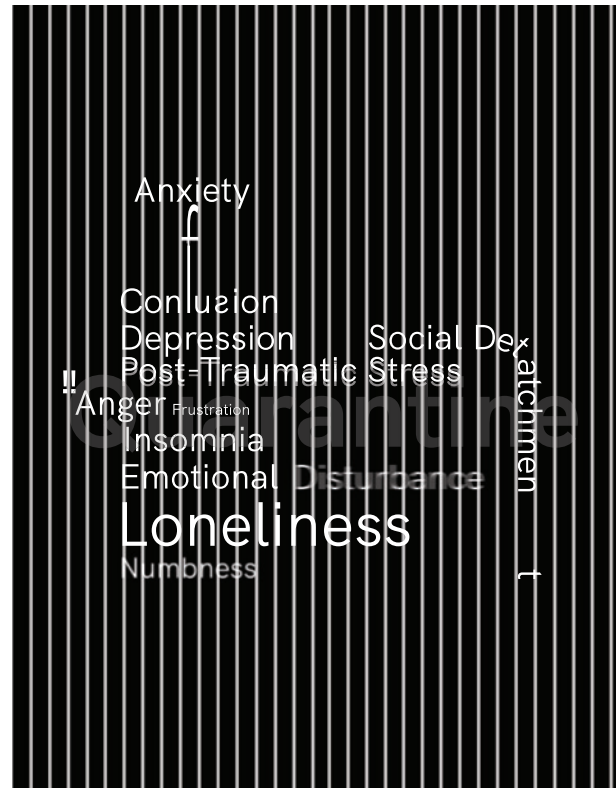


Fig 2.1 - Effects of Mandated Isolation

Textual Representation dramatizing the many negative psychological effects for long periods of time in quarantine.

### Can the effects of mandated isolation be reduced?

Understanding that mandated physical isolation has the ability to psychologically affect people, it is important to consider possible methods to reduce the harm it can deliver.

There is the one main aspect being that the overall investigation seeks to use windows to promote connectivity, and in doing so reduce these negative effects and feelings, but those conclusions come too early for this section of the publication. Instead there may be some other specific methods that in best efforts may reduce the burden of mandated physical isolation. Some are more public-related decisions while others personal.

They include:

- Keeping the quarantine and/or lockdown period(s) as short as reasonably possible.
- Give people enough information about the sickness as well the overall situation.
- Provide an adequate amount of supplies and implement measures to enforce equal access
- Reduce boredom/improve communication.
- Health-care workers deserve priority in receiving supplies and medical treatment.
- It is better to orient decisions (including mandated physical isolation) as related to helping others versus forcing compliance.

13. Brooks, Samantha K. et al. "The Psychological Impact of Quarantine and How To Reduce It: Rapid Review Of The Evidence". *SSRN Electronic Journal*, 2020. Elsevier BV, doi:10.2139/ssrn.3532534.

## Psychological Effects of Windows

The conventional idea of a window is usually known for having three main beneficial aspects in a space: they provide Natural Light (also called Daylight), Natural Ventilation, and Views (to the outdoors). How these aspects of windows affect people within a general context will be analyzed to gain a better understanding of the window's psychological influence.

### Natural Light



Natural Light can improve the workplace productivity of the inhabitants inside a building through its effect on three main areas: The Visual System, the Circadian System and the Perceptual System.

The Visual System focuses on the main concept that light - whether it being natural or artificial - affects an individual's ability to see (Boyce 10). Thus when it comes to a productivity standpoint, there is the common knowledge that in order for people to do various tasks, they need to have a level of vision, (interact with the visual system). However, this idea can be extended to thinking about both the provided clarity of the space as well as the light quality. With the proper positioning of windows to harness direct and potentially reflected light, this can affect the perceived quality of the light entering the space. A good usage of light with the visual system should be reflected in the design, situating/sizing windows to help illuminate a space without also causing glare.

It could be argued that windows are not needed to provide light for the purposes of the visual system, as this can be achieved with artificial light. Furthermore it could also be argued that the art-

ificial lights could also be specifically designed to potentially mimic the lighting quality and temperature of natural light, reinforcing the opposition. Although this may true, having good lighting by simply providing window access to the exterior is a much more humble and honest usage of the light, and it is also subject to variation with the passage of time - there's a beauty in that. Using lights to mimic this, has not been done to the extent of the variation that natural light has with the seasons, weather and times of day (Boyce 65).

The Circadian system (also known as one's body clock), gives people a sense of what time it is in the day such that when it is the morning one feels potentially tired but ready to begin their day, and for the evening a sense of relaxation and the moment to wind down. This is the way people live normally and healthily, and is why having natural light is important, as windows allow for the circadian system to operate normally and consistently for humans (Boyce 23).

The perceptual system looks at light invoking a sense of mood in people/the atmosphere of the space. If this type of system could illustrate objective guidelines to make one feel a certain way, then potentially the window could already begin to avert some of the negative effects/feelings of mandated isolation. However, it is difficult to be able to show conclusive findings relative between light and mood, such that the former affects the latter and thus natural light is vital. It can be said though that in an indirect sense windows improve peoples behaviors such that people will almost always prefer a space with windows as opposed to none at all (See **Research Question 2 and 3**).

14. Boyce, Peter et al. *The Benefits of Daylight Through Windows*. Lighting Research Center, Rensselaer Polytechnic Institute, 2003.

### Natural Ventilation



Natural Ventilation can be beneficial in that it can bring fresh air from the exterior into the space, while cycling the stale air out. This is important as the air quality of a space can affect the health of the inhabitants inside.

Although the Building Code for Windows section focused more on windows providing natural ventilation, it is important to note that having access to fresh air in general is an enforced law. The difference is that fresh air could be supplied with a Mechanical Ventilation System as opposed to strictly windows, and often times for the winter time it is expected that a mechanical ventilation system is the one to do so, as opening windows would remove the heat from the building.

An aspect that is worth mentioning in regards to natural ventilation is a point that acts as a double-edged sword, and that is its differing relation to disease transmission. According to the World Health Organization (W.H.O.), there is a minimal amount of data suggesting natural ventilation's ability to combat airborne sicknesses, but more sources suggesting insufficient ventilation can increase disease transmission (Atkinson et al. 17). This is especially relevant with the Covid-19 virus which is considered an airborne sickness (it can travel through pathogens in the air), as this asks the question whether access to natural ventilation would increase or decrease the transmission rate for these forms of sicknesses. Although the answer to this specific question may not be clear, what does remain is the fact that there is always a need for it on the basic level of human health.

15. Atkinson, James et al. *Natural Ventilation for Infection Control in Health-Care Settings*. World Health Organization, 2009.

### Views



Views allow the window to exist without existing, in that individuals forget that the window is present as they look through it to the outside. Views are an important as well as beneficial aspect of windows that allow people to have a perception of life existing outside of the space itself. This aspect is one of the main components of windows that is difficult to dispute against, for people want that connection to the outside and that reminder of life existing. The sense of life going on outside of the space one is in is a significant concept due to its existential quality, as it gives an individual a sense of reality.

It has been debated in different workplace contexts that windows with views can be more of a distraction than a benefit, and thus defeating the intention of productivity. Results from studies in school settings with kids, showed no significant differences in scores on tests, assignments...etc. but to look at something like this so quantitatively is missing the main point. "Looking out the window can be, of itself, an educational experience, providing...change, variety and awareness of the external world" (Farley & Veitch 5).

The program of a space is a big component for whether or not a window that is implemented to give access to views is necessary. Places like theatres, cinemas and museums are all examples of spaces that usually would not have windows for their specific programs. As mentioned above, it is in the project typologies where it is difficult to determine if a window to provide views is needed, and this is where disputes can arise.

16. Farley, Kelly M. J, and Jennifer A Veitch. *A Room with a View: A Review of the Effects of Windows on Work and Well-Being*. Institute For Research In Construction, National Research Council Canada, 2001.

### All of These Elements Together

These three elements of windows: natural light, natural ventilation, and access to views, are often seen to benefit the health of humans, workplace productivity and the overall quality of a space, yet there is also a fourth aspect. This aspect is the ability for the window to simultaneously have all three, which in itself can serve as another reason as to why windows are important psychologically.

Besides this idea of windows simultaneously providing three main aspects, there are sub-aspects which increase the complexity for what windows can bestow within general contexts. With natural light and access to views, windows also allow access to information about the passage of time and weather conditions, both of which involve an inherent meaningful variability” (Boyce 27).

The desirability of windows stems from the fact that it is a singular element (conceptually), that can achieve many purposes all aligned with bettering the health of humans in a building. This is combined with the fact that windows have a natural aspect to them, a hole is made in the wall and a protective material - which is usually transparent - “covers” the hole in the wall so that the cons of having an actual opening are not experienced while its benefits are gained. This natural sense is achieved by the simplicity of providing an opening, as it allows access to the outside and forming a meaningful connection with it. This is an interesting point as it suggests that windows have a simplistic design, one could call it intuitive, and yet it can also provide a multitude of health related benefits.

This idea suggests a powerful capability to windows, and as such it should be noted that these aspects of the window require careful design and consideration, for if not done so properly these benefits will become burdens:

Natural Light needs to think about the amount of light entering the space, as well as the direction, for just as much as natural light can be a blessing to a space, an increase in visual glare can make it even more so uncomfortable. Although this was not explicitly talked about, the entrance of light can also bring with it the heat of the Sun, so careful design is also required as heat can affect both the energy efficiency of a building as well as the comfort of the occupants.

Natural Ventilation can be utilized to instill better air quality as well as to help refresh the building inhabitants, but poor design can make them exceedingly cold in the winter. In both cases of Natural Light and Ventilation too many windows can cause energy loss due to an increase of heat or massive amounts of heat loss (See Extremes of Windows section).

Views can remind people that a beautiful world exists outside, but it could also showcase the ugly parts of it too.

Windows require a careful balance and thoughtfulness, which is a poetic concept. With careful design, the windows can be maximized to their full potential and provide workplace productivity, or even a beautiful quality of space. Redefining them will require this same level of consideration.

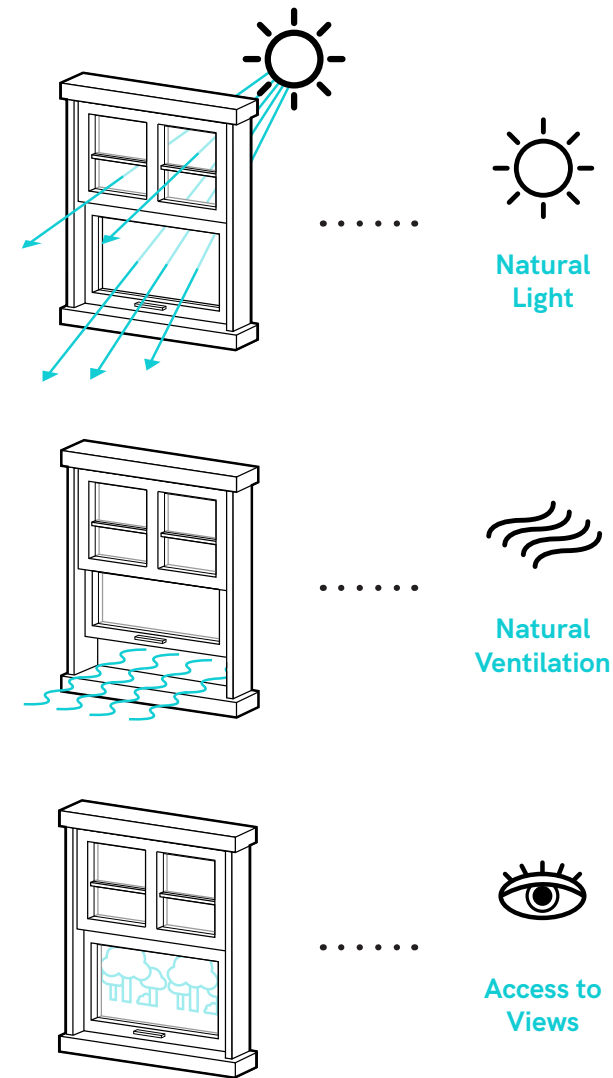


Fig 2.2 - Three Main Aspects of Windows

14. Boyce, Peter et al. *The Benefits of Daylight Through Windows*. Lighting Research Center, Rensselaer Polytechnic Institute, 2003.

A survey was conducted as a response to the current lack of research surrounding the possibility of connections between windows and how they could improve being confined to mandated physical isolation (more specifically being in lockdown for the current Covid-19 pandemic). This is due to the fact that the Covid-19 pandemic is still an ongoing event at the time of this writing and as such, research in general is still being formulated - this area of investigation would most likely be considered an expansive topic outside of the realm of just the sickness. It is also important to note that the study was made completely anonymous, as the investigation required data that was based off of collective responses.

This survey could be completed in approximately two minutes, and was divided into three sections: Demographics, Spending time in a Space/Room during Lockdown, and Lockdown with Windows. The first section was for categorization, included so that it could be utilized if comparing groupings was needed/applicable. The second section asked participants to identify a space/room they resided in for the majority of the Lockdown period of Covid-19, the period whereby everyone was required to stay at home to slow the spread of the sickness. This section also asked participants to give a rating for the quality of that space as well as explain why they chose to spend the most time in that space during the lockdown period. The third section focused on asking about the specifics of their window situation within that space, with the goal of examining if there could be a possible correlation between people spending more time in windowed spaces in contexts of mandated physical isolation.

17. Zanier, Jordan. "Jordan Zanier Master's Thesis Survey". *Google Forms*, 2020. [https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf_link)

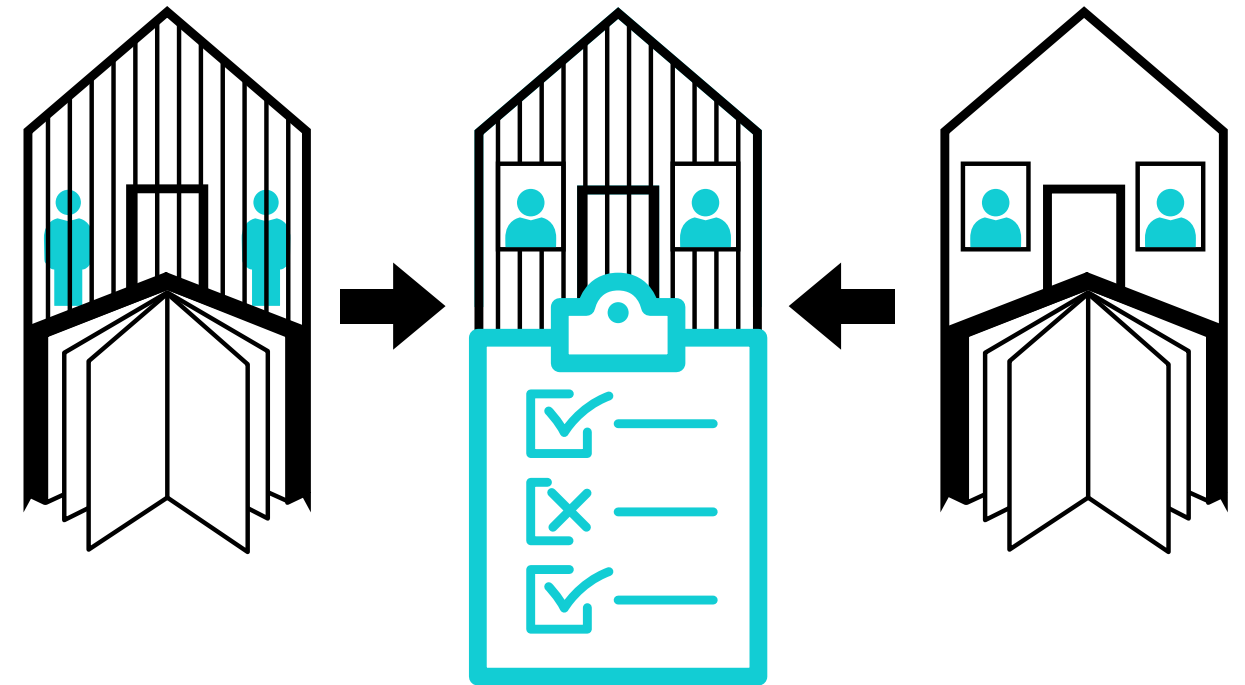


Fig 2.3 - The Need for a Survey

Research exists for the effects of isolation and windows separately, but there is a gap when connecting the two.



## Research Questions/Demographics

In total there was 114 participants, split close to half male, half female within two main age groupings of less than 18-23 and 24-70+ years of age.

Three research questions were formulated:

*Does Occupational/Financial Situation potentially affect anxiety for the COVID-19 Pandemic?*

*What spaces are people spending the most time in during lockdown, and why?*

*What are Windows' effects as well as perceived importance for these spaces during lockdown?*

## Survey Demographics

*This Survey was anonymous, meaning that it did not collect names, or other related information about the participants.*



Gender



Main Age Ranges



The total amount of participants were 114 people, selected from a variety of groups including colleagues, faculty, family, and friends.

17. Zanier, Jordan. "Jordan Zanier Master's Thesis Survey". Google Forms, 2020. [https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf_link)

## Main Questions from Survey

During Lockdown what Space/Room did you spend the most time in?

- Bedroom
- Living Room
- Kitchen
- Dining Room
- Rec Room
- Home Office/Den
- Outside (Front yard/Backyard)
- I spent more time outside of my home
- Other (Please State)

Name one reason for spending more time in that space during lockdown.

Please State here

What does that space need to make it better to be in during lockdown?

Please State here

For the space/room in your home that you spent the most time in during lockdown, did it have any windows?

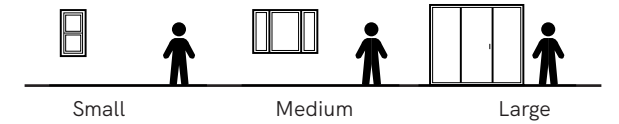
- Yes
- No

When it comes to being stuck inside your home during lockdown, would you say windows are important?

- Yes
- No

How would you classify the overall size of these windows? (Select multiple answers if there are different sizes of windows in that space/room)

- Small
- Medium
- Large
- No Windows



Which quality about windows would you consider to be the MOST important to you for being in lockdown?

- Access to Daylight
- Fresh Air
- Being able to see Outside
- Other (Please State)

When it comes to being stuck inside your home during lockdown, would you say windows are important?

- Yes
- No

Did you ever feel anxious or stressed out by the fact you were stuck in your home during lockdown?

- Yes
- No

# Research Question 1

<18 - 23 years of age

## BEFORE LOCKDOWN



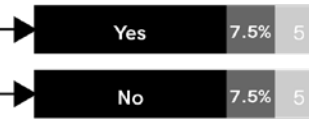
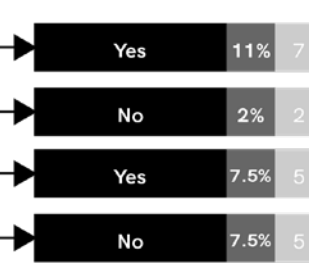
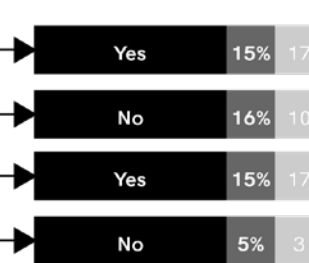
## DURING LOCKDOWN



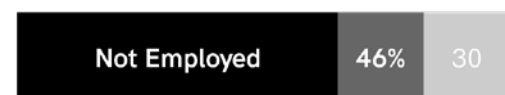
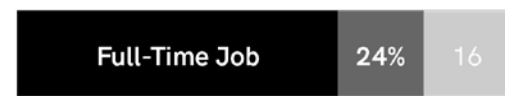
## INFERENCE



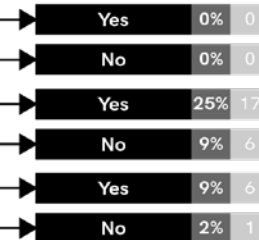
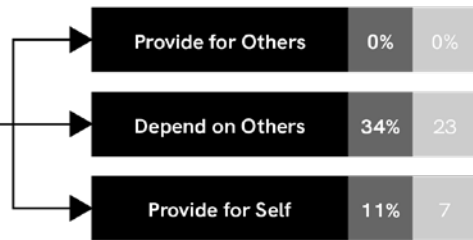
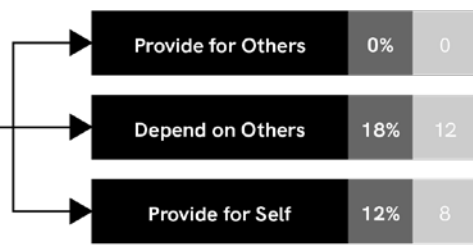
## ANXIOUS ABOUT LOCKDOWN



## DURING LOCKDOWN



## FINANCIAL SITUATION

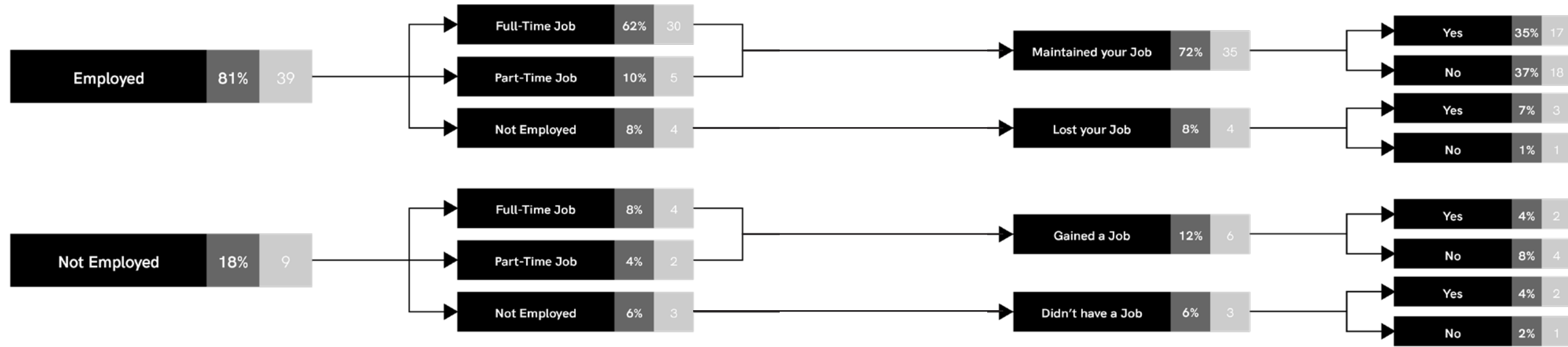


**BEFORE LOCKDOWN**

**DURING LOCKDOWN**

**INFERENCE**

**ANXIOUS ABOUT LOCKDOWN**



**DURING LOCKDOWN**

**FINANCIAL SITUATION**



## Research Question 1.

Research Question 1 asks the question:

*Does Occupational/Financial Situation potentially affect anxiety for the COVID-19 Pandemic?*

It should be noted that with this research question, any conclusions that are made do not fully determine one's possible reasons for feeling anxiety or stress about the Covid-19 pandemic, and this is mentioned as to avoid selection bias.

This first research question seeks to investigate if there exists a possible correlation(s) between occupational and/or financial situation with participants who felt stress or anxiety towards the Covid-19 pandemic situation. It was also created to challenge an aspect of past research, as a study (see Reference 6 in the Psychology Section) that compared undergraduate students, typically in the 18-22 age range, who quarantined to those who did not, stating that they found: "no significant difference between the groups in terms of post-traumatic stress symptoms or general mental health problems" (Brooks, Samantha K. et al 913). Taking this one step further, the reasoning the study gave for these findings was that undergraduate students, "who are generally young... have fewer responsibilities than adults who are employed full-time" (Brooks, Samantha K. et al 913). Since the author is in this age group as well as disagrees with this provided statement, reevaluating it was deemed to be necessary.

The survey asked questions related to occupational situation and financial situation before and during lockdown, which allowed for inferences to be made on whether people lost, gained, or mai-

13. Brooks, Samantha K. et al. "The Psychological Impact of Quarantine And How To Reduce It: Rapid Review Of The Evidence". *SSRN Electronic Journal*, 2020. Elsevier BV, doi:10.2139/ssrn.3532534.  
18. Wang Y, Xu B, Zhao G, Cao R, He X, Fu S. *Is quarantine related to immediate negative psychological consequences during the 2009 H1N1 epidemic?* Gen Hosp Psychiatry 2011; 33: 75-77.

ntained jobs/was not employed in general. Each individual response from this question was then linked to the response of the same participant for another question: if they felt a level of stress or anxiety towards the overall Covid-19 Pandemic. From this, conclusions can be drawn:

For the age group of less than eighteen to twenty three - being the more conventional age range of undergraduate students - seventy percent of the participants felt stressed/anxious about the pandemic, while the other age gap of twenty-four to seventy and older had a fifty-fifty split. This goes on further as the undergraduate age group was mainly in situations of Financial Dependency and yet they still had the higher percentage for stress and anxiety. These results challenge the past research that was previously mentioned, as there is evidence that people of this age demographic seem to be undergoing stress, even if they are financially being taken care of.

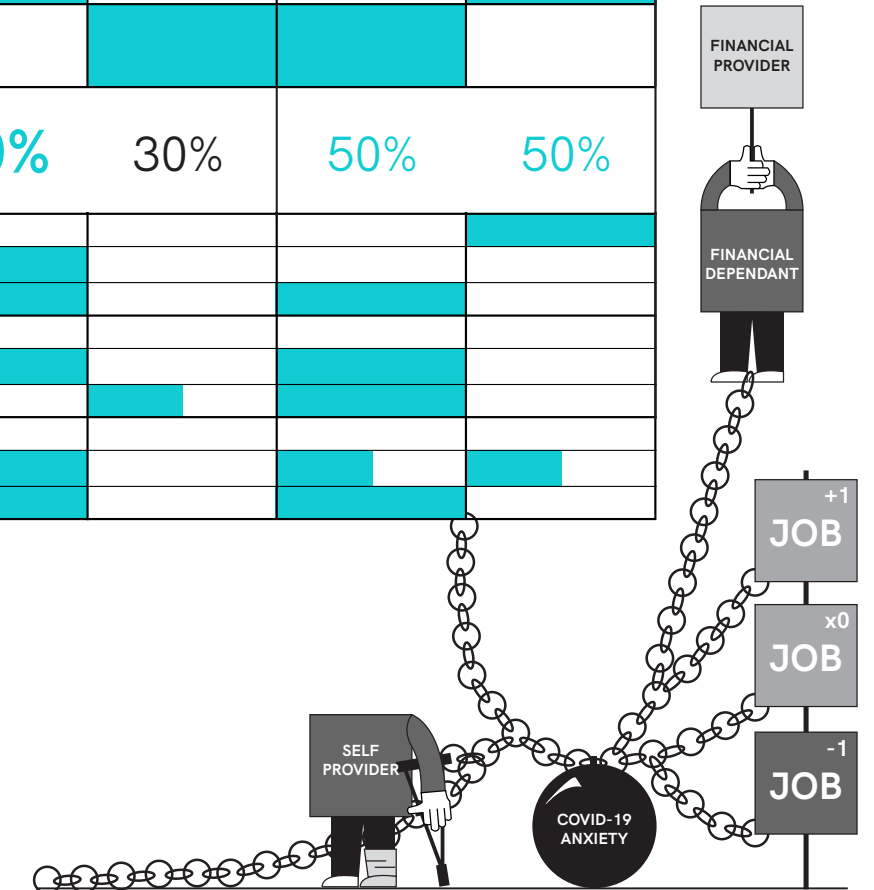
To extend the idea, a possible inference can be made that to suggest that undergraduate students most likely are working towards their career opportunities, and as such many of them who may have had a job lined up, lost these opportunities. So to say that they have less responsibilities and thus this means they should not have psychological issues related to quarantining, is absurd.

The age groups were split for this research question as people <18-23 are more likely to not have an established job as opposed to the 24-70+ age group. Both age groups had the correlation between losing their job because of the pandemic with also being stressed about Covid-19.

17. Zanier, Jordan. "Jordan Zanier Master's Thesis Survey". *Google Forms*, 2020. [https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf_link)

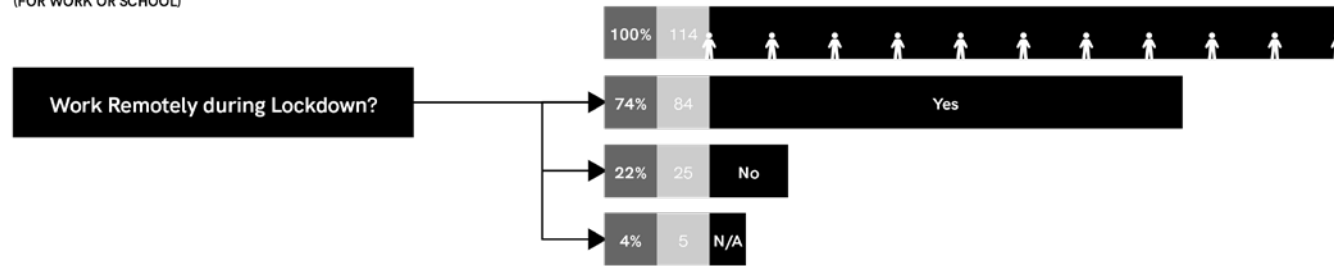
Age Group		<18-23		24-70+	
		Was the Majority Anxious/Stressed out about Covid-19 Pandemic?			
Situation		Yes	No	Yes	No
Maintained Your Job		70%	30%	50%	50%
Lost Your Job		70%	30%	50%	50%
Gained a Job		70%	30%	50%	50%
Didn't Have a Job		70%	30%	50%	50%
Full-Time	- Provide for Others	70%	30%	50%	50%
	- Depend on Others	70%	30%	50%	50%
	- Provide for Self	70%	30%	50%	50%
Part-Time	- Provide for Others	70%	30%	50%	50%
	- Depend on Others	70%	30%	50%	50%
	- Provide for Self	70%	30%	50%	50%
Not Employed	- Provide for Others	70%	30%	50%	50%
	- Depend on Others	70%	30%	50%	50%
	- Provide for Self	70%	30%	50%	50%

Table 2.0 - Research Question 1: Findings

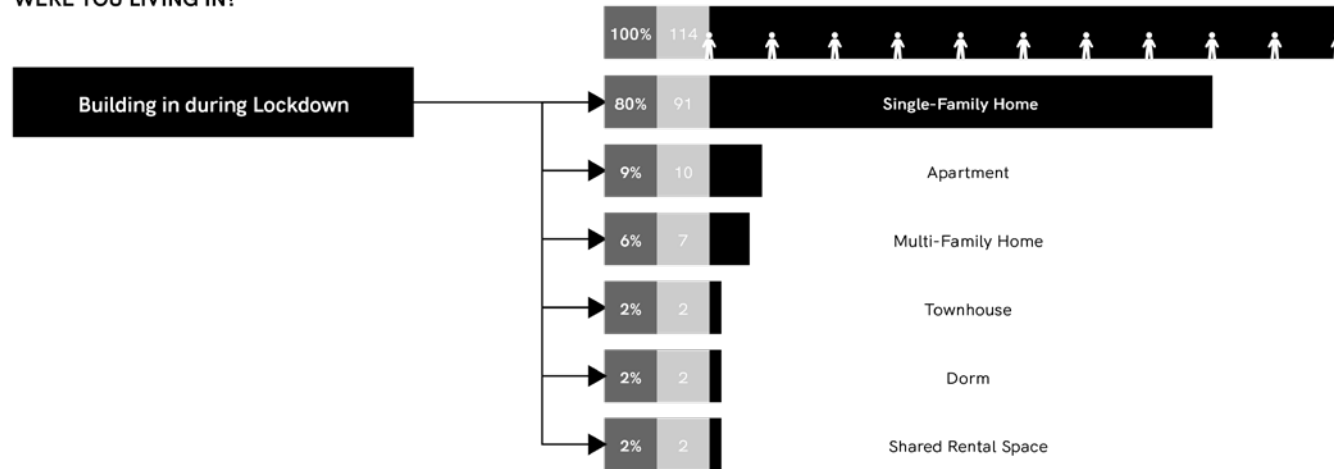


## Research Question 2

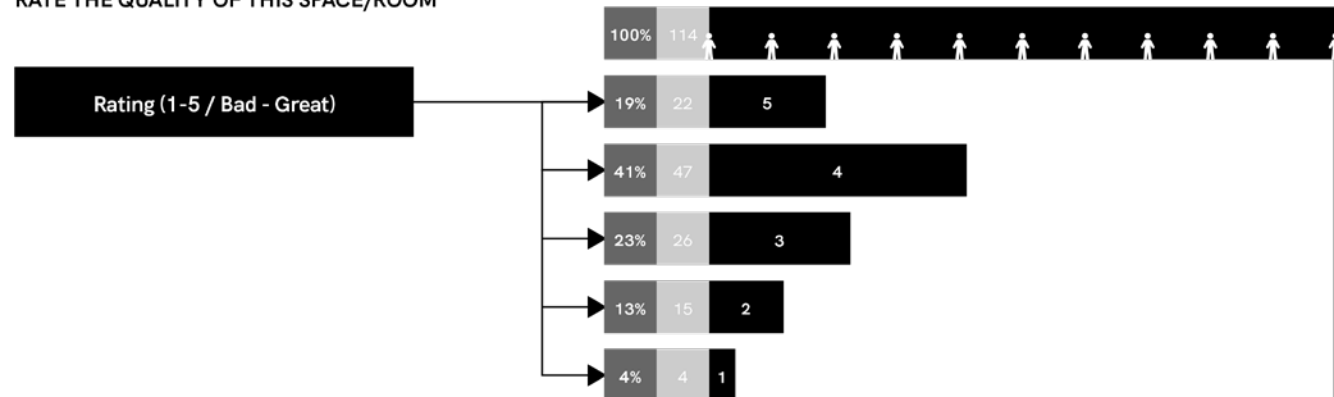
### DID YOU WORK REMOTELY DURING LOCKDOWN (FOR WORK OR SCHOOL)



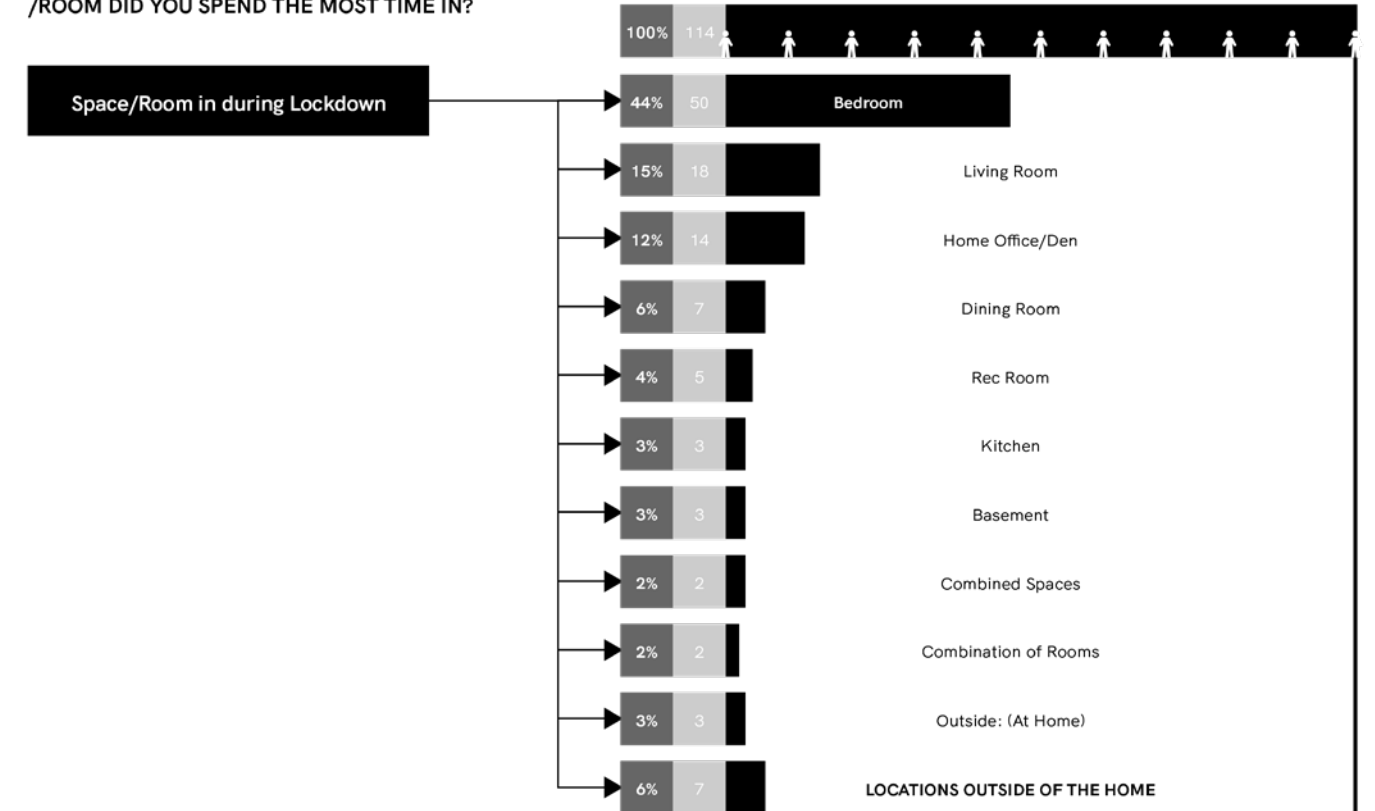
### DURING LOCKDOWN WHAT TYPE OF BUILDING WERE YOU LIVING IN?



