ARCHIMUSIC: DESIGNING ARCHITECTURE WITH MUSIC

A THESIS BY

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Lubbock Performing Arts Center

Lubbock, Texas

by

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A Thesis in Architecture Submitted to the Architecture Faculty of the College of Architecture of Texas Tech University in Partial Fulfillment for the degree of

Master of Architecture

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May 2007

Music and Architecture

Acknowledgements

Upon reflecting over the past several years of the college career, I cannot fully express the deep level of appreciation and gratitude I have for everyone who has contributed to my academic success. Education is a powerful tool, without which I would not have the opportunity and privilege to become a great designer, mentor, and individual. I am forever in debt to all those who have contributed their knowledge, experience, ideas, and support towards assisting me in my academic career. I would first like to say thank you to the most inspirational and supportive people in my life, the family. Your strong guidance and direction in life has been beneficial to a degree which is immeasurable. I would also like to say thank you to all my professors who gave me guidance and support to become a dependable person, creative thinker, and group leader. The knowledge and experience I now possess will be applicable to every facet of the life and career, giving me opportunity and possibility that I would be unable of achieving without. Lastly, I appreciate all the support, critique, and opinions of the friends and colleagues that I have been fortunate enough to work with over the years. I wish them all the best hope to stay in contact with each of these wonderful people. My gratitude also goes to all the individuals who assisted me in collecting the necessary information to develop not only this program, but every project and educational endeavor I have pursued throughout my entire academic career. I cannot accept any of the praise I have received without giving credit to all of these people who have supported me and my decisions in life.

Preface

I believe that architecture is the most influential, informative piece of emotional artwork in society. As I aspire to connect to my audience through emotion and sensation, creating architectural work that connects to art outside the realm of architectural design is my goal. Music, the collaboration of musical instruments creating pleasant sounds, is another art which is comforting and inspiring to mankind. The collaboration of these arts has the potential to create a synergy which touches peoples at the emotional and spiritual level.

As a musician and aspiring architect, my appreciation for the musical and spatial creativity is magnified through my experience with each discipline. Playing music for an audience creates a feeling of excitement and assurance, as you see the accepting response of the audience to your art. The reaction of a person in response to the design of a building creates a similar feeling, as it gives you assurance that a person's expectations have been fulfilled. A performing arts center serves to combine these arts, creating an acoustical world within a defined boundary. Surrounding us within its walls, the architecture becomes a piece of music frozen in time, creating a world of fantasy and excitement. So, let the building set the stage for something special to happen.

"In most of the world, reality imposes itself upon us, and we escape into private fantasies, In the theater, the construct that surrounds us is, in part, itself a fantasy, an architecture environment made to symbolize a kind of magic. If it is working, a great piece of theater architecture, like the theater itself, uses this fantasy to help us escape into a more knowing and wise reality."

- Paul Goldberger

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Abstract

Theory:
Music and Architecture are each arts of the creative mind, composing elements of time or space to create a harmonious whole. The two arts share comparative and complimentary characteristics, resulting in the formation of a unique relationship from which each may contribute qualities to the other. A performing arts facility, the home of musical and human drama performance creativity, is inherently a musical body, which serves to empower both the performer and audience member with its magical aura. Together, architecture and music form to create a theory of design which expresses music, musical creativity, and a passion for the excitement of viewing the performing arts.

Facility:
Over the past decade, the rise in attendance to live performances has increased significantly while watching recorded media on television has showed statistically significant declines. Currently, Lubbock provides a number of different performing facilities, most of which are located in the downtown area or within city limits. The design of this facility proposal will provide a multiuse theater and small cafe, catering to small to medium musical and theatrical performances, to be used by either local performers or traveling shows. The proposal incorporates an existing outdoor amphitheater, allowing flexibility to the option of having indoor or outdoor performances.

Context:
The site proposed for this performing arts facility is located in east Lubbock, adjacent to the aesthetically pleasing Mackenzie Park. As Lubbock has few sites with such lush greenery and extensive views to the horizon, the challenge in designing within this context is having a building which responds to this ecological sensitivity of the area. With the numerous museums and outdoor attractions built in the area, this small region is becoming an area of civic arts, to which the community of Lubbock can enjoy the attractiveness of this area. The performing arts center will need to respond to all the different cultural and environmental aspects of this site.

Theory

Theoretical Concept

Theory Statement

Music is the art of composing various elements in a collaborative manner to produce a unique, harmonious whole. Music has the potential for a broad range of interpretation and manipulation, suiting needs and desires of every individual. Likewise, architecture is the art of composing multiple building elements in such a way that the individual parts form a collaborative whole. Architectural design is capable of adapting itself to numerous concepts and ideas, analogous to the abstract and complex discipline of music. Together, the two disciplines form a unique relationship from which each discipline may contribute qualities and characteristics to form a complementary whole. As Marcus Novak says, "Architecture and music are bonded into a new discipline: archimusic"[1] Combination of the two disciplines of architecture and music is fitting, as both share many of the same qualities and terminology. Just like music, architectural design is open to multiple interpretations, where the most abstract and unusual ideas can be expressed through the creativity of its designer. The only difference between the two is that music is designed in time while architecture is designed in space.[2]

In theory, one can conceive music has having no real beginning or end, where the listener is open to interpretation and free will. "[W]e interpret music as the immediate language of the will, and our imaginations are stimulated to embody that immaterial world, which speaks to us with lively motion and yet remains invisible."[3]

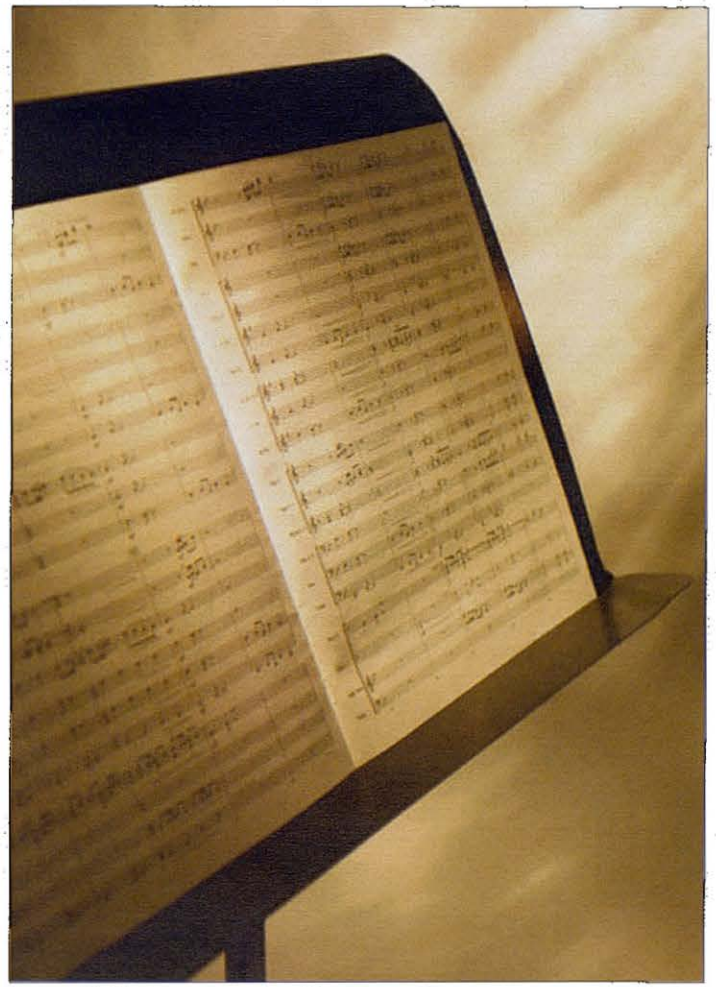


Figure A0: Music score composition

Theoretical Concept

Architecture, while just as easily open to imagination and language of the will, can only express musicality in a fixed body. However, the space of architecture is capable of displaying or inventing anything the designer desires. A performing arts facility, the home of musical and human drama performance creativity, is inherently a musical body, which serves to empower both the performer and audience member with its magical aura. The goal of the archimusic theory, is designing a facility which is expressive of music, musical creativity, and a passion for the excitement of viewing the performing arts. "The external appearance of a theatre, its shape and decorative elements, clearly provide information not only to its patrons, but also to casual passersby, about that specific organization and its offerings, and often about theatre in general within a particular society."[4] Architecture must be evocative of its inherent nature and purpose, which in the case of performing arts center is musicality and spontaneous creativity. Johann Wolfgang von Goethe famously states that essentially, "Architecture is frozen music".

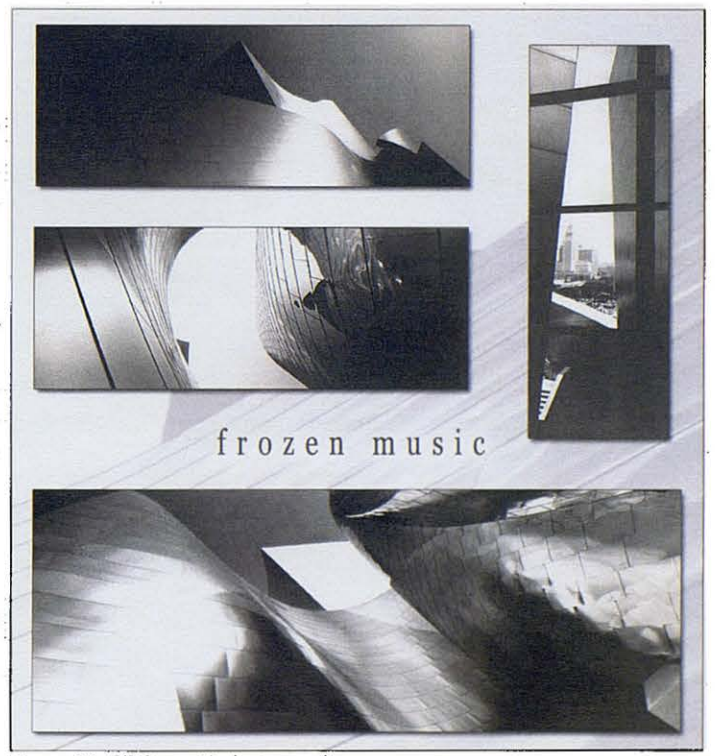


Figure A1: Gil Garcetti photographs

The mutual qualities and characteristics of music and architecture extend to the terminology and form of design interpretation. "The analogies made between music and architecture have historically generated an overwrought territory of comparisons along narrow channels of interaction: number, rhythm, notation, and proportion."[5] This universal language of architecture and music extends even beyond these listed definitions of design and terminology.

