

Music at Large
Architecture for the Renegade Musician

by

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ABSTRACT

The classical music scene in Vancouver is preserved through the Vancouver Symphony Orchestra, as well as the few institutions dedicated to musical learning. Because the VSO reproduces the most recognized and established works of classical music, works of less established composers and musicians do not find their way out through traditional channels. Musicians not employed by the orchestra, dubbed as “Renegade Musicians” in this project, are serious and talented musicians who do not follow the path laid out by the elite institutions.

Currently, these musicians rely on busking, or performing in weddings and parties. Unfortunately, these performances and venues do not offer the musicians a legitimate platform for the appreciation of their music, nor do they offer the ideal spatial and acoustic conditions to compliment the musicians’ talents. Combined with Vancouver’s gradual closures of music venues and rehearsal spaces due to rising lease rates, musicians not part of an institution will have greater difficulty developing and performing their work.

Music at Large proposes that Renegade Musicians perform to their audience using pop-up stages. These flexible modules can be deployed anywhere with vehicular access. Also, they provide adjustable acoustic panels that accommodates different acoustic needs for performances and practice. Renegade musicians take ownership of their spaces for music, and live music has the potential to appear at every corner of the city.

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PART I

INTRODUCTION

DECLINE OF CLASSICAL MUSIC

Classical music in our contemporary times is dying, especially in terms of audience attendances of live performances. Classical music concert attendance saw a 34% decline between 2008 and 2012 (Ilchef, 2019). According to an article in the New York Times, not only is classical music suffering from a lack of connection with the younger population, but it also suffers from a variety of issues including: labour disputes from American orchestras due to lack of funding, reduction or outright cancellation of Metropolitan Opera and New York Philharmonic tours and concerts, decrease in popularity of classical music radio stations in America, and the increasing popularity of rock and pop superstars while classical music venues have a hard time booking concerts for their artists (Dreyer, 2012).

The architecture for classical music has barely evolved in its lifetime, and primarily exists inside prestigious and expensive concert halls that cannot function without government support. The buildings themselves are enclosed and segregated from the community, denying access without the purchase of a ticket. In essence, classical music is physically isolated from the community, protected within the prestigious shell of the concert halls and the institutions.

Figure 1. Salvage. By author, 2013.



Vancouver is one of Canada's hub for music and has a well-developed classical music scene. There are a variety of classical music performance spaces as well as public and private instructions for the education of classical music. The highest-level orchestra scene revolves around Vancouver Symphony Orchestra and the Orpheum; their primary performance space. Despite an established classical music network, it still fails to escape the isolated and elite institutions and make a mark on the general population in the same way that popular music does today. Engagement with classical music is still highly former and done within isolated and enclosed architecture.

AGING AUDIENCE

One key issue with the decline in classical music is the aging audience demographics (see Figure 2 & 3). According to statistics, 13.6 % of the population aged 65 to 74 attended a classical musical concert

in the year 2010, as compared to only 6.1% of the population aged 25-34 (McClintock, 2017). One of the primary objectives of modern-day orchestras is attraction and retention of younger audiences, which costs more money as it is usually done by bringing in well known soloists. Therefore, even though many orchestras, especially those in larger cities are succeeding, this gradual decline in attendance and gradual increase in age demographics will be greatly noticeable in the next decades. It is important then, to think of solutions now that can revive classical music by spreading it to the younger generation.

ECONOMY OF MUSIC

In an interview with Robert Flanagan, a professor of economics at Stanford University and the author of *The Perilous Life of Symphony Orchestras*, he discusses the economy of orchestras as: "They all run an operating deficit, in the sense that the money

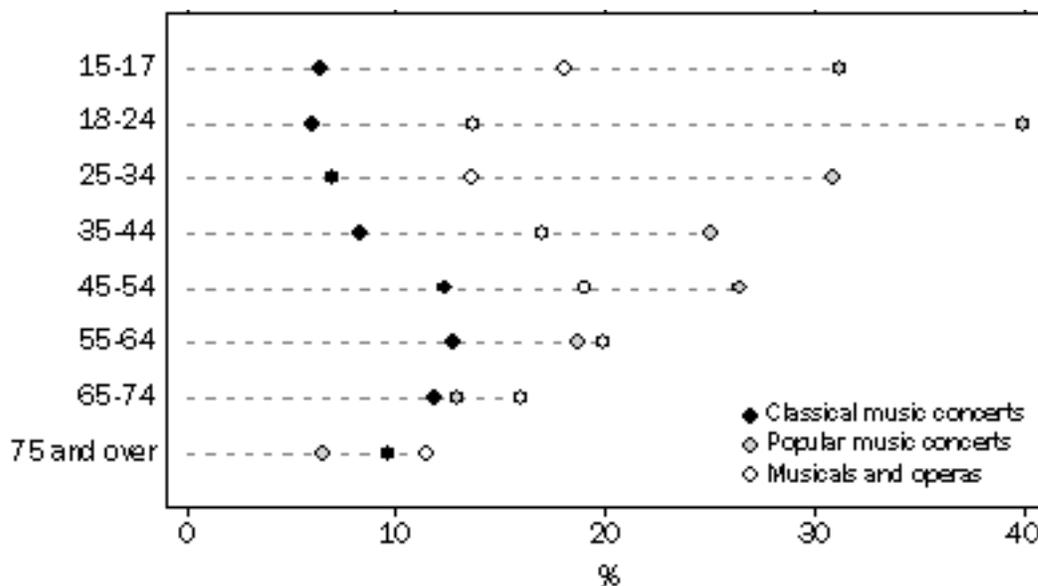


Figure 2. Live music audience demographics. From "Music attendance in Australia," by Australian Bureau of Statistics, 2009.

they earn from concerts, records and so forth does not cover their expenses (McClintock, 2017).” According to ABC news, no symphony orchestra in the world makes money (Ilchef, 2019). Each orchestra comprises of 45 to 100 salaried musicians. Extra costs must be invested towards bringing in international conductors and soloists. The issue with orchestras is that it must change its performance routinely. Whereas a theatre production can operate using the same performance for upwards of a year and a half, orchestral performances usually spend a few days practicing and only give the same performance two or three times. This method greatly brings up the cost and time spent preparing for a performance (McClintock, 2017). As a result, orchestras receive about 40% to 75% of their funding from the government, depending on their size and popularity. Young musicians entering the classical music industry have it particularly hard, with two fifths of newcomers in the UK taking unpaid work (Savage, 2018).

In Vancouver, despite the prestige of the VSO, its centuries old history has been plagued by a series of financial obstacles; including a bankruptcy in 1988 (Gooch, Cluderay, & Ware, 2015). Today, the VSO is operating relatively well, but still requires the support of government funding and philanthropic backing. To help spread the word and advertise to the greater audience, the VSO performs an annual free outdoor concert at Sunset Beach Vancouver. This outdoor concert is extremely successful with an expected attendance of over 7000 (Chan, 2018). They have also performed very successful concerts at Burnaby and Whistler. On the other hand, the 2780 capacity Orpheum Theatre is rarely fully seated even when international soloists are performing.

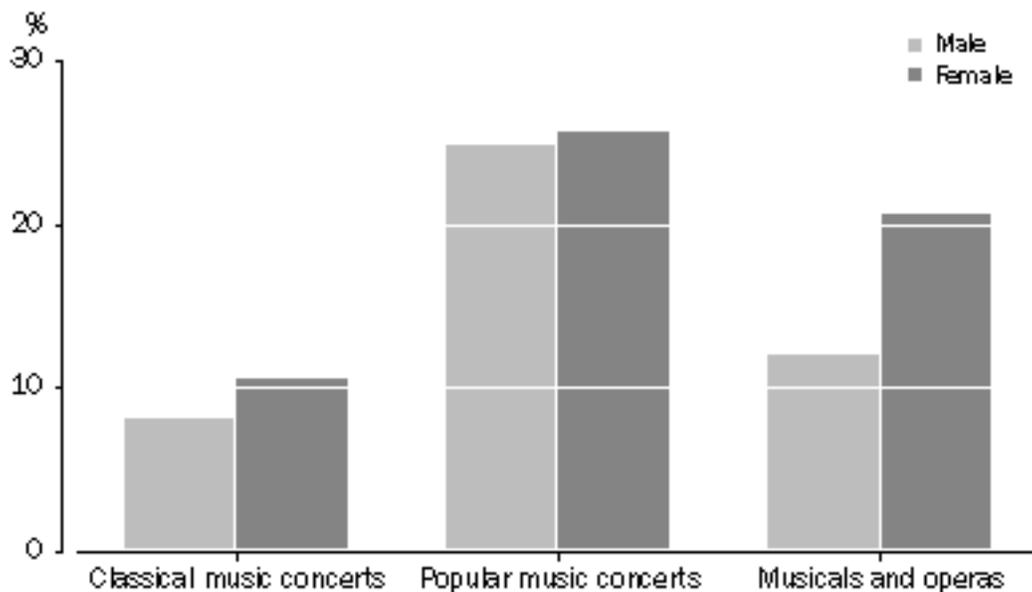


Figure 3. Live music attendance chart. From “Music attendance in Australia,” by Australian Bureau of Statistics, 2009.

*WHY IS CLASSICAL MUSIC ATTENDANCE
DECREASING?*

Music is often a reflection of society. Therefore, the most successful music effectively represents the people and culture of its era. The most successful music also takes advantage of technology, with the “architecture” that we engage with music changing over time as technologies evolve. The great classical composers of the 17th and 18th centuries created music that was new and refreshing for their time. If Beethoven were alive today, he could be producing music that would be new and refreshing for our time. This could be electronic dance music, pop, or perhaps he would be a movie music composer (which is often heavily based on classical music). Interestingly, orchestrally produced movie music (or music of high budget TV shows, anime, and even video games) are as popular as ever. In the VSO, a September 2019 concert featuring world renowned piano soloist Daniil Trifonov (see Figure 4) and a full orchestra costs \$20 for the cheapest ticket and still possessed empty seats. On the other hand, an April 2020 performance featuring Joe Hisaishi (see Figure 5); a Japanese composer for studio Ghibli animated movies, possess a cheapest ticket of \$130 and is sold out months before the performance. Both feature a traditional orchestra and produce high quality instrumental music. It is clear that the audience of today appreciate music with a greater connection to pop culture and is less interested in traditionally composed classical music.

Figure 4. Daniil Trifonov at Carnegie Hall. By S. Pisano, 2017.



The ways in which people listen to music has drastically shifted throughout the past century (see Figure 7). The first breakthrough technology was the phonograph (the first record player) which was invented in 1877. This technology revolutionized music by eliminating the need for live music and allowing people to enjoy music in the comfort of their own homes, in the absence of any performer. The next invention was the radio in 1895, which allowed live broadcasts of performances (whether it be music, sports, or news) across the nation. The invention of the television in 1926 provided a new form of household entertainment, as well as allowing audiences to engage both their audio and visual senses. The invention of the Walkman in 1979 provided the ability to take music on the go, further eliminating the need for live performance. Today, people engage with music primarily through handheld devices like Ipods and smartphones. We hear music through small ear pods or through headsets for higher sound quality. These devices can be considered an “architecture” for music, as they take a concert hall with all its performers and compresses it into a tiny machine that anyone can take to go. Music can be heard no matter where you are, or what you are doing.

A portion of the population still attend classical music performances. It is collectively agreed that engagement with the younger population is paramount to the survival of classical music. In a study of Taiwanese university students and their interest towards classical music (Chun-F & Hu, 2006), a random sample found that 67% of the students were interested in classical music, while 33% were not. The study also extracted the reasons that individuals did not attend the concert (see Figure 6). For the sampled male

students, the primary reason was that the atmosphere of the classical performance is too serious (Chun-F & Hu). Age also plays a role in the study. All students appreciate convenience in buying tickets and the location of the venue. For younger students, the way in which the performance was advertised is very important factor in deciding whether to attend a classical performance. For older students, a major factor is their inherent knowledge of the music, which provides the desire to see a live performance. This data is useful in developing physical and spatial qualities that can be designed to make live performances more attractive.

Table 4. Reasons for Not Attending and Gender

| | The Mean of Male | The Mean of Female |
|---|------------------|--------------------|
| I am not interested in classical music concerts | 1.85 | 1.64 |
| The inconvenience of the location | 1.18 | 1.66 |
| I am too busy to attend classical music concerts | 1.78 | 1.65 |
| I am not interested in classical music concerts | 1.75 | 1.6 |
| Way the performance was advertised | 1.75 | 1.58 |
| The atmosphere of classical music concerts is too serious | 1.81 | 1.56 |
| The inconvenience of buying tickets | 1.81 | 1.59 |

Table 5. Age and Attendance

| | 18 | 19 | 20 | 21 | 22 |
|---|------|-------|------|------|------|
| I am attracted by the live performances | 3.6 | 3.43 | 3.37 | 4.57 | 3.84 |
| The convenience of the location | 3.44 | 3.38 | 3.34 | 4.66 | 3.83 |
| To satisfy my curiosity | 3.44 | 3.44 | 3.34 | 4.5 | 3.72 |
| I am interested in classical music concerts | 3.33 | 3.472 | 3.34 | 4.66 | 3.55 |
| Way the performance was advertised | 3.11 | 3.41 | 3.46 | 4.66 | 3.61 |
| I know the music very well | 3.22 | 3.36 | 3.46 | 4 | 3.5 |
| The cheap tickets | 3.22 | 3.44 | 3.48 | 3.66 | 3.38 |
| The convenience of buying tickets | 2.88 | 3.41 | 3.5 | 4.57 | 3.27 |

Figure 5. Classical music attendance statistics. From “The attitudes of university students to classical concerts: A study in consumer behaviour,” by Chun-Fu & Hu, 2006.



1450 1500 1550 1600 1650 1700 1750

- 161 A.D. - Odeon of Herodes Atticus
- 80 A.D. - Colosseum
- 1530 - Viola
- 1516 - Double Bass
- 1397 - Harpischord (Piano predecessor)
- 3500 B.C. - Harp
- 43000 B.C. - Flute
- 1599 - Shakespeare Globe Theatre
- 1700 - Clarinet
- 1732 - Joseph Haydn
- 1660 - Cello
- 1700 - Piano
- 1530 - Violin

ARCHITECTURE

INNOVATION

PEOPLE

THE RISE AND FALL OF CLASSICAL MUSIC

TIMELINE - ZHONG JI CAI

1450 1500 1550 1600 1650 1700 1750

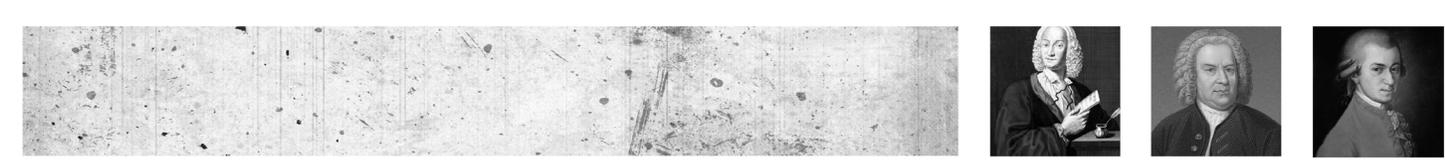


Figure 6. Rise and fall of classical music - timeline. By author, 2016.



1800

1850

1900

1950

2000

PRESENT

- 1756 - Margravia Opera House
- 1767 - Trombone
- 1770 - Wolfgang Amadeus Mozart
- 1770 - Ludwig van Beethoven
- 1810 - Frederic Chopin
- 1813 - Richard Wagner
- 1817 - University of Music and Performing Arts, Vienna
- 1818 - French Horn
- 1825 - Bolshi Theatre
- 1833 - Johannes Brahms
- 1840 - Pyotr Ilyich Tchaikovsky
- 1862 - Claude Debussy
- 1869 - Vienna State Opera
- 1875 - Palais Garnier
- 1877 - Phonograph
- 1891 - Carnegie Hall
- 1895 - Motion Picture
- 1895 - Radio
- 1926 - Television
- 1935 - Elvis Presley
- 1935 - UBC School of Music
- 1947 - Elton John
- 1954 - Yanni
- 1956 - UBC School of Music
- 1957 - Camp Nou
- 1958 - Michael Jackson
- 1960 - The Beatles
- 1968 - Led Zeppelin
- 1969 - Lincoln Center for the Performing Arts
- 1970 - Queen
- 1972 - Personal Computer
- 1972 - Eminem
- 1973 - Sydney Opera House
- 1979 - Sony Walkman
- 1982 - Lang Lang
- 1982 - Chan Center
- 1991 - Danill Trifonov
- 1997 - Chan Center
- 2001 - iPod
- 2002 - Modern Social Media
- 2007 - iPhone

ETY

1800

1850

1900

1950

2000

PRESENT



Figure 7. Violin. By author, 2011.

CONNECTION TO MATH, ART, AND ARCHITECTURE

Classical music is highly intertwined with a multitude of both scientific and creative disciplines. It has directly influenced architectural design and thinking in the past and in the present. In the 16th and 17th century, architects created forms and proportions in direct relation to rhythms found in classical pieces. This relationship produces a correspondence between architecture and music in the Baroque, the Classical, and the Romantic periods. In these three periods, there are very strong similarities between the music composed and the architecture designed. These similarities will be discussed later in the report.

On the other hand, some of the greatest works of architecture exist in the form of the opera house. The exteriors of this architectural typology are typically idiosyncratically designed, however the performance spaces themselves are highly scientific and directly corresponds to the type of music that is performed. The evolution of classical music and the formation of the modern-day orchestra places acoustic, ritualistic, visual, and functional demands on a space. These demands create and shaped the amazing concert hall designs we see today.

BASIS FOR EDUCATION

Despite the waning popularity of orchestras, classical instruments are regularly taught to young children. It is an important fundament teaching tool for





increasing focus, coordination, and rhythm. Instruments can also be a lot of fun to play with. A study by the YouGov for the Royal Philharmonic Orchestra in the UK found that nine in ten children (aged 6 to 16) want to learn a musical instrument (Roberts, 2018). In this study, band instruments like the guitar (45%), piano (36%) and drums/percussion (35%) proved the most popular. Meanwhile, 75% of children opted for an orchestral instrument, such as the violin (10%), flute (8%) and saxophone (8%). This same study found that as the child gets older, they become less interested in classical instruments. The students that were interviewed stated that a major reason for this decline is the lack of encouragement from their school to develop an interest in music. Furthermore, the more a child is exposed to media and other forms of music, the less interest towards classical music.

For those who wish to pursue a career in composing music, whatever their end genre may be, a basis in classical music is a must. According to the UBC's School of Music application page, application of the music composition program is required to know at least one classical instrument (preferable more, and preferable to know piano). The complexity and depth that is held within classical music enriches music of all forms. Even contemporary hip pop, rap, and EDM musicians still use various forms of classical music in their compositions.

Classical music may indeed be past its prime in its reflection of our society, however it must be kept alive because it is still highly connected with the maths, arts, architecture, and serves as a basis for all music education.

VANCOUVER MUSIC VENUES & CLOSURES

Railway Club
 Closed November, 2016
84 Year old live music venue



Tapestry Music Vancouver
 Closed January, 2019
400 Students displaced



Figure 8. Vancouver classical music venues map. By author, 2020.

VANCOUVER MUSIC VENUES & CLOSURES

Over the past years, numerous Vancouver live music venues, schools, and rehearsal studios have closed down due to rising lease rates.

Clark Drive Studios
Closed October, 2019
30 Musicians displaced



Renegade Studios
Closed October, 2019
50 Musicians displaced



Figure 9. Vancouver rehearsal spaces map. By author, 2020.

ON THE BRIGHT SIDE

In 2016, the province of B.C. announced the creation of the B.C. music fund, a **\$15-million** investment to support the growth of B.C.'s music industry.

In 2018, the province announced another **\$7.5-million** in funding for Amplify B.C. to support local musicians

WHO ARE THE RENEGADE MUSICIANS?

For the purposes of this thesis, the “Renegade Musicians” are talented, classically trained musicians who are not employed by an orchestra. These musicians still rely on music to earn a living but prefer to take an alternative route than the one laid out by the elite institutions.

There are a variety of reasons why a talented musician is not employed by an orchestra; the musician prefers to perform experimental music; does not like orchestra’s strict routine; the cost of formal education and orchestral level instruments are too high; the orchestra in the city is already full; and more. For the most part, Renegade Musicians are relatively unknown and are rarely offered a platform to perform to the public.

Oftentimes their only option is busking, which is not an ideal solution for a highly trained musician. Studies have shown that roughly half the population associate buskers with beggars, or at least, a failed musician. Whether or not people appreciate buskers, not having a stage to perform on limits the potential and legitimacy of the musician. On the other hand, buskers take on a degree of risk through their encounters with a wide variety of people, as well as a heavy reliance on high quality public spaces. These Renegade Musicians need a dedicated space to develop their music and a better method for performing to the public.

Classically Trained Musician



Buskers



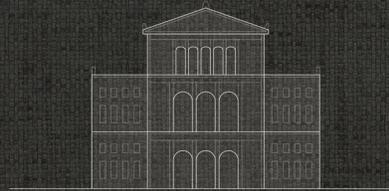
The Middle Musician



Orchestral Musicians



Outdoor Public Spaces



Elite Institutions



The Rebellious Soloist



The Student Duo



The Experimental Composer



The Contemporary Chamber Group



Figure 10. Diagram of musician types. By author, 2020.

PART II

DEFINING MUSICAL TERMS

Classical music has a long and rich history with many complex elements. A set of definitions is required to understand the fundamentals of musical components in their relationship to architecture, and to later design spaces that can accommodate them. Also, it is useful to understand the types of performances and the history of classical eras to develop a social and cultural dialogue between music and architecture.

REVERBERATION

Sound bounces off surfaces and behaves like light. Flat, hard surfaces directly reflect sound with minimal changes to sound quality (see Figure 9). Soft, textured surfaces scatter and absorb sound, leading to its decay. The most important factor for the design of theatres, reverberation is the time it takes for a sound to “decay” within a space. In typical concert halls (based on concert halls designed by Nagata Acoustics), the ideal reverberation time is anywhere between 1.0s (Fondation Louis Vuitton) and 2.3s (Hamburg Elbphilharmonie) depending on the size of the space. If the reverberation time is too short, the sound may not reach the entire audience, especially those sitting in the back. If the reverberation time is too long, the extended echoes of sound will disrupt the quality and clarity of the performance. Reverberation directly affects the shape

and materiality of a performance space, as the way and direction that sound bounces or are absorbed on surfaces is paramount to its acoustic quality.

RESONANCE

Sound travels in waves. Like a wave of water, it possesses an amplitude, wavelength, and frequency. When two soundwaves with the same frequency connect, the amplitude of the wave increases, and the result is a more powerful sound (see Figure 10). The comparatively weak vibrations produced at the end of an organ pipe, for example, cause a column of air in the pipe to vibrate in resonance, thus greatly increasing the loudness of the sound (Muecke & Zach, 2007). Designers of acoustic spaces must consider the frequency and wavelength of different sounds to obtain a suitable level of resonance for the intended purpose of the space.

HARMONY

Harmony refers to the balance of different notes in a musical piece which produces a sound that is pleasant to the ear. Harmony is solely controlled by the musicians themselves and is not affected by the architectural space. However, the principles of harmony and balance have been used in architectural practice for centuries, hence the deep relationship between music and architecture (Muecke & Zach).

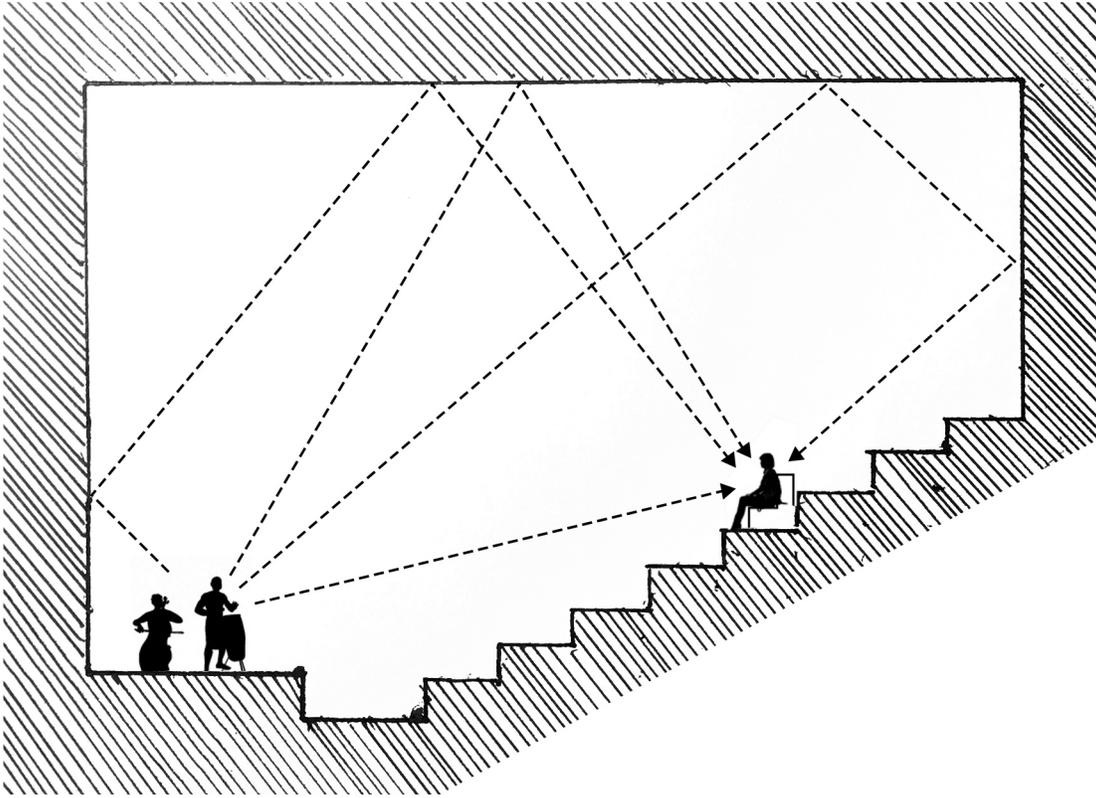


Figure 11. Reverberation in a theatre. By author, 2019.

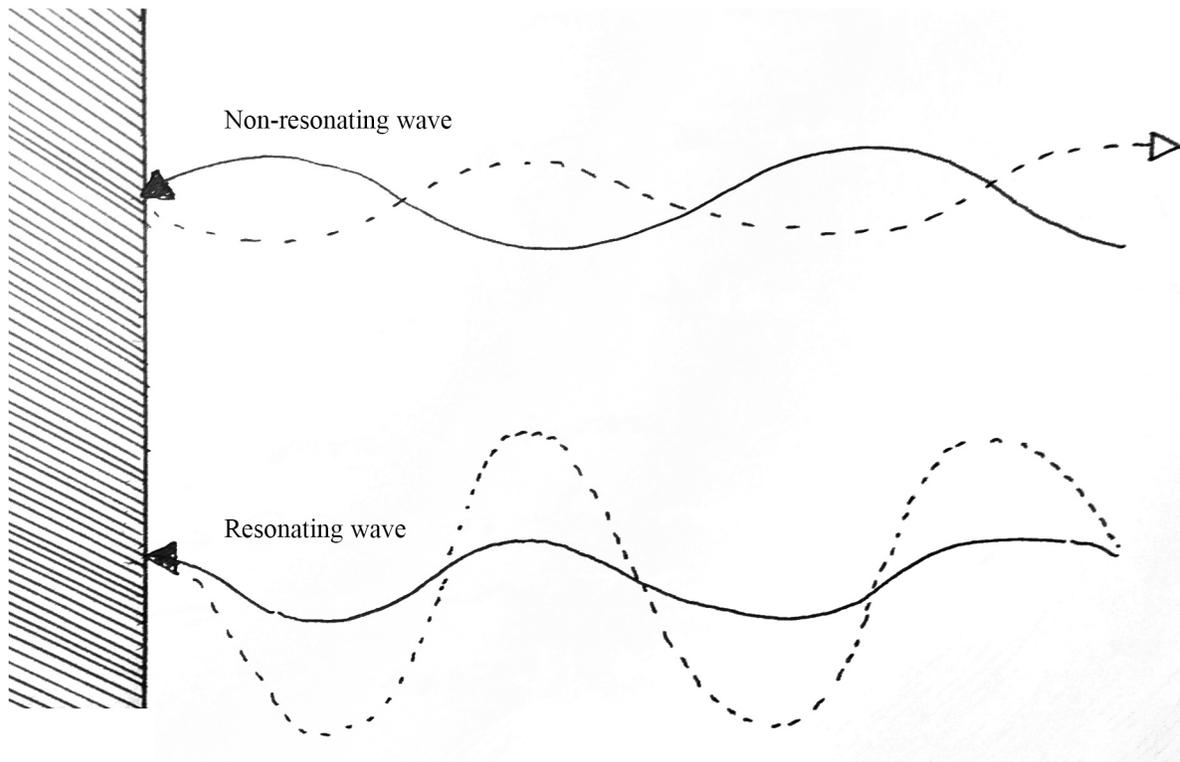


Figure 12. Resonance & amplification of sound. By author, 2019.

TEMPO

The rate of speed of a musical piece or movement. Tempo affects the energy and atmosphere of a performance. A slow tempo can be used to convey sadness to the audience. A fast tempo can be used to convey excitement and often used for the climax of a movement (Muecke & Zach).

MOVEMENT

A musical movement refers to a longer performance that features a series of musical ideas and themes. Performance of musical movements can surpass an hour, in which the performers are playing throughout its entirety without a break.

SOLO

A performance by a single musician. The most popular instruments for solos are pianos and violins.

CONCERTO

A performance accompanied by an orchestra. It is led by a conductor and features a variety of instruments. The performance could still be focused on a single performer or group of performers.

CHAMBER MUSIC

Classical music performed by a smaller number of musicians as compared to an orchestra. There is no conductor and the musicians lead the performance themselves.

OPERA

A classical music performance where the lead role is taken up by a singer. A wide variety acts may be used, which may include actors, musicians, props, and backdrops.



Figure 13. Leopold Mozart with Wolfgang Amadeus and Maria Anna. By L.C. Carmontelle, 1763.

BAROQUE PERIOD (1600 – 1750)

Baroque represents the genesis of the age of classical music. Famous composers including Johann Sebastian Bach, Antoni Vivaldi, and George Frideric Handel pioneered new styles like the concerto, sonata, and opera. The loosening of religious control over Europe is what allowed non-religious instrumental music to flourish, and Baroque music exploded in popularity. Opera became a way for composers to express their mood and emotions through music. Similarly, the intention of the music was to affect the emotion of the audience (ClassicFM, 2019).

CLASSICAL PERIOD (1730 – 1820)

This is a specific term that describes an era in which composers Beethoven, Mozart (see Figure 11), and Haydn were active. In this period, symphonies were revolutionized, comic operas were created, as were the creation of piano sonatas (piano replaced the harpsichord as the main keyboard instrument). Classical period music is known to be lighter and clearer as compared to Baroque music and is less complex (ClassicFM).

ROMANTIC PERIOD (1830 – 1900)

The simplified music of the Classical period became more enriched in the Romantic period as music took greater inspiration from literature and art. Symphonies were expanded and operas became more dramatic. Richard Wagner revolutionized the opera by lengthening the performances of each piece, at a time when music was performed in shorter pieces like modern day songs. Other famous composers in this time include Tchaikovsky, Brahms, Mahler, and Verdi (ClassicFM).

THEATRE TYPOLOGIES

PROSCENIUM STAGE

This is a standard typology that features the stage on one end of the room, and the audience on the other side. These theatres typically possess a curtain and a large back-of-stage space. For classical music venues, a there often exists an orchestral pit underneath the apron for use by musicians. This provides the opportunity for an orchestrally-backed theatre production. Backdrops, lighting, and curtains can all be easily controlled without the operator being seen by the audience. This makes this typology popular for theatre productions. It is easy for performers to enter and exit the stage without disrupting the performance. Movie theatres are form of proscenium theatre as the audience needs to face in one direction to view the flat screen. Famous proscenium theatres include the Palais Garnier (see Figure 12), and Vancouver's Chan Center as well as the Orpheum Theatre.



Figure 14. The interior of the Palais Garnier. By FHKE, 2010.

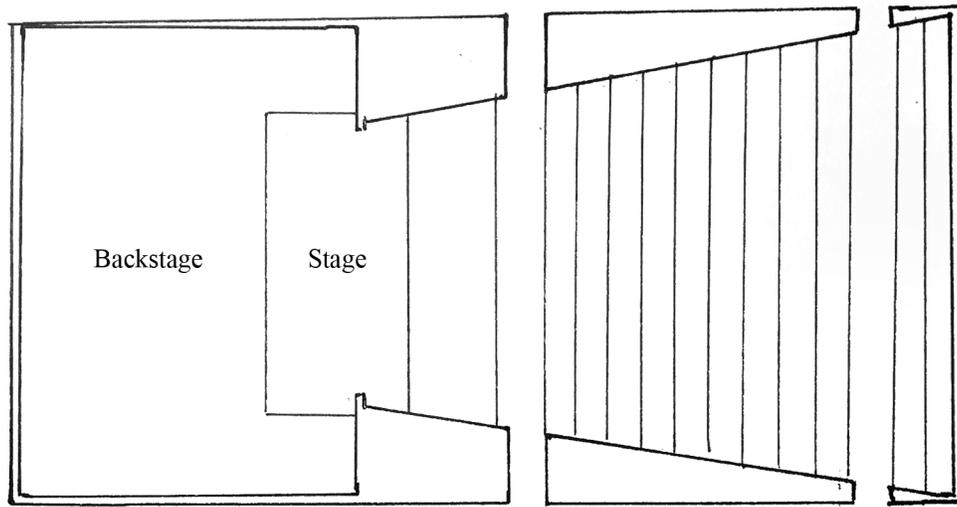


Figure 15. Proscenium stage diagram plan. By author, 2019.

