architecture + music  music + architecture

a music center for recording, performing, and living where music creates architecture and architecture creates music
architecture + music
music + architecture

a music center
for recording,
performing,
and living
chicago, illinois

undergraduate architectural thesis
by Eric M. Sowers spring 1996
ball state university
college of architecture and planning
muncie, indiana 47304
I would like to thank Dr. Bruce Meyer, Dr. Edward Wolner, and all my fellow architectural thesis students for their criticism and support.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>2</td>
</tr>
<tr>
<td>Thesis Research Summary</td>
<td>3</td>
</tr>
<tr>
<td>Precedence Research</td>
<td>7</td>
</tr>
<tr>
<td>Research and Experiments</td>
<td>12</td>
</tr>
<tr>
<td>Thesis Program Overview</td>
<td>14</td>
</tr>
<tr>
<td>Site Analysis</td>
<td>17</td>
</tr>
<tr>
<td>Design Process</td>
<td>21</td>
</tr>
<tr>
<td>Conclusion</td>
<td>36</td>
</tr>
<tr>
<td>Bibliography</td>
<td>37</td>
</tr>
<tr>
<td>Appendix</td>
<td>39</td>
</tr>
</tbody>
</table>
How all's to one thing wrought!
The members, how they sit!
O what a tune the thought
Must be that financed it.

Nor angel insight can
Learn how the heart is hence:
Since all the make of man
Is law's indifference.

[Who shaped these walls has shewn
The music of his mind,
Made known, though thick through stone
What beauty beat behind.]

Not free in this because
His powers seemed free to play:
He swept what scope he was
To sweep and must obey.

Thought down his being's bent
like air he changed in choice,
That was an instrument
Which overvaulted voice.

What makes the man and what
The man within that makes:
Ask whom he serves or not
Serves and what side he takes.
For good grows wild and wide,
Has shades, is nowhere none;
But right must seek a side
And choose for chieftain one.

Therefore this masterhood,
This piece of perfect song,
This fault-not-found-with good
Is neither right nor wrong.

No more than red and blue,
No more than Re and Mi,
Or sweet the golden blue
That's built for by the bee.

[Who built these walls made known
The music of his mind,
Yet here he has but shewn
His rudera-rounded rind.
His brightest blooms lie there unblown,
His sweetest nectar hides behind.]

Gerard Manley Hopkins *On a Piece of Music*
"Creating architecture derived from musical patterns allows for the creation of formal and spacial structures best suited to musical related functions and expression of music itself."

This is the question I will try to prove through my thesis exploration, can architecture be created by concepts derived from organizational patterns found in music? Some people would argue yes while others would wholeheartedly so no. But, most individuals would agree that the similarities between architecture and music are numerous enough not to ignore them. My purpose for looking at architecture and music is more based on a personal interest in music. I enjoy music and felt this would be great way to learn about it.

Not only does music act as the main catalyst for design, it is also the focus of the programmatic functions found in this thesis project, which is a music center. My interest in music prompted me to create a place where all types of musicians may come to record, all provided at a low cost. The center is composed of three recording studios, three live performance spaces, a music library, a sphere of music, and 32 apartments. The purpose of this center is to provide starving musicians the proper equipment and facilities to communicate to the largest possible audience their unique music. Hopefully the center will allow new musicians the ability to express new and creative ideas with out the pressure of selling out to make money. This center is allowing the artist a chance to keep their music honest, individual expression is expected here.

To provide these services to the largest number of people possible, Chicago, Illinois was chosen as the project site. The actual site is located at the corner of Halsted and Webster street north of the downtown area. This site provides for the acceptance of diversity, easy accessibility, and, believe it or not, a large amount of open space. All of these factors are vital to the success of this center. The actual size of the center is 100,452 sq. ’ with an estimated total project cost of $7,694,623. See appendix A for a comprehensive look at the space square footages and building cost breakdown.

In the following pages the reader will be introduced to the process necessary to answer the thesis question posed at the beginning of this abstract. This information will encompass precedence studies, research, positions, objectives, programmatic requirements, design process, final design, and concluding remarks regarding the outcome of the thesis project.
For many years musicians, architects, and countless others have been interested in the similarities shared between architecture and music. More than once has a reference to “Architecture as Frozen Music” been made. Many architects, in fact, have used music or music theory to create architecture, while many musicians have used pieces of architecture to help create music. If one were to study architecture and music they would begin to understand the numerous connections shared between the two art forms. References to these connections are seen at the very foundation of architecture and music, the sharing of the same basic organizational principles defining their structure: rhythm, balance, proportion etc. Also, there is a connection seen in basic theories of mathematics and geometry, such as the golden section, which can be applied to the creation of both arts. It was Pythagoras and Plato, during classical Greek times, who were among the first to develop theories interweaving mathematics, geometry, music and architecture. During the Renaissance architectural theoreticians used music to help define architectural concepts. And until rather recent times it was felt to be a skilled architect one should also be schooled in the art of music. Although this connection seems quite strong and well understood, there are still individuals whom believe architecture should remain architecture and music. They do not believe in any great connection and feel architecture and music should remain void of each other.

I, personally, do believe in a connection between music and architecture and intend to explore this connection through my thesis project. But it is not the intention of this thesis project to attempt to persuade others to believe in a connection, between the two, nor is it to try to reinforce the connection itself. Simply, this project is an exploration into a field of personal interest, music. I am interested in music and feel this is a chance to start studying and learning more about it. I also feel that because of the close connections between music and architecture a positive relationship can be formed which can use the two to build off one another creating stronger conceptual ideas.

The thesis project on a conceptual level is using music to create architecture, while using architecture to conversely effects the creation of music. The intention of this integration is to create a more visually interesting, cognitively challenging project while retaining the capacity for good acoustic qualities. This will be done through the manipulation of several basic organizational structures of music. These organizational structures will be used to create architectural space and form. I believe this will accomplish several goals. First, it will allow me the opportunity to satisfy my interest in exploring music. Secondly, by using architecture and music I feel I can create a structure which bridges across the borders of culture and race to bring diverse individuals together. And lastly, I believe this will create a more visually interesting and expressive architectural form representative of music. This all will culminate to form the spaces and forms found in a proposed music center.
This music center is to provide services to those bands not able to afford studio time. If you were to look at any number of cities small or large, you would likely find the existence of what some refer to as an underground music scene. This music scene consists of individuals or groups interested in the creating and performing of their own styles of music, not that of the mainstream, and the followers who enjoy listening to this type of new music. Within this music scene there are of course varied levels of interest, ranging from those seeing music simple as a hobby and playing only a few times a month to those seriously dedicated to playing as often as possible. The majority of the people found in the underground fall somewhere in between these two extremes. There are not seriously considering any future or career in music they are just playing to play and express them selves through their music. But, on occasion you might wander into a group or individual with the talent and the will to struggle and survive until the day they get the break which propels them into stardom and fame.

Whatever the degree of commitment you find in these musicians, most never get the chance to play in front of a crowd let alone have the opportunity to be discovered. Most small towns just can’t support this sort of musical interest. They simply don’t have the resources such as places to perform or the followers to allow the band to succeed. While most small towns don’t have the resources for bands to survive most bands don’t have the economic resources to afford and travel to larger and try to survive. You have to wonder, with all the obstacles, how many talented musicians have never been able to nurture their talent because of lack of opportunity.

This is why I am creating a music center. I wanted to create a center capable of creating the opportunities of recording and performing most musicians don’t have and providing these services at very low cost. These are individuals or groups not yet in the mainstream of music. These are bands creating their own music representing their own creative artistic selves. This is music which has not been corrupted by money or the masses.

