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by

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2013

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**The Photographic and Spatial Survey Method for Video Projection**

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**The Photographic and Spatial Survey Method for Video Projection**

**by**

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**Thesis**

Presented to the Faculty of the Graduate School of

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## **Dedication**

For my parents, family, friends and all others who have supported me along the way. Your encouragement was invaluable to me in my endeavors. Thank you.

## **Acknowledgements**

I would like to thank all of the artists, designers, collaborators, and friends that I have had the pleasure of learning, creating and exploring with over the years.

## **Abstract**

### **The Photographic and Spatial Survey Method for Video Projection**

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The process and practices that are described in this document were used in several realized video installation projects over the course of 2011-2013. These installations all encompassed the use of Architectural Video Projection Mapping techniques to create transformative animated video projections upon the pre-existing architecture of multiple locations. The process used to achieve this required the integration of multiple practices to obtain and translate specific spatial data to be used in the artistic content creation process. Particular to this method uses a photographic and spatial survey to map the video content accordingly to the architecture of the space. The projects included an installation on a building facade for the Art Alliance Austin's Holiday Stroll in 2011, another installation on the architecture of an interior wall of a museum space for an event at the Austin Museum of Art in 2013, a site-specific musical theater piece called *Almost Invincible* in the University of Texas Co-op's Cohen New Works Festival 2013, and multiple stages of a live music venue named Cheer-up Charlie's in Austin, Texas from 2011 to 2013.

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## Chapter 1: Introduction

Over the course of my time researching the use of video projection as a narrative device for live performance, I was drawn to the possible use of architectural projection mapping techniques for live performance. There is no universally standard approach how to create an architectural video projection mapping installation. There is also a lack of publications that reference an explanation on how to achieve this successfully. Through the various practices and techniques described in the following writing, I have devised a method to projection map a structure using surveying, drafting and photographic techniques.

The method that will be explained involves conducting a spatial survey and the use of specific photographic reference to create a scale animation template from which to create animated video projected content. This spatial survey and photographic method to create a scale elevation of the projection surface was implanted into the process of creating four separate video mapping installations. In each installation, the process and methods described in this document were successful in accurately projecting the video content upon the architectural surfaces of the space.



Illustration 1: *Almost Invincible*



Illustration 2: Austin Museum of Art



Illustration 3: Cheer-up Charlie's (inside stage)



Illustration 4: Cheer-up Charlie's (outside stage)

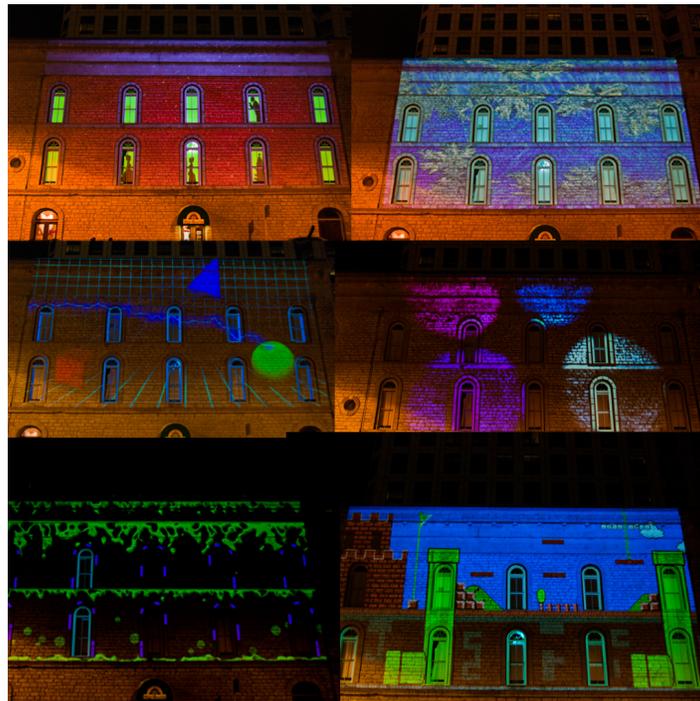


Illustration 5: Art Alliance Austin Holiday Stroll

The installations that were created using this process were all designed and created for a specific event as an installation or a an element of a performance. The Art Alliance Austin's Holiday Stroll was an AVPM installation designed for viewing by the general public on the city streets of Austin, Texas. The Austin Museum of Art was an installation projected upon the exposed architecture of the interior museum wall as a

backdrop for a social event. For *Almost Invincible*, AVPM was used to create an animated architectural backdrop for the performance of a musical theater piece. At the live music venue, Cheer-up Charlie's, video mapping of the stage spaces is used to visually enhance and support the musical performances. Each of these projects required the use of the various techniques involving surveying, photography, content creation and video projection concepts that are described in this methodology in accurately mapping video content to a structure.



Illustration 6: *Almost Invincible* without projections



Illustration 7: *Almost Invincible* with projections

## **Chapter 2: Architectural Video Projection Mapping**

The creation of an Architectural Video Projection Mapping (AVPM) installation is a process involving a conglomeration of practices including digital animation, video projection, photo-metrics, photo-manipulation software, computer-aided drafting software and physical space surveys. There is no one particular tool or software that can be used on its own to create an AVPM installation. A number of different types of digital software must be used throughout the process for specific purposes to make the animation fit the architecture correctly. The methodology described in this writing was used in the creation of the aforementioned video installations. The explanation of this process in the following chapters will explain the aspects of my methodology.

The final product of an AVPM installation after the process is complete is video projected imagery that is specifically fit to the architectural characteristics and elements of a projection surface. This can create a very spectacular illusion that the architecture of the building itself becomes an active and transformative surface through the animations that are projected upon it. For example, AVPM animations can make the architecture of a building appear to be that of another style or era, make animated scene interact upon a static building, emit perceived light without a physical source, manipulate the passing of time, etc. There are limitless ways animation can be used in AVPM to transform the surfaces of the building.

One of the key measures for success of an AVPM installation involves the level accuracy in the fitting of the content over the projection surface. If the content created is not precisely mapped to fit the architecture, it is possible that the misaligned projections

would appear skewed, distorted and possibly indecipherable to the audience. Any major alignment issues between the content and surface can be detrimental to the transformative effect of an AVPM installation.

### **Project descriptions**

The Austin Museum of Art (AMOA) installation was designed as a visual element to support an event to introduce the new artistic director of their organization to their season subscribers and Austin art community. For this project, the content was designed to incorporate welcoming visual aspects of Austin, Texas upon the raw architecture of the gallery wall. Footage and photographic reference of the city of Austin were the basis of several design concepts for the event. The content for this installation included creation of animated versions of local wall murals, and incorporating imagery of Austin with that of the natural landscape distinctive to the city. Additional content was created to help in the branding of the event by integrating the AMOA logos into animations. These animations were more abstract. They focused on the accentuation of architecture and integrating the organization into the projections, rather than specific thematic content.

The Art Alliance Austin's Holiday Stroll (AAA) had a very open design format in which I was able to experiment with animation, projection and mapping techniques upon two stories of a building. For this project, I created several animated pieces that were projected off of a rooftop to an adjacent building across a 4-lane downtown street. The installation was part of a larger event involving several other video art installations being displayed upon buildings to be seen from the streets of downtown Austin after the

Christmas tree lighting at the Capitol Building. I used several animation techniques thorough out the individual pieces of this project. The content of the animations included the use of animated lighting, transformative animations, and perspective in animated 3-D space. These animations were all conceptualized to highlight and experiment with the transformative nature of AVPM.

The content and installation of the music venue stage mapping at Cheer-up Charlie's has been designed to be adaptable to various genres and styles of musical performances. The animations for this space were generally built as short ten second loops, making it possible to fluidly change between videos and to adjust timing of the loops to sync with the particular musical tempo and style of the performer. Two separate stages in the venue have been used as video installation sites for performances. The projections mapped for the inside stage consists of animating a pre-existing mural on the wall behind the performers. The wall is painted with a graphic consisting of dark outlines depicting four cartoons of cats perched upon clock towers with faces. This mural is painted on a white wall with colorful paint splatter and drips across the top of the wall. The animations for this space transform the colors of the space to create an illuminating effect on the paint drips, colorful cats with glowing eyes and alter the colors of the buildings and skyline in the mural.

The outside stage space is an orchestra shell located in the rear of the property. The two upstage walls are adorned with rectangular pieces of carpet attached to the wall in a grid like pattern. This grid surrounds two pieces of fence that are also attached to the stage walls. This mural consists of geometric shapes and faces laid out abstractly across

the planks of the fence. The content for this stage was created in a similar way and for the same purposes as the inside space. The animations are mostly short loops that transform the space and accompany the musical performance. The animations for this space accent the grid pattern and the mural art within the architecture of the stage.

*Almost Invincible* was a site-specific narrative musical theater performance. The video design concept was to use AVPM techniques to transform a found space on the University of Texas at Austin campus to become the set for a narrative performance. The performance was held in front a building that was projected upon to create transformative AVPM backdrops of a fictional city. Using the architectural features of the surface, the building surface was animated to transform the structure to transport us to various settings within the play. These settings included City Hall, a laboratory and a vista overlooking the city. Variations of these setting included the City Hall during a celebration featuring confetti and roving spotlights, and the once exquisite laboratory burning in a catastrophic fire.

### **Historical background**

Early AVPM theories and techniques can be traced to the research done at UNC Chapel Hill in the academic research “Spatial Augmented Reality”(1998) and “Dynamic Shader Lamps: Painting on Moving Objects”(2001) by Ramesh Raskar, Greg Welch, and Henry Fuchs. The focus of these studies in Spatial Augmented Reality (SAR) is the use of media based technology to create an immersive environment using interactive media to transform space and objects in the real world by combining them with a digital/virtual

world. The proposed usage of these technologies in real world applications included enhanced telecommunications, architectural surface and light rendering models, medical imaging and immersive entertainment. AVPM has now branched out from its roots in SAR to become known more independently and exclusively as its own form of video installation art.

In recent years, AVPM has grown in popularity and significance as a form of video installation. Much of this growth is due to online exposure of the practice through the sharing of footage of mapping installations via social media and video hosting websites. Many of the recent AVPM installations videos posted online have been created for commercial marketing or festival/event based installations. Two notable AVPM installations that were some of the first to become heavily shared online are The Macula's Prague Astronomical Clock 600th Anniversary Installation and NuFormer's Samsung 3-D projection on The Beurs van Berlage in Amsterdam. Some videos of these particular installations have been viewed over a million times online. This form of spectacle video projection can be used as a marketing tool to aid in the branding of an event or company. The visually impressive nature of an AVPM installation can perpetuate the viewership of the piece beyond the physical audience present at installation site by sharing of video footage through social media. Regardless of whether these installations are successful for promotional marketing, an interest in the practice of video projection mapping itself in artistic communities has grown and its familiarity amongst the general public is on the rise due to the increasing exposure. This increased interest has also spawned a market for

affordable software with video mapping capabilities and has also contributed to the growth of that online community interested in the use of video projection mapping.