Theoretical Concept

Repetition, order, volume, segmentation, sequence, style, symmetry, and structure are a few more of the many elementary terms that are applicable to the interpretational relationship between architecture and music. "A single note is patently meaningless, but intervals, patterns, changes of volume, tempo and timbre, and above all rhythms are the prime bearers of musical significance."[6] The defining terminology of music and architecture is complimentary in the sense that each is comprised of an articulated structure of space and sound. Varying the composition of architecture can be as easily manipulated as can the notes of a musical score. The possibilities for applying these tools of design are endless, as each can be manipulated, adjusted, and delineated in numerous ways. Design has the potential to vary the composition so that it creates a new dictionary from a common vocabulary of notes.[7]

Taking a different perspective on musical design, one may argue that applying musical characteristics to architecture may come in the form of abstract, discontinuous singularities as opposed to the repetitive, formal structure of a musical score. As both music and architecture are open to such broad interpretation and meaning, an abstract approach is just as fitting to the theory of a design. Each individual is open to free will in the manner in which they understand and interpret the language of music and architecture. Just like architecture, "music acts in the double character of an art of impression as well as of imitation."[8] How one art imitates the other is to the decision of the designer in need of creating an impression.

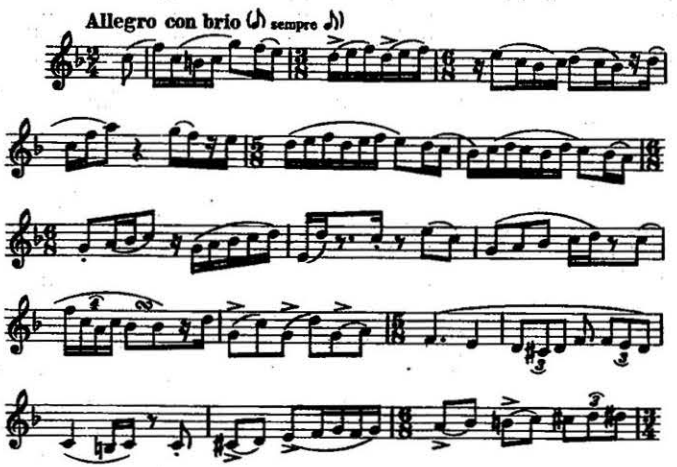


Figure A2: Composition of single music notes

ITEM	NOTE	REST	VALUE (number of beats)
Whole note/rest	𝅝	𝄻	4
Half note/rest	𝅗𝅥	𝄼	2
Quarter note/rest	♩	𝄽	1
Eighth note/rest	♪	𝄾	1/2
Sixteenth note/rest	𝅘𝅥𝅯	𝄿	1/4

Figure A3: Vocabulary of music

Theoretical Concept

A composition of singularities can be interpreted as a language in the same sense that repetition can be understood. Just as music is a repetitious composition of segmented notes and sounds, it may also be a continuous flow of singular, harmonious tones that are peaceful to the human senses. In looking at Frank Gehry's Walt Disney Concert Hall as an example, the design achieves a level of continuity; while in effect, the building is bodies of discontinuity, of singularities rather than repetitions. As David Lidov describes, "Continuity may be regarded as the normal, primary, unmarked state for music perception and, in a sense, for all aesthetic absorption."[9] The approach to the design breaks away from the typical formal, rigid structure of music, taking rather a unique approach which examines the unrestricted, harmonious flow of music and sound. The beauty of architecture and music is the flexibility that allows each to serve as a symbolic representation in a multitude of forms.

Applying music to architecture can also come in the form of inspiration from the actual musical instruments themselves. The uniquely curving lines, metallic materials, shining reflectivity, and color are also applicable traits of music that can be related to architectural design. Each material in the construction of a musical instrument serves a specific purpose, whether it is sound quality, reverberation, or appearance. The science and precision of manufacturing is comparable with that of architecture, as the final product must perform to a specified quality. The creation of sound is dependent on developing this shaped material.

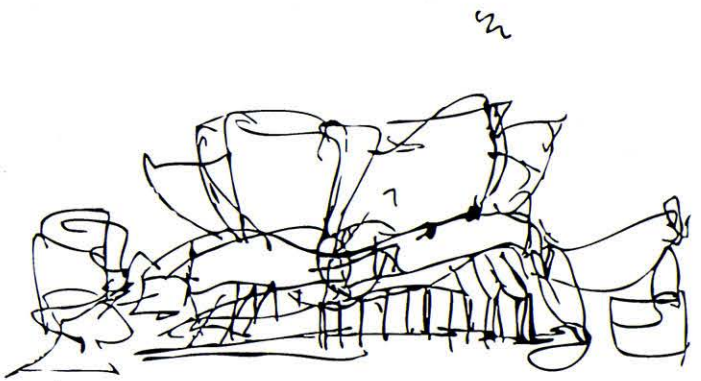


Figure A4: Bodies of discontinuity

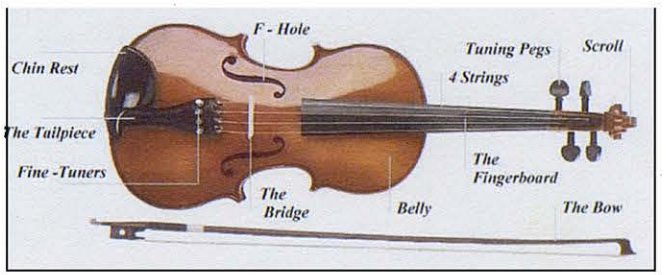


Figure A5: Violin pieces

Theoretical Concept

Small variations may create noticeable differences in output, possibly creating a whole new style of sound altogether. An aesthetic quality is seemingly tied to the harmonious sound of musical instruments. Orchestral music instruments are created with a wonderful composition of wood and brass, as if the instrument is supposed to create a delightfully peaceful sound. As compared with architecture, the aesthetic appearance will give an impression to the experiential quality of a design, impacting people at an emotional, sensual, and intellectual level.

Connecting to the human senses is the primary goal of music and architecture. The difference between the two arts is one will be designed in time while the other is designed in space. Without time and space, matter is inconceivable, becoming a dead thing. Space gives form and proportion while time supplies it with life and measure.[10] The human brain is naturally inclined to perceive an attractive sound in a musical sense. "If sound is organized and presented in a certain way, it invites listeners to interpret is as music."[11] Architectural design has the capability of producing sound in various methods, whether naturally or artificial. The volume, tone, and rhythm of the music will determine the appeal to the human senses. Space is important in that sense that any space becomes an acoustical container of sounds. The design of a theater is specialized for movement and clarity of sound, where any change in the space's size and shape will effect what we hear.

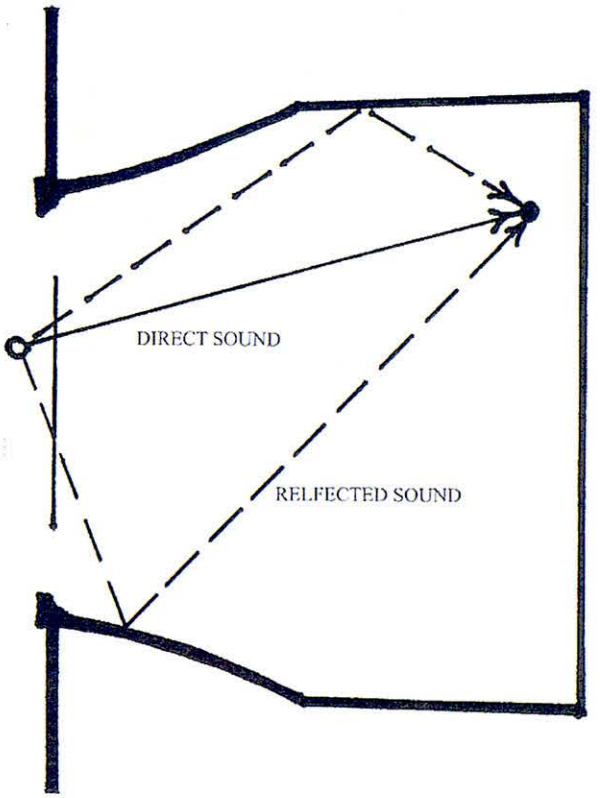


Figure A6: Acoustical container of sound

Theoretical Concept

"The power of acoustics has its roots in the way that it ties a person into the sound of a room... This interconnection between humans and space is a dialogue that enables us to experience ourselves in the sound of a room."[12]

The similarity of grammar, formal structure, and colloquialisms between music and architecture is the most evident and uniquely organizing feature. "In their rudimentary media of expression, such as notes, meters, tones and lines, colors and geometrical forms, the union is carried on by their respective systems of artistic and imaginative composition, design and execution."[13] The two forms of creative expression in design are comparable to each other in numerous aspects, sharing too many similarities to be ignored. "Architecture could also be thought of as silent music... there is a relationship between architecture and music--you could almost call music fluid architecture, because in both there is sense of design."[14] The design of a musical facility should create a world for the general audience to enter, where the architecture magnifies the expressive dimensions of the music. Where the ears act as the instruments in response to hearing music, the eyes must become the instruments of perception in viewing the expressiveness in architecture. The fact is that the designer, whether it be for music or architecture must express an idea that is apparent to at least one the five senses of human beings. Creating a form or sound that appeals to the senses and draws inspiration and ideas from unconventional sources is the idea of modern design.

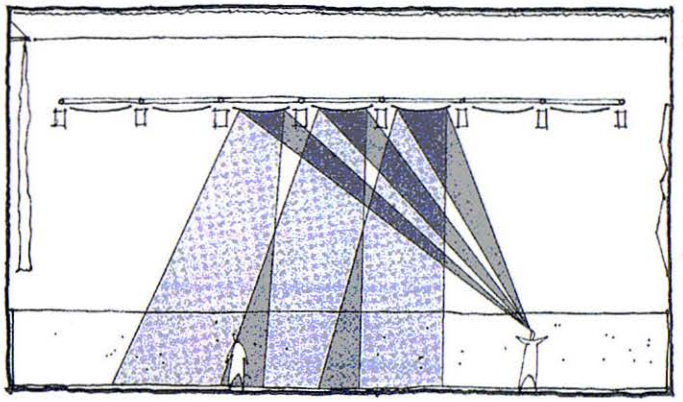


Figure A7: Dialogue between human and space

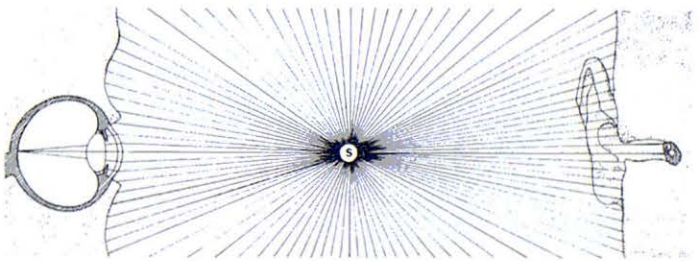


Figure A8: Eye and ear as instruments

Theoretical Concept

Music and architecture stand in an era where there is an overlap of concepts and ideas from one discipline to another. "We stand at the dawn of an era that will see the emancipation of architecture from matter. The intuition that allows us to even consider architecture as 'frozen music' or music as 'molten architecture' comes from a deep and ancient understanding that, in its very essence, architecture exceeds building, as music exceeds sound."[15]

Theoretical Issues

Composition

Goal:

The performing arts center should replicate the structural characteristics of music in form.