I have found once a band becomes popular and famous a lot of times they experience a change in the style of their music. Some people say this change is a maturing process others would call this “selling out”, what ever causes this change I don’t know, but the fact that it does occurs is rather interesting. I find I enjoy the earlier unpolished or raw first experiences of these musicians, before they go through the change, more then after. So I wanted to design a center which will take these bands and record their raw and individual sounds, and let them know that they don’t have to sell out to survive in the music world..
Maybe needing to change one's music style to survive will be done away with by this center. But, survival for these musicians or bands will still be the ability to gain as much exposure to the largest number of people as possible. This exposure can be obtained several ways. One is to play as often as possible and in front of as many people as possible. Secondly is the distribution of physical copies of their music to radio stations and stores to increase the bands' exposure to more people. Now this might be done at different scales from college radios stations and college supported music stores to large radio station and national chains of stores. But to accomplish at any level this distribution, bands need the ability to record their music onto either tape, vinyl, or C.D. Anyone of which takes a lot of money and the proper facilities to produce a quality album. And in the music world the physical sounding quality of a bands' work will make you or break you. If a band is not willing to spend the money to have a good album made they will not be taken seriously. Although this germinating seed was fed by one general music type, users served by the facility will represent a very diverse range of musical interest, from reggae to classical music from individual performers to orchestras, this center will serve all.

The purpose of this center is to provide the required services bands need to gain the exposure so important to their survival. These services will include renting recording studios so bands may produce their own albums at low cost to the bands. Performances spaces varying in sizes from 300 to 5000 people capacity will be incorporated into the center. The center will also integrate within itself apartments for rent by patrons of the center. These apartments will make it convenient to work in the recording studios at all hours of the day and also create a relaxed atmosphere used to unwind after a recording session.

The music center will be a place used for recording, performing live, making connections, and living. The purpose of the center is to provide the highest quality equipment and facilities at the lowest possible cost to the users. This will be done through several methods. The first will simply be the obtaining of money from large music corporations sponsoring the center. Secondly, the outdoor and large performing spaces will be used to draw in large name acts and use the revenue from ticket sales to
supplement the cost of the recording studio. Next, manufactures will donate equipment to the center in return for free advertisement. The cost of the living quarters will be self sufficient. After the center has established itself as a good quality place to record, artist with the ability to pay for studio time will start using the space and pay and possible donate money to the center. All of these methods along with grants from the endowments of the arts will allow the facility money to begin operation. Once the facility has gained a good reputation it will be able to support itself.

Once the thesis problem was established, a search for past projects and works containing some concepts similar to those being explored in this thesis was undertaken. This precedence research brought together information that was used to solve certain issues and helped create new ideas. The next pages are the resulting precedence study.
The Bad Animals Studio is located outside Seattle's downtown in an old brick warehouses.

The sweet spot is the location at which the engineer and producer sit during a recording session. At the Bad Animals Recording Studio this sweet spot is located at the prime position, in the middle of the control room. To create this sweet spot there is a wall of concrete with speakers embedded and focused right at the control board. This along with the sand-filled bass traps and helmholtz resonators are geared to creating a perfect balance of frequencies and tonalities at this one spot. All this creates an astonishing sense that the music has been liberated from the instrument.

The Bad Animal Studio demonstration a good combination of architecture and technology needed to produce studios with good acoustic characteristics. To achieve this desired sound all excess or stray sound form both inside and outside the studio must be eliminated. This is done in the Bad Animals Studio by several construction techniques. The first step is to completely isolate all spaces in the studio from each other. Which is done by creating spaces within spaces or boxes within boxes. Separate boxes are created by pouring one base slab and then pouring individual slabs for each space. These secondary slabs should be separated by 2 in. of rubber. Each individual slab has its own shell walls. Shell walls are stud walls covered in drywall, acoustically rated sound board and 1/2 in. plywood. To complete the room separation the ceilings of the spaces are connected to the shell walls and not the structure of the building. The acoustic sound achieved in this studio is bright and hard.
because that is what most rock artists prefer. To create spaces with less reverberation time there are isolation booths provided. To achieve this bright hard sound a lot of wood is used. To try to integrate the natural look of the wood with technology the architects gave the wood a cleaner crisper appearance. The expressive forms within the studio is not derived entirely from acoustic or architectural needs, but the combination of the two.

View from control room into main recording Studio.

Longitudinal section cut showing control room relation to recording studio.
The Stretto House in Texas by Steven Holl is an examination of a specific site as much as a theoretical study in which disciplines outside architecture, in this case music, impinge, says Architectural Record.

The structure was designed around the idea of "flowing." Holl wanted to address the site with its four ponds and dams. Holl says he has always been interested in links between architecture and music. "The idea of water overlapping in space is analogous to a condition in music called Stretto, where one set of melodies or tones overlaps another, like a fugue." this house was designed around a musical piece by Bartok Music for Strings, Percussion, and Celeste. Bartok composed according to the Golden Section, and combined Modern and Archaic form. The home is not a direct analogy of the music but many similarities do occur.

Bartok’s composition is in four movements with distinctions of heavy (percussion) and light (strings). The home is broken up into four sections each consisting of two parts: heavy orthogonal masonry and light curvilinear metal. The floor plan is strictly orthogonal while the section contains curvilinear forms. This represents his combination of modern and archaic forms. lastly, the guest house is based on a music principle of a retrograde row, this is the playing of a set of notes upside down and backwards. The plan of the guest house is curvilinear while the section is orthogonal, an inversion of the main house.

Although the house is not a direct analogy of music. It demonstrates one way to interpret music and architecture.
Metropolis Studios are located in an old power station used to drive trains in London. This studio space is intriguing in the mixed use approach taken by the architects. The building combines five recording studio/mixing rooms, recreation and leisure spaces, a bar/restaurant, office space, and 19 apartments into one building envelop. To separate all of these different functions acoustically the architects created several boxes with in a box.

Also technology was not the main driving force, as it usually is, in the design of recording studios. In this project there was a great deal of integration of technology and architecture. This integration creates an interest feel of old and new, with an interior which seems high tech and archaic but all contained within a honest straight forward structure. This project shows me that integrating different functions into a recording studio is possible and gives me ideas of what can and has been done.
y-condition

by:

elizabeth

What is interesting about this project is that it is a graphic representation of music. The piece is based on the sets and ordering procedures in minimal music.

To help understand this project a little knowledge of minimal music is needed. Elizabeth Martin says minimal music is composed in such a way as to deny hierarchic structures and patterning resulting in a succession of events rather than a progression of events. She says, traditional music is linear, having a beginning and an end similar to those of a classical novel. Minimal music creates a cyclical experience much like that of a factory: repetition of a product being made. Minimal music focuses on repetitive cycles where the basic form is repeated and where smaller units with different rhythm are added.

The music was represented by graphically drawing it out, one square equals one eighth note, within a range of forty-five notes. "Symbols were assigned to various modes of articulation and a simple set of rhythmic cells were created, connected by lines of chord members and successive noted at the same dynamic level to complete the structure".

This process was then used to create a structure. I don't understand all the process and some of the terminology yet but the overlapping of elements, rhythms, connections, and process of interpreting music in 3 D is very interesting and related to what I would like to accomplish in my thesis.
research and experiments

Research concerning The thesis project was actually begone before the thesis program and design process were started. Prior to the beginning of the thesis project several experiments were undertaken which helped the defining and understanding of particular areas of the thesis project.