Illustration 8: Prague Clock Tower by The Macula



Illustration 9: Nuformer's Samsung 3-D Projection, Amsterdam

Video projection and projection mapping has become an integrated aspect in the design for performing arts and entertainment as well. Projection mapping techniques similar to those used in architecturally based projection mapping have been incorporated in the designs of many types of performances. Award shows for the entertainment industry, Broadway shows like *Sunday in the Park with George*, and touring concert productions like Amon Tobin's ISAM tour have all used video projection mapping techniques in recent productions and tours. One AVPM exhibition that is now being regularly performed is Disney World's *Celebrate the Magic* show displayed upon Cinderella's Castle. The daily attraction is a very large-scale AVPM installation that runs as night sets over the park before it closes. The content projected upon the castle is a 10-minute compilation of Disney themed animations and architecturally transformative videos. This consistently increasing exposure and the implementation of this fairly new type of video art has created a foothold for itself in the entertainment industry as a new tool to be used in the design for performances.

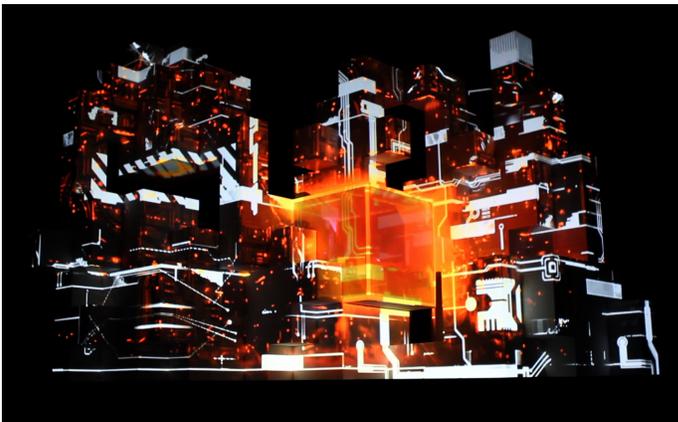


Illustration 10: Amon Tobin's ISAM set

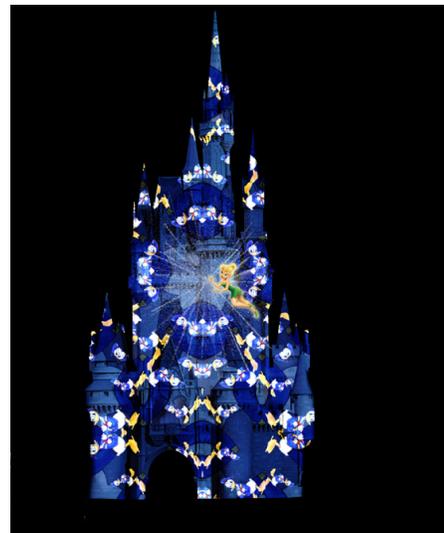


Illustration 11: Disney World's *Celebrate the Magic* Show

### **Chapter 3: Space and surface characteristics**

Spatial needs for video projections and the aesthetic characteristics of the projection surface are two very basic aspects of an AVPM installation, yet they are quite important in achieving a visible and accurate projection. The level freedom in surface selection amongst these projects was always limited, but on various levels. For the AAA Holiday Stroll, the projection surface had to be found inside of a two by eight block area along Congress Street in Austin, Texas. This was quite a large area to select an installation site, in comparison with the live music venue, Cheer-up Charlie's, whose stages are established in a specific location. For the projects utilizing AVPM techniques associated with this writing, the following criteria were found to be necessary in terms of space selection.

#### **Projection Surface Criteria**

The architectural aesthetic itself is the most influencing characteristics in the design of the content for AVPM. Architectural surfaces for an AVPM installation should have an adequate amount of open space to display narrative or visual content, yet this open space must be aesthetically balanced with architectural elements to integrate into the final content creation. With sparse architectural elements there is a possibility that content may appear flattened out. This may eliminate the transformative effect of the content projected on the architecture and render the surface as more of an architectural screen. With an insufficient amount of architectural elements to integrate with the content, there may not be much of an opportunity to create any type of animation that

visually changes the appearance of the architecture itself. Too many architectural elements may clutter the projection surface and limit the amount of content that can optimally be displayed to the audience. An abundance of windows may be an interesting surface architecturally, but with limited space between them it reduces the size or amount of content specifically unrelated to the architecture that can be presented.



Illustration 12: *Almost Invincible* space and surface detail

Various architectural characteristics of a projection surface for an AVPM installation can be used to enhance the transformative effect of the surface through video projection mapped upon it. These architectural characteristics are unique between various spaces. Those that were present in some the locations of the installations associated with this document involved window framing, pillars, archways, bricks patterns, pre-existing mural art and other decorative elements.



Illustration 13: AMOA space and surface detail

Surface pigment is an especially important characteristic to take notice of in the AVPM process. Surfaces with a lighter value are always more desirable as a projection surface due to their ability to reflect more of the visible light spectrum put out of video projectors. The value of brightness of the projection surfaces that were used in the described installations was a major consideration in space selection. The hue of the surface is also an important factor in space selection. In the case of some projects, multiple architectural surfaces were found that had interesting structural elements suited for video projection mapping, but issues with the pigment of the structure existed. The hues and saturation levels of the architectural surface of these potential spaces were deemed problematic for use in some of these particular AVPM installations. For example, some were constructed of bricks of a dark red color or were painted with darker colors over some of the facade. The higher saturation levels of these surfaces would

create issues in being able to project specific colors over it due to the additive nature of light mixing upon pigments of a surface. Certain pigment colors of a potential projection surface could mix with certain hues of light from the projection to create the appearance that the projected light is of another color, this could adversely affect the appearance of the colors for the final installation. This presence of saturated pigments also limits the ability to project certain colors over certain areas of the projection surface. Saturated surfaces also create an issue for projections when white is projected upon them. Rather than seeing the desired white that is displayed in the content, the white projections just reveal the true color of the surface. This may just create the effect that the projections are illuminating the surface, and not transforming it. The spaces that were selected for these projects all had the specific color characteristics of being uniformly lighter value and lower in saturation to avoid any color mixing issues.

### **Spatial Criteria**

As with any installation with video projections involved, several crucial characteristics of the spaces are needed to be present. These are adequate darkness, control of local lighting, unobstructed field of projection, suitable positions for projector placement, and accessible audience viewing space.

Adequate darkness at the installation space is a property in any video projection installation that will provide for optimal image reflection off the projection surface. Ambient light from street lighting, stage lighting or house lights can adversely affect the quality of the projections in a major way. Control of any potential problematic lighting is

would be ideal, but is not always possible. A possible solution would be to increase the amount of lumens projected on the surface by using a more powerful projector or multiple projectors transmitting the same imagery.

It is also necessary to ensure that the field of projection is unobstructed by anything that can create a shadow over the surface. Some examples of obstructions that were encountered at potential spaces included trees, street lamps, interior ceiling rafters, lighting fixtures and P/A speakers. In the spaces used for these specific projects obstruction was minimal and had limited effect on the projections.

Another factor to be taken into account for an AVPM installation is the space for the audience to view the projections. There were multiple spaces that were not selected as an installation site because of complications with the viewing space. Though the other criteria had been met, the ideal viewing area had certain issues that prevented the viewer from seeing the surface clearly. Some of these issues included limited viewing space, visually obstructed space, and space located in inconvenient locations. This rendered the use of these spaces for installation an unacceptable, though their architectural aesthetic may have been of interest.

Projector positioning is a major factor in properly mapping a surface with projection. The positioning of the projector should ideally be centered laterally within the width of the projection surface. This will place the projector perpendicular from the center of the space where the image is to be projected. Height determination varies depending upon the image shifting capabilities of the specific projector being used. Based on the manufacturer specifications of many video projectors, the projector should

be positioned level with the top or bottom edge of the projection surface. These positioning factors are the ideal situation to reduce the amount of correction needed to be done in playback software to make the imagery fit accurately. Projection position is not always ideal in found space. Multiple locations in these projects were deemed unsuitable due to lack of accessible positions to place projectors.



Illustration 14: *Almost Invincible* Spatial reference photos

All of these spatial characteristics were taken into account before space selection was finalized for the AVPM installations mentioned in this document. These spatial qualities were essential in the proper installation of these projects. The absence of being able to meet just one of these needs could be detrimental to the success of an AVPM installation.

## **Chapter 4: Video projection specifications**

Spatial aspects are also associated with the selection of video projectors for an AVPM installation. The potential positions to place projectors within any space will generally dictate projector selection. The throw distance between the video projector and projection surface is a very important factor in projector selection. Taking into account the parameters of the space, the selection of projector is based on the lens specifications, native aspect ratio, and lumen output needed for a particular project. To fit the image upon the surface as efficiently as possible, specific lens specifications are needed. With the proper projector specifications met for use in a particular space, minimal correction should be needed to map content to the projection surface in the playback software.

The proportional size of the projected surface was also conducive in the selection of a projector. Awareness of the width to height ratio of the projection surface was always a factor in determining the ideal projector to use for efficiently covering it with video. Ideally the surface width to height ratio would be as close to that of the common video aspect ratios, like 4:3, 16:9 and 16:10. In the assessment of the projection surfaces and spaces for these installations, there was always an investigation into the relationship between the width and height dimensions of the projection surface to the native aspect ratios of the available projectors.

These factors involving ideal lens selection and ideal aspect ratio were taken into account to ensure that a projection surface is covered as efficiently as possible. When projecting video upon surfaces other than video screens it ideal to project as many pixels as possible upon it. The objective in proper projector selection is to cover the surface

adequately with a minimal amount of spill or unused pixels projected. The spill of projection beyond the area to display content reduces the amount of lumens per square foot projected upon the surface and reduces the resolution actually being projected on the surface. This reduces the perceived brightness and definition of the video projections that the audience will see. As much as these ideal projector specifications were measured and taken into account, all of the projector determinations for the specific projects were made primarily based on projector availability. The projector selected for each installation was selected for use because they were as close to the ideal as possible. These selections were limited to availability in a stock of university supplied, privately owned and commercial rental video equipment.