PR: The building should have a rhythmic, musical form.

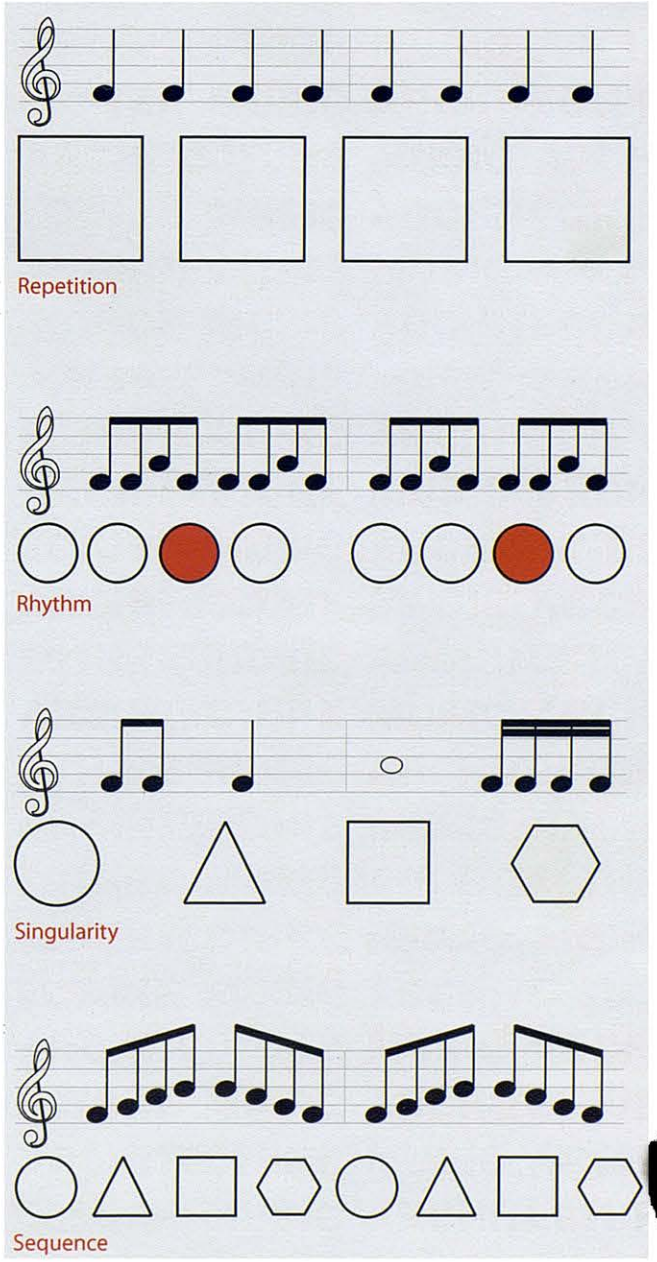
PR: Building pieces should follow a sequence of singularity or repetition.

Supporting Theories:

"Although music + architecture have different phenomenal presences, the underlying organization of their respective formal structures and colloquialisms are similar."[16]

"In music as well as in architecture, form, rhythm, proportion, and mathematics are of elementary importance."[17]

"Repetition and variation are the most dependable tools by which music creates a new dictionary from a common vocabulary of notes."[18]



Theoretical Issues

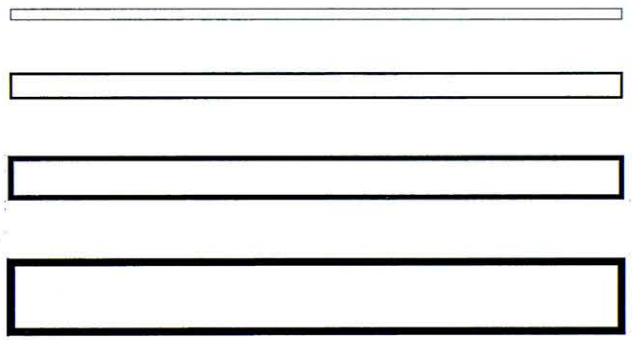
Materials

Goal:

The materials of the performing arts center should be reflective of the contrasts present between the notes and sounds of music.

PR: There should be a balanced mix of heavy versus light building materials

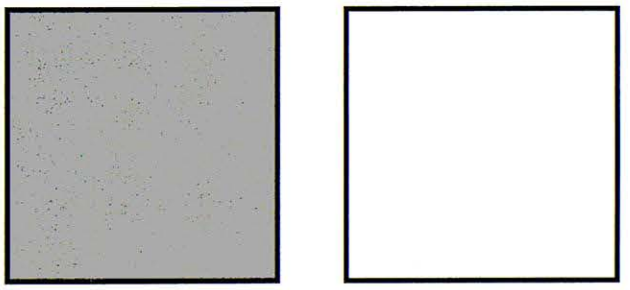
PR: There should be a balanced mixture of opaque versus transparent materials



Heavy versus Light

Supporting Theories:

"Formative repetition frequently characterizes its materials by contrasting transparent and opaque units of similar length. This contrast provides an essential asymmetry in otherwise symmetrical structures."[19]



Opaque versus Transparent

"Transparency becomes a ground for a complicated distancing of inside from outside, allowing the building to reach out beyond the space it occupies, to gather light from outside, and, most importantly, to allow its own form to be a matter of a shimmering surface of interpenetration as both perception and idea."[20]

Theoretical Issues

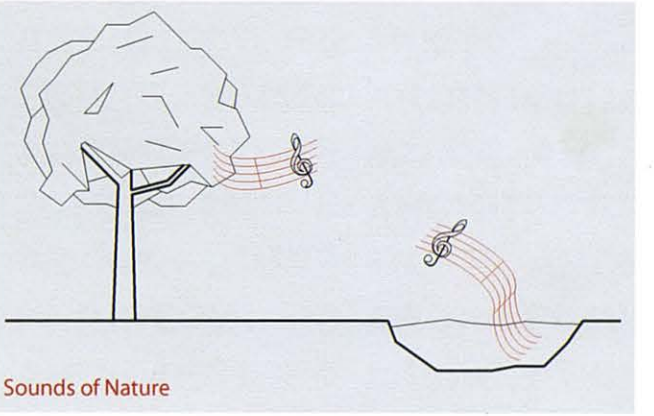
Sound

Goal:

The performing arts center should use sounding building elements as an aspect of sound creation and dissipation.

PR: The exterior site should use landscaping to create peaceful sounds

PR: Selected walkways should have rhythmic sequence of noisy versus quiet surface materials



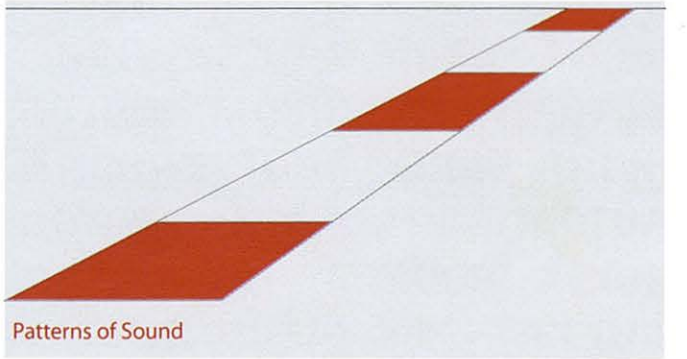
Sounds of Nature

Supporting Theories:

"If sound is organized and presented in a certain way, it invites listeners to interpret it as music."[21]

"music acts in the double character of an art of impression as well as of imitation."[22]

"The listener is not only a social or psychological type, but a body thinking the world through hearing, being in time through, because with, the music."[23]



Patterns of Sound

Case Study 1

Stretto House

The Stretto House by Stephen Holl is a design that has applied music to architecture in a formal, organized manner. Exploring the musical concept of "stretto", this term is defined as an overlapping of statements in a fugue, with each voice entering immediately after the preceding one. Bela Bartok's Music for Strings, Percussion, and Celeste was chosen as the guiding musical concept due to its extensive use of Stretto. "In four movements, the piece has distinct division between heavy (percussion) and light (strings)."[24] As Stephen Holl describes, "Like the score, the building has four sections, each consisting of two modes: heavy orthogonal masonry and light curvilinear metal."[25] The main house in plan is purely orthogonal, while in section the roof lines are curvilinear. The guest house is an inversion of the main house, as it features a curvilinear plan with a orthogonal profile in section. This is a direct response to the inversion which occurs in the first movement of the Bartok score. The spatial sequence of the interior was designed to flow as a series of overlapping perspectives. Proportioning of the room sizes were tuned according to the Golden Section ratio of 1:1.618. The Bela Bartok score, by no coincidence, is composed according to the Golden Section as well. The house is located in Dallas, TX, on a site featuring lush greenery and a stream with three concrete dams and ponds, creating a constant sound of water overlapping. Together, the house and the site create a harmonious relationship, creating a complimentary relationship.