The first project relating to my thesis exploration was the design of an Opera House. Although, a connection between an Opera House and my purposed music center is limited it did create the need to begin the study of some basic principal s of acoustics and spacial relationships. The acoustic information acquired during this project was latter applied to the design of the centers performance spaces and recording studios. Also the programmatic and spacial relationships developed during the opera house project were helpful in the designing of spaces catering to live performances, as are seen in the music center.

Next, I undertook a photography project with the intentions of photographing rhythms. I wanted to look both in nature and in architecture for rhythms. The reasoning for this was to begin looking for different types of rhythms in locations and in ways not normally observed. I believe this exercise made me look at my thesis project from a different point of view, which helped to open my mind to different solutions.

Along with the above mentioned projects a precedence research was undertaken, and mentioned in the previous few pages. With this precedence established and a direction for which I would proceed more nailed down it became time to start thinking about obtaining the knowledge I would need to better understand music. You see the little knowledge of music I did poses was comprised of band names, songs they created, and what types of music I liked. Unfortunately, being able to read music, understand music or being able to play an instrument was not part of the knowledge I possessed. Knowing what I did not know I start to try and get a handle on the basics of music and music theory. To begin this needed quest for knowledge a compilation of books on music and music theory were read.
Although, these books did start the learning process a lot of information was still missing and unobtainable through readings. To counter this situation a decision was made, I needed, and wanted, to learn how to play an instrument. With the help of a fellow student, whom had a rather rounded understanding of music, I began teaching myself to play the piano. What was so helpful about this approach to learning was that it made me look at the very basic fundamentals of an art I was trying to dive right into the middle of, with little success. By starting at the beginning musical concepts and theories were more easily understood and learned. It also created an interest or hobby which will last a life time.

With the understanding of music beginning to take shape I also needed to focus some attention toward the understanding of the functional side of recording studios and acoustics. Again, books where the beginning of my search into this unknown. Several books dealing directly with the creation of recording studios were found, but it was the actual visitation to a studio which produced the greatest amount of knowledge and understanding needed to design these complex spaces. Over the course of this thesis project I read as much as I could concerning recording studios, music, acoustics, and equipment. Unfortunately, I was only able to scratch the service of this industry and art. What I was able to comprehend helped, tremendously, my design and increased my interest of music and its associated fields.
thesis program overview

My thesis project conceptually is an exploration into the creation of architecture from music. The thesis program is to be used as a guideline for the projects physical and functional requirements which are born out of the conceptual exploration of music and architecture. In this project that manifestation is a music center. The programmatic functions making up this center are three independent recording and mixing studios, two apartment blocks, able to house up to 48 musicians, three various sized performance spaces, a music library, the inter connecting circulation system, and various exterior spaces. The entire complex occupies an area of 480' x 650' on a site located in Chicago, Illinois. The actually square footage of the center is 100,452 square feet at an estimated cost of $7,694,623.

The thesis program also gives an in depth look at all spaces included in the music center. Within each space, the program addresses issues concerning design criteria, users, activities, primary relationships to other spaces, furnishings and equipment, lighting, design criteria: thermal, acoustics, materials, and square footage. These criteria are based off of the overall programmatic design philosophy as established by the program, which are stated below.

The purpose of the thesis is to explore the creation of architecture from music. The center will be a place where architecture and music physically come together to create spaces and forms. I want the music to effect the creation of architecture while architecture is effecting the creation of music. This will be done by using concepts found in music to derive architecture, some of which could be patterns rhythms, time etc. The facades of the center will reflect music through positive and negative spaces create rhythmic patterns. Because of the different types of music heard at the center there will be a combination of many musical concepts all of which will be brought together to form one balanced and united element.

users:
The goal of this facility is to provide services to as many people as possible, with focus on individuals laking the money necessary to rent recording time in most studios. Along with recording, individuals using the center will have the opportunity to perform live in various settings and will be able to live in apartments incorporated into the center. Although, the focus is on those who can not afford these services bands of all levels of success will use the center.

Bands or individual musicians from all over the Midwest and nation will come to the center to use its primary function the recording studios. These individuals will also be able to use the technology in the music library to make connections with large label recording companies. The majority of the bands which use the center will stay within the apartments of the center. These apartments will make it much more convenient for them to record during all hours of the day. To provide technical services for recording music engineers and producers will also use the center. They will be in charge of the recording sessions and will likely be musicians themselves.

One goal of the center is to provide educational experiences for students, particularly the High school located just south of the site. There will be an outreach program which brings in students and people interested in learning about music engineering. These classes will be taught at low or no cost to the students. There
will be larger fees for nonstudents interested in classes.

The center will not be a place just for the recording of music used only by bands or musicians, it will also be a place for any member of the community interested in learning music or the process of recording music to come and visit. And with the integration of performance spaces and a club there will be a very divergent range of people using this center.

Through the service of many there will be created a place of great artistic freedom, expression, and acceptance. Bands will not only come to record music and perform live. They will come because the atmosphere which is created by the center and neighborhood will help the individuals using the facility tap their own creative spirits. This will be a place musicians come to immerse themselves into a diverse and creative atmosphere, it will be a place to simply be.

**acoustics:**
Because different music styles call for different acoustic conditions several recording studios will be incorporated into the center. These studios will vary in size to accommodate from 1 to 100 musicians. Each studio will have its own unique acoustic quality suited to serve a particular music style. Although the independent studios have different acoustic qualities, within each there will be the ability to alter to some degree acoustic conditions. This can be done through various additions or deletions of sound reflective or absorptive materials. The independent studios will have smaller isolation booths used to further change acoustic conditions for the recording process.

The performing spaces incorporated into the center will also
need good acoustic properties. These spaces will have the ability to change and adapt to different performances. This ability will allow for the best acoustic conditions for a wide variety of performances. As in the recording studio this can be accomplished through the addition or deletion of sound reflective or absorptive materials. Along with good acoustic conditions goes the need for acoustic isolation between spaces. This will be addressed by the construction techniques used during the building of the center. Literally what is needed to achieve acoustic isolation is to build boxes within boxes.

**spatial relationships:**
Because of all the different acoustic conditions necessary for providing good studio environments relationships between spaces is very important. This importance is also seen at the site level. The placement of the individual function housed by the center must be located with respect to the amount of noise emanating from the surrounding sites. The recording studios will be shielded from the street noise by the other functions of the center. This introspective placing of the recording studios will help create the sound isolation so important in recording music.

**materials:**
The materials used in this facility will serve several functions. Depending on the spaces used, materials will either serve acoustic needs or they will be used to reinforce the concept of musical expressions. The materials need not only provide acoustic or conceptual ideas they also need to create an atmosphere appropriate to the function of the space they are used in, studio spaces need to be energetic and creative while apartment spaces need to be relaxing and light. Whatever the function of the material, all will be brought together to express the notion of diversity. Because the center will bring many diverse individuals together I want the materials used in the center to reinforce this idea of acceptance. This will be accomplished by integrating a large number of different materials together.

Included in the appendix is a selected amount of programed spaces.
Site Analysis

To successfully create the structures and environment needed to allow for the functional, progressive, and creative explorations of music occurring within the center a lot of thought and consideration needed to be taken when choosing the proper site. For the site will play a large part in determining the success or failure of this center. To achieve success the site needs to respond to many areas of concern. These concerns being ease of accessibility by a large number of outside people, a location from which a large pool of interested users can be pulled, an area which accepts diversity, and a large open site located adjacent to a busy thoroughfare.