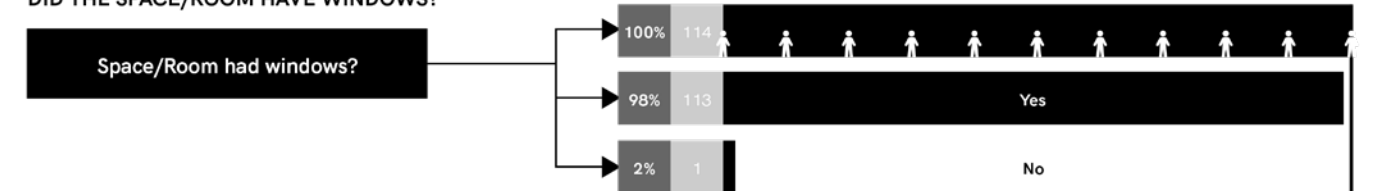
### RATE THE QUALITY OF THIS SPACE/ROOM



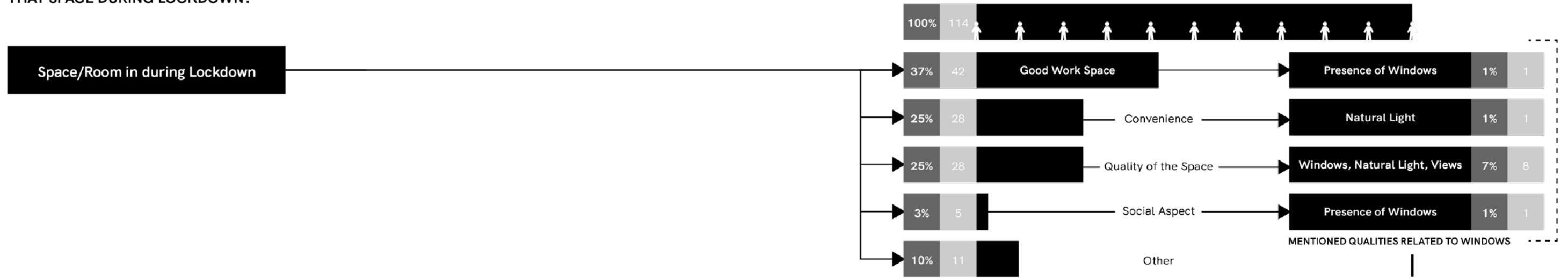
### DURING LOCKDOWN WHAT TYPE OF SPACE /ROOM DID YOU SPEND THE MOST TIME IN?



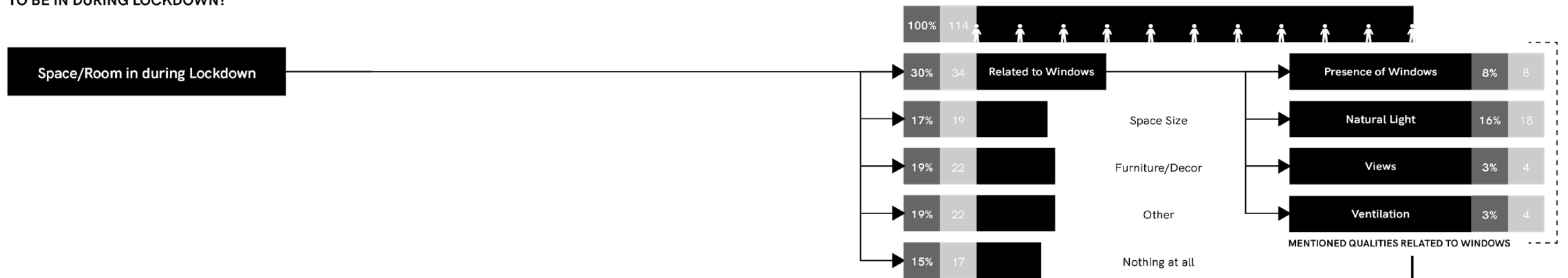
### DID THE SPACE/ROOM HAVE WINDOWS?



NAME ONE REASON FOR SPENDING MORE TIME IN THAT SPACE DURING LOCKDOWN?



WHAT DOES THAT SPACE NEED TO MAKE IT BETTER TO BE IN DURING LOCKDOWN?



## Research Question 2.

Research Question 2 asks the question:

*What spaces are people spending the most time in during lockdown, and why?*

It should be noted that the word choice of space/room was selected as space is a term more familiar for those in the field of architecture, although it is sometimes understood by the general public. The word room is a more commonly known term for the latter group.

This research question seeks to investigate what kinds of spaces people were spending the most time in during Lockdown, and as being stuck at home can be frustrating, what is it about these spaces that make people gravitate to them. This is where the survey started to shape itself as a unique asset, for besides trying to obtain the answers to the above questions, it can take it one step further and try to see if there is a correlation between these spaces and them potentially having windows. Doing so may suggest evidence that windows are critical for our health and well being from a psychological standpoint, and as applied to lockdown situations, people have the tendency to gravitate to spaces with windows.

The survey asked participants questions such as: what type of building they lived in, what type of space/room did they spend the most time in during lockdown, why they spent the most time in this space/room, how they would rate the space/room for the purpose of spending time in it for lockdown, and one way they would improve this space/room to make it optimal for residing in it during mandated physical isolation.

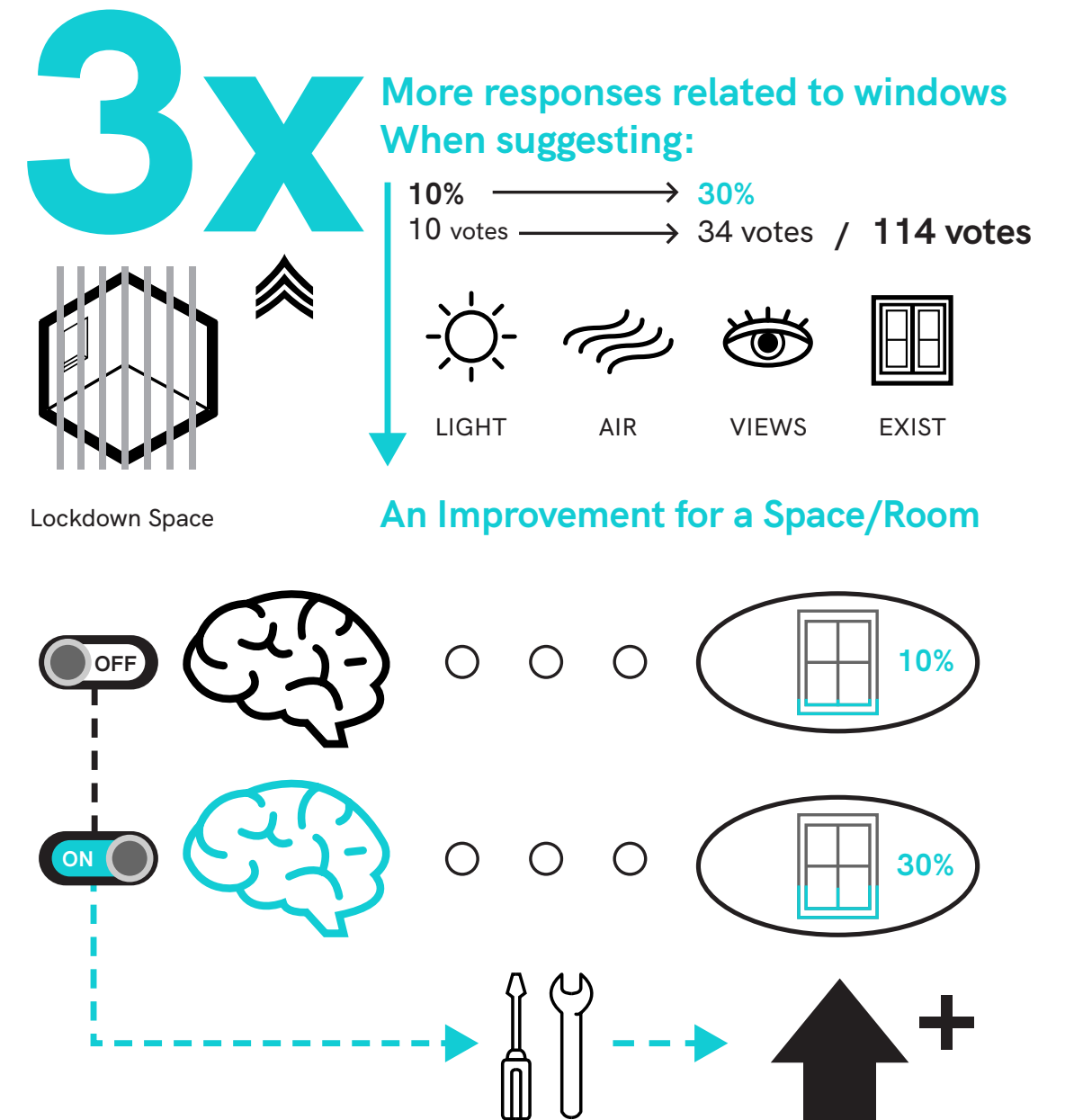
Most of the responses of participants were that they live in a single-family home, the space they spent the most time in during lockdown was their bedroom, and that the space was good but could use some improvement(s) (rating of 4 out of 5).

For why they spent the most time in that space/room, **10%** of the total responses were related to the **presence of windows/aspects they bring** such as natural light, natural ventilation, views...etc. However, when asked for an **improvement to this space**, one to specifically make it better for being in during lockdown, the amount of responses related to the presence of windows/aspects they bring increased by three times (**Increased to 30%** of all responses).

This is an important find as it suggests an intuitive nature to windows, in that people appreciate them - especially in this lockdown context - but they do not necessarily conceptualize windows' existence as well as what benefits that they bring. However, when the survey rephrased the question to make participants consciously think about an improvement, people more immediately think of windows. This idea suggests an overall intuitiveness to windows as they conceptually exist without existing, humbly providing various beneficial aspects to humans without being recognized. Additionally this acts as excellent grounds for the investigation, as it suggests people do in fact see windows as a tool for improvement in the context of mandated physical isolation.

This research question's main finding will be important later on as it suggests what will become a fundamental aspect of windows: Intuition.

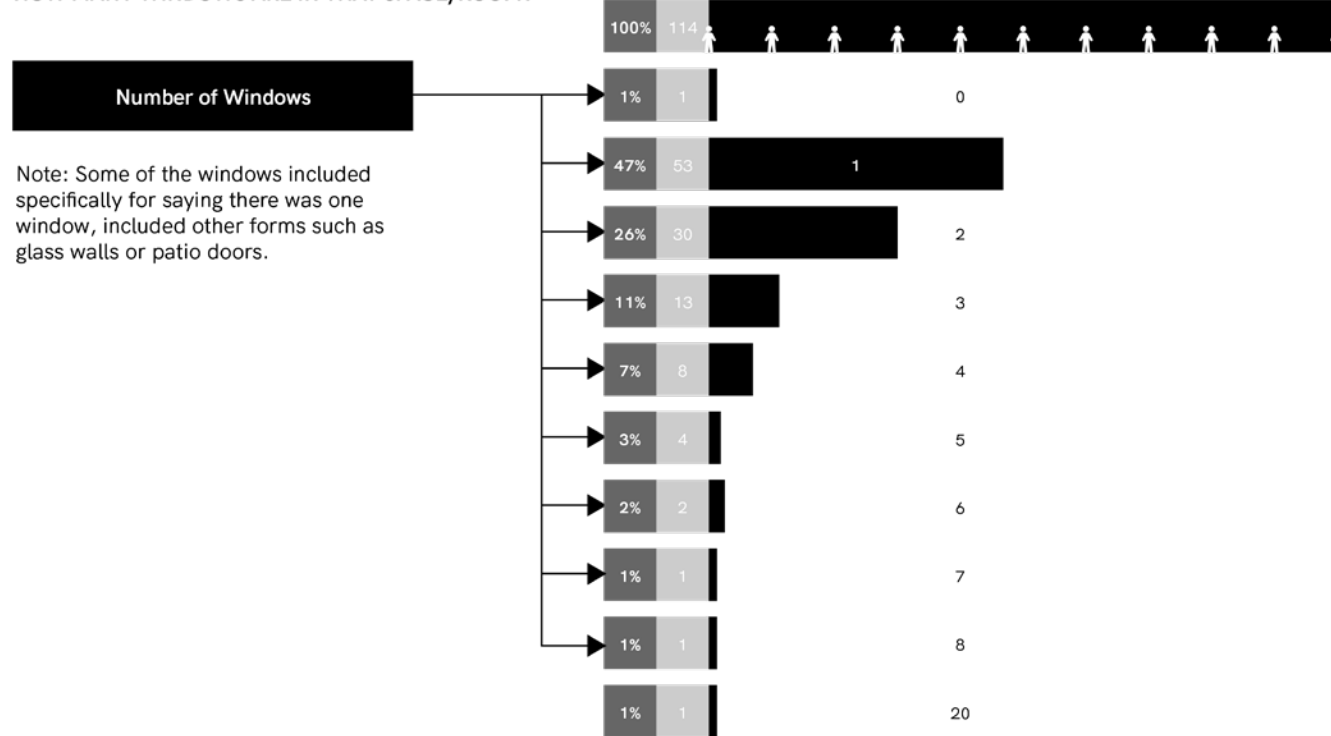
Fig 2.4



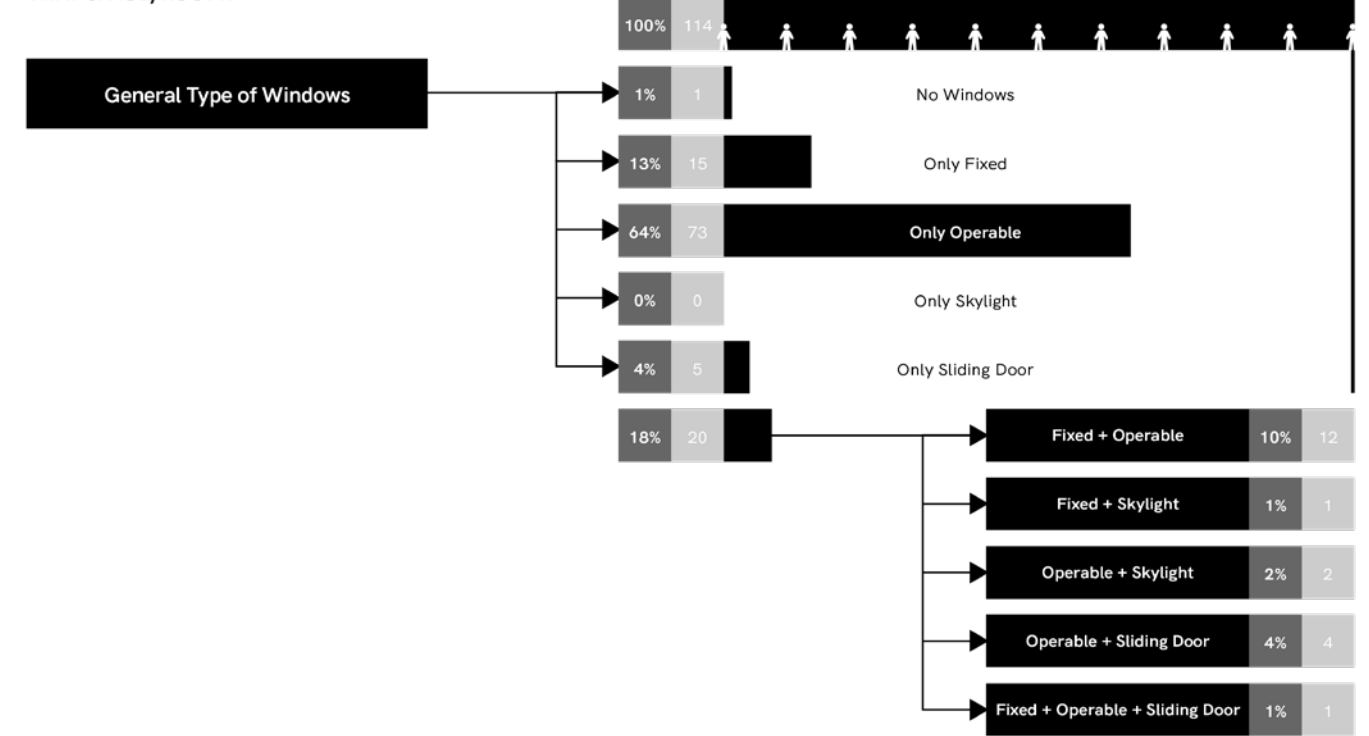
17. Zanier, Jordan. "Jordan Zanier Master's Thesis Survey". Google Forms, 2020. [https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPSvQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPSvQ/viewform?usp=sf_link)

# Research Question 3

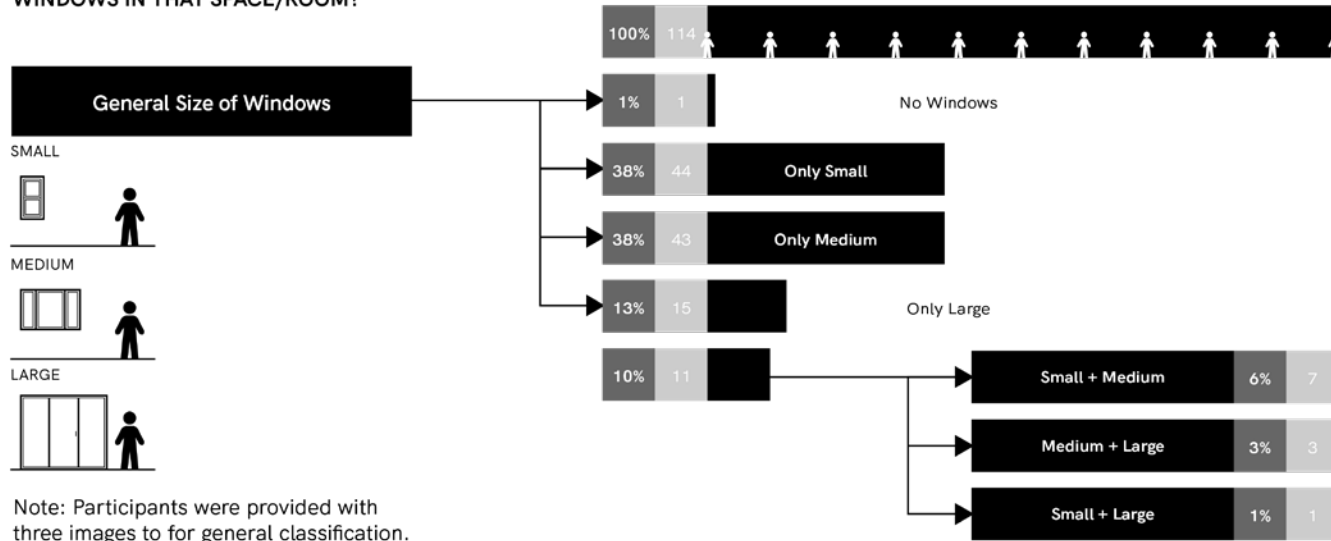
## HOW MANY WINDOWS ARE IN THAT SPACE/ROOM?



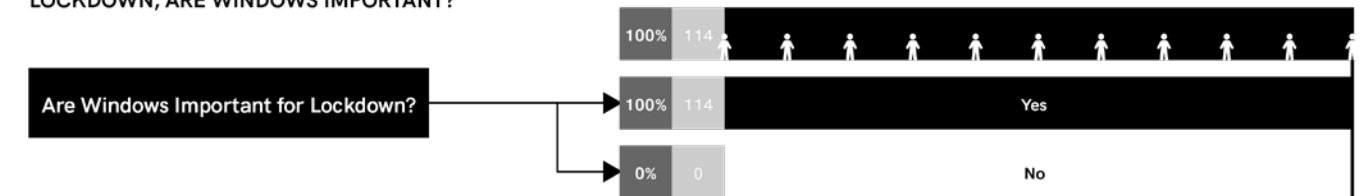
## HOW WOULD CLASSIFY THE TYPE OF WINDOWS IN THAT SPACE/ROOM?



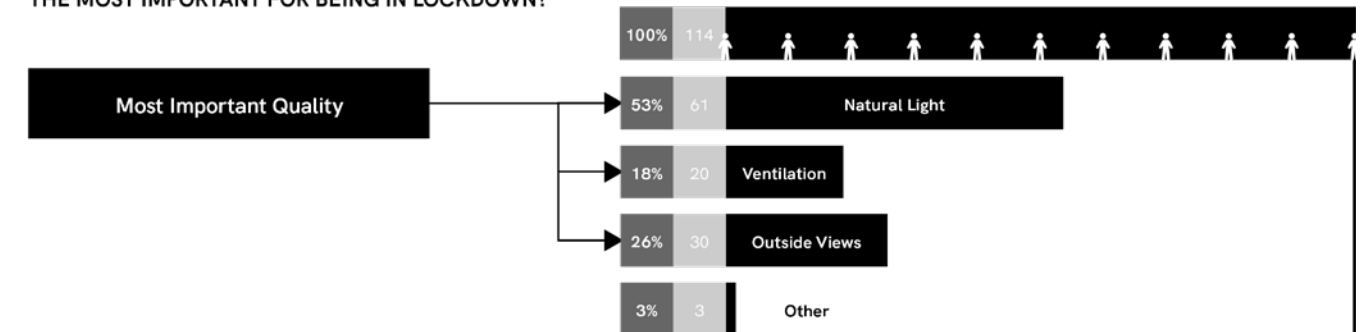
## HOW WOULD CLASSIFY THE SIZE OF THE WINDOWS IN THAT SPACE/ROOM?



## FOR BEING STUCK IN A SPACE/ROOM IN LOCKDOWN, ARE WINDOWS IMPORTANT?

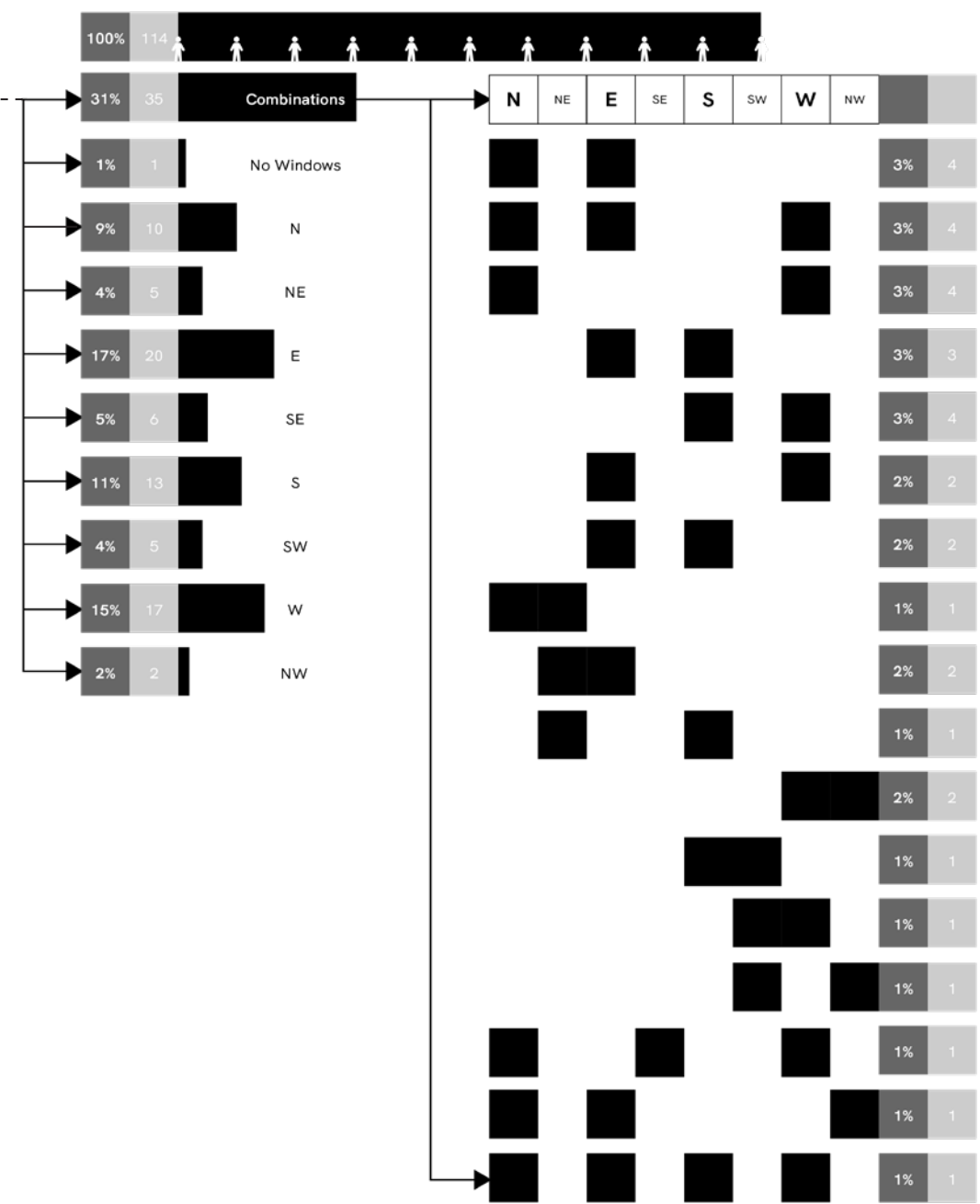
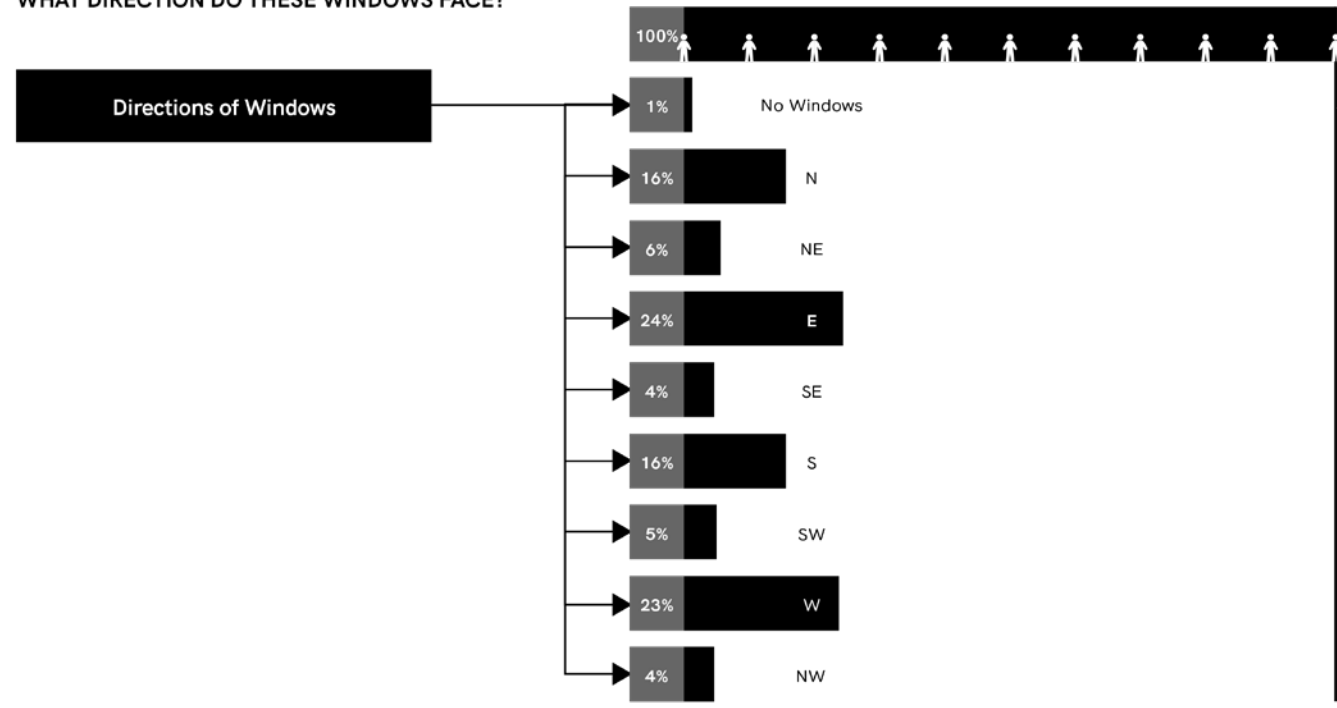


## WHAT QUALITY OF WINDOWS WOULD YOU SAY IS THE MOST IMPORTANT FOR BEING IN LOCKDOWN?

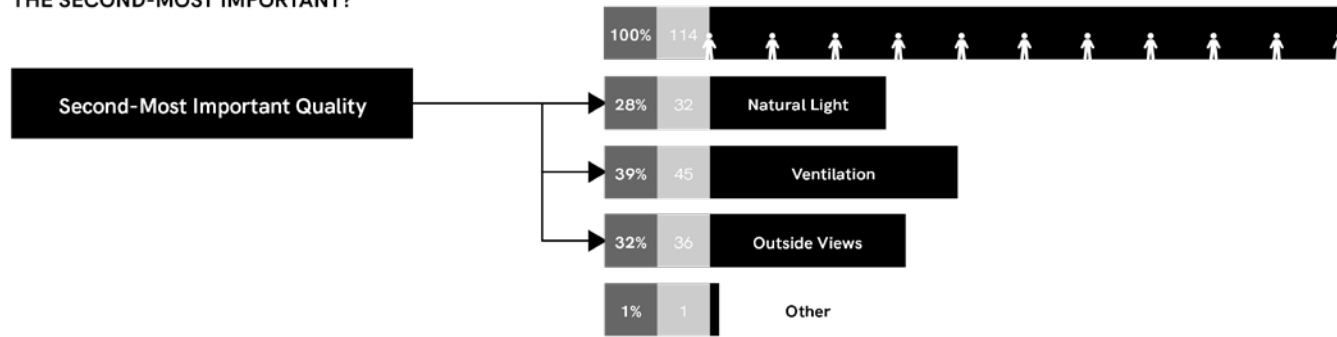




WHAT DIRECTION DO THESE WINDOWS FACE?



WHAT QUALITY OF WINDOWS WOULD YOU SAY IS THE SECOND-MOST IMPORTANT?



### Research Question 3.

Research Question 3 asks the question:

*What are Windows' effects as well as perceived importance for these spaces during lockdown?*

This research question seeks to investigate what was participants' window situation in these selected spaces, especially as all but one response had windows for a space that they resided in for the most time during lockdown. Stemming from the concluding idea of Research Question 2 of the fact that windows are seen as a tool to improve these spaces for mandated isolation situations, Research Question 3 seeks to ask what aspect(s) of windows is the most important. Understanding this idea will help to give a better idea as to what seems to resonate with people and make them gravitate to these spaces in these situations.

The survey asked participants questions to gain a better understanding of their window situation for the space examined in Research Question 2, and these questions included asking: what size/combinations of sizes of windows did they have in the space/room, what general type/combinations of types of windows did they have in the space/room, as well as what cardinal direction(s)/combinations of directions did these windows face. These answers were documented to illustrate the potential options participants had, but they were not used for main conclusions. Main conclusions were provided by three questions being: for being stuck in a space/room during lockdown, are windows important, and what are the most and second-most important aspects of windows for situations of mandated physical isolation. From this conclusions were drawn:

19. Brill, M. (1985) *Using Office Design to Increase Productivity*, Workplace Design and Productivity Inc: New York, NY.
20. Collins, B. *Windows and People: A literature Survey - Psychological Reaction to Environments With and Without Windows*, Natural Bureau of Standards: Gaithersburg, MD.

Fig 2.5

### ARE WINDOWS IMPORTANT FOR LOCKDOWN?

# YES!

100%

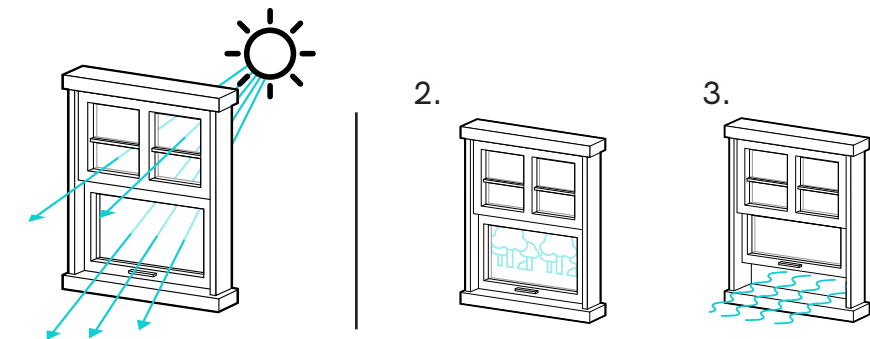
114 votes / 114 votes

All participants stated that in the context of being confined at home due to mandated physical isolation, windows are critical. When they were asked about what key aspects of windows are the most important for a space/room that one must spend the majority of their time in (during lockdown), participants selected natural light as the most followed by natural ventilation. It should be noted that this was divided into two questions: the first asking the most important aspect, and the second asking for the second-most aspect, and this is significant as in both questions having access to views came in second.

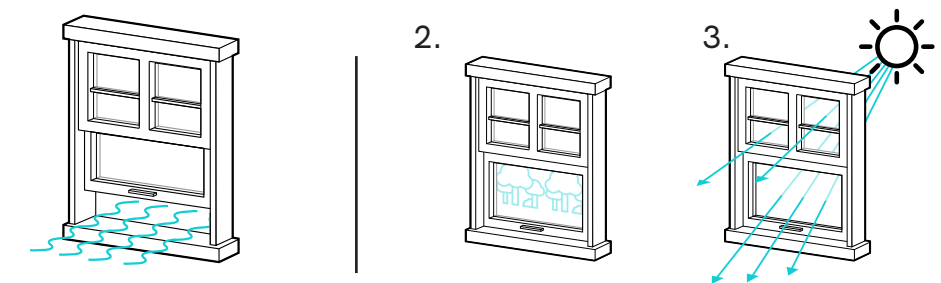
Compared to past research, Natural Light being the most important aspect and access to views being in relatively second is similar to a survey of office workers (See References 7 and 8) where it was agreed upon that: "the two most important attributes of windows are views and the admission of daylight" (Boyce 27). This is could be an important consideration when it comes to redefining windows. Overall, these conclusions help to reinforce the idea that windows are critical for our health and well being.

14. Boyce, Peter et al. *The Benefits of Daylight Through Windows*. Lighting Research Center, Rensselaer Polytechnic Institute, 2003.
17. Zanier, Jordan. "Jordan Zanier Master's Thesis Survey". *Google Forms*, 2020. [https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPSvQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPSvQ/viewform?usp=sf_link)

### MOST IMPORTANT QUALITY



### SECOND-MOST IMPORTANT QUALITY



## Extremes of Windows

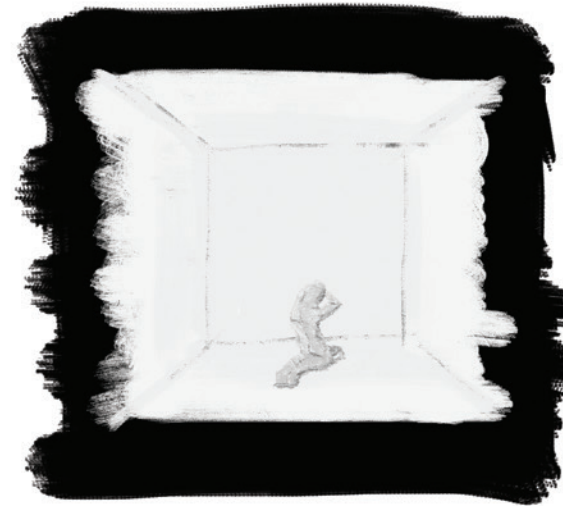
### Absence of Windows

**T**hus far, this section has delved into the various aspects of windows which provide beneficial aspects to humans. This was done to show that windows are critical for our health and well being from a psychological standpoint, but this has its limitations. It is important to also consider both sides of a window's impact, including the situations where the use of windows is taken to the utmost extreme. This translates to the one end of the scale of a complete absence of them, versus the other end of having too many windows. As it will be seen these extremes can lead to negative psychological effects, further reinforcing the idea that windows have a tremendous impact to the health and well being of humans.

With the absolute absence of windows there is also the absence of the good qualities it brings. Examining this from the perspective of the three aspects mentioned earlier, (natural Light, natural ventilation, as well as access to views), it was mentioned that they can technically be replaced through other means. Natural Light can be simulated with specifically designed artificial lights, Natural Ventilation can be simulated through mechanical ventilation, and potentially views could be replaced with landscape paintings on the wall - just as an example to illustrate the point. It was also mentioned that although these things can be individually replaced, the window accomplishes all three with the simple/logical method of creating an opening within the façade. This simplicity brings the sense of a natural quality: with Natural Light being provided by having access to the Sun, Natural Ventilation brought by having access to wind, as well as Views being provided by having the ability to see the outdoors.

21. Smith, Jodi. "White Torture is a Sensory Deprivation Method that Erases all Sense of Reality". *Ranker*, 2019, <https://www.ranker.com/list/extreme-white-torture-facts/jodi-smith>.