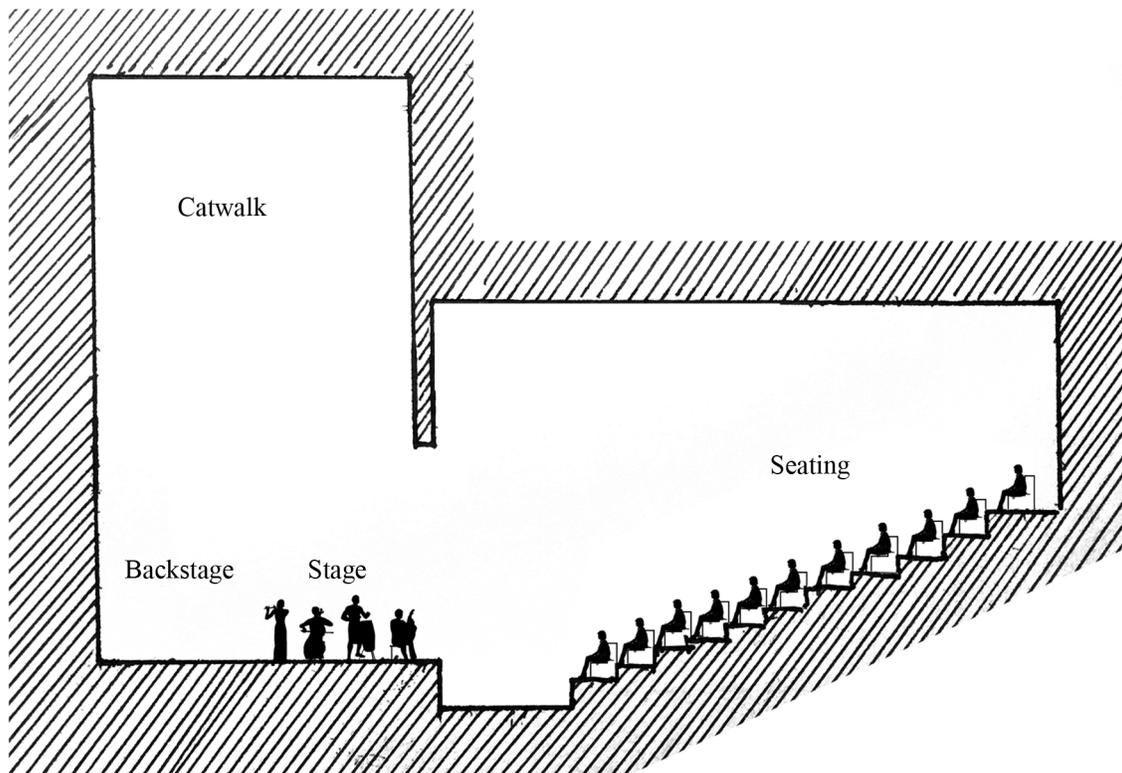


Figure 16. Proscenium stage diagram section. By author, 2019.

ARENA THEATRE

This typology places the performers in the middle platform of the theatre with audiences on all sides. This design provides more intimacy between the performers and the audience by providing more seating closer to the stage. This typology is almost always created for orchestral performances, providing the highest quality acoustic spaces. Famous arena theatres include the Hamburg Elbphilharmonie and the Paris Philharmonic Hall.

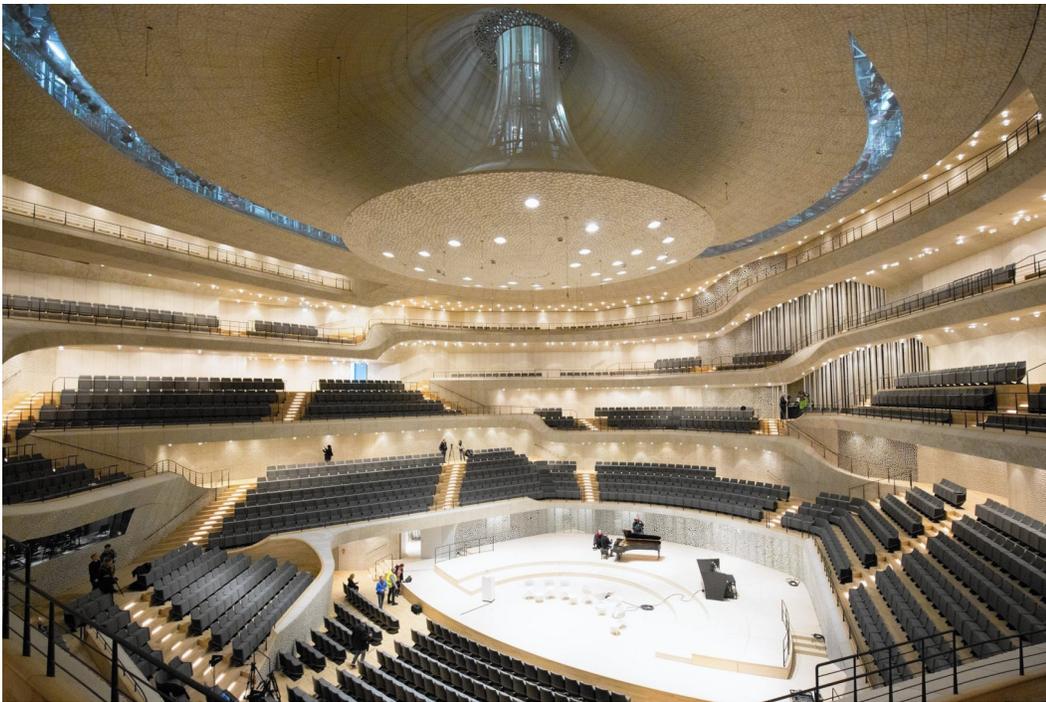


Figure 17. Elbphilharmonie hall. From “Showtime for the Elbphilharmonie,” by C. Charisius, 2016.

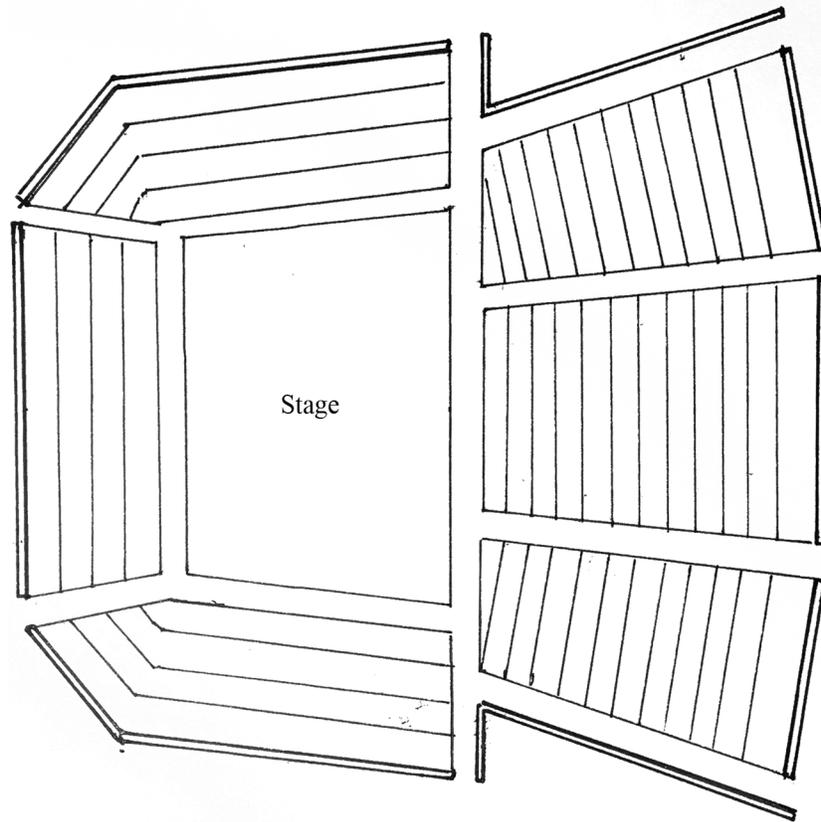


Figure 18. Arena theatre diagram plan. By author, 2019.

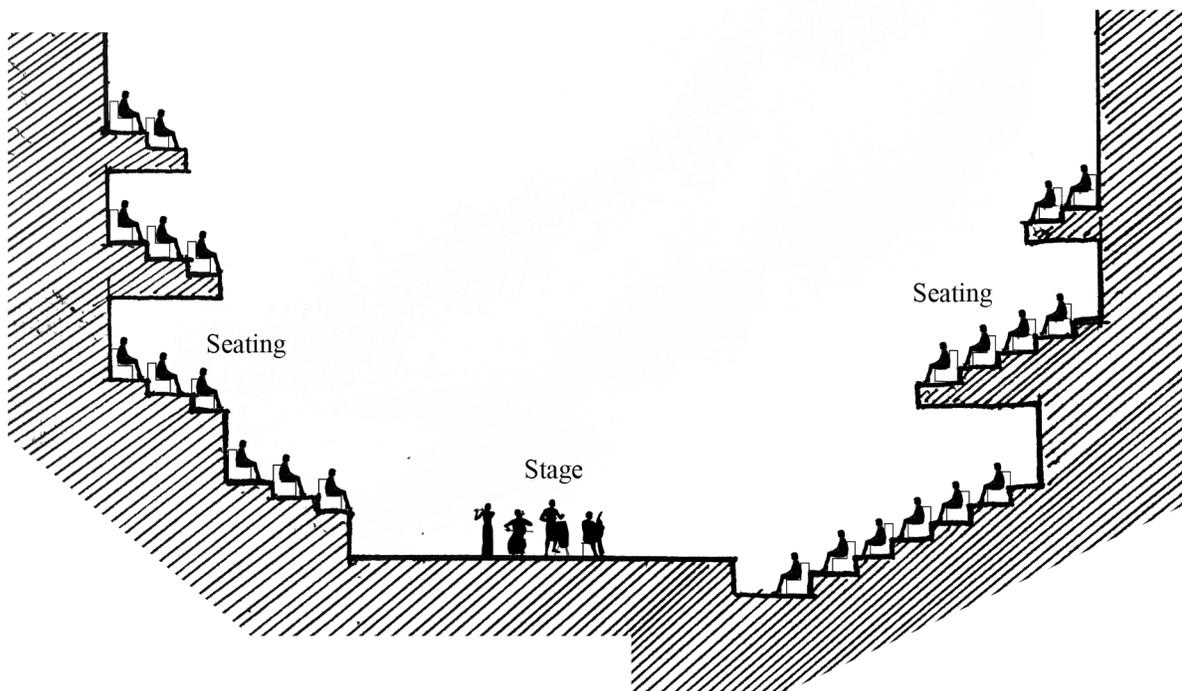


Figure 19. Arena theatre diagram section. By author, 2019.

THRUST STAGE

The audience is “thrust” into the auditorium with the audience sitting on three sides. This typology provides more intimacy between the audience and the performers, without sacrificing the performer’s ability to use backdrops and preserving ease of access. This typology is commonly used by circuses such as Cirque du Soleil.



Figure 20. A thrust stage at the Pasant Theatre. By Wharton Center, 2007.

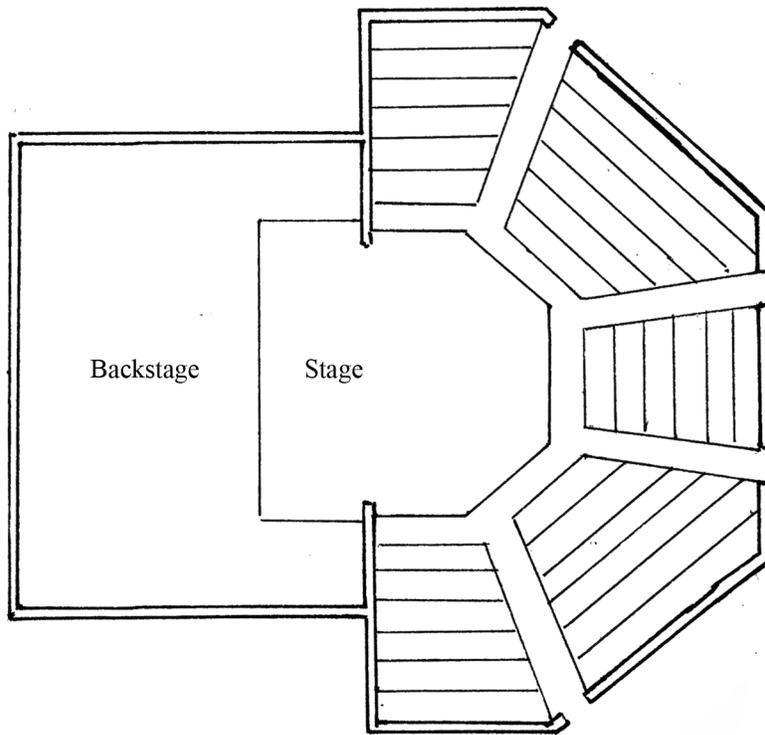


Figure 21. Thrust stage diagram plan. By author, 2019.

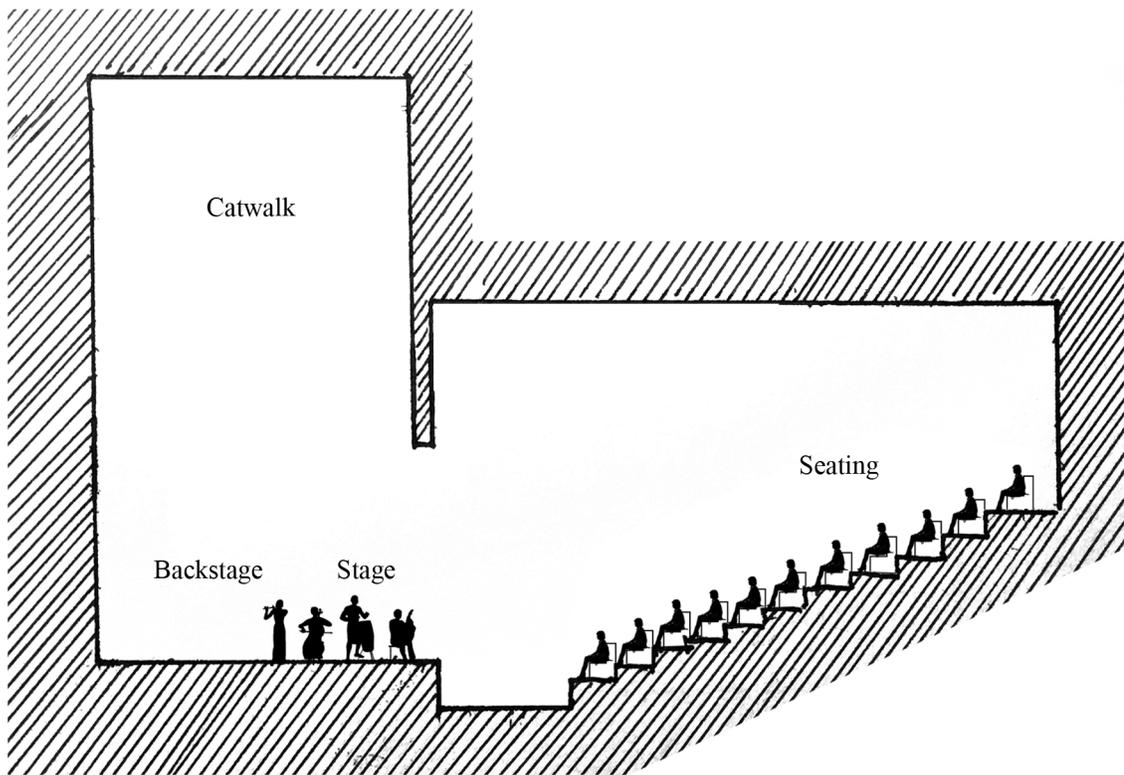


Figure 22. Thrust stage diagram section. By author, 2019.

BLACK BOX THEATRE

These are minimalist performance spaces that are designed to be flexible and accommodating to a wide variety of different performances. They are often painted black, hence “black box,” and have a flat floor. This means that the audience is level with the performers. Black box theatres are used for rehearsal and small productions, providing an intimate environment that is more ideal for theatre productions than for classical music.



Figure 23. Hattiloo Theatre interior. From “Hattiloo Theatre / archimania,” by H. Mardukas, 2007.

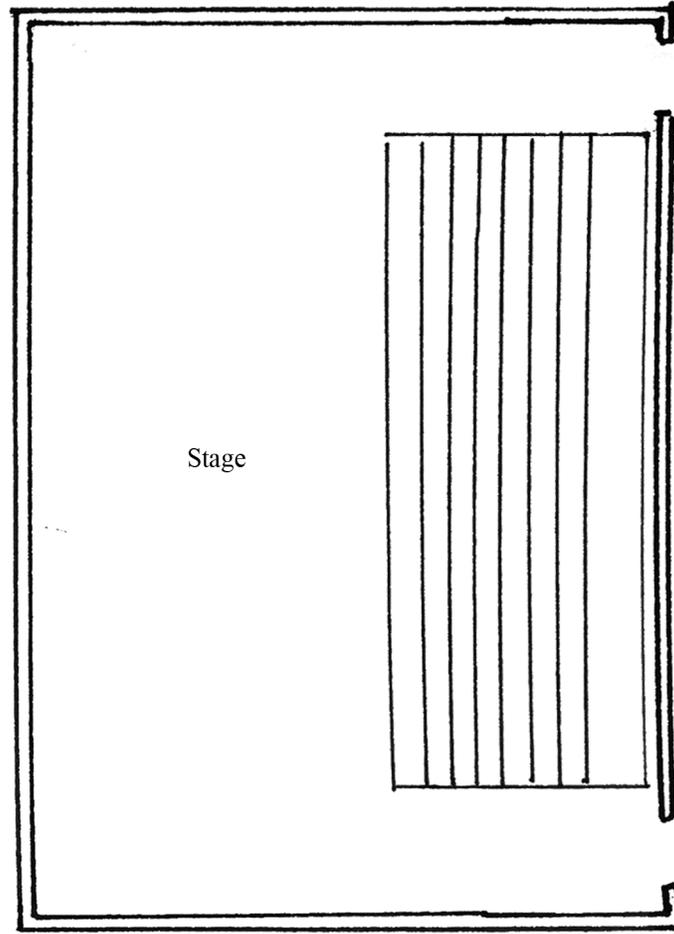


Figure 24. Black box theatre diagram plan. By author, 2019.

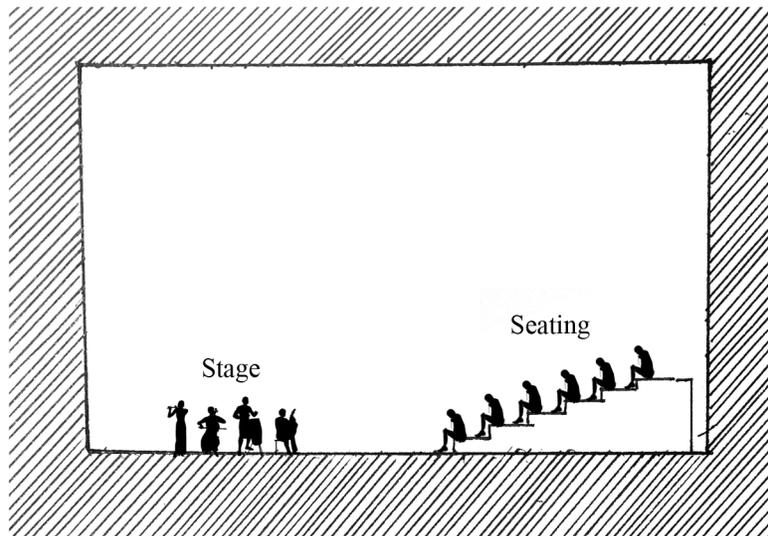


Figure 25. Black box theatre diagram section. By author, 2019.

CONCERT RITUALS

Attending a concert is a highly ritualistic activity and provides the experience with a level of prestige. It is one of the reasons that classical concert halls feel like an escape from reality. Its formality both attracts a certain demographic of individuals (usually older) and turns away younger and more casual audiences. Understanding the rituals of both the performers and the audience is important to develop an architecture that preserves the integrity and professionalism of a classical performance. It also helps to understand the barriers and inefficiencies that can be mitigated to create an experience that is more open and democratic. There is a set etiquette for attending a classical concert that is generally agreed upon across the world. This etiquette has been developed over the centuries that classical music has existed and is still preserved today. For the purposes of this study, the exact rituals will be simplified down, and focus will be given towards the most important activities.

ARRIVAL

The theatre begins with the arrival at the front steps of the concert hall (some may even argue that it begins with the car ride there). The arrival can be a highly social ritual, depending on the design of the design of the hall. In the case of Vancouver's Orpheum (see Figure 24), the small ticketing area means that most guests must form a line that sometimes warps all the way to the end of the structure on Seymour Street. This issue can only be mitigated by constructing a larger lobby. After patiently navigating towards to end of the line and picking up their ticket, the guests move along towards the main hall.

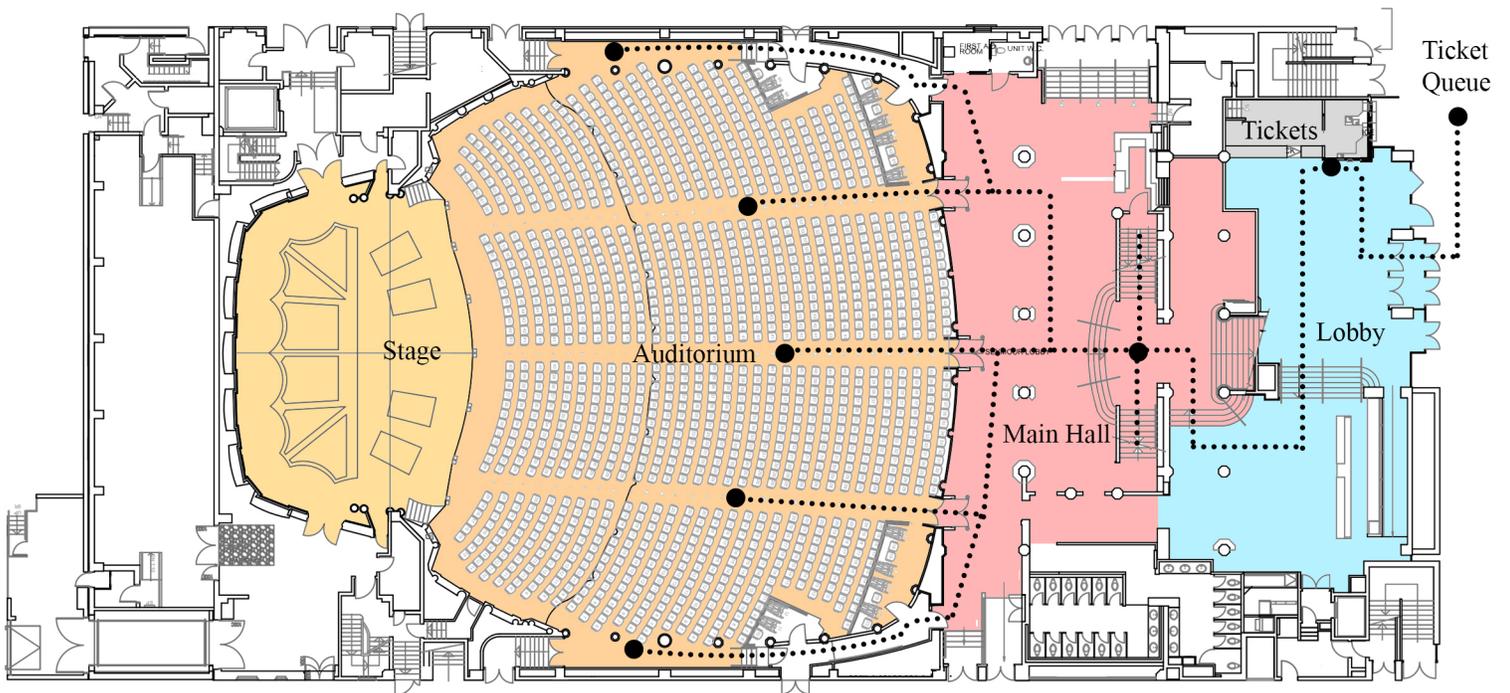


Figure 26. Orpheum floorplan - audience circulation & destinations. By author, 2019.

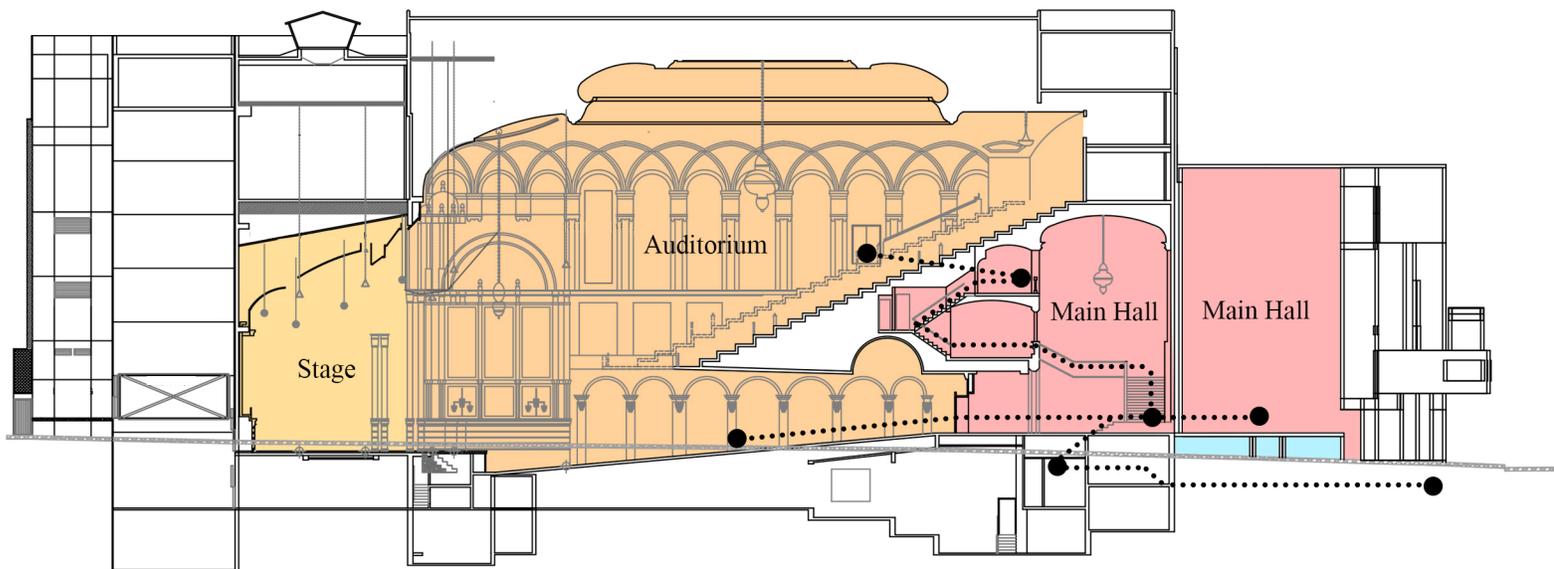


Figure 27. Orpheum section - audience circulation & destinations. By author, 2019.



Figure 28. Orpheum main hall. By author, 2019.

Figure 29. Orpheum guests at main hall. By author, 2019.



MAIN HALL

Second to the theatre itself, the main hall is the most important space in a concert hall. An integral step in the theatregoing ritual, this is where the concertgoers can observe the other guests and socialize. Being seen and being able to see others is traditionally an important social dynamic when attending a performance. Therefore, the architecture is designed to accommodate this interaction. Depending on the architect and the time of construction, the main hall can take on a variety of forms. The most important thing is that it needs to be a high, multilevel space that is visually permeable. In older theatres like the Vancouver's Orpheum (see Figures 24 & 25), a grand staircase sits in the middle of a large atrium, taking guests up to second level that is lined with balconies. The concertgoers standing at the balconies can watch the arriving guests below (see Figure 26 & 27), often looking out for familiar faces or important figures. The people walking up the staircase are advantageously displayed for the entire hall to see. Then the next group walks up, and it's their turn to be seen. After the initial period of entropy, everyone will find a place in the hall to socialize or have a drink. Eventually, the performance is about to begin, and everyone makes their way towards their gate to enter the theatre.

THE PERFORMANCE

During the time that the audience slowly files into the theatre, the musicians are already onstage preparing. During this time, the concertmaster (head of the violin section) must stand up and ask for quiet so that the musicians can begin tuning their instruments. At this point, the audience can watch the musicians go about their preparations and various sounds from various instruments can be heard. Usually a single in-

strument (usually oboe) plays a tuning note so that the other musicians can match the note with consistency.

Next the conductor comes on stage, at which time both the audience and the musicians all stand up and applaud. The conductor shakes hands with the quartermaster. At this point the musicians sit back down and the conductor turns towards them, and begins the music.

In classical music, the music piece is often played with multiple parts. The musicians may briefly stop during these parts, but the audience cannot clap. For a newcomer, this unspoken rule may be alien and confusing. The orchestra hands out a detailed breakdown of the program to help guide the audience and provide a sense of time. Only when a piece is finished, is when the audience should give applause. In the VSO, a typical classical performance features two to three pieces of music, includes a 15-minute intermission, and takes around two hours to complete.

END OF THE PERFORMANCE

At the end of the performance, the audience gives out a long, extended applause. This seemingly old-fashioned ritual is intended as a way of giving and receiving energy. The performers gave their energy to the audience through music, and the audience gives energy back through applause. In the past, had the performance not been to the audience's liking, "boos" would have been heard and produce sometimes thrown at the performers. After the applause has died down, both the audience and performers begin to depart the theatre. The audience is free to leave immediately, or to continue socializing in the grand hall. The conductor or soloist will sometimes join and mingle with the audience after the performance.

CLASSICAL MUSIC & NATURE

Classical music has a special connection to the natural world in that many pieces of its music are inspired by the natural world. In fact, classical music is primarily inspired by nature and older folk music. This deep connection to nature differentiates classical music from contemporary music, which are primarily reflect society and people. Because of this relationship, tradition composers often preferred writing music in the heart of nature, away from the city. In fact, famous Norwegian composer Edvard Grieg (1843 – 1907) had built a separate composer’s hut detached from his main home (see Figure 28). This hut sat on a small hill, surrounded by forest, overlooking an ocean bay. His house, known now as Troldhaugen, has become a popular museum destination and features a small concert hall for classical performances.

According to performing musician and composer Dr. Justin Wildridge, being inspired by nature when composing music is inescapable. One well-known piece music he mentions is Beethoven’s ‘Pastorale’ Symphony No. 6 in F major. In need of relaxation as well as inspiration, Beethoven would nearly always be accompanied by his sketchbook so that in the heart of nature he could notate his ideas undisturbed by other humans (Wildridge 2019). No. 6 is specifically titled with direct references to nature. For example, the first movement is titled: “Awakening of cheerful feelings on arrival in the countryside,” while the fourth movement is: “Thunderstorm.” The tone and atmosphere of the music follows the names precisely. Another well known piece that draws upon nature is Flight of the Bumblebee by Rimsky-Korsakov.

This relationship speaks to the origin of classical music, and it is logical to conclude that classical music would best be performed in the outdoors, as opposed to the interior of a building (preferably with equally good acoustics). If performed in the outdoors, the music may reveal its meaning more clearly, whilst being supplemented by the visuals, smell, and feeling of the environment.

Figure 30. Grieg's Cabin, Trolldhaugen. By B. Buster, 2008.



BUSKERS - OBSERVATIONAL RESEARCH

1

Granville Island - Triangle Square



2

Granville Island - Anderson St

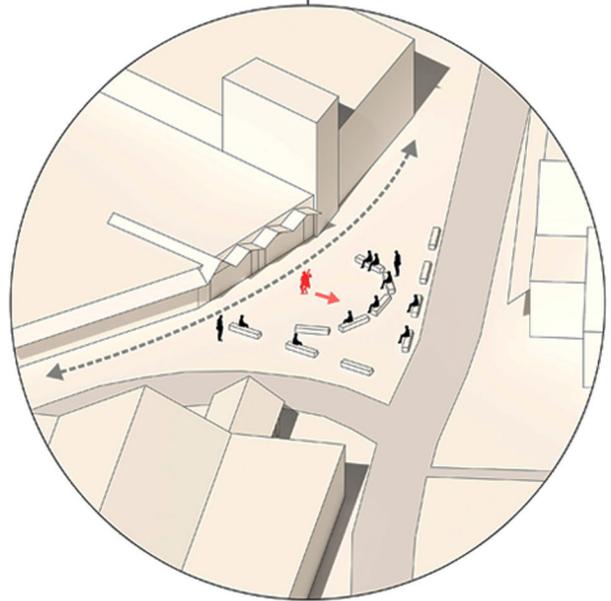
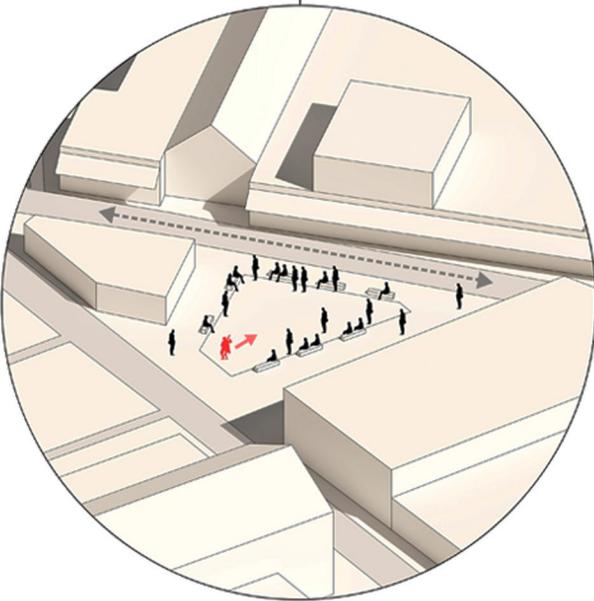


Figure 31. Photographs and diagrams of Vancouver buskers part 1. By author, 2020.