Trying to find a site fulfilling all these criteria was going to be a challenge. A logical place because of its size and location was Chicago. Miraculously enough, located north of the Chicago downtown a site fitting all requirements was found. The exact site location being on the south east corner of Halsted and Webster street. This location lies on an open site three blocks south of the University of DePaul and one block north of a Chicago area high school. This location is in the middle of a large number of potential users seen in DePaul's and the high school's student bodies. Also, this close proximity to a university environment allows for an area already use to diversity. With a center expecting any and all types of people the acceptance of diversity is very crucial to success or failure. The diversity which exist in the area can be seen in the different commercial establishments, catering to many different groups of people. Halsted street, a major north south thoroughfare bordering the site to the west creates accessibility by both private
and public transportation means. These transportation means being city buses, an El line running two blocks west of the site, taxes, and private automobiles. This site even filled the most difficult requirement, which was a large open area. Because of the sites location just north of a high school there is a large open field / park which use to be the football field and baseball diamonds for the school. This access to an open site fulfilled the spacial requirements needed to allow for outdoor concerts and activities to take place right next to the center.

The site itself is surrounded on the west by four story commercial and residential buildings. To the north of the site you find a majority of two and three story town houses. To the south and east is the continuation of the park and open space which the center itself is located. The site is completely flat and roughly 480' x 650' in size with the north south dimension being the shorter of the two. Because of the activity of Halsted street noise infiltration into the site will primarily be a concern from the west. Winter winds cross the site from the north west to the south east and summer winds starting at the south west and proceeding to the north east. The main volume of pedestrian traffic is located at the perimeter of the site with the exception of one walkway running north and south through the site at the east edge of the site. These conditions are the main factors needed to be addressed when locating the structure on the site.
Photo from the center of the site looking north and west toward Webster st.

Photo from Webster st. approximately half way down the site looking to the south and east across the site.
photo from the center of the site looking north and east toward Webster st.

Photo from Halsted st. between Webster and Dickens showing the character of this area.

Photo from the corner of Halsted and Webster looking south.
Design Process

Now the part you have all been waiting for, the heart and soul of the thesis experience, the design process and final design solution. Let’s begin with a quick reminder of the thesis statement “Creating architecture derived from musical patterns allows for the creation of formal and spacial structures best suited to musical related functions and the expression of music itself.” Now that the thesis statement is fresh in everyone’s mind let’s start the design process.

That is much easier said then done. Even after all the research conducted on music I still posses a great lack of knowledge concerning music and all that is associated with it, beginning the design was not so easy. I new what I wanted to accomplish but how I was actually going to do this was not so apparent. First, let me refresh everyone’s mind concerning what it was I wanted from this thesis exploration. This thesis project was an attempt to create an architectural experience based from a dialogue created between architecture and music. It was the thesis intention to have this dialogue create something that was unlike anything I had ever done, something more theoretical, creative, and expressive in form and space. All of which was derived from music and able to communicate to architecture and music. The newly created forms and spaces would then combine to form the music center.

Let me start by explaining what the thought process at the outset of this project was. The first attempt at creating architecture from music was based on trying to obtain a more technical and physical connection between music and architecture. That is a connection conceived from known principles of music and architecture. An example of this concept would use rhythmic patterns associated with music to create a different way of using rhythms found in architecture. I actually meet with relative success when approaching the design from this angel, but this success was more at a conceptually level only.

This approach was based around my interest of the physical make up of a piece of music. I should explain that this physical make up is what I think of as a layering and patterning effect created by different sounds heard in music. When listening to a piece of music I like to try and hear the different patterns of sounds. It is this conglomeration of individual patterns which overlap and combine to form a whole piece of music. The patterns and layering I am referring to are, the different sounds and feelings created by the instruments and vocals used to create the piece of music. With in a piece of music there can range anywhere from a single instrument to a 100 piece orchestra creating different sounds (patterns). It is this layering and combination of elements (patterns) that is interesting to me. I am
intrigued by the idea of having many different individual elements coming together to form one unified and beautiful piece of art. Although the instruments and vocals create different sounds and feelings they are all based on an ordering system which is able to allow for individual freedom while holding all pieces together. I began thinking of a way to derive, from music, an ordering system of this type which could be translated into architectural terms. This ordering system would be the conceptual equivalent to the ideas stated above, the creation of an ordering system which allows for freedom of individual parts while still holding an entire object together.

To begin solving this conceptual idea I started looking strictly to music for an ordering system. What developed out of this thinking was a simple understanding of how, in music, there are certain patterns seen throughout an entire musical piece. I learned that these patterns are formed by groups of notes which are repeatedly found together, these groups of notes are called phrases. A multitude of phrases are seen throughout a piece of music and form certain patterns which can be represented as A B A or A B A B C patterns, see figure 1. Within the different phrases there are also a number of notes which form patterns. These notes are not restricted to a strict pattern among phrases, there is some play in the pattern. The overall concept is, however, the same for each identical phrase. Although, the phrases are similar to small pieces of music they all come together and form a well proportioned and harmonized piece of music.

It was this idea, of phrases, which would be the first attempted translation of music into an architectural vocabulary. The concept is actually very simple, let’s use a pattern of A B A C as an example, see figure 2. The first step was to assigned each
individual part of the pattern a grid. The assigned grids are all different but all based on a similar proportion. The next step was to draw the grids in the same order as the pattern established from the beginning. This in a very simple way was a physical representation of the pattern established by the piece of music. Now the translation was taking one step further. This next step involved overlaying the grids on each other with out any particular order. This overlapping and combining of grids created spacial experiences different from that of a normal grid but in actuality was formed from the same ordering system as the grid.

After the expression of this idea there was an attempt to expand this recently established concept. Unfortunately, a wall was encountered when this concept was attempted in a more functional way. This wall made it necessary to find a different approach to the solving of the thesis problem. Don’t worry the first attempt was not a total failure, actually I don’t believe it was a failure at all. In fact, you will see the basic conceptual principles established above are used as a major driving force behind the final design solution. But a new overall approach to the thesis problem was established at this point.

This new approach to design was instigated basically because of a lack of knowledge. To avoid a lot of the technical and theoretical principles of music it was decided to approach the thesis problem from a more personal point of view. That is I decided to attempt to represent in architecture the feelings I experience while listening to music. Don’t think this was done purely out of laziness or an attempt to side step the learning process, it was not. In fact to try and understand music I started teaching myself how to play the piano. This experience along with all the text, I had read, gave me much more insight then I previously had. It also opened my eyes to the fact that if I did expect to have any time to design this project I needed to simplify the problem. Like architecture music is a field one could spend a lifetime exploring and trying to understand yet still not comprehend all facets. So by taking this approach I was able to increase my actually designing time and cut down on research time.

To begin this new approach I started to introspectively analyze what it was, about music, which created such an interest and love within me. After many hours of thought and communications of ideas I realized it simply was the range and experience of emotions and feelings which music created that had the powerful effect of drawing my interest. It was this realization from which sprung the first concrete physical idea of the form this project would take. This realization began as a simple sketch of a procession, see figure 3 and figure 4. Why a procession? The procession was a representation of the changing
emotions that are experiences when listening to music. This emotional experience can best be explained by referring to the events which occur during a concert. First there is, what I will call, the calm before the storm, before a performance begins there is the emotional experience of a void, this void creates a feeling of anticipation, which can be accomplished several different ways: one the lights go down, two curtains are drawn, three a silence falls upon the performance area, or any combination of these experiences. But the importance of this void is that it begins an emotional roller-coaster ride starting from this point and ending sometime following the conclusion of the concert. It is this constant change of emotions and how the music effects me which I find so powerful. When I am at a concert or listening to a C.D. what happens is the music starts and I am simply listening. If it is music I really enjoy it starts to penetrate into my mind and my soul. The way in which the lyrics and different sounds of the instruments are put together can really take hold of my emotions and control them. This control might be dancing, singing, or just an awe for what it is I am listening to. It is this emotional envelopment by music that the sketch of the procession was trying to communicate. The actual events of the procession where comprised of walking down a corridor with a rhythmic patterns of natural light and darkness. This circulation then started expanding until it reached a large room in which was located a recording studio suspended in mid air. This large space was totally saturated with the sounds produced from the recording studio. I wanted this experience to represent the emotionally power music can have on a person.