Fig 2.6 - White Torture



White Torture is a form of isolation or sensory deprivation torture technique, whereby the individual spends an undefined amount of time in a holding cell that is sound absorbent, and completely white. The individual may have light and some air quality, both of which are artificial, and no access to views. The absence of connection to the outside world is why this torture technique is considered to be one the most damaging things to do to a person, with effects of caused identity/memory loss, post traumatic disorder, hallucinations, and fear of the color White (Smith, 2019). To make matters worse, associated effects from this type of torture method are said to be never fully curable even after years of rehabilitation. This is an extreme example but it demonstrates that an absence of outside connection can cause forms of psychological damage to humans.

## Excessive Amount of Windows

There can also be a point where too many windows can cause psychological issues. As it was stated with an absence of windows leading to an absence of beneficial qualities, having too many windows can be seen as an exaggeration of these same aspects. With this idea of exaggeration, the aspects also lose their meaning.

Natural Light allows beautiful, varying light from the outside environment to illuminate the inside, but giving too much access to the Sun will light up everything, bringing the problem of glare. Now the Sun is a reminder of an inconvenienced existence where the light blinds the inhabitants more than it allows them to see (Recall the visual system from Boyce). Having too much Sun will also bring up the issue of excessive heat, and this can decrease the overall comfort of the inhabitants. Applying this to the idea that someone is stuck in this space during mandated physical isolation, it could be hypothesized that there would be an increase to frustration and agitation, which could potentially stimulate further negative psychological effects/feelings over time. The issue of heat also affects energy efficiency, as the building will have to use increased amounts of energy to cool down or heat up the space, since too much heat is gained in the summer or lost in the winter.

Natural Ventilation is a trickier one to argue when it comes to being worsened by exaggeration, as it is achieved through controllable means. Opening up too many windows can be a problem, but this is more so an issue with the winter season, where windows should remain closed. It could be said that having too many open windows could cause anxiety related to someone trespassing.

14. Boyce, Peter et al. *The Benefits of Daylight Through Windows*. Lighting Research Center, Rensselaer Polytechnic Institute, 2003.
22. Craven, Jackie. "Mies Van Der Rohe and Cost Overruns at the Farnsworth House". *Thoughtco*, 2019, <https://www.thoughtco.com/mies-van-der-rohe-edith-farnsworth-177988>.

Fig 2.7 - The Farnsworth House



What can be more potentially impactful is the exaggeration associated to views, which translates to a sacrifice of all sense of privacy. As one may have a level of visual access to the outdoors, so too can those who are outside have visual access to the inside. A building that has glass on all of its sides means an individual can see your everyday life, what you do every second, and the anxiety as well as lack of security that is generated from this can cause psychological issues.

Having too many windows can be looked down upon such as the Farnsworth House by Mies van der Rohe, which is a commonly criticized "blunder" of architecture. Mies' lack of thoughtfulness with generating the residence, resulted in it having glass on all sides, and as a result it succumbs to the issues of privacy as well as poor energy performance (Craven, 2019).

Fig 2.8 - Visual Analysis of Windows (See Next Page)



**A**s mentioned in the Building Code for Windows section, the goal of the visual analysis is to push forth the knowledge gained from each area of the investigation to understand the bigger picture ideas. With psychology there is a lot of aspects that invoke the qualitative, and as such it was decided to create a more compositionally-based analysis. This is with the hopes that the visual analysis will also invoke qualities/perceptions in a fluid and free-flowing manner.

This composition analyzes the major ideas that were being revealed under the window's surface. This includes the concept that windows can act as an improvement to spaces, whether in a mandated physical isolation setting or not, as well as the even more so beautiful quality associated to their ability to disappear. Windows have an intuitive nature as people know that as an element of architecture they can bestow positive effects, but in the day to day, they also forget that they exist. As the quote to the right summarizes, Windows are constructed to disappear. To essentially exist for the purpose of not existing.

Windows find themselves in a place where they are critical for the health and well being of humans but they are also overlooked. This is quite poetic as it suggests a humble nature to windows, as they can provide so much for humans yet exist without any recognition. Where the human is more likely to exclaim about their wonderful view than to exclaim about the window that provides it for them, so to it seems that something is lost. The composition seeks to blend the glass of the window with the grand vista of mountains and a valley to suggest the window's fluctuating state of existence. In doing this the composition tries to ask questions such as who is the one that improves the quality of life for people, is it the view itself, or the window for providing the ability to connect with that view? Should it go back all the

way to the visual system? The eye? Light's interaction with the eye? With these existential types of questions/ideas arising from the visual analysis, there is a key concept being revealed that will situate itself further in the investigation. It is the central idea that what a window is and what it can encompass is far more than its conventional perception. What constitutes a window can be related to abstract elements of thought, and as such redefining windows to become an essence of connectivity may require a level of abstraction.

As a potential way to begin to analyze the window from an abstract perspective, it is important to get a better grasp of what this sense of intuition is. The questions above were generated by questioning if the window should be celebrated as opposed to being overlooked. Although recognizing something and ignoring it appear as polar opposites, maybe the potential form of celebration for a window is to overlook its existence.

Humans need to breathe air to survive, yet they do not think about the air, or the fact that they are breathing it, and in this way it too exists without existing. The difference here is that humans can not see any air, but they can see the window (although a major portion of it is typically transparent). What is more important is the idea that for both elements which are critical for our health and well being, it may be possible that their appreciation is rooted in one's subconscious. In this way the window achieves its intuition by becoming subliminal, which suggests a level of hidden power to the architectural element.

What a window is physically composed of is another concept questioned by the visual analysis as the window in the composition is more of an opening, existing in its fluctuate state but being framed by its outside edges. This reinforces the idea that its intuition may also be negative space.

**“ We construct windows to look through them, making them exist for the purpose of not existing, and it is with this fact that for an entity which provides so much for us without us even realizing it's there - is why windows are a stroke of brilliance.**

Jordan Zanier

## Conclusion

### A Reflection on the Section.

This area of the investigation focused on the psychology of having windows within situations of mandated physical isolation, as well as understanding what aspects the architectural element provides for the health and well being of people.

It was critical to first understand the psychological effects attributed to situations of mandated physical isolation, to understand how these kinds of scenarios, such as the current Covid-19 pandemic, negatively impact people's mental health. The main point here, is not only to acknowledge what negative psychological effects can exist but also methods to potentially reduce them as well. This is because mandated physical isolation may not just be limited to strictly global sicknesses in the future, so having a solid understanding of this information from a broad perspective may help to make it more applicable.

Although both this section and the last one focused on the central argument that windows are critical for our health and well being, this section tended to be more qualitative, as opposed to the analysis of building codes which operates in the objective realm. Data was gathered by analyzing past and current research on the subjects as well as with an integrated survey to try to answer the questions that are too recent or specific for new publications. Convincing data from the survey showed evidence that people conceptualize Windows as a tool for improvement, and this is applied to a space one must reside in for a mandated physical isolation setting. With that idea, there was also the suggestion that windows have an intuitive nature to them, in that they operate without recognition, while providing a multitude of beneficial effects for humans. Complex questions started to form surrounding the fluctuating nature of the window between existing and not existing, combined with the main purposes of the window to provide Natural Light, Natural Ventila-

tion as well as Access to Views. In this state of flux the window as a tool is questioned, for part of its functionality is its perceived disappearance.

Additional questions arose from the visual analysis which invoke further investigation, bringing up ideas of how the window can be manipulated to abstract elements of thought. As the investigation moves away from grounding the window as being critical for our health and well being, these concepts of defining the window beyond its traditional perception are important, and shall help to guide the way forward.

As much as this section is the conclusion to the psychology of windows, in general and specific contexts, it is also a conclusion to the overall argument - windows are critical for our health and well being. As much as it is to say they are important in situations of mandated physical isolation, the two sections: Building Code for Windows and the Psychology of Windows work in cohesion to argue for the window's overall importance within general contexts as well.

As it has been discovered, windows have a tremendous impact on humans from a multitude of angles. They provide natural light, natural ventilation, access to views, and physical access to escape, providing all of these aspects as a simple element. As a rebuttal, it was also mentioned that the individual aspects of the window can be simulated, but the congregation of all these qualities is part of the central idea of a window. The fact that it can bring so much to people and it can continue to exist in complete and utter humility suggests an utmost sophistication for the architectural element.

Element, the idea that windows can exist in all of its characteristics while still being a part of a larger system of architecture which provides the



Fig 2.9 - Extending the window's perception

Windows need to be expanded outside of its conventional perception to truly see what they can encompass.

buildings and spaces that are present today. This idea that windows in the conventional sense, as much as any other architectural element as well as the composition of all these elements, require careful and thoughtful design. This is due to the fact that if they are designed poorly, such as in absence or exaggeration, the effect of windows in the negative will consume any potential positive it could ever have. This adds to the overall poetic quality of windows, in that they must always remain vigilant and thoughtful to benefit others.

This small piece of the investigation which sought to prove that windows are critical for our health and well being, has led to a striking of the surface of the larger conglomerate that is a window. It has revealed that it involves a phenomenological question that needs an attempt at answering, and in doing so obtaining a better understanding of how it can fulfill the role of becoming an essence of connectivity. Delving into what it is as well as what it can encompass will shape the way windows can be redefined for this purpose.

## The Conventional Perception

and its relation to connectivity.



After analyzing both the building codes and the psychology of Windows, the investigation is grounded by the argument that windows are critical for our health and well being. However, what was also discovered from these analyses was the idea that windows must be expanded from their conventional perception which the previous sections were based on.

### The Conventional Perception

Research associated to current building codes as well as publications surrounding psychology are both constrained to a singular, conventional perception of the window. The conventional window is explained with the following definition:

*“A window is a constructed architectural element that is attached to a wall of a building, and structurally composes of a piece of glass held in place by a frame. It can come in different shape or sizes, be operable/non-operable, and serves the purpose of separating interior & exterior conditions while simultaneously bringing daylight, ventilation and views. If a window is attached to a ceiling it is called a Skylight.”*

Some pieces can be extracted from this definition to understand what a conventional window is composed of. These elements are separately explained below:

- Windows are **constructed**, which is the idea that they are manufactured.
- Windows are **architectural elements**, meaning that they are a part of the respective field.

- A physical component of windows is a piece of **glass held in place by a frame**, which gives it its transparency.
- Windows can specially customized to be **different shapes and sizes**.
- They can be **operable or not operable**, meaning that they can provide natural ventilation.
- One of the window’s main purposes is to **separate interior and exterior conditions**.
- Windows also provide **natural daylight, ventilation**, as well as **views** for humans.

### How does this apply to connectivity?

These aspects mentioned above constitute what the conventional window is, but this perception is limited by its strictness. This is logical as the publications that were consulted with (to prove that windows are critical for our health and well being) would base their information on what windows are conventionally conceived as. However, this perception limits its capability to be applied to providing connectivity - which is the goal of the larger investigation. Frankly, the publications do not mention any information with regards to how windows can become a connective essence, but this is not a problem - it is an opportunity.

Having no direct information from these sources to suggest how windows can fulfill their new purpose, suggests a gap in current literature. Having a gap in literature fortifies the importance of this investigation being conducted.

23. “Meaning of Window in English”. *Oxford Dictionary*, <https://www.lexico.com/definition/window>.  
24. “Definition of Window”. *Merriam-Webster Dictionary*, <https://www.merriam-webster.com/dictionary/window>.  
25. “Window | Description & Facts”. *Encyclopedia Britannica*, <https://www.britannica.com/technology/window>.

### Definition of a Window

*(Conventional Window)*

“A window is a **constructed, architectural element** that is attached to a wall of a building, and structurally composes of a piece of **glass held in place by a frame**. It can come in **different shapes and sizes**, be **operable/non-operable**, and serves the purpose of **separating interior and exterior conditions** while also providing **daylight, ventilation and views**. If a window is attached to a ceiling it is called a Skylight.”

### Essence of Connectivity

*(How can the perception be applied?)*





# 02 Connectivity & Understanding the Origins of Windows

**Section 2.**  
See Appendix B.

**A** major aspect of the investigation is to establish a basic understanding of what is meant by the term “connectivity”, as well as its associated forms, and how the window can start to relate to these concepts through its etymology.

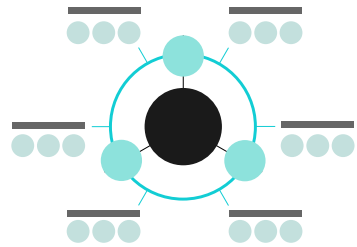
In this section, the words of connection as well as connectivity will be defined, and the relationship between connection, connectivity/forms of connectivity will be illustrated. These forms are critical, as they suggest not only that connectivity is manifested in different types, but also the fact that the investigation is looking at certain forms that have been negatively impacted (by mandated physical isolation). This will orient the overall investigation by explaining what aspects of connectivity are being diminished, and which forms will be mainly addressed with the poetic designs.

Etymology looks at the origination of words with their history, associated culture, as well as comparison to similar versions of the word. Beginning to look at the origination of the term, “Window”, will reveal the initial perceptions of what a window is as well as how it relates to connectivity on a basic level. As it will be seen later in the investigation, perceptions are a critical component.

# Connectivity & Understanding the Origins of Windows

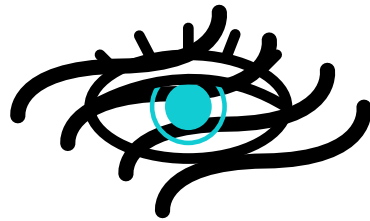
## Table of Contents Phenomenology of Windows

Introduction .....	100 - 101
Connectivity and Connection .....	102 - 105
Window Etymology .....	106 - 107
Conclusion .....	108 - 109



**Connectivity & Connection**  
PGs. 102 - 105

Defining the terms of connection and connectivity to orient the overall investigation. Connectivity also has variations that are affected by mandated physical isolation.



**Window Etymology**  
PGs. 106 - 107

Looking to the origin of the word "window" to find what it is based on, and from this analysis, searching for correlations between windows and connectivity.

<b>Fig. 3.0</b> - Connectivity and Etymology	101
<b>Fig. 3.1</b> - Connection and Connectivity	103
<b>Fig. 3.2</b> - Variations of Connectivity	105
<b>Fig. 3.3</b> - Windows and Connectivity	106
<b>Fig. 3.4</b> - Etymological Groups	107
<b>Fig. 3.5</b> - The Cave Opening and Windows	108

# Connectivity/Window Etymology

## Introduction

This page of the Connectivity & Understanding the Origins of Windows section, will explain what it encompasses, as well as its relevance/association to the investigation.

### Scope

To understand the guiding lens of the investigation, it is important to establish the main ideas which will inform the research. These ideas are the concepts of connection, connectivity, as well as the forms of connectivity which are affected by mandated physical isolation. Additionally, this section also seeks to conduct a basic analysis of windows through their associated forms of etymology, in this case studying the origins of the word, "Window". Doing so shall reveal some basic ways that windows can relate to connectivity.

### Methods

The terms of connection and connectivity will be defined and applied to the investigation, to better orient its path. This combined with the identification of forms of connectivity - that are negatively impacted by mandated physical isolation - will be utilized to help illustrate the overall relationship between all three. Some of the forms of connectivity that are affected will be more so addressed than others, as some may require solutions that are derived from other sources than windows.

With the etymological analysis of windows, the associated origins for the word, "Window", will be grouped together on the basis of similarities with the word composition, with the purpose of showing how different cultures have similar perceptions as to what the window is derived from. After this, it will be identified which words establish what associations to the window, as well as the functions, to then its relation to connectivity.

### Assumptions and Limitations

The main form of assumptions/limitations associated to this section, is the idea that the forms of connectivity identified are a form of interpretation, and this means that it is not necessarily fully encompassing. Other forms could potentially be identified, but the ones that are, are adequate for the purposes of the investigation.

On the side of window etymology, the same can hold true, in that additional origins of the word window - could also potentially exist - and with that additional perceptions could be missing. For this section of the overall investigation, the window etymology is analyzed with the purpose of providing a basic analysis for how windows can relate to connectivity. In that, it is supposed to be basic not extensive, to emphasize the fact that on a very simple level windows do have a relation to the concept of connectivity.

### Relevance to the Larger Argument

*Connectivity & Understanding the Origins of Windows*

Defining both the terms of connection and connectivity as well as the forms of connectivity, to then combining this with window etymology, will help to suggest initial correlations between windows and connectivity.

### Relevance to the Overall Investigation

Establishing that there is a relation between windows/connectivity, will ground the investigation, by suggesting that windows should be redesigned to provide connectivity. This is the central goal of the entire investigation, so to show that on a basic level, without the implementation of design, that windows can in fact be eligible to serve this new role, further fortifies the need to redesign them

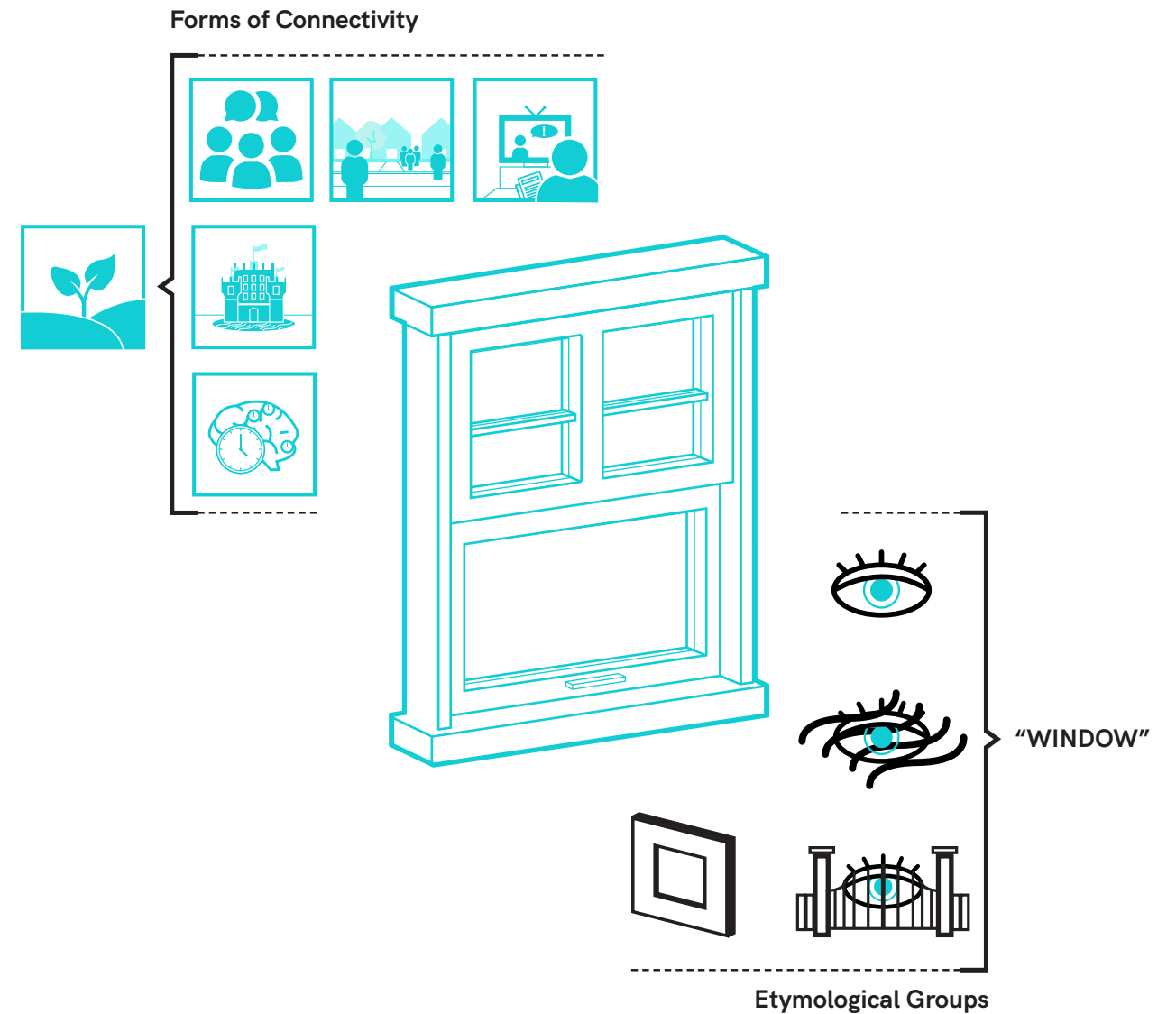


Fig 3.0 - Connectivity and Etymology

Connectivity will be explored in this section along with Window Etymology. (The origin of the word, "Window").

# Connectivity and Connection

## Defining the Overarching Concepts

The words, "Connection"/"Connectivity" need to be defined to establish the framework of the larger investigation. They are provided below:

### Connection

"Connection is a **form of relationship that involves linkage between entities**, such that they develop a form of association with each other and as a unified whole. These **linkages can be causal as well as sequential**, and involve, but are not limited to, Physical, Visual, Spatial, Implied, Communicative, Knowledge-based, Social, Movement-based, and Energy-based applications".

### Connectivity

"Connectivity includes the **State, Quality and the Capability/Capacity**, associated to experiencing a **specific form of connection**. **Connectivity** can exist in a multitude of **specified forms/variations**, with their aspects of **Ability, Access, and Quality** being subject to factors outside of the connection".

It is important to now apply the definitions above to the investigation, to better understand the elements that guide it towards its central goal:

### (Applied to Investigation)

The Covid-19 pandemic, as well as other forms of mandated physical isolation, have negatively affected **specific variations of Connectivity**. With the decision to use windows, an architectural element that provides multiple forms of connection, this presents the unique opportunity to redefine them so that they can adapt to these situations.

**Chosen Element** - Window  
**Method** - Re(defining/designing) Windows  
**Purpose** - To provide Connectivity



26. "Meaning of Connection in English". *Oxford Dictionary*, <https://www.lexico.com/definition/connection>.  
 27. "Meaning of Connectivity in English". *Oxford Dictionary*, <https://www.lexico.com/definition/connectivity>.

28. "Definition of Connection". *Merriam-Webster Dictionary*, <https://www.merriam-webster.com/dictionary/connection>.  
 29. "Definition of Connectivity". *Merriam-Webster Dictionary*, <https://www.merriam-webster.com/dictionary/connectivity>.

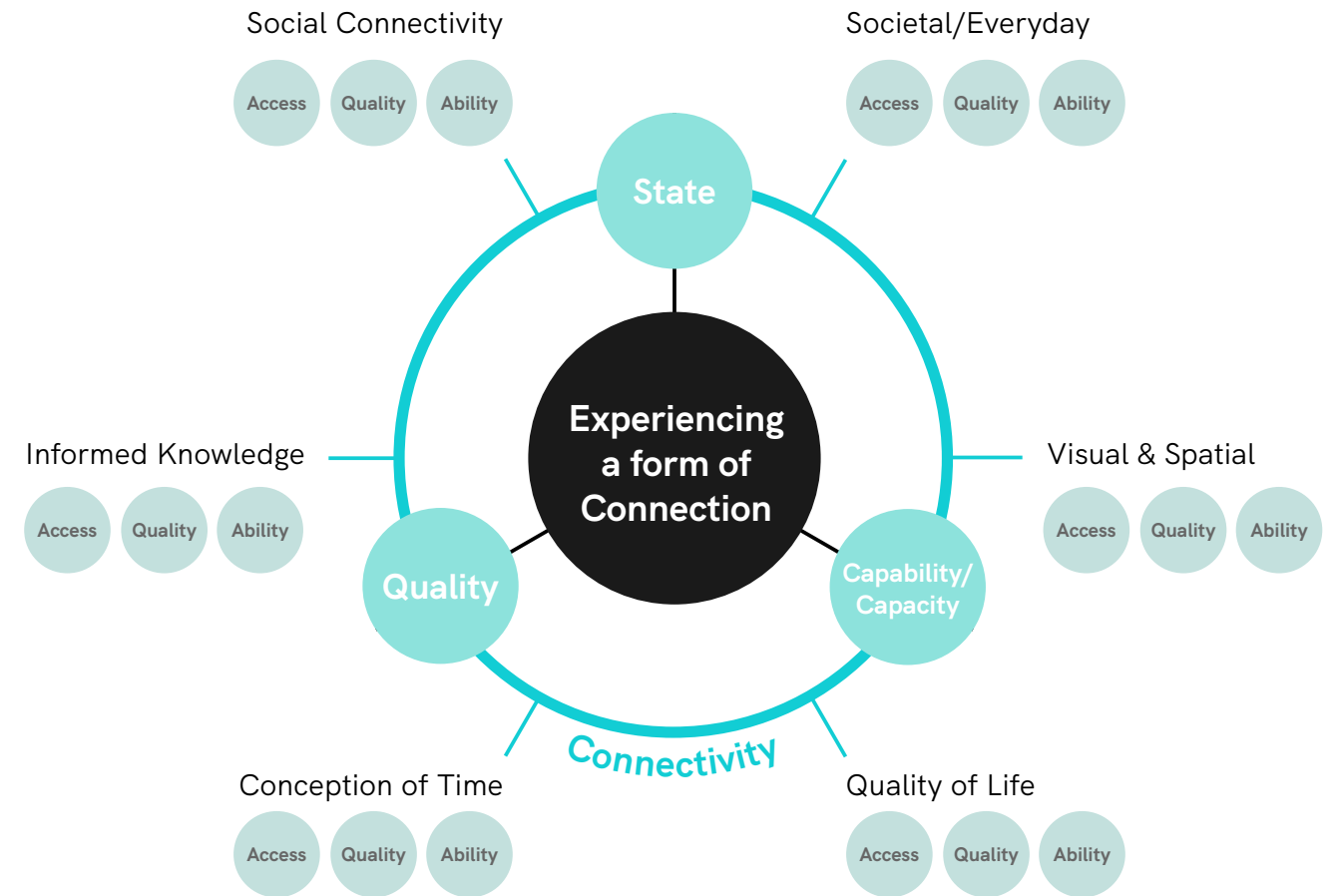


Fig 3.1 - Connection and Connectivity

Connectivity is the State, Quality as well as Capability/Capacity of experiencing a specified form of connection.

### Specific Variations of Connectivity

Specific variations of connectivity are affected by mandated physical isolation. Fig 3.2, evaluates if the Access, Quality as well as Ability to experience those forms of connectivity are increased, decreased or unaffected. These forms include:

- **Social Connectivity**  
Socializing/being with People
- **Societal/Everyday**  
Being a part of society/everyday life.
- **Informed Knowledge**  
Being informed to what is going on around you
- **Visual and Spatial**  
Variance of Visual & Spatial conditions.
- **Conception of Time**  
Being able to conceive of the passing of time.
- **Quality of Life**  
Sense of worth related to living.  
*(Is a result of having multiple variations)*

For the purposes of this investigation, the poetic designs for new windows that provide connectivity, (in situations of mandated physical isolation), will address the variations of **Social Connectivity**, **Societal/Everyday**, **Visual and Spatial**, as well as **Quality of Life**. The others will not be addressed, because the window does not act as an adequate solution for them. For Informed Knowledge, too much information requires filtering it, while the Conception of Time requires having a routine.

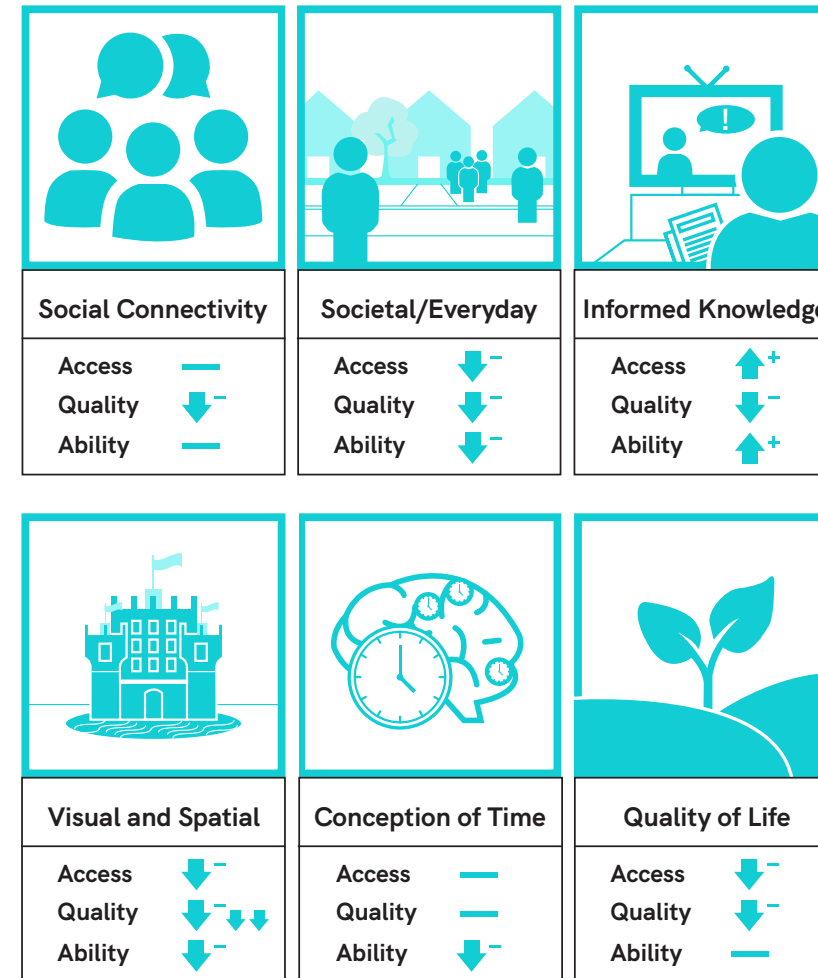


Fig 3.2 - Variations of Connectivity

There are different variations that can exist depending on the given situation, and they are subject to outside factors.

# Window Etymology

## Understanding the Origins of Windows

The word “Window”, has interesting variations with regards to its etymology, but some intriguing similarities can also be found. Understanding the origin of the word will help to unveil ways the window is already related to connectivity.

There are four major etymological groups for the term “window”, and they are organized through the similarities in how the word is composed. The four main groups are **OKO**, **VINDAUGA**, **MADO**, and **FENSTER**, each of them outlined below:

**OKO** is the Czech version of window and has the basis of calling the window an **Eye**. Other similar words are found in mostly Slavic languages. The other forms include: Okno (Polish), **ОКНО** (Russian) and the exception - Oculus (Latin).

**VINDAUGA** is the Norse version of window, and has the basis of calling the window a **“wind-eye”**. (vindr ‘wind’ + auga ‘eye’). Other forms include Vindöga (Swedish), Vindue (Danish) and Ventana (Spanish). It should be noted that Vindauga is also the ancestral origination for the English word, “Window” (Oxford Dictionary).

**窓 | MADO** is the Japanese version of window, and has the basis of calling the window an **“Eye-gate”**. There are many other Japanese forms that bear similarity including 間戸 | [Mado] meaning “gap-door”, 目戸 | [Meto] meaning “eye-door”, and 天戸 | [Amanoto] meaning “heaven-door”.

**FENSTER** is the German Version of window, with the basis of calling the window either a **“Hole or Opening”**. Other forms include Venster (Dutch), Fenêtre (French) and Finestra (Italian).

### The Window’s Basic Relation to Connectivity

As it can be see in Fig 3.4, the window can have different associations to other elements as well as functions, but it is the common shared one of them all which is the most important. **An EYE**.

OKO directly bases the word window on the eye in its structural composition, Vindauga has wind alongside the eye, Mado has the eye combined with a gate, but as an exception Fenster refers to a hole or opening. The association to an eye is significant as it is the idea which begins to relate the window with connectivity.

Fig 3.3 - Windows and Connectivity



With the window being associated to the eye, an eye itself can benefit some of the variations of connectivity (on a basic level).

On a basic level the eye positively affects the variations of connectivity: being able to see allows one to be a part of society, to be aware of what is going around us, have a variance in visual and spatial conditions, and see the passage of time. This is not all though. Yasunari Ueda from the Windows Research Institute states that, “Just as the eyes are essential sensory organs for ensuring the human body’s connection to the external world, windows connect the closed spaces of a house with its external environment” (2018). On a basic level, windows do provide connectivity.



OKO	VINDAUGA	窓   [MADO]	FENSTER
Okno - Polish Version	Vindauga - Norse Version	窓   [Mado] - Japanese Version	Fenster - German Version
Okno - Polish Version	Vindöga - Swedish Version	間戸   [Mado] - gap-door	Venster - Dutch Version
ОКНО - Russian Version	Vindue - Danish Version	目戸   [Meto] - eye-door	Fenêtre - French Version
Oculus - Latin Version	Ventana - Spanish Version	天戸   [Amanoto] - heaven-door	Finestra - Italian Version

Connection	Connection	Connection	Connection
Function	Function	Function	Function

Fig 3.4 - Etymological Groups

Three out of four etymological groups associated the window to an eye, which can relate the window to connectivity.

33. “Okno”. *Sciaga.pl*, <https://sciaga.pl/slowniki-tematyczne/9718/okno/>.  
 34. Ueda, Yasunari. “Vol. 0: Windows From The Perspective Of Contrastive Etymology | Research | WINDOW RESEARCH INSTITUTE”. *Window Research Institute*, 2018, <https://madoken.jp/en/research/window-terminology-a-la-carte/3144/#:~:text=The%20German%20word%20for%20%E2%80%9Cwindow,a%20partition%20wall%20or%20rampart%E2%80%9D>.

35. “Meaning of Window in English”. *Oxford Dictionary*, <https://www.lexico.com/definition/window>.

## Conclusion

### A Reflection on the Section.

This area of the investigation focused on the concepts of connection as well as connectivity, the variations of connectivity negatively impacted by mandated physical isolation, as well as the etymological groups for the term “Window” and how they suggest windows provide connectivity.

Connectivity is the state, quality as well as capability or capacity associated to experiencing a form of connection. It has a plethora of specific variations depending on the situation, and these variations help to establish two main ideas: First is the fact that people have forms of connectivity diminished because of mandated physical isolation, and the other is that there is a major need to strengthen the forms that were weakened. This provides grounds for the thesis to be conducted, as there is a relevant issue that exists, and it requires an adaptive solution to combat it.

The Etymological analysis of the Window helped to unveil the origins of the word, which could be seen through four main groups organized by the versions that had a similar compositional structure. The associated basis of most of the terms had a relation to the eye, whether it was the eye alone or combined with another element, such as Vindauga translating to “wind-eye” versus Mado with “eye-gate”. This suggests that the window is connected to the eye by being a similar element and having the same function. This is an important finding as it begins to illustrate the relation between windows and connectivity. The eye bestows the ability to see, which can benefit some forms of connectivity, and thinking of windows as eyes, (for humans and buildings), provides connectivity between people and the external world.

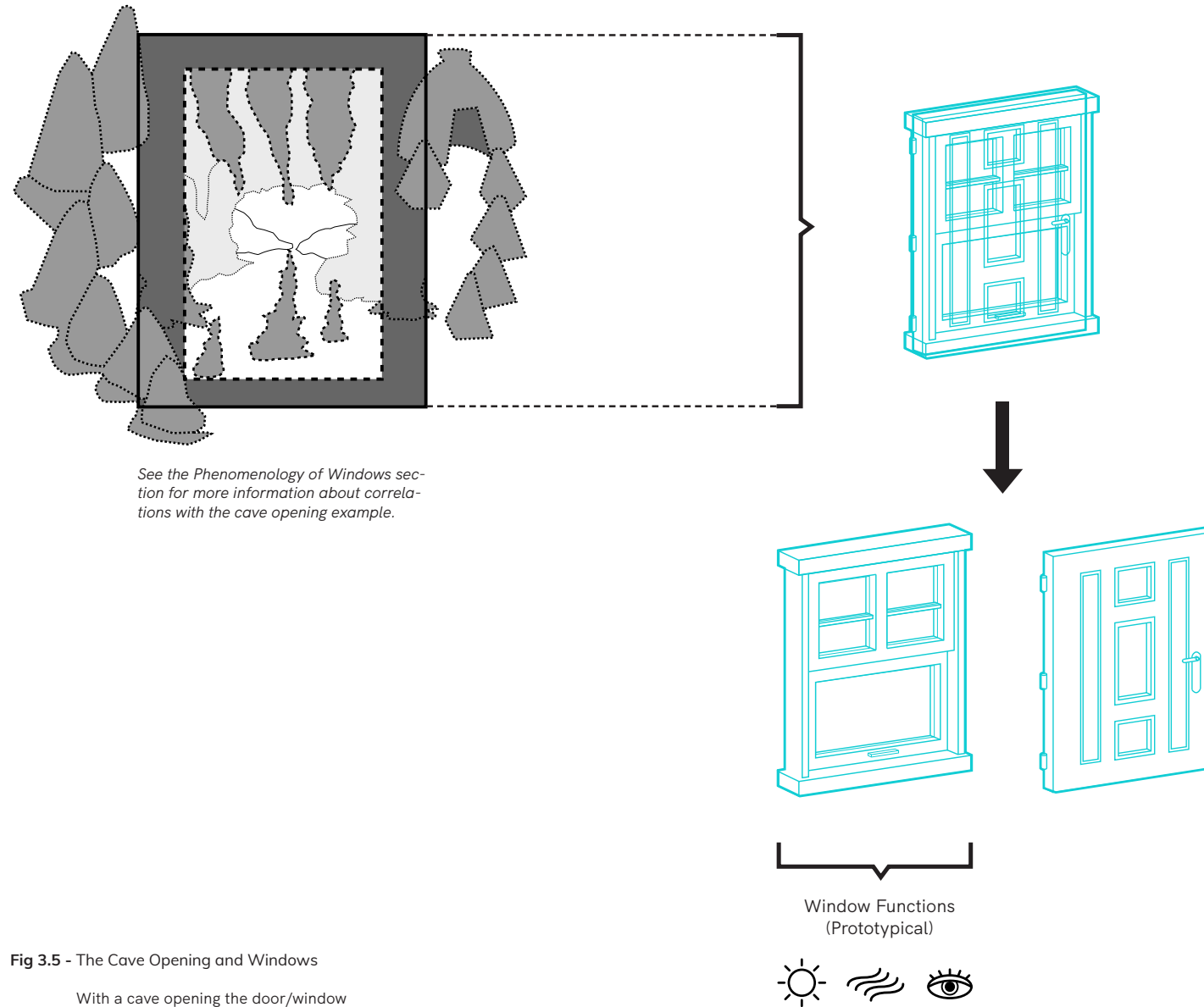


Fig 3.5 - The Cave Opening and Windows

With a cave opening the door/window have shared functions, so the existence of a window began with its separation.