## **Chapter 5: Physical space survey**

Once the surfaces in the space and projection needs were considered to be adequate for video projection, a spatial survey was needed to create a scale representation of the building. Using a laser distance-measuring tool, key measurements were taken to establish reference points throughout the architecture of the surface and aid in the creation of a scale animation template. These key reference points were selected based that they were visually identifiable in a photograph and provided measureable architectural points on the projection surface to measure between. Some key dimensions necessary were the width and height of the general projection surface, dimensions of doors, archways and windows, and distances between various architectural elements throughout the surface. During the spatial survey process measuring distances between key architectural reference points proved to be very effective in establishing their location in the drafting and insuring that the final content would fit as planned over the projection surface. Extra redundancy in taking measurements through the survey process was always practiced to insure that they were correct and accurate.

### **Space photography**

At the time of the space survey, photos of the space are taken from various positions help assess the spatial aspects in further detail. A key reference photo is also taken from the point of view of the video projector. This photo is essential to create a scale animation template. One of the advantages in the use of digital photographic reference in creation of a scale animation template is that the architectural characteristics

of the surface are easily definable. This is useful in the content creation process in visually identifying the architecturally interesting parts of the surface to animate upon, like the bricks and mortar of an archway. The use of photographic reference also makes it possible to conceptualize how to frame content within defined areas of the architectural characteristics.

## Chapter 6: Digital drafting of the projection surface

The process of determining absolute or relative locations of points in space by the measurement of distances is known as trilateration. This geometric process of locating points in space was the basis for the method in recording measurements in all of the installation spaces. Distances between architectural elements and absolute reference points were all used in determining scale and sizes of less accessible or immeasurable aspects of the architecture. After the space survey was complete, a scale drawing of the projection surface and its key reference points was drawn using computer aided drafting (CAD) software. This drawing was built using the notes and measurements taken on the physical survey of the space. The drawing included measurements between the select architectural points and established points of reference throughout the architecture of the surface. Next in the process this scale drawing is used, in combination with the reference photography, to start the creation of a scale animation template.

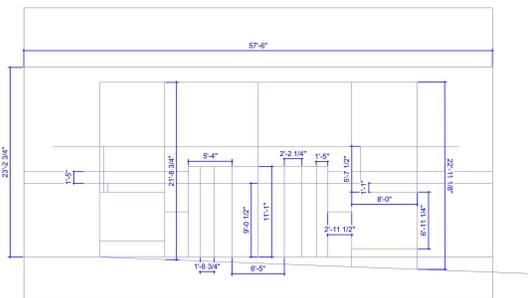


Illustration 15: *Almost Invincible* drafting

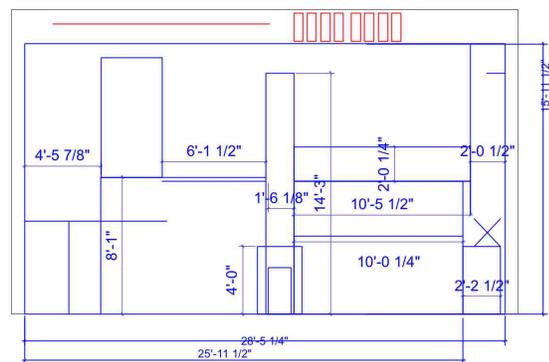


Illustration 16: AMOA drafting



## Chapter 7: Photo manipulation and animation template creation

Using photo manipulation software, the scale drawing and the key reference photograph are imported into the same workspace. This scale drawing was then layered over the digital photograph of the projection surface taken from the position of the video projector to be used in the project. The photograph was distorted in the photo manipulation software to fit within the scale drawing created in CAD software and also corrected to eliminate the effects of lens distortion created by the camera. The goal in distorting the photo of the projection surface is to align it with the established points of reference in the CAD drawing is to create a photographic scale elevation. Another layer is then drawn over the flattened photograph to create the actual scale animation template to be used in the content creation process. The animation template is now ready to be exported in the proper format and resolution for use in content creation. This template will generally define and partition the various areas to layer animations upon the architecture of the projection surface.



Illustration 19: AMOA photo with scale drawing layered upon it

Illustration 20: AMOA photo distorted to match scale drawing



Illustration 21: *Almost Invincible* photo with scale Drawing layered upon it



Illustration 22: *Almost Invincible* photo distorted to match scale drawing



Illustration 23: Cheer-up Charlie's photo with drawing layered upon it



Illustration 24: Cheer-up Charlie's photo distorted to match scale drawing

## Chapter 8: Animation and content creation

The animation and content creation process begins at the completion of the scale animation template. The scale animation template image is imported into animation software to act as a guide to generate content within. It is important to maintain consistent positioning of this template in the animations between scenes or animation files. This maintains that the animations will be consistently projected as expected upon the building. The first file I usually create is a test pattern to be used in any projection test fitting. Before the animation process gets too in depth, the test pattern image can be projected upon the surface with the same projector from the same projection position to ensure that the animations and mapping will correctly fit as planned. This step in the process of all of the described installations was not possible, due to budgetary and technical issues. Accessibility to rental projectors without additional cost, electrical power access in site-specific locations and use of spaces during regular business hours were all factors in the inability to test fit projections over the surface prior to the animation process. However, the steps taken to build an accurate scale drawing of the projection surfaces all proved to be successful upon the final installation.

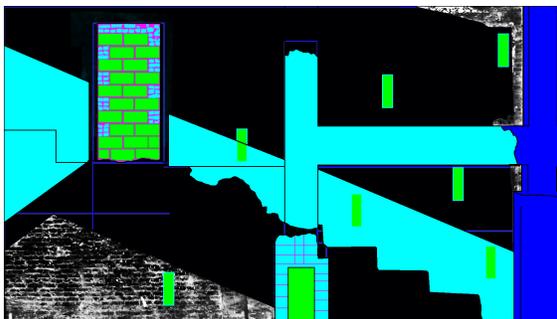


Illustration 25: AMOA animation template



Illustration 26: AMOA animation screenshot



Illustration 27: *Almost Invincible* template



Illustration 28: *Almost Invincible* animation screenshot

These projects all required the used of various animation techniques and methods. Some content was original animation, while others involved the integration of video footage or photographic images in the final projections. Each of the projects described all had specific motivations and reasoning behind how the content was created and what the final aesthetic was. All of these installations utilized the same method of space surveying and creation of a scale representation of the projection surface. In each individual installation this method proved to be successful in projecting the content accurately and as predicted.

## **Chapter 9: Project Installation**

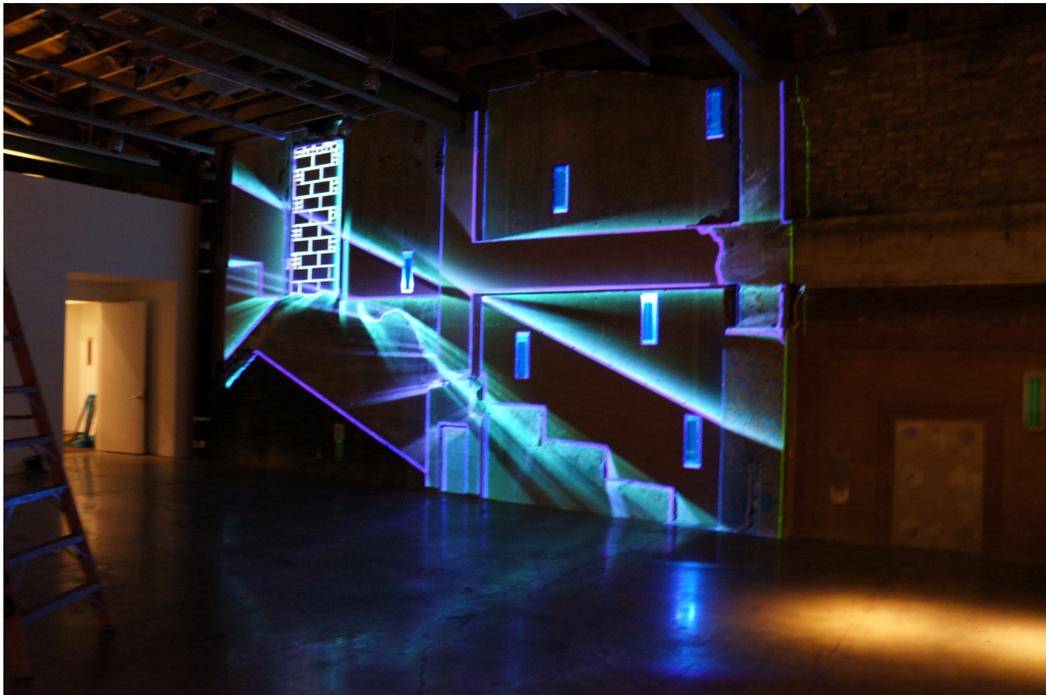
All of these installations required only one projector per projection surface to be presented. Each was played back through software on a laptop computer. The only important specification of the video playback software used in this process was the capability to distort the projected imagery to make fine tuned adjustments to properly fit the content over the architecture. Scale animations theoretically should fit precisely upon the architectural surface with ideal projector placement, which is not always necessarily available. The projection playback software must be equipped with a distort tool that can independently stretch the four corners of video content to desired positions on a projection surface. The ability to adjust the geometry of the content over the surface more accurately through software can help to correct some issues involving less than ideal projector placement.

## **Chapter 10: Conclusion**

The practical use of the methods described in the creation process of these projects was found to be the most valuable and rewarding aspect of the process. Between the different projects much insight was gained into the relationship between geometry, space and projection surfaces. These projects have also help to develop a better recognition of aesthetically interesting projection surfaces. It has also given me the opportunity to create animations for architecture of varying complexity. This has aided in the assessment of how much time is needed create an AVPM installation. The accuracy and consistency of this method in projection mapping has reassured me that it can be implemented again in similar projects.

It is now my interest to integrate 3-D animations to projects that I expect to be remounted using the existing animation templates associated with this projection surface mapping method. I am also interested in experimenting with using the same principles of trilateration to create animations designed to fit upon more complex surfaces. Surfaces with more spatial depth are particularly challenging to accurately projection on. These are inherently susceptible to increased image distortion. I am interested in exploring how the photographic and spatial surveying methods could be used or adapted to aid in the creation of accurate projections upon more dimensional surfaces.