It was this idea of procession which became the actual beginning manifestation of my design. This procession represents the void, introduction, and total immersion I experience when listening to music.

I wanted to accomplish this same emotional experience with architecture through the entry sequence for this center. This sequence starts at the corner of Halsted and Webster as a void of architecture, structure, and everything associated with the center. At this particular point the patron is unaware of the music center. As the patron starts to move into the site the center starts to slowly build up and enclose around the person. Once you are totally enclosed and occupied by the structure you move ever deeper into the center to experience a space which is an open space representing a void. This space would not actually be considered a void because the intention was to
fill that space with a number of different elements, creating a layered seemingly chaotic experience of structure, all of which was based on a pattern. This space was a representation of music, different layering of instruments playing at the same time but being held together by an underlying organizational pattern or idea. Located within this void was the large space containing the suspended recording studio. This was the area where architecture formed a space that totally encompassed the individual and surrounded them with music. Although a powerful idea, the ending space, containing the studio, needed rethinking to allow for a more functional and emotional solution.

The development of a new idea transformed the studio space into a sphere void of any obvious features other then means of circulation. What the space lacked in physical features it made up for with other devices for different sensory experiences. This space actually became the heart of the center because of the emotionally expressive qualities found with in the sphere. What the sphere became was a space designed to totally emirs someone into a sublime experience of music, surrounding and overtaking the individual, moving them to a higher level of energy and consciousness. The experience of this space is describe in more detail at a later time. Functionally the sphere became part of the main circulation for the center. Because of its importance to the enhancement of the emotional experience of the center all who use the center where made to pass through this space.

With a main focus of design established, an explanation of how the rest of the design manifested itself to reinforce this focus and the thesis question will follow. I wanted all the individual spaces, of the center, to be very expressive in form, while still maintaining the understanding that all were derived from a common organizing principle. What was needed, to accomplish this, was an idea, based from music, which would direct the creation of the forms. I attempted many different solutions to this problem and finally settled with a very simple concept. I started thinking about how music is created. Musicians have a certain quantity of notes available to them. The also have an organizational structure on which to place these notes, this being the musical clefs. There is, basically, an organizational system and a minimal number of elements which can be placed on this system. What is interesting, to me, is that within this simple system an infinite number of solutions can be created. For instance a musician can overlap, combine, leave out, and space, a few elements and a new piece of music is created. What I was looking for was an architectural equivalent to this musical structural system, an organizational system which allowed for the creation of an infinite number of forms. I found an architectural equivalent in a structural system based on grids.

I started looking at using a pattern of intersecting points based on a grid for my organizational system. With the intersecting points of a grid established I uses a simple process of connecting points of intersection with other points of intersection to create the spaces of the center. The problem was, although, it was all based from one organizational pattern the forms where chaotic and did not read as anything much more then a mess. A simplification of this concept was then introduced. This second attempt keep the intersecting pattern formed from the grid but introduced horizontal, vertical, and random diagonal lines to connect the intersection points. This simplified version was used to form the first completely functional layout of the center, see figure 5. Unfortunately, although the spaces where rather
expressive in form, there still were to many chaotic elements. The horizontals and verticals were starting to work but the different diagonals did not read as if they originated from the same grid as the horizontals and verticals. To try to counter this problem a simplification of forms was again needed. This time the horizontals and verticals were complemented by one consistent angle. The angle which was used was the 45 degree angle. By keeping the diagonal at a 45 it made the connection between the horizontal and vertical more readable. This concept became the organizational system from which the final plan was derived, see figure 6.

The architecture music connection is created by the conceptual representation of similar elements. The grid in this system functions conceptually the same way the clefs in music function. It forms a base organizational system from which an infinite number of elements can be places to create new expressions. The horizontal, vertical, and diagonal walls creating the spaces of the center represent the limited number of notes and the infinite amount of connections which can be formed. Although this system is very simple it allows for the creation of rather expressive and complex forms. I would like to remind you that this system is actually just a slightly different realization of the first concept I used to begin the design process.

During the process of realizing the organizational system of this center I was, also, involved with creating the proper spacial and functional relations needed between the spaces of the center. When working on this I found there where several different elements with which to work: one was the grid with its horizontal, vertical and diagonals, second was the sphere and the curved courtyard in which it rested, third was the procession form street corner into and through the entire complex, and finally the intermixing of said curve and said grid. With all of these guidelines it was a simple process organizing the relationships between spaces. I started with the sphere, because it was one of the most powerful ideas. Being such a dominate factor it became the focus from which the design revolved around.

The sphere was a large object which attracted attention because of its size and shape. The physical features and the importance of the activities occurring within the sphere determined that it would be placed at the center of the complex. Being the central
space the goal was to have all circulation proceed through this space. This allowed all patrons of the facility the opportunity to experience the sphere. The sphere also acts as the focal point to the entry sequence and procession of the facility, which was described earlier. Once the sphere came into existence it stayed relatively constant through the design process, the space in which it is located, however, did not.

The sphere is located in an open and sunken courtyard on axis 45 degrees from the corner of Halsted and Webster. This courtyard has always functioned as the place where the organizational system of the center would be represented in its pure physical form. But that form has varied over the design process. In the early stages of design the courtyard became an architectural representation of three parts of music: rhythm, harmony, and melody. These three fundamental and basic principles of music when translated into architectural elements became the grid, intersecting points, and movement. This translation begins with harmony, which is represented by vertical elements at intersecting points found on the grid. Next, melody becomes an architectonic element connecting one vertical element to another vertical element. Lastly, rhythm is seen as the voids created by the absence of the previous two elements. This translation of music into architecture was derived from the reading of Musitecture by George Holz. This translation would manifest itself as the multiple layers of structure talked about earlier in the book. What this sunken courtyard became in the final design solution was more of a park atmosphere, of course with the sphere still remaining in the center. The ordering system of the project represented by the grid was still found here but, simply, as a pattern on the ground. And instead of vertical architectural pieces found at the intersection trees were planted. This courtyard provided a contrast to the high-tech stainless steel sphere located in its center. This now was a space more human and inviting.

This courtyard and sphere brought to life physically the two organizational system used to create the spaces and forms seen in the rest of the center. Up till now the main system was the horizontal, vertical, and diagonals associated with the grid.
During the design process a new system appeared. This organizational system was born from the sphere, itself. This new system is, simply, a curve. These two systems work together to control and define the forms and spaces of the center. The grid acted more as a functional form giver to spaces, where as, the curve is more of a controlling element. No where in the project did these two systems come together more obviously then in the apartment blocks.

With in the apartments you have both elements equally defined and understood. The curve is used as the structural support, while the grid acts as a space definer. The two elements were also used to articulate a high-tech feel representing the modern high-tech recording process. This was accomplished by having the curve of the apartments created out of concrete and the grid made of brushed aluminium. These two forms and materials worked well together, giving an high-tech feel and character to the center.