### The Window and the Door

As the window’s etymology establishes the relation between it and the provision of connectivity, how the window conceptually originated is part of a deeper level of thought/analysis.

It can be hypothesized that the first, and original forms of architecture could translate to shelters, and the first forms of shelters could translate to caves. What is significant about this correlation is not the cave itself, but the cave opening, which arguably could be the first version of a window; its ancestral origin. The cave opening being an opening would share the functions of both a door and window but, “The concept of what we call “windows” today hence only came into existence when the original multi-functional cave opening became solely an entryway by shedding its other functions”. (Ueda, 2018).

This is an important consideration for the overall investigation, as now the question arises if it should consider redefining and redesigning doors as well; to serve the same goal of providing connectivity for the situations of mandated physical isolation. It was decided that **doors will NOT be included in the investigation** for a couple reasons:

- With the Etymological Analysis, the findings suggested a basic relation between connectivity and windows (not doors).
- The window in some contexts can have act as a door (See Building Code for Windows section - M.E for Emergency Exit), while the door can not intrinsically act as a window.

34. Ueda, Yasunari. “Vol. 0: Windows From The Perspective Of Contrastive Etymology | Research | WINDOW RESEARCH INSTITUTE”. *Window Research Institute*, 2018, <https://madoken.jp/en/research/window-terminology-a-la-carte/3144/#:~:text=The%20German%20word%20for%20E2%80%9Cwindow,a%20partition%20wall%20or%20rampart%20E2%80%9D>.

# 03 What can Windows Encompass & how they Provide Connectivity

**Section 3.**  
See Appendix C.

**A**s it has been established multiple times with the previous two sections of the overall investigation, there is an inherent need to expand what windows can encompass to be able to re-define them as essences of connectivity. In their basic etymology, small correlations can be made between windows and the concept of connectivity, so to expand them shall unearth more truths.

To examine what windows can encompass, one method could be to look to phenomenology, with reducing them to their fundamental aspects. The specific concept that windows can act as thresholds will serve as this section's counterpart, for understanding the window in its most fundamental form should also look to the relationships it generates. These two forms of analyses will generate ideas surrounding what the window can be as well as what it can encompass, while illustrating potential methods for applying the window to become an essence of connectivity. These methods will not be specifically prescriptive, and this is important because what a window is and what it can encompass will truly be challenged, affecting how the investigation can prescribe redefined windows. As it will be seen, there will be a prescription of thinking as opposed to conclusions.

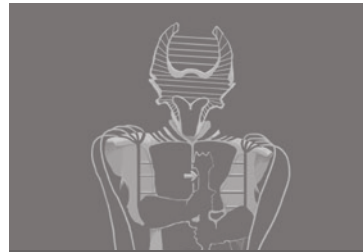


# What can Windows Encompass & how they Provide Connectivity

## Phenomenology of Windows

PGs. 112 - 135

Searching for the fundamental aspects of windows as well as challenging what they can possibly encompass.



## Windows as a Threshold

PGs. 136 - 151

Examining the window as a transitory element for environments, with the ability to control their division, blurring or unification as part of an overall relationship.



## Table of Contents

### Phenomenology of Windows

Introduction .....	114 - 115
Reduction Stages .....	116 - 117
The Fundamental Elements of Windows .....	118 - 121
The Cave Opening Example .....	122 - 123
Challenging what the Window can Encompass .....	124 - 131
Conclusion .....	132 - 133
<b>The Phenomenological Perception .....</b>	<b>134 - 135</b>

<b>Fig. 4.0 - Phenomenological Reductions</b>	115	<b>Table 4.0 - Reduction Stages</b>	116
<b>Fig. 4.1 - Grouping of Elements</b>	119		
<b>Fig. 4.2 - Stage 4 Qualities</b>	120		
<b>Fig. 4.3 - The Cave Opening</b>	123		
<b>Fig. 4.4 - Group 1 - Permeability</b>	125		
<b>Fig. 4.5 - Group 2 - Opening</b>	127		
<b>Fig. 4.6 - Group 3 - Access/Interaction</b>	129		
<b>Fig. 4.7 - Group 4 - Intuition/Identity</b>	131		
<b>Fig. 4.8 - Prescribing Thinking</b>	133		

# Phenomenology of Windows

## Introduction

This page of the Phenomenology of Windows section will explain what it encompasses, as well as its relevance/association to the investigation.

### Scope

To understand how the window can be redefined to become an essence of connectivity, what windows are and what they can encompass needs to be further analyzed. As explained near the end of the Windows are Critical for our Health and Well Being section, there is a need to abstract what the window is so that it is not limited by its conventional perception. Phenomenology will unveil various elements associated to windows as well as challenge what they can be through the modification/removal of certain elements.

### Methods

Phenomenology is a branch of philosophy which typically focuses on the reduction of concepts or ideas to their fundamental elements. The associated elements of the conventional perception of windows were listed as a base point, before being taken through their series of phenomenological reductions. These reductions translate to conceptualizing what each individual element is at its core, and this was done in multiple stages to continue to refine the list, (until a decided end point was reached). In the case of the investigation the Stage 1 list went through 3 reductions to reach an end point, and these elements would be organized into four groups to look for similarities. These groups would incite the creation of various “Combinations of Windows”. The combinations of windows are lists that suggest variations where some of the elements of a window are kept, while others are modified or omitted, and this is done to challenge what the window can be as well as what it can encompass.

### Assumptions and Limitations

With Phenomenology and reducing a chosen element to its fundamental aspects, there are two main factors: interpretation, as well as deciding when an end point has been reached. The basis of the reductions already comes from a form of interpretation - conventional perception - and as such, reducing it does not limit other possibilities as to what can be fundamental to a window. Deciding an end point for the reductions is also limited, because at some point a decision has to be made for when to stop, being the point where further reduction provides elements that can not be retraced to the original conception.

### Relevance to the Larger Argument

*What can windows encompass & how they provide connectivity?*

The Phenomenology of Windows section focuses on answering the first main question: “What can windows encompass?”, so any evidence here will help to unveil possibilities of what windows can be. As it will be seen through a plethora of combinations of windows, the main lessons behind the window’s phenomenology will also explain how it can be redefined to provide forms of connectivity. This is applied to the contexts of mandated physical isolation.

### Relevance to the Overall Investigation

Having fundamental knowledge of windows will allow one to understand how they can be redefined for their new role, which is the central goal of this investigation. It can also be said that the phenomenology of windows will challenge what a window is/can be, and this should open up forms of debate relative to what element(s) of a window must exist to maintain its classification.

## CONVENTIONAL PERCEPTION

STAGE 1 - Qualities of the Conventional Window
Attached to a wall, ceiling
Glass
Potentially Operable
Frame
Brings Daylight
Brings Ventilation
Brings Views
Constructed/Manufactured
Physical Object
Typically separates inside and outside
Comes in different shapes and sizes
Architectural Element
In the field of Architecture

**STAGE 2**  
Reduction of Stage 1 qualities.

**STAGE 3**  
Reduction of Stage 2 qualities.

**STAGE 4**  
Final Reduction/Fundamentals

**STAGE 5**  
Cave Opening Example

**STAGE 6**  
Reduction/Grouping of Stage 4

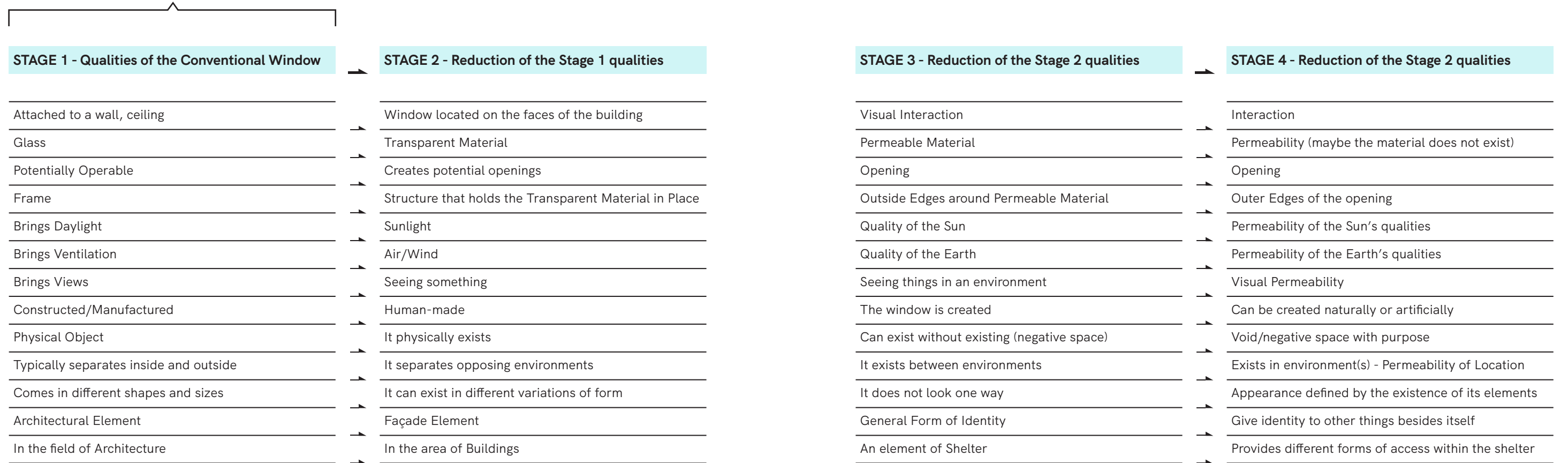
### Groupings of Fundamental Qualities

- Permeability
- Access/Interaction
- Opening
- Intuition/Identity

Fig 4.0 - Phenomenological Reductions

Table 4.0 - Reduction Stages

CONVENTIONAL PERCEPTION



## The Fundamental Elements of Windows

The four main groups of fundamental elements for the window include: Permeability, Opening, Access/Interaction, and Intuition/Identity.

### Permeability

Permeability looks at the ability for something to pass through the window. Whether this is a physical form or conceptual, what is most important is the concept of potentially manipulating what can pass through, how easily it can pass through, and by how much. Other forms of permeability are: with regards to the **Sun's qualities**, **Earth's qualities**, **Visual Permeability** as well as **Location-based permeability**.

The **permeability of the Sun's qualities** involves heat, light and Ultraviolet Radiation (UV) passing through the window. Heat can affect the temperature of a space, light can illuminate the space, and Ultraviolet Radiation can provide beneficial/harmful effects to humans in the space.

The **permeability of the Earth's qualities** involves air/wind, connecting to the outdoors/nature, and pollutants/allergens passing through the window. All of these qualities are associated to opening the window, which allows in outside air/wind to cycle out the stale, interior air; being connected to nature through the sights and smells of it; and also potentially letting in outside pollutant/allergens which can be harmful for humans.

**Visual Permeability** translates to the visual system, having access to views, and the blurring of two environments. With light passing through the window humans can use the visual system (ability to see) to look through the window, having access to views translates to being able to look through the window at something and thus being visually engaged, and the blurring of environments is the concept that visually environments of interior

and exterior can appear to be connected/divided based on the visual connection between the two. (See Windows as a Threshold section).

### Opening

Opening looks at the fact that windows typically involve some component that is conceivably a hole, which also has been seen to be an element that helps to provide permeability. More specifically opening involves possibility of opportunity, an essence of vacancy and traversal/connection. Other forms of opening include the **Outer edges of the opening** and the **void/negative space**.

The **outer edges of the opening** includes establishing the negative space, setting the perimeter, and acting as structure for the window to have operability. The negative space of an opening is established when the edges of it exist; a perimeter is created by the outer edges, and constitutes the physical restraints of the window; and in the case of an operable window, the outer edges that provide its structure are where mechanisms are implemented (to allow for operability).

The **void/negative space** aspect of openings involves an opportunity from vacancy, being able to exist without existing, and being achieved with or without a material. Being a negative space suggests the possible opportunity derived from the vacancy of something physical (in the opening), a negative space can exist without being a physical thing, and the opening can be composed of a transparent/lucent material or nothing at all.

### Access/Interaction

The forms associated to Access/Interaction include: **Access**, **Interaction**, and **Opening**. **Access** involves the physical access associated to window's operability/permeability; visual access for

connection between multiple environments; and visual access being relative to the safety/privacy of people. **Interaction** looks at the physical interaction of opening the window, visual with looking through it, and physical interaction manipulating

### STAGE 4 - Reduction of the Stage 2 qualities

Interaction
Permeability (maybe the material does not exist)
Opening
Outer Edges of the opening
Permeability of the Sun's qualities
Permeability of the Earth's qualities
Visual Permeability
Can be created naturally or artificially
Void/negative space with purpose
Exists in environment(s) - Permeability of Location
Appearance defined by the existence of its elements
Give identity to other things besides itself
Provides different forms of access within the shelter

the visual interactions. Being an Opening means that one can see through it, one can physically traverse through the window, as well as it being physically sealed but not visually.

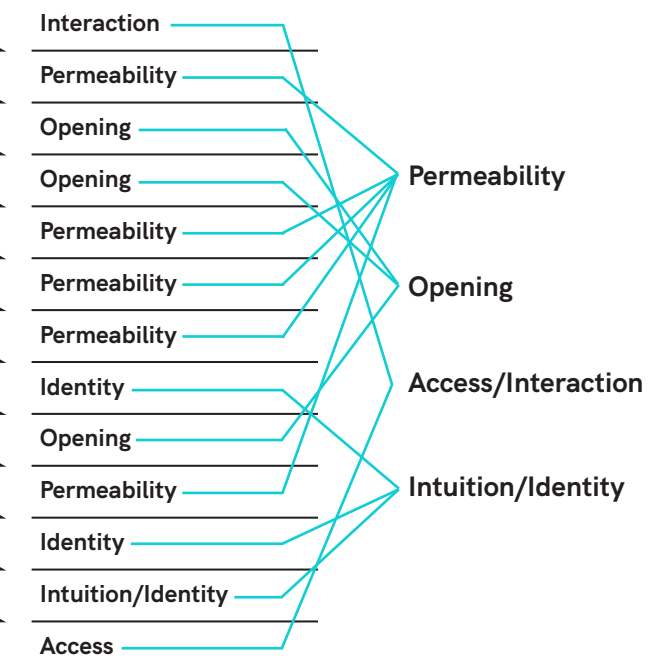
### Intuition/Identity

Intuition/Identity involves the elements of identity involving windows being located on the face of a thing, the conventional perception of the window identifies other things, and questioning if the

identity is modified when the form is as well. This includes the **Elements Existing** and that windows are **Created**. **Elements existing** looks at the phy-

Fig 4.1 - Grouping of Elements

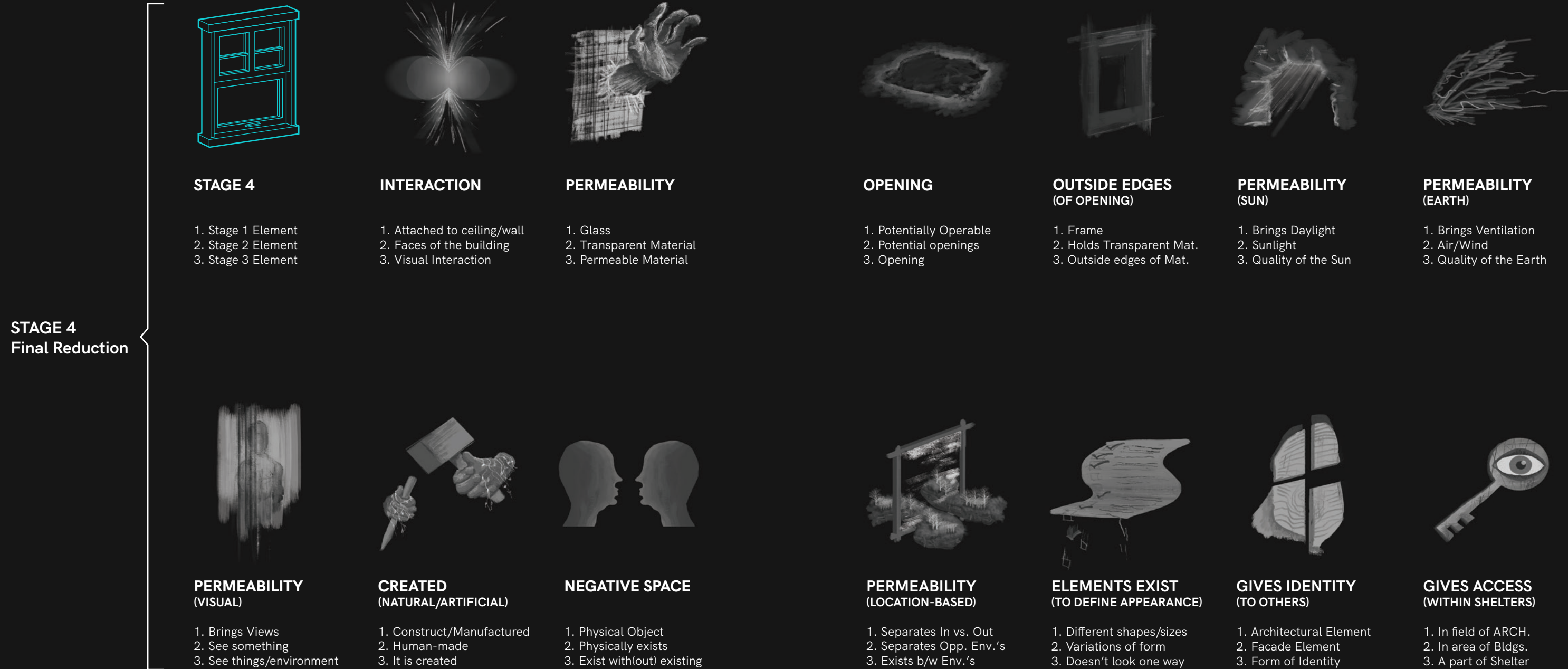
### STAGE 6 - Reduction/Grouping of Stage 4



The four groups for the phenomenological elements are: Permeability, Opening, Access/Interaction and Intuition/Identity.

sical being attributed to the opening and outside edges of a window; the variance in form affects a variance of identity, as well as the element of opening existing as a void. Created encompasses concepts that are opposing as well as causal with natural vs. artificial creation, happenstance vs. intended construction, and the outside edges creating the opening of windows.

Fig 4.2 - Stage 4 Qualities



## The Cave Opening Example

As it was previously mentioned within the Connectivity & the Origins of Windows section, both the window as well as the door originated from the shared functions of an opening. It is also important to reiterate the fact that most likely the first types of shelter for the earliest humans would have been caves<sup>34</sup>, and as such the first conception of the door and window would be the cave opening. The window and door would truly originate when both shed their shared functions with the opening, going separate ways.

Although the door and window may have separated themselves from the Cave Opening, it can be hypothesized that there are still remnants of it which reside in the current perceptions of both the door and window. As such it is important to utilize the phenomenological findings to analyze the cave opening - which is a harkening back to the window's possible origination.

When the Fundamental Elements of the Window (Stage 4) were conceptually applied to the Cave Opening, they seemed to transfer mostly seamlessly. Again, it should be repeated that the Cave Opening acts a form of origination for the window, but it is not necessarily the phenomenologically fundamental window nor the fundamental door.

A great majority of the Stage 4 elements could be applied to the Cave Opening example through the main groups of these elements: Permeability, Opening, Access/Interaction, as well as Intuition/Identity. The most common examples were with Permeability. This is mainly due to the fact that Permeability deals with something being able to pass through the window, and this connects with

After translating the Stage 4 qualities to the cave opening example, this list was comprised:

### STAGE 5 - Cave Opening Example

Seeing through and walking through the opening

Cave Opening = no material = Fully Permeable

Cave Opening is an opening

The cave edges = outside edges of the cave opening

Light enters cave/Illuminates the outer environment

Opening = Fully air/wind permeable

See through the opening = Fully visually permeable

Naturally created

Opening = Negative space/void of the cave surface

Environment in cave vs./= Environment outside cave

Elements that compose the opening physically exist

Cave is defined by its opening, its access

Being inside the cave = physical, and visual access

the idea of an opening which for many aspects is considered fully permeable. It provides visual permeability to see through it; it is permeable to the elements of the Sun/Earth, (brings in sunlight and wind); an opening allows for easy physical as well as visual access or interaction with the cave and its surrounding context; and lastly it allows location-based permeability of environments by completely unifying them.

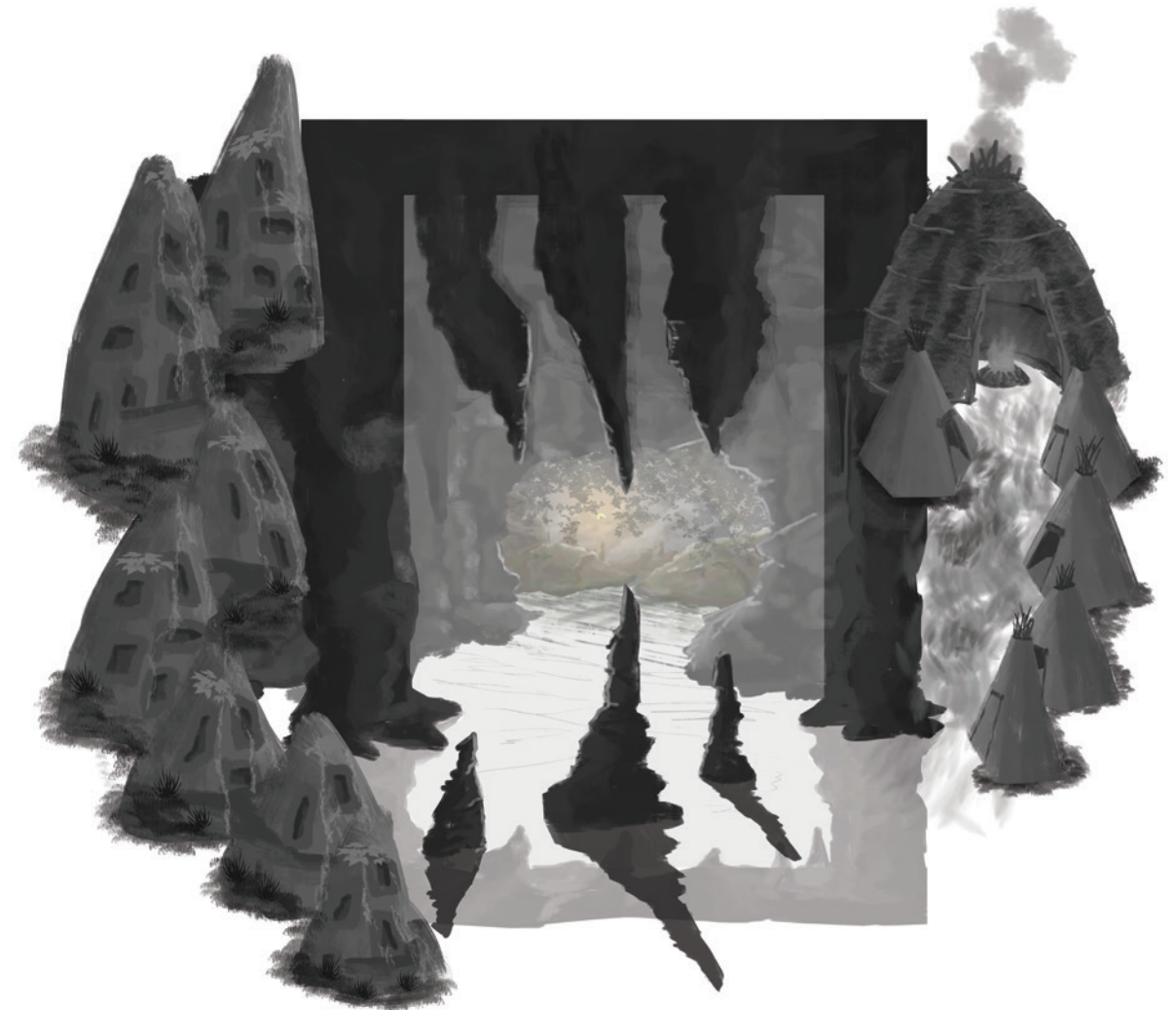


Fig 4.3 - The Cave Opening

The Cave Opening acts as a possible origination of windows/doors, with the fundamental elements easily applied.

34. Ueda, Yasunari. "Vol. 0: Windows From The Perspective Of Contrastive Etymology | Research | WINDOW RESEARCH INSTITUTE". *Window Research Institute*, 2018, <https://madoken.jp/en/research/window-terminology-a-la-carte/3144/#:~:text=The%20German%20word%20for%20E2%80%9Cwindow,a%20partition%20wall%20or%20rampart%20E2%80%9D>.

36. "Meaning of Cave in English". *Oxford Dictionary*, <https://www.lexico.com/definition/cave>.

37. "Definition of CAVE". *Merriam-Webster.com*, <https://www.merriam-webster.com/dictionary/cave>.

38. White, William. "Cave | Definition, Formation, Types, & Facts". *Encyclopedia Britannica*, <https://www.britannica.com/science/cave>.

## Challenging what Windows can Encompass

This area of the section utilizes the groups of fundamental elements to create: "Combinations of Windows" - variations on windows where specific elements are utilized, while others are either omitted or modified. This is for the purpose of challenging what windows can encompass, and asking the question of if these variations are still classified as windows.


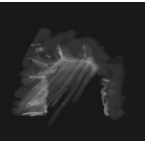

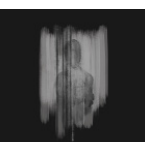

The conventional perception defines permeability by the amount of uncontrolled air that passes through, but as it can be seen with the phenomenological group, there are more aspects such as: permeability of the Sun, the Earth, visual permeability, and location-based permeability. These additional forms of permeability translate to the Combinations of Windows by utilizing some elements (related to being able to pass through the window), while modifying or omitting others.

The combination of a **window that allows light in but not views** was further analyzed with the real life example of the Massachusetts Institute of Technology's (MIT) chapel, by Eero Saarinen. It was completed in 1956, with the design having a cylindrical brick form with circular subtractions at the base, and being situated in a moat. This latter detail is where the project has its main relevancies to the selected combination. The walls of the chapel are designed to allow light to refract from the water of the moat and bounce into the space, which brings light into the space, animating it with the motion of the water. The decision to remove all views to the outside was a specific design choice as Eero Saarinen states it: "implied the self-contained, inward-feeling which was desirable" for a place of worship (MIT).

### CONVENTIONAL PERCEPTION

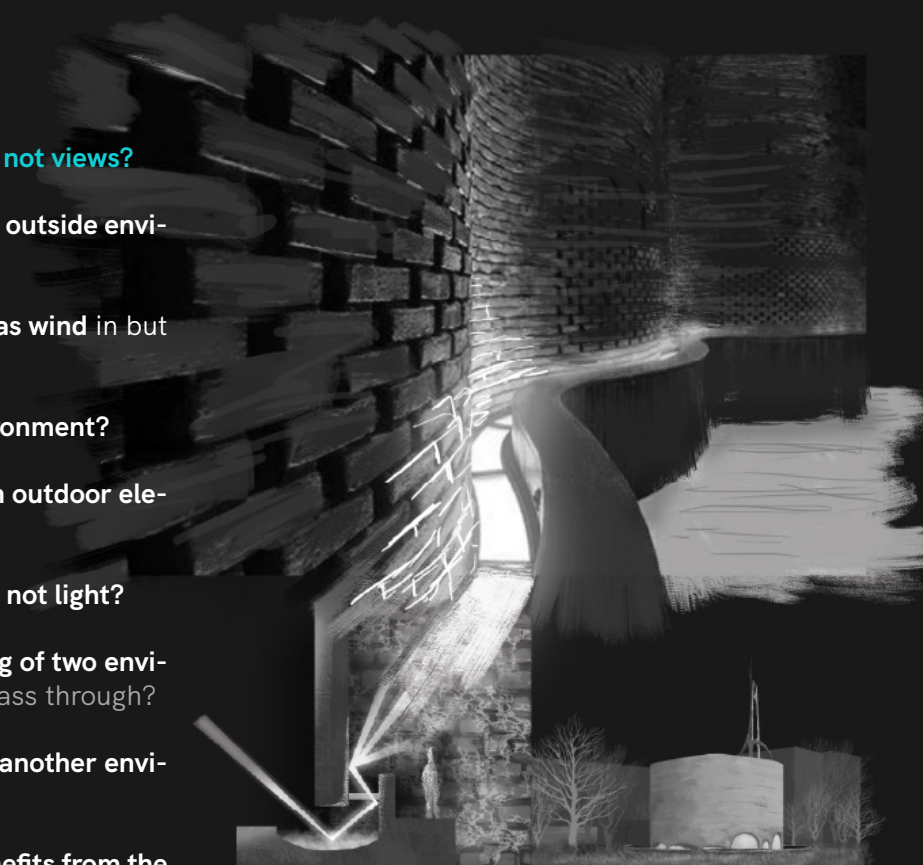
Permeability looks at the amount of uncontrolled air that passes through the window (air tightness).

#### Phenomenological Elements

<b>PERMEABILITY</b>	
- Ability for something to pass through - Manipulating the degree of the ability - Physical/Non-physical passing through	
<b>PERMEABILITY OF THE SUN</b>	
- Heat - Light - Ultraviolet Radiation (Electromagnetic)	
<b>PERMEABILITY OF THE EARTH</b>	
- Air/Wind (Fresh Air Benefits) - Connecting to the Outdoors/Nature - Vehicle for Pollutants	
<b>VISUAL PERMEABILITY</b>	
- Entrance of light - Access to views - Blurring of two environments	
<b>LOCATION-BASED PERMEABILITY</b>	
- 50/50 Division of environments - Micro-environment within larger one - Blurring of two environments	

#### Combinations of Windows

- **Window that allows light in but not views?**
- Window that **allows views to an outside environment in but not light?**
- Window that **allows air as well as wind in but not people in** to the space?
- Window that is **in a single environment?**
- Window that is **composed of an outdoor element?** (Ex: Stream of Water)
- Window that **allows heat in but not light?**
- Window that **allows the blurring of two environments but not air/wind** to pass through?
- Window that **allows views and another environment but not light?**
- Window which **gives health benefits from the Sun (UV) while being immersed in nature?**



MIT Chapel - Eero Saarinen

Fig 4.4 - Group 1 - Permeability

The combinations of windows center around Permeability, the idea that something can pass through the window.

39. Saarinen, Eero. "Eero Saarinen's MIT Chapel | Detailed Drawings, Saarinen, Chapel". *Pinterest*, 1956, <https://www.pinterest.ca/pin/370632244330417595/>.  
40. "MIT Chapel | Division Of Student Life". *Studentlife.Mit.Edu*, <https://studentlife.mit.edu/cac/event-services-spaces/event-spaces/mit-chapel>

The conventional perception identifies the element of a window's opening to being associated with some form of hole in the facade, and a piece of glass over it to provide for both transparency and a sealed enclosure. Although this is true in most respects, it is limited. On the basic level an opening is an open hole, and as such that side should be integrated within the conventional perception, besides just having glass over top of it. When an operable window is opened, there is an open hole in the facade.

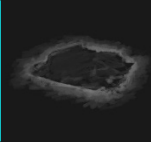
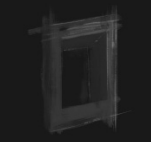

There are more abstract concepts related to an opening, such as its correlation with opportunity, specifically opportunity from vacancy. Similar to how an open job position means there is opportunity from vacancy, the window as an opening brings opportunity from non-existence (a hole in the facade). As a negative space, it can be said that an opening is generated by its outer edges.

The combination that was selected to be further analyzed was a **Window that is open on all sides to become a completely negative space**, and this is in relation to the real life examples of Finnlough Bubble Domes as well as Finland Glass Igloos. Both of the projects are transparent domes that are used for vacation retreats, with the intention of providing "uninterrupted views so you can immerse yourself in nature and sleep beneath the starry skies" (Finnlough.com). They both achieve this with different approaches, as the Finnlough domes are completely transparent where Glass Igloos technically are not, (with their steel frame structure). The contexts also differ as the former is situated in secluded areas within a forest, while the latter has a community-like organization.

### CONVENTIONAL PERCEPTION

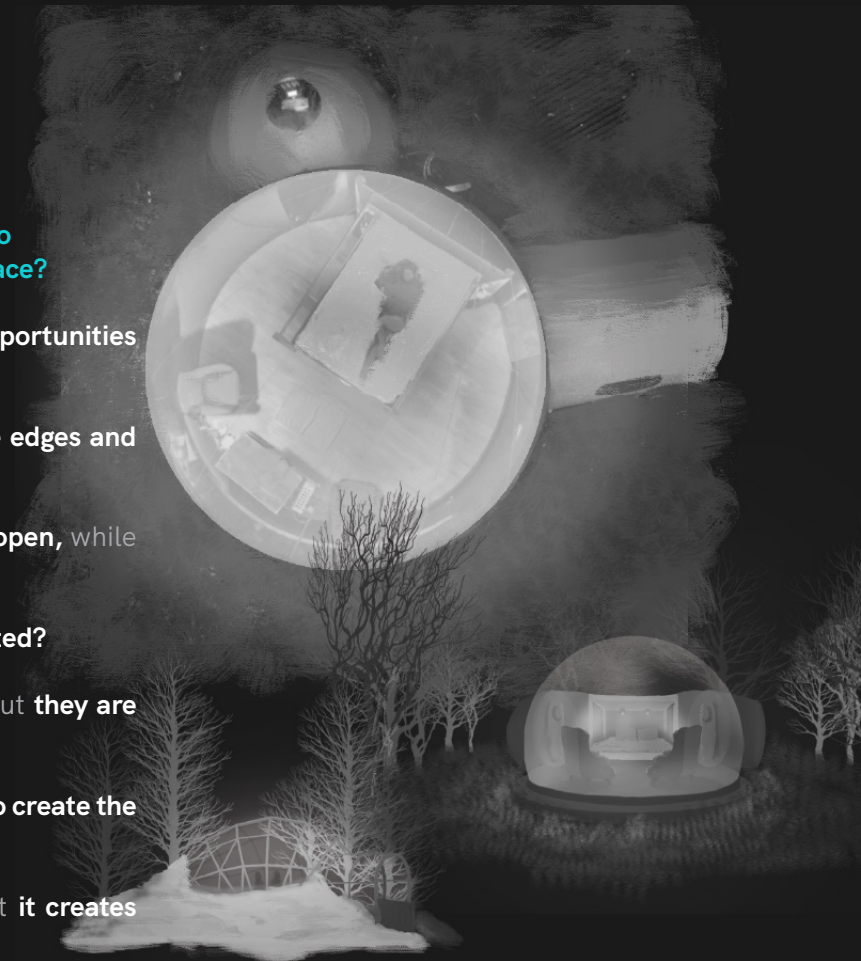
The Window is the opening (hole) in the wall with glass over it to keep the facade sealed.

### Phenomenological Elements

<b>OPENING</b>	
<ul style="list-style-type: none"> <li>- Opening = a possibility or opportunity</li> <li>- Opening meaning vacancy</li> <li>- Traversal/Expansion</li> </ul>	
<b>OUTSIDE EDGES</b>	
<ul style="list-style-type: none"> <li>- Can establish the negative space</li> <li>- Setting the perimeter = restrictions?</li> <li>- Structure allows operability</li> </ul>	
<b>VOID/NEGATIVE SPACE</b>	
<ul style="list-style-type: none"> <li>- Opportunity from vacancy</li> <li>- Existing without existing</li> <li>- Achieved with/without a material</li> </ul>	

### Combinations of Windows

- **Window that is open on all sides to become a completely negative space?**
- Window that **provides possible opportunities when it is opened?**
- Window that **exists by its outside edges and opening not existing?**
- Window that **makes a space feel open**, while also **setting a perimeter?**
- Window that is **vacant but inhabited?**
- Window that **has outside edges but they are also a negative space?**
- Window that **allows the opening to create the potential operability?**
- Window that is **not inhabited but it creates possible opportunities?**



Finnlough Bubble Domes  
Finland Glass Igloos

Fig 4.5 - Group 2 - Opening

The combinations of windows center around Opening, with the ideas of opportunity as well as negative space.

41. "Finnlough - Bubble Domes". *Finnlough*, <https://www.finnlough.com/sleep/bubble-dome>.

42. "Ireland's Bubble Domes Let You Sleep Under The Stars". *Beautiful Life | Web Design, Industrial Design, Art Works, Interior Design, Graphic Design And More*, 2020, <https://www.beautifullife.info/urban-design/irelands-bubble-domes-let-you-sleep-under-the-stars/>.