3

Granville Island - Harbor Square



4

Granville Island - Alleyway

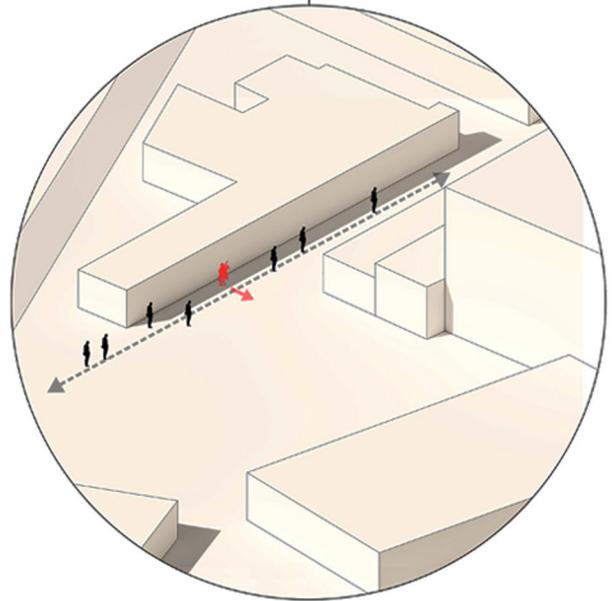
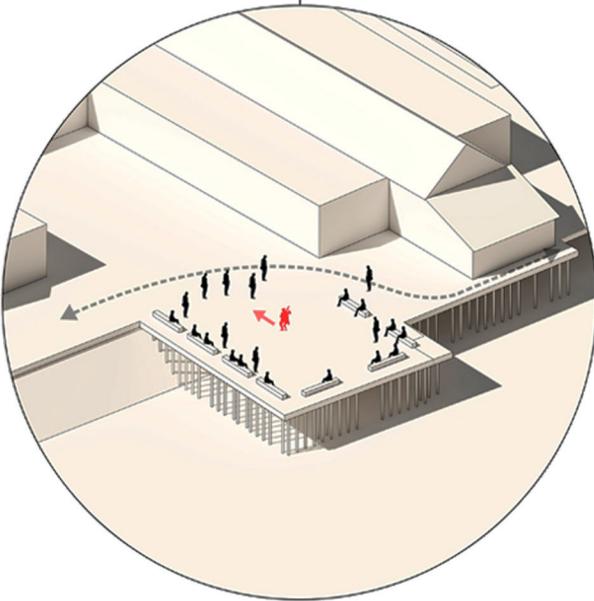
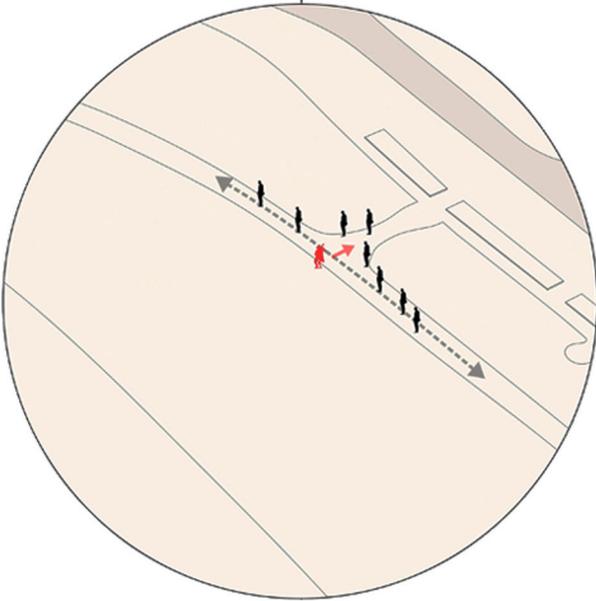


Figure 32. Photographs and diagrams of Vancouver buskers part 2. By author, 2020.

5

English Bay Beach - Intersection



6

English Bay Beach - Promenade

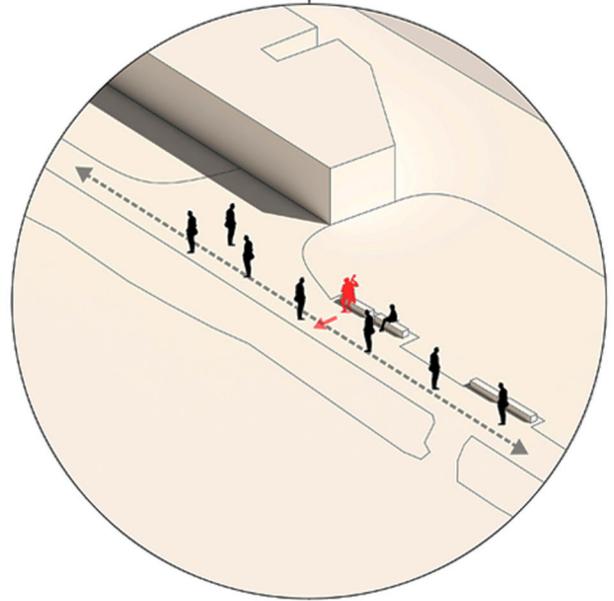


Figure 33. Photographs and diagrams of Vancouver buskers part 3. By author, 2020.

7

Robson & Granville - Shopping Street



8

Yaletown Roundhouse - Skytrain Station

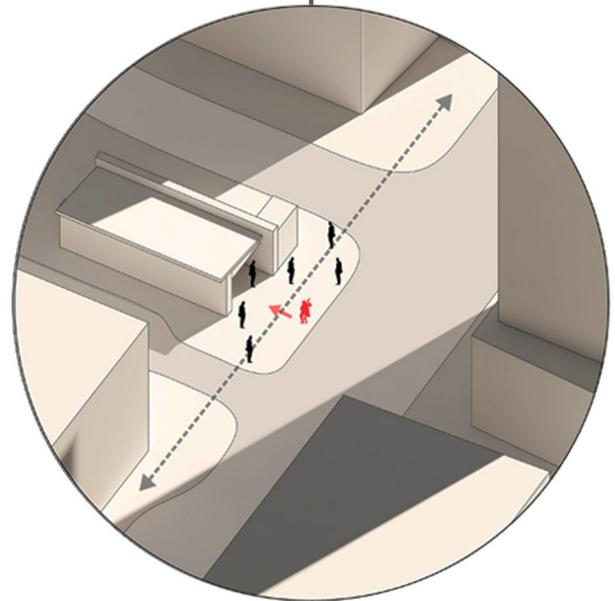
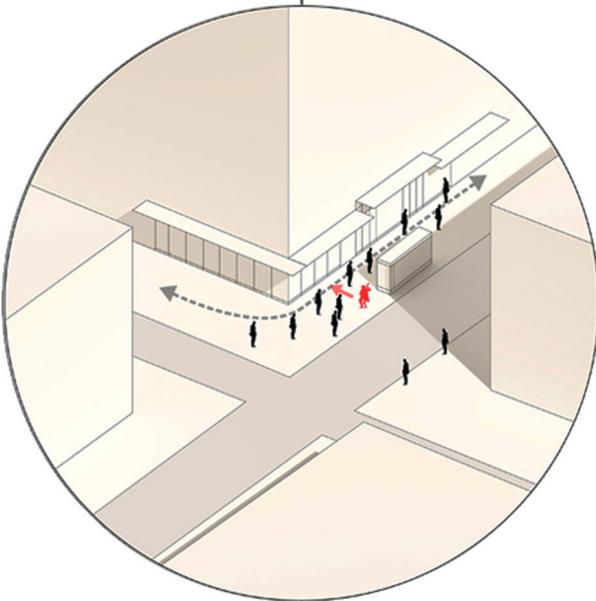


Figure 34. Photographs and diagrams of Vancouver buskers part 4. By author, 2020.

Figure 35. Jim Deva Megaphone. By R., Bollwitt, 2019.

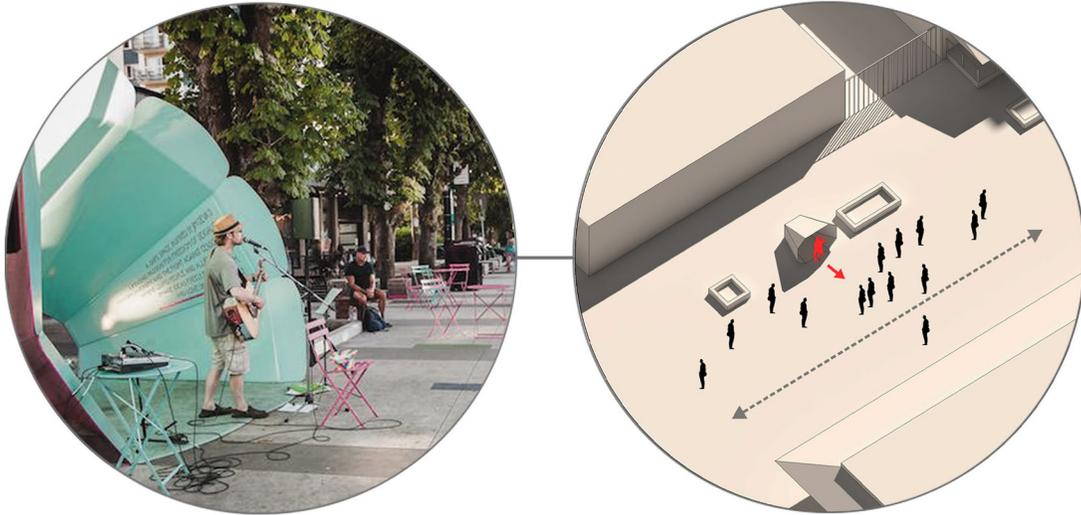


Figure 36. Byward Market, Ottawa. By P., Perreault, 2018.

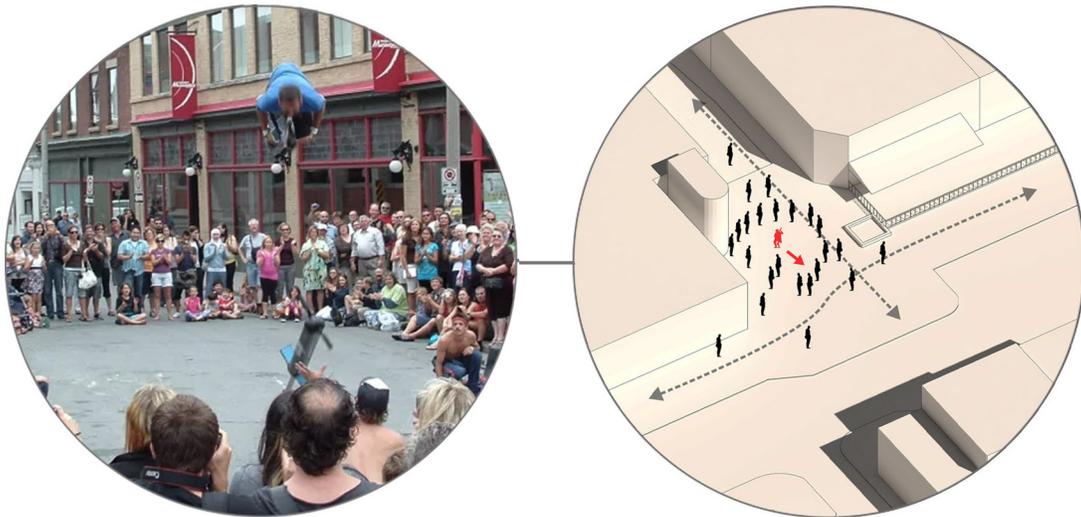


Figure 37. Copenhagen busking street. By Dawn, 2016.

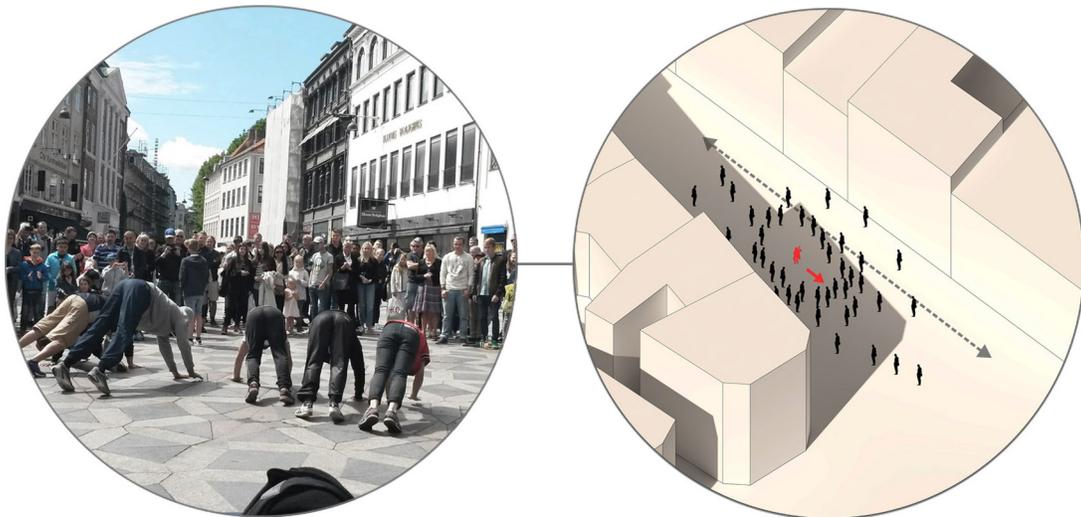


Figure 38. Diagrams of buskers. By author, 2020.

BUSKER RESEARCH FINDINGS

An observation research was conducted on the buskers in Vancouver, with a focus on the factors that allow the performer to attract a stationary audience. I took note of the type of music that buskers play, professionalism of the performance, location, and reception by the audience. Do people give money? Do people stop and listen, or do they keep walking?

The research reveals that acoustic and spatial qualities are extremely important factors influencing the success of the performance. First, performers who had good acoustic amplification, and who could be heard from far away in a busy area, managed to attract a bigger audience than performers with poor acoustic amplification. This makes sense, as these performers could draw in people from a wider area, as well as provide a livelier and more dominating performance. Due to this fact, performers should look for spaces with good acoustic qualities – eg. place with natural amplification and low ambient sound.

These research findings in Vancouver are also supported by other examples from Copenhagen, Ottawa, and Vancouver itself. Copenhagen is one of many European cities that create an ideal setting for buskers. The city is an extremely popular and profitable setting for buskers. The city is filled with many pedestrian-only streets that are enclosed by medium-height buildings on each side (see Fig. 1 & Fig. 2), allowing sound to bounce naturally between the building walls to help amplify the performance.

Although Canada rarely possess the beautiful rows of ornate stone buildings alongside a busy pedestrian-only street, Canada does have alternative busking hotspots. A popular busking spot exists in

Byward Market, Ottawa (see Fig. 3 & Fig. 4). This is a market district that is enclosed by a flat façade of shops and restaurants, allowing the sound to resonate between the tight streetscapes. This area is a hive of shopping and culture, and buskers naturally fit in with the environment. In this case, it was the Ottawa buskers themselves that pushed the city to make this a busking spot, and it has been a popular busking spot ever since. This example highlights a “less is more” approach, achieving the same success as some of the best European public spaces using a small space with less impressive architectural surroundings.

In Vancouver, a unique design intervention is the Megaphone in Jim Deva Plaza (see Fig. 5 & Fig. 6). Originally an art installation in honour of Jim Deva, a West End business owner and vocal advocate for free speech rights and equality in Vancouver’s LGBTQ2+ community, it has been often used by buskers for its ability to amplify sound properties. Furthermore, the bright backdrop provides a greater level of legitimacy to the performance as compared to the backdrop of generic buildings and trees behind it. This is a good example of a small-scale installation that can have a great impact on the activities surrounding it, and at the same time promoting culture and music in an otherwise normal public square.

Figure 39. Mapping of Vancouver's culture, attractions, & public spaces. By author, 2020.

Vancouver culture, attractions, & public space

- Major pedestrian pathway
- Concert Hall/Theatre
- Major music educational institutions
- Minor music educational institutions
- ▲ Non-music cultural/education institution
- Popular cultural/education area
- Popular park area
- Beach area
- Project site





Music Gallery Academy

Ambleside Park

Ambleside Beach

Harmony House School of Music

3rd Beach

Stanley Park

Vancouver Aquarium

Stanley Park Rose Garden

Shakespeare Garden

Malkin Bowl

Totem Poles

Lost Lagoon

2nd Beach

Ceperley Park Playground

Vancouver Harbour

English Bay Beach

English Bay

Harbour Green Park

Vancouver Convention Center

Canada Place

Bill Reid Gallery

Vancouver Art Gallery

Coastal People's Fine Art Gallery

Robson Square

YSL School of Music

Gastown

Sunset Beach

Sunset Beach Park

Pyatt Hall

Vancouver Playhouse

Andy Livingstone Park

Vancouver Maritime Museum

Orpheum & Commodore Ballroom

Queen Elizabeth Theatre

Vancouver Public Library

BC Place

Castings Mill Store Museum

Kitlano Beach

Museum of Vancouver

Vancouver Academy of Music

Vanier Park

Emergy Barnes Park

Yaletown

Thornton Park

Kitlano Beach Park

Seafarth Museum

George Wainborn Park

David Lam Park

Vancouver Island Park

Hinge Park

Cultural Academy of Music

Denoni's Academy of Music

Granville Island

False Creek

Science World

Resound School of Music

Music Academy

Pacific Arts Market

West Point Grey School of Music

Hill's Native Art Gallery

Precedent Study

TORONTO MUSIC GARDEN

Toronto, Canada

The park design is inspired by Bach's First Suite for Unaccompanied Cello, with each dance movement within the suite corresponding to a different section of the garden. Free classical music concerts are offered in the summer, and guests are encouraged to bring folding chairs or blankets as the benches fill up quickly. Two Canadian artists created special features for the Music Garden. Tom Tollefson, architectural blacksmith, fabricated the Music Pavilion, and the late Anne Roberts of Feir Mill Desing Inc., designed the Maypole.

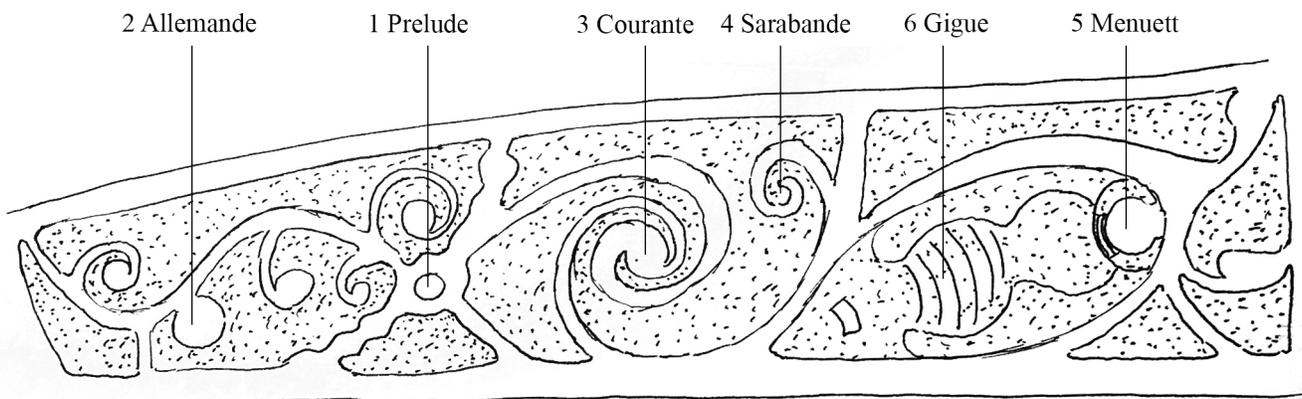
The park is broken down into six sections, each specifically curated to match the different segments of Bach's No 1. (see Figure 31). The varying landscapes include; an undulating riverscape, a forest grove of wandering trails, a wildflower meadow, a conifer grove, a formal flower parterre, and a large grassy amphitheatre. Visitors can traverse this garden in sequence to experience the phenomenological connection to Bach's composition.

DESIGN SIGNIFICANCE

Landscape is curated to tell the story of Bach's composition. Although this design methodology is highly personal and subjective, it does add an extra layer of richness and peculiarity to the garden. Visitors will understand that this garden is all about music; specifically, classical music. Sound and movement are expressed through the design, and it preserves history by representing it through an alternative medium.

Figure 40. Harbourfront Center - Toronto Music Garden. By G. Dillon, 2018.





Lake Ontario

Figure 41. Toronto Music Garden programming. By author, 2019.



Precedent Study

DALHALLA OPERA

Rättvik, Sweden

In 1991, Rättvik municipality saw a growth in arts & culture and needed a new performance space. Former opera singer Margareta Dellefors proposed the idea of using the former limestone quarry which was far away from all the buildings and free from noise pollution (Rock Engineering Research Foundation, 2014). A new building with an outdoor amphitheatre was constructed at the base of the quarry, and this stunning performance space has been in use ever since. The ticketed venue holds 20-25 concerts a year. The site is primarily accessed by vehicle, and guests follow a long ramp that slowly descends into the quarry base. Interestingly, the high rock walls of the quarry produced excellent reverberation that made this an excellent natural acoustic space. A moat separates the stage from the audience, and warps around the back of

the concert hall. Several expansions of the years has brought the seating capacity of the amphitheatre to 4000.

DESIGN SIGNIFICANCE

Taking advantage of existing natural formations is a powerful method of producing interesting architectural spaces. Dalhalla also represents that new functions can be created by combining two disciplines that most would think are unrelated; music and mining. For the purposes of Music at Large, clashing seemingly unrelated ideas to form new ideas is a useful methodology to exceed the boundaries of current architectural understanding and bring new paradigms to the built environment.

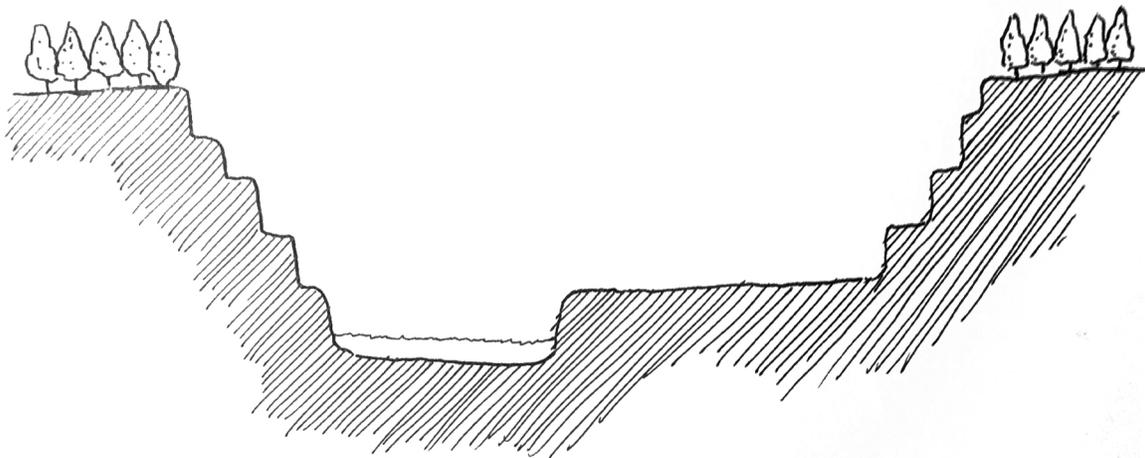


Figure 42. Original quarry section. By author, 2019.

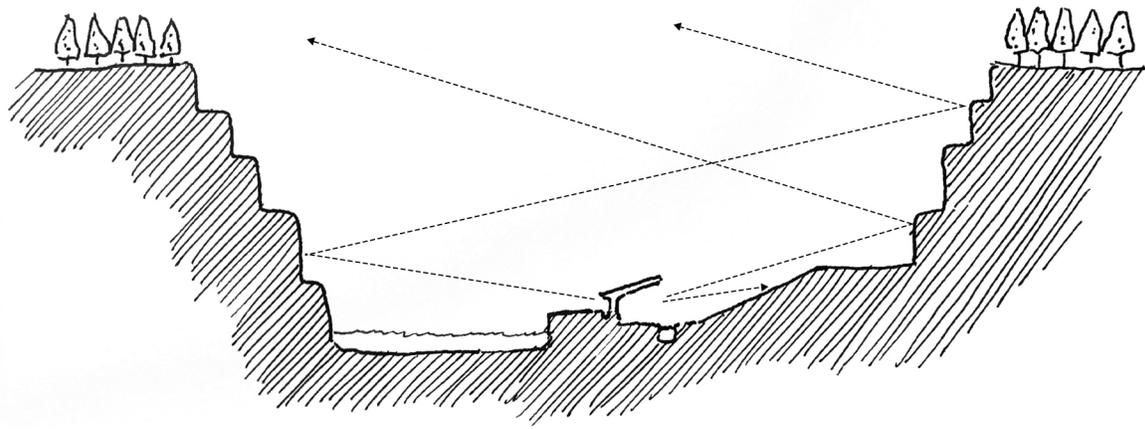


Figure 43. Dalhalla Opera & reverberation within quarry. By author, 2019.

Figure 44. Dalhalla Opera aerial view. By Dalhalla, 2014.



Precedent Study

POINT COUNTERPOINT II

Pittsburgh, USA

One of Louis Kahn's lesser-known projects, this playful, retro-futuristic maritime vessel doubles as a floating concert stage. Originally built for use in Pittsburgh USA in 1967, this vessel brought music from the rivers of Pittsburgh to small towns throughout America to the great capitals of Europe. It brought music and art to small towns that didn't have their own orchestras, spreading culture all over the world. It is used by the American Wind Symphony Orchestra when in operation.

The vessel features a 75-foot stage sits at the center of the vessel and is opened and closed using hydraulics (Bloom, 2017). It also holds a theatre showroom and a small art gallery. The round windows and doorways give the ship the resemblance of a flute, which could be dedicated to Louis Kahn's daughter; who is a flute player. When in use, the rotating cast of young AWSO musicians often stayed with the host families in the towns that they were performing. The vessel would park alongside a beach, and the towns-

Figure 45. Point Counterpoint II appears in Stockholm, Sweden, in 1989. By American Wind Symphony Orchestra, 1989.



people would turn up with picnic blankets and lawn chairs during a performance. This riverboat is not designed for oceanic travel, so when needed to perform in Europe, it would be ferried by a container ship to make it across the North Atlantic (Bloom, 2017). This vessel made its final performance in 1997 and is currently being considered for demolition.

DESIGN SIGNIFICANCE

Concert halls are a stationary space that isolate classical music within its enclosed shell. From the research by Chun-F & Hu, it is noted that one of the primary reasons preventing interested university students from attending a classical concert is the location. This vessel solves the problem of location and brings the music to the audience. Furthermore, it possesses the power to travel further and enrich the culture of towns without a developed musical scene, spreading music beyond the city. Movement and change are especially important themes in our modern, fast paced world. The idea of a moving performance aligns with the nature of active and energetic Vancouverites. There is great potential for a similar system to be deployed in Vancouver, which is lined by a myriad of waterfront public space.

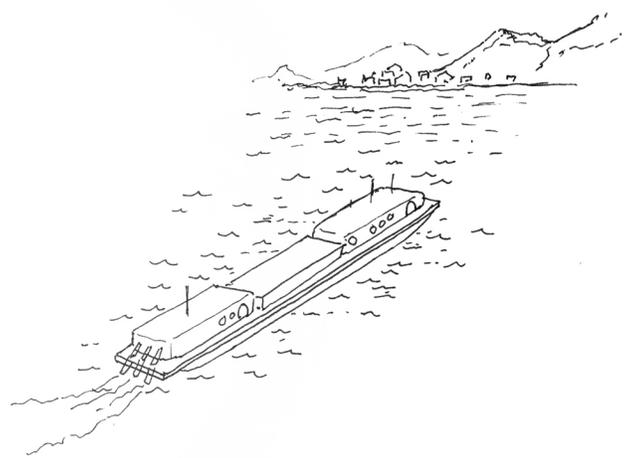


Figure 46. Vessel travelling to new destination. By author, 2019.

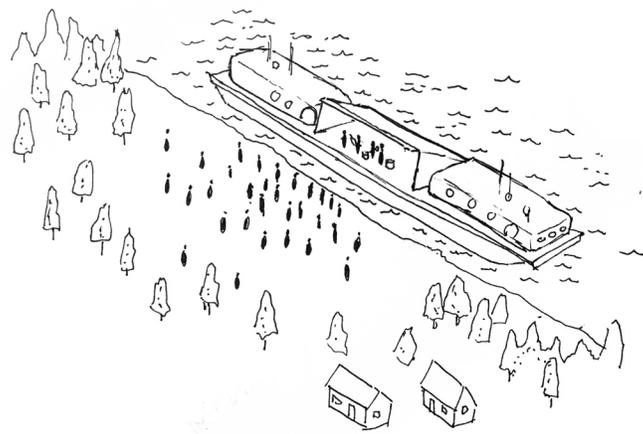


Figure 47. Vessel performance at the waterfront. By author, 2019.

Precedent Study

SWISS SOUND PAVILION

Hanover, Germany

Designed by architect Peter Zumthor, the Swiss Sound Pavilion is Switzerland's entry in Expo 2000 in Hanover. It is intended to function as an acoustic space and an architecture of the senses. Rotating musicians perform within the structure, sound weaving through the permeable, interwoven walls to provide each visitor a unique experience. The project is highly phenomenological, focused on change, atmosphere, emotion, and memory (Hubertus, 2011). A harmony is created between multiple musical performances and the casually stalling visitors without acoustic dissonance.

The structure is composed of 118 wood-

stacked walls that are held together with post tensioned cables and uses no adhesives or nails. The plan follows a basket weave pattern and is highly permeable and open without dead ends. The spacing between the walls are varied, creating spaces with different atmospheric and light qualities. The interconnected corridors give way to inner courtyards and rooms, which are used for performances and dining.

DESIGN SIGNIFICANCE

This project is interesting in its Phenomenological aspects and its focus towards curating unique experiences for each visitor. Having multiple musi-

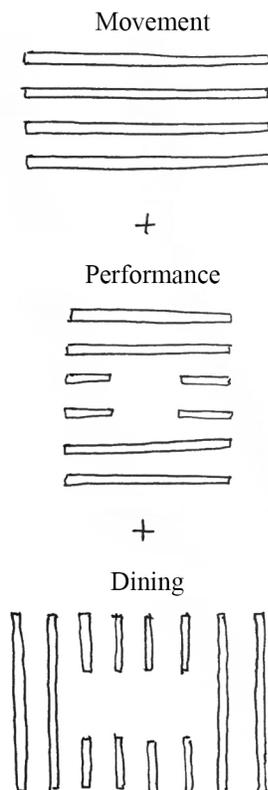


Figure 48. Swiss Sound Pavilion components. By author, 2019.

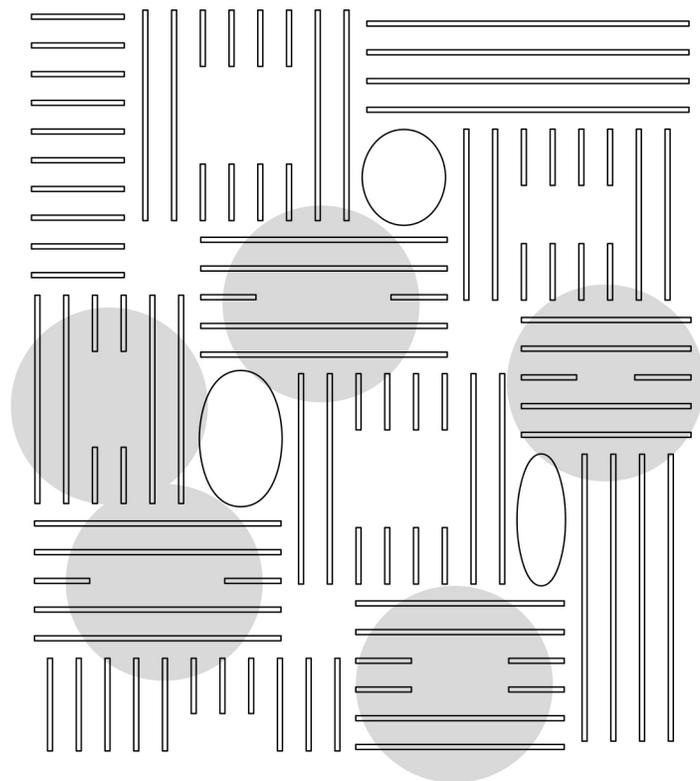


Figure 49. Pavilion plan & locations for performance. By author, 2019.

cians playing at the same time while visitors weave in and out inside the space provides more freedom and engagement between musician and audience (Hubertus). Of the precedents, this is the first that proposes the act of listening to music without looking at the performers. The sounds act as a guide to help guests navigate the maze-like pavilion. Audience engagement and interaction is very important in bringing classical music to the masses. In typical performances, the audience is looking at the musicians from a distance, like they are some sort of precious display. Creating more interaction breaks down the isolation and elitism of classical music and is a powerful tool in drawing in younger, more casual audiences.

Figure 50. Swiss Sound Pavilion. By Wikiarquitectura, 2001.