**Appendix A: Photos of Final Installation at Austin Museum of Art**



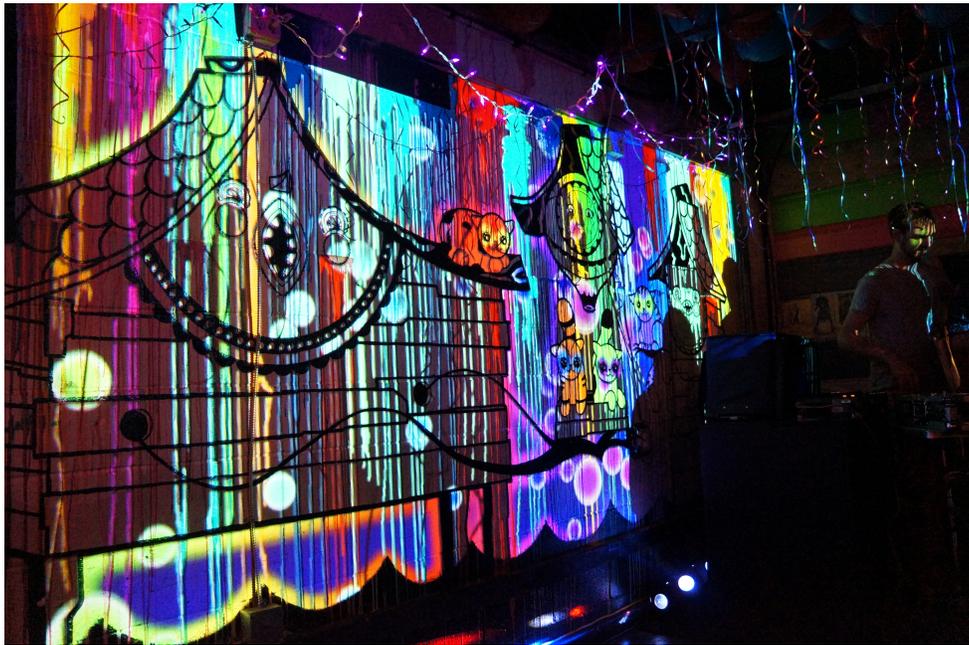
**Appendix B: Photos of Final Installation of *Almost Invincible***



**Appendix C: Photos of Final Installation of the Holiday Stroll**

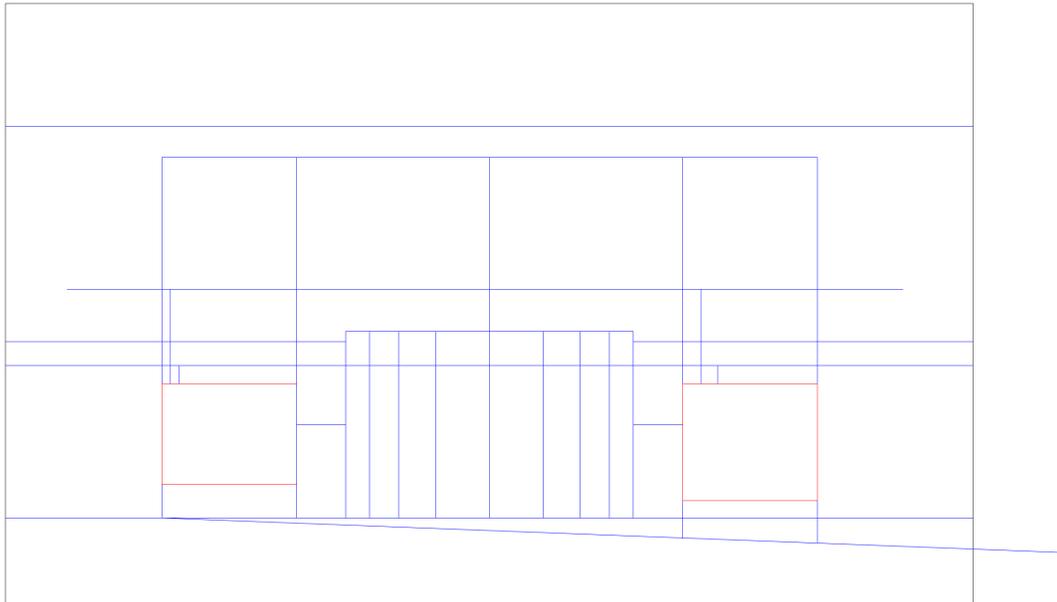
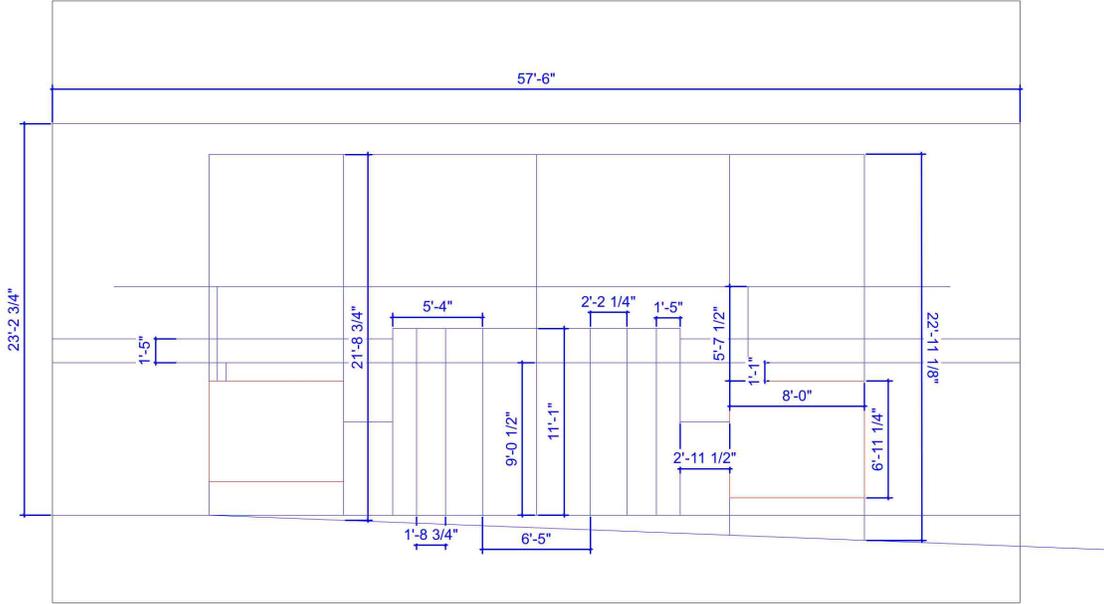


**Appendix D: Photos of Final Installation at Cheer Up Charlie's**

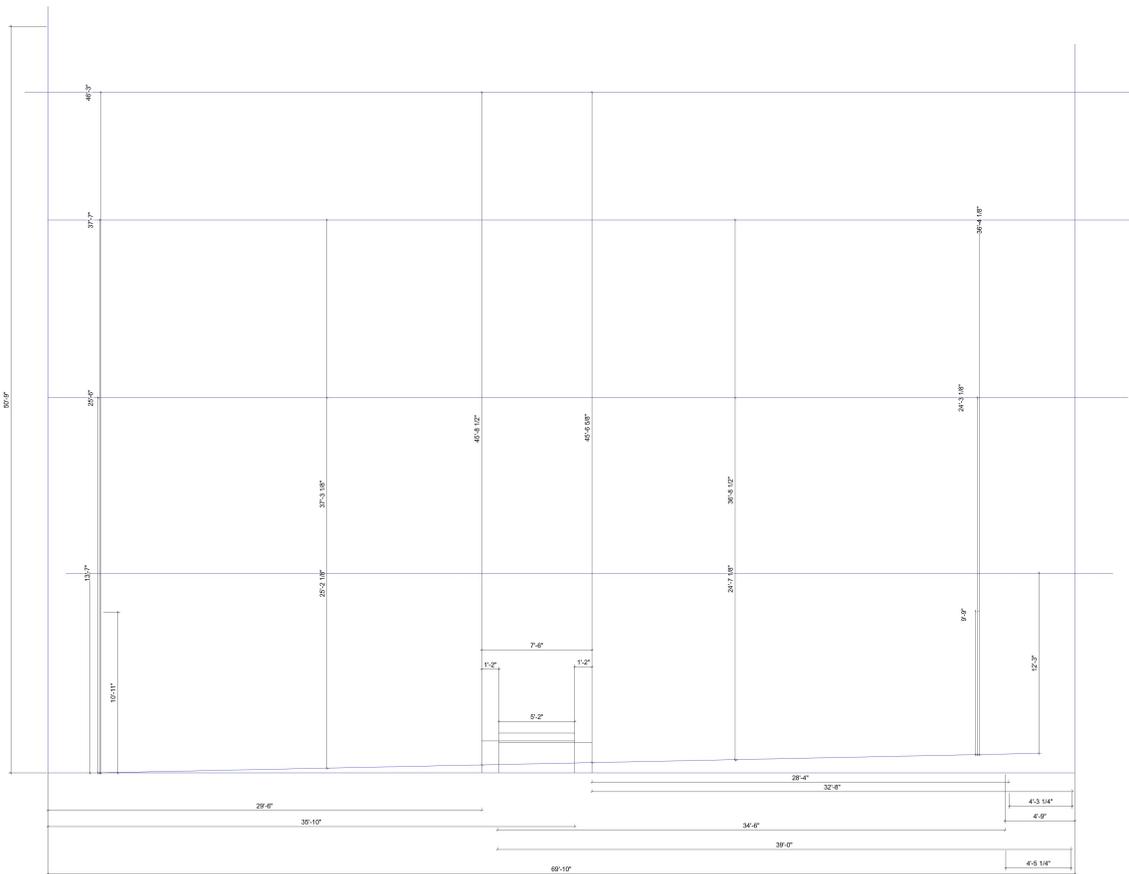




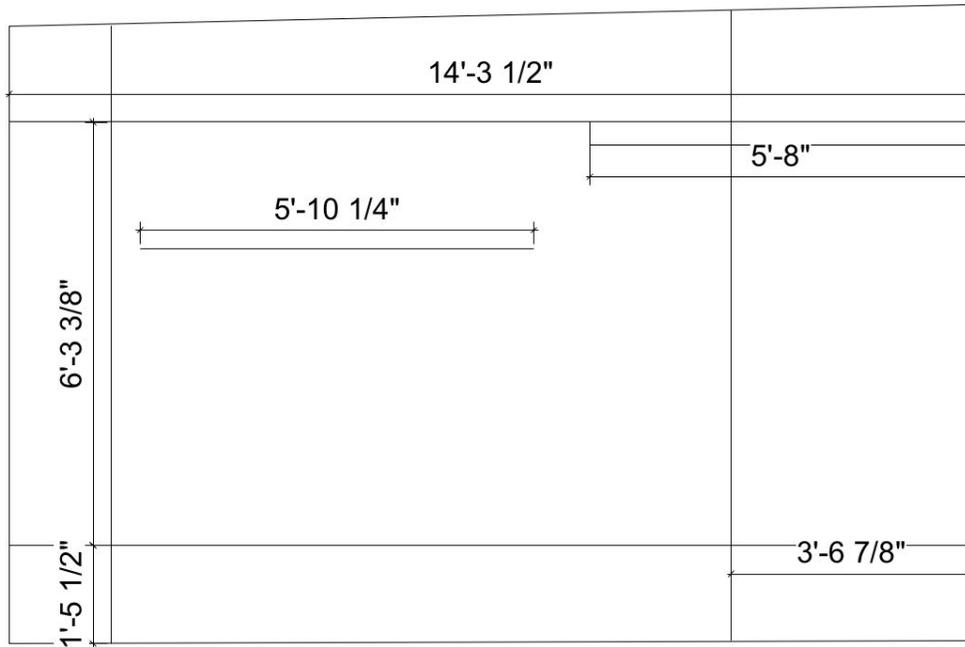
## Appendix F: *Almost Invincible* - Space Survey Drafting