Figure A9: Exterior view from pond

Figure A10: Curvilinear roof versus orthogonal walls

Case Study 1

Stretto House

"Where music has a materiality in instrumentation and sound this architecture attempts an analog in light and space."[26]

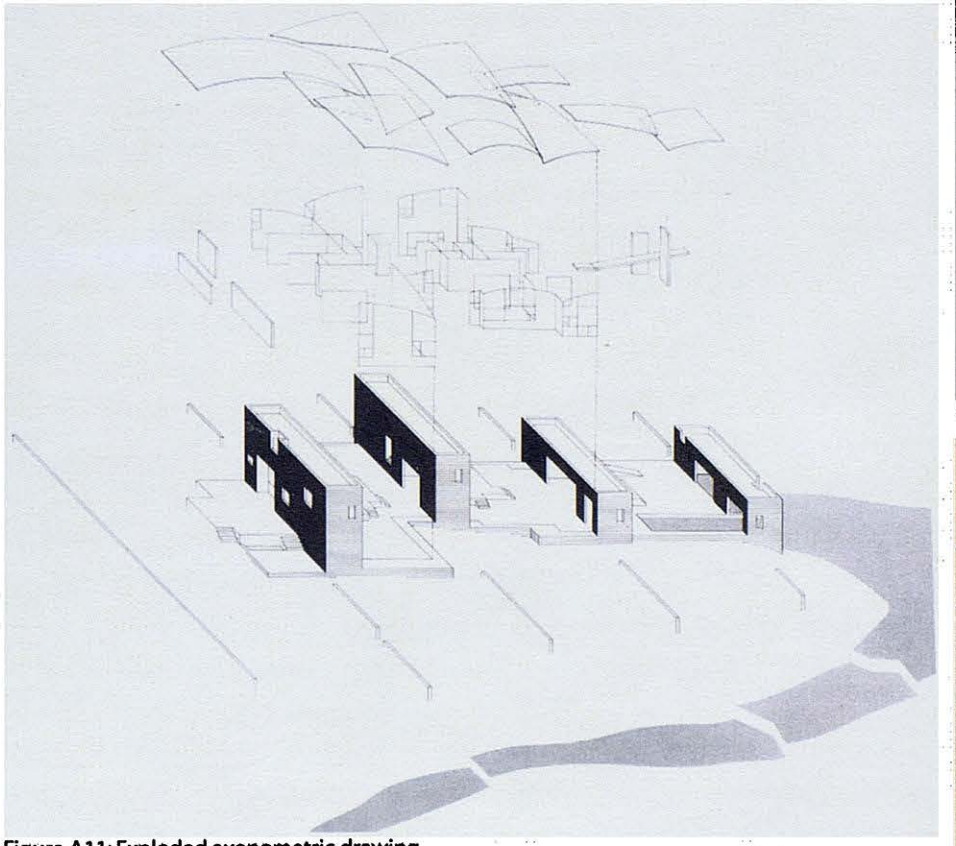


Figure A11: Exploded axonometric drawing

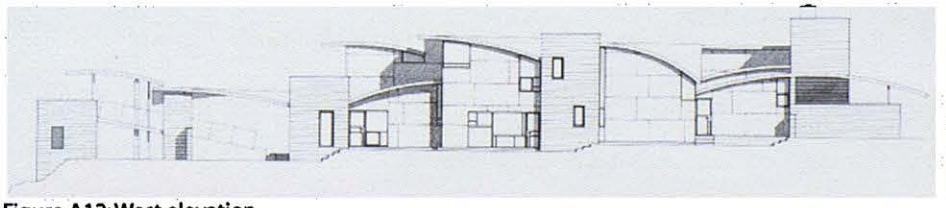


Figure A12: West elevation

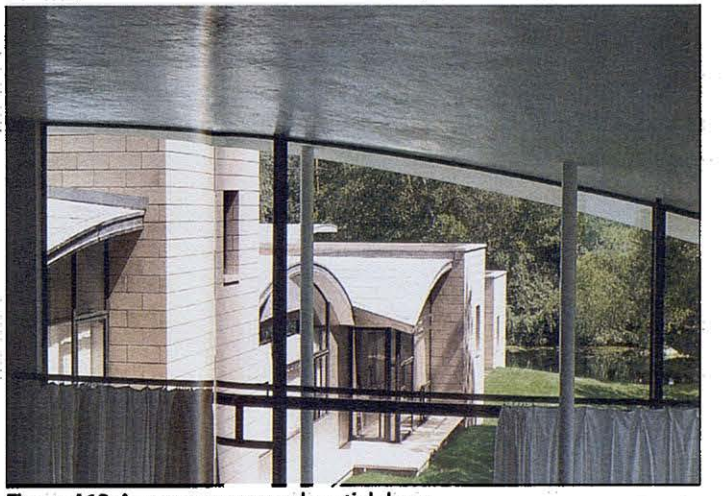


Figure A13: Aqueous space and spatial dams

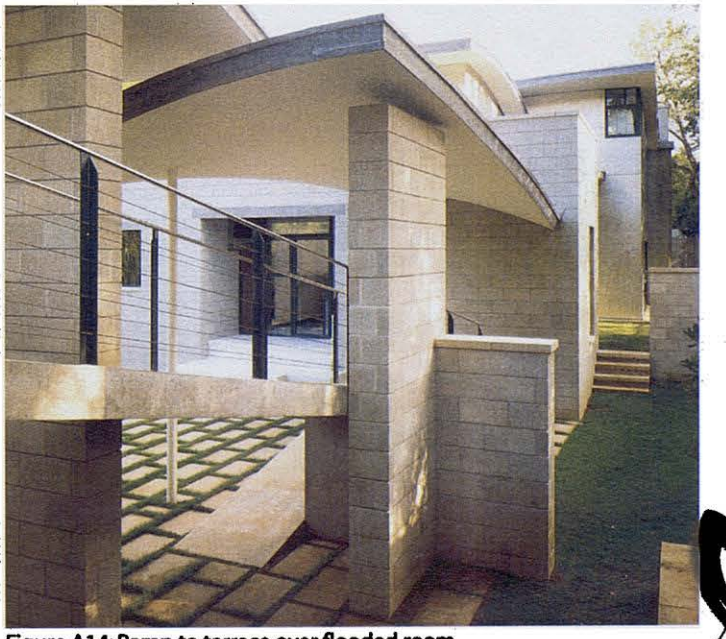


Figure A14: Ramp to terrace over flooded room

Case Study 2

Walt Disney Concert Hall

The Walt Disney concert hall approaches the idea of applying music to architecture in a very unique style. The approach to the design breaks away from the typical formal, rigid structure of music, taking rather a unique approach which examines the harmonious flow of music and sound. Gehry sees the concert hall as relating to music as a form of singular pieces, flowing together in a harmonious manner, which is reflective of the inherent characteristics of music. The design achieves a level of continuity while the building is actually a series of bodies in discontinuity, of singularities rather than repetitions. As Gehry describes, "The symmetry and curvature of the hall allow it to become an almost continuous surface that compliments the continuity of the body, facilitating, through what it share with it, access to the extreme articulation of singularities that, differently, music and architecture are."[27] The materials of the building are used in such a way that they activate the design, driving the design as opposed to being brought to life by it. Unlike the rigid grid of a musical score, his design is made of intersections between movements that do not stop moving, rather than starting and stopping to the dictation of a grid. "The task of the building is to provide a passage from the visual to the auditory, and it is through its use of percepts that it makes the former introduce the latter and transfer the listener from one to the other at the appropriate moment."[28] Gehry's architecture becomes a system of movement, disembodied as to become capable of describing or inventing any shape or form, where the building becomes frozen music.

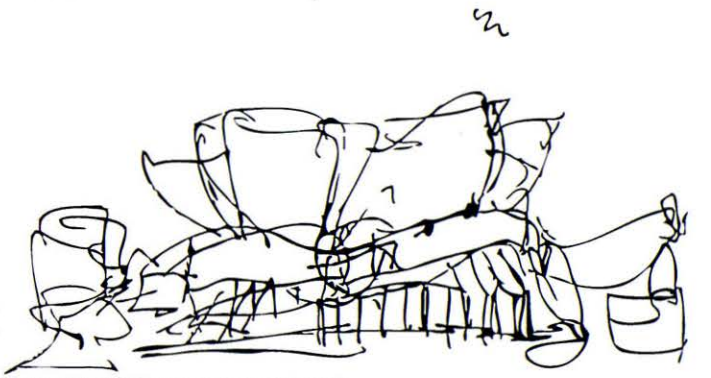


Figure A15: Gehry conceptual sketch

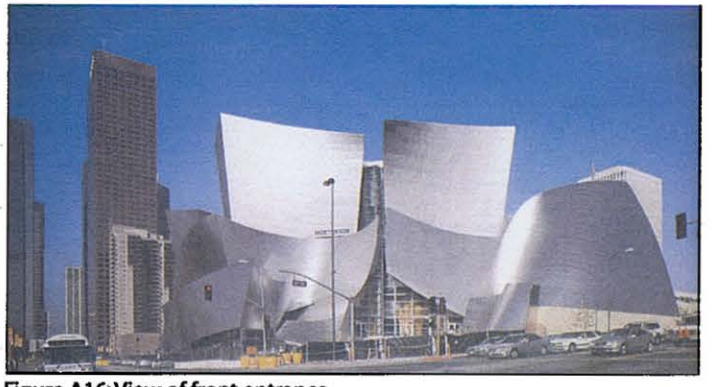


Figure A16: View of front entrance

Case Study 2

Walt Disney Concert Hall

Figure A17: View of east facade

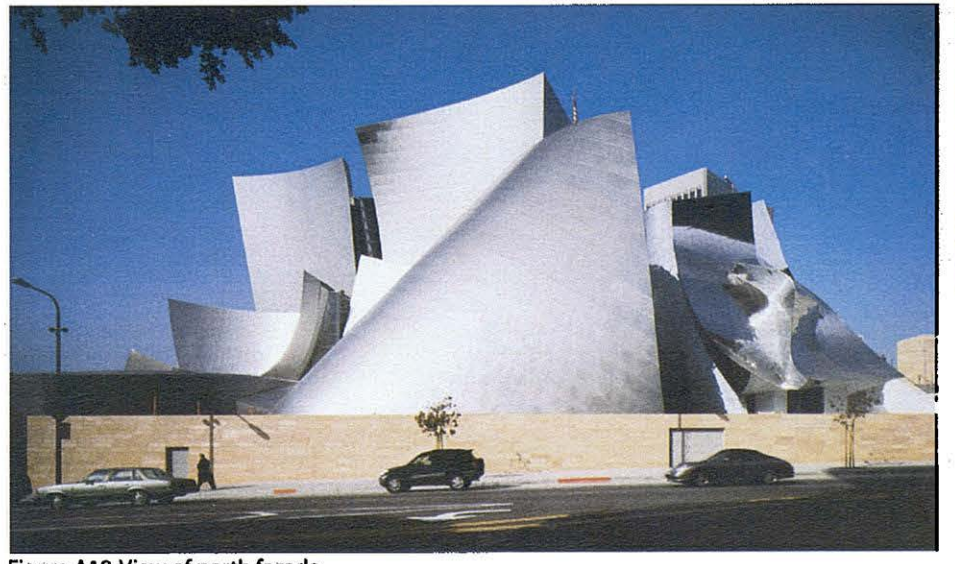


Figure A18: View of north facade

Figure A19: Concert hall interior

Case Study 3

Experience Music Project

Located on 5th Avenue, adjacent to the Space Needle at Seattle Center, this unique facility is intended to celebrate creativity and innovation as expressed through American culture and music. Designed by Frank Gehry, this museum and exhibition environment gives visitors the opportunity to not only explore the history of popular music, but also participate in the music making process, learning the secrets of its composition and performance. The building is a molded cluster of curving elements, clad in painted aluminum panels and in stainless steel panels. The inspiration for the design came from electric guitars, as used by the famous musician Jimi Hendrix, which Gehry purchased and took to his office and cut into little pieces. Most noticeable to this project is the bold use of color. The colors, a mix of gold, blue, purple, red, and silver, are symbolic references to various songs and events from the history of rock and roll. The red panels in particular were designed so that in time the red will fade, altering the appearance of the building's exterior and reflecting how music is always changing. "A fusion of textures and myriad of colors, the museum structure symbolizes the energy and fluidity of music."[29] The six elements of this facility house an activity that inspires musical creativity and knowledge of the art. The use of form and color designates the transition into a different sector of the building, in which numerous activities are used to illuminate the history, culture, and technology of music.