43. Mitchell, Ryan. "Glass Igloos". *The Tiny Life*, 2012, <https://thetinylife.com/glass-igloos/>.



The conventional perception identifies the element of a window's access/interaction as being the idea that one can visually see through it and physically open it. Although this is true, there are more conceptual underpinnings relative to both.


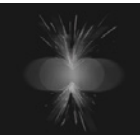
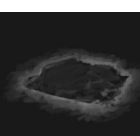
Physical interaction is not only related to the operability of the window, but also physical access to permeability as well. When one opens a window, permeability of the Earth (through air and wind) begins to be physically accessed by the individual. On the visual side there is the concept of visual access being associated to visual trespassing, in which the window can affect both the safety as well as the privacy of a building's inhabitants from prying eyes. Having visual access also connects a human with their outdoor environment, and both of these examples are related to the Farnsworth house which was discussed in regards to the extremity of having too many windows (see Psychology of Windows section).

The combination that was selected to be further analyzed was a **Window that provides a physical and mental escape to a place**, and this is in relation to the real life example of the Greenhouse Neptuna designed by Monika Gora. Completed in 2006, the design features a shell-like form with glass panes and its main motivation was to "develop a construction with as much transparency as possible" (Octatube). It is situated in an infill site, restricting its usage of transparent form, but a small landscape/micro-environment is provided in the design. This suggests a physical escape to a place by isolating a separate environment, where one can sit and relax within the context of a busy city, (the glass inciting interaction with it).

### CONVENTIONAL PERCEPTION

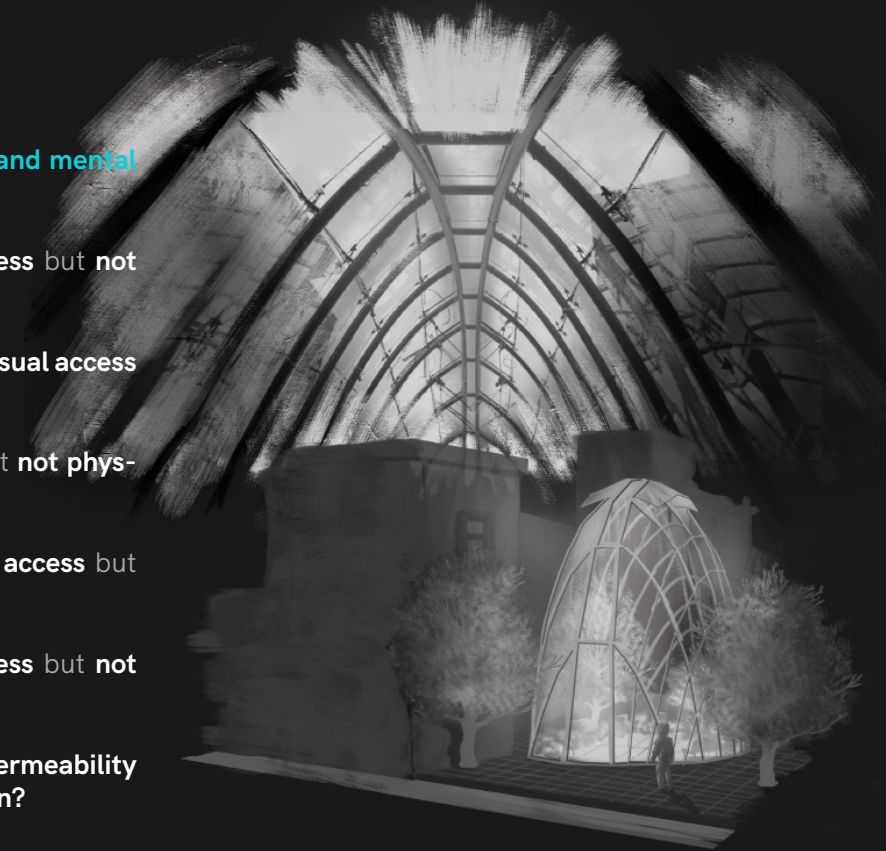
The window allows one to be able to see the outside and potentially open it to allow air inside.

#### Phenomenological Elements

<b>ACCESS</b>	
<ul style="list-style-type: none"> <li>- Physical for operability/permeability</li> <li>- Visual for connection w. environments</li> <li>- Visual for safety/privacy</li> </ul>	
<b>INTERACTION</b>	
<ul style="list-style-type: none"> <li>- Physical with opening the window</li> <li>- Visual with looking through window</li> <li>- Physically modifying the visual</li> </ul>	
<b>OPENING</b>	
<ul style="list-style-type: none"> <li>- As a hole = seeing through (Visual)</li> <li>- Allows traversal through</li> <li>- Physically sealed, but not visually</li> </ul>	

#### Combinations of Windows

- **Window that provides a physical and mental escape to a place?**
- Window that **allows physical access** but **not visual access?**
- Window that through **modifying visual access** **affects the physical access?**
- Window that is **visually sealed** but **not physically sealed?**
- Window that **allows solely visual access** but **not physical access?**
- Window that **provides visual access** but **not seeing through it?**
- Window that has its **operability/permeability** **be operated with visual interaction?**
- Window that is **only visually sealed?**



Greenhouse Neptuna - Monika Gora

Fig 4.6 - Group 3 - Access/Interaction

The combinations of windows center around Access/Interaction, with the visual and physical counterparts.

44. "Greenhouse Neptuna". *Octatube.NL*, [https://www.octatube.nl/en\\_GB/project-item/projectitem/168-greenhouse-neptuna.html](https://www.octatube.nl/en_GB/project-item/projectitem/168-greenhouse-neptuna.html).

The conventional perception does not identify the element of a window's intuition/identity, as this is a more qualitative aspect of the window.


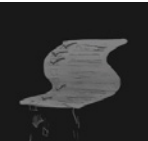

The phenomenological group of Intuition/Identity involves the intuitive nature of windows as well as its ability to give identity to the thing it is situated in. The intuition of the window was previously explained at the end of the Psychology of Windows section with the concept that windows can exist without existing, and thus they provide a plethora of beneficial effects for humans while remaining humbly unacknowledged. On a basic level, windows can give identity to a building through its integration with the facade; this can be used to suggest possible programmatic divisions.

The combination selected to be further analyzed was a **Window that gives identity but is not on the face of a thing**, and this is in relation to the real life example of the Mill City Museum designed by Thomas Meyer. The project started construction in 2001, and is a reuse of what used to be the Washburn A. Mill. (Maps.roadtrippers.com) The flour mill was almost completely destroyed in a fire in 1991, leaving behind ruins of the old walls, and the project is a commemorative museum in its place. The window for this precedent is eight stories tall and features, "True-to-scale graphics of the milling machines... on the glass façade to give visitors an idea of how massive the milling operation was" (Maps.roadtrippers.com) This window expresses the combination as it is not strictly secured on the face of the building, instead it juts out from the façade, and it gives identity to what used to exist. This includes both at face value, and suggesting multiple layers.

### CONVENTIONAL PERCEPTION

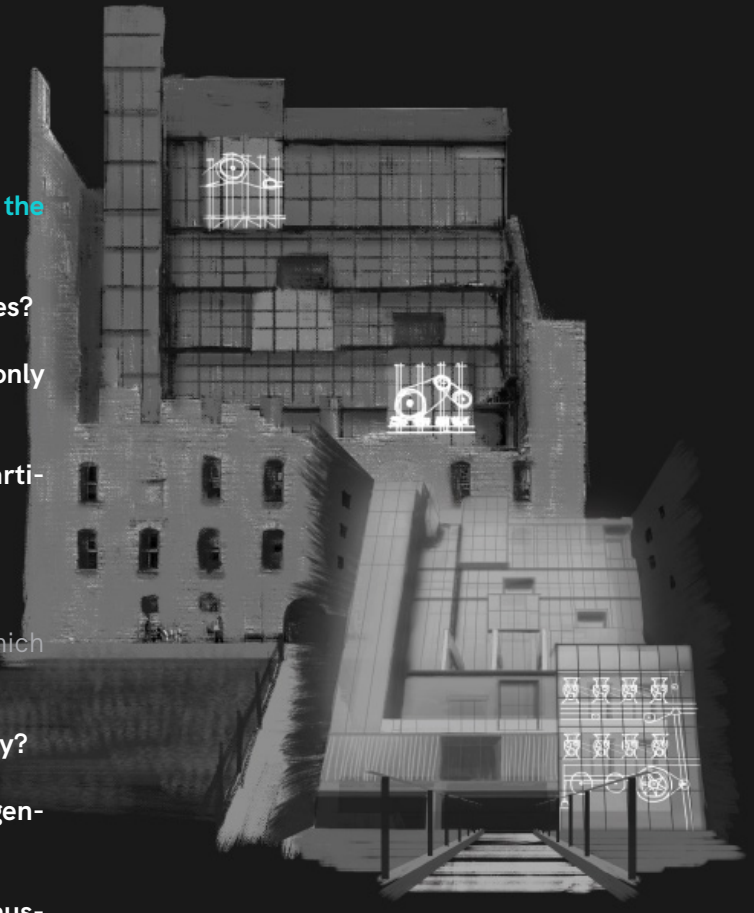
This qualitative aspect is not covered under the conventional perception. (Therefore N/A).

### Phenomenological Elements

<b>GIVES IDENTITY</b>	
<ul style="list-style-type: none"> <li>- Located on the face of a thing</li> <li>- Conventional form identifies others</li> <li>- Identity affected by form modification</li> </ul>	
<b>ELEMENTS EXIST</b>	
<ul style="list-style-type: none"> <li>- Physical = Opening, Outside Edges</li> <li>- Variance in form = Variable Identity</li> <li>- Opening Element can exist as void</li> </ul>	
<b>CREATED</b>	
<ul style="list-style-type: none"> <li>- Natural vs. Artificial Creation</li> <li>- Happenstance vs. intended construction</li> <li>- Outside Edges create the Opening</li> </ul>	

### Combinations of Windows

- Window that gives identity but is not on the face of a thing?
- Window that exists with multiple identities?
- Window that can create identity but can only look one way?
- Window that is both naturally as well as artificially created?
- Window that is on the face of a window?
- Window with a constructed opening(s) which creates the outside edges?
- Window that has only one form of identity?
- Window that has a new perception and generates a new identity to other things?
- Window that is intended construction causing happenstance creation?



Mill City Museum - Thomas Meyer

Fig 4.7 - Group 4 - Intuition/Identity

The combinations of windows center around Intuition/Identity, with the ideas of modifying identity/how it is created.

45. "Mill City Museum". Roadtrippers, <https://maps.roadtrippers.com/us/minneapolis-mn/attractions/mill-city-museum>.

## Conclusion

### A Reflection on the Section.

This section of the investigation analyzed the phenomenology of windows to better understand what they are, and what they can potentially encompass. This would provide an understanding of windows, as well as methods to redefine them - something that will be necessary when they must be conceptualized as an essence of connectivity.

Main findings from this analysis were four fundamental groups of elements that are associated to the window, these being: **Permeability, Opening, Access/Interaction**, as well as **Intuition/Identity**. The concept of Permeability focuses on the idea of something(s) passing through the window; the group of opening looked at the window as a hole; Access/Interaction analyzed the physical and visual methods of engaging with the window and what was gained after interaction; and Intuition/Identity looked at the intuitive nature of windows alongside its ability to give identity to the things that it is situated in.

### Combinations of Windows

For each fundamental grouping a series of variations of the window were proposed, these being generated by keeping some elements, while others were modified or removed. What would result was a plethora of these variations which all individually challenged what windows are as well as what they can potentially encompass. With each variation, the question would always remain: "Is this still considered a window"?

This is an important point relative to not only this section, but also to the larger investigation, and this concept is based on what is prescribed. As a multitude of combinations of windows are being suggested, all of which are challenging what they are/encompass, there is a difficulty in objectively prescribing specific types of windows as being a "proper" window (versus other interpretations).

## In this investigation can we prescribe specific types of Windows?

The answer is **NO**.

What classifies a "window", will always be **subjective to what Elements Exist** that align with one's perception of what a window is.

What we can do is instead **prescribe a level of thinking** related to windows being a tool to promote connectivity.

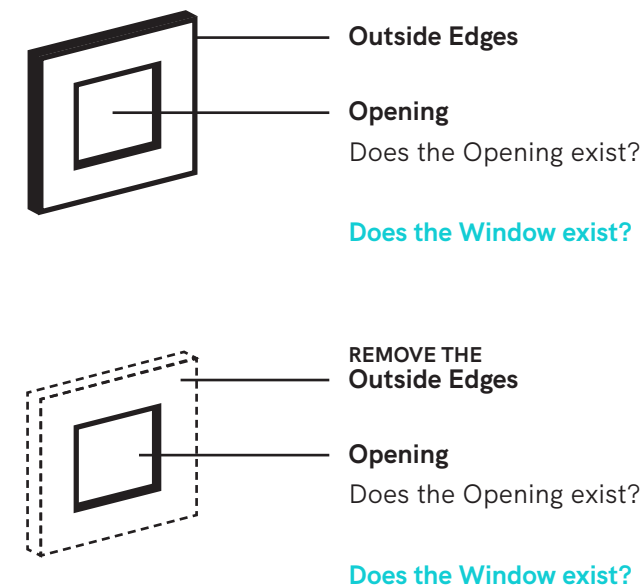


Fig 4.8 - Prescribing Thinking

By prescribing thinking as opposed to specific results, this allows others to filter their interpretations into the design.

At face value, this appeared to be an issue for the investigation, as how can the publication suggest ways windows can be essences of connectivity, if it can not do so objectively? The key here is not to think that there is a binary way of approaching the investigation, but instead it must operate within the realm of functional ambiguity, the idea that there is not a singular right answer, but possible interpretations of answers.

Instead of prescribing specific windows with an end-all-be all approach, it is a lot more logical to prescribe a level of thinking. This idea translates to suggesting potential ways windows can be re-defined for connective purposes, accepting that it is still a form of interpretation. What is being provided is a system of thinking. There is a value in having a system of thinking in areas where it is potentially impossible to be fully objective. By prescribing thinking, one should be able to utilize this investigation with their own interpretations, to design windows that can provide connectivity.

The reason why the investigation is to prescribe a system of thinking, is because the combinations of windows involve the manipulation of its elements. Some are kept, while others are omitted or modified, but what windows are, will always be bound to one's subjective perception (as it relates to the elements existing for the window). For example, if the investigation were to state that for windows light is critical but not views, this may be adequate for the viewpoint of the author, but to the reader this could be unacceptable. It is this variance in what is allowed to be classified as a window that causes potential disagreement.

Similar to the Windows are Critical for our Health and Well Being section having the conventional perception of windows, this area of the investigation which looked at phenomenology, will now have a **Phenomenological Perception**.

## The Phenomenological Perception

and its relation to connectivity.



After analyzing the phenomenology of the window, fundamental elements were determined to be necessary to constitute a phenomenological window. It is because of the fact that there is no reasonable way to objectively prescribe specific elements over others, when experimenting with the combinations of windows, that this form of window must solely be held by its fundamental components. Doing so allows objectivity with the freedom to challenge what windows are and what they can encompass.

### The Phenomenological Perception

To have a standard baseline for a phenomenological window, the following definition is provided:

*“A Window is a form of entity that has the ability to either exist as, or provides Permeability, Opening, Access/Interaction, as well as Intuition/Identity. It is in a state of flux, whereby a multitude of variations can be conceived, all relating to the absence or modification of various functions/elements attributed to the window. Windows are bound by one’s subjectivity related to what elements must be present, to enable its classification.”*

Some pieces can be extracted from this definition to understand what a phenomenological window is composed of. These elements are separately explained below:

- Windows are **entities**, which is the idea that they are things with an associated existence.
- Windows must **exist as or provide** the fundamental elements, whether actively/passively.
- **Permeability, Opening, Access/Interaction as well as Intuition/Identity** are the fundamental groups of elements that constitute windows. They act as a baseline for this type of window.

- **The absence or modification of various functions or elements** refers to the combinations of windows, with the purpose of challenging what they are and what they can encompass.
- **Bound by one’s subjectivity** refers to the classification of windows, and is the reason the investigation prescribes a level of thinking.
- **What elements must be present**, is in combination with the subjectivity of the variations of windows as well as window classification. These elements are the fundamental aspects of windows that constitute them.

### How does this apply to connectivity?

These aspects mentioned above constitute what the phenomenological window is. The phenomenological perception also provides an application to how one might redefine windows (to become an architectural essence of connectivity).

This can be done by using the method of creating combinations of windows through the utilization, omission, and modification of elements. As it is stated, so long as with the creation of the combinations of windows the fundamental groupings of Permeability, Opening, Access/Interaction as well as Intuition/Identity are in some way, shape or form provided by the said window, it is considered to be a phenomenological window. This allows for different perspectives to agree or disagree with a designed window, with it still being able to be objectively classified as a phenomenological window. With this ability, one can have a level of freedom to design a window and have a solid grounding that it will bear the fundamental elements. This prescribes a level of thinking, as one can use this method to design windows for the purpose of providing connectivity in situations of mandated physical isolation.

### Definition of a Window

*(Phenomenological Window)*

*“A Window is a form of **entity** that has the ability to **either exist as, or provides Permeability, Opening, Access/Interaction, as well as Intuition/Identity.** It is in a state of flux, whereby a multitude of variations can be conceived, all relating to the **absence or modification of various functions/elements** attributed to the window. Windows are **bound by one’s subjectivity related to what elements must be present,** to enable its classification.”*

### Essence of Connectivity

*(How can the perception be applied?)*

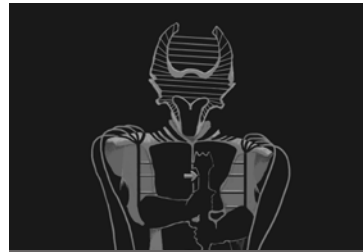
**So long as the entity has the ability to provide Permeability, Opening, Access and Interaction, as well as Intuition and Identity,** with differing degrees/perceptions as to what those qualities entail, **it remains classified as a Phenomenological window.** With redefining the window to be an essence of connectivity, **one can modify the functions/elements that exist allowing the entity to be intentionally designed for its purpose.**

# What can Windows Encompass & how they Provide Connectivity

## Phenomenology of Windows

PGs. 112 - 135

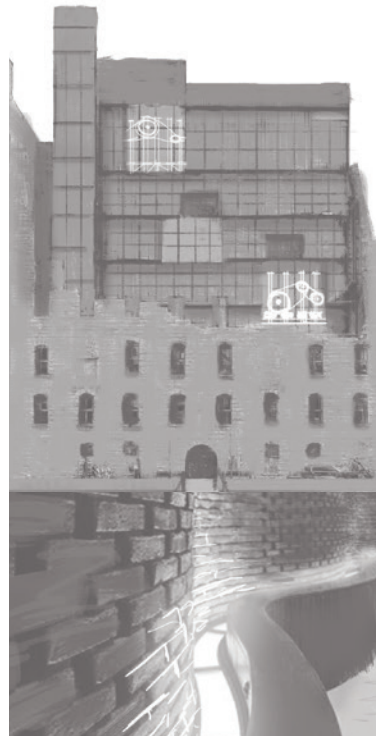
Searching for the fundamental aspects of windows as well as challenging what they can possibly encompass.



## Windows as a Threshold

PGs. 136 - 151

Examining the window as a transitory element for environments, with the ability to control their division, blurring or unification as part of an overall relationship.



## Table of Contents

### Windows as a Threshold

Introduction .....	138 - 139
Environments and Thresholds .....	140 - 141
The Threshold Relationship .....	142 - 143
Compositional Maps .....	144 - 145
How does it act as a Threshold? .....	146 - 147
Conclusion .....	148 - 149
<b>The Threshold Perception .....</b>	<b>150 - 151</b>

<b>Fig. 5.0 - Window as a Gatekeeper</b>	139	<b>CM 5.0 - Compositional Maps</b>	144
<b>Fig. 5.1 - The Threshold Relationship</b>	141		
<b>Fig. 5.2 - Threshold Relationship Scenarios</b>	143		
<b>Fig. 5.3 - Modifying Thresholds</b>	147		
<b>Fig. 5.4 - Connection and Separation</b>	149		

# Windows as Thresholds

## Introduction

This page of the Windows as a Threshold section will explain what it encompasses, as well as its relevance/association to the investigation.

### Scope

To understand how the window can be redefined to become an essence of connectivity, what windows can be as well as what they can encompass needs to be further analyzed. Having a phenomenological understanding provides a solid basis for what windows are, but windows should not be studied in isolation. They are part of a relationship with forms of environments, acting as a permeable gatekeeper among them.

### Methods

The window will be looked at through the lens of being a form of threshold, and this requires analyzing both the concept of thresholds as well as environments. Understanding these pieces individually will help to establish what the possible relationships the window can be situated in regards to environments, but this will be of a more binary approach. To illustrate the layers of history/time that is associated to environments, the method of compositional mapping will be utilized for a specifically selected site: This overall investigation was first conceived of by the author in his workspace, a space that was utilized extensively before as well as during the Covid-19 pandemic. It has large windows which give a beautiful view to the backyard, as well as connection to the external world during times of mandated physical isolation. This is the site that will be investigated in the compositional maps, featuring the exterior-based environment, the interior environment as well as the connection between the two. The workspace was also used in the visual analyses from the Building Code for Windows section.

### Assumptions and Limitations

It will be suggested that windows can affect the relationship of environments to differing degrees, this being relative to a spectrum, but the quantitative point on the spectrum can not be provided. This is because to what degree the window acts a threshold is open to subjectivity, and as such this too should be perceived as a system of thinking as opposed to objective results. The scale that will be provided, will help to give one the ability to conceive of differing levels as to how these environments and the window can exist together.

### Relevance to the Larger Argument

*What can windows encompass & how they provide connectivity?*

The Windows as a Threshold section will expand the argument by stepping outside from just windows, to considering what they can encompass through the relationships they are a part of. For the phenomenological analysis of Windows, the fundamental elements of the window were considered, and although this lends itself to a better understanding of the window itself, it is equally as important to also understand how the window affects things around it.

### Relevance to the Overall Investigation

The idea mentioned above is an important aspect for the redesigning of windows (so that they can provide connectivity), as there is the need for not only understanding the window itself, but how it affects those who use it/the spaces they are situated in. Having an understanding of the different types of environments, as well as their relation to the window, may also influence the contexts that the new, connective windows are to be placed in, making the designs more thoughtful.

Fig 5.0 - Window as a Gatekeeper (See Right)



# Environments and Thresholds

## Defining Overarching Concepts

To begin to conceptualize windows as a form of threshold, some important definitions need to be provided to establish the relative elements.

### Environments

#### (An Environment)

“An Environment is a **form of context** with conditions/surroundings, being **characterized by what inhabits it as well as what activities are performed there**. It gives a place to a **system of connected parts** operating together or individually”.

NOTE: The following two definitions are the more specific elements which will be used for analysis.

#### Exterior-Based Environment

“An environment with conventional qualities and systems that are associated to natural contexts. They are typically characterized by climate conditions provided by the Earth.

#### Interior-Based Environment

“An environment with conventional qualities and systems that are associated to human constructed contexts. They are typically characterized by climate conditions provided by constructed systems”

#### Assumptions/ Limitations

These definitions for the two categories of environments, were generated with the intention to keep them open and objective but also differentiated based on conventional contexts, (exterior

versus interior). It should be noted that this analysis is based on: “An environment”, as opposed to “The environment”, which is described below:

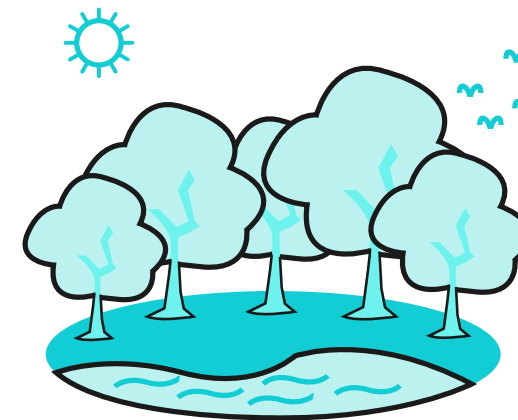
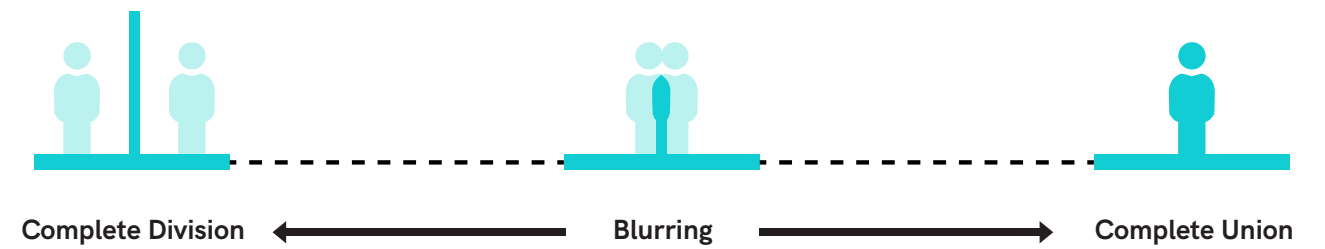
#### (The Environment)

“The Environment is the natural context, which is typically described as being unaffected by direct human intervention”.

#### Thresholds

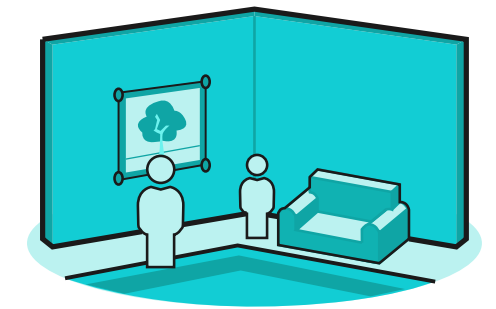
“Thresholds represent a form of transition which can take the form of either a division, blurring or unification of environments, objects, places, values, elements of psychology/physiology...etc”.

Architecturally, thresholds are typically described as the bottom of a doorway which lies in between two spaces, (as well as the door dividing them), but for this analysis, a broader definition will be used. The new definition of thresholds provides a conceptual approach, with the knowledge that windows can **Divide**, or **Unite**, with **Blurring** running along the spectrum in between the two. As such, a qualitative scale was generated to visualize the threshold relationship with the opposites of division and unification, and the idea of blurring to differing degrees situated along the length of the scale. One would utilize the scale to simply envision to what degree is a selected window dividing or unifying the environment(s) it is situated within. To say that environments are being blurred is to mean that they are not fully divided or unified, but they are either balanced between the two or striding closer to one side. Threshold relationships most likely do not fully hit one side.



#### Exterior-based Environment

- Conventional qualities/systems associated to **natural contexts**, May include some human interventions.
- Typically are characterized by **climate conditions provided by the Earth** (Natural Systems).



#### Interior-based Environment

- Conventional qualities/systems associated to **human-constructed contexts**.
- Typically are characterized by **climate conditions provided by constructed systems**.

Fig 5.1 - The Threshold Relationship

52. “Meaning of Environment in English”. Oxford Dictionary, <https://www.lexico.com/definition/environment>.  
 53. “Definition of Environment”. Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/environment>.  
 54. “Definition of The Environment”. Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/the%20environment>.

55. “Meaning of Threshold in English”. Oxford Dictionary, <https://www.lexico.com/definition/threshold>.  
 56. “Definition of Threshold”. Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/threshold>.

# The Threshold Relationship

## Division, Unification, and Blurring

The Threshold relationship looks at the interaction of environments with the window, which can take the shape of division, unification or the blurring of the associated environments.

This generates a scale, (or more conceptually a spectrum), in which division and unification are on opposing sides and any degree in between is considered to be blurring. Many examples exist in regards to the scale, the difference being with the form of interaction and the type of environments undergoing the relationship. These include situations such as the window dividing the exterior-based environment from the interior-based one, a blurring of these two, or a unification. The threshold relationship can include multiple of the same environment, such as the window dividing two interior-based environments, or potentially two exterior ones. Its should be noted that this scale is not limited to solely two environments, there could be more at play such as the window unifying seven interior-based environments. On the other end, it is debatable if this scale could also apply to a single environment, as one might say that there is no transition without at least two environments, but this is not true. The Earth can be considered an exterior-based environment (to a massive scale) and yet it has different types of land associated to it, so to utilize a window to be a threshold for different parts of land could be reasonable. An example of this may be to put a window in between a body of water and the land that is situated beside it.

As such, this investigation will provide the viewpoint that the threshold relationship can occur, in at least one environment or more, so long as there is adequate evidence to show the window is providing some form of division, unification or blurring to the environment(s) at question. It also is not limited to environments but people as well.

### Complexities of the Threshold Relationship

It is important to note that they are some complex aspects associated to the threshold relationship, which are included to enrich the concept:

The first aspect is the idea that threshold relationships may appear as multiple, different forms for the same relationship. An example of this is with the conventional situation seen in Fig. 5.2, which illustrates the scenario of a window for a building dividing the exterior-based environment from the interior-based environment. At its face value, this may seem somewhat reasonable to think that the window separates the exterior from the interior but the key is to what proportion? In reality it can still be a division, but the window is a tiny threshold which separates a micro-environment (interior-based), from the much larger exterior-based environment. This example shows that the relationship appears to be at a one-to-one scale as well as at a massively disproportionate scale.

As it will be seen with the pair of compositional maps, another key aspect adds complexity to the threshold relationship. Thus far the concept has been illustrated in a binary means, but in reality environments are built over time, regardless if they are exterior or interior-based. Environments have a complex layering of crafted history, which combined with its modern day state formulates a palimpsest of historical identities that have been blended into its current one. There may be fundamental elements that make up this palimpsest, as outlined in the compositional map iconography, but they are only isolated elements. It is the congregation of these elements and the passage of time which formulates our true conceptions of an environment. As such the threshold relationship is part of this passage of time and deserve recognition of its associated complexities.

CM 5.0 - Compositional Maps (See Next Page)

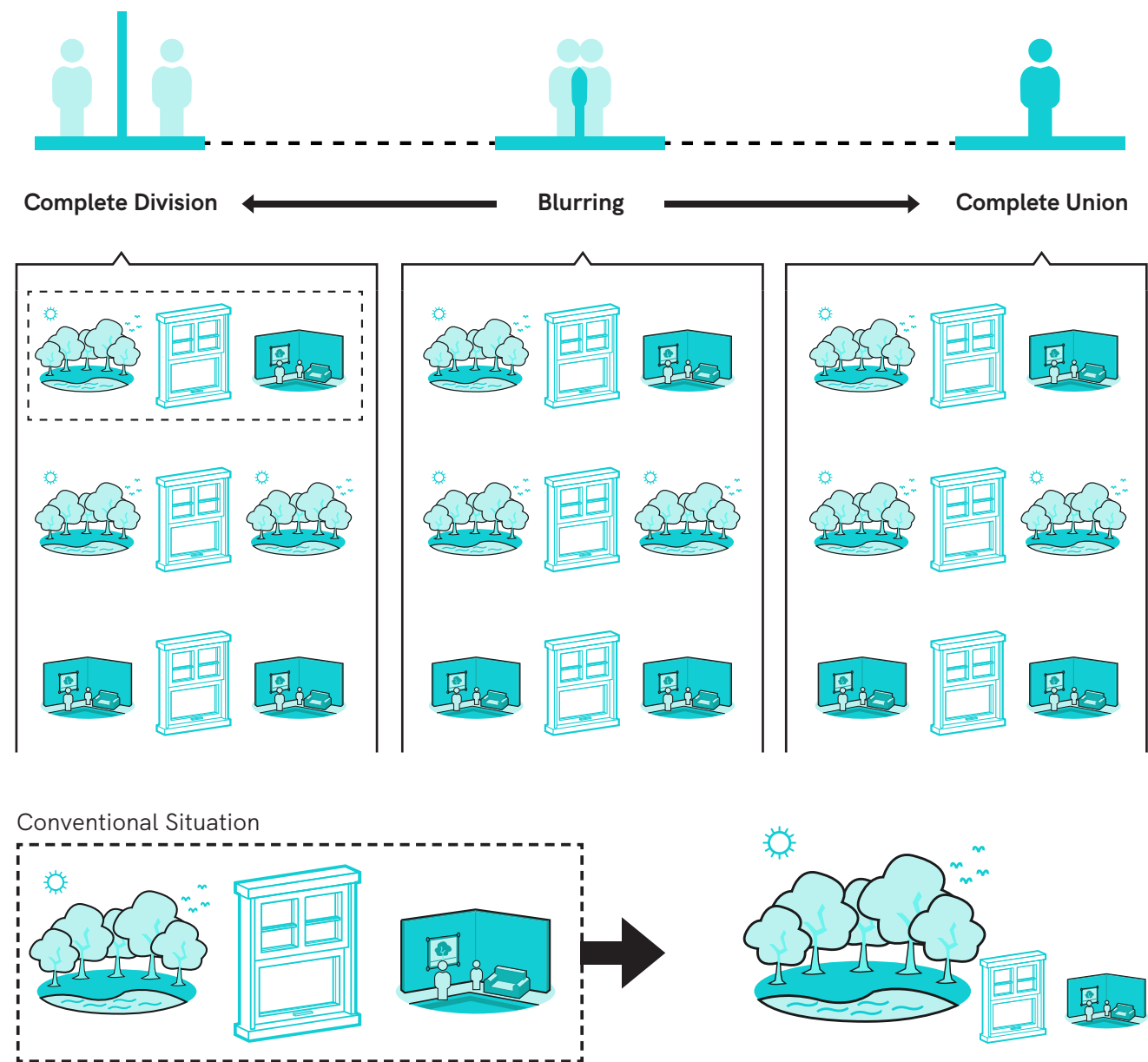
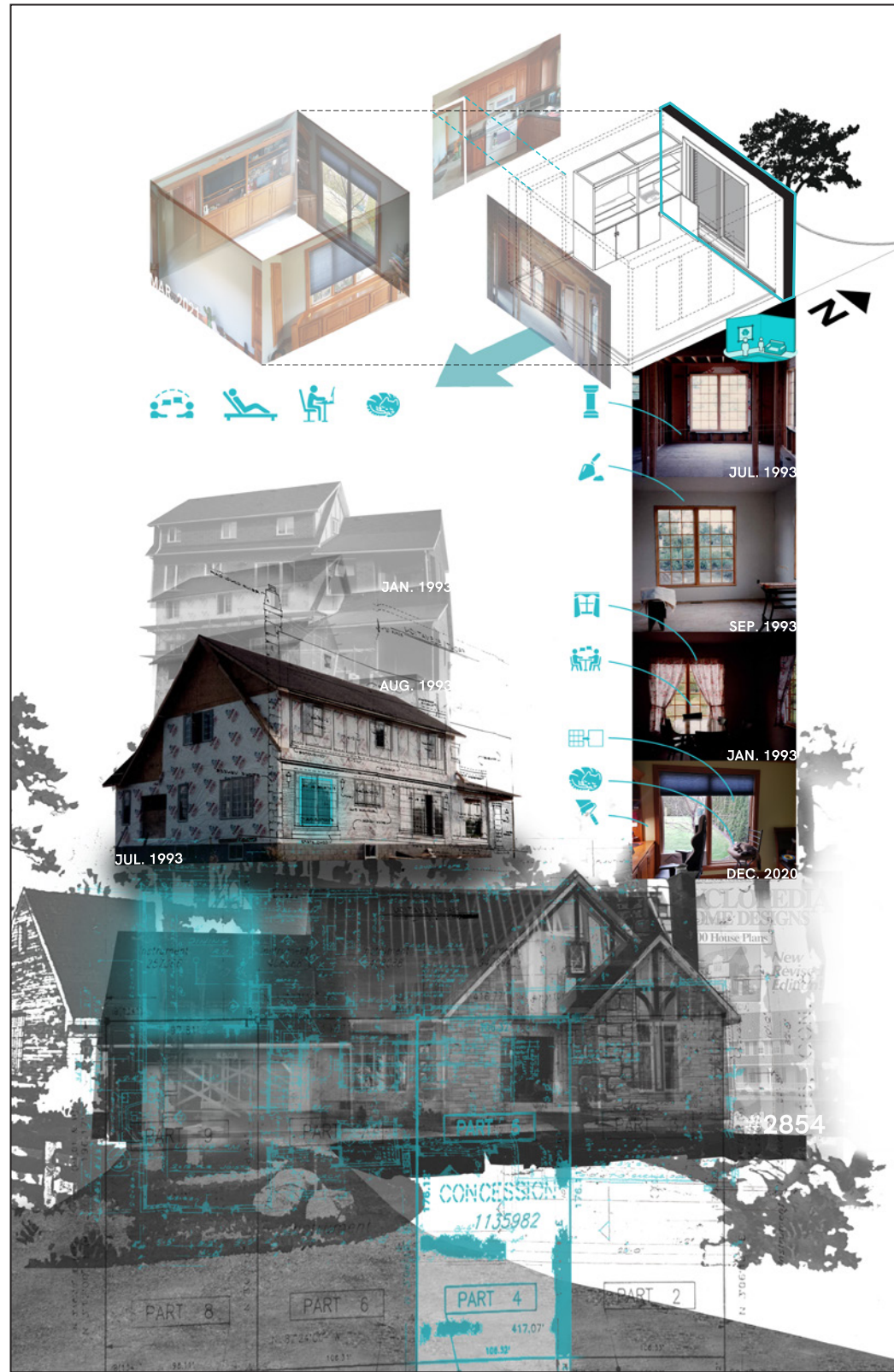
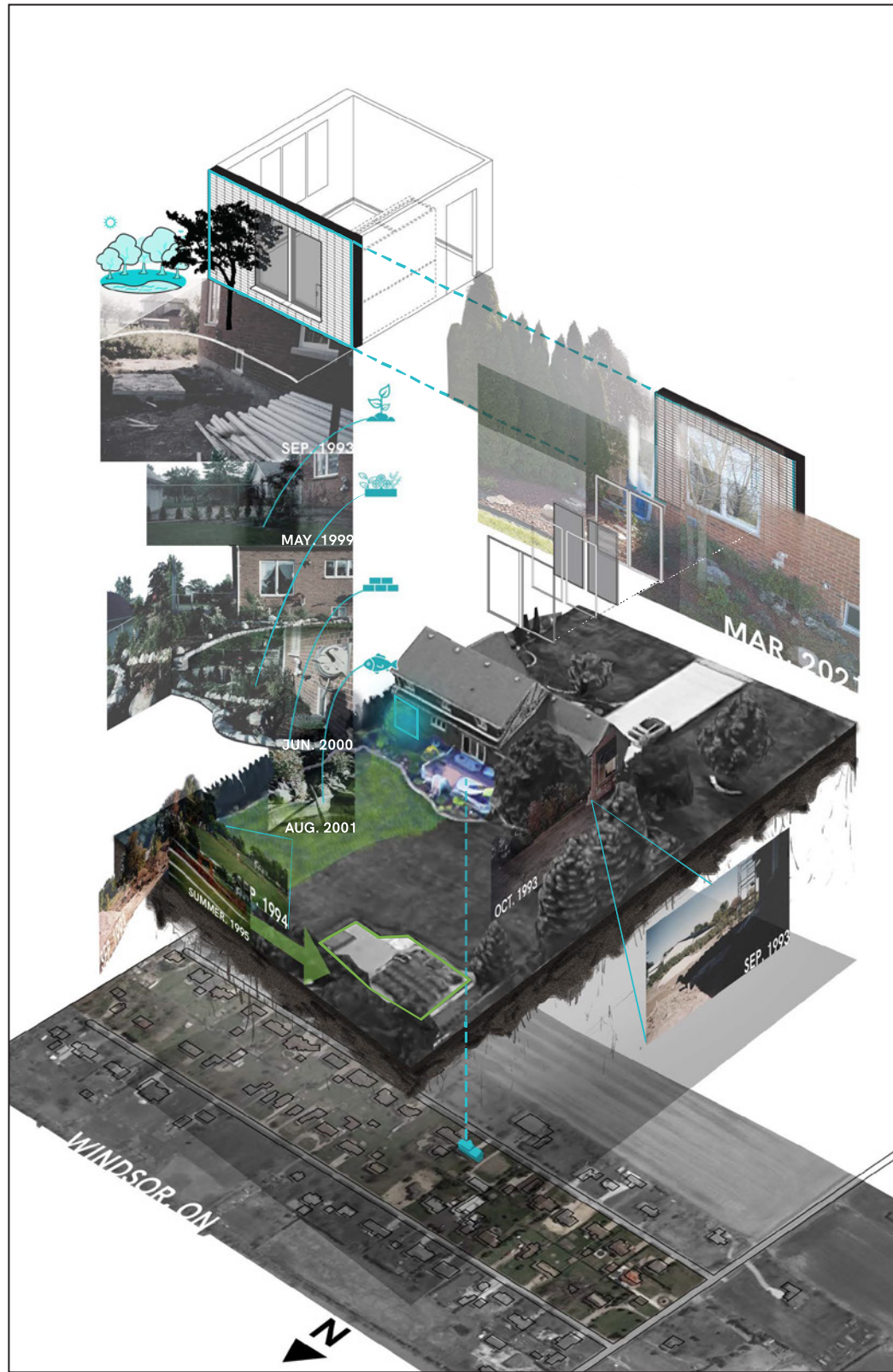


Fig 5.2 - Threshold Relationship Scenarios

Many possibilities exist for threshold relationships, with differences in the transition and environments at play.