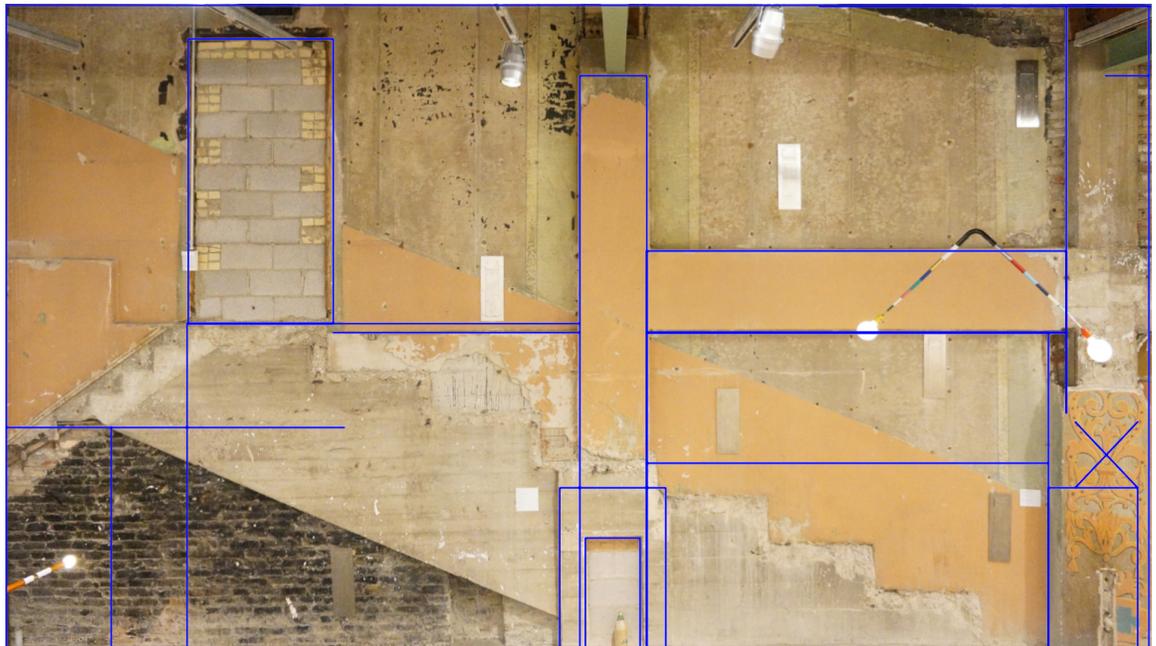
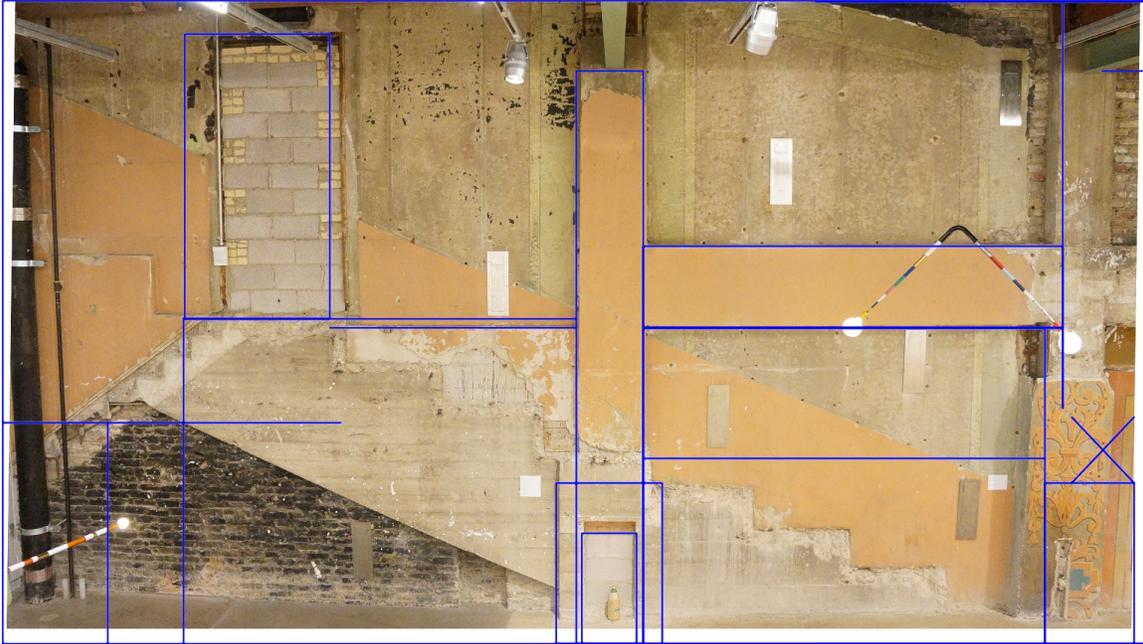
# Appendix G: Art Alliance Austin Holiday Stroll - Space Survey Drafting- Sampson Building



## Appendix H: Cheer Up Charlie's Inside Stage - Space Survey Drafting



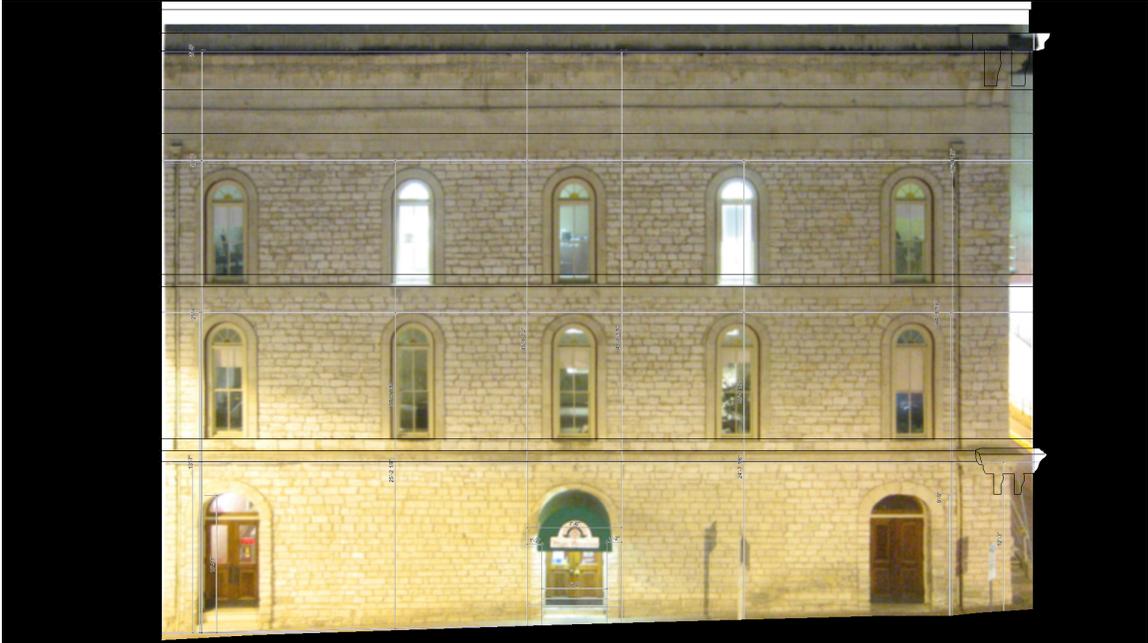
**Appendix I: Austin Museum of Art – Drafting Overlaid on Projection Surface.**



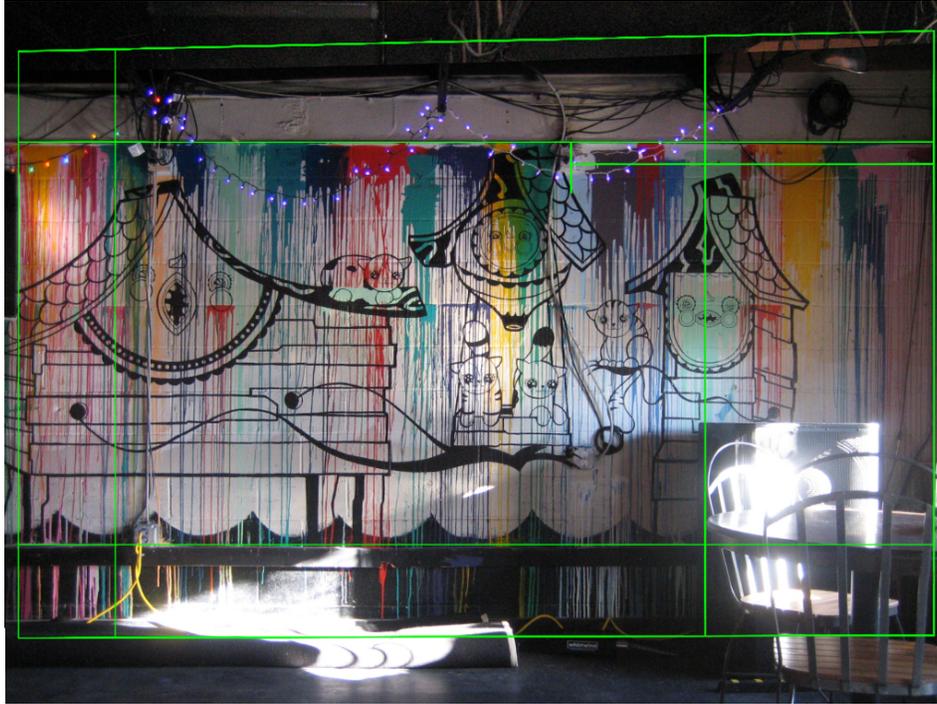
**Appendix J: *Almost Invincible* – Drafting Overlaid on Projection Surface.**