PART III

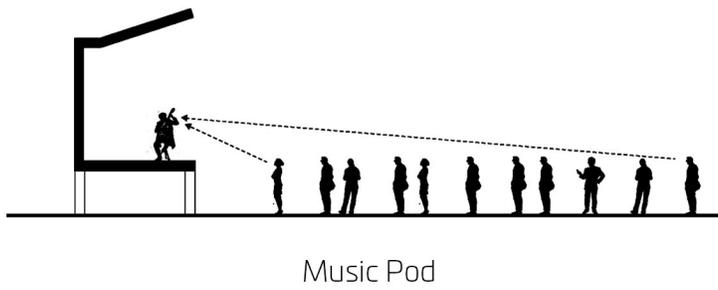
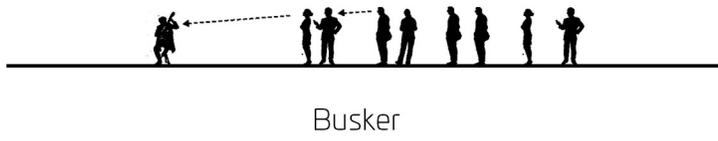
MUSIC AT LARGE

PROPOSAL

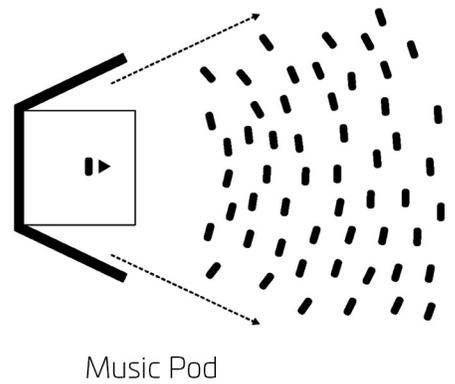
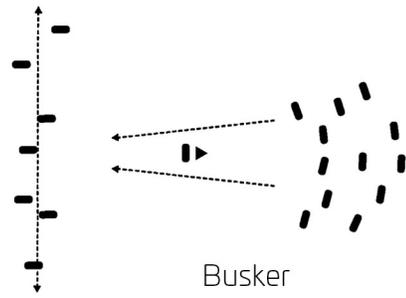
This thesis proposes a new system of practice and performance of music, tailored specifically to the needs of the Renegade Musicians. This system will involve a new form of architecture for rehearsal and performance, as well new financial relationships that mitigate the detrimental effects of Vancouver's rising lease rates. Inspired by versatility of buskers, Music at large proposes to bring the acoustic and aesthetic qualities of concert halls to the dynamic street performance. Instead of the audience travelling to the concert hall, the concert hall is brought to the audience.

Renegade Musicians will practice and perform using highly flexible and adaptable "Music Pods". These pods provide acoustic and visual controls to greater legitimize a musical performance. The pop up stage can be brought to anywhere with a road, bringing high quality live performances to areas without performance venues. Furthermore, the storage facility for the Music Pods act as a center for the Renegade Musicians. In this facility, musicians can practice, collaborate, develop connections, and offer performances to the public. Due to the flexible nature of the storage structure, the prototype design will engage in the adaptive reuse of an underutilized site instead of building on an empty lot of land. Music at Large intends to support the needs of the experimental classical musicians and breathe new life into the live music scene of Vancouver.

Visibility



Defining Space



Acoustics

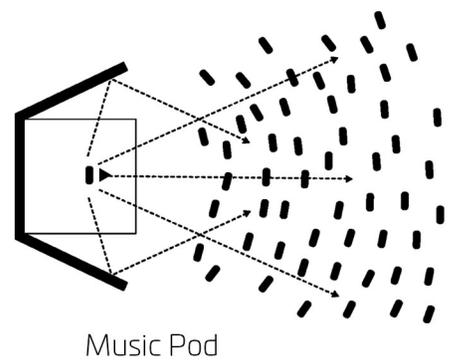
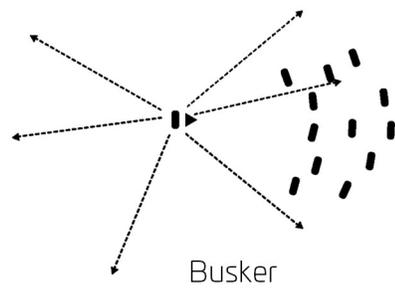
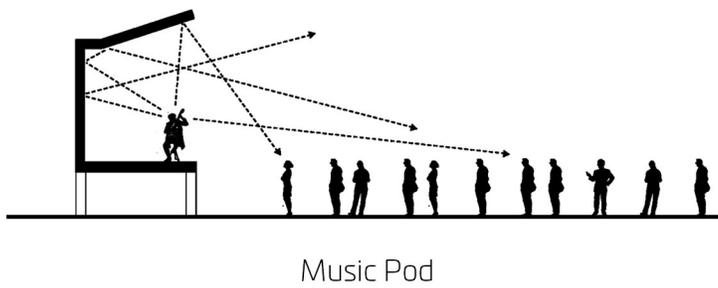
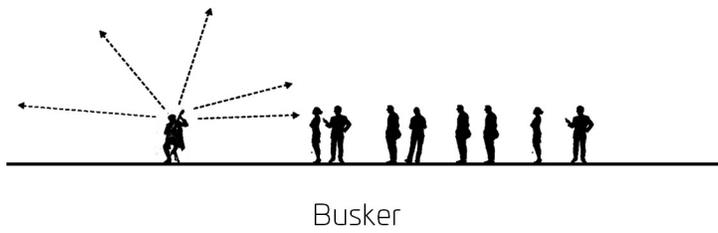


Figure 51. Music pod concept diagram. By author, 2020.

Standard Model

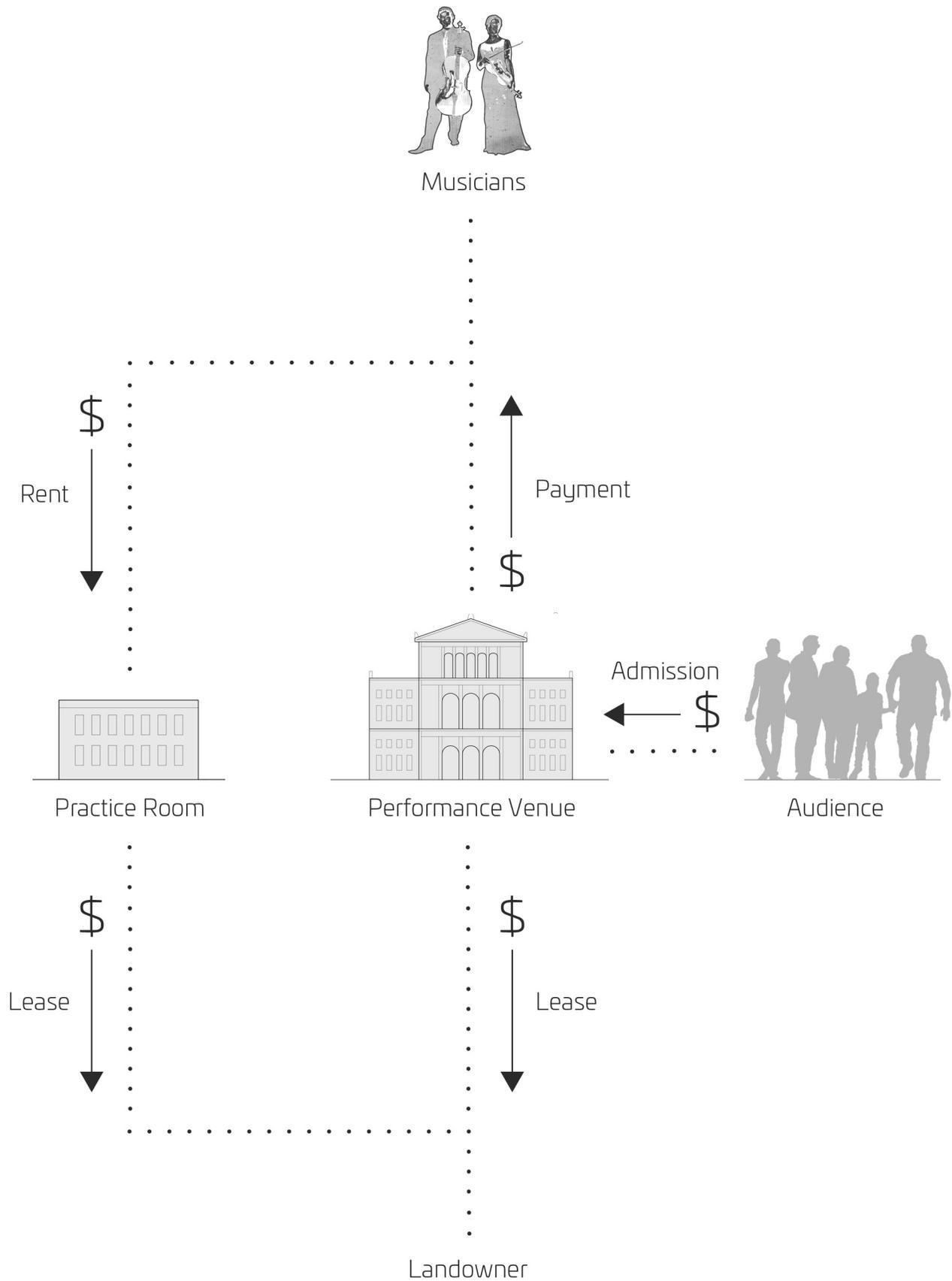


Figure 52. Typical financial model. By author, 2020.

Music at Large Model

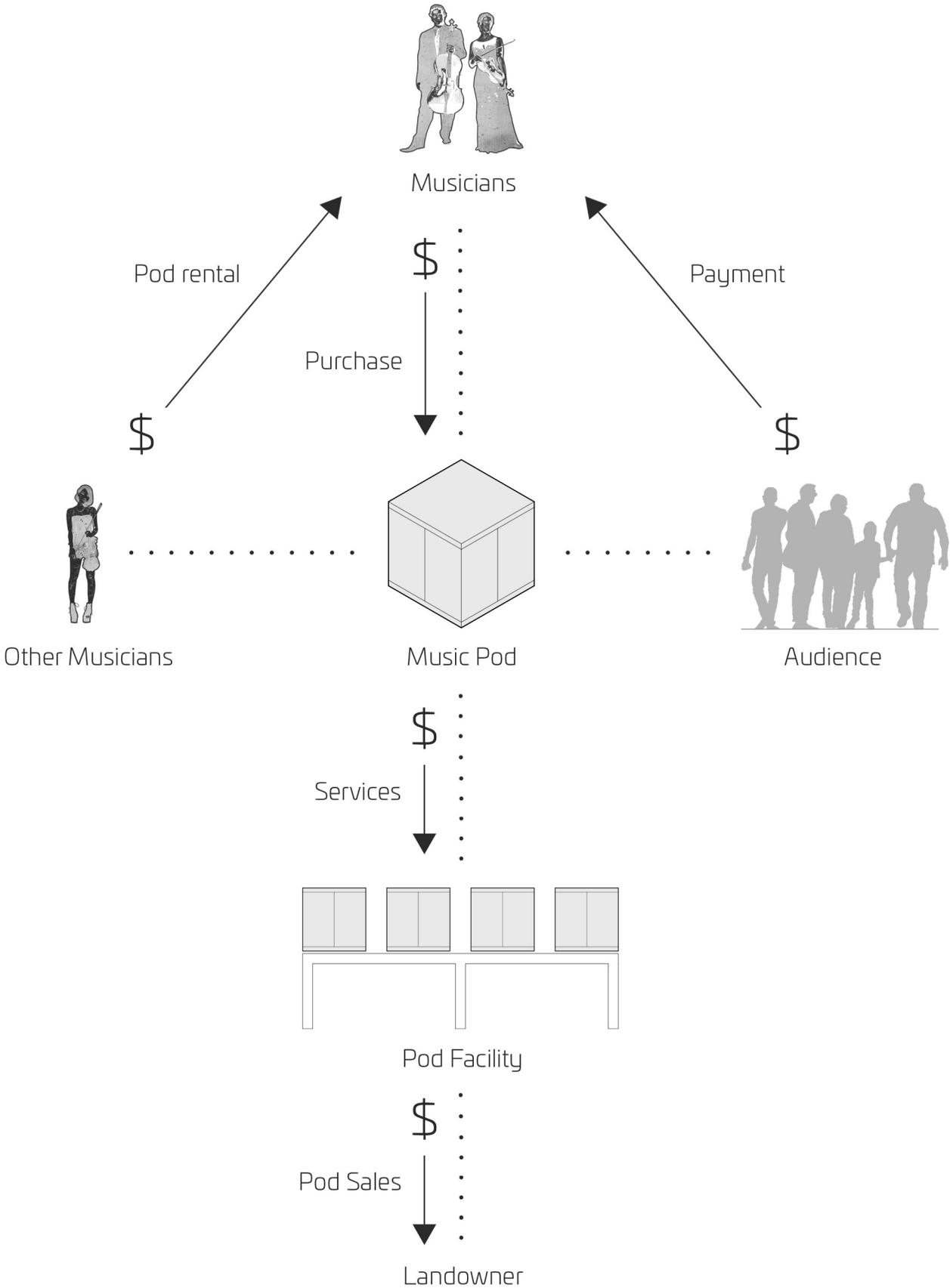
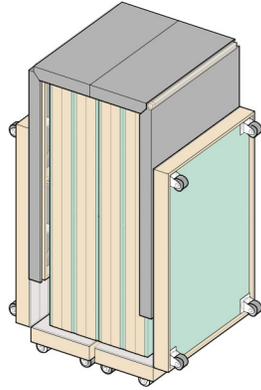
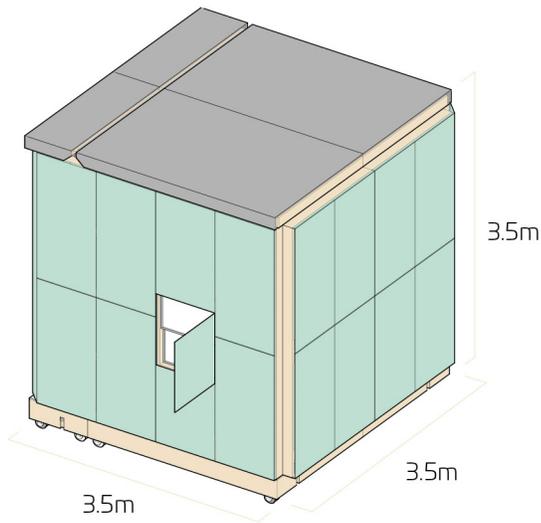


Figure 53. Music pod financial model. By author, 2020.

Music Pod Design



Transport Mode

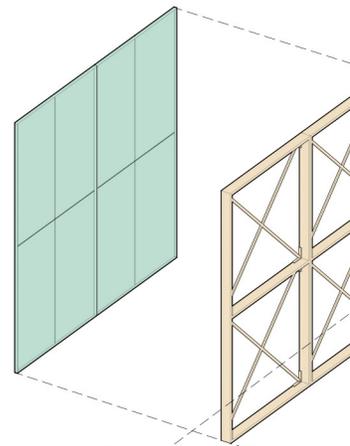


Practice Room Mode

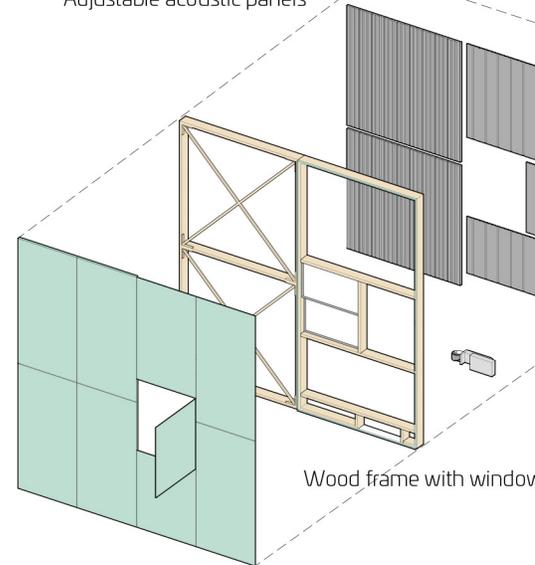
Insulated steel ro

Woo

Sound absorbi



Adjustable acoustic panels



Wood frame with window

Insulated steel rainscreen

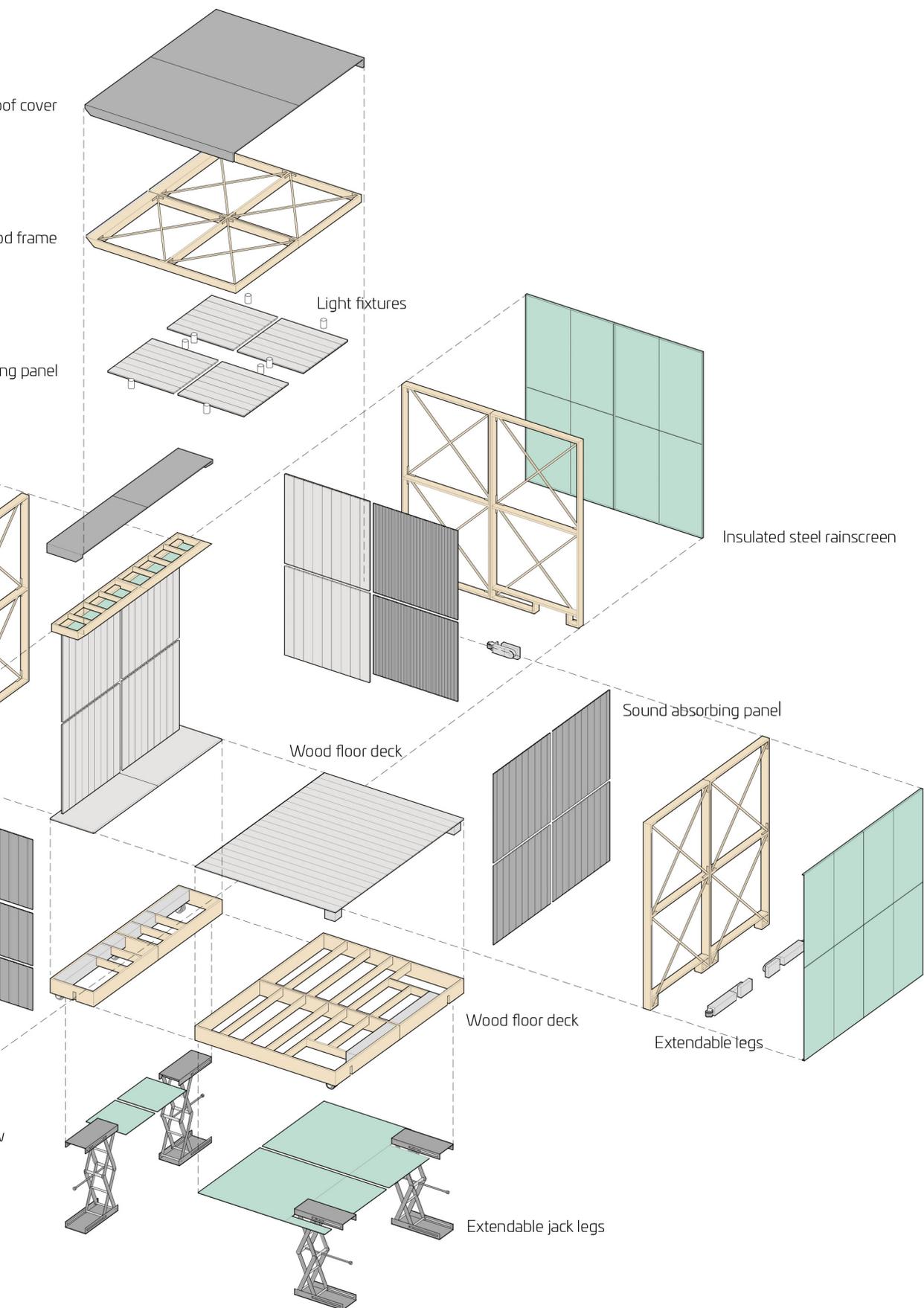


Figure 54. Music pod design components. By author, 2020.

Micro Pod For soloists performing to small and medium sized audiences.



Transport Mode

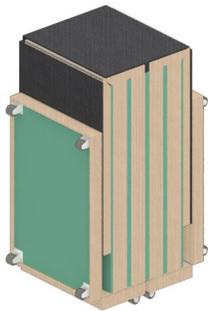


Practice Room Mode

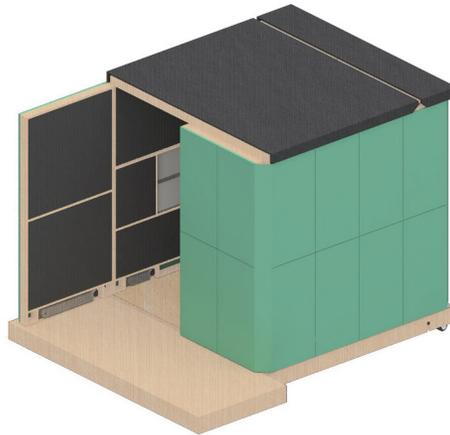


Performance Mode

Standard Pod For soloists and duos performing to medium and larger audiences.



Transport Mode



Practice Room Mode



Performance Mode

Grand Pod For small ensembles ranging from trios to chamber groups.



Practice Room Mode



Performance Mode

Figure 55. Music pod variations. By author, 2020.

POD VARIATIONS

Three pod types complement the needs of different musicians and musician groups. Standard pods are the most flexible and offer the best acoustic performance. Their size requires the use of a custom delivery truck to assemble on a site. Micro pods are smaller and can be towed with any vehicle. They do not offer the height advantage of standard pods, but are effective for sites with existing height advantages or for performing to smaller audiences. The grand pod for larger musician groups combines two standard pods, and offers all of the features of the standard pod. Two trucks are required to deliver the pieces of the grand pod.

REVOLVING ACOUSTIC PANELS

The typical walls of the Standard and Grand pods possess acoustic walls that revolve to shift between different absorptive and reflective acoustic qualities. For rehearsals in a closed room, it is best to reduce the reverberation of sound to avoid damaging the musicians' ears. For outdoor performances, high reflection is important to allow the sound to travel further. Just like how a musician can tune their instrument, they can now tune their performance space to match their acoustic requirements.

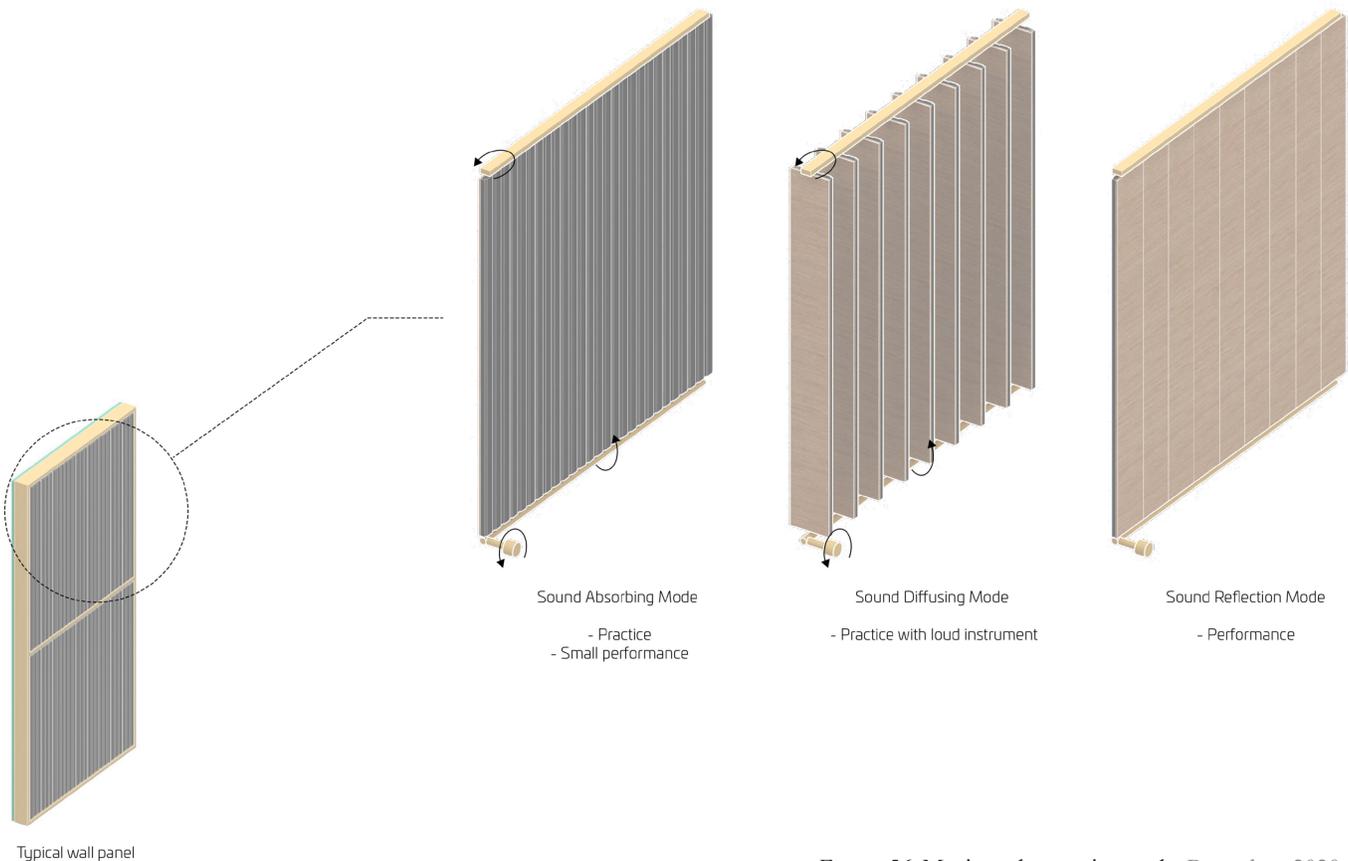


Figure 56. Music pod acoustic panels. By author, 2020.

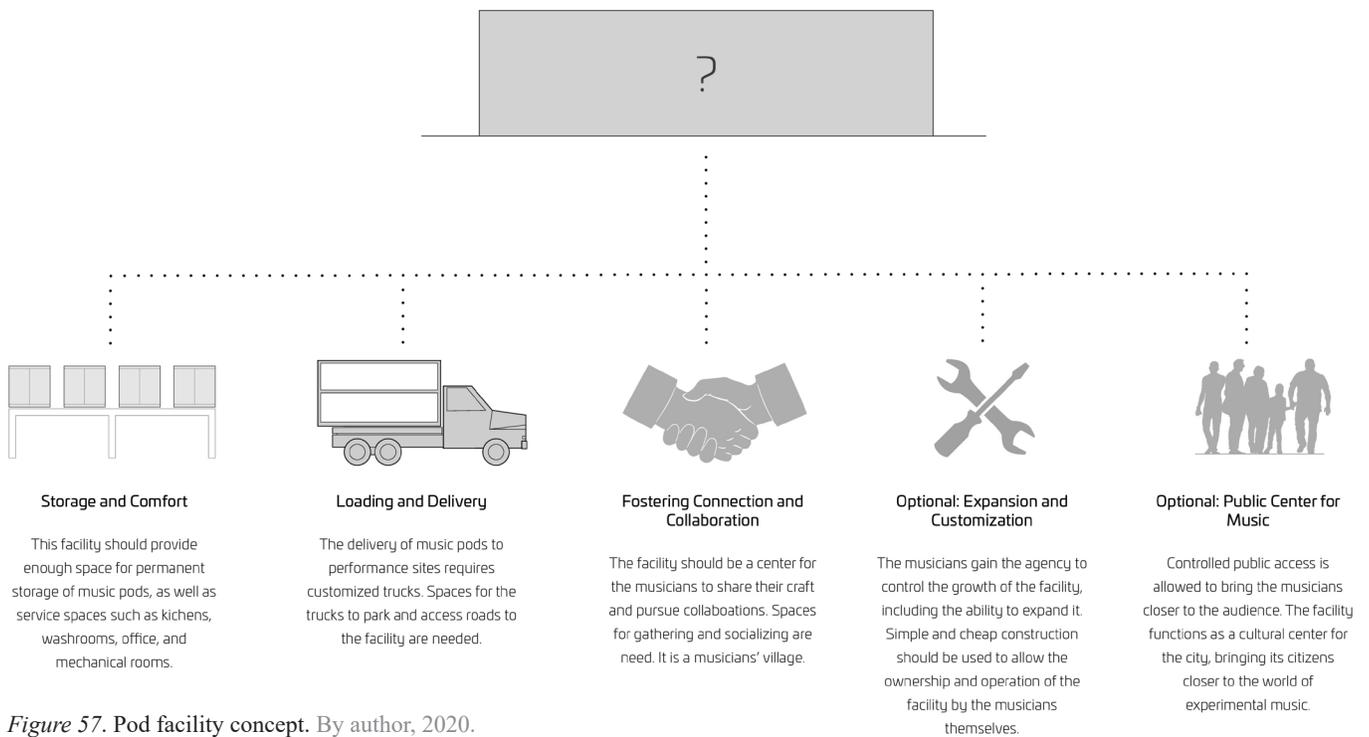


Figure 57. Pod facility concept. By author, 2020.

POD FACILITY: A NEW TYPOLOGY

Music pods cannot be left out in public spaces permanently, therefore a pod storage facility is required to facilitate and maintain the pods. The architecture of the pod facility should represent the needs of the Renegade Musician and visually differentiate itself from the elite musical institutions.

SITE SELECTION CRITERIA

The prototype pod facility will be designed for the city of Vancouver. Due to the presence of many cultural institutions and quality pedestrian networks, the pod facility will be designed for public access to act as a center for music. To reach the largest amount of people, it is important to select sites that are close to a major public space, or along a major pedestrian route. For ease of access for the musicians to travel to and from the site, it is preferable that the site is located nearby a music institution with existing infrastructure. The integration of the pod storage facility should subtly, but effectively supplement the existing music network.



Figure 58. Sound mapping of Vancouver's bridges. By author, 2020.

LEGEND

- xx Outdoor sound level
- xx Bridge underside sound level

Examples of Noise Levels

- 30 Quiet rural area
- 40 Library
- 60 Restaurant conversation
- 80 Chamber music
- 87 Violin
- 95 Clarinet
- 125 Symphonic music peak

BURRARD BRIDGE

GRANVILLE BRIDGE

CAMBIE BRIDGE

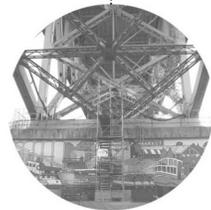


Figure 59. Bridge underside photos. By author, 2020.

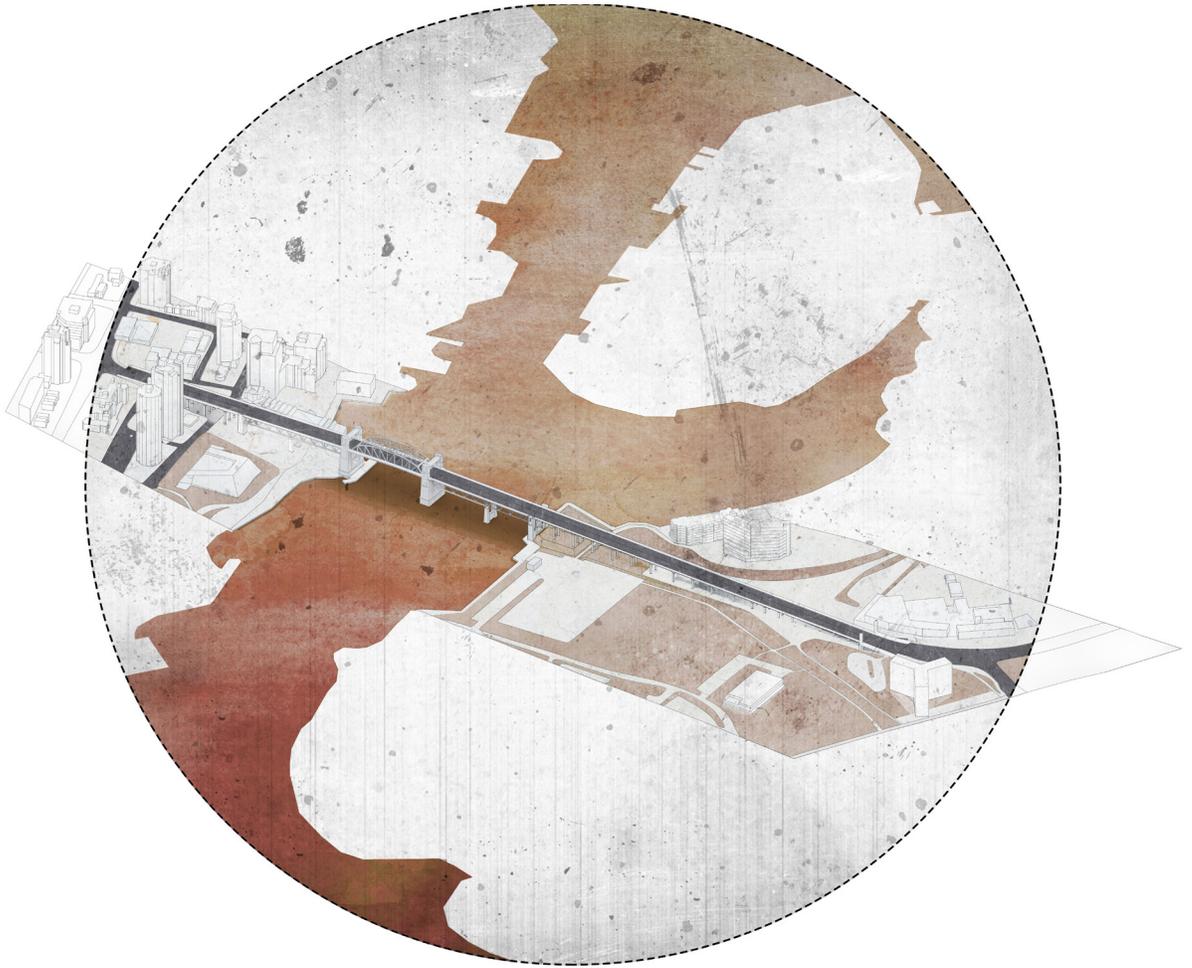


Figure 60. Burrard bridge axonometric. By author, 2020.