## How does it act as a Threshold?

### Modifying the Threshold Condition

As it has been established, the window acts as a form of threshold which can divide, unify or blur environments, but how does it do this?

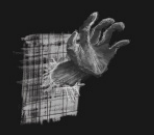
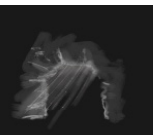
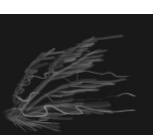
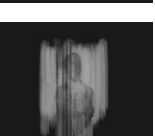
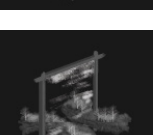
#### Harkening back to Phenomenology

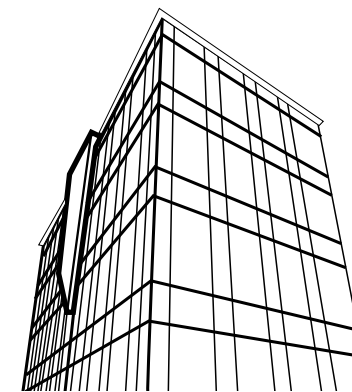
The answer to the question above can be found if one recalls some important information from the Phenomenology of Windows section, specifically the fundamental groups of elements. This section looked at reducing the window to its core components to better understand what is as well as **what it can encompass**, thus it makes sense to reference this area of the investigation with regards to finding out what windows can do (in this case, to be able to act as a threshold). The reason why a window can act as a threshold for various environments is because of its **Permeability**, and associated forms with it.

The fundamental group of permeability looks at the ability for something(s) to pass through the window, and includes the forms of permeability of the Sun, of the Earth, Visual permeability and Location-based permeability. The last form, **Location-based permeability**, directly deals with the window acting as a threshold as it suggests the ability for environments to pass through the window. It explains that this idea could transpire through fifty/fifty divisions of the environments, a micro-environment within a larger one, as well as the blurring of two environments. Although this type of permeability directly relates to the window being a transitory element, the other forms can also have relevancy. Sunlight, air and wind, as well as views from a window can all provide a sense of connection between two environments.

57. Carl Condit, *The Chicago School of Architecture: A History of Commercial and Public Buildings in the Chicago Area, 1875-1925* (Chicago: University of Chicago Press, 1964).

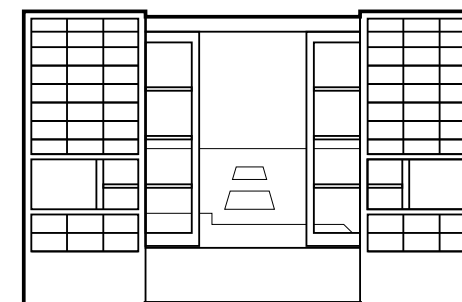
58. Sigfried Giedion, *Space, Time and Architecture: The Growth of a New Tradition* (1941; reprint, Cambridge: Harvard University Press, 1973), 385-388.

<b>PERMEABILITY</b>	
- Ability for something to pass through - Manipulating the degree of the ability - Physical/Non-physical passing through	
<b>PERMEABILITY OF THE SUN</b>	
- Heat - Light - Ultraviolet Radiation (Electromagnetic)	
<b>PERMEABILITY OF THE EARTH</b>	
- Air/Wind (Fresh Air Benefits) - Connecting to the Outdoors/Nature - Vehicle for Pollutants	
<b>VISUAL PERMEABILITY</b>	
- Entrance of light - Access to views - Blurring of two environments	
<b>LOCATION-BASED PERMEABILITY</b>	
- 50/50 Division of environments - Micro-environment within larger one - Blurring of two environments	



CURTAIN WALL

SHOJI SCREEN



"When you close the screens, you don't see the other side. So, it's just paper, but paper makes it a different space. I call it mysterious space. What we don't know is very mysterious... Just like in life"

- Hanafusa, Hisao, 2015

Fig 5.3 - Modifying Thresholds

Curtain Walls/Shoji screens illustrate potential methods to modify the threshold condition based on permeability.

### Modifying the Window to affect the Threshold

#### Curtain Walls



Curtain walls are a type of building facade which is mostly comprised of glass, the first one being seen with the Reliance Building in 1895, that was designed by Charles Atwood. Architectural critic Sigfried Giedion would state that this curtain wall was an "undulating veil" (Merwood 54), which is a fluid or wave-like form of motion, and this suggests one possible method of designing a window as a threshold. One could modify the location-based permeability by designing the threshold(s) (the window) in a way that emanates the qualities of things that can exist in an exterior-based environment. The curtain wall can also suggest the method of changing the scale of the window to become a monolithic threshold for multiple interior-based environments (floors of the building), and this increases the sense of division as well.

#### Shoji Screens



As it says in its name, Shoji Screens are Japanese screens which use rice paper to diffuse light into a space. In its family it features various forms to serve different purposes including: acting as an opaque barrier, framing the outdoors, subdividing the interior, allowing light in (without views), as well as providing a large canvas for ornamental paintings (Spacey, 2015). The method in this case is modifying the permeability of the translucent or transparent component, in this case a screen, to affect the threshold condition, whether to divide/unify/blur interior from exterior, celebrate it, or even to artistically evoke it.

59. Merwood, Joanna. "The Mechanization Of Cladding: The Reliance Building And Narratives Of Modern Architecture". *Grey Room*, vol 4, 2001, pp. 52-69. MIT Press - Journals, doi:10.1162/152638101750420807. Hanafusa, Hisao. "China Uncensored." *Building Without Nails: The Genius of Japanese Carpentry | China Uncensored*. 2015, <https://www.youtube.com/watch?v=7708E1bmoxc>.

61. Spacey, John. "17 Classic Features of Japanese Houses". *Japan Talk*, 2015, <https://www.japan-talk.com/jt/new/japanese-houses#:~:text=2017%20Classic%20Features%20of%20Japanese%20Houses%20,These%20were%20traditionally%20used%20as%20a...%20More%20>.

## Conclusion

### A Reflection on the Section.

This area of the investigation focused on the perception of windows as a threshold, with the main purpose of analyzing the window being situated within various environments. Doing this in turn would enrich the understanding of what the window can encompass, as it is important to not only understand what the window is fundamentally, but also what things it affects around it.

As it was found, windows can act as thresholds for environments - the environments either being exterior-based or interior based - through division, unification as well as blurring. This can be conceptualized in a scale where division and unification are at the opposing ends, while blurring is found anywhere along the spectrum between the two. This provided a simple, system of thinking to understand how the threshold relationship is constituted, as well as applying the scale to a multitude of potential scenarios.

Windows have a powerful position in the threshold relationship, as they are the central element that can control what, and how much of the environment can pass through it. This concept of something being able to pass through the window is the same overall concept as the fundamental element of Permeability - from the Phenomenology of Windows section - and is also the reason why windows can act as thresholds. This is because having something pass through the windows allows it to be a transitory element.

Location-based permeability is one of the various forms of permeability, and more specifically it encompasses concepts related to environments passing through the window. It mentions a fifty/fifty division, a micro-environment situated within a larger one, as well as the potential blurring of two environments. The other associated forms of permeability can also affect a window's ability to act as a threshold, as having elements such

as sunlight, air/wind, and exterior views passing through the window can allow a better connection to the external world. As part of the overall analysis, curtain walls and shoji screens were analyzed to suggest possible methods for modifying thresholds, including emanating things found in environments, altering the scale of the threshold as well as modifying the transparent/translucent component of the window.

### Connection and Separation

An important aspect of windows relative to the investigation came to realization with the compositional maps, and this is the idea of connection as well as separation:

The investigation is centralized on the redefining of windows so that they can provide connectivity in situations of mandated physical isolation. With the analyses/research conducted thus far, connectivity has been looked at in various ways but not separation. The single time separation as a concept was discussed, was in the Psychology of windows section, more specifically the Extremes of Windows. In this area of the investigation the absence of windows was illustrated through the example of White Torture, a torture technique where inhabitants have no windows and thus no connection to the outside world. It describes the multitude of extremely harmful psychological effects, but this idea of separation was left at the extreme perception after this area was finished.

With the compositional maps exploring the history and crafting of environments, it was realized that the feeling of connection to an external environment was different with the threshold window depending on where one is situated. This invokes some bias as a threshold, for one can more easily feel connected from the interior-based environment looking out to the exterior-based environ-



Fig 5.4 - Connection and Separation

This composition represents the idea that windows can provide connection & intentional separation for protection.

ment than vice versa. What this suggests is the idea that conceivably windows can act as a form of connection but also intentionally as a form of separation. In the case of the window, one would want to be able to see from the inside to the outside, but from a privacy standpoint it would not be appealing for anyone outside to see as easily to the inside. This intentionality is key.

Separation seems somewhat similar to Isolation, with the idea that both appear to be adversarial to the overall investigation, but in actuality there is a need for separation as intentional protection.

If one wanted to be fully connected with another, they could just go and see the person physically., but with the situations of mandated physical isolation, people can not do this for the possibility of contagion (with the Covid-19 pandemic in particular). Thus it can be said that as much as it is an important concept to have the windows providing connection, so to is the need for intentional separation. Intentional separation provides a level of protection, which is a new concept that enriches the overall investigation. For the Poetic Designs, this idea of intentional separation as well as connection will be thought about (Poetic Design III).

## The Threshold Perception

and its relation to connectivity.



After analyzing the perception of the window acting as a form of threshold, core concepts related to the threshold relationship were found to constitute a definition of a Threshold Window. These concepts centered around the window being a transitory element with the ability to either divide, unify or blur environments with differing degrees. The phenomenological element/grouping associated to permeability is what allows a window to act as a threshold and as such, it is reflected in the definition of a Threshold Window.

### The Threshold Perception

To have a standard baseline for a threshold window, the following definition is provided:

*“A window is an entity which has the ability to control the connection between environments, whether to divide, blur or unite them. It bears a relationship with interior and exterior-based environments, resulting in a multitude of combinations, and this is defined by the window’s fundamental element of Permeability, which asks questions related to what, how, and how much of something can pass through it.”*

Some pieces can be extracted from this definition to better understand what the threshold window is composed of. These elements are separately explained below:

- Windows are **entities**, which is the idea that they are things with an associated existence.
- Windows have the **ability to control the connection between environments**, which refers to the threshold relationship.
- **Divide, blur or unite them**, refers to the methods in which windows act as thresholds, and more specifically their affect on environments.

- **Relationship with interior and exterior-based environments**, refers to the types of context-related environments that are affected by the threshold (window).
- **Defined by permeability**, means the window’s ability to act as a threshold is associated to the fundamental element of permeability.
- **What, how, and how much of something can pass through it**, are the ideas related to the element of permeability. They are also applicable to the other associated forms.

### How does this apply to connectivity?

These aspects mentioned above constitute what the threshold window is. The threshold perception can also provide an application to how one might redefine windows (to become an architectural essence of connectivity).

This can be done by incorporating into the design some level of thoughtfulness regarding what the window can affect outside of itself. It also allows the designer to consider the intentionality associated to context-sensitive solutions, to determine if division, unification and/or blurring of environments is needed/applicable. Beyond the realm of environments is the idea that humans **experience** the environments, so this division, blurring and unification can be between humans as well. This is important for the context of mandated physical isolation, as certain proposals for connective windows may also need a level of division. This was previously talked about with intentional separation, which looks at the window providing a deliberate means of protection balanced with a level of appeared connectivity. The window acting as a threshold begins to act as the gatekeeper controlling through permeability what, how, and how much of something can pass through.

### Definition of a Window

*(Phenomenological Window)*

“A window is an **entity** which has the **ability to control the connection between environments**, whether to **divide, blur or unite them**. It bears a **relationship with interior and exterior-based environments**, resulting in a multitude of combinations, and this is **defined by** the window’s fundamental element of **Permeability**, which asks questions related to **what, how, and how much of something can pass through it.**”

### Essence of Connectivity

*(How can the perception be applied?)*

**Permeability** allows the window to act as a threshold, but more importantly it **gives the designer the ability to manipulate the threshold condition** and achieve a specific purpose. **Interior and Exterior-based environments can be experienced by humans**, and as such manipulating the threshold can result in the **division, blurring, or unification of humans with each other**. The **Window can exist as a element of connectivity and separation**.

# 04 Poetic Designs for Windows that provide Connectivity

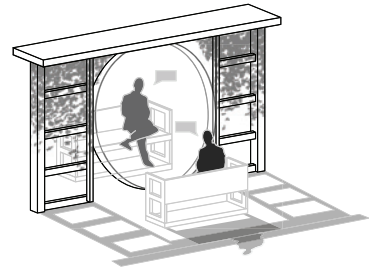
**Section 4.**  
See Appendix D.

**A**s the investigation nears its final progression, it is time to accumulate the entirety of the research to finally suggest possible redesigns for windows, ones that provide connectivity in situations of mandated physical isolation. A total of Three Poetic Designs will be proposed, and the reason that they are called “poetic”, is the idea relative to their conception as well as their ability to prescribe thinking.

As it has been seen throughout the overall investigation, variations of connectivity are weakened by mandated physical isolation, and this can severely impact the quality of life and mental health of people. When humans are knocked down, it is critical that they stand up and face the adversity of these situations, thinking of ways to design a brighter future when the present seems bleak.

This is the intention of the Poetic Designs. They act as a form of conceptual activism, where the author is making a stand against a darkness that people are experiencing, with the intention to not say exactly how things must be done, but to open our minds to powerful possibilities. These Poetic Designs should redefine what windows can be as well as what they can truly achieve for all.

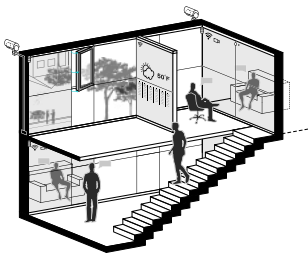
# Poetic Designs for Windows that provide Connectivity



Poetic Design I

PGs. 158 - 161

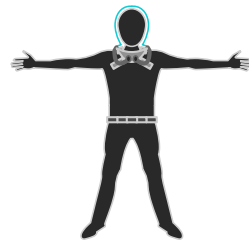
Examining the window as a transitory element for environments, with the ability to control their division, blurring or unification as part of an overall relationship.



Poetic Design II

PGs. 162 - 165

Examining the window as a transitory element for environments, with the ability to control their division, blurring or unification as part of an overall relationship.



Poetic Design III

PGs. 166 - 169

Examining the window as a transitory element for environments, with the ability to control their division, blurring or unification as part of an overall relationship.

## Table of Contents Poetic Designs of Windows

Introduction .....	156 - 157
Poetic Design I .....	158 - 161
Poetic Design II .....	162 - 165
Poetic Design III .....	166 - 169
<b>Conclusion .....</b>	<b>170 - 171</b>

**Fig. 6.0** - Poetic Design Progression 157

**Fig. 6.1** - Poetic Design I 159

**Fig. 6.2** - PD I Evaluation 161

**Fig. 6.3** - Poetic Design II 163

**Fig. 6.4** - PD II Evaluation 165

**Fig. 6.5** - Poetic Design III 167

**Fig. 6.6** - PD III Evaluation 169

# Poetic Designs of Windows

## Introduction

This portion of the Poetic Designs of Windows section will explain what it encompasses, as well as its relevance/association to the investigation.

### Scope

As an accumulation of the research as well as the investigation, three Poetic Designs are proposed. These Poetic Designs are with the central intention of redefining new windows that can provide connectivity for the situations of mandated physical isolation. Each design acts as a hypothetical “solution” to the issue at hand, proposing different strategies alongside applications to achieve a desired outcome. They also reflect the research that has been conducted thus far.

### Methods

The Poetic Designs that will be proposed, each have a unique approach whether it being **Subtle, Complex or even Hypothetical**. They will be explained with their relation to a guiding **Concept**, what specific **Applications** were used, as well as what the design wishes **to Achieve** with its existence. Additional information such as the scope of the design as well as the type of site(s) where it should be implemented will also be mentioned.

It is also important to evaluate how the designs are related to the previous research that was conducted, and as such this section will explore this. How the evaluation will occur, is with the analysis of how the specific Poetic Design in question: addresses the **Variations of Connectivity**, relates to the **Phenomenological Perception of Windows** as well as how it relates to the **Threshold Perception of Windows**. All three designs were intended to be based upon the research conducted, but the ways they accomplish this can vary and as such this should be discussed further.

### Assumptions and Limitations

An important point that should be made relative to these Poetic Designs is the fact that they are not end-all-be-all solutions to the central issue, (The issue requiring the provision of connectivity through redefined windows). As previously established in the conclusion of the Phenomenology of Windows section, the classification of what constitutes a window is bound to subjectivity and as such, these solutions may also not be considered windows to some. Since this can be a possibility in regards to the reader’s interpretation, it should be stated again that the Poetic Designs are providing hypothetical thinking through the proposal of possible solutions. The reader is encouraged to formulate their own opinions associated to the solutions, as this means that the investigation is inciting conversation and conceptual thought.

### Relevance to the Larger Argument

*Poetic Designs for Windows that provide Connectivity*

Having hypothetical designs that are both poetic in nature, and strive to provide connectivity (for situations of mandated physical isolation), helps to fortify the larger argument that windows have the potential and unique eligibility to do this.

### Relevance to the Overall Investigation

Establishing the three Poetic Designs acts as the accumulation of the entire investigation, as well as the research conducted within it. This is due to the fact that the research and its associated conclusions and perceptions are translated to a finite thing: a conceptual design. The designs extend the research, in their hypothetical existence, and explore the central purpose of the investigation with the different tiers of Subtlety, Complexity, and Hypothetical forms of design.

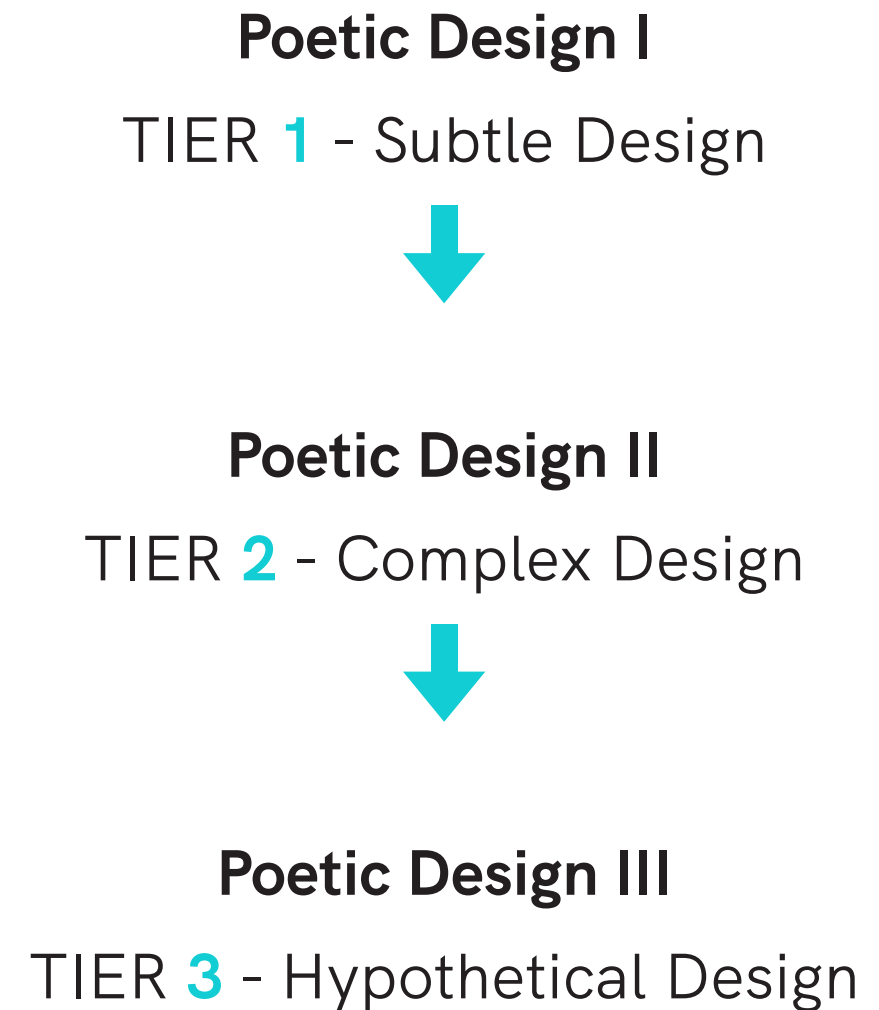


Fig 6.0 - Poetic Design Progression

# Poetic Design I

## A Subtle Solution

The first Poetic Design strives to use a subtle approach, for the goal of providing connectivity in the situations of mandated physical isolation. Information about the design is provided below:

### Design

Utilizing a Convex Lens tuned to magnify an individual, to appear at reasonable conversational distance from another person.

### Scope

Simulate normal conversation with the illusion of the removal of social distancing. Utilizing this design intentionally to talk with others.

### Site(s)

In Parks as a form of "Installation".

The first Poetic Design features a both minimal and permeable structure, that supports the new window in the center. This window is a Convex lens, or in simple terms it uses the same glass as a magnifying glass, to make things appear bigger. The frame that supports the convex lens was designed to evoke a "light" and permeable aesthetic, combined with a seating-based program.

Benches are situated on both sides of the convex lens with an associated spacing of six feet - the same dimension that is stated by social distancing requirements. These benches evoke the same qualities as the structure due to the fact that they are designed with the same language. The design is to be situated in the context of parks, and the integration of the frame with the natural world, is expressed through an implementation of vines which cascade along the sides of the window.

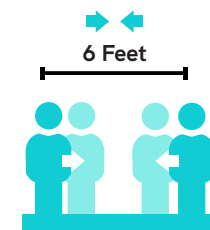
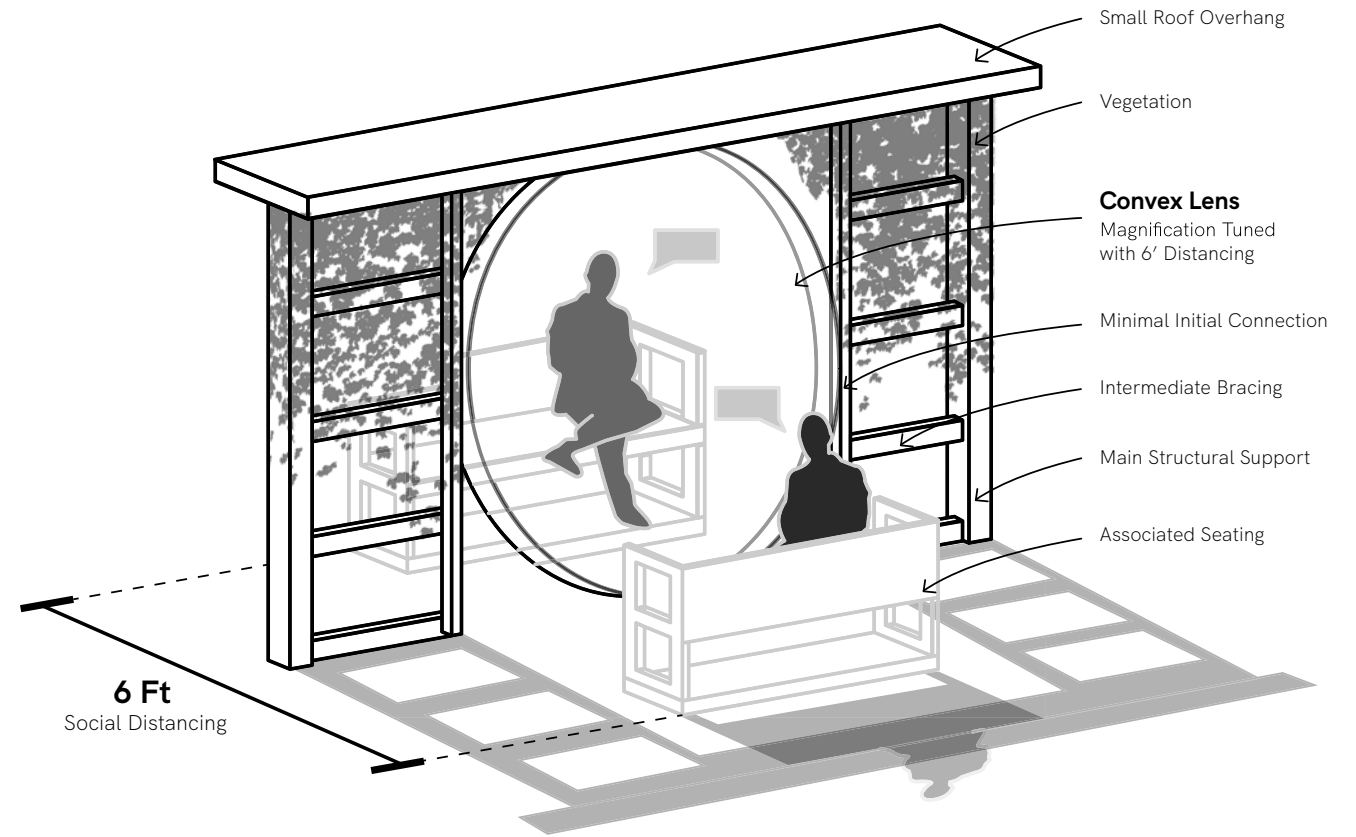
### Guiding Elements of the Poetic Design

This Poetic Design is based on a guiding concept for **Simulating the removal of Social Distancing**. The standard measurement associated to these requirements is 6 feet, or for other parts of the world, this length is rounded up to 2 meters. In any case, these distances can physically denormalize social interactions, because of mandates extending ranges at which the interaction occurs. It can feel awkward as well as absurd, and although it allows for conversation to occur within situations of mandated physical isolation, the act of social distancing is a reminder that times are not normal, and that people are isolated from others.

The main application of this Poetic Design is to use a **Convex Lens**, which are commonly used for the purposes of magnification. For something to appear bigger is to make something also appear closer, so this idea could be applied to people, **to make someone appear closer**. It is not logical to suggest having convex lenses exist everywhere, but it could be advantageous to have them exist in specific contexts, so that they can be utilized with intention. Parks are relaxing contexts where conversations can be had, so to have this design situated in them can coincide with the relaxation. A minimal pavilion design is used to focus on the conversation and extend the qualities of a park.

This Poetic Design is intended to suggest a subtle approach for providing connectivity, by instilling the **feeling of having a normal conversation with others**. With the levels of uncertainty associated to situations of mandated physical isolation, an effective form of relief is to converse with people. Humans are social creatures, so to be unable to talk with other people can increase the sense of isolation that is felt during these situations. This Poetic Design helps us to socially reconnect.

Fig 6.1



### CONCEPT

Simulating the removal of Social Distancing (6 feet)



### APPLICATION

Making someone appear closer with Convex lens



### TO ACHIEVE

Feeling of having a normal conversation with others



Evaluating this Poetic Design requires analyzing how it addresses Variations of Connectivity, and how it relates to both the Phenomenological as well as Threshold Perceptions of the window.

### Variations of Connectivity

This Poetic Design, as well as the other designs, addresses the variations of connectivity including Social Connectivity, Societal/Everyday, Variance of Spatial and Visual Conditions, and Quality of Life. They are individually discussed below:

**Social Connectivity** is positively affected by this Poetic Design for all aspects of Access, Quality and Ability. This is because the design seeks to improve people's social connectivity through simulating the removal of social distancing. As such, people would have access to this design to talk to others, the quality would be improved to now being able to talk with others, and it also gives the ability for people to be socially connected.

**Societal/Everyday** is positively affected for only the Ability to experience this form of connectivity. This is because it allows one to go to a park and be a part of society/the everyday, but access to society is determined by the government who mandates what degree of physical isolation the area is to abide by. The quality of being in society is not necessarily improved by the design.

**Visual and Spatial** is positively affected for both Access and Ability, as related to one giving themselves variance of these types of conditions. An individual gains access to a park with this design as well as seeing another person physically. The design also gives a person the ability to choose to create variance in their visual/spatial situation, by providing an option to go/use the design. The quality is the same as the design is stationary.

**Quality of Life** is positively affected by this Poetic Design for all aspects of Access, Quality as well as Ability. A person's quality of life is improved when they have multiple variations of connectivity, in this case the design can provide a person with Social Connectivity, Societal/Everyday, and Visual/Spatial, so therefore it can be said that on some level their quality of life has been improved. How much it is improved is difficult to objectively quantify, but the fact that there is an improvement is the thing that is worth more.

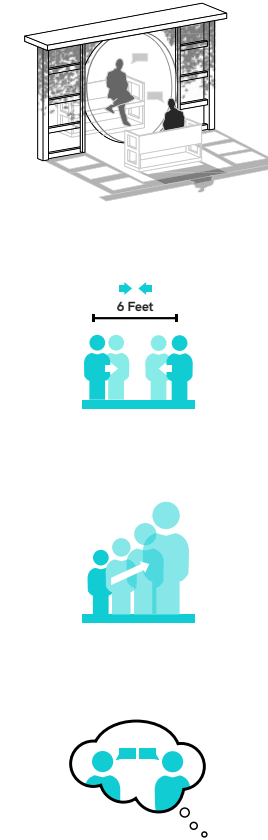
### Phenomenological Perception

**Permeability** is achieved with the design through the structure and the window itself. The structure is minimal as well as light, so that air and sound can pass through, while the window gives enhanced visual permeability to the people that are conversing. (The Convex Lens enhances it). **Opening** is achieved in this case through the window being a focal point. The frame acts as the outside edges, as well as uses itself and nature to define the opening. (Wraps around the window). **Access/Interaction** is achieved as users interact with each other through conversation, while also interacting with the window to do so. This interaction occurs intuitively (without the recognition of the window) which is why it can achieve the element of **Intuition/Identity**.

### Threshold Perception

The poetic design situates itself in the threshold relationship, as blurring and unification within a single exterior-based environment (situated in a park context). In this case it is for one environment as the transitory element acts between two people on either side of it, within the same larger exterior environment. With that idea, it can also be said that there is a blurring/unifying of people.

Fig 6.2



### Variations of Connectivity Addressed

Access ↑+	Access —	Access ↑+	Access ↑+
Quality ↑+	Quality —	Quality —	Quality ↑+
Ability ↑+	Ability ↑+	Ability ↑+	Ability ↑+

### Phenomenological Perception

Permeability	<input checked="" type="checkbox"/>	<b>Modification of Elements</b> Window that has a <b>focalized view</b> .
Opening	<input checked="" type="checkbox"/>	Window with <b>manipulated visual access</b> .
Access/Interaction	<input checked="" type="checkbox"/>	Window that allows <b>escape to a place</b> .
Intuition/Identity	<input checked="" type="checkbox"/>	Window that has gives <b>visual &amp; simulated physical access to other human beings</b> .

### Threshold Perception



## Poetic Design II

### A Complex Solution

The second Poetic Design utilizes a complex approach for providing connectivity within situations of mandated physical isolation. Information about this design is provided below:

#### Design

Using screens as a form of window that is simulated, and offering full scale video communication, utility functions, and/or a larger exterior view.

#### Scope

Ability to variate one's view(s), have utility, and simulate having people over at one's house.

#### Site(s)

Single Family Homes, Apartments (depending on Landlords), communal areas in buildings.

The second Poetic Design involves a more complex as well as comprehensive system associated to it. The design features a series of screens lining the inner walls of a residence, with periodic placement of windows for dedicated natural ventilation supply (by having access to outdoor air). These wall screens need to be connected to additional components including: a power supply, outside cameras, interior motion sensors, a form of internet connection (whether wired or wireless connection), and associated computer software.

As the functionalities will be further discussed, it is important to note that the windows which provide natural ventilation also serve the purposes of daylight/maintaining reality. With a home that is lined with screens, obscuring physical connection to the external world is both illegal (as stated in building codes), and incredibly dangerous.