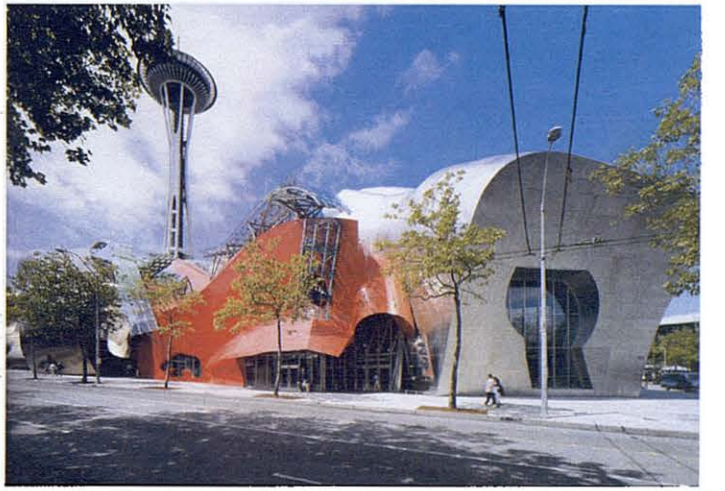


Figure A20: View from street

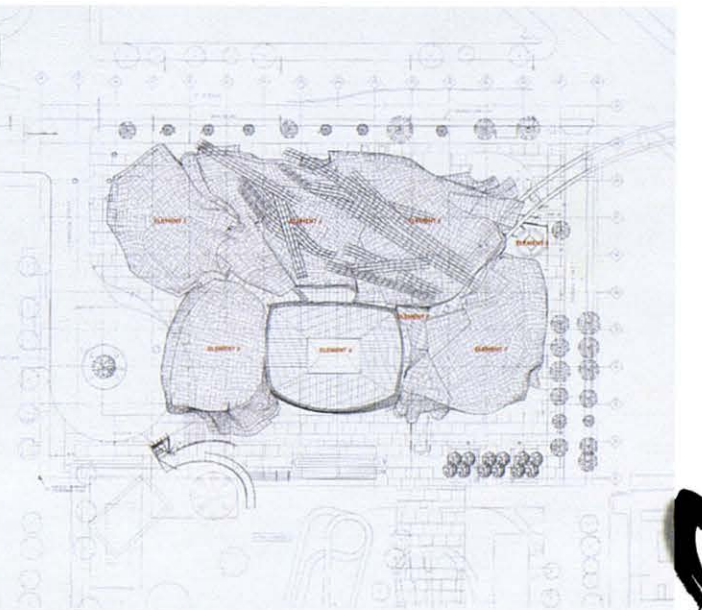


Figure A21: Site plan

Case Study 3

Experience Music Project

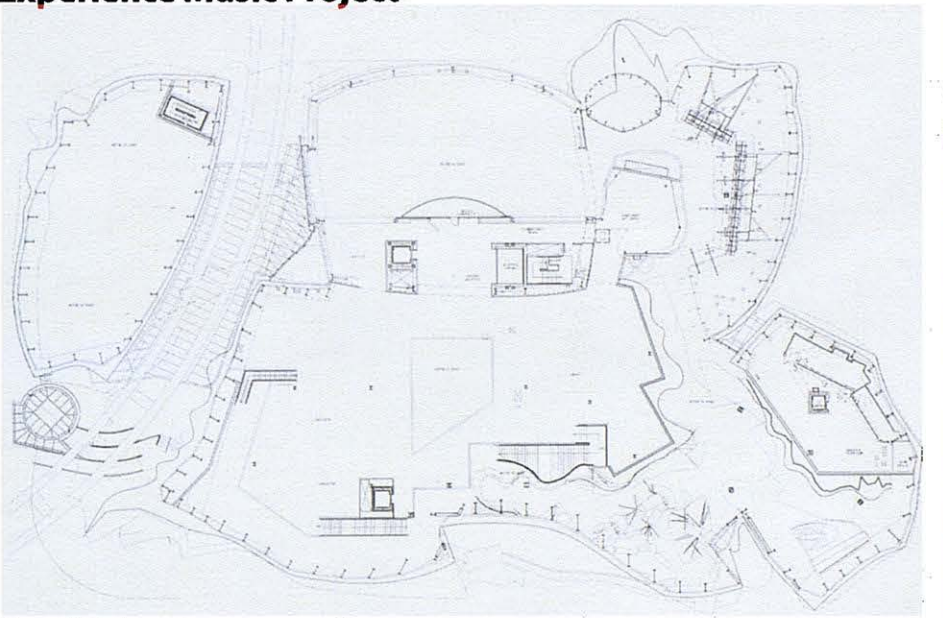


Figure A22: Floor plan

Figure A23: View of exterior facade

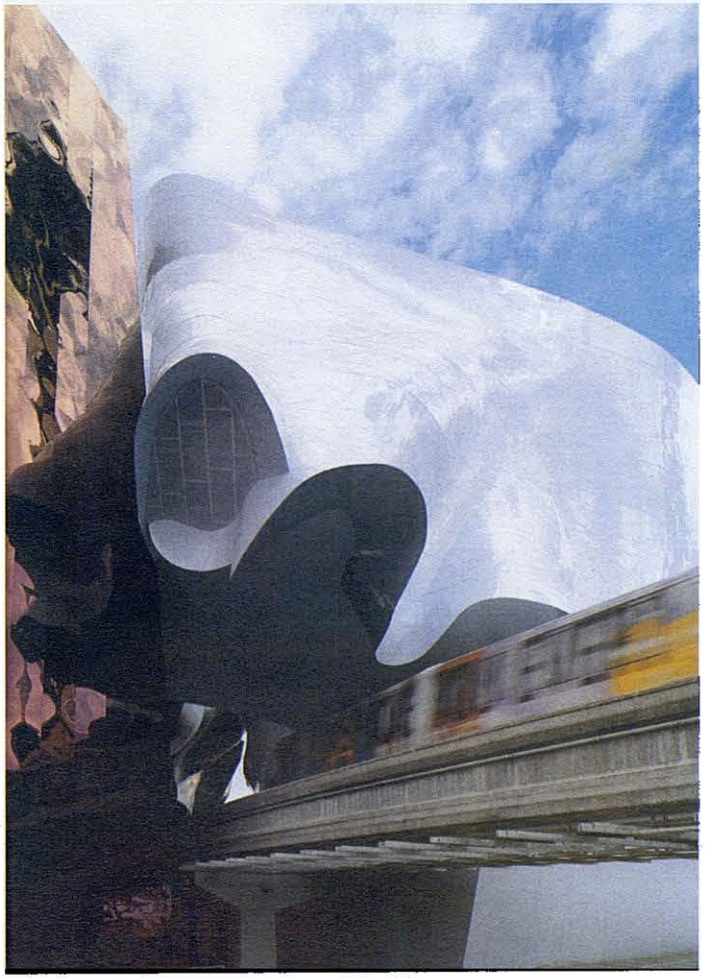


Figure A24: Subway running through building

Theory References

1 Martin, Elizabeth, ed. *Pamphlet Architecture 16: Architecture as a Translation of Music.* New York: Princeton Architecture P, 1994, 66.

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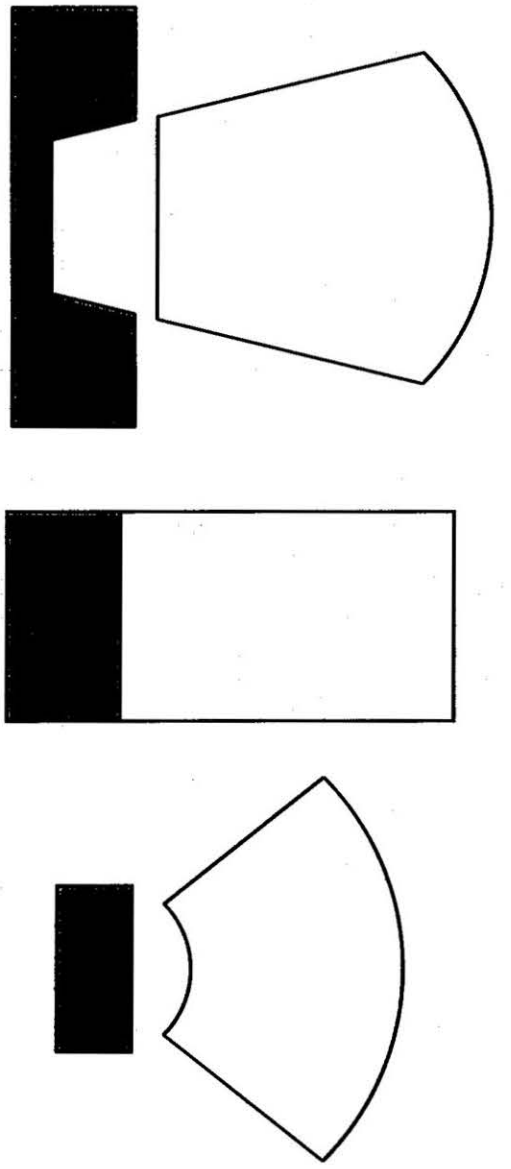
Introduction

Lubbock, TX Performing Arts Center

The facility is a performing arts center located Lubbock, TX. The center will focus primarily on musical performances, using two multipurpose auditoriums to accommodate for various sizes and types of music and drama performance venues. The first theater hall will consist of a standard shoe-box shaped concert hall, designed with flexibility in form, acoustics and seating to accommodate a broad range of different performance types. The second theater hall will consist of a proscenium theater for drama, dance, and other various small productions. This theater will also consist of multipurpose, flexible design features to adjust the size and acoustical parameters of the hall. Each theater design is intended to be capable of providing adequate conditions for both small and medium productions, to include all of the necessary facility rooms necessary for preparation, performance, and business production.

An existing amphitheater has been recently completed, serving to provide a performance facility for Texas Tech University, Lubbock Independent School District, and other various commercial and private performance organizations. The amphitheater will be integrated into the design of the new performing arts center, giving both additional flexibility to the building program and the option of an indoor our outdoor performance space. As the existing amphitheater was not been fully constructed, the design of this facility will propose a completed design for the amphitheater that connects the theaters both functionally and visually.