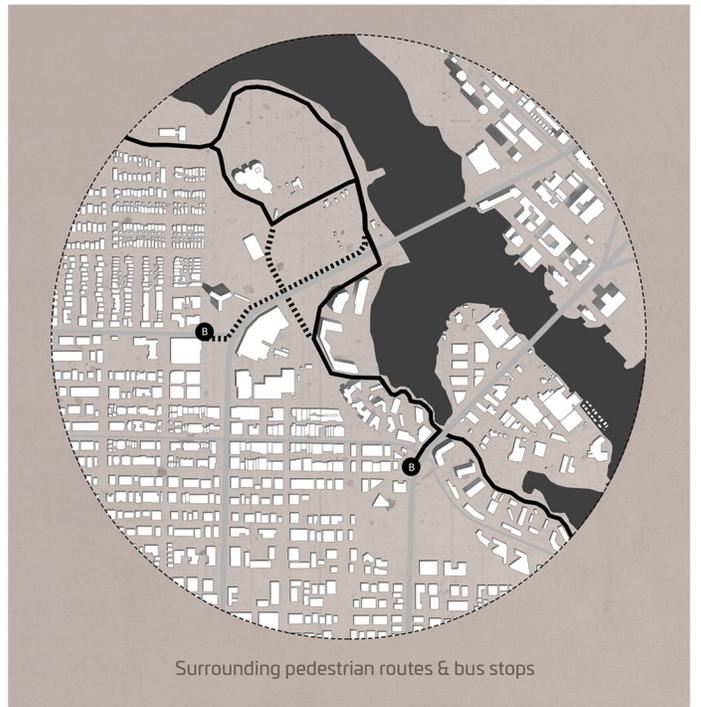
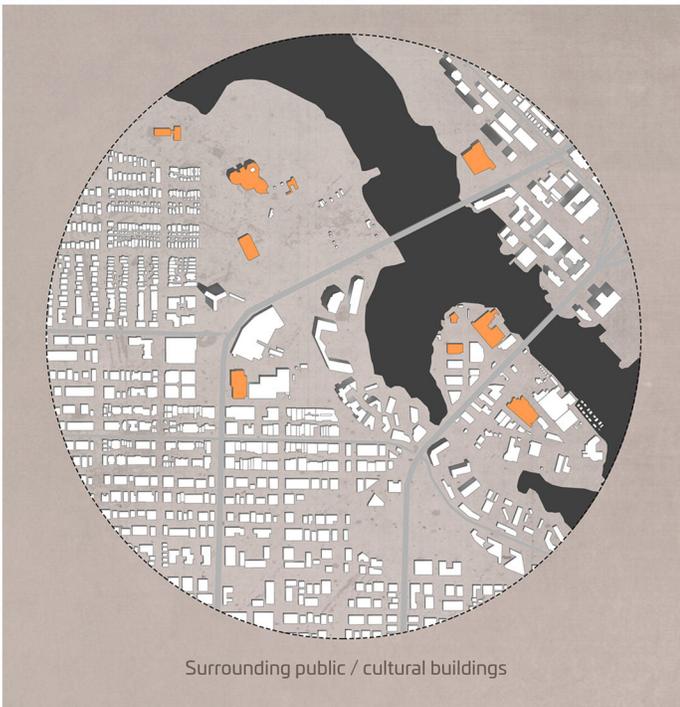


Figure 61. Area analysis diagrams. By author, 2020.

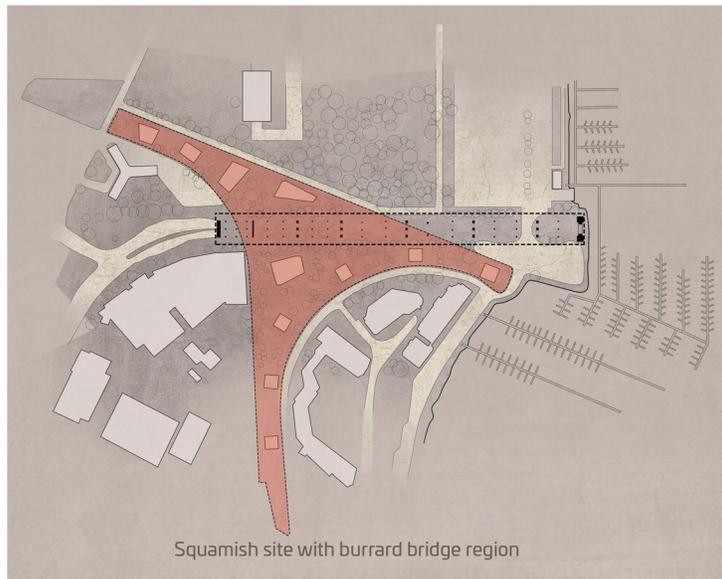
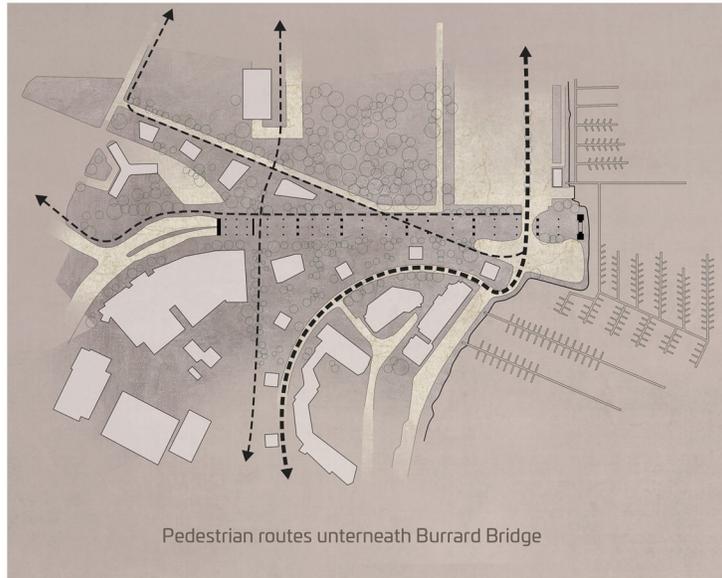
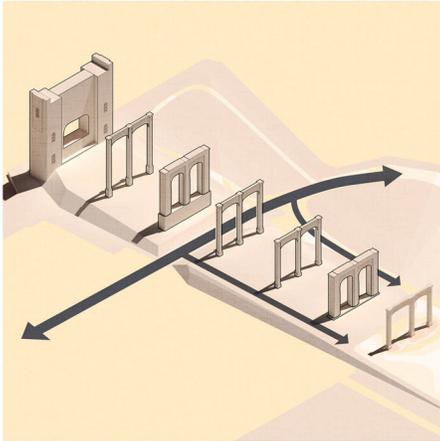


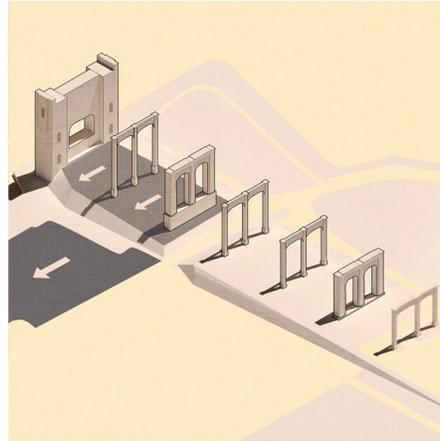
Figure 62. Site analysis diagrams. By author, 2020.

POD FACILITY DESIGN

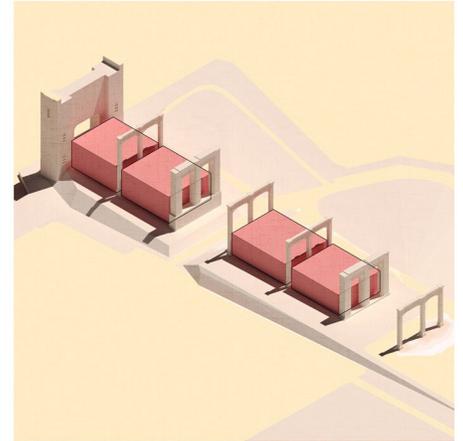
Underneath the Burrard bridge, the prototype pod facility is designed as a flexible scaffold structure that expands over time to accommodate greater demand. The uniquely clad music pods sit on top of the scaffold structure, forming an outdoor gallery of album artwork. Within the facility, musicians are given the space to interact and collaborate. On specific days, the music facility opens up to the public, allowing the audience to take a peek inside the world of music creation. The facility becomes Vancouver's Center for Renegade Music.



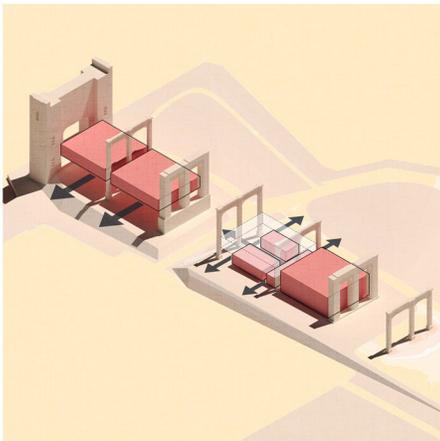
1 Existing site & pedestrian circulation



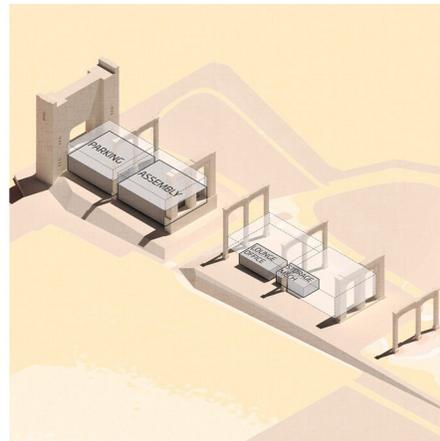
2 Vehicle access & truck parking



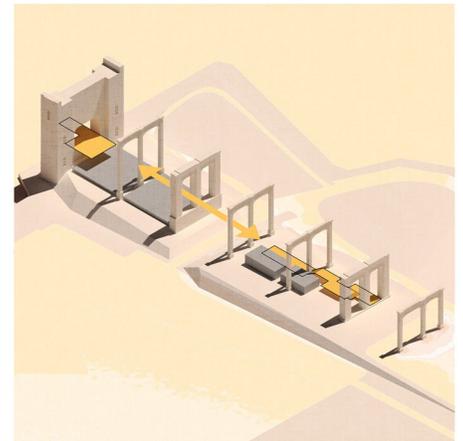
3 Building masing



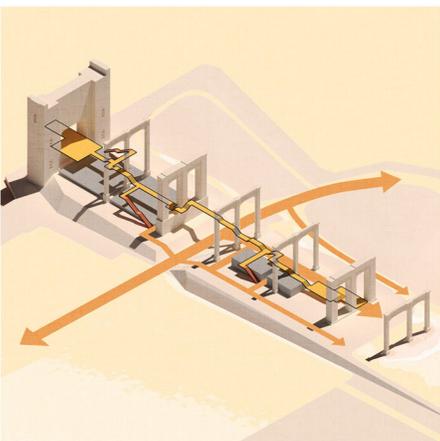
4 Cutting away volumes for pedestrian & vehicle access



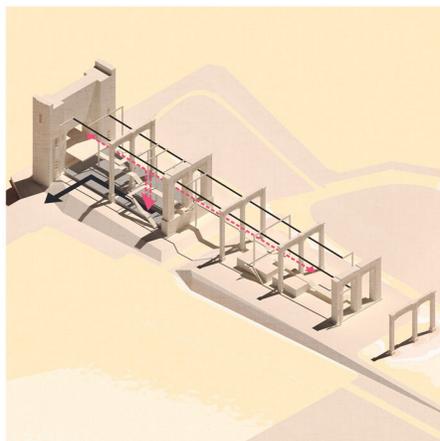
5 Support spaces



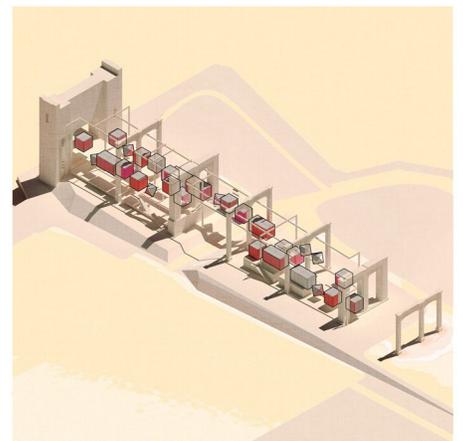
6 Social encounter spaces on each end



7 Boardwalk bridges two ends & connects to pedestrian routes



8 Crane system and drop-of area



9 Two rows of music pods connect to central pathway





Figure 64. Pod facility perspective. By author, 2020.

MUSIC AT LARGE

A short film was made to represent how Music at Large comes together. The interaction between musicians and audience, between music pods and the city, and inner workings of the pod facility are detailed out in this hand drawn animation. The following images are stills from the short film *Music at Large*.

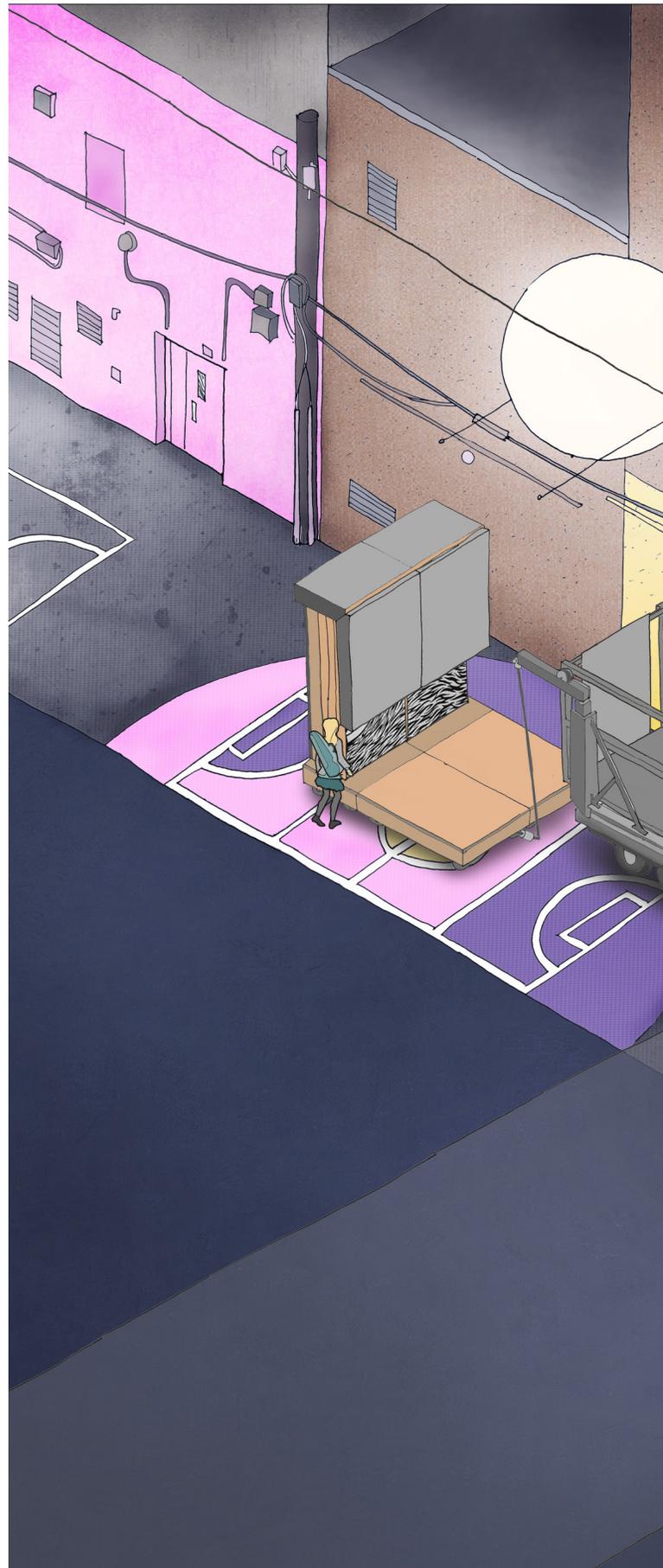


Figure 65. Alleyway performance setup. By author, 2020.

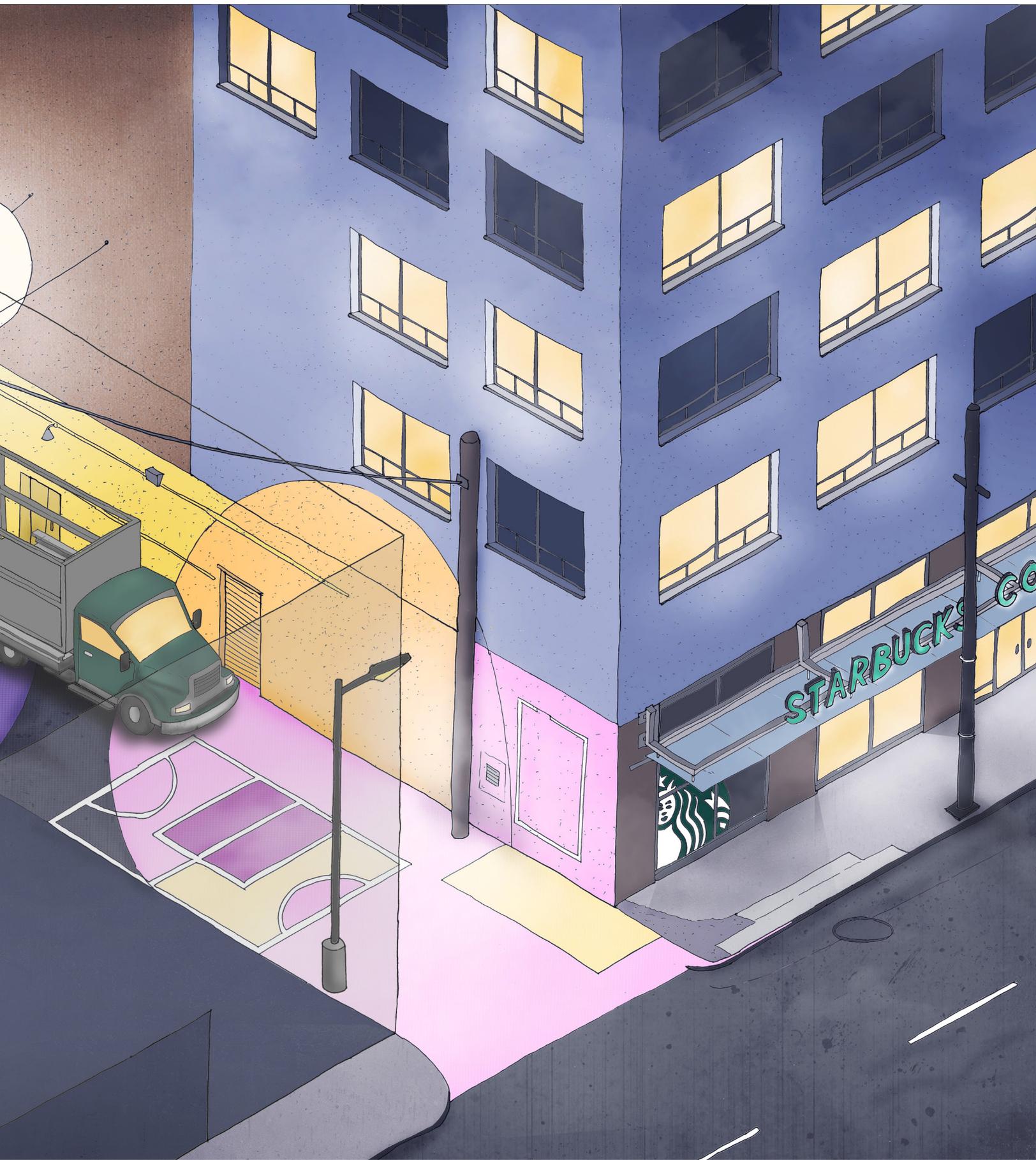




Figure 66. Stills #1 from Music at Large. By author, 2020.

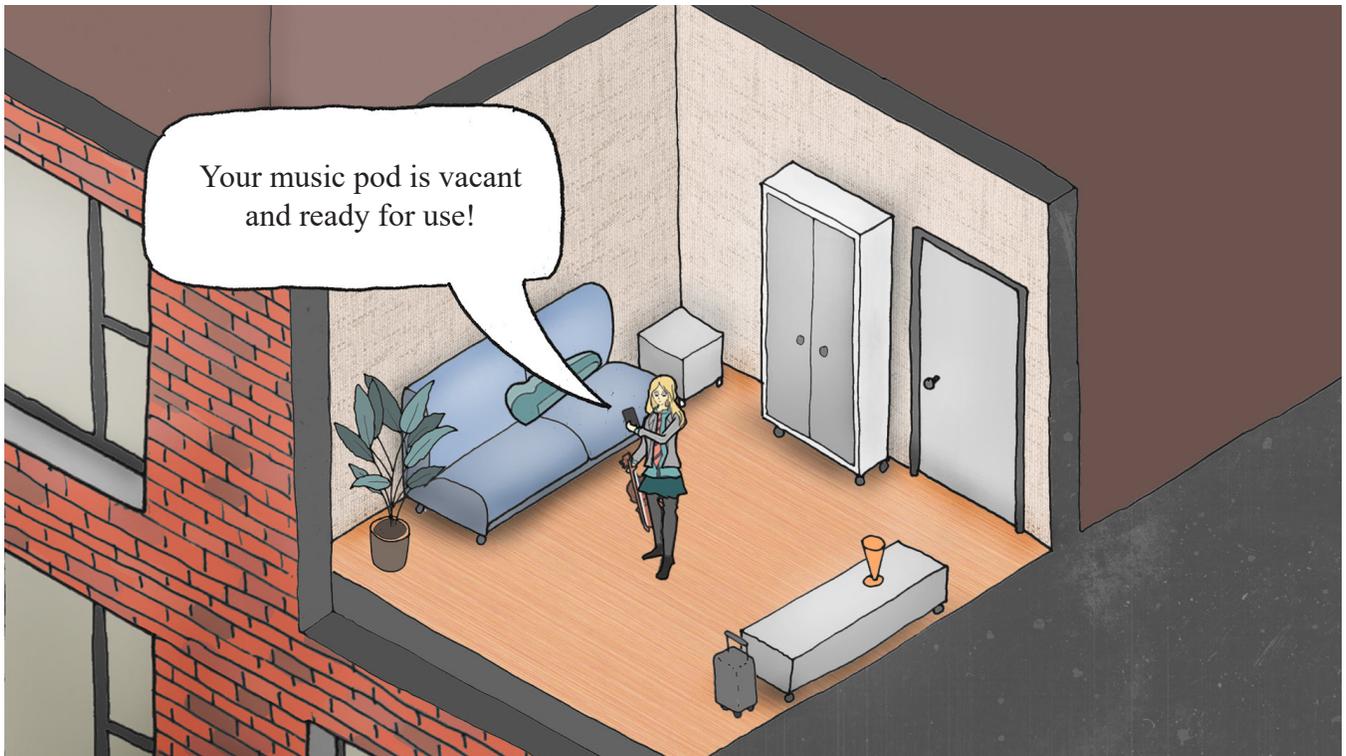


Figure 67. Stills #2 from Music at Large. By author, 2020.

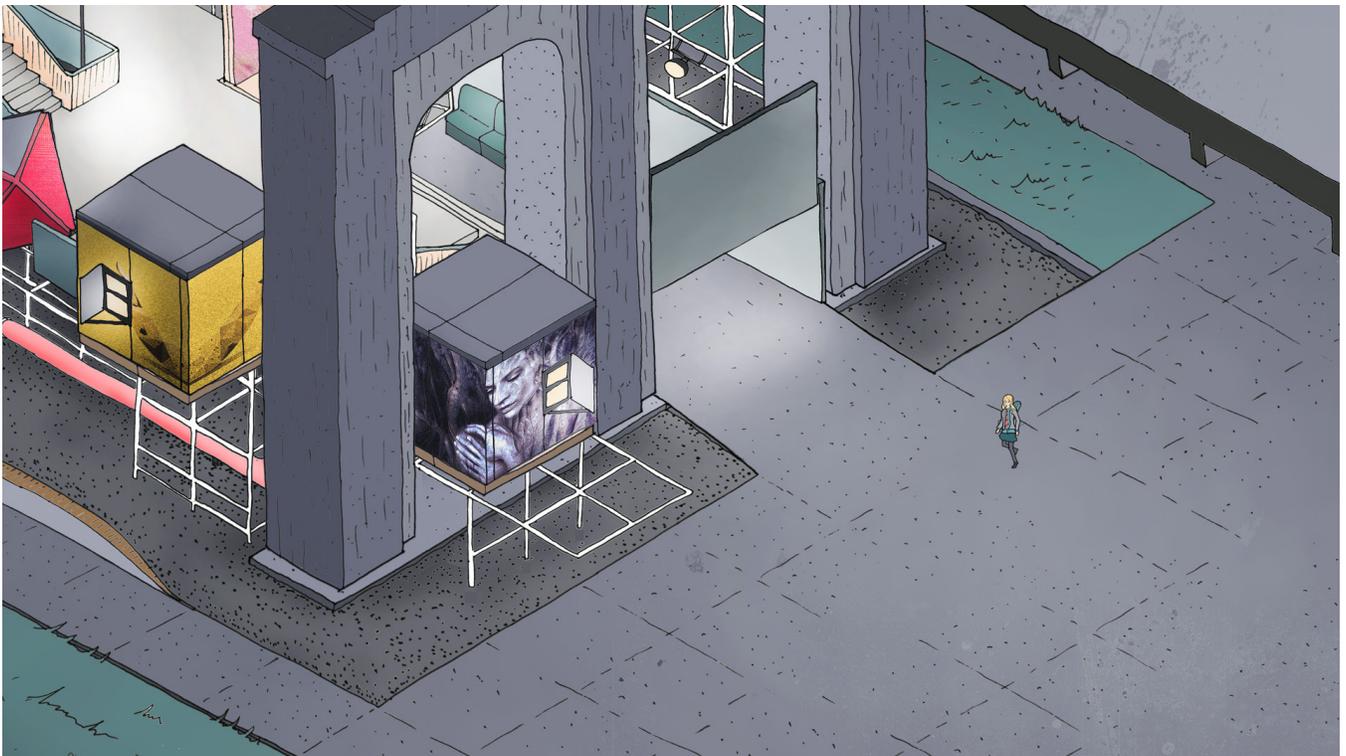


Figure 68. Stills #3 from Music at Large. By author, 2020.

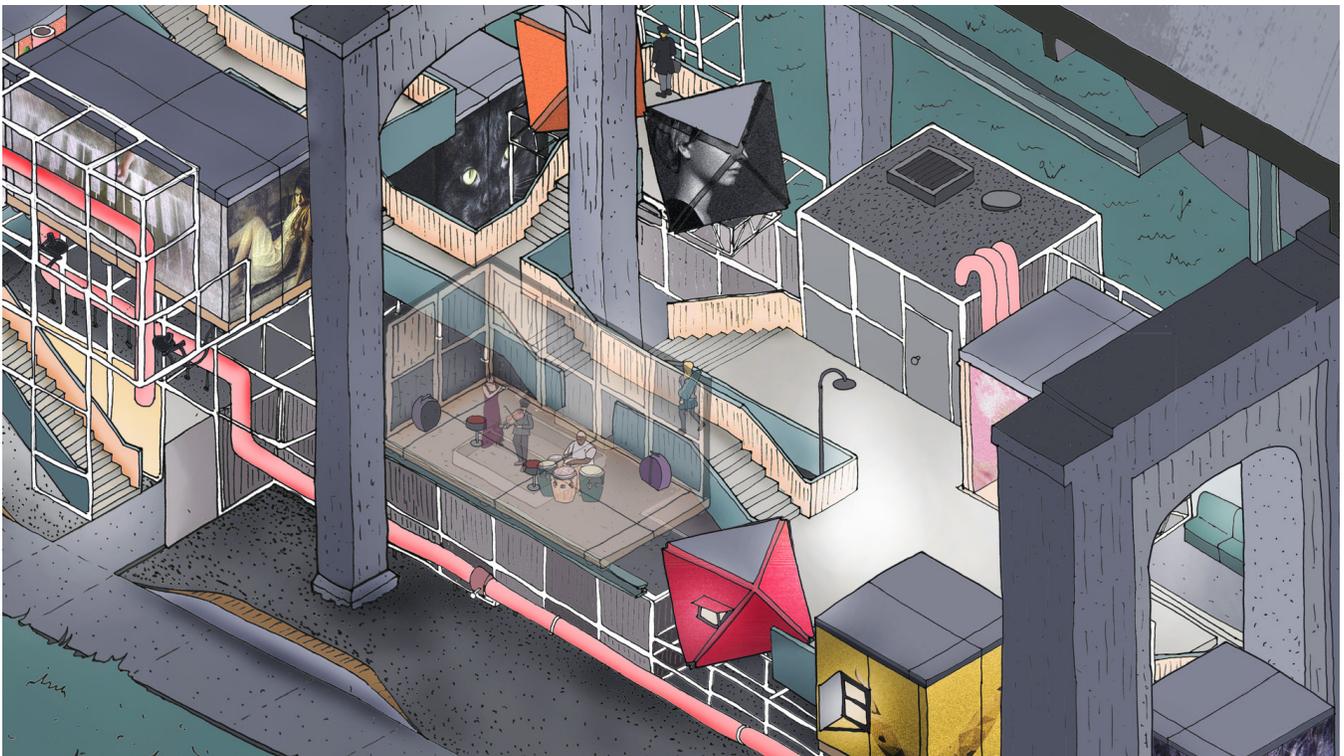
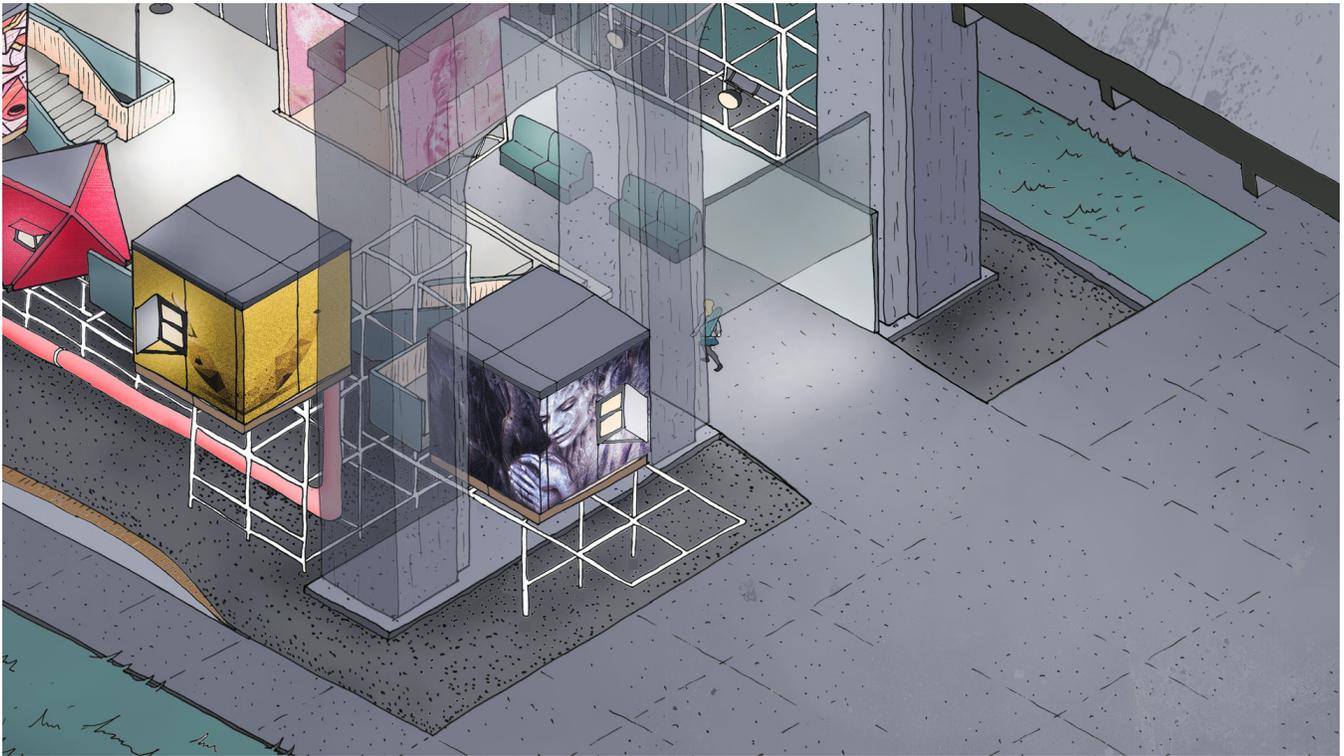


Figure 69. Stills #4 from Music at Large. By author, 2020.