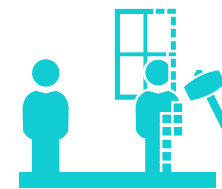
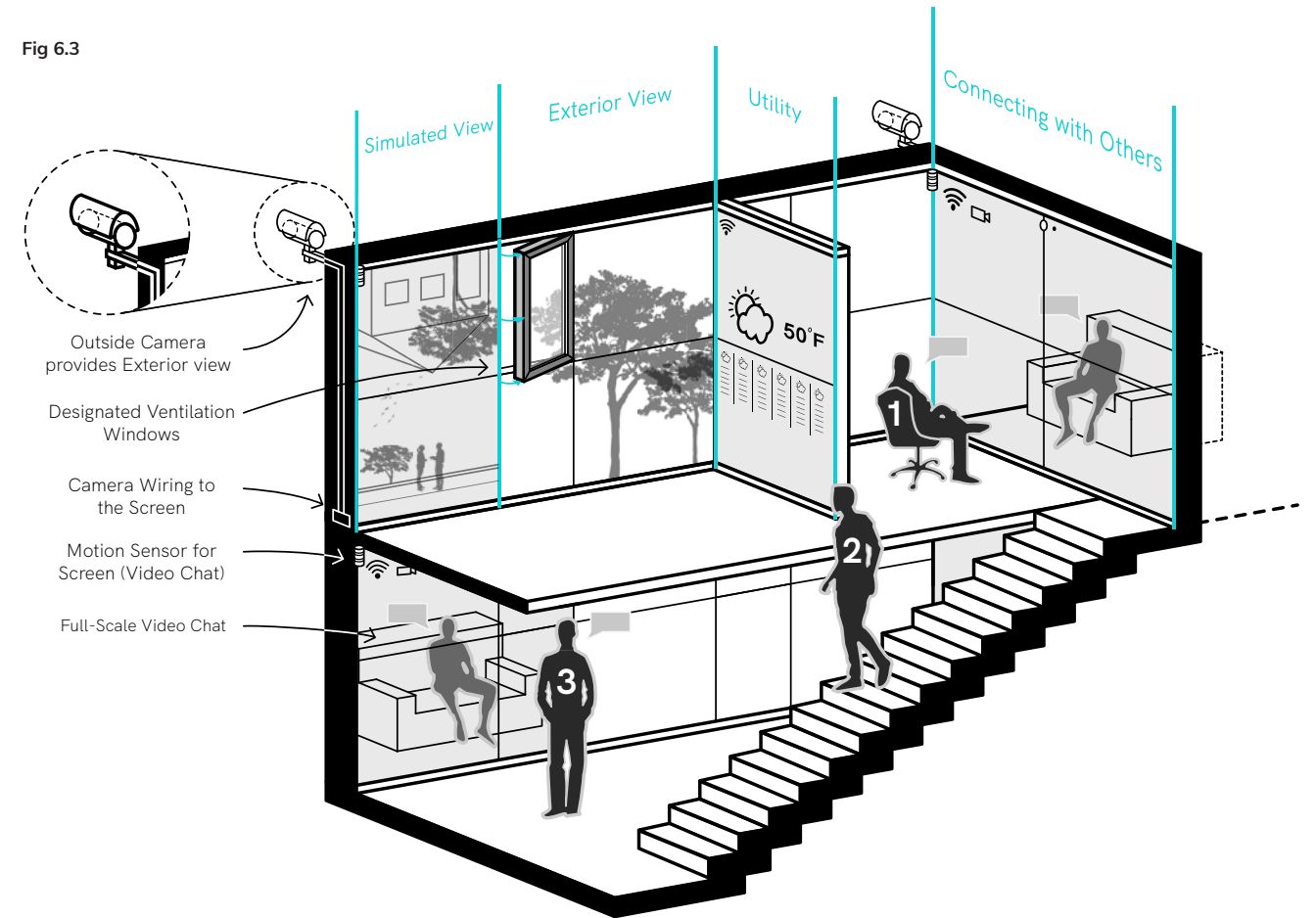
#### Guiding Elements of the Poetic Design

This Poetic Design is based on a guiding concept for **Simulating views/people being in one's home**. With mandated physical isolation, it is both the inability to see other people physically, as well as the stagnation of views which can lead to the depreciation of variations of connectivity, as well as the overall quality of life for an individual. If one can simulate any view to provide variety as well as to mentally transport oneself to another place, combined with the ability to simulate others being with you from head to toe, this can help to improve the diminished forms of connectivity.

The main application of the second Poetic Design is to utilize **screens alongside motion sensors and outside cameras** to give different kinds of amenities. The screens can be used to simulate any view; provide an exterior view using the camera; have utility functions that are commonly associated to phones/computers (such as having apps, smart thermostat, using social media, watching videos, playing music...etcetera); and be able to have full scale video chats that can follow a person as they move throughout their home (this can be done through connected motion sensors).

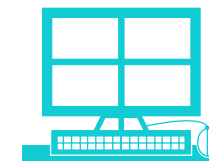
This Poetic Design is intended to suggest a more complex approach towards the provision of connectivity, by giving people the ability to **control one's spatial/visual connections**. Using forms of video communication, people can remain socially connected through the times of mandated physical isolation, but this does not provide a feeling of being fully connected with others, as it cuts off at chest level. Having full scale video communication allows one to feel that others are in their home, they can see the person from head-to-toe as well as their spatial conditions. This is one of many ways to extend visual and spatial confines.

Fig 6.3



#### CONCEPT

Simulating views as well as people being in your home



#### APPLICATION

Using Screens w. Motion Sensors/Outside Cameras



#### TO ACHIEVE

Being able to control one's spatial/visual connections

Evaluating this Poetic Design requires analyzing how it addresses Variations of Connectivity, and how it relates to both the Phenomenological as well as Threshold Perceptions of the window.

### Variations of Connectivity

This Poetic Design, as well as the other designs, addresses the variations of connectivity including Social Connectivity, Societal/Everyday, Variance of Spatial and Visual Conditions, and Quality of Life. They are individually discussed below:

**Social Connectivity** is positively affected by this Poetic Design for all aspects of Access, Quality and Ability. This is because the design seeks to improve people's social connectivity through full scale video communication connected to motion sensors. All aspects are benefitted because this function being used is purely decided by the user.

**Societal/Everyday** is positively affected for only the Ability to experience this form of connectivity. This is because the design allows one to be connected more fully from their homes with the outside world (potentially having more **Informed Knowledge** as well). The quality of being in society is not necessarily improved with this design.

An important concept to mention arises with the aspects of access/ability, as it can be controversial. One could shut themselves out of society if they choose to, and this could be a possible negative effect relative to the user's actions. This is an interesting point for the second Poetic Design, as the idea of control can change the associated effects related to the variations of connectivity.

**Visual and Spatial** is positively affected for all of the aspects, as one can give themselves variance for these types of conditions with the design.

**Quality of Life** is also positively affected by this Poetic Design for the Access, Quality and Ability. As mentioned previously, one's quality of life is improved when the individual has multiple variations of connectivity, the second Poetic Design provides Social Connectivity, Societal/Everyday, as well as Visual and Spatial, so therefore it can be said that on some level their quality of life has been improved. The main difference here is the realization that user control can affect this.

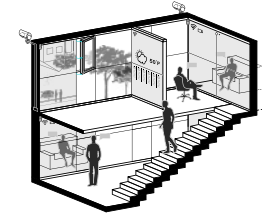
### Phenomenological Perception

**Permeability** is achieved with the design through the potential for location-based permeability as well as visual permeability depending on the use of the screens. **Opening** is achieved in this case through the window providing opportunity, (the screens allow for multiple functions and as such multiple opportunities for use). It could also technically be stated that physical openings are also provided with the windows designated for natural ventilation, daylight, and reality, as they are also a major component for the design. **Access/Interaction** is achieved through the users physical/visual interaction with the screens, and as it was discussed there is great power in this. The element of **Intuition/Identity** is achieved through the concept that manipulating the window's form modifies its identity. For this design the window is manipulated to being a screen, and its identity is modified with each chosen, simulated view.

### Threshold Perception

The Poetic Design situates itself in the threshold relationship with a blurring and division between an exterior-based environment and the interior-based environment. As it can be seen, this design has the potential to separate the user from the external world, reinforcing the sense of division.

Fig 6.4



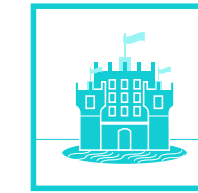
### Variations of Connectivity Addressed



Access ↑+  
Quality ↑+  
Ability ↑+



Access ↓-  
Quality —  
Ability ↑+



Access ↑+  
Quality ↑+  
Ability ↑+



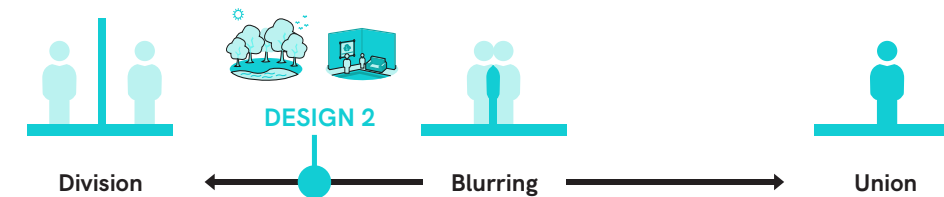
Access ↑+  
Quality ↑+  
Ability ↑+

### Phenomenological Perception

- Permeability
- Opening
- Access/Interaction
- Intuition/Identity

- Modification of Elements**  
Window that can have a **simulated view**.  
Window that allows **escape to a place**.  
Window that **blurs connection to people**.  
Window that **extends the physical confines of the space it is situated in**.

### Threshold Perception



## Poetic Design III

### A Hypothetical Solution

The third Poetic Design utilizes a hypothetical approach, for the goal of providing connectivity in the situations of mandated physical isolation. Information about the design is provided below:

#### Design

Using a forcefield to operate as both a protective window, and as a third skin. It provides visual access with protected physical access.

#### Scope

One can remain protected, have a level of normality, and the person is still identifiable.

#### Site(s)

The Body, Humans.

The third Poetic Design utilizes a more hypothetical approach, and what this means is that it is based on technology which does not exist at the time of this writing. This is important, as the last Poetic Design seeks to extend the research much farther as an ultimate form of analysis.

The design is to utilize Forcefield technology, an idea that is popularized in science fiction, which is a protective barrier comprised of some form of energy and with the abilities of protecting, sometimes deflecting, and having visual permeability. For this Poetic Design it was conceptualized as a helmet as well as a tank with oxygen (inhale)/carbon dioxide (exhale) conversion, and an upgrade to a full body suit. The upgrade brings a question with it: How can the window adapt to situations of mandated physical isolation, where exposure to the outside environment can harm humans?

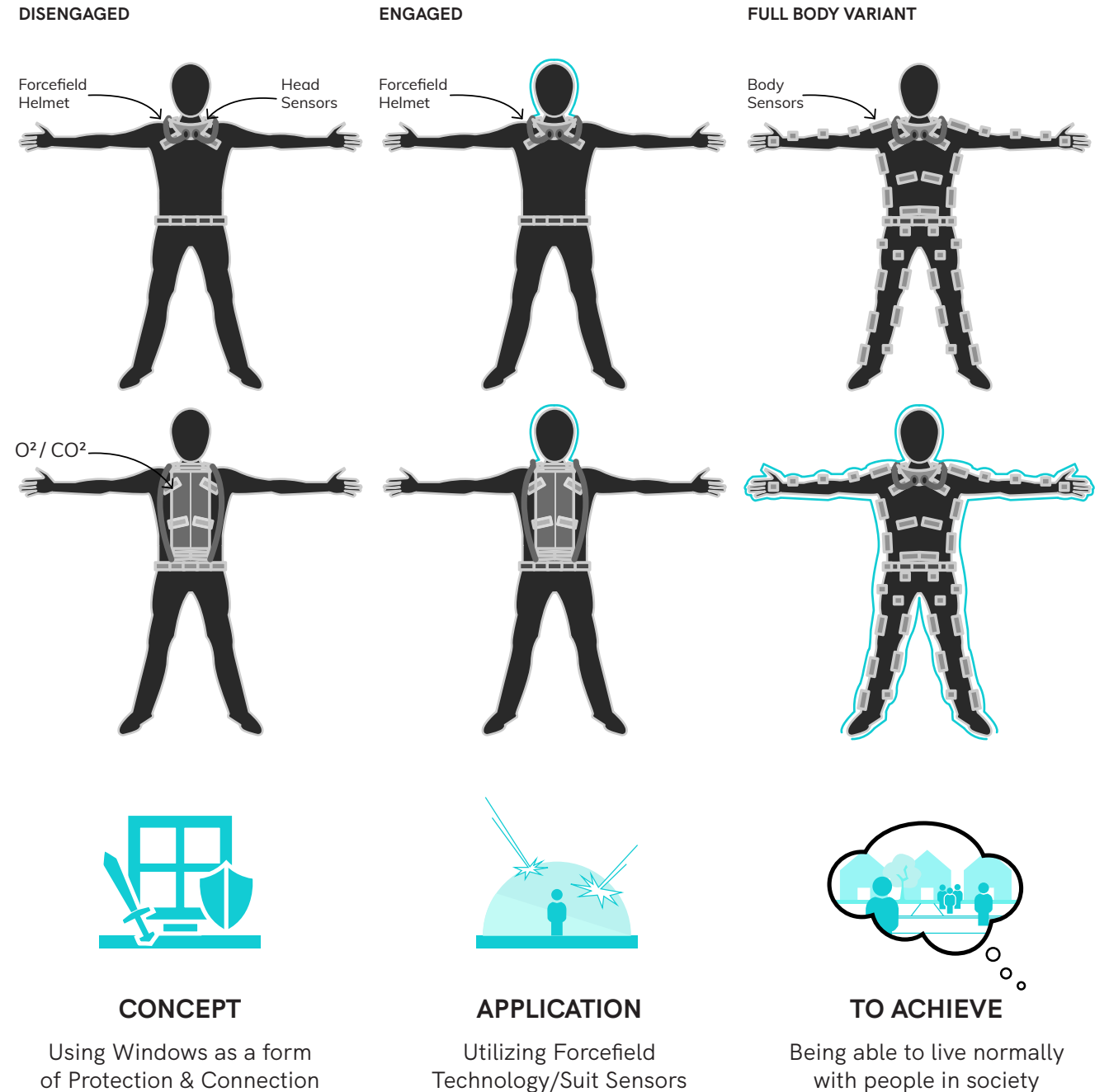
#### Guiding Elements of the Poetic Design

This Poetic Design is based on the guiding concept for **Using Windows as a form of Protection & Connection**. As it was mentioned in the conclusion of the Thresholds for Windows Section, the concept of intentional separation is as important as connectivity itself, (for mandated physical isolation). This is because although windows can be used to connect people in these situations, there is also the inherent need to separate people, (in the case of the Covid-19 Pandemic, separation is needed to protect against contagion). This design seems to be the most poetic of them all, as being the last design/near the end of the investigation, the human and the window become one entity.

The main application of the third Poetic Design is to utilize **Forcefield Technology/Suit Sensors** to provide a protective but visually permeable layer over the human head, (and potentially the body). Using an apparatus resting on the upper chest, a forcefield would be activated, and with a series of sensors, the forcefield would follow the contours of the individual's head. For the full body suit, additional sensors would be lined along the surface of the body so that the shape as well as the curvature of different human bodies, could be replicated and offset by the forcefield. For both variants, an oxygen and carbon dioxide conversion pack would be worn for steady air supply.

This Poetic Design is intended to suggest a more hypothetical approach towards the provision of connectivity, by giving humans the ability to **live normally with people in society**. Although a new normality would constitute a society wearing the Poetic Design, nothing is being overly intruding to the human face. Masks can protect humans, but they have to impede on one's personal space as well as obscure the person's identity to do so.

Fig 6.5



Evaluating this Poetic Design requires analyzing how it addresses Variations of Connectivity, and how it relates to both the Phenomenological as well as Threshold Perceptions of the window.

### Variations of Connectivity

This Poetic Design, as well as the other designs, addresses the variations of connectivity including Social Connectivity, Societal/Everyday, Variance of Spatial and Visual Conditions, and Quality of Life. They are individually discussed below:

**Social Connectivity** is positively affected by this Poetic Design for all aspects of Access, Quality and Ability. This is because the design allows for people to normally talk with each other so long as the helmet is being worn. This is with the intention of being as close to normal conversation as possible, considering any associated limitations for situations of mandated physical isolation.

**Societal/Everyday** is positively affected for all of the aspects (Access, Quality as well as Ability). This is because the Poetic Design allows people to go out and be a part of society/everyday life, and the access/ability to do so is only determined by the individual *choosing* to do so. The quality of being in society is also improved, compared to potentially not being able to at all.

**Visual and Spatial** is positively affected with this Poetic Design for all aspects of Access, Quality and Ability. An individual gains access/ability to go out to the outside world, which allows them to give themselves a variance in visual and spatial conditions. The quality is also improved, as the design is not a stationary window, but the human as a window. It can move with them, and allows them to be present in the world with a fluidity not obtained from traditional helmets or suits.

**Quality of Life** is positively affected by this Poetic Design for all the aspects of Access, Quality as well as Ability. It was previously mentioned that one's quality of life is improved when they can have multiple variations of connectivity, and this Poetic Design has the ability to provide a human with Social Connectivity, Societal/Everyday, and Visual/Spatial, so therefore it can be said that on some level their quality of life has been improved. The difference with this design is that its fluidity is what allows one to experience connectivity.

### Phenomenological Perception

**Permeability** is achieved with the design's visual permeability, for instead of protecting one with a conventional helmet or suit, a forcefield variant allows seeing through it to the person. **Opening** is achieved with opportunity as well as being a form of fluid negative space. The Poetic Design allows one to live normally again, which in situations of mandated physical isolation, is a huge opportunity in itself. It acts as a negative space that is generated not by outside edges, but inside edges (sensors on the body). **Access/Interaction** is achieved as users are able to interact with each other visually and physically by simply wearing the Poetic Design. **Intuition/Identity** is achieved through its ability to identify humans. As opposed to a normal helmet, having a forcefield helps to maintain the identity of the individual wearing it.

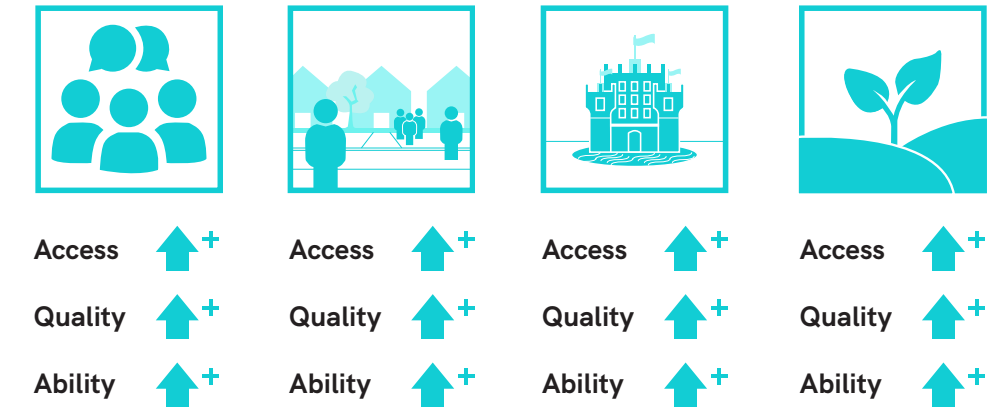
### Threshold Perception

The Poetic Design situates itself in the threshold relationship with a blurring, division, and unification between the exterior-based environment and a person. This specific design can divide for protection, it can blur to give a sense of societal normality, and it can unify for connection. This was the only design that could have all three.

Fig 6.6



### Variations of Connectivity Addressed



### Phenomenological Perception

Permeability	<input checked="" type="checkbox"/>	<b>Modification of Elements</b> Window that can <b>provide protection</b> .
Opening	<input checked="" type="checkbox"/>	Window that is <b>one with the human</b> .
Access/Interaction	<input checked="" type="checkbox"/>	Window that <b>separates and connects</b> .
Intuition/Identity	<input checked="" type="checkbox"/>	Window that <b>limits physical connection while still maintaining visual connection</b> .

### Threshold Perception



*"As architecture can act as a third skin for humans, the window can act as a third skin that allows us to breathe, to exist in the external world, and to become connected with its system of interrelated elements."*

Jordan Zanier

## Conclusion

**T**his investigation can be likened to a conceptual journey that saw an issue potentially arising from the Covid-19 pandemic, one that specifically affected the author in ways that incited some epiphanies. First was a darkness of mind frame which upon realization of its hold on the author, led to the awareness that it should not be experienced ever again, and the second is that these forms of psychological damage must be affecting a lot more people in the world. This investigation sought to use the fascinating element of windows to provide connectivity in these situations after redefining what they can encompass. This unique opportunity comes from the already mysterious nature of windows as they exist present day. This level of mystery was why comprehensive analysis (of what they are/encompass) was conducted, leading to a deeper understanding of the potential of windows. Accumulating all of the research to create poetic designs of new windows which provide connectivity, was a liberating experience to finally illustrate how the window can be widely encompassing as well as be redefined for this new purpose. Designing led to a poetic conclusion where the window and the human became as one, an evolved entity with a connective existence where connectivity is the most diminished.

# 05 References, List of Figures, & Appendices

<b>Section 5.</b>	References .....	174 - 177
	List of Figures/Tables .....	178 - 179
	Appendices .....	180 - 191

# References

## 01 | Windows are Critical for our Health & Well Being

### Building Code for Windows

1. APPROVED DOCUMENTS (B, F, M, N). HM Government: *The Building Regulations 2010*, 2010
  - 1.1 APPROVED DOCUMENT N - Glazing - (safety in relation to impact, opening and cleaning) - N4: Safe access for cleaning windows - 4.2 a.
  - 1.2 APPROVED DOCUMENT B - Dwellinghouses - B1: Means of warning and escape - Guidance - B1.i - Section 2: Means of escape - Introduction - 2.1
2. Canadian Commission on Building and Fire Codes. *National Building Code Of Canada 2015*. 14th ed., National Research Council Canada, 2015.
  - 2.1 DIVISION B - ACCEPTABLE SOLUTIONS - Notes to Part 9 Housing and Small Buildings - A-9.8.8.1.(4) Height of Window Sills above Floors or Ground
  - 2.2 DIVISION B - ACCEPTABLE SOLUTIONS -Part 9 Housing and Small Buildings - Section 9.6. Glass - 9.6.1. General - 9.6.1.3. Structural Sufficiency of Glass - 9.6.1.3.- (Tables A - G)).
  - 2.3 DIVISION B - ACCEPTABLE SOLUTIONS - Notes to Part 9 Housing and Small Buildings - A-9.9.10.1.(2) - Window Height
3. Ann Arbor Municode Library. *Library.municode.com*, 2013, [https://library.municode.com/mi/ann\\_arbor/codes/code\\_of\\_ordinances?nodeId=COANARMI](https://library.municode.com/mi/ann_arbor/codes/code_of_ordinances?nodeId=COANARMI)
  - 3.1 CHAPTER 105 - HOUSING CODE - 8:502 Minimum standards for light and ventilation - Point 5
4. International Building Code (IBC). *International Coding Council (ICC)*, 2018
5. International Residential Code (IRC). *International Coding Council (ICC)*, 2018.
  - 5.1 CHAPTER 3 - BUILDING PLANNING - R303 - Light, Ventilation & Heating - R303.1 Habitable Rooms - Exception 1,2
6. Michigan Department of Licensing & Regulatory Affairs: Bureau Construction Codes. *2015 Michigan Building Code*. International Code Council (ICC), 2017.
7. Polish Regulation Concerning Building Technical Requirements And Building Localization. *Polish Ministry Of Infrastructure*, 2002, [https://architektura.info/prawo/warunki\\_techiczne\\_budynki](https://architektura.info/prawo/warunki_techiczne_budynki).
  - 7.1 CHAPTER III - Buildings and premises - Chapter 2. Lighting and Sunlight - Ad 1 - par 57 [Suitable daylight] - Point 1
  - 7.2 CHAPTER III - Buildings and premises - Chapter 2. Lighting and Sunlight - Par. 58 [Lighting only with artificial light]
  - 7.3 CHAPTER IV - Technical equipment of buildings - Chapter 6. Ventilation and air conditioning - Par. 147 - [Ventilation and air conditioning]
8. Technical Handbook - Domestic. *Scottish Building Standards 2016*, 2016, <https://www2.gov.scot/resource/buildingstandards/2016Domestic/chunks/index.html>.
  - 8.1 3. Environment - 3.16 Natural Lighting - Mandatory Standard 3.16
  - 8.2 3. Environment - 3.14 Ventilation - 3.14.0 Introduction
9. Edwards, Alistair. "PROPERTY: Construction of Structure Blocking a Neighbor's View Not a Nuisance". *Nlrg.Com*, 2018, <https://www.nlrg.com/legal-content/the-lawletter/property-construction-of-structure-blocking-a-neighbors-view-not-a-nuisance>.
10. FindLaw's Team of Legal Writers and Editors. "Can my Neighbor Legally Block my View? - Findlaw". *Findlaw*, 2018, <https://www.findlaw.com/realestate/neighbors/can-my-neighbor-legally-block-my-view.html>.
11. FindLaw's Team of Legal Writers and Editors. "View Ordinances - Findlaw". *Findlaw*, 2016, <https://www.findlaw.com/realestate/neighbors/view-ordinances.html>.

### Supplementary Sources

12. Sweet, Justin et al. *Construction Law For Design Professionals, Construction Managers, and Contractors*. Thomson-Engineering (Nels), 2014.

### Psychology of Windows

13. Brooks, Samantha K. et al. "The Psychological Impact Of Quarantine and How to Reduce It: Rapid Review Of The Evidence". *SSRN Electronic Journal*, 2020. Elsevier BV, doi:10.2139/ssrn.3532534.
14. Boyce, Peter et al. *The Benefits of Daylight Through Windows*. Lighting Research Center, Rensselaer Polytechnic Institute, 2003.
15. Atkinson, James et al. *Natural Ventilation for Infection Control in Health-Care Settings*. World Health Organization, 2009.
16. Farley, Kelly M. J, and Jennifer A Veitch. *A Room with a View: A Review of the Effects of Windows on Work and Well-Being*. Institute For Research In Construction, National Research Council Canada, 2001.
17. Zanier, Jordan. "Jordan Zanier Master's Thesis Survey". *Google Forms*, 2020. [https://docs.google.com/forms/d/e/1FAIpQLScEgqkFFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScEgqkFFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZAsAPsvQ/viewform?usp=sf_link)
18. Wang Y, Xu B, Zhao G, Cao R, He X, Fu S. *Is quarantine related to immediate negative psychological consequences during the 2009 H1N1 epidemic?* *Gen Hosp Psychiatry* 2011; 33: 75-77.
19. Brill, M. (1985) *Using Office Design to Increase Productivity*, Workplace Design and Productivity Inc: New York, NY.
20. Collins, B. *Windows and People: A literature Survey - Psychological Reaction to Environments With and Without Windows*, Natural Bureau of Standards: Gaithersburg, MD.
21. Smith, Jodi. "'White Torture is a Sensory Deprivation Method that Erases all Sense of Reality". *Ranker*, 2019, <https://www.ranker.com/list/extreme-white-torture-facts/jodi-smith>.
22. Craven, Jackie. "Mies Van Der Rohe and Cost Overruns at the Farnsworth House". *Thoughtco*, 2019, <https://www.thoughtco.com/mies-van-der-rohe-edith-farnsworth-177988>.
23. "Meaning of Window in English". *Oxford Dictionary*, <https://www.lexico.com/definition/window>.
24. "Definition of Window". *Merriam-Webster Dictionary*, <https://www.merriam-webster.com/dictionary/window>.
25. "Window | Description & Facts". *Encyclopedia Britannica*, <https://www.britannica.com/technology/window>.



## 02 | Connectivity & Understanding the Origins of Windows

### Connectivity and Connection

26. "Meaning of Connection in English". Oxford Dictionary, <https://www.lexico.com/definition/connection>.
27. "Meaning of Connectivity in English". Oxford Dictionary, <https://www.lexico.com/definition/connectivity>.
28. "Definition of Connection". Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/connection>.
29. "Definition of Connectivity". Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/connectivity>.

#### Supplementary Sources

30. "Meaning of Interconnected in English". Oxford Dictionary, <https://www.lexico.com/definition/interconnected>.
31. "Definition of Interconnected". Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/interconnected>.
32. "What Does Connexio Mean in Latin?". Wordhippo, <https://www.wordhippo.com/what-is/the-meaning-of/latin-word-d9048c7e899123d2966e030b8a1c8fe679438fe0.html>.

#### Window Etymology

33. "Okno". Sciaga.PL, <https://sciaga.pl/slowniki-tematyczne/9718/okno/>.
34. Ueda, Yasunari. "Vol. 0: Windows From The Perspective Of Contrastive Etymology | Research | WINDOW RESEARCH INSTITUTE". Window Research Institute, 2018, <https://madoken.jp/en/research/window-terminology-a-la-carte/3144/#:~:text=The%20German%20word%20for%20%E2%80%9Cwindow,a%20partition%20wall%20or%20rampart%E2%80%9D>.
35. "Meaning of Window in English". Oxford Dictionary, <https://www.lexico.com/definition/window>.

## 03 | What can Windows Encompass & how they Provide Connectivity

### Phenomenology of Windows

36. "Meaning of Cave in English". Oxford Dictionary, <https://www.lexico.com/definition/cave>.
37. "Definition of CAVE". Merriam-Webster.com, <https://www.merriam-webster.com/dictionary/cave>.
38. White, William. "Cave | Definition, Formation, Types, & Facts". Encyclopedia Britannica, <https://www.britannica.com/science/cave>.
39. Saarinen, Eero. "Eero Saarinen's MIT Chapel | Detailed Drawings, Saarinen, Chapel". Pinterest, 1956, <https://www.pinterest.ca/pin/370632244330417595/>.
40. "MIT Chapel | Division Of Student Life". Studentlife.Mit.Edu, <https://studentlife.mit.edu/cac/event-services-spaces/event-spaces/mit-chapel>
41. "Finnlough - Bubble Domes". Finnlough, <https://www.finnlough.com/sleep/bubble-dome>.
42. "Ireland's Bubble Domes Let You Sleep Under The Stars". Beautiful Life | Web Design, Industrial Design, Art Works, Interior Design, Graphic Design And More, 2020, <https://www.beautifullife.info/urban-design/irelands-bubble-domes-let-you-sleep-under-the-stars/>.

43. Mitchell, Ryan. "Glass Igloos". The Tiny Life, 2012, <https://thetinylife.com/glass-igloos/>.
44. "Greenhouse Neptuna". Octatube.Nl, [https://www.octatube.nl/en\\_GB/project-item/projectitem/168-greenhouse-neptuna.html](https://www.octatube.nl/en_GB/project-item/projectitem/168-greenhouse-neptuna.html).
45. "Mill City Museum". Roadtrippers, <https://maps.roadtrippers.com/us/minneapolis-mn/attractions/mill-city-museum>.

#### Supplementary Sources

46. Rudofsky, Bernard. *Architecture Without Architects*. Academy, 1964, pp. 1-13.
47. Sharman, Jess, and Lee Jones. "Windows, Glass, Glazing - A Brief History". NBS, 2017, <https://www.thenbs.com/knowledge/windows-glass-glazing-a-brief-history#:~:text=When%20glass%20was%20discovered%20in%20Roman-occupied%20Egypt%2C%20it,started%20with%20a%20long%20balloon%20of%20blown%20glass>.
48. "The Plains Indians - Surviving With the Buffalo - Legends of America". Legendsofamerica.com, <https://www.legendsofamerica.com/na-plainsindians/>.
49. "Indian Camping and Camp Circles | Access Genealogy". Access Genealogy, <https://accessgenealogy.com/native/indian-camping-and-camp-circles.htm>.
50. Holloway, April. "The Incredible Rock Houses and Underground Cities of Cappadocia". Ancient-Origins.net, 2014, <https://www.ancient-origins.net/ancient-places-europe/incredible-rock-houses-and-underground-cities-cappadocia-001394>.
51. "Definition Of SHELTER". Merriam-Webster.Com, <https://www.merriam-webster.com/dictionary/shelter>.

#### Windows as a Threshold

52. "Meaning of Environment in English". Oxford Dictionary, <https://www.lexico.com/definition/environment>.
53. "Definition of Environment". Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/environment>.
54. "Definition of The Environment". Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/the%20environment>.
55. "Meaning of Threshold in English". Oxford Dictionary, <https://www.lexico.com/definition/threshold>.
56. "Definition of Threshold". Merriam-Webster Dictionary, <https://www.merriam-webster.com/dictionary/threshold>.
57. Carl Condit, *The Chicago School of Architecture: A History of Commercial and Public Buildings in the Chicago Area, 1875-1925* (Chicago: University of Chicago Press, 1964).
58. Sigfried Giedion, *Space, Time and Architecture: The Growth of a New Tradition* (1941; reprint, Cambridge: Harvard University Press, 1973), 385-88.
59. Merwood, Joanna. "The Mechanization Of Cladding: The Reliance Building And Narratives Of Modern Architecture". Grey Room, vol 4, 2001, pp. 52-69. MIT Press - Journals, doi:10.1162/152638101750420807.
60. Spacey, John. "17 Classic Features of Japanese Houses". Japan Talk, 2015, <https://www.japan-talk.com/jt/new/japanese-houses#:~:text=%2017%20Classic%20Features%20of%20Japanese%20Houses%20,These%20were%20traditionally%20used%20as%20a...%20More%20>.
61. Hanafusa, Hisao. "China Uncensored." *Building Without Nails: The Genius of Japanese Carpentry | China Uncensored*. 2015, <https://www.youtube.com/watch?v=7708E1bmoxc>.