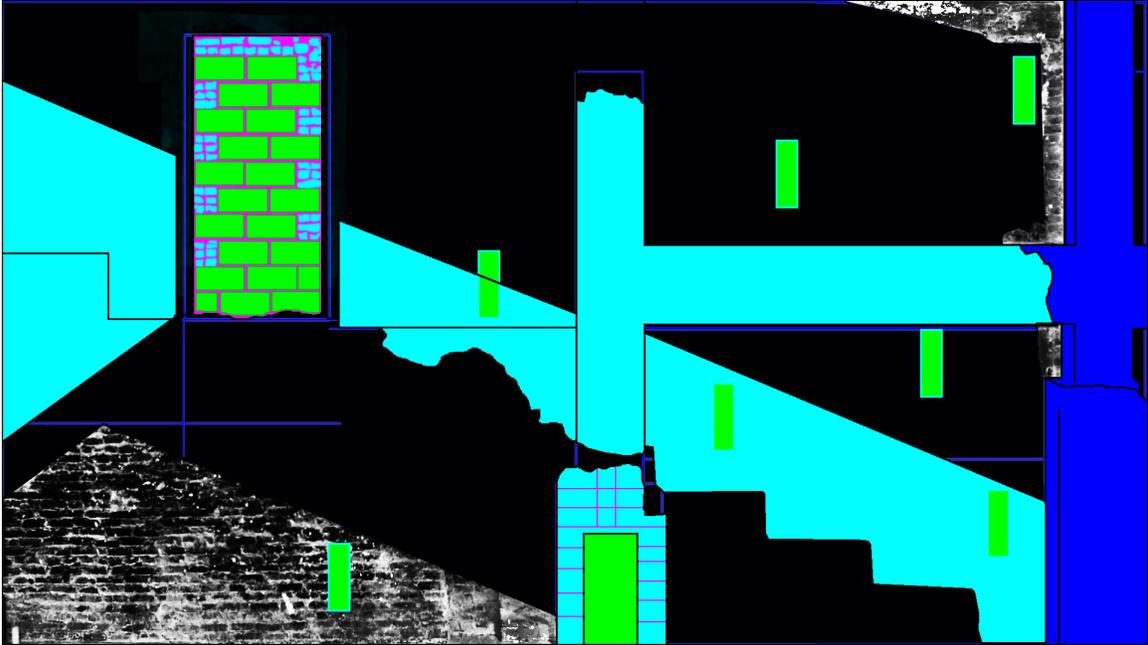
**Appendix K: Sampson Building - Art Alliance Austin Holiday Stroll –  
Drafting Overlaid on Projection Surface.**



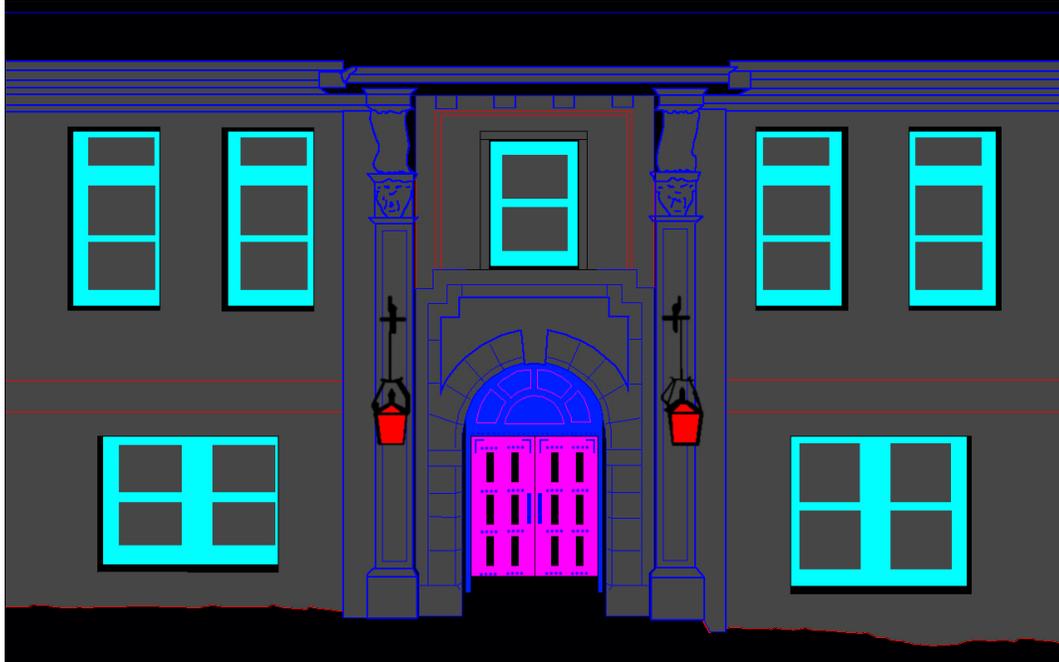
**Appendix L: Cheer Up Charlie's – Drafting Overlaid on Projection Surface.**



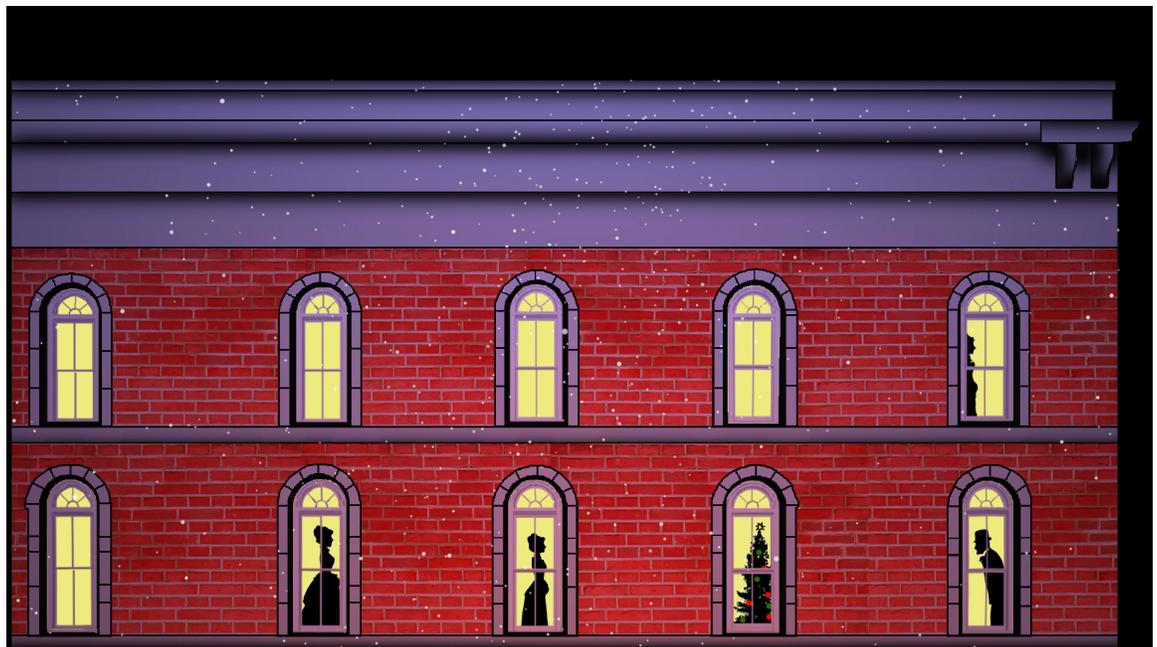
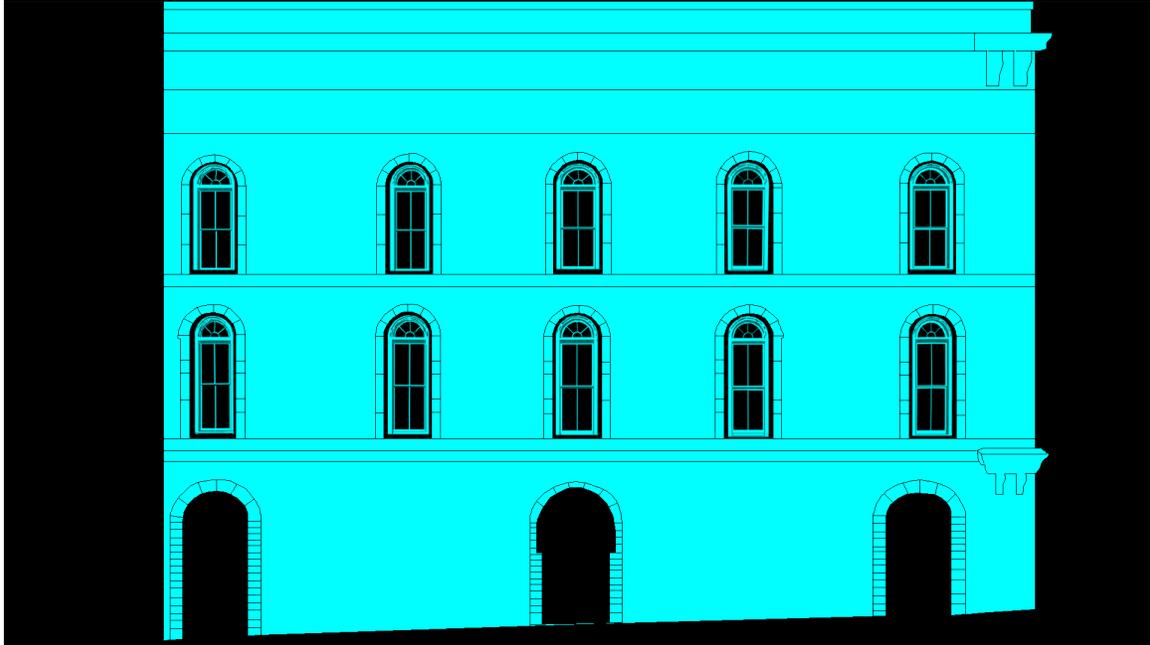
**Appendix M: Austin Museum of Art – Animation Template and Animation Screen Shot**



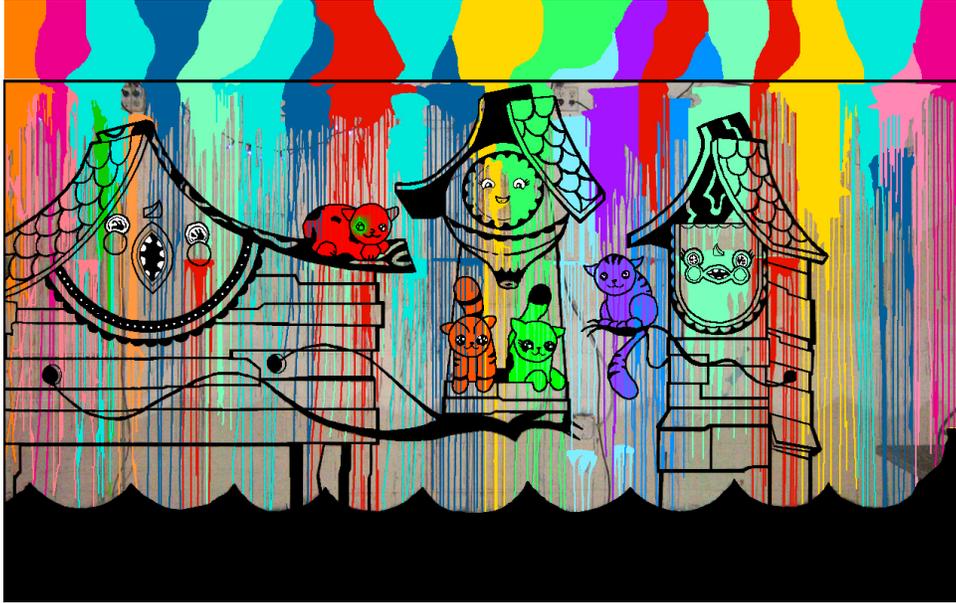
Appendix N: *Almost Invincible* – Animation Template and Animation Screen Shot



**Appendix O: Sampson Building - Art Alliance Austin Holiday Stroll - Animation Template and Animation Screen Shot**



**Appendix P: Cheer Up Charlie's – Animation Template and Animation Screen Shot**



Almost Invincible

A Musical By Joseph Dailey

ACT I  
SCENE I

Lights up on the city of Hopington. Projected is a bustling city. Two news anchors stand on either side of our stage. The citizens adorn the streets: street sweeping, selling food, enjoying the city, and the like.