Theater Layout Forms

History

Performing Arts Theater

The theater as a place of performance dates back thousands of years, to the Greek and Roman era. Built of large stone, Greek amphitheaters were built into the hillside of the country landscape. The theater form was monumental in scale, the largest holding as many as twenty thousand people. The key aspect of theater design is form, developing how to create the best relationship between the audience and the performance. History shows that Greek and Roman designers found out by empirical means that speech and hearing are essentially directional, each following the straight-line phenomena. Therefore, if a sound source is within a reasonable distance and can be seen, it should also be heard. Goods sight lines came to be accepted as a general rule for determining good lines for hearing. With the architectural and structural limitations that the ancients were forced to work, inclining the seats at a slope was the only practical solution. The Romans borrowed extensively from the Greek theater, but adapting it to their own needs. The semi-circular orchestra of the Greeks eventually came to be eclipsed by the use of a raised stage, in light of the more vigorous acting style of the performers.

Some claim that the theater died following the fall of the Roman Empire, with its memory being kept alive only in the performance of small, traveling bands, street players, acrobats, and jugglers. The preservation of theater was kept alive by the church, re-enacting religious stories. Growth of the town and popularity of theater performance would eventually separate theater and church.

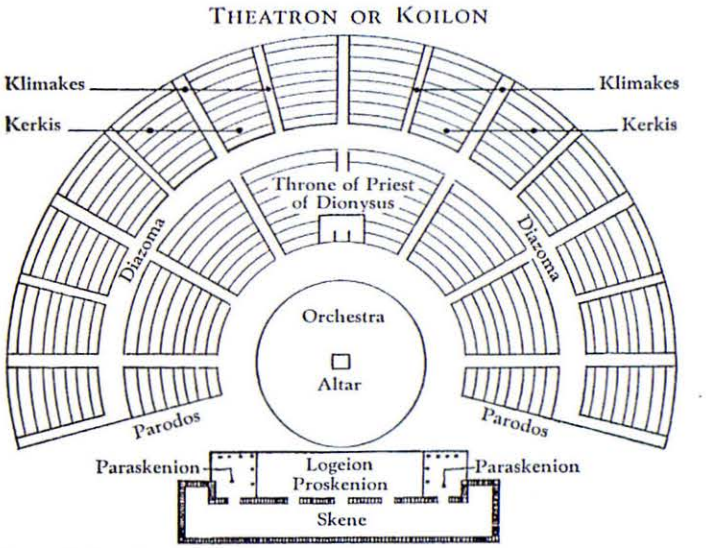


Figure B1: Greek theater layout

Figure B2: Ancient theater ruins

History

European society was influenced by the Renaissance, "rebirth" of the classical worlds of Rome and Greece, during the 15th and 16th centuries. The rediscovery of classics during the Renaissance influenced the development of the stage. Italy took the first steps in the development of the proscenium, or "picture stage" as commonly known, which is still the standard theater form used today. During this time period, England stage performance took place on "apron stages", surrounded by galleries and audience members seated not only around the stage, but on the stage itself. Religious reformation in Europe caused disruption to playwrights, resulting in the creation of original, secular performances for a general, non-religious or political nature. Elizabethan and Shakespeare Theater had a significant impact on theater performance. Shakespeare encouraged a more natural style of speaking, as opposed to the declamatory dialogue practiced by others.

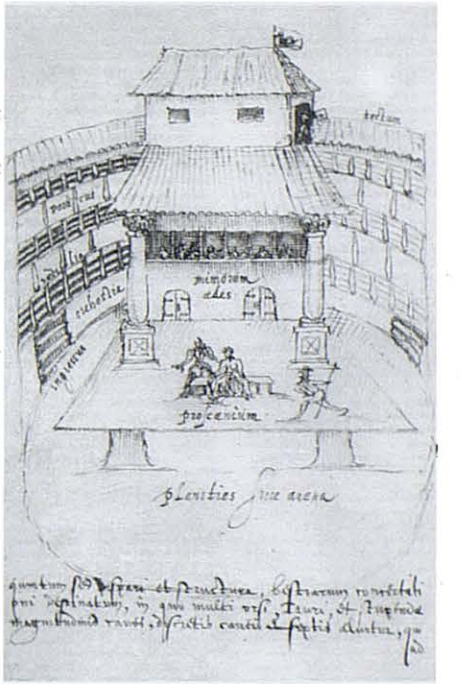


Figure B3: Shakespeare theater

In the 17th century, Theater in France and England began to focus on the mechanics of scenery and spectacles in drama performances. It was during this period that theaters began to be roofed in, be designed for the royal pleasure. This was also the period which saw the introduction of women in stage performances, as opposed to being played by young men. Theaters began to display the standard proscenium style or architectural form; however the forestage would remain the principal place in which acting took place. The area behind the proscenium was reserved for scenery display changes, being slide into view by means of panels on tracks.

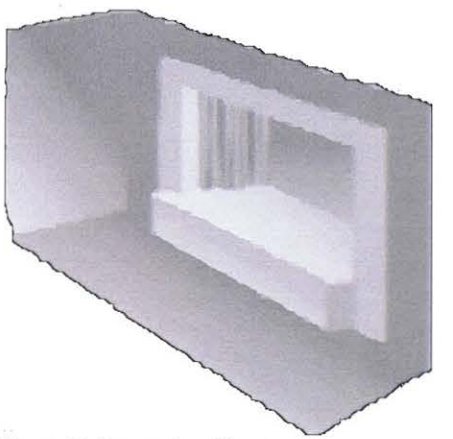


Figure B4: Proscenium Stage

History

During the 18th century, theater in England was transformed by an actor named David Garrick (1717-1779). Garrick emphasized a more natural style of speaking and acting, resembling that of normal life. He also banished the audience from the stage, shrinking the audience hall to being strictly behind the proscenium opening. Now the actors could perform among the furnishing, scenery, and other stage settings. It was at this point in time that commercial theatre made an appearance in the North American Colonies.

The 19th century was significantly changed by the Industrial Revolution, changing not only the face of theater, but the way in which people worked and lived. The introduction of gas lighting was first seen in 1817, evolving over time to the use of electrical lighting by the end of the century. Elaborate mechanisms for flying scenery changes, including fly-lofts, elevators, and revolving stages were also introduced during this time period.

In the 20th century, a completely new attitude toward shaping theaters was brought into existence. As opposed to the past, where developing production technique gave rise to a single theater shape, the 20th century saw the discovery or rediscovery of several new theater shapes. However, revival of earlier stage forms from 19th century architecture continued to accompany the mainstream tradition of the proscenium stage. New choices in theaters gave designers new options, a situation unknown to previous times. The proscenium stage still continues to be the most generally accepted and most widely built theater shape in this country.

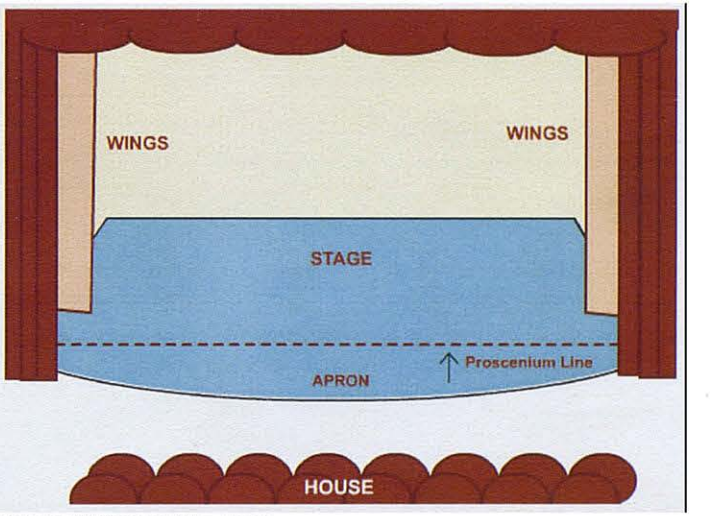


Figure B5: Proscenium stage

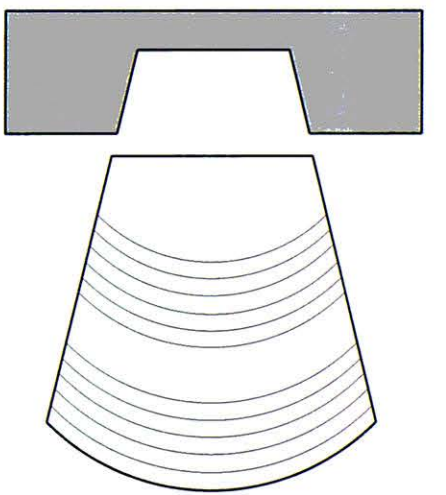


Figure B6: Proscenium form

Mission Statement

To create a performing arts facility that supports musical creativity and inspiration, providing users with an intimate environment through the use of sight, sound, and scale.

This facility seeks to provide the ideal environment, both on the exterior and interior, that will create an interactive facility which connects the user and performer together at an intimate scale. The facility will be expressive of music, musical creativity, and inspiration to all those who visit the center, with or without a background and knowledge of the musical arts. The facility will include all the necessary features to harvest this inspirational cause, providing space and time for the musical impression, the performance, and the interaction between user and performer. Even those coming in who are not a musician, will aspire to be one as they come out. This performing arts center will be a haven for both musicians and all those who have an appreciation for the art alike. The main goal of this facility is to bring together musicians and non-musicians alike into an environment where they may appreciate the performance and its presentation to the audience. Another goal of this project is to create a flexible, acoustically appropriate environment in which performers can come together and collaborate in the most ideal settings. Let the facility have as significant an impact on the performer as the performer does on the listener. May we create architecture that not only works for the user, but with the user.

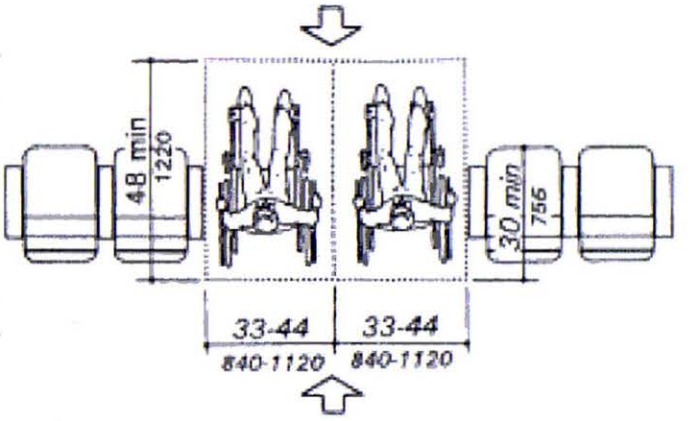
Texas Accessibility Standards

Assembly Area

As required by the Texas Accessibility Standards, specific provisions in the design of a public facility must meet code requirements. Texas Accessibility Standards contains a documented list of all spaces and size requirements for a Handicapped Accessible facility. Wheelchair access and egress requirements are the two most vital components to designing a facility which protects the health, safety, and welfare of the occupants.