## List of Figures/Tables

### 01 | Windows are Critical for our Health & Well Being

Building Code for Windows

<b>Fig. 1.0</b> - Building Codes Analyzed	21	<b>Fig. 1.8</b> - Visual Analysis Structure	44
<b>Fig. 1.1</b> - Minimum Existence	22	<b>Fig. 1.9</b> - Enforcing Views in Code	47
<b>Fig. 1.2</b> - M.E. Concept	23	<b>Fig. 1.10</b> - Light, Breeze, Escape	49
<b>Fig. 1.3</b> - Visual Analysis of Building Codes 1	28		
<b>Fig. 1.4</b> - Visual Analysis of Building Codes 2	34	<b>Table 1.0</b> - ME   Natural Light	26
<b>Fig. 1.5</b> - Visual Analysis of Building Codes 3	40	<b>Table 1.1</b> - ME   Natural Ventilation	32
<b>Fig. 1.6</b> - Window's Provision of M.E's	42	<b>Table 1.2</b> - ME   Emergency Exit	38
<b>Fig. 1.7</b> - Minimum Existences Found	43	<b>Table 1.3</b> - Other Related Information	47

Psychology of Windows

<b>Fig. 2.0</b> - Breaking down Psych. of Windows	53	<b>Fig. 2.6</b> - White Torture	85
<b>Fig. 2.1</b> - Effects of Mandated Isolation	56	<b>Fig. 2.7</b> - The Farnsworth House	87
<b>Fig. 2.2</b> - Three Main Aspects of Windows	61	<b>Fig. 2.8</b> - Visual Analysis of Windows	88
<b>Fig. 2.3</b> - The Need for a Survey	63	<b>Fig. 2.9</b> - Extending the window's perception	93
<b>Fig. 2.4</b> - Research Question 2: Findings	77		
<b>Fig. 2.5</b> - Research Question 3: Findings	82	<b>Table 2.0</b> - Research Question 1: Findings	71

### 02 | Connectivity & Understanding the Origins of Windows

Connectivity and Connection/Window Etymology

<b>Fig. 3.0</b> - Connectivity and Etymology	101	<b>Fig. 3.3</b> - Windows and Connectivity	106
<b>Fig. 3.1</b> - Connection and Connectivity	103	<b>Fig. 3.4</b> - Etymological Groups	107
<b>Fig. 3.2</b> - Variations of Connectivity	105	<b>Fig. 3.5</b> - The Cave Opening and Windows	108

### 03 | What can Windows Encompass & how they Provide Connectivity

Phenomenology of Windows

<b>Fig. 4.0</b> - Phenomenological Reductions	115	<b>Fig. 4.6</b> - Group 3 - Access/Interaction	129
<b>Fig. 4.1</b> - Grouping of Elements	119	<b>Fig. 4.7</b> - Group 4 - Intuition/Identity	131
<b>Fig. 4.2</b> - Stage 4 Qualities	120	<b>Fig. 4.8</b> - Prescribing Thinking	133
<b>Fig. 4.3</b> - The Cave Opening	123		
<b>Fig. 4.4</b> - Group 1 - Permeability	125		
<b>Fig. 4.5</b> - Group 2 - Opening	127	<b>Table 4.0</b> - Reduction Stages	116

Windows as a Threshold

<b>Fig. 5.0</b> - Window as a Gatekeeper	139	<b>Fig. 5.4</b> - Connection and Separation	149
<b>Fig. 5.1</b> - The Threshold Relationship	141		
<b>Fig. 5.2</b> - Threshold Relationship Scenarios	143		
<b>Fig. 5.3</b> - Modifying Thresholds	147	<b>CM 5.0</b> - Compositional Maps	144

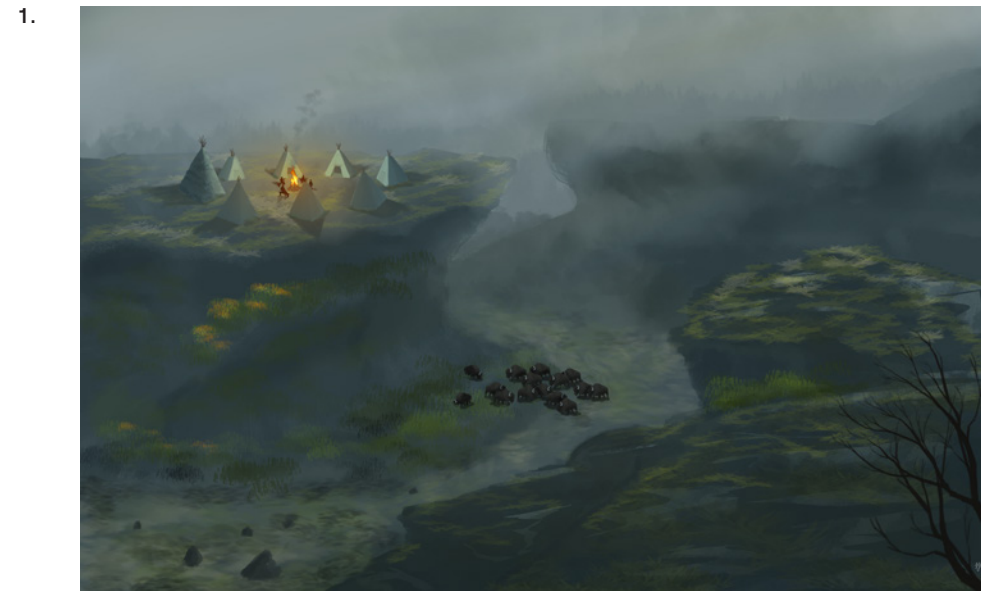
### 04 | Poetic Designs for Windows that provide Connectivity

Connectivity and Connection/Window Etymology

<b>Fig. 6.0</b> - Poetic Design Progression	157	<b>Fig. 6.4</b> - PD II Evaluation	165
<b>Fig. 6.1</b> - Poetic Design I	159	<b>Fig. 6.5</b> - Poetic Design III	167
<b>Fig. 6.2</b> - PD I Evaluation	161	<b>Fig. 6.6</b> - PD III Evaluation	169
<b>Fig. 6.3</b> - Poetic Design II	163		

### 01 | Windows are Critical for our Health & Well Being

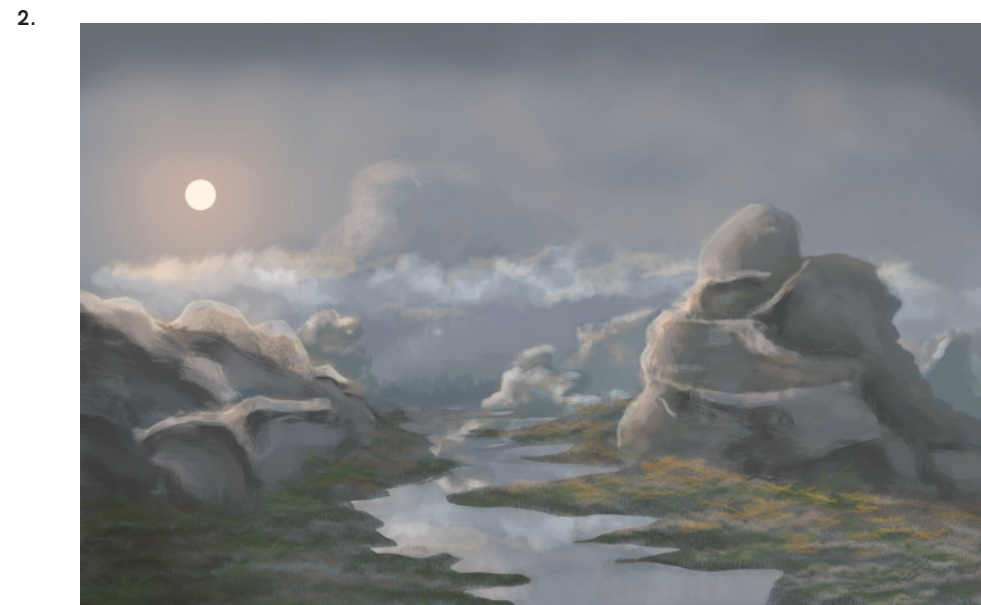
#### Psychology of Windows



Related to the Cave Opening

Concept painting to illustrate the nomadic lifestyle as one aspect of the evolution of the cave opening

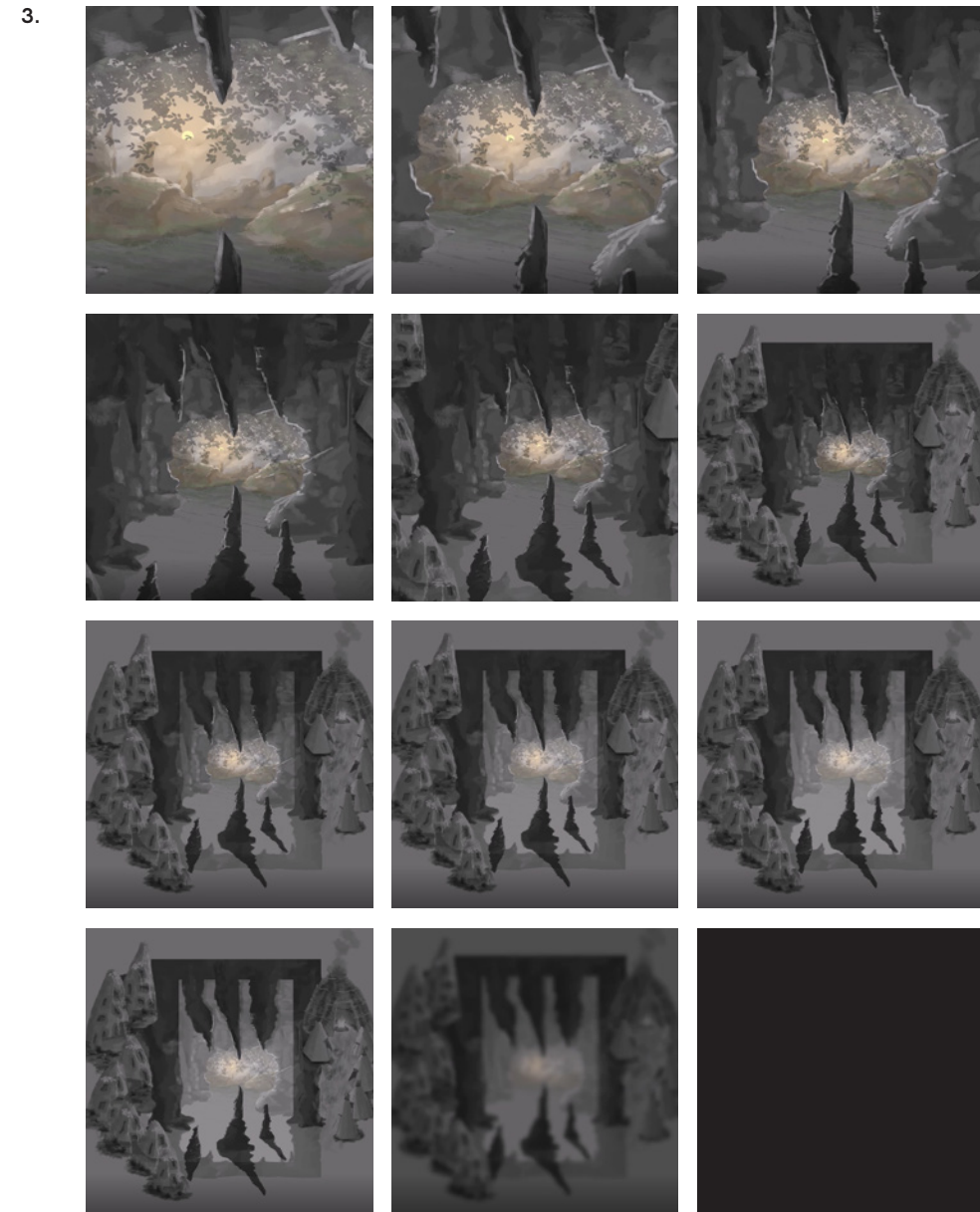
(Teepee Opening related to cave Opening and windows).



Related to the Cave Opening

Concept painting that was intended to illustrate the origin of caves being situated in the natural context.

(Rock formations related to cave Opening and windows).



Related to the Cave Opening

The Cave Opening painting initially had an animation to it, with the viewer seeing the outside of the cave and slowly zooming out to being more and more in the cave.

When the entire composition is in frame, slowly a sheet of glass would appear over top to suggest the layering of the window over the cave opening (Its ancestral origin).

Length: 42 seconds

4.

## Jordan Zanier - Masters Thesis Survey

My name is Jordan Zanier, a Masters of Architecture Student at the University of Detroit Mercy. As part of my thesis I am reaching out to people in hopes of gaining data related to one aspect of my academic investigation.

My thesis seeks to design conceptual models of space that promote Connectivity while being in physical isolation, and using windows, (in all definitions of the term - even abstract ones), as a tool to achieve this. This is with the purpose of redefining the future of architecture, by tackling one aspect of how it can evolve from the COVID 19 pandemic: rethinking how spaces should be designed in the event of future lockdown situations.

This survey will consist of 3 short sections and aid me in answering the Research Question:

In situations such as lockdown, where we are confined to our buildings/homes, do people gravitate towards spaces that have windows, and if so, why?

**\*\*CONFIDENTIALITY:** Your answers will be combined with the responses of others and summarized in group profiles to be used for study purposes. Participants will remain completely anonymous, and no individual responses will be reported\*\*

If you have any questions or concerns reach out to me at: [zanierjo@udmercy.edu](mailto:zanierjo@udmercy.edu)

Thank you for your time in filling out this survey!

### Survey

This was conducted anonymously and with the use of Google Forms.

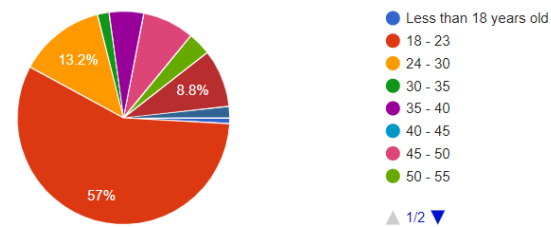
Survey Link:

<https://docs.google.com/forms/d/e/1FAIpQLScEgqkfFM7FZCTmNo-wATVPe2Dk1bmvwkFiGw2Zh3ZA-sAPSvQ/closedform>

### Demographic Questions

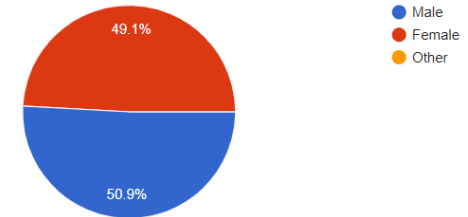
#### What is your Age Range?

114 responses



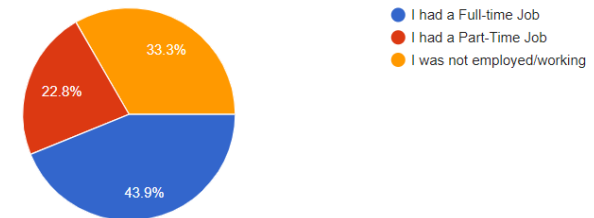
#### What is your Gender?

114 responses



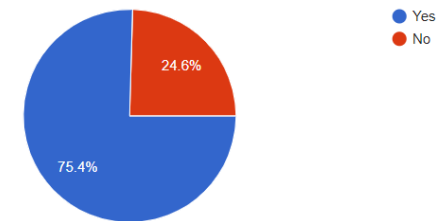
#### What was your Job situation during lockdown?

114 responses

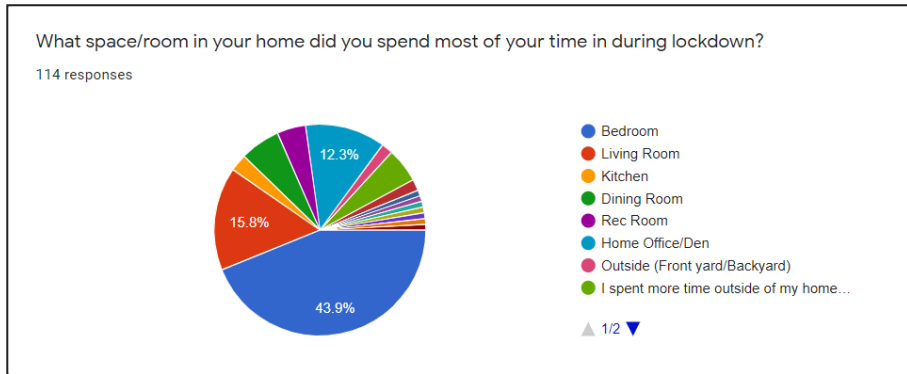
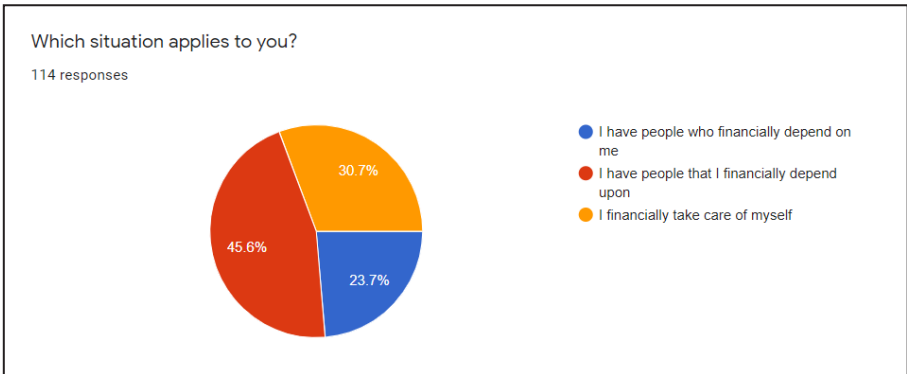
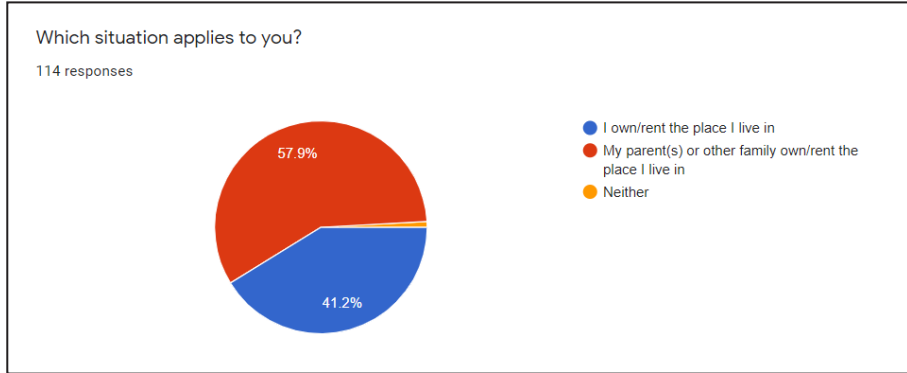
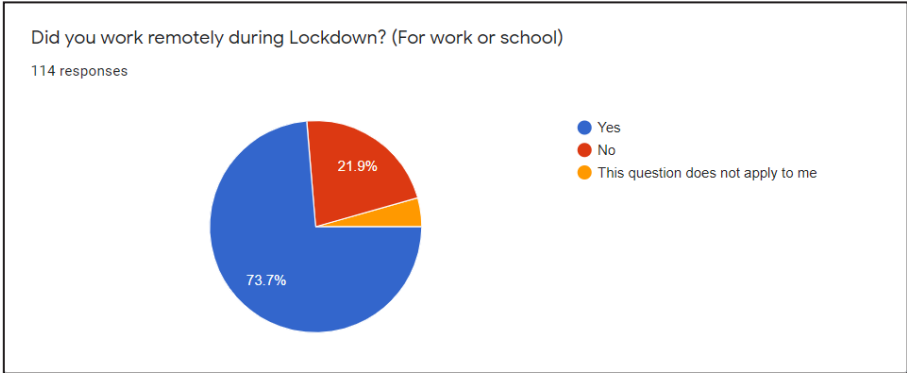
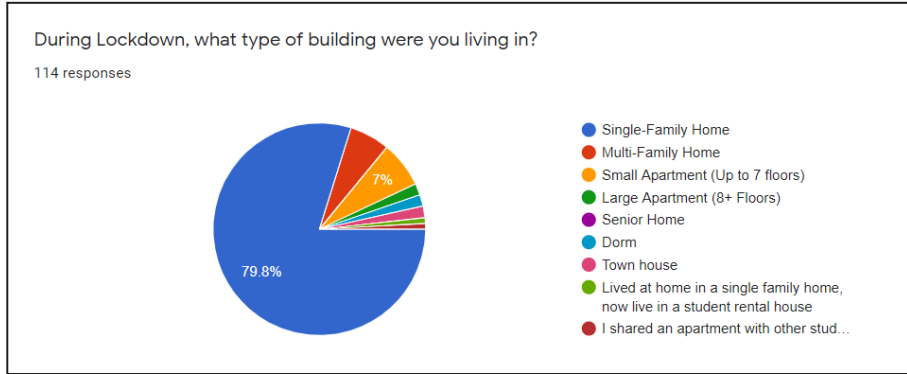
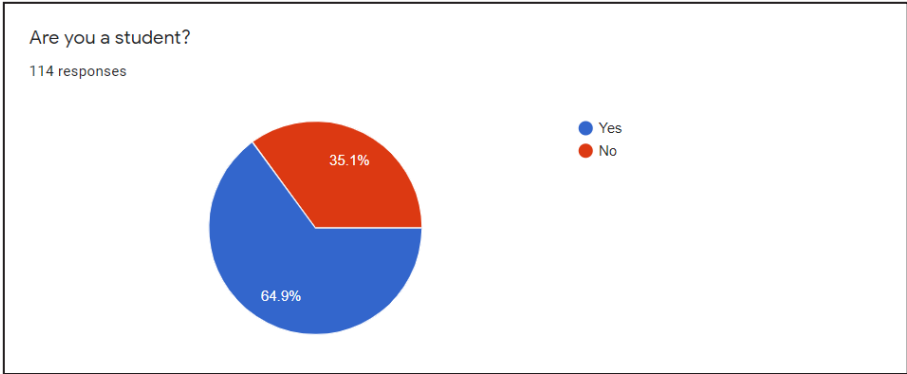


#### Did you have a Job before lockdown?

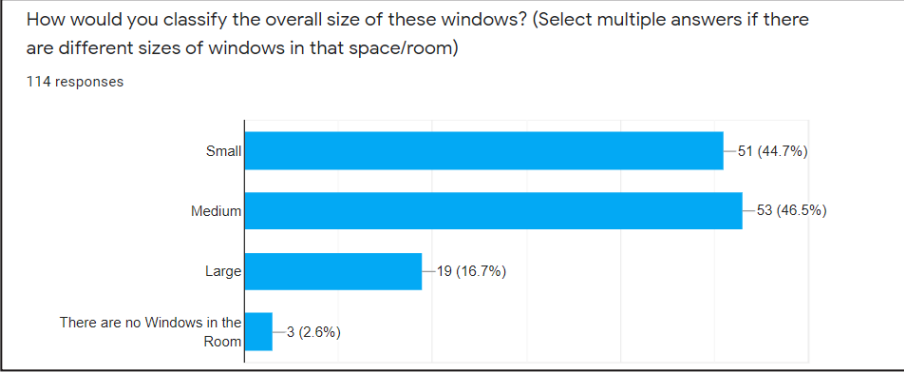
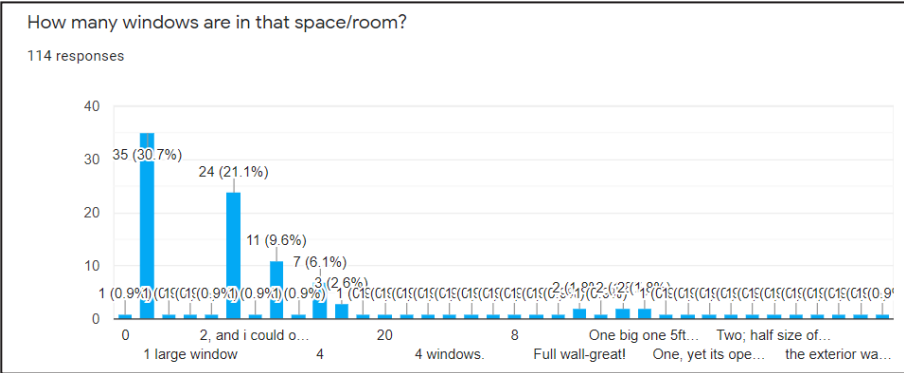
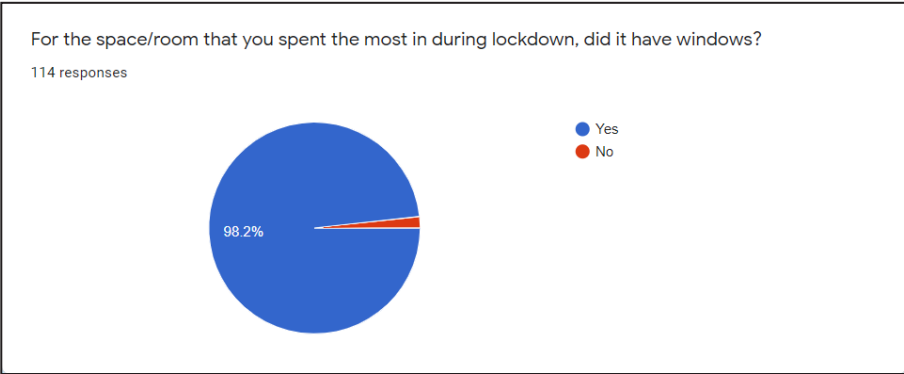
114 responses



Being in Lockdown Questions



Having Windows in Lockdown Questions



Name one reason for spending more time in that specific space/room while being in Lockdown?

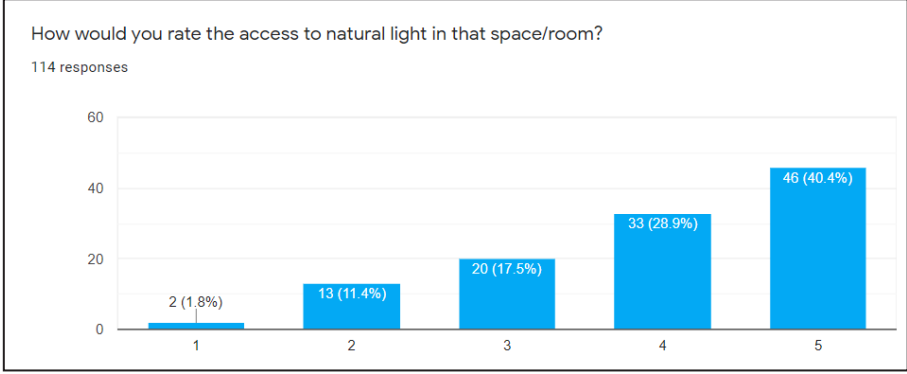
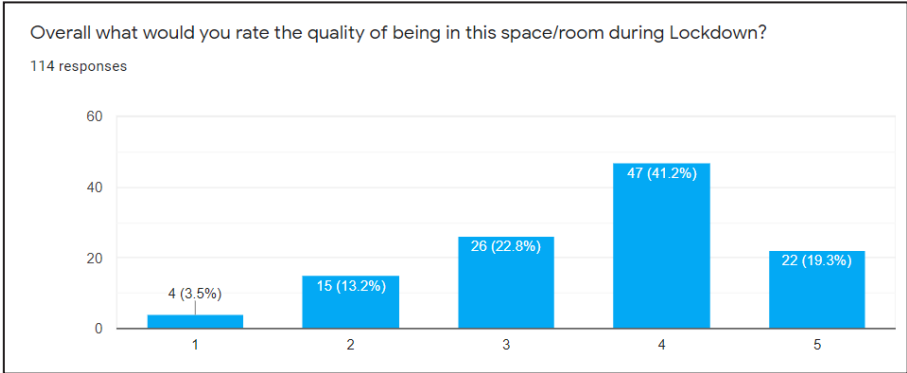
114 responses

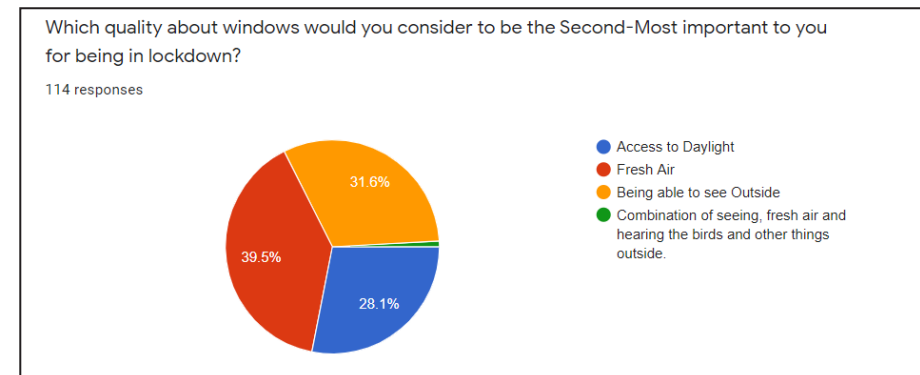
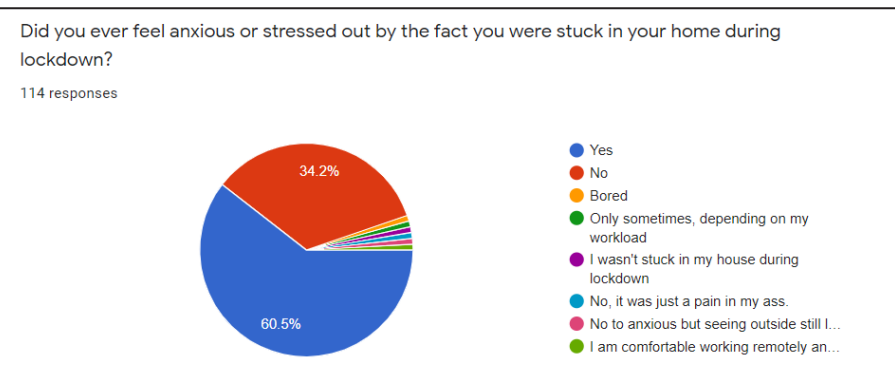
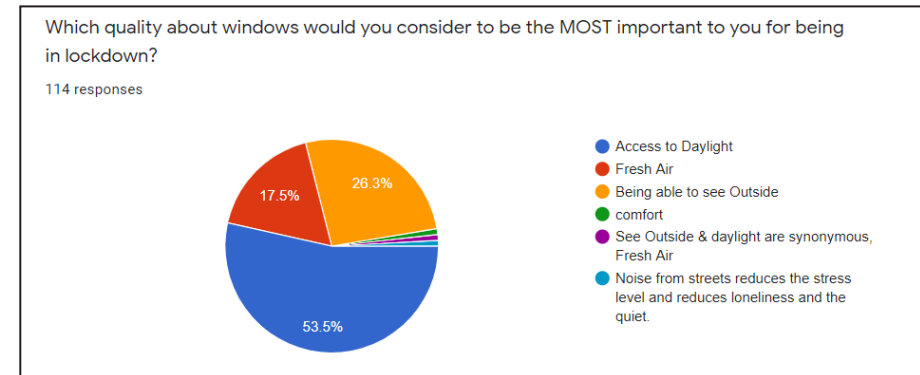
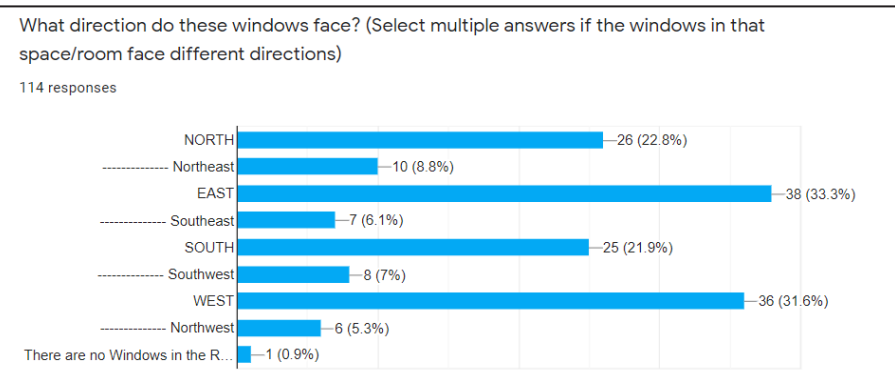
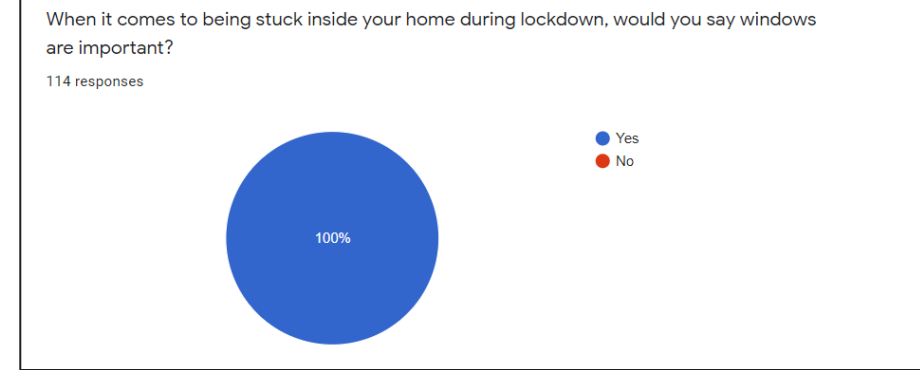
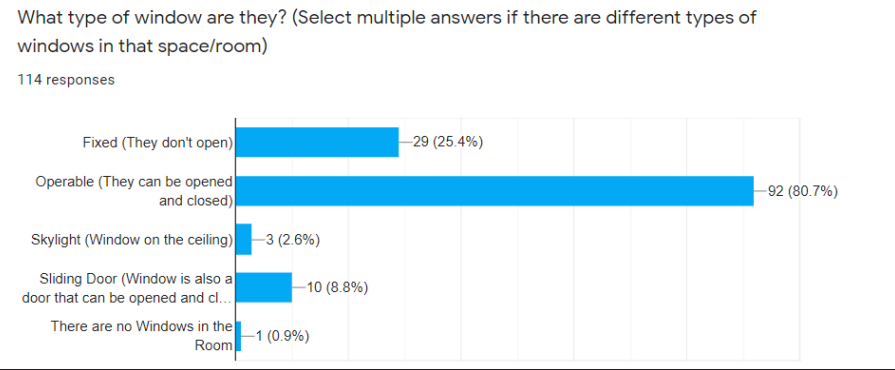
*Individual Responses will not be displayed to protect the anonymity of the participants.*

What do think that space/room needs to make it better for being in during Lockdown?

114 responses

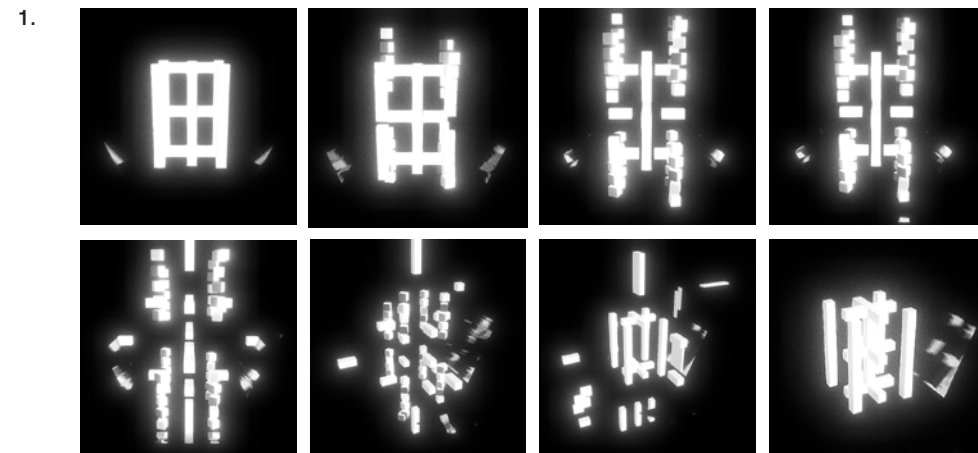
*Individual Responses will not be displayed to protect the anonymity of the participants.*





02 | Connectivity & Understanding the Origins of Windows

(After) Window Etymology



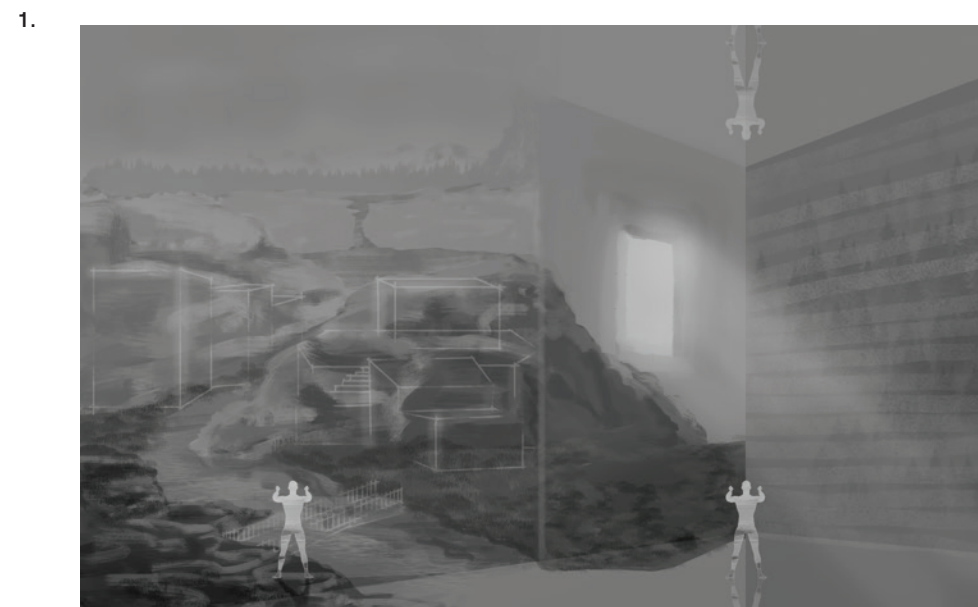
What is Window?  
Sketch Problem

This was a multimedia animation with cubes appearing to formulate a window, depending on one's view. This piece would expand and deconstruct itself, representing the start of questioning what the window is and what it can encompass.

<https://sketchfab.com/3d-models/jordan-zanier-sketch-problem-i-825a71da953e-4f2f9d4de2249aaf8ae3>

03 | What can Windows Encompass & how they Provide Connectivity

Windows as a Threshold



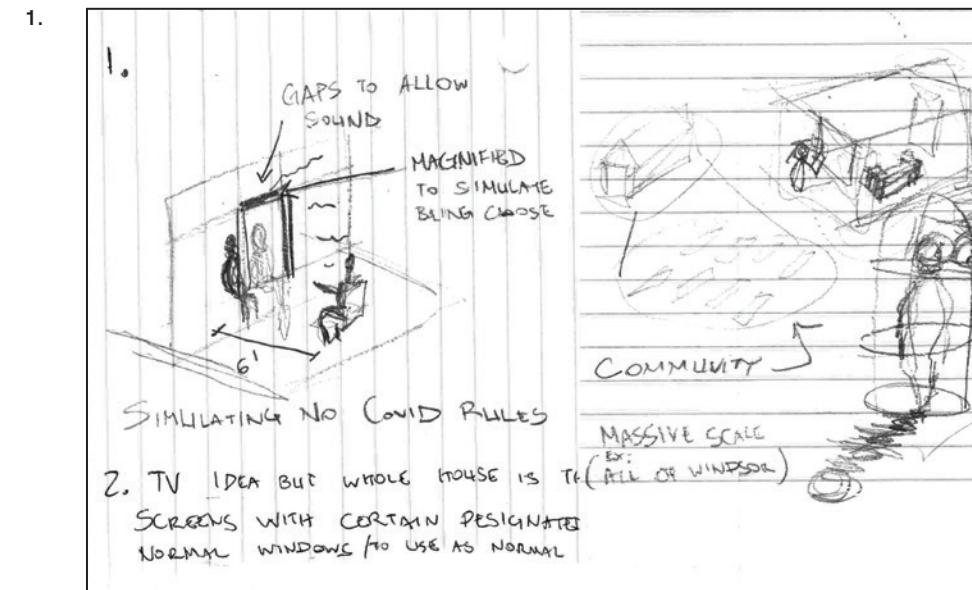
Related to Thresholds

Concept painting that was intended to explore the state of flux experienced by windows when they act as a transitory element.

(Has elements of Location-Based Permeability in the piece).

04 | Poetic Designs for Windows that provide Connectivity

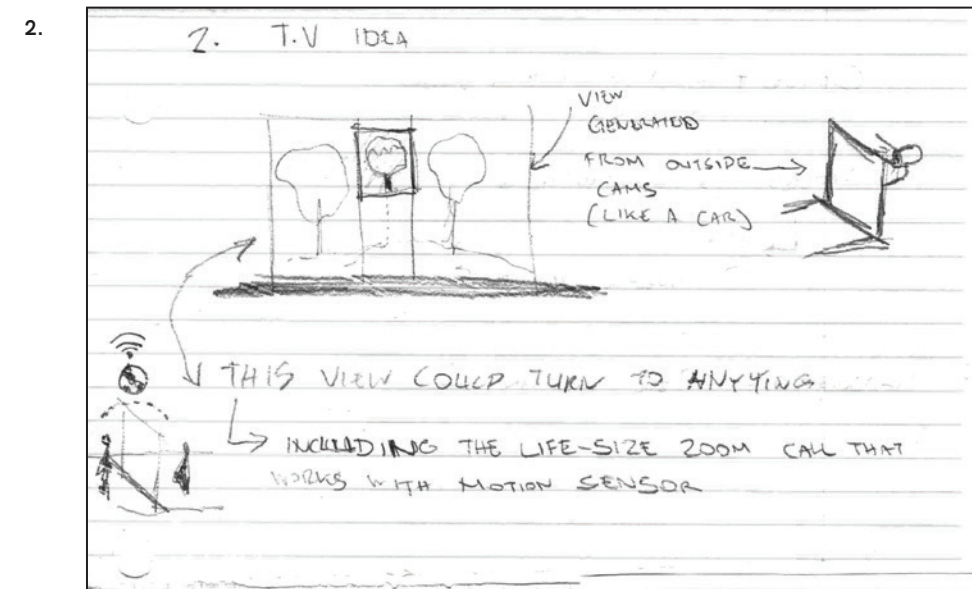
Poetic Design I - III



Related to the Poetic Designs

Rough concept sketches for Poetic Design I (Left) and Poetic Design III (Right).

Poetic Design III was changed from a tubular structure (sketch) to wearable forcefield technology.



Related to the Poetic Designs

Rough concept sketches for Poetic Design II. Multiple sketches were generated in relation to the different associated components.