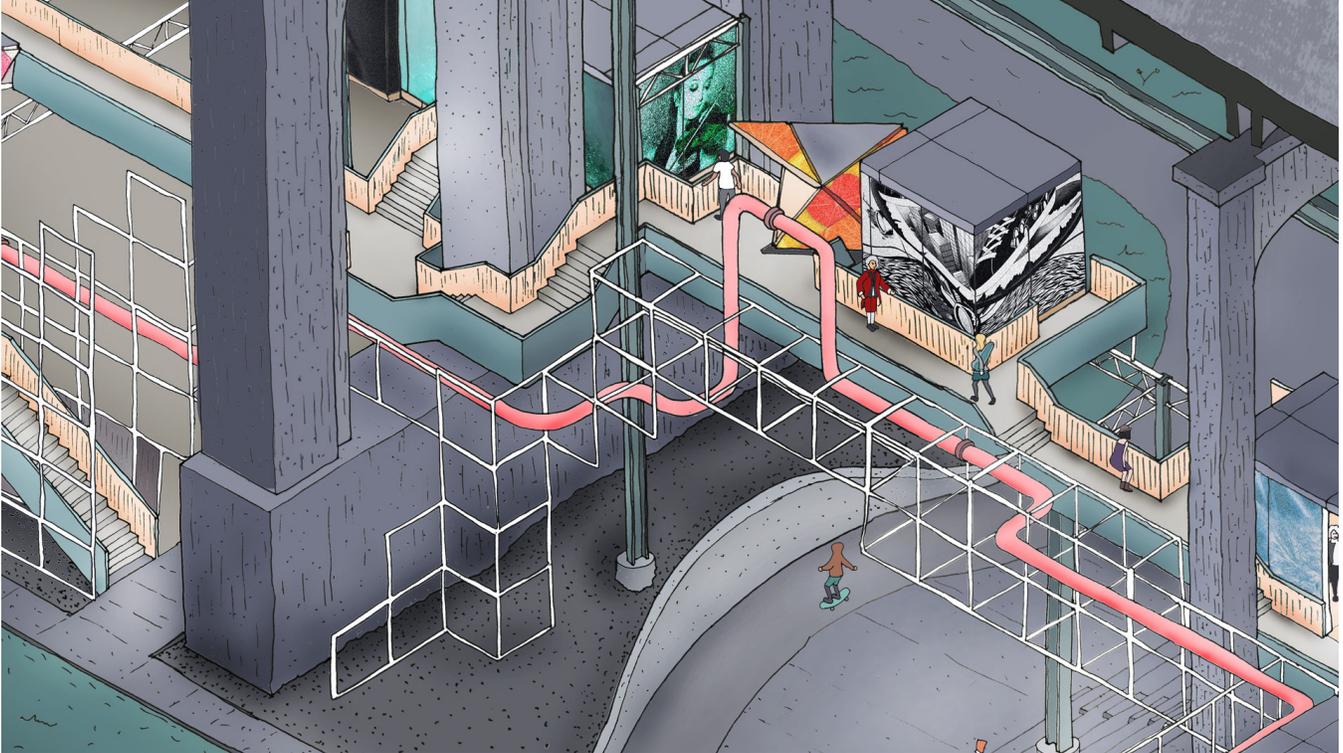
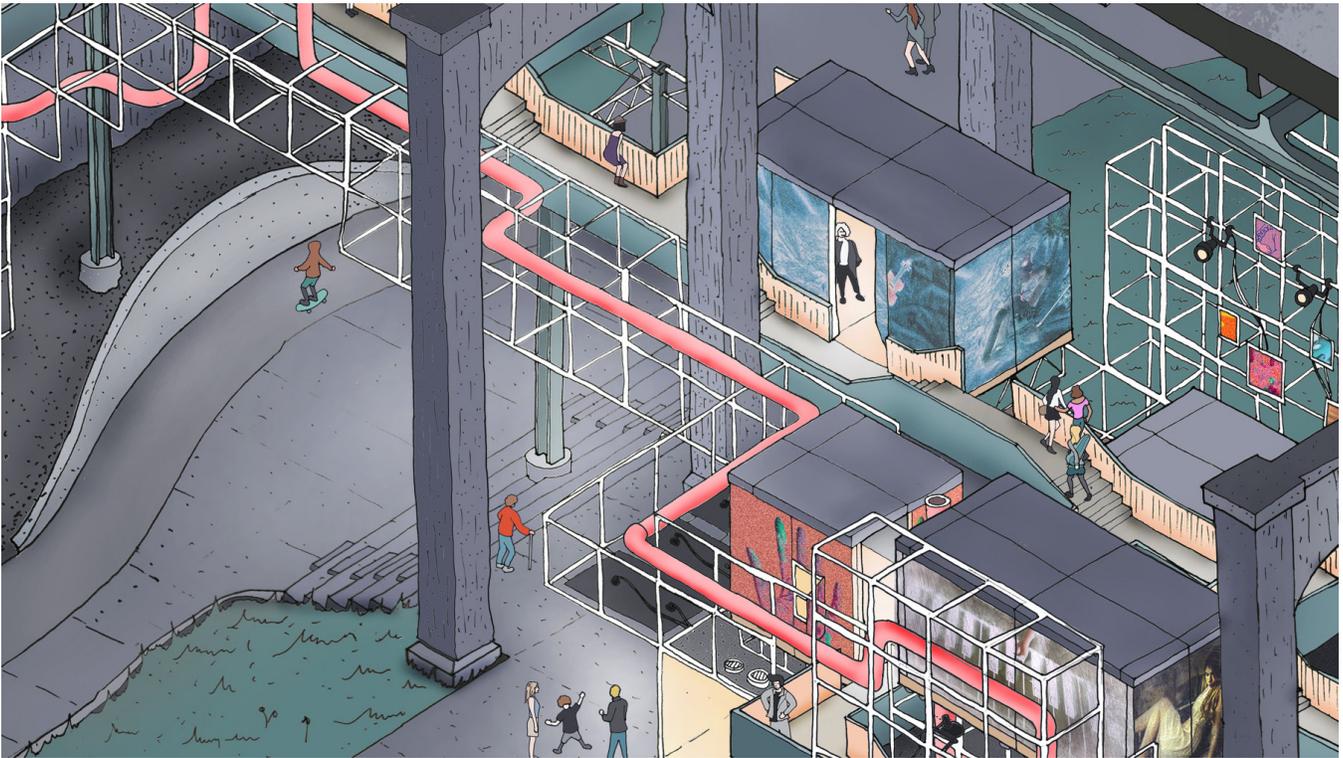


Figure 70. Stills #5 from Music at Large. By author, 2020.

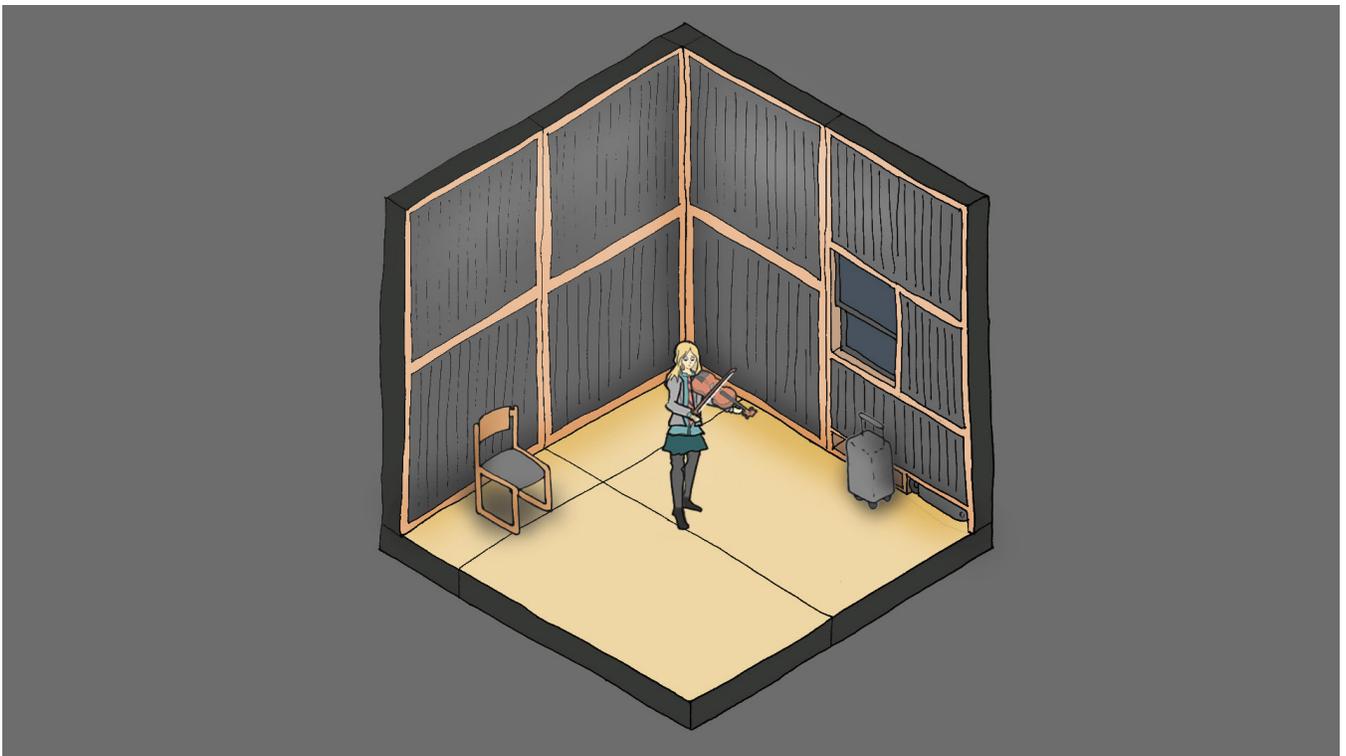
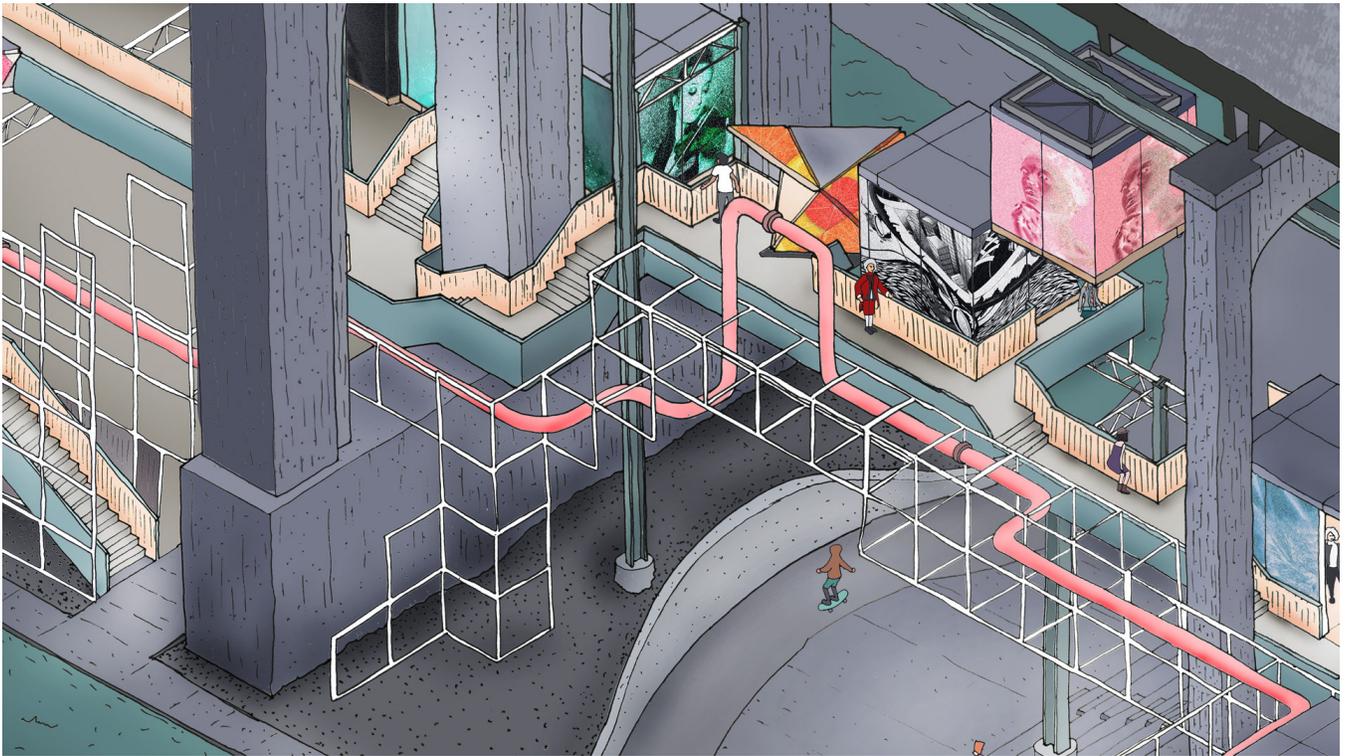


Figure 71. Stills #6 from Music at Large. By author, 2020.

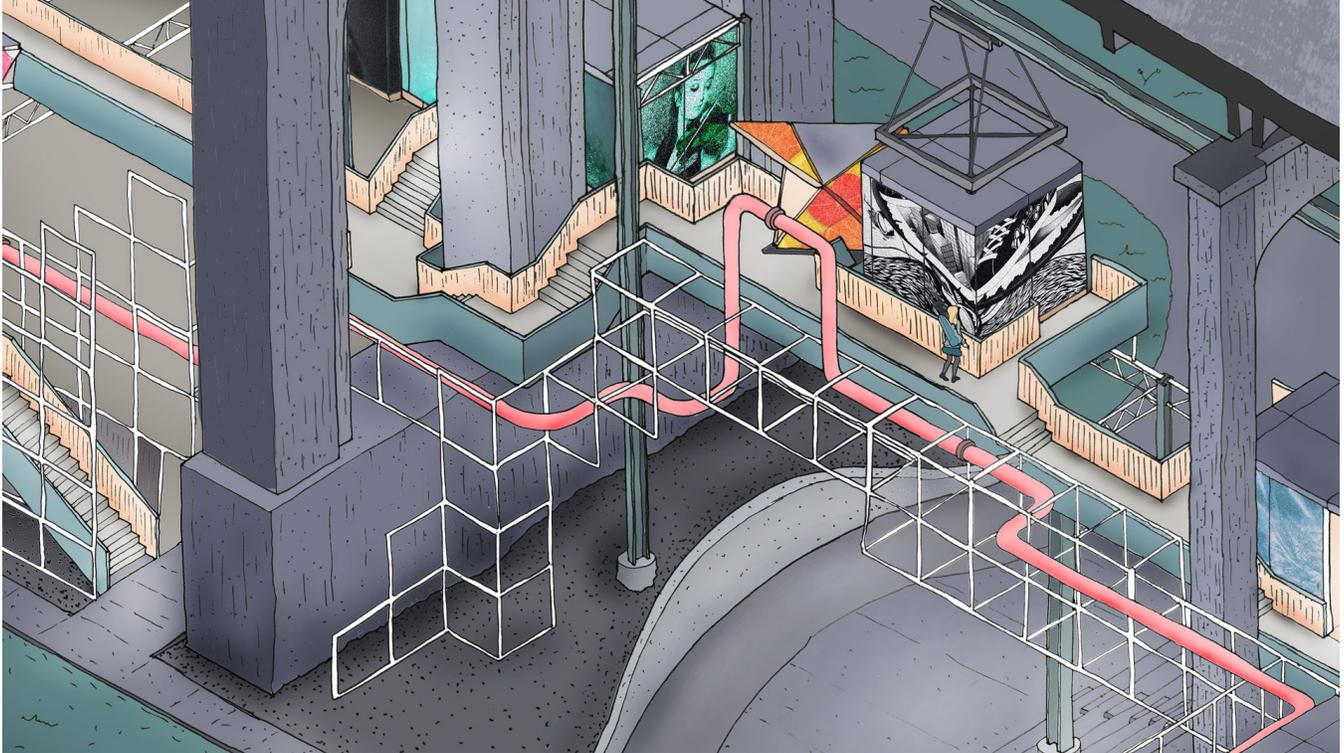
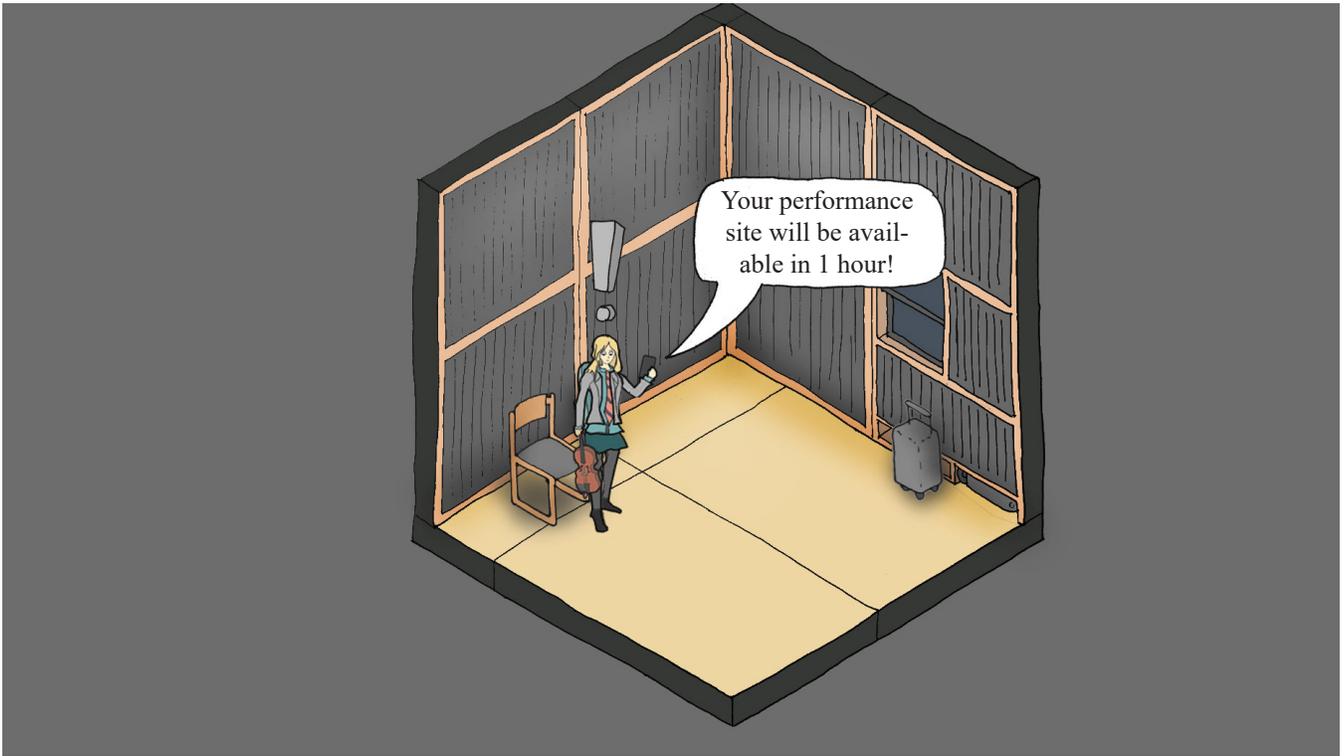


Figure 72. Stills #7 from Music at Large. By author, 2020.

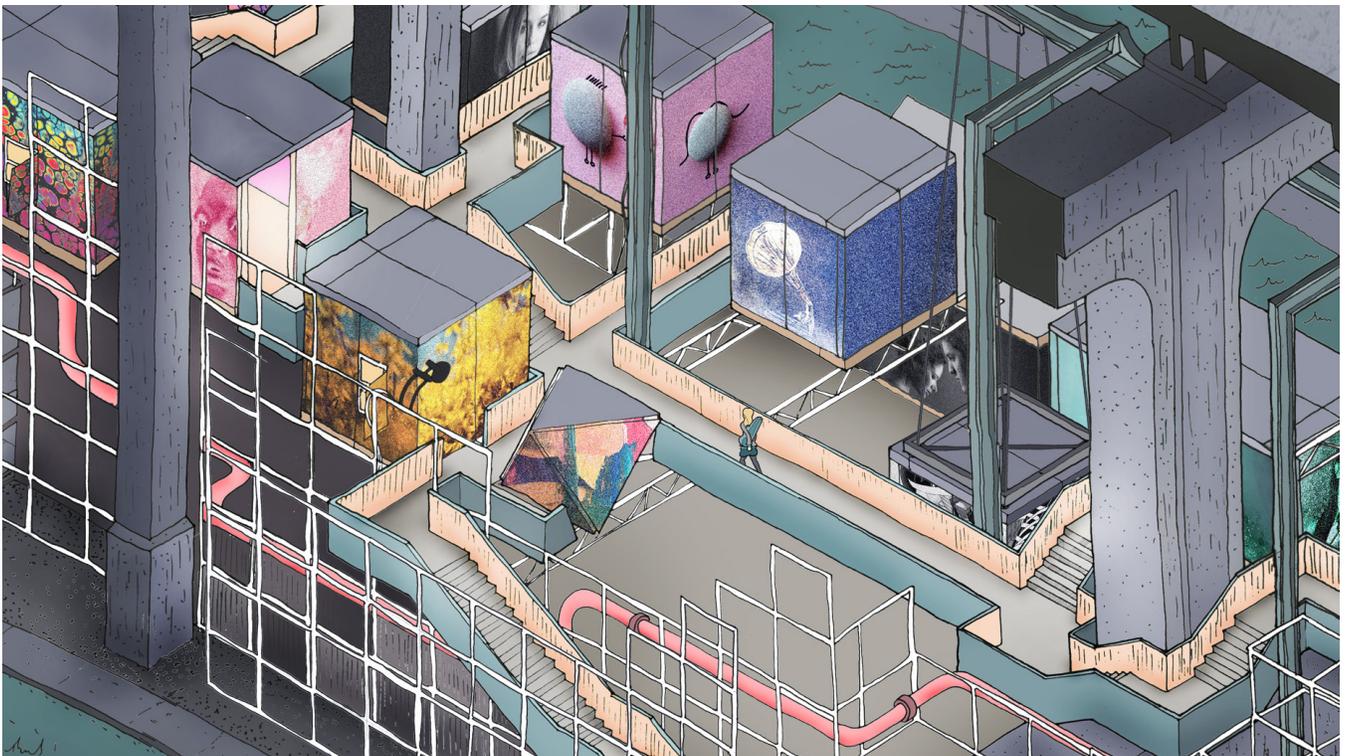
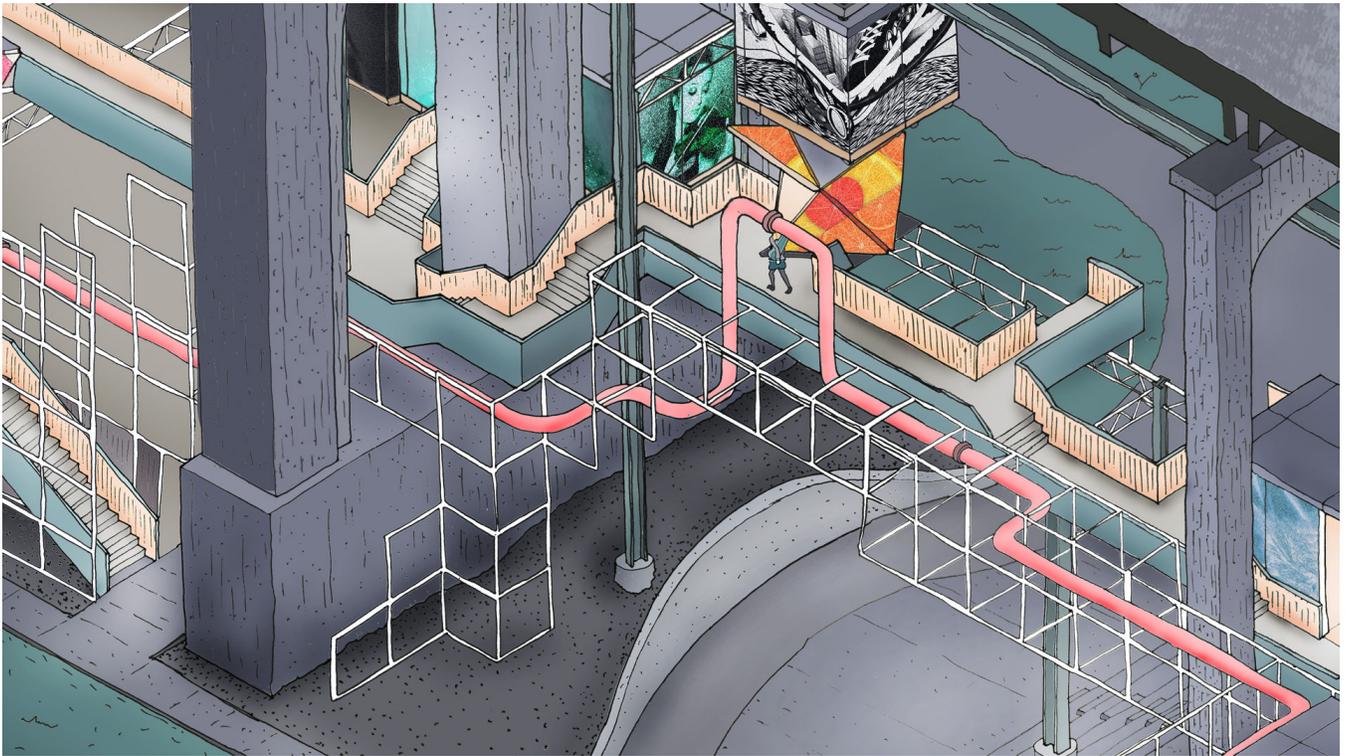


Figure 73. Stills #8 from Music at Large. By author, 2020.

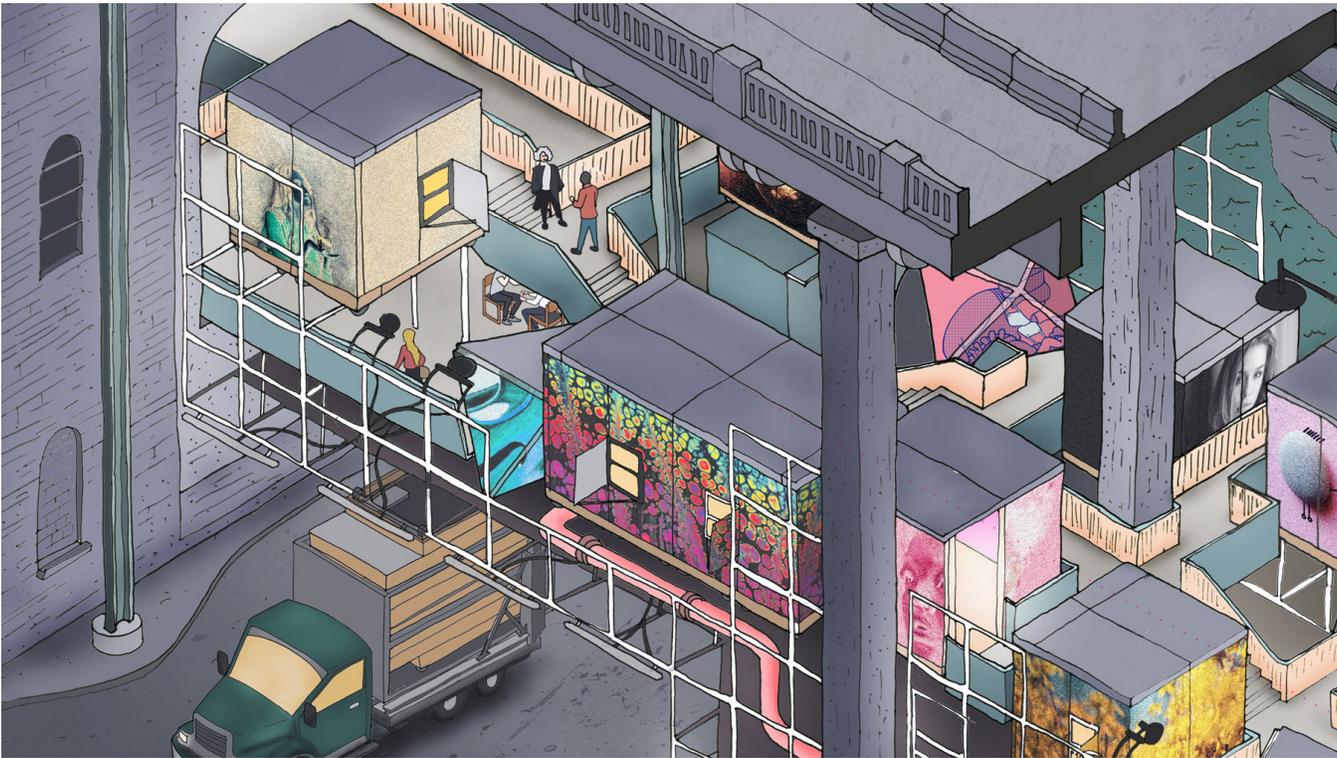


Figure 74. Stills #9 from Music at Large. By author, 2020.

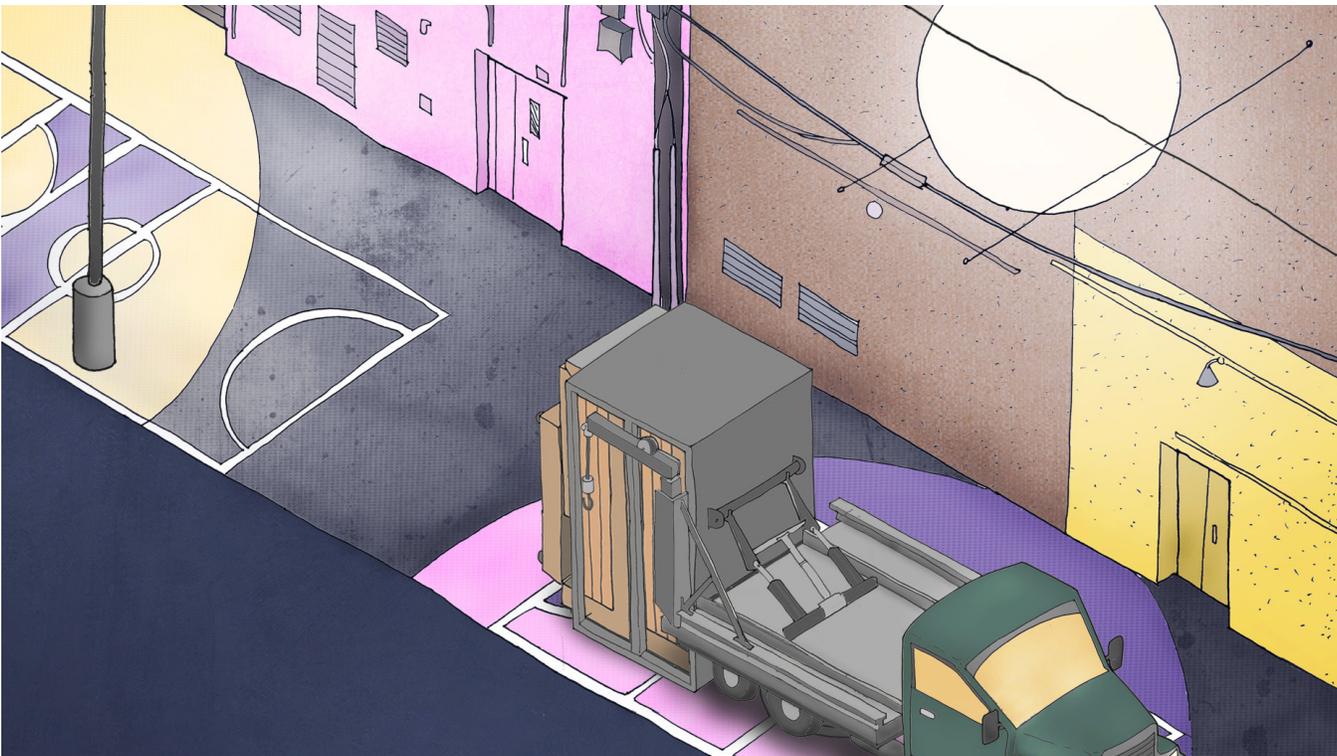
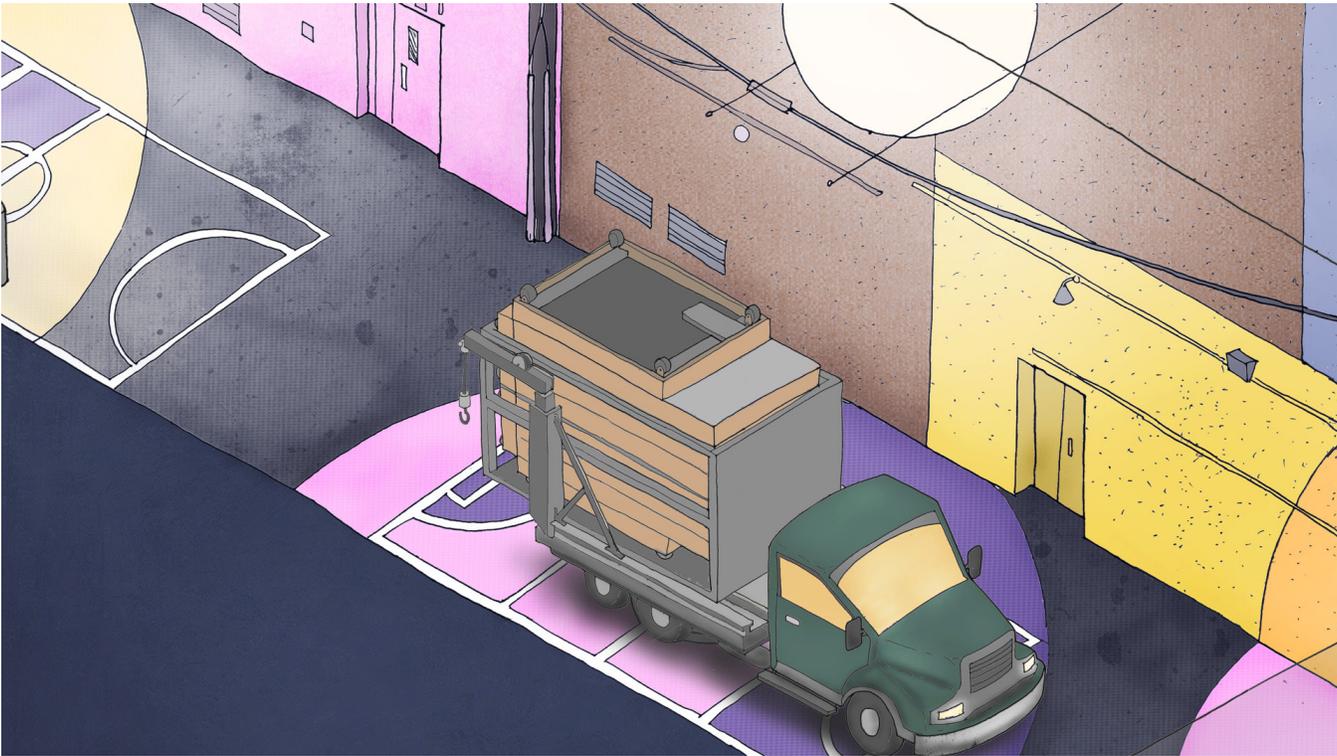


Figure 75. Stills #10 from Music at Large. By author, 2020.