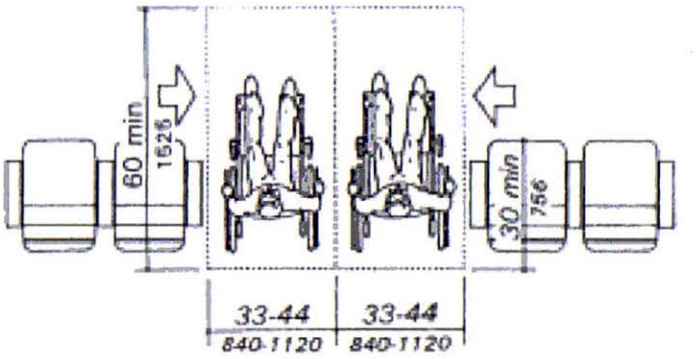
For Assembly Areas, Texas Accessibility Standards requires that in an assembly area having a seating capacity in excess of 25, each wheelchair location shall accommodate two persons in wheelchairs by providing minimum clear ground or floor spaces. When seating capacity of an assembly area exceeds 500, the number of wheelchair spaces required to be in pairs may be reduced to 50 percent of the minimum number of spaces.

Wheelchair areas shall be dispersed as to provide disabled people a choice of admission prices and lines of sight comparable to those for other members in the audience. At least one companion fixed seat shall be provided next to each wheelchair seating space. Readily removable seats may be installed in wheelchair spaces when the spaces are not required to accommodate wheelchair users. Access to performing areas, including stages, arena floors, dressing rooms, and other spaces used by performers is required.



(c)
Forward or Rear Access

Figure B7: Wheelchair access diagram



(d)
Side Access

Figure B8: Wheelchair access diagram

Texas Accessibility Standards

Dressing and Fitting Rooms

Texas Accessibility Standards requires that Dressing and Fitting Rooms be on an accessible route. A clear floor space allowing a person using a wheelchair to make a 180-degree turn shall be provided in every accessible dressing room entered through a swinging or sliding door. No door can swing into any part of the turning area. Turning space shall not be required in a private dressing room entered through a curtained opening at least 32 inches wide.

Every accessible dressing room shall have a 24 inch by 48 inch bench fixed to the wall along the longer dimension. The bench is required to be mounted 17-19 inches above the finish floor. Clear floor space shall be provided alongside the bench to allow a person using a wheelchair to make a parallel transfer onto the bench. Where installed in conjunction with showers or other wet locations, water shall not accumulate upon the surface of the bench and the bench is required to have a slip-resistant surface.

Where mirrors are provided in dressing rooms of the same use, then in accessible rooms, a full-length mirror, measuring at least 18 inches wide by 54 inches high, shall be mounted in a position affording a view to a person on the bench as well as to a person in a standing position.

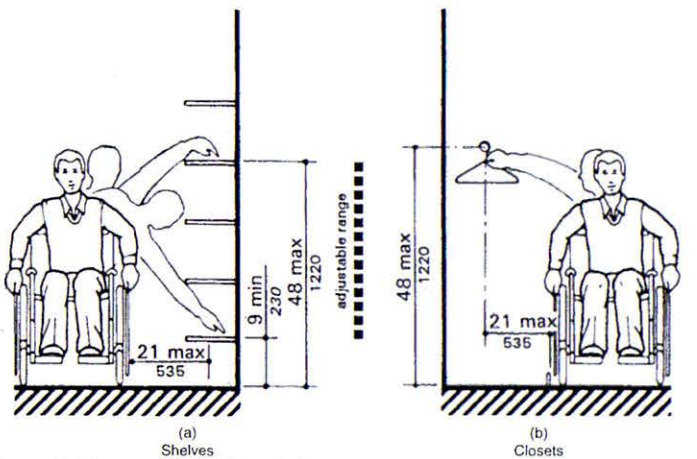


Figure B9: Accessible shelf and closet

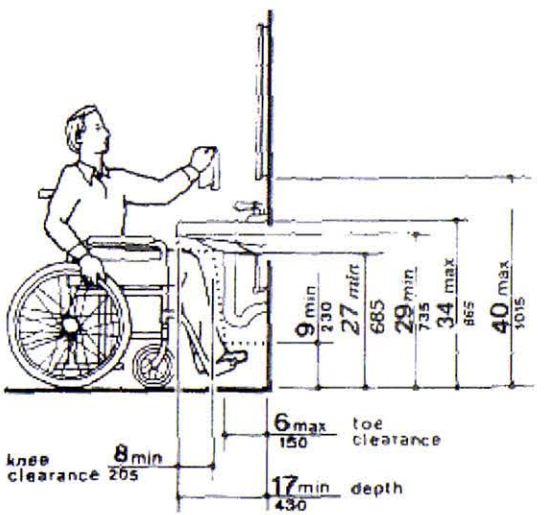


Figure B10: Accessible sink and mirror

Texas Accessibility Standards

Accessible Routes

Texas Accessibility Standards requires various clearances for wheelchair bound patrons. A wheelchair passage width for a single wheelchair shall be 32 inches at a point and 36 inches continuously. Width for two wheelchairs passing is to be a minimum of 60 inches wide. For turning space, the minimum space required for a standard wheel chair to make a 180-degree turn is a clear space of 60 inches in diameter, or a T-shaped space.

All walks, halls, corridors, aisles, skywalks, general circulation routes, and other spaces that are part of an accessible route must comply with the following conditions. At least one accessible route within the boundary of the site shall be provided from public transportation stops, accessible parking and accessible passenger unloading zones. The street and sidewalk serving the building must also be handicapped accessible. The width of an accessible route shall be 36 inches, with 60 inches clear at reasonable locations for wheelchairs to pass.

Ground and floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs, and curb ramps, shall be stable, firm, and slip-resistant. Soft or loose materials such as sand, gravel, and wood chips are not suitable.

Any part of an accessible route with a slope great than 1:20 shall be considered a ramp. The maximum slope of a ramp is new construction shall be 1:12, with the maximum rise for any run being a maximum of 30 inches.

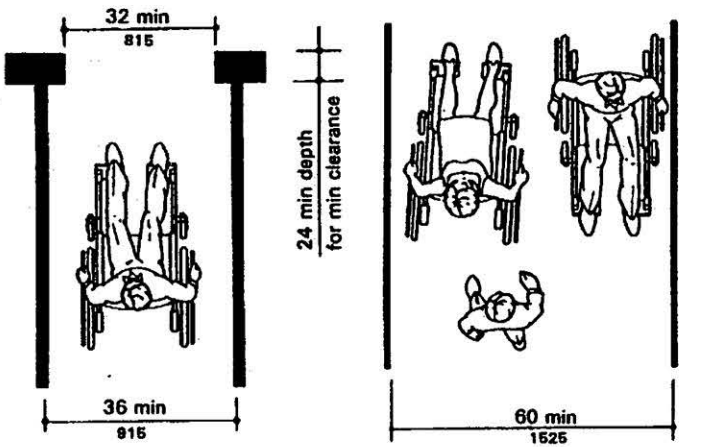


Figure B11: Wheelchair passage widths

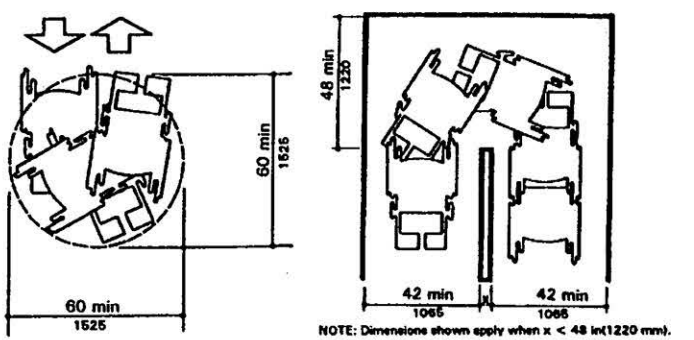


Figure B12: Wheelchair turning widths

Texas Accessibility Standards

Emergency Alarms

Emergency alarms are one of the most important features in a large assembly area. Texas Accessibility Standards requires that visual signal appliances be provided in buildings and facilities in each of the following areas: restrooms and any other general use areas, meeting rooms, hallways, lobbies, and any other area for common use. If provided, audible alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room by at least 15 decibels. Visual alarm signal appliances shall be integrated into the building of facility alarm system. The lamp shall be a clear or nominal white xenon strobe.

In general, no place in any room or space required to have a visual signal appliance shall be more than 50 feet from the signal. In large rooms and spaces exceeding 100 feet across, without obstruction 6 feet above the finish floor, such as auditoriums, devices may be placed around the perimeter, space a maximum of 100 feet apart.

All exits shall be clearly marked with sufficient space to quickly remove all occupants in a timely manner. Emergency lights shall be provided in the event of a power loss.

Figure B13: Emergency fire alarm

Architectural Issues

Flexibility

Goal:

The facility's auditoriums should integrate techniques of multi-use flexibility into the theater design.

PR: The seating layout of the concert hall should be changeable for different musical events.

PR: Acoustic elements should be manually adjustable to control sound reverberation for different events.

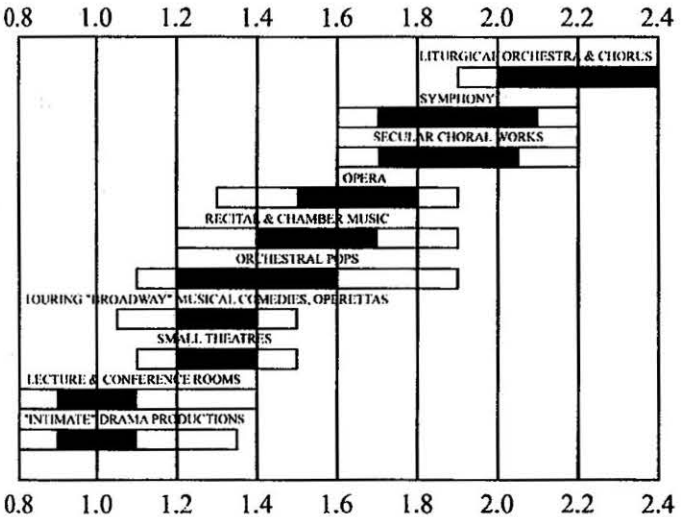


Figure B14: Reverberation Times by Performance Type

Supporting Statements:

"Various types of musical performance require flexibility of the platform and its surroundings"

("Building Type Basics", 35)

"Multipurpose rooms require acoustical characteristics that can be adjusted to suit each performance activity."

("Performing Art Spaces", 717)

"Physically adjustable acoustic devices are employed to reduce the acoustical "liveness" for opera, ballet, and amplified performances."