ENSEMBLE

*Hello!*  
*Hi!*  
*What is up?*  
*Tell me what is good with you!*  
*It's such a beautiful day!*

*Hello!*  
*Hi!*  
*What is up?*  
*Tell me what is good with you!*  
*It's such a beautiful day!*

*Hello!*  
*Hi!*  
*What is up?*  
*Tell me what is good with you!*  
*It's such a beautiful day!*

BRUCE  
Hello City of Hopington! I'm Bruce Steel.

SUZANNE  
And I'm Suzanne Parks. Thanks a lot for tuning in to your only station for the news, WGAS 12.

BRUCE  
*It's a beautiful day in the middle of nowhere*  
*And there's not a cloud in sight.*  
*And to tell you the truth, I know that you don't care*  
*but I'm gonna get trashed tonight.*

SUZANNE

ENSEMBLE  
*Hello! Hi! What is up?*

*Tell me what is good*  
*with you? It's such a*  
*beautiful day!*

ENSEMBLE  
*Not a cloud in sight!*

*Tonight! Tonight!*

*I spent four years in some stupid college  
and I'm still in a pile of debt.*

ENSEMBLE  
*Four wonderful years!*

BRUCE  
*That's right.  
Four years of useless knowledge  
and it hasn't paid off yet.*

CITIZEN 1  
*Ye-*

SUZANNE  
*So tell me, what are you waiting for?  
Are you just trying to kill time?*

BRUCE  
*Do you want us to tell you to lock your doors,  
due to a recent rise in crime?*

SUZANNE AND BRUCE  
*Because the news never changes,  
there's no point to us at all.  
Only time re-arranges  
and we'll still be here next fall.  
There's no story for the ages.  
I'm sure anyone would agree.  
That we've yet to say something important  
and you're still watching T.V.*

ENSEMBLE  
*News never changes.  
News never changes.  
Oooo, oooo, ooo.*

BRUCE  
*Do you really think anyone is paying attention?*

SUZANNE  
*I'm pretty sure I just saw someone leave.  
(To alleged audience member leaving)  
Go to hell!*

SUZANNE  
*Wow! You're still tuned in.  
Tell us, what is it you wanna know?*

ENSEMBLE  
*Whoa, whoa, whoa, whoa!*

BRUCE  
*There's nothing going on in Hopington.  
Unless you like to watch grass grow.*

ENSEMBLE  
*Watch that green grass grow!*

SUZANNE

*In case you were wondering,  
your team didn't win the game.*

CITIZEN 4  
*Goddammit!*

BRUCE

*Really, think about it,  
there's always a fifty percent chance of rain.  
It will or it won't.*

SUZANNE AND BRUCE

*And the news never changes.  
We're all criminals at some point in time.  
There's a fire and a robbery  
and somebody's bound to lose their mind.  
The only thing that's strange is,  
we've got a hero in our town.  
And everybody feels so safe because  
he's always been around.*

ENSEMBLE

*News never changes.  
News never changes.  
Oooo, oooo, ooo.*

SUZANNE

*Hollywood's become a circus.  
Some celebrity just flipped their lid.*

BRUCE

*A brand new drug just surfaced,  
and it's bound to destroy your kids.*

SUZANNE

*A nation is in mourning  
for someone they'll soon forget.*

BRUCE

*Someone was killed this morning  
and the law doesn't give a shit.*

SUZANNE and BRUCE

*Because the news never changes.  
Someone's rich and someone's poor.  
And a brand new war wages  
that we don't want to fight anymore.  
But our city's flawless,  
No big scandals to relay.  
Just another perfect day in Hopington*

ENSEMBLE

*Hello. Hi! What is up? Tell me how  
are you today? It's such a beautiful day!  
Hello. Hi! What is up? Tell me how  
are you today? It's such a beautiful day!  
Hello. Hi! What is up? Tell me how  
are you today? It's such a beautiful day!*

*So have a pleasant fucking day.*

SUZANNE

Let's get the fuck out of here.

SCENE II

Lights and projections transport us to the laboratory of David Sellers.

DAVID

*Never have I felt this way  
As though it were the perfect day  
It's never felt so good to be alive*

*The sun is out, the weather's cool  
I feel almost invincible  
I couldn't ruin this day if I tried*

*Never did I feel  
Anything more real  
I have to say I have the perfect life  
I can't begin to understand  
How this ordinary man  
In this perfect world could know this perfect girl  
And get to call her wife*

MARY

*Never has it felt so sweet  
To lose the ground beneath my feet  
It's never felt so good to be in love  
And even if the sky were gray  
It wouldn't take our love away  
To me that's proof there's something up above*

*Never did I feel  
Anything more real  
I have to say I have the perfect life  
Nothing takes me high'r  
Your love still sets my soul on fire  
And takes me to another world  
Where there's no such thing as strife*

DAVID  
*Never did I feel so crazed  
I could hold you in my arms for days  
It's never felt so good to go so mad*

MARY  
*In seven months, just wait and see.  
We'll have the perfect family.*

DAVID  
*I can't believe I'll finally be a dad.*

BOTH  
*Never did I feel  
Anything more real  
I have to say I have the perfect life  
I don't know what I'd do  
If I did not have you*

DAVID  
*I don't know how I'd manage/*

MARY  
*You'd be fine.*

DAVID  
*I don't think I'd survive.*

MARY  
Let's go.

She kisses him.

DAVID  
Go?

MARY  
You're coming to *our* appointment with the obstetrician. You know, for *our* baby.

DAVID  
I'd love to Mary, but I can't stop right now. I almost have it.

MARY  
David.

DAVID

I have it this time. By this time next month, I may have developed a testable cure for muscular dystrophy. But that won't happen if I /stop.

MARY

Stop.  
You can't keep doing this.

DAVID

Working?

MARY

Putting your work first. You're a good man, David. I know how great you want to make this world, but it will not be at the expense of our child. I care about my work as much as you care about yours, but right now I'm putting that on the backburner. You need to do the same.

DAVID

What about on Saturday? If I work all day today and tomorrow, I may be able to simplify a way of triggering the methylation of the histone proteins-

MARY

Our anniversary's tomorrow.

DAVID

I'm a fucking idiot.

A beat.

MARY

I guess I'll see you whenever-

DAVID

Let me just finish up here tonight, and tomorrow, I'll come in early to collect some more data and begin a new cycle of tests. Come in at lunch and I'm yours for the next three days.

I'm trying.

Come on, Mary. We just had a nice moment.

She gives him a look.

MARY

You put too much pressure on yourself. You're a brilliant man. If anybody could have cured it before, it wouldn't be a thing anymore.

I miss you.

DAVID

I just want to change the world a little bit.

MARY

If you don't, maybe our son will.

DAVID

Our son?

MARY

I'll see you at home.

DAVID

I love you. So much. I'm sorry for being a jackass.

MARY

After ten years, I'd expect nothing less. I love you too.

Mary leaves.  
A gauge in the lab  
gets out of control.

DAVID

(Reacts to gauge)

Shit!

(To Mary)

Be safe.

SCENE III

A sweep up the height  
of the building. We are  
taken to the top. Mr.  
Righteous, noticeably  
a superhero, stands  
overlooking the city.  
He looks  
overwhelmed,  
overworked, and just  
plain broken.

(V.O) NEWSCASTER/ PREACHER/ CITIZEN 4

And the question remains. Who is Mr. Righteous, the man that has been Hopington's praised vigilante for over a decade? Worldwide, medical experts call him a medical marvel. A product of chance and rare genetic mutation.

(V.O) CITIZEN 3

He just took 'em out and the lady gave him a huge hug and said, "you saved my life." Never seen nothing like it. Guy's incredible.

MR. RIGHTEOUS

*I never feel as lonely  
As when I'm standing at the top  
Of this building. I can hear their cries  
For help. They never stop.  
I'm just another icon,  
Just another photo op.  
Who've I become?*

*I wish that I could leave this,  
Get a nice job at a desk.  
I no longer want to have to be  
This emblem on my chest.  
These strangers count me lucky.  
They see my curse and call me blessed  
I'm growing numb.*

*They call me hero  
When I don't want to be.  
They have taken  
So much from me.  
I gave you ten years  
how much more can you demand?  
I just want to be  
an ordinary man.*

(V.O) NEWSCASTER/ MAYOR

The building looks like it is about to collapse!

(V.O) CITIZENS

Look!/ Oh my God!/ Hey!

(V.O) NEWSCASTER/ MAYOR

A close call! Our hero does it again. Thank God for Mr. Righteous.

MR. RIGHTEOUS

*I hardly feel the crowbar*

*When it hits me in the arm.  
Science claims  
I'm not the same  
Things seldom do me harm  
I'm always waiting for disaster  
For the sound of the alarm.  
I'm doomed to defend.*

*I wish that I could quit this  
Act like I'm someone that I'm not.  
Meet somebody  
Start a family  
Give a normal life a shot.  
I only risk lives with relationships  
So these are only empty thoughts.  
When does this end?*

*They call me hero  
When I don't want to be.  
They have taken  
So damn much from me.  
I gave you ten years  
how much more can you demand?  
Don't want to clean up  
This world's mess.  
Just want to get  
a little rest.  
I just want to be  
an ordinary man.*

He's- (V.O) CITIZEN 1

Perfect. (V.O) CITIZEN 2

Flawless. (V.O) CITIZEN 3

Invincible. (V.O) CITIZEN 4

Whatever deity created me, MR. RIGHTEOUS

*Why did you curse me with this gift!?  
I'm the reason they believe  
That something good can still exist.  
It is only for these people that  
I feel I must persist.  
Even for me  
It's not easy  
I just want to be  
An Ordinary Man.*

SCENE IV

The sounds of alarms,  
fanfare, sirens, chaos.  
Impending distress building  
in an orchestral crescendo.  
Building and building and  
building and... Mr.  
Righteous leaves his post.  
Comic book cells: Chanting  
crowds, supporters signs,  
City Hall. Finally, we are in  
front of City Hall. Our  
cynical news anchors return  
to us in fine form.