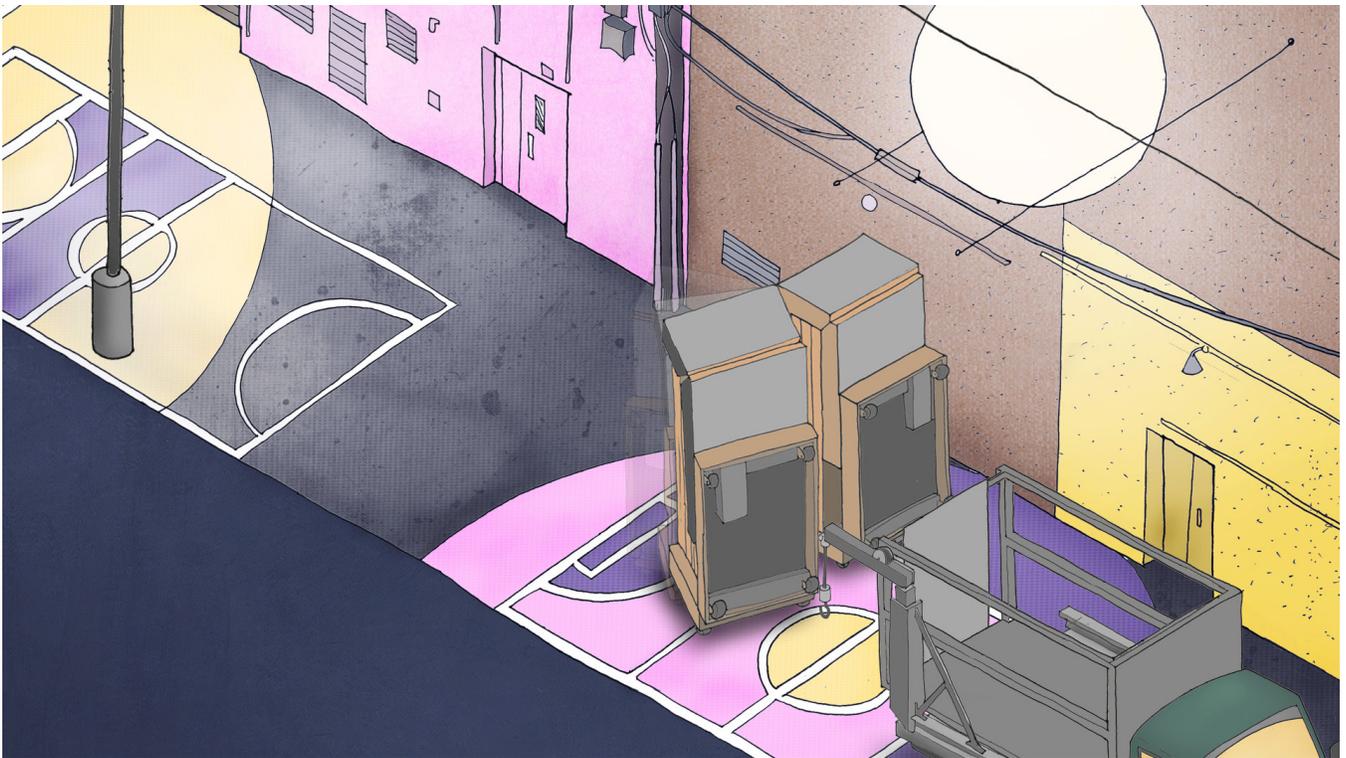
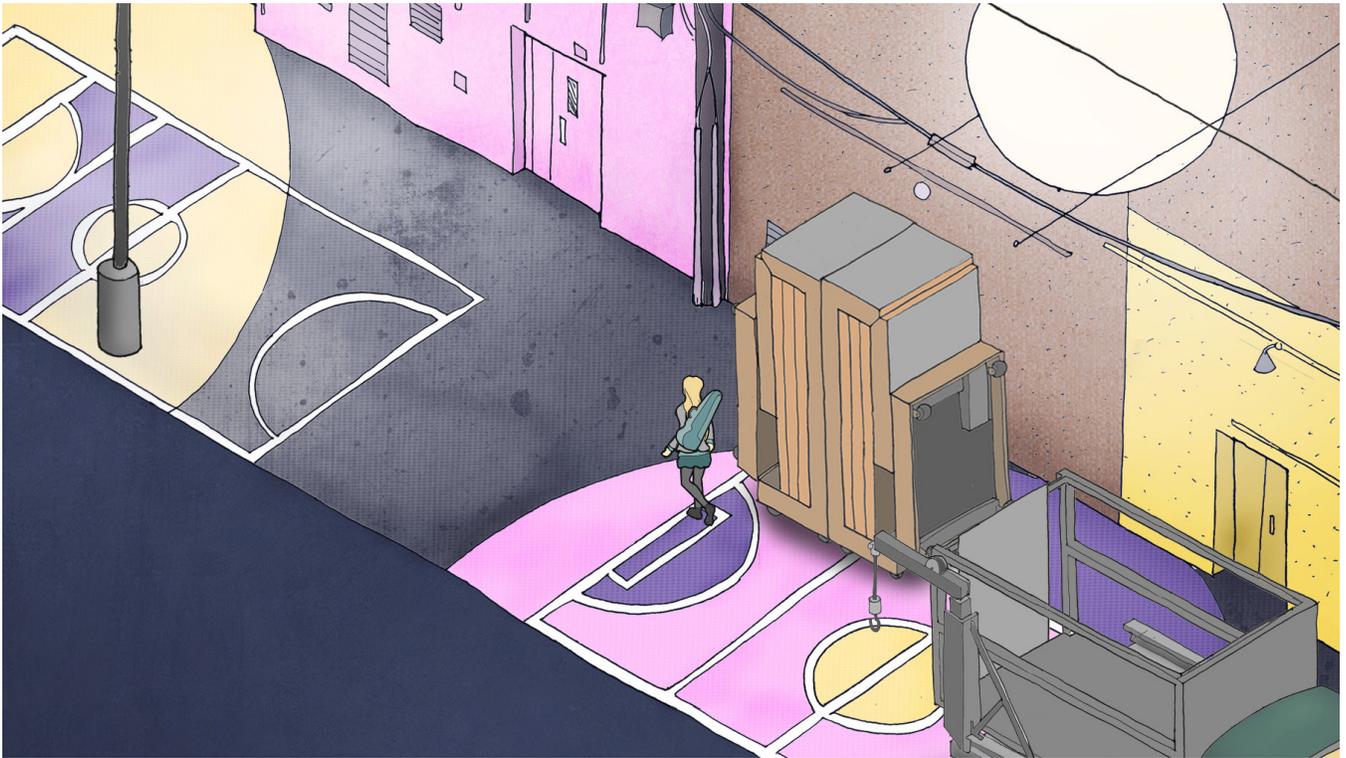


Figure 76. Stills #11 from Music at Large. By author, 2020.

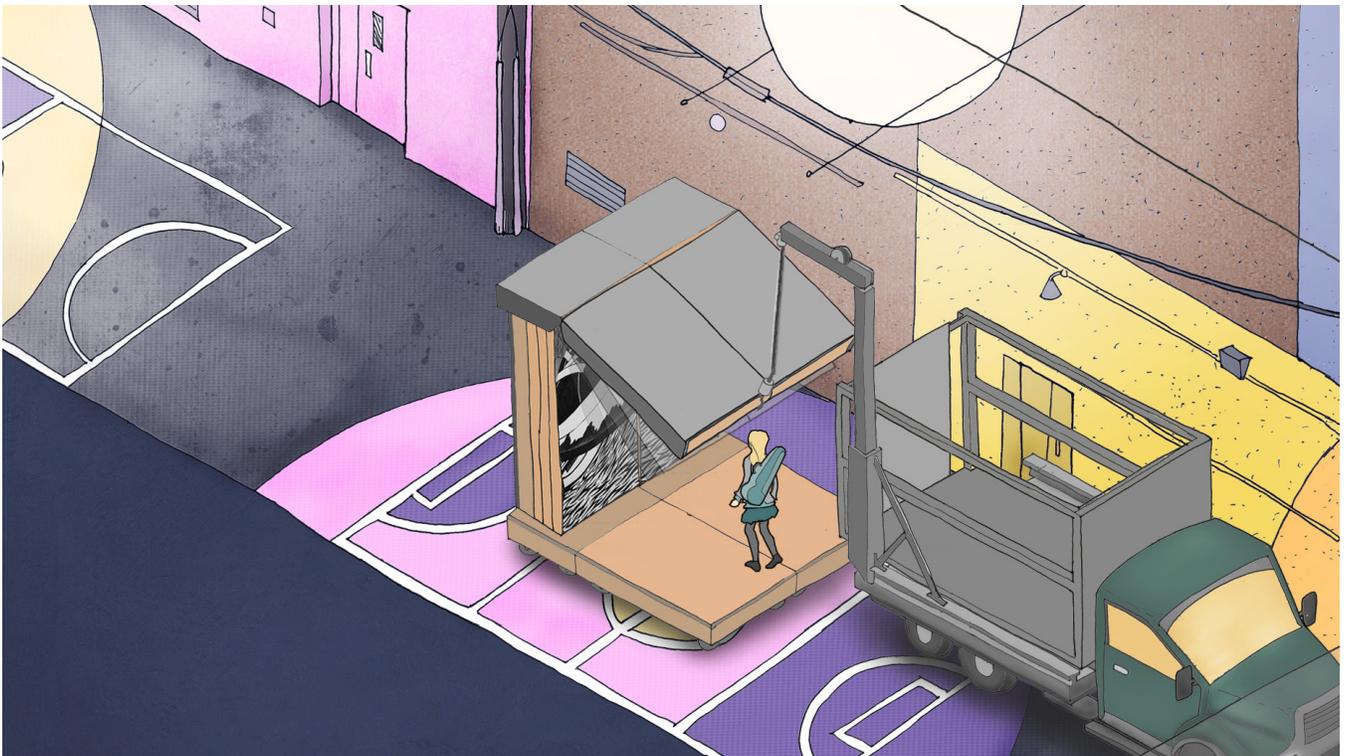
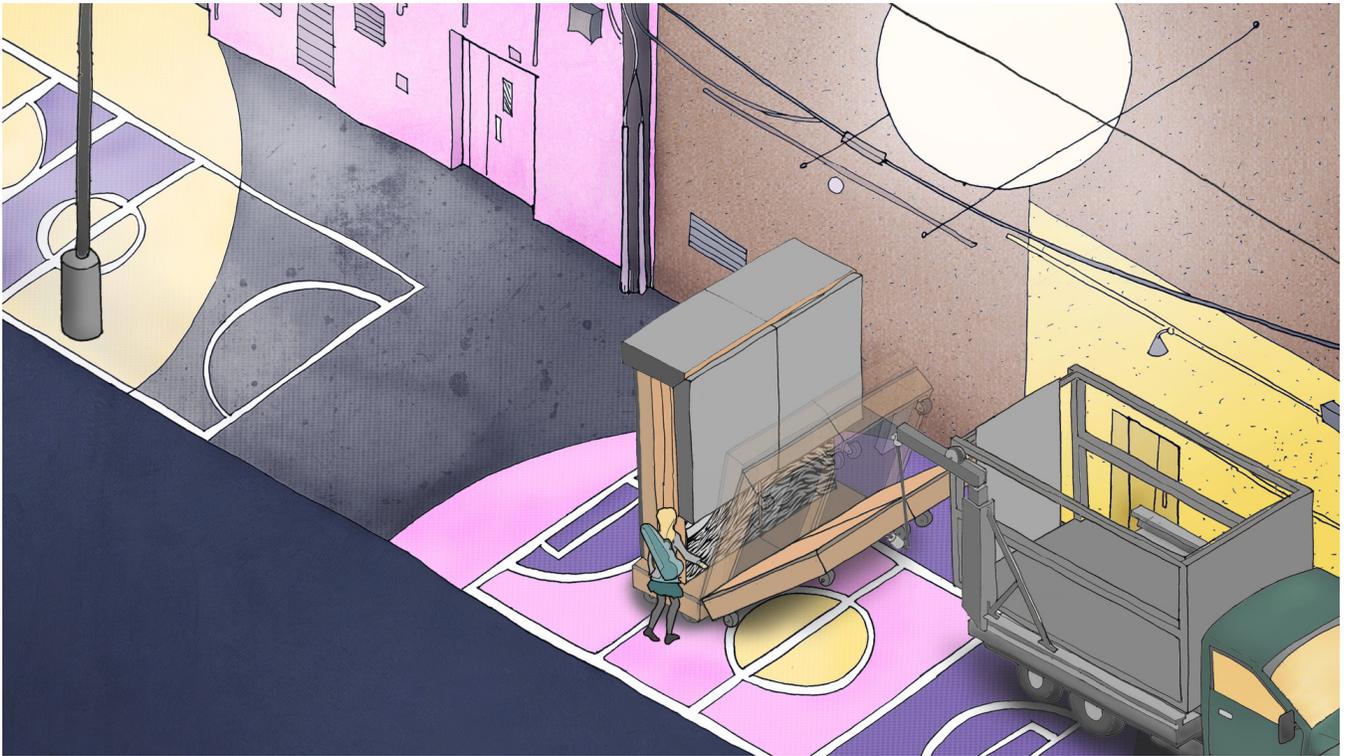


Figure 77. Stills #12 from Music at Large. By author, 2020.

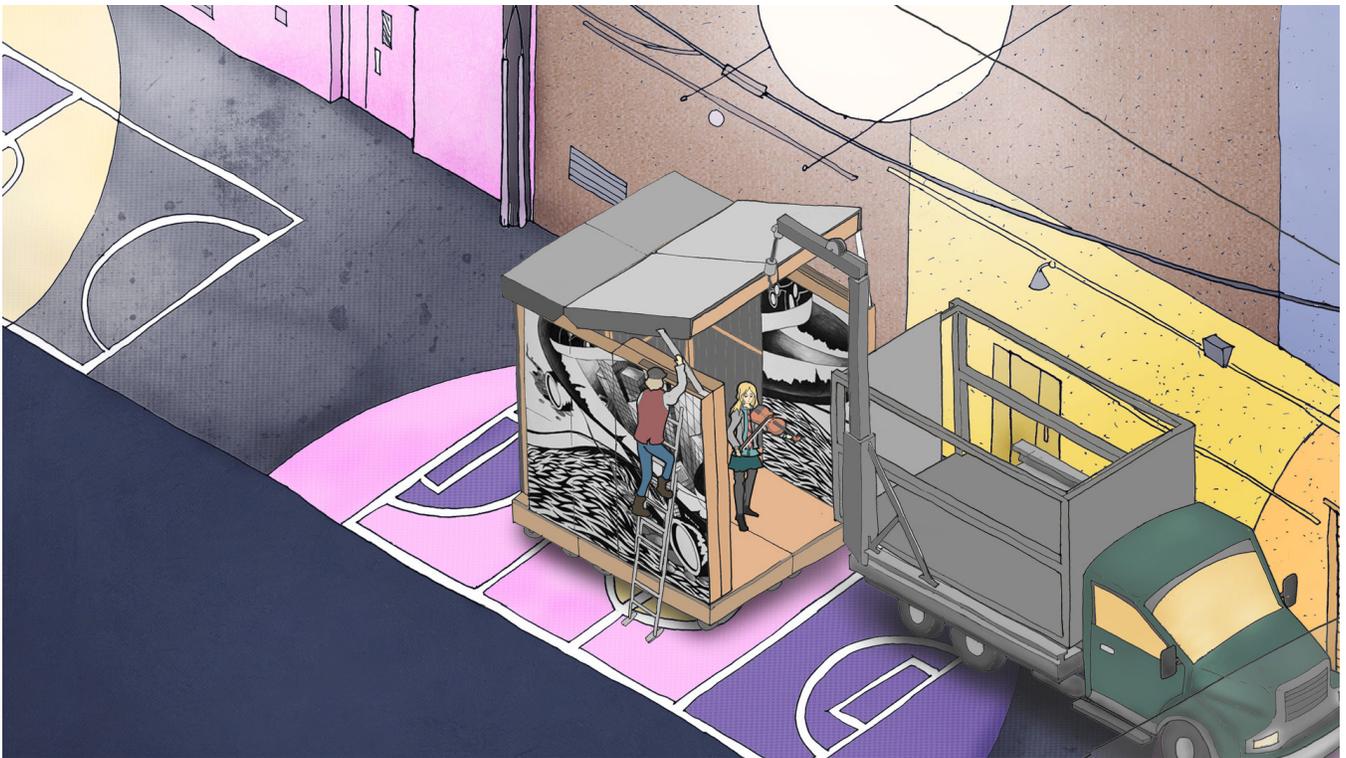
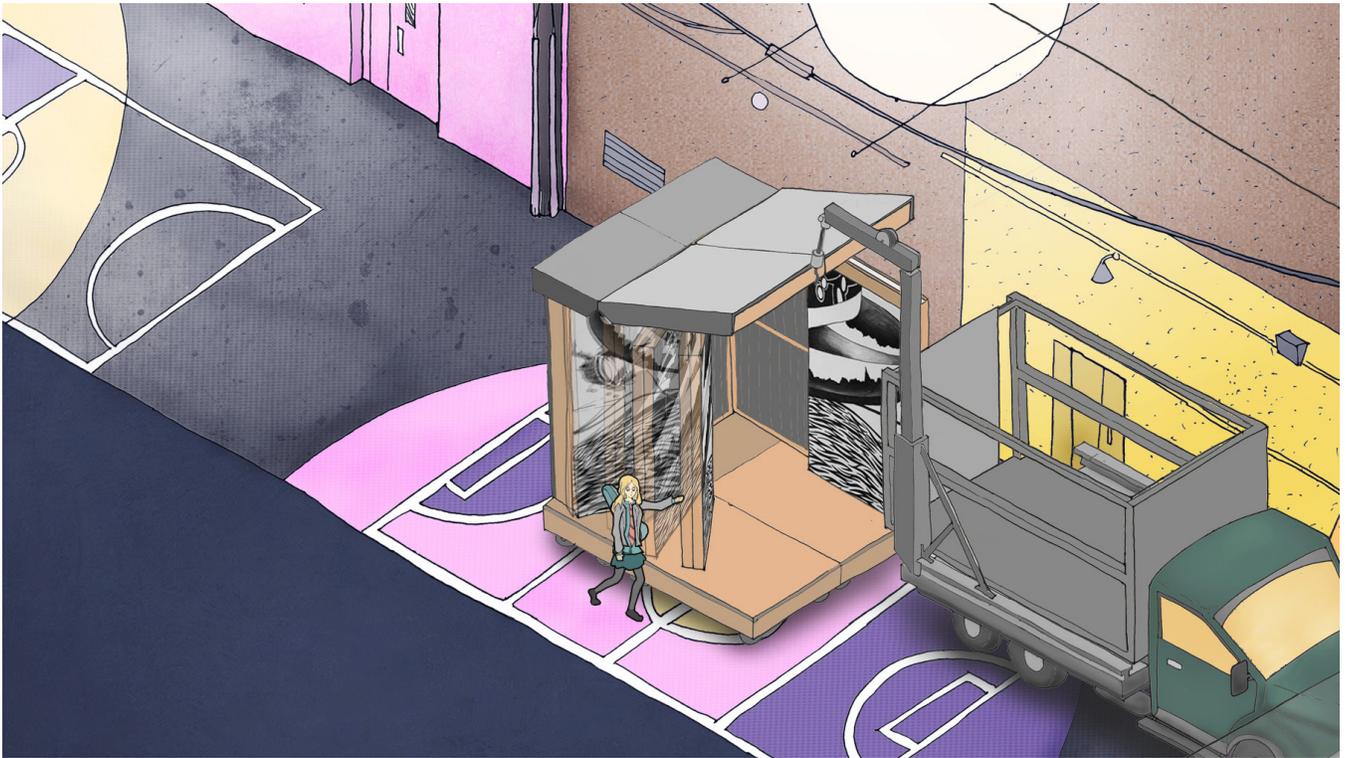


Figure 78. Stills #13 from Music at Large. By author, 2020.

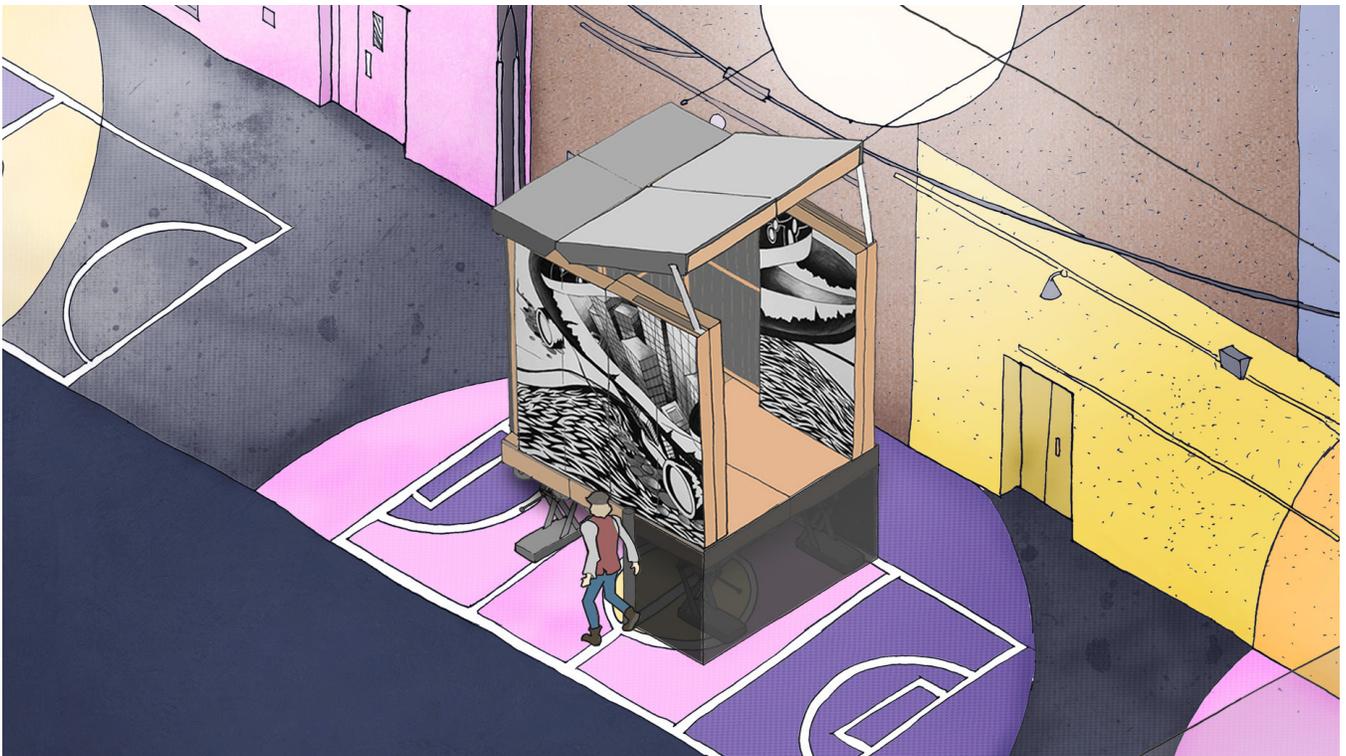
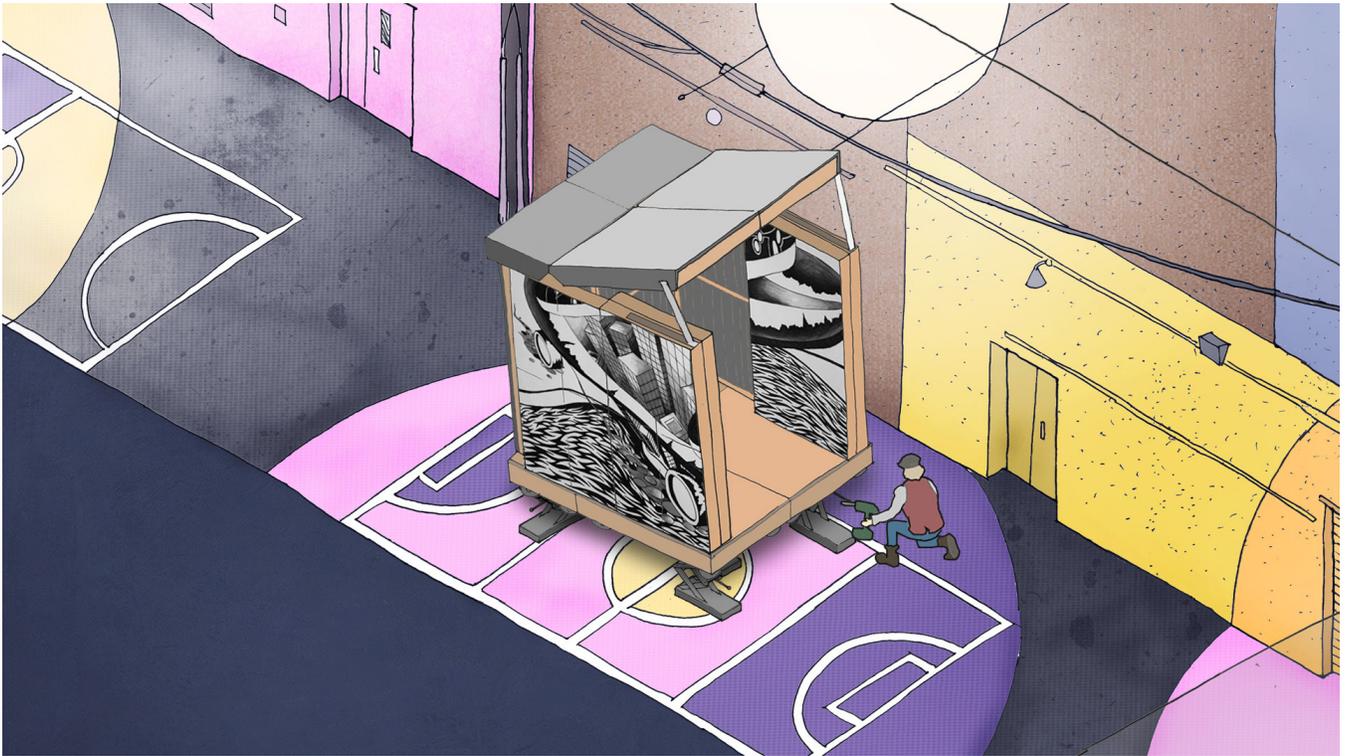


Figure 79. Stills #14 from Music at Large. By author, 2020.

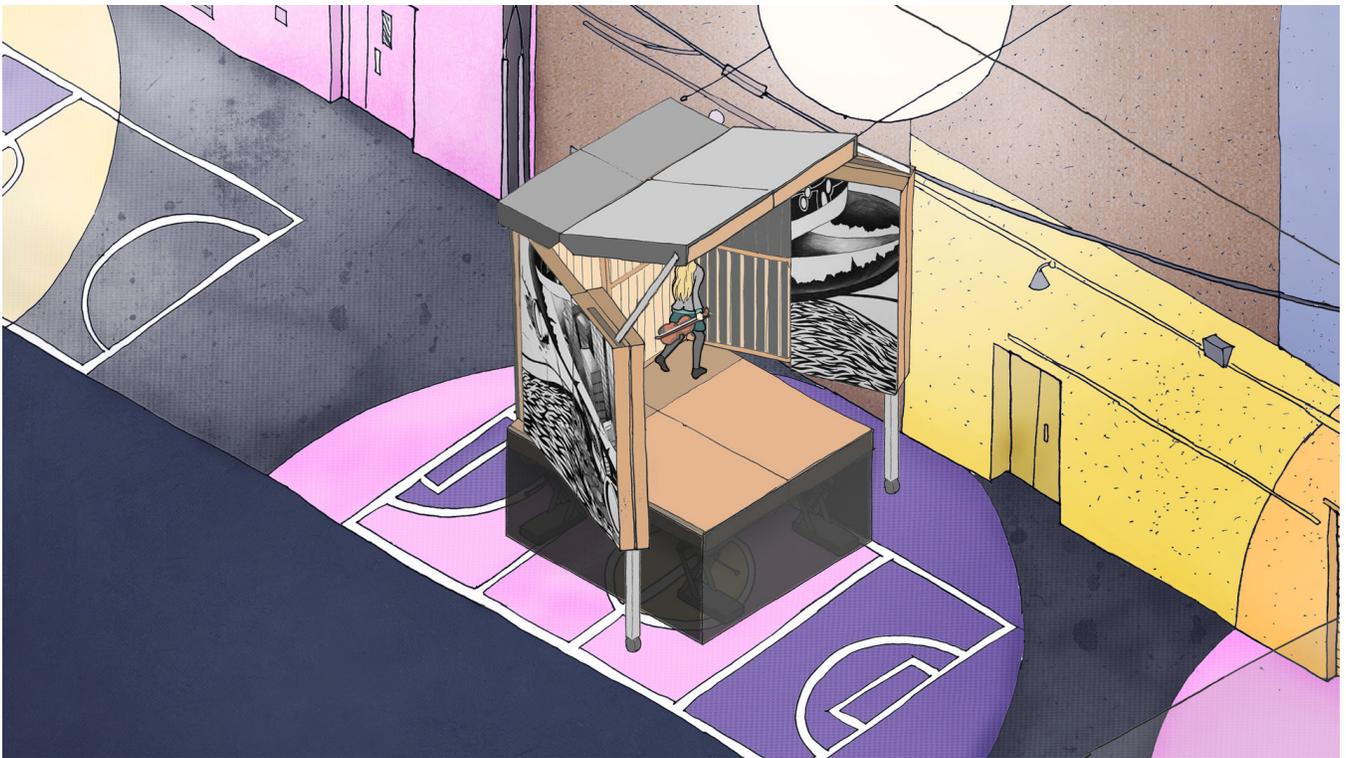
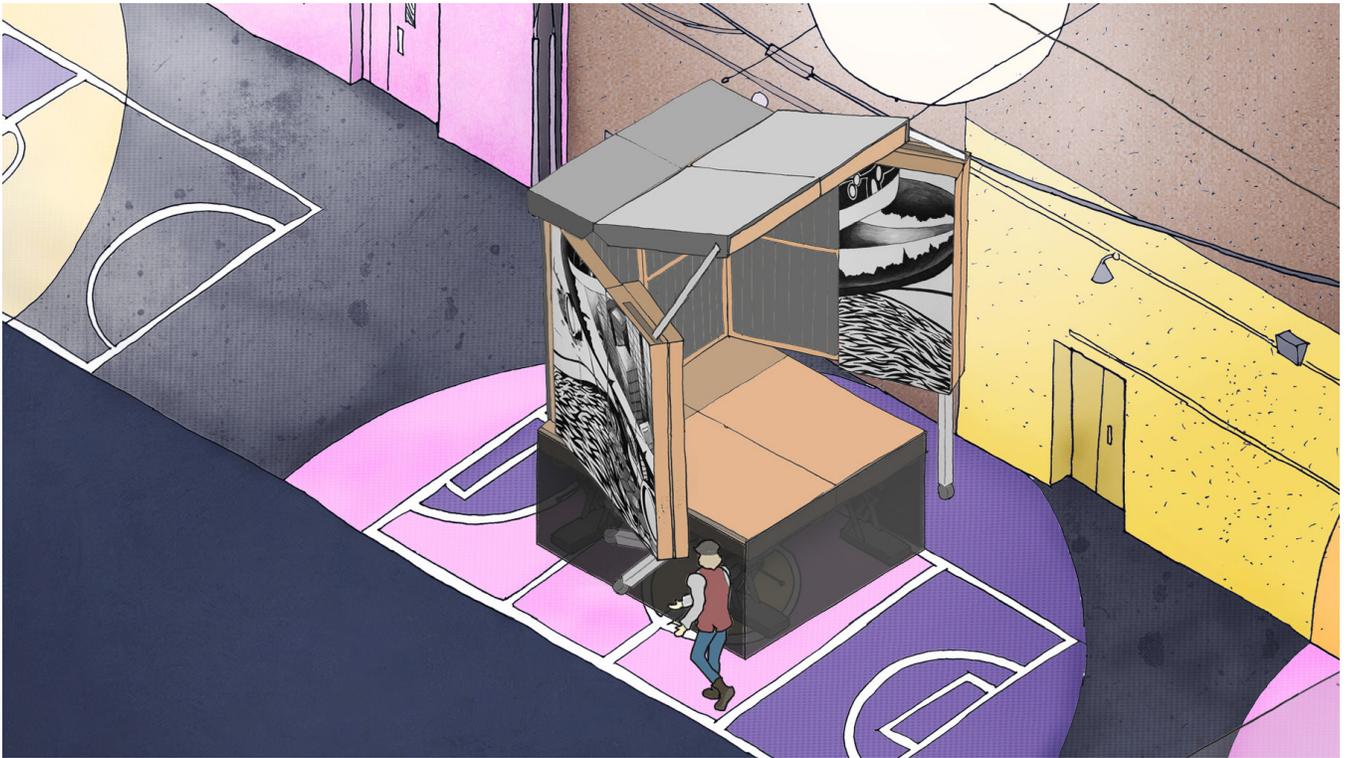


Figure 80. Stills #15 from Music at Large. By author, 2020.