Where the apartment block is rather rigid and conforming, allowing it to be excepted by the surrounding neighborhood, the rest of the center diverges somewhat to becomes less strict and more expressive. The concept behind the expression of forms was to create a more free and individualized structure in the recording studios. The recording studios needed to be more expressive, so as not to hamper the creative process of creating music.

All though there is individual expression represented in the studios and other spaces of the center all elements are derived from and held together by the defining grid. To help reinforce the wholeness of the center all the spaces were roofed using the same form. The form that was used was a curved structure focusing toward the sphere. This similarity of form seen in the
roof really creates a unified looking project.

I will now run through the entry sequence of the building to help you get a feel for the relations of spaces to one another. As earlier mentioned the procession starts at the corner of Halsted and Webster where there seems to be no significant feature of the music center present. But in reality their is. What occurs here is an open area comprised of a few benches, some trees, and vegetation. What occurs in this area is an orientation of pedestrians to the center. All of these elements, within this area, are oriented to focus and move the pedestrian toward the music center. To help reinforce this evoked movement the sidewalks becomes curved to emulate the curve that will later be seen with in the center. This curving of pavers leads to an axis connecting the corner of Halsted and Webster with the center of the sphere. This axis is highlighted by a change in pavers placed on the diagonal, seen thorough out the center. This diagonal leads straight to the front entry.

As one begins moving toward the structure they begin to experience the center through more representation of the grid and the beginning of the structure itself. To move into the complex one needs to penetrate and experience movement up and through the two symmetrical apartments blocks. The sequence of movement is very important to the creation of emotions. As mentioned earlier the patron moves into the building without really being aware of the transition. How this occurs is the building slowly builds up and around someone walking towards it, eventually you walk underneath part of the structure but are still outside. At this point you are confronted by a decision to ether get in an elevator or take a flight of stars up to the second level. What ever the choose is this particular
event does two things. First it interrupts your axial movement, second it moves you abruptly into the building. Once you get off the elevator on the second level you are within the structure. This quick transition is needed to help create an emotional experience as you step off the elevator. What occurs is you exit the elevator and are looking directly at the large stainless steel sphere looming before you. As one not actually living at the center you have no option but to move forward to a narrow bridge. The bridge continues, over a large circular and sunken courtyard, toward the sphere. The openness of this courtyard is intended to relax the viewer but still helps to create anticipation as one moves closer and closer to the sphere. As the procession creeps closer and closer the bridge becomes darker and darker until you penetrate the threshold of this unknown odyssey and are plunged into relative darkness. This is it you have entered into the powerful and sublime sphere. The journey continues into the space of perceived nothingness on a steel grated bridge toward a 16 foot diameter platform seemingly suspended in mid air with in this scaleless space. Then you are overtaken and penetrated by a sound it seems to take you over controlling your thoughts and emotions. What has happened, is you have entered the center of the sphere and now you are becoming one with music. Music is being played all around you, above you, below you, to your left, and to your right. It totally surrounds you and penetrates into you. This is the experience of music or architecture, it is a total letting go of your emotions to the art, be it music, architecture, anything. This is what architecture and music are all about. The understanding is clear a revelation has occurred.

This climax of experience is also the circulation hub for the center. If you continue forward and leave the sphere behind the
1500 seat performance space is revealed. Move to the left and a small club featuring one of the bands recording at the center is found. Move right and a technological filled music library is discovered. But after these three options are understood there is a noticing of a secondary paths. The paths described above are the only ones the public may use. But, with in the sphere there is located a circulation route used only by those residing in the apartments and working in the recording studios. The center needs to provide privacy and security to those living and working here. To accomplish this two separate circulation routes where developed. The first being the one described above for use by the visiting patrons of the building. This route services the entry, performance spaces, library, and sphere. The second is the one used only by those living and working at the center. This route services the apartments, sphere, all three studios, and the courtyard.

To allow the patrons a connection to the recording process and still maintain security and privacy a visual connection was create. This connection allows the public to see the recording process from a distance. The connection occurs at the center of the sphere. When one is standing at this center there are windows violating the purity of the sphere and opening on to the courtyard and recording studio. All three recording studios are oriented in such a manner that these windows line up with windows in the main recording space and control room of the studios. From the vantage point in the sphere individuals can look directly into a recording session and beyond, into the control room. This connection helps satisfy the curiosity of the public.

This procession generally described the entry sequence and circulation of the center but it does not give a great understanding of how the center is laid out. So I will give a quick description of the center layout. First you have the sphere which is located on a 45 degree angle coming from the street corner. This angel is the main axis of the center, this is were the procession occurs, and is where the sphere and large performance space are located. From the center of the sphere there is radiating out a minor cross axis on which you find the library and small dance club. The three recording studios are arranged between the sphere and performance hall and oriented in a circular pattern around the sphere. The apartments last but not least are also contained by a curve radiating out from the sphere located as mentioned toward the corner of the site.
conclusion

Now the ultimate question, did I prove the validity of the thesis question. Did creating architecture derived from musical patterns allow for the creation of formal and spacial structures best suited to musical related functions and expression of music? Within the confines of the definitions I established I believe the thesis statement was proven. Music was used to form architecture, through an interpretation of feelings and based on organizational principals. I also feel using music, as a bases for architecture, helped solve the problems associated with the programmatic requirements of spaces involving musical functions. Music was used to create a organizational system which allowed for the proper functioning of spaces involving musical related activities. Although, I believe the thesis question is proven, the solutions could be taken much further. It would probable be necessary to have a better understanding of music but more interesting forms of expression can be found.

Functionally, the thesis accomplished all the goals set out in the thesis program. The music center was designed with 32 apartments, three recording studios, three live performance spaces, a music library, and a sphere of music. I feel the layout of the center has been very well resolved and allows for the activities associated with the center to function properly. What could have been looked at more closely was the connection between the center and the site surrounding it. Exterior spaces found with in the confines of the center work well but more needs to be addressed particularly to the north and east of the center.

If this project were to continue I feel the next step would be looking at more expression of forms. I would concentrate this development in the studio areas of the center. Along with experiments into form, learning more theoretical ideas relating to music would be a positive point of continuation. In that since I do plan on keeping this project alive through my learning of the piano. I would also like to think that in my professional career I would take some lessons learned on this project with me. Not unnecessarily concerning music, but the underlying idea of the thesis, using other interest to try and create new and unique ways to approach architecture.
BIBLIOGRAPHY


Betsky, Aaron, “Good Sound for Bad Animals,” Architectural Record, April 1993, p. 32-35


Holz, George A. Musitecture. Educational Hall Library, 1981


recording studio:

design criteria:
The control room is the technical heart of the recording studio. This is the room where the individual sounds of all the instruments and voices are manipulated and pieced together to form one musical element. Because of this function the acoustic quality of this space should be equal to or considered more important then the studio space.

Within this space there is a feeling of contradiction brought on by a very high-tech array of equipment, opposed by a large quantity of wood finishing needed to obtain the proper acoustic quality. Maintaining this proper acoustic quality along with acoustic isolation is very important in obtaining a good control room. To achieve this, quite literally, the control room should be built as a box within a box. And to create the desired sound within the room there should be no parallel walls, the front and front side walls should be reflective surfaces, the rear walls should absorb sound, and this space should be designed to have a live end and a dead end space. This same acoustic treatment of spaces will be seen in many areas of the recording studio. Although acoustic isolation is required between control room and studio, a visual connection must also be maintained. This connection should allow for the producer and engineer to have unobstructed views of the musicians, but also allow for viewing by guest. Given all the requirements of this space the functionality of it becomes very important to the recording process. Providing easy access to all equipment will be a necessary but difficult task.