BRUCE

Let's just get this story and get out.

SUZANNE

You don't have to tell me twice.

An over excited crowd  
member turns to Suzanne.

CITIZEN 2

Hey! You're Suzanne Parks from the news!

SUZANNE

Fuck off.

Crowd member slinks away.

BRUCE

People...

*Mr. Righteous!* CROWD

Hear that? BRUCE

*Mr. Righteous!* CHORUS

Sheep. Every one of them just another member of a flock. SUZANNE

Bruce grabs his right ear and listens intently.

BRUCE

Alright! Looks like we're on the air. Thank you for joining us on what is about to be declared "Mr. Righteous Day."

SUZANNE

That's correct. There are starving children in third-world countries but today, a man who has almost everything-

BRUCE

Superhuman strength, speed, the adoration of everyone -

SUZANNE

All due to a genetic fluke, will be getting a day in his honor.

*Mr. Righteous!* CROWD

Listen to that crowd. BRUCE

That's what superstardom sounds like. SUZANNE

*Mr. Righteous!* CROWD

Bruce walks over to the crowd.

BRUCE

Sir/Ma'am, you look like you want to be on T.V. Can you share with us why you're here?

CROWD

*Mr. Righteous!*

CITIZEN 1

*He's respectable. A servant to our city.*

CITIZEN 2

*I love his hair.*

CITIZEN 3

*He's so strong and mmm, mmm, mmm, he's just so pretty.*

CITIZEN 4

*I can trust this man to rid this town of crime, if we have any left at all.*

CROWD

*Mr. Righteous, is the savior of us all!*

SUZANNE

(Like a Sheep, looking directly at the audience)

Baaaaaa.

(Normal)

Let's talk to a couple of other-

CITIZEN 2

(Interrupting)

*I saw him fight a gang once. He didn't even get his hands dirty.*

CITIZEN 4

*He's in fantastic shape.*

CITIZEN 3

*I hear he just turned thirty.*

CITIZEN 1

*He saved me once. He pulled me from a ledge as I was just about to fall.*

CROWD

*Mr. Righteous, is the savior of us all!*

BRUCE

Enough of that. Let's hear a word from our mayor.

MAYOR

*Now the time has come to thank this man for what he's done for ten years, never failing to follow through. Let's hope that he won't retire. That he'll stick around and still inspire the people that call this town home too. Mr. Righteous, I dedicate this day to you.*

CROWD

*Mr. Righteous!*

MR. RIGHTEOUS

*You know, ten years ago, I never asked to be some praised hero. I did my best to help, to keep our city strong. It seems as though you need me now; that you believe that I am able to protect your town. It's been an honor to serve you for so long. Thank you for your kindness. Bless you, city of Hopington.*

Mr. Righteous reluctantly poses for a picture and smiles.

CROWD

*Mr. Righteous!*

CITIZEN 3

*I got a picture of him shaking hands!*

CROWD

*Mr. Righteous!*

CITIZEN 2

*This is the first time I've ever loved a man!*

CROWD

*Mr.-*

MAYOR

Mr. Righteous!

SCENE V

The Mayor points straight ahead. Mr. Righteous looks. Concerned, Mr. Righteous runs to help.

DAVID  
Mary! The heat is warping the door. Babe, I'm trying!

MARY  
David, please go!

DAVID  
I'm going to bust it down.

MARY  
I love you.

DAVID  
I love you too.  
(Frustrated)

Goddammit!  
MARY  
David, you need to go!

MR. RIGHTEOUS  
Get out of here.

DAVID  
My wife's in there. I have to- Honey, Mr. Righteous is here. He's going to save you, alright?

MR. RIGHTEOUS  
I can't do that.

MARY  
I love you! Please just go!

DAVID  
You're a fucking superhero!/  
MR. RIGHTEOUS

MR. RIGHTEOUS  
It's the backdraft. It'll kill us all.

DAVID  
Get the hell out of here. /Mary? Mary?!

MR. RIGHTEOUS  
Let's go./ You're going to get yourself killed.

Save him!

MARY

David tries to move past Mr. Righteous, but Mr. Righteous stops him.

Save her!

DAVID

MR. RIGHTEOUS  
I won't risk my life for someone I've never met. People die.

Mary!

DAVID

Mr. Righteous knocks out David. Drags him away. The crowd applauds Mr. Righteous.

*Mr. Righteous!*

CROWD

*That isn't me.*

MR. RIGHTEOUS

*Mr. Righteous!*

CROWD

*Is this what I was born to be?*

MR. RIGHTEOUS

*Mr. Righteous...*

CROWD

David regains consciousness as the crowd and Mr. Righteous leave.

Mary!?! Mary! Somebody, help!

DAVID

David looks around to find that he is alone.

DAVID

*Never did I feel this way  
As though it were the darkest day  
This is not at all the life that I dreamed of  
It never did occur to me  
In moments I'd lose everything  
I never thought I'd ever lose my love.*

SCENE VI

News Anchors stand in front of a black background.

SUZANNE

*In other news, the world is pleased  
Cause a dog learned how to water ski  
The Internet video has half a billion views.*

BRUCE

*In other news, we got to speak  
With the new star student of the week  
Her favorite subject's math and she likes to sing the blues*

BOTH

*They discontinued our favorite booze, in other news.*

BRUCE

*In other news, my wife left and took the kids  
She never said that it was anything that I did.  
I think she found someone else that she would rather screw.*

SUZANNE

*In other news, my car got repossessed  
And my girlfriend's under house arrest  
I had to walk to work and I ruined my new shoes.*

BOTH

*We feel like we are being used, in other news*

*It's these little news stories that I always hate  
Tell me where the fuck is my Watergate  
Now I'm sitting here thinking, "God, what would Kronkite do?"*

BOTH

*I was an intern. I paid my dues, in other news*

SUZANNE

*In other news, a doctor lost his wife  
Our hero couldn't save her life  
Guess there are still some things that supermen can't do*

BRUCE

*And now we'll send you to the scene  
To show you what is happening  
To witness someone's worst nightmare come true*

BOTH

*We'll take whatever dignity we've yet to lose, in other news.*

We are transported to the  
gravesite of Mary Sellers.

PREACHER

*We're gathered here today, they say,  
To pay our last respects  
To celebrate her life as she's preparing for the next*

*By a loving husband this young woman is survived  
Of a life of love and family, she is sadly now deprived*

The Lord is my shepherd; I shall not want.  
He maketh me to lie down in green pastures: he leadeth me beside still waters.  
He restoreth my soul: he leadeth me in the paths of righteousness.

PREACHER (cont.)

Yea, though I walk through the valley of the shadow of death,  
I will fear no evil: for thou art with me

David leaves the funeral as a  
choreographed umbrella dance  
underscores the speech of the  
priest.

SCENE VII

David enters his burned laboratory. It is a far cry from the scientific wonder that we saw in our introduction to the happy couple.

DAVID

*I walk into this room  
Where I hoped to heal the sick  
Now all I find is my burned lab coat  
And charred, discolored brick  
To think I used to call this place  
My future; it's a shame  
Still I wonder why tomorrow never came*

*Right here I learned the news  
Of a brand new baby boy  
It was there that I promised her a lifetime full of joy  
And I know he could have saved her life.  
I've only got that man to blame.  
Still I wonder why tomorrow never came.*

*Mary, can you hear me?  
There was nothing I could do.  
I hope that you'll forgive me  
The next time I see you.  
Now my death is cloaked as freedom  
And I'll never be the same  
Until I find out why tomorrow never came.*

*Still I wonder why tomorrow never came.*

*I'll save these people  
From this villain they applaud  
I'm gonna cure them  
Of this reckless, thankless fraud*

*I'll save these people  
From this villain they applaud  
I'm gonna cure them  
Of this reckless, thankless fraud*

MARY

*Please don't become something you're not  
This is the only life you've got  
They will destroy you and they can  
I loved a good man*

MARY

*Please don't become something you're not*

*This is the only life you've got  
They will destroy you and they can  
I loved a good man*

SCENE VIII

The Streets of Hopington. The city is in disarray. Flames and confusion paint the city's streets.

*Where did Mr. Righteous go?*

ENSEMBLE

*I don't give a fuck.*

BRUCE

*I don't want to know.*

SUZANNE

*But things are heating up in Hopington.*

SUZANNE and BRUCE

*A mad man burned a building down.*

BRUCE

*Righteous was nowhere to be found*

SUZANNE

*Now shit is getting real in Hopington*

SUZANNE and BRUCE

*So stay tuned in 'cause in our top story tonight  
Hopington is hopeless. There's no hero in our sight.*

SUZANNE and BRUCE

*With no one here to help us, will this be our bitter end?*

ENSEMBLE

*I guess you're gonna have to stay tuned in.*

SUZANNE and BRUCE

*Mr. Righteous, hear my call.*

CITIZEN 1

*Who will catch me when I fall?  
I don't know who to trust at all anymore.*

CITIZEN 2

*Mr. Righteous, can't you see  
Exactly what you've done to me?  
I offered all my love and you just tossed it on the floor!*

SUZANNE and BRUCE

*Stay tuned in cause in our top story tonight,*

SUZANNE, BRUCE, ENSEMBLE

*Hopington is hopeless, no one here to set things right.*

ENSEMBLE

*We loved you Mr. Righteous. Please return to us again.*

SUZANNE and BRUCE

*I guess you're gonna have to stay tuned in.*

CITIZEN 3

*Mr. Righteous, hear my plea.  
This is not how life's supposed to be.  
Without you here, I'll never find my way.*

PREACHER and MAYOR

*Now everyone must turn to me.  
A cruel dose of reality.*

PREACHER

*I'll bow my head and pray.*

MAYOR

*I gave you your own fucking day!*

DAVID

*Mary, I'll get his attention now  
I burned those empty buildings down  
And everyone will thank me when he's gone*

MARY

*I don't know if I know you anymore.*

DAVID

*I'll cure him first and then he'll see  
what it's like to be a man like me  
I'll destroy him in the name of Hopington.*

MARY

*You'll be fine, just wait and see  
If not for you, do it for me  
What happened to the man I knew before?*

SUZANNE and BRUCE

*So stay tuned in 'cause in our top story tonight  
Hopington is hopeless. There's no hero in our sight.  
With no one here to help us, will this be our bitter end?  
I guess you're gonna have to stay tuned in.*

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