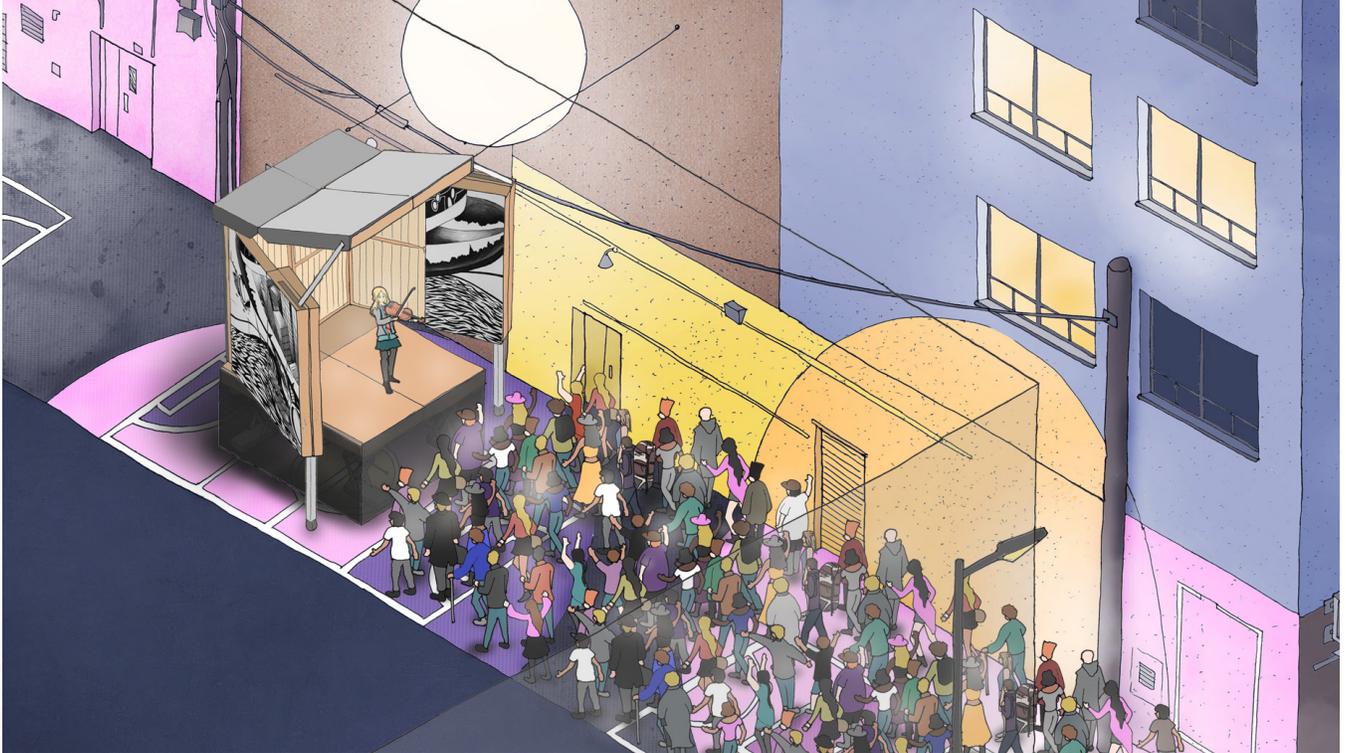
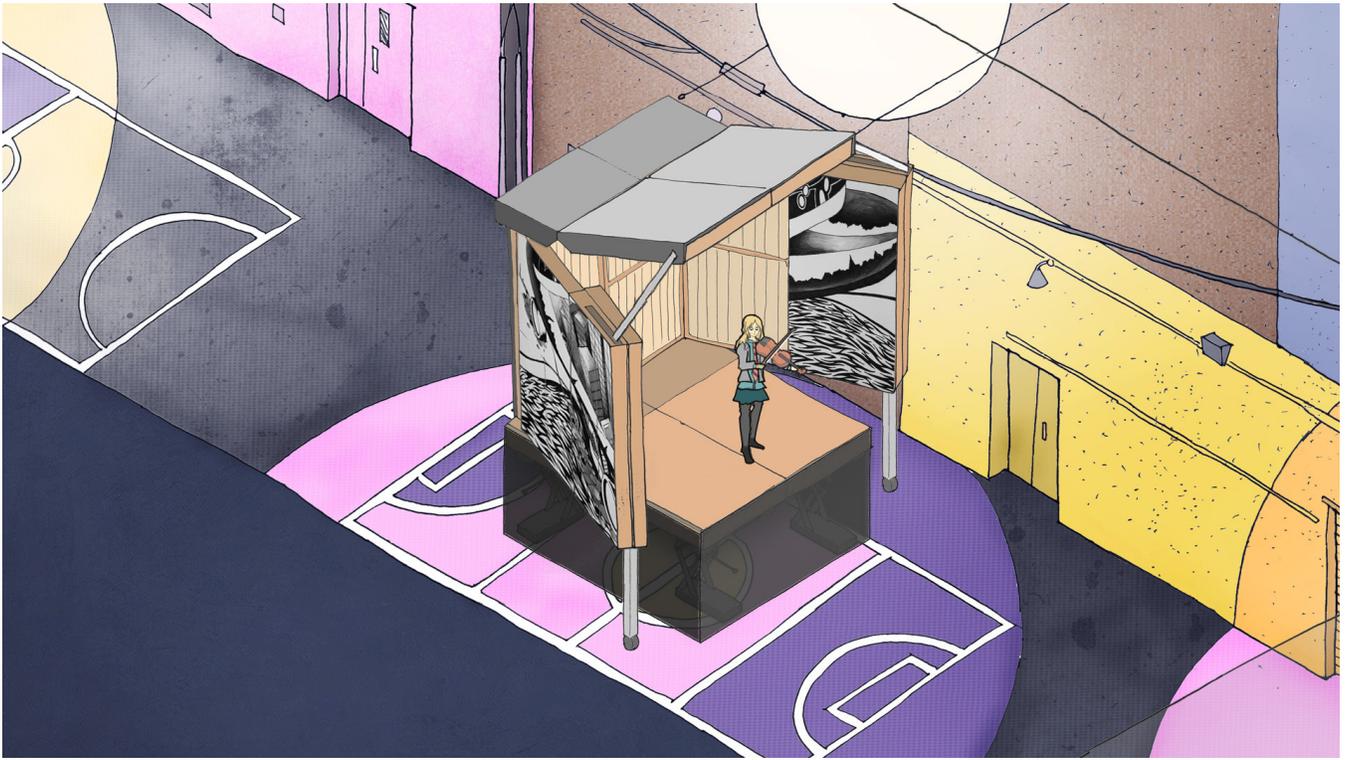


Figure 81. Stills #16 from Music at Large. By author, 2020.



Figure 82. Stills #17 from Music at Large. By author, 2020.



Figure 83. Stills #18 from Music at Large. By author, 2020.



Figure 84. Stills #19 from Music at Large. By author, 2020.



Figure 85. Stills #20 from Music at Large. By author, 2020.

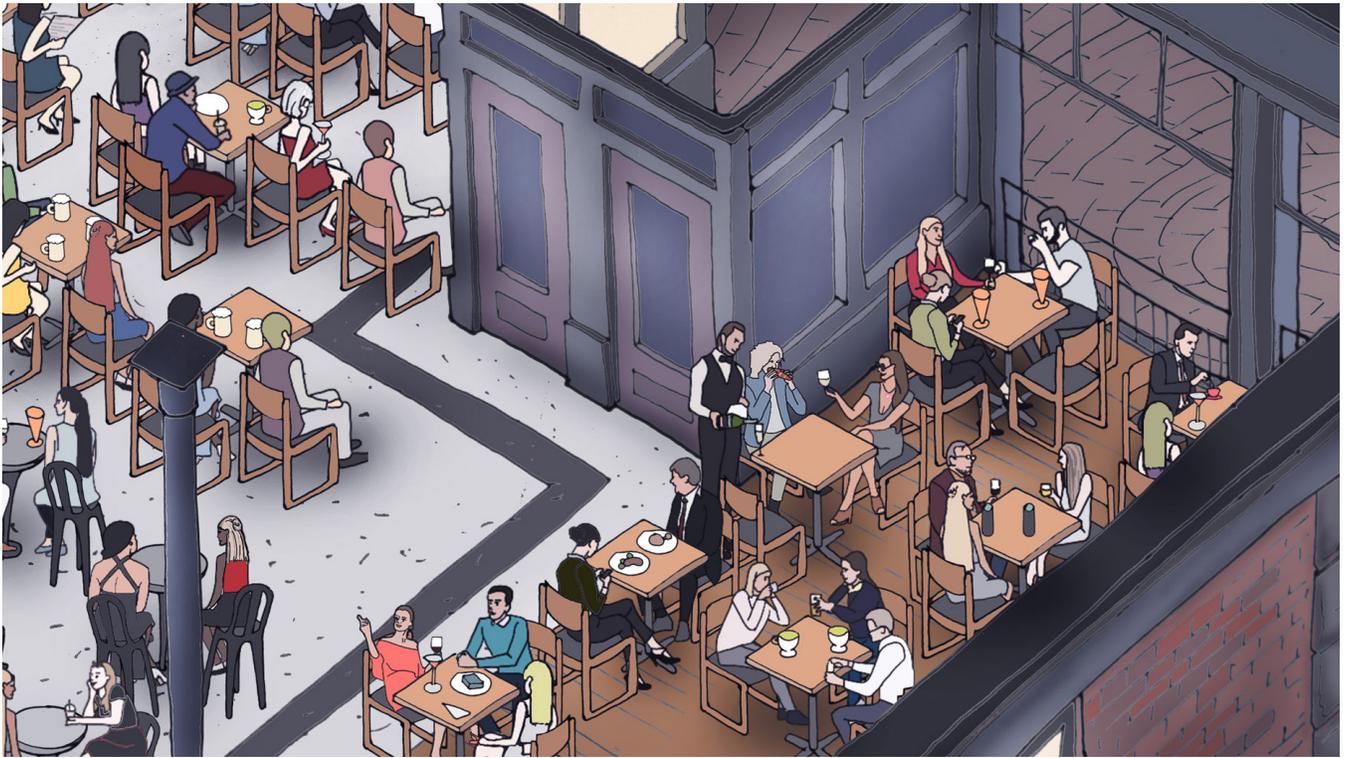


Figure 86. Stills #21 from Music at Large. By author, 2020.

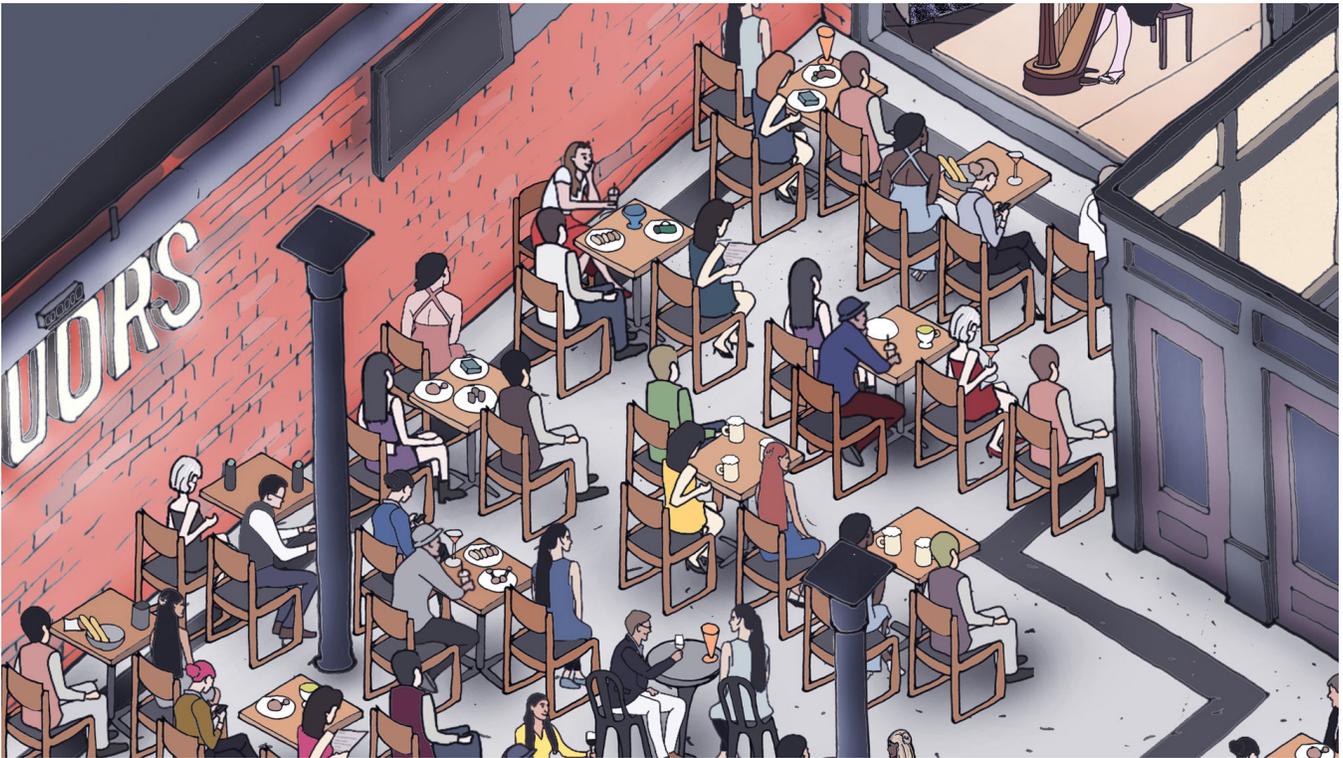


Figure 87. Stills #22 from Music at Large. By author, 2020.

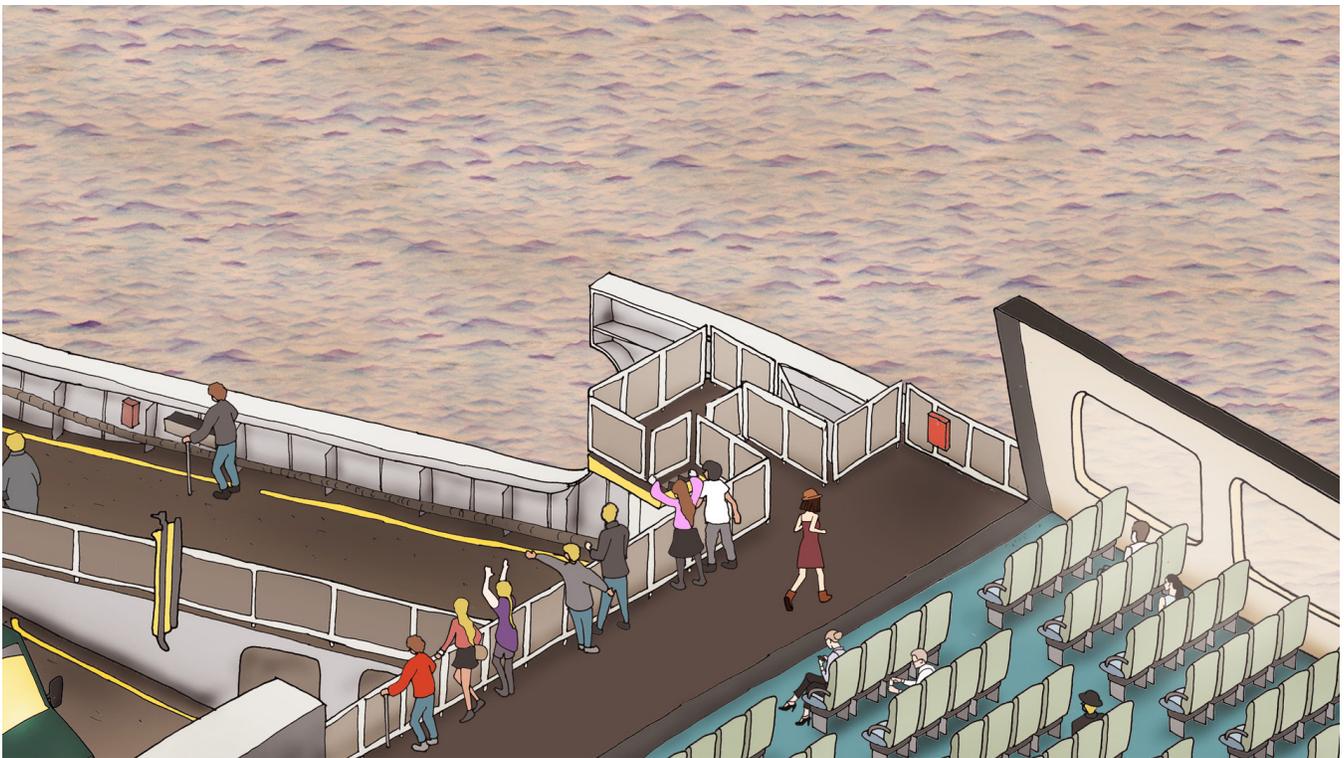
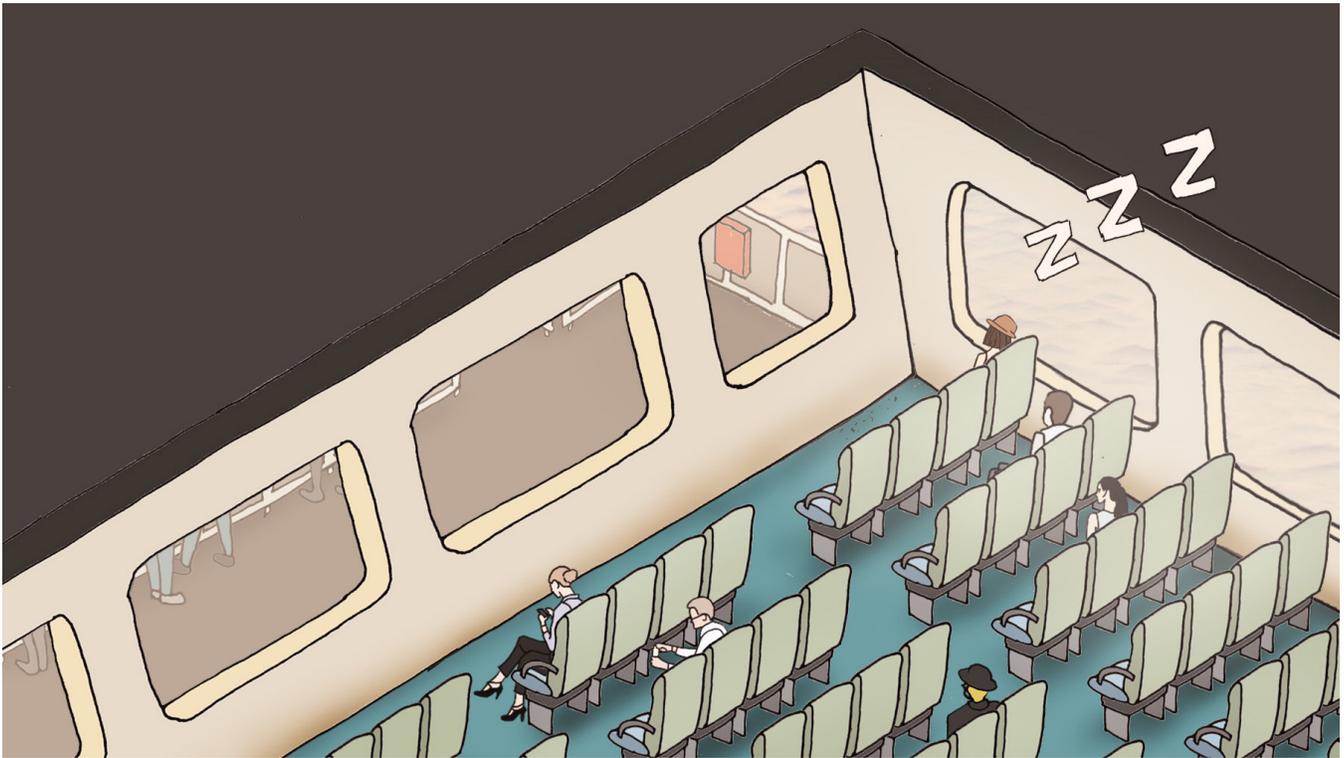


Figure 88. Stills #23 from Music at Large. By author, 2020.



Figure 89. Stills #24 from Music at Large. By author, 2020.

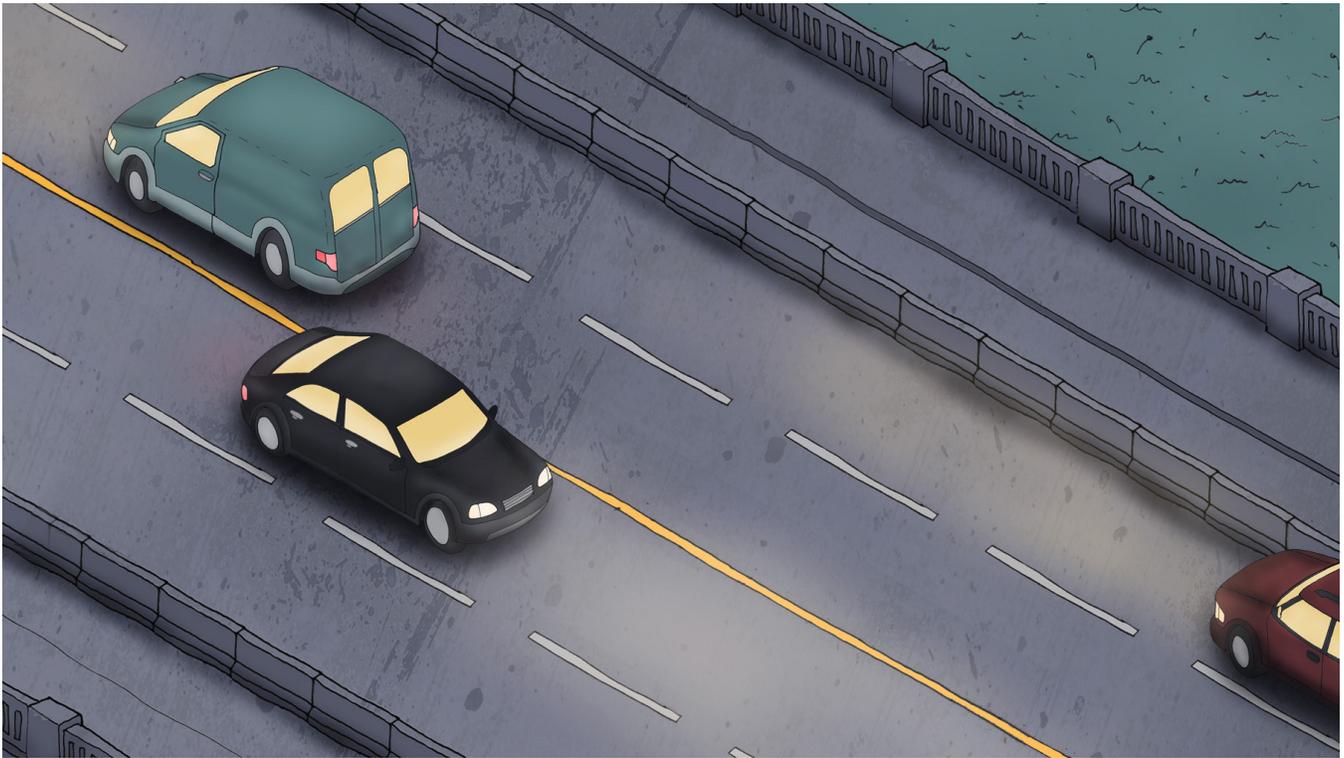


Figure 90. Stills #25 from Music at Large. By author, 2020.

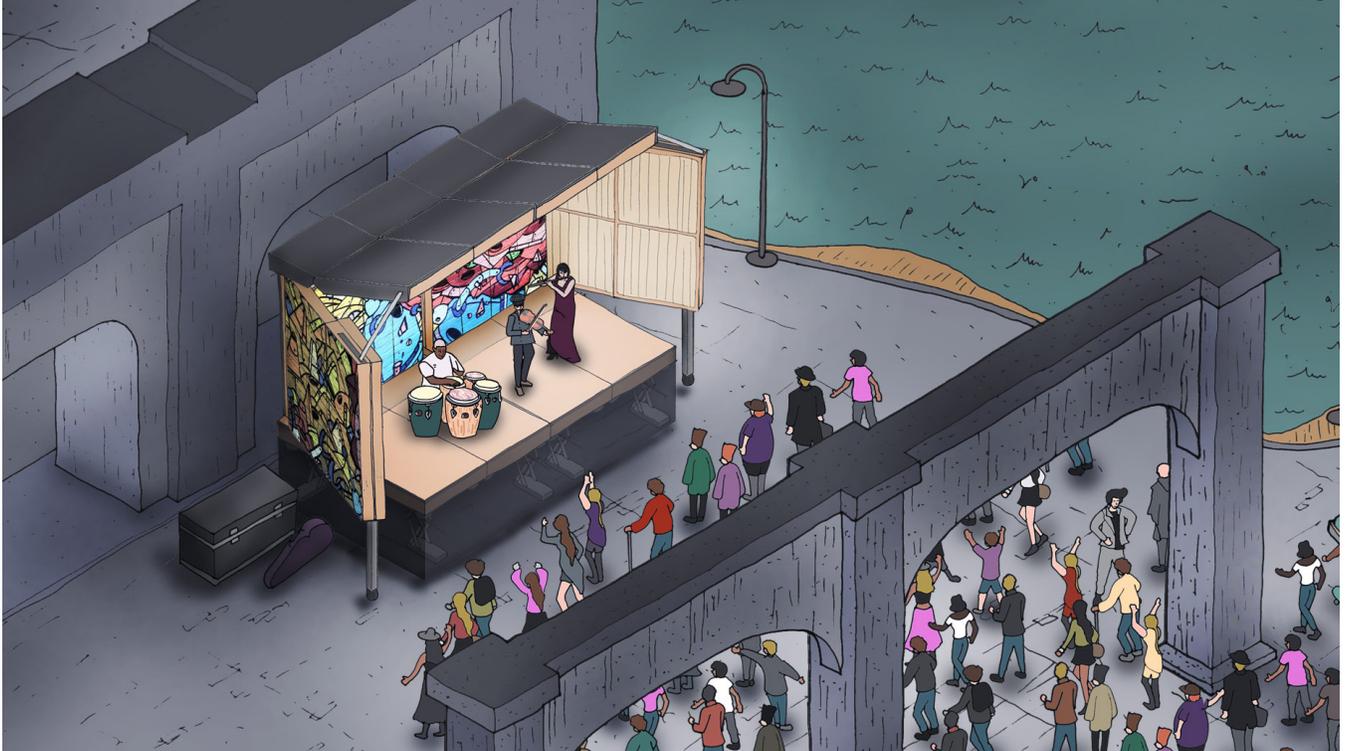


Figure 91. Stills #26 from Music at Large. By author, 2020.

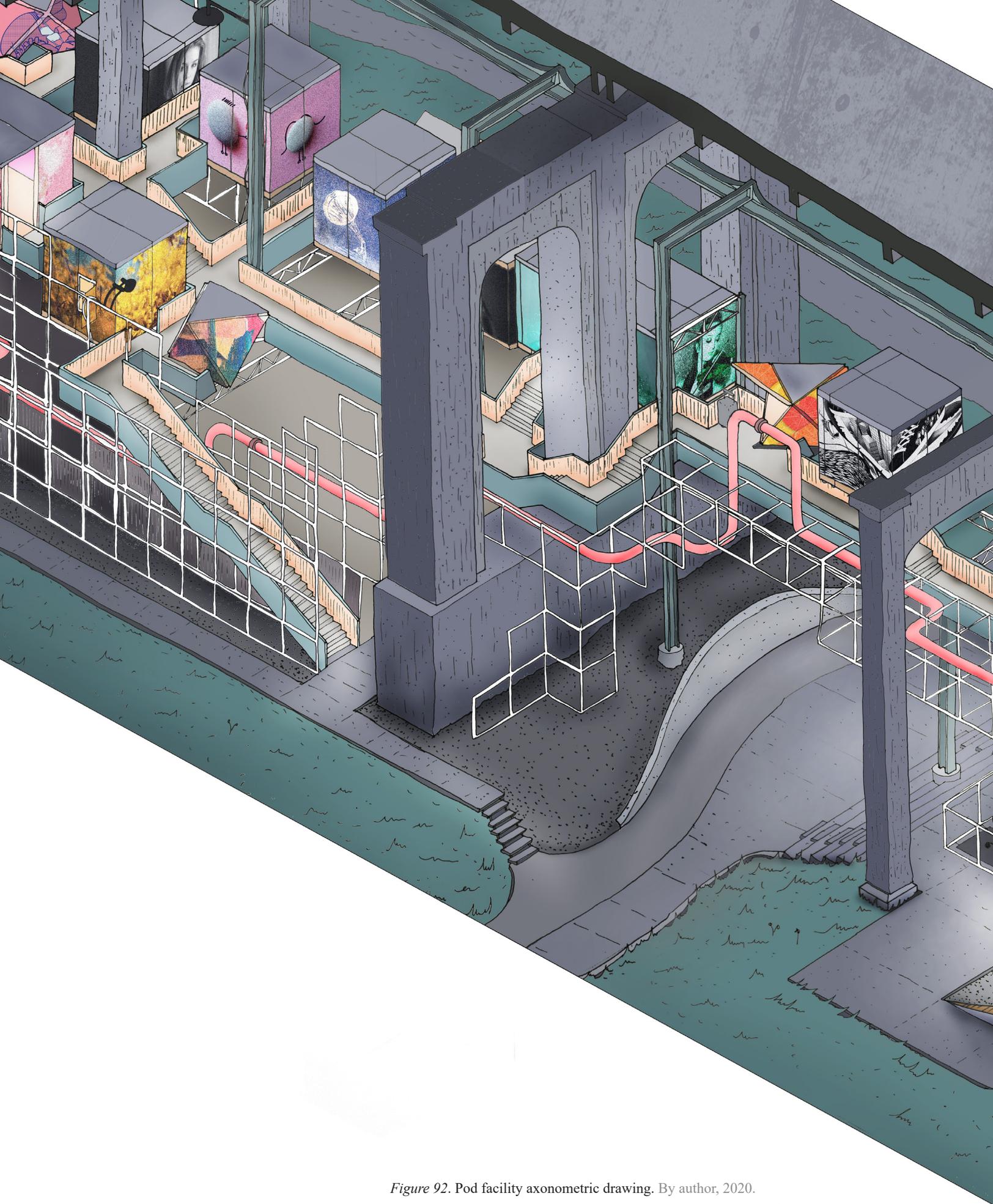
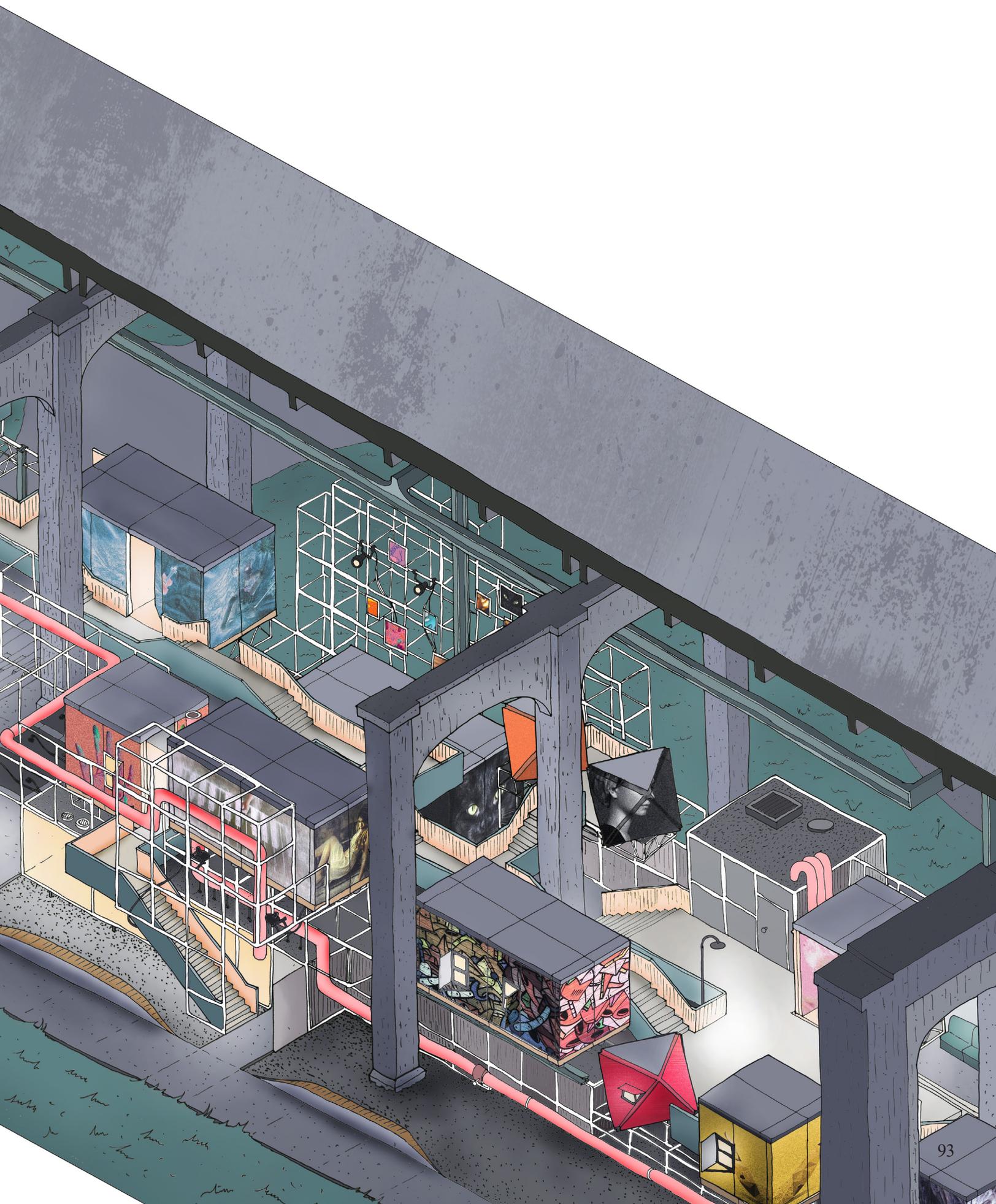


Figure 92. Pod facility axonometric drawing. By author, 2020.



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