Because of various acoustic conditions needed during the recording process of different music styles there will be three studios within the music center. The three studios will all have a unique acoustic characteristic but the isolation and control of the sound quality within all the studios will be equally important. The major difference in these three recording studios will be size. This will determine how many musicians each space can accommodate.

users:
Producer, music engineers, musicians, friends, students

activities:
Recording and mixing of music
recording studio:  control room

primary relationship to:
sound studio, sound locks, lounge, isolation booth, machine room

furnishings and equipment:
Sound board, various recording devices, computers, chairs, monitors, microphones, television monitors etc.

acoustics:
As mentioned above, acoustical separation from adjacent spaces while maintaining a good acoustic quality within the space are the main concerns in this area. To allow for the best representation of the music acoustical absorption, reflection, and diffusion devices should focus sound symmetrically around the sound board. By doing this the creation of the “sweet spot” is formed. To help achieve this the monitors placed in this room should be embedded in concrete and focused on the sound board.

lighting:
A low level of ambient lighting will be provided by reflected ceiling lights, with task lighting available for independent work areas.

materials:
floor: floating floor of concrete and wood
ceiling: floating ceiling of drywall and wood
walls: wood and drywall

thermal:
Standard 68 - 73 degree range
Standard 45 - 55% relative humidity

square footage:
studio A control room 700sq."
studio B control room 600sq."
studio C control room 600sq."

Sample control room Expansion Ceiling™
Expansion Ceiling is a registered trademark of Jeff Cloquet Architects AIA
recording studio:

design criteria:
The main studio space is where the majority of the musicians perform the music to be used in creating the master copy. Within this room architecture and music while physically come together. Here architecture effects the creation of music and music effects the creation of architecture. To create a good studio a small controlled space with a lot of volume is needed. On average require 1200 cubic feet of space is needed per musician. The studio usually needs a long reverberation time to produce a lively sound quality, but within the studio you can have both live and dead areas. This allows for more flexibility if the budget is limited to the creation of only one studio space. The acoustic quality of the studio will also have the ability to change to a degree. The space will be a combination of architectonic shapes and forms based on acoustic needs. The studio needs to be a comfortable and creative space. Musicians will be more inspired by an attractive comfortable space. The three different studios will be able to accommodate from 1 to 100 musicians, depending on their size.

users:
Producer, musicians, music engineers, students, friends

activities:
The performance of the music which is being recorded, class meetings, rehearsals

primary relationship to:
Control room, isolation booth, piano booth, sound locks, lounge, equipment storage

furnishings and equipment:
Different instruments, microphones, acoustical panels
recording studio: main studio

acoustics:
This space will be, acoustically, the most live space in the recording studio. As with the control room it is very important to isolate this space from all sounds outside the space. Again this will be done by building a box within a box. The diffusion and absorption of various unwanted sound qualities also needs to be addressed. This will be dealt with through a series of canted and sloped shapes, along with sound traps and the use of absorptive materials.

lighting:
Lighting needs to be comfortable but not overwhelming. Movable and dimmed lighting should be used to create the appropriate lighting levels conducive to the feel of the particular recording section.

materials:
floor: floating floor of concrete and wood
ceiling: floating ceiling of drywall and wood
walls: wood and drywall

thermal:
Standard 68 - 73 degree range
Standard 45 - 55% relative humidity

square footage:
studio A main studio 1500 sq. ft.
studio B main studio 1000 sq. ft.
studio C main studio 800 sq. ft.
large performance space: stage

design criteria:
Because this is the main performing area and the focus of the large performance space the stage must do many jobs. First, this space must convey with great clarity the concept driving this project, the expression of music as architecture. Secondly, this space must provide the technical support, acoustic qualities, functionality, and lighting required to create the best possible stage atmosphere. The stage will be a place of high energy provided by both the performers and the architecture of the stage itself. The use of materials, lighting, acoustic, and music theory will combine to satisfy the above mentioned requirements for this space.

users:
Performers, technicians, audience, students, lecturers

activities:
Musical performances, lectures, speeches

primary relationship to:
Back stage, audience, sound/light control booths, equipment storage

furnishings and equipment:
The stage will house no permanent equipment, it will all be stored elsewhere or brought in by bands.

acoustics:
The quality and adaptability of acoustic characteristics will be very important in the design of the stage space. The materials used in this space will be moveable and of a nature which absorbs or deflect sound according to what positions they are located. The basic need, acoustically, of this space is to project sound out and into the audience. This will be done by the mentioned moveable acoustical panels and the use of electronic means, monitors.

lighting:
The lighting must also be adaptable to different situations. This will be accomplished using standard concert, and theater lighting. The majority of lighting will come from spots, floods, cans, and various colored lights, no natural lighting will be introduced into this space.

materials:
floor: hard wood on interchangeable floor panels covering a steel joist grid system
ceiling: acoustical panels hung from open web steel joist
walls: concrete block walls configured to host a myriad of attachable acoustical panels and fabrics

thermal:
The thermal requirements during performances will call for cooling of the space. This will be done with as much natural ventilation as possible. During times of inactivity the space will be keep below the standard 68 - 73 degree range, this will allow for the most energy savings.

square footage:
2400 sq. ft.
large performance space: seating area

design criteria:
This space will be a continuation of the feeling and forms begone in the stage area. Materials, forms, acoustics, lighting, music and architecture will all come together to form a space expressive of the ideas of this center. Along with the architectural importance of the space there is a functional importance needing attention. To be a good seating area there must be a good acoustical and visual link from every seat in the house to the largest portion of the stage. Establishing this connection and making the space as intimate as possible will be a major concern in the layout of this area.

users:
Audience, maintenance and cleaning personal, performers

activities:
Viewing performances, adjusting acoustical panels

primary relationship to:
Stage, lobby

furnishings and equipment:
Seating, acoustical panels

acoustics:
Acoustic control will be provided by the materials used in this space. The materials used will either absorb or reflect sound according to their location. With the use of removable panels and fabrics the acoustic quality can be adapted, to suit the performance.

lighting:
House lighting will be provided by large floods in the ceiling, isle lighting in the floor and some wall mounted fixtures.
large performance space: seating area

materials:
- floor: carpeting
- ceiling: Acoustically appropriate materials hung on open web steel joist.
- walls: concrete block with interchangeable reflecting or absorbing panels.

thermal:
The thermal requirements during performances will call for cooling of the space. This will be done with as much natural ventilation as possible. During times of inactivity the space will be kept below the standard 68 - 73 degree range, this will allow for energy efficiency of the HVAC system.

square footage:
20,000 sq. ft.
economy apartments:

bed / living space

design criteria:
Because of the need to keep the cost of this apartment as low as possible the living space and sleeping area will be combined. This combination is based on the typical hotel room configuration. These spaces will be large and open and provide a connection to the outside. The only difference between a single and a double economy apartment will be the size of this space.

users:
Users will be limited by the individual occupier of the room.

activities:
Sleeping, relaxation, private conversation, etc.

primary relationship to:
Closet, kitchen, bathroom

furnishings and equipment:
Bed, chairs, shelving, phone, table, T.V.

lighting:
Some natural lighting, task lighting

materials:
floor: carpeting
ceiling: drywall
walls: drywall

thermal:
Standard 68 - 73 degree range
Standard 45 - 55% relative humidity

square footage:
single bed economy 200 sq.‘
double bed economy 300 sq.‘
suite apartments: living area

design criteria:
This will be the public area of the apartment. Here the clients will socialize and entertain guests. The area will be open and light to reinforce the inviting and social function of the space. The living area will be the center of the apartment providing access to all other spaces. This living space will be the same size and serve the same function in both the single and double bed suite apartments.

users:
Individuals staying in the apartment, guests

activities:
Entertaining guests, conversation, relaxing

primary relationship to:
Kitchen, bathroom, bedroom, entry

furnishing and equipment:
T.V., chairs, tables, couches, stereo system, wet bar

acoustics:
No special acoustic conditions required

lighting:
Task lighting, indirect lighting from wall and ceiling mounted lights, natural lighting

materials:
floor: carpeting, ceiling: drywall, walls: drywall

thermal:
standard 68 - 73 degree range
Standard 45 - 55% relative humidity

square footage:
200 sq.'
**space**

**general**

- entry lobby = 2000 sq. ft.
- music library = 2500 sq. ft.

**recording studios**

<table>
<thead>
<tr>
<th>studio A</th>
<th>studio B</th>
<th>studio C</th>
</tr>
</thead>
<tbody>
<tr>
<td>control room</td>
<td>control room</td>
<td>control room</td>
</tr>
<tr>
<td>= 700 sq. ft.</td>
<td>= 600 sq. ft.</td>
<td>= 600 sq. ft.</td>
</tr>
<tr>
<td>main studio</td>
<td>main studio</td>
<td>main studio</td>
</tr>
<tr>
<td>= 1500 sq. ft.</td>
<td>= 1000 sq. ft.</td>
<td>= 800 sq. ft.</td>
</tr>
<tr>
<td>isolation/piano booth</td>
<td>isolation/piano booth</td>
<td>isolation/piano booth</td>
</tr>
<tr>
<td>= 500 sq. ft.</td>
<td>= 300 sq. ft.</td>
<td>= 300 sq. ft.</td>
</tr>
<tr>
<td>sound lock</td>
<td>sound lock</td>
<td>sound lock</td>
</tr>
<tr>
<td>= 300 sq. ft.</td>
<td>= 200 sq. ft.</td>
<td>= 200 sq. ft.</td>
</tr>
<tr>
<td>equipment storage</td>
<td>equipment storage</td>
<td>equipment storage</td>
</tr>
<tr>
<td>= 1000 sq. ft.</td>
<td>= 500 sq. ft.</td>
<td>= 500 sq. ft.</td>
</tr>
<tr>
<td>machine room</td>
<td>machine room</td>
<td>machine room</td>
</tr>
<tr>
<td>= 250 sq. ft.</td>
<td>= 175 sq. ft.</td>
<td>= 175 sq. ft.</td>
</tr>
<tr>
<td>lounge</td>
<td>lounge</td>
<td>lounge</td>
</tr>
<tr>
<td>= 800 sq. ft.</td>
<td>= 600 sq. ft.</td>
<td>= 600 sq. ft.</td>
</tr>
<tr>
<td>rest rooms</td>
<td>rest rooms</td>
<td>rest rooms</td>
</tr>
<tr>
<td>= 1000 sq. ft.</td>
<td>= 1000 sq. ft.</td>
<td>= 1000 sq. ft.</td>
</tr>
<tr>
<td>office</td>
<td>office</td>
<td>office</td>
</tr>
<tr>
<td>= 400 sq. ft.</td>
<td>= 400 sq. ft.</td>
<td>= 400 sq. ft.</td>
</tr>
<tr>
<td>total studio A</td>
<td>total studio B</td>
<td>total studio C</td>
</tr>
<tr>
<td>= 6450 sq. ft.</td>
<td>= 4775 sq. ft.</td>
<td>= 4575 sq. ft.</td>
</tr>
</tbody>
</table>

**suite apartment**

- living area = 200 sq. ft.
- bed room
  - single = 150 sq. ft.
  - double = 2x 150 sq. ft.
- kitchen = 70 sq. ft.
- bath room = 80 sq. ft.

**economy apartment**

- bed / living area
  - single = 200 sq. ft.
  - double = 300 sq. ft.
- kitchen = 40 sq. ft.
- bath room = 60 sq. ft.
<table>
<thead>
<tr>
<th></th>
<th>total</th>
<th>single = 500 sq.'</th>
<th>double = 650 sq.'</th>
</tr>
</thead>
<tbody>
<tr>
<td>performance spaces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>large</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stage</td>
<td>2400 sq.'</td>
<td>600 sq.'</td>
<td>2400 sq.'</td>
</tr>
<tr>
<td>back stage</td>
<td>2400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>seating area</td>
<td>20,000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sound booth</td>
<td>450 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lighting booth</td>
<td>450 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equipment storage</td>
<td>1000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loading dock</td>
<td>1600 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dressing room</td>
<td>100 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>green room</td>
<td>1000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lobby</td>
<td>10,000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rest rooms</td>
<td>1000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bar</td>
<td>400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lounge</td>
<td>2000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>42,800 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>medium (club)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stage</td>
<td>600 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>back stage</td>
<td>600 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>seating area</td>
<td>4000 sq.'</td>
<td></td>
<td>no permanent sq.'</td>
</tr>
<tr>
<td>sound booth</td>
<td>sound /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lighting booth</td>
<td>lighting booth = 400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equipment storage</td>
<td>equipment storage = 500 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loading dock</td>
<td>loading dock = 300 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dressing room</td>
<td>100 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>green room</td>
<td>600 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lobby</td>
<td>none</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rest rooms</td>
<td>1000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bar</td>
<td>400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lounge</td>
<td>none</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dance floor</td>
<td>2500 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>game room</td>
<td>1500 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>12,400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>outdoor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stage</td>
<td>2400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>back stage</td>
<td>2400 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>seating area</td>
<td>no permanent sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sound booth</td>
<td>450 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lighting booth</td>
<td>450 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equipment storage</td>
<td>1000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loading dock</td>
<td>800 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dressing room</td>
<td>100 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>green room</td>
<td>1000 sq.'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting room</td>
<td>none</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>10,000 sq.'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total project gross sq.' = 87,350 sq.'
Total project net sq.' = 100,452 sq.'
# Building Cost Estimate

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio space 15,800 s.f. x $101.00</td>
<td>$1,595,800.00</td>
</tr>
<tr>
<td>Suite apartments [500 s.f. x 4 + 650 s.f. x 4] x $67.35</td>
<td>$309,810.00</td>
</tr>
<tr>
<td>Economy apartments [300 s.f. x 4 + 400 s.f. x 4] x $50.65</td>
<td>$141,820.00</td>
</tr>
<tr>
<td>Large performance space 42,800 s.f. x $75.20</td>
<td>$3,218,560.00</td>
</tr>
<tr>
<td>Club performance space 12,400 s.f. x $51.70</td>
<td>$641,080.00</td>
</tr>
<tr>
<td>Outdoor performance space 10,000 s.f. x $55.90</td>
<td>$559,000.00</td>
</tr>
<tr>
<td>Total construction cost</td>
<td>$6,466,070.00</td>
</tr>
<tr>
<td>Professional fees 7% total construction cost</td>
<td>$452,624.9</td>
</tr>
<tr>
<td>Contingencies 10% total construction cost</td>
<td>$646,607.00</td>
</tr>
<tr>
<td>Administrative cost 2% total construction cost</td>
<td>$129,321.4</td>
</tr>
<tr>
<td>Total budget</td>
<td>$7,694,623.3</td>
</tr>
</tbody>
</table>