("Performing Art Spaces", 735)

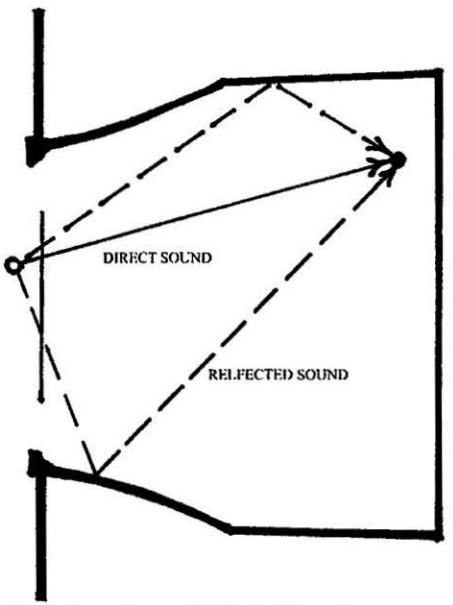


Figure B15: Direct Sound verus Reflected Sound

Architectural Issues

Circulation

Goal:

The facility should direct patrons and performers to their desired location.

PR: The interior should provide efficient pedestrian circulation throughout each public space.

PR: Vehicular circulation should separate patron cars and performance venue semi-trucks.

Supporting Statements:

"Public traffic flow should be designed so that the movement of patrons throughout the lobby is straightforward."

("Performing Arts Spaces", 726)

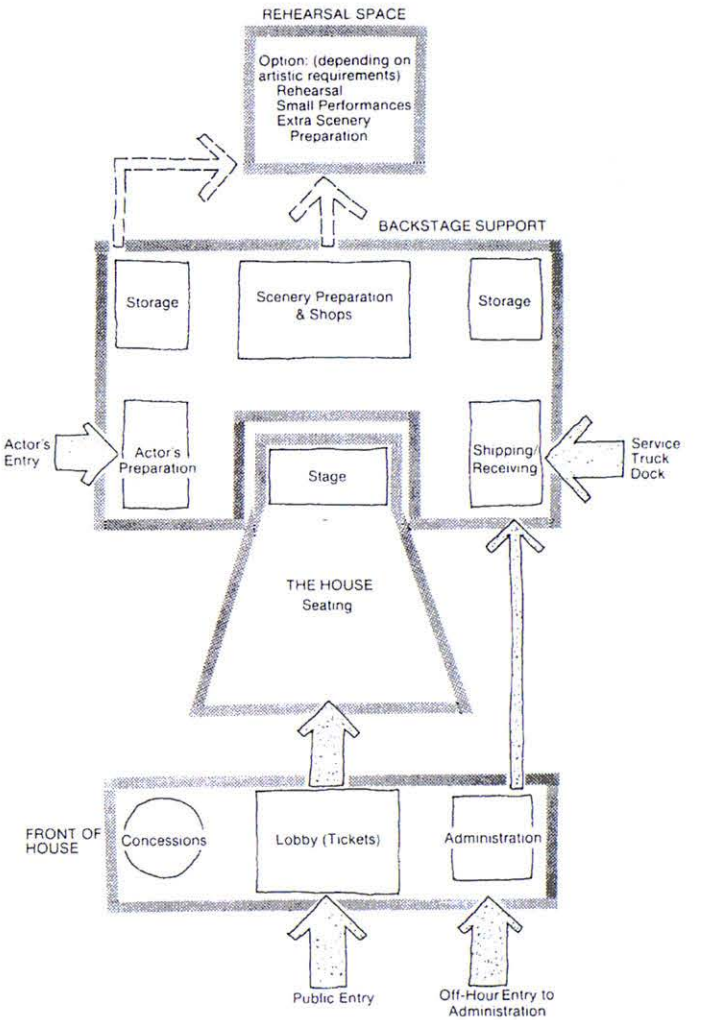


Figure B16: Interior Space Circulation

Architectural Issues

Lighting and Acoustical Isolation Control

Goal:

The facility should isolate disruptive lights and sounds from the performing area.

PR: Unwanted light and noise should be controlled from entering the theater with the use of vestibules

PR: Noise vibration should be controlled through structural building separation

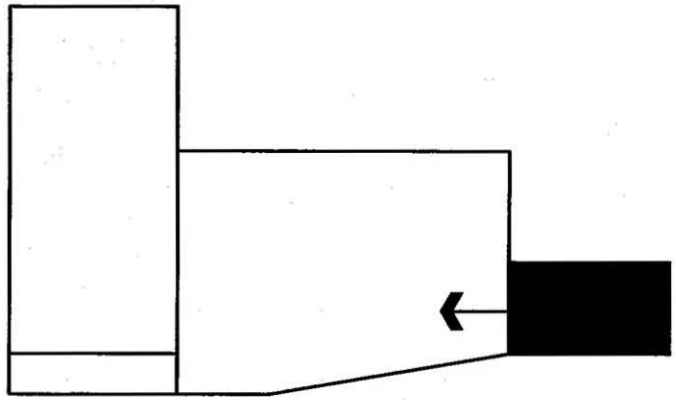


Figure B17: Sound and Light Lock

Supporting Statements:

"Every entry should be designed with vestibules that incorporate sound-absorptive finish materials."

(Building Type Basics, 108)

"Isolation between spaces within a facility and between the performance spaces and the exterior can be provided through careful structural-system design."

(Building Type Basics, 107)

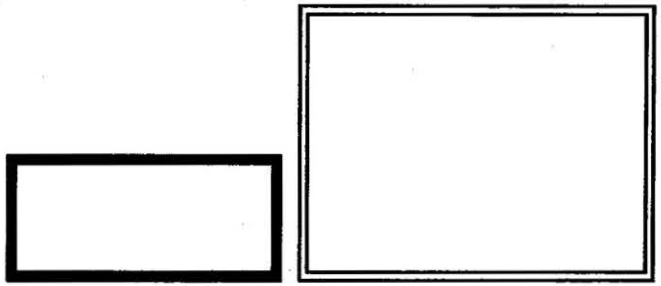


Figure B18: Structural Separation

"Control of noise – whether from exterior traffic, from other spaces within the facility, or from the building's heating, plumbing, and electrical systems – is a critical consideration for any theater."

(Building Type Basics, 106)

Spatial Analysis

Lobby

Description:

The lobby will act as a central point of circulation for the users, providing access to each part of the facility. The space will serve to collect users before, during, and after a performance.

Activities:

Circulation, event gathering, socializing, observing, expositions, rehearsing.

Size:

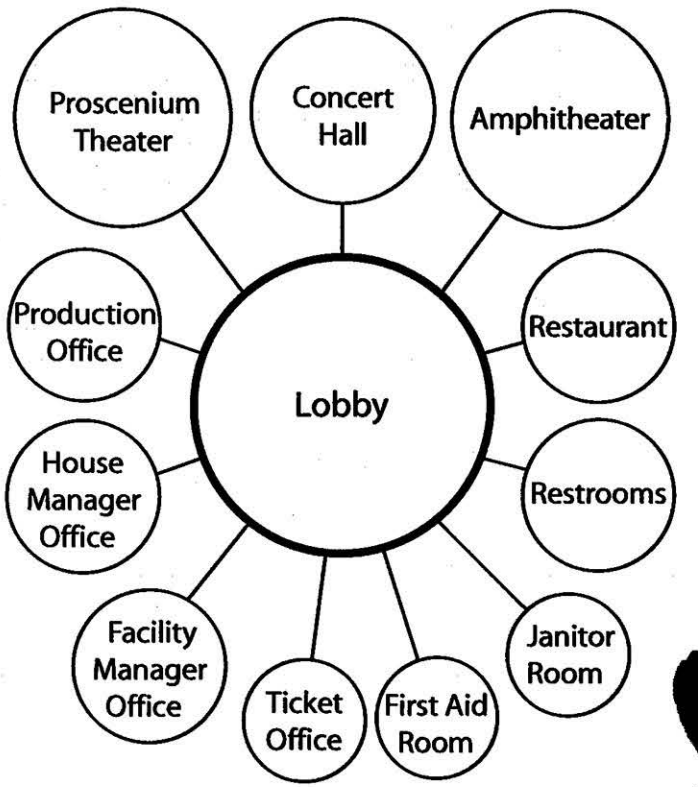
8,000 square feet

Users:

Visitors, facility personnel, performers

Design Considerations:

- Clearly delineated access to restaurant and auditoriums
- The space needs to maintain a comfortable temperature
- Flexible lighting to accommodate for secondary activities
- Use of natural day lighting
- Materials should be selected based on maintenance and aesthetic appearance
- Accessibility to Lobby from loading dock is preferred
- Separation from the theater entrance through vestibules is recommended
- Flexible seating arrangements
- Large wall spaces for performance pin-ups/posters



Spatial Analysis

Ticket Box Office

Description:

The office will serve as a multi-window ticket office for both theaters.

Activities:

Purchasing tickets, waiting in line, socializing.

Users:

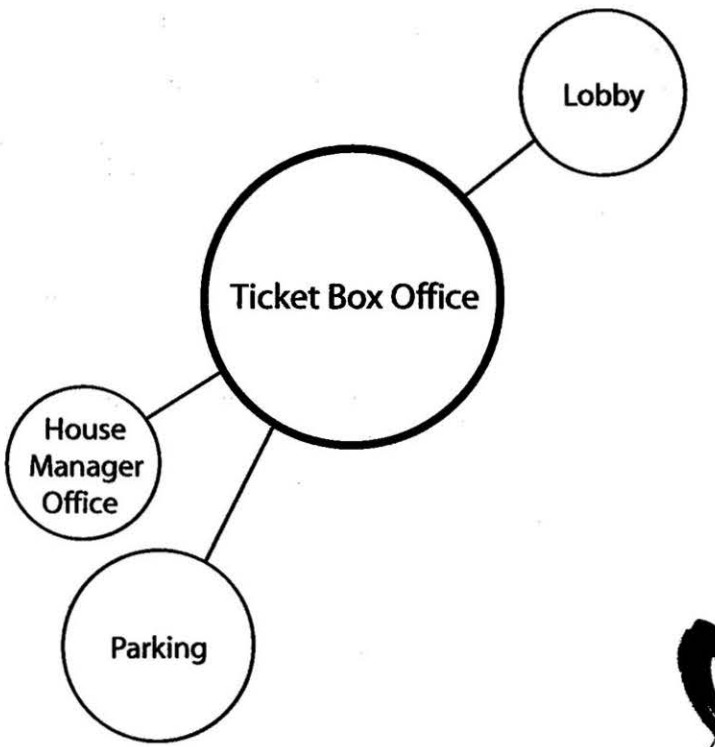
Visitors, facility personnel

Size:

150 square feet

Design Considerations:

- Convenient location and accessibility from parking lot and theater entrances
- Clear signage to identify use by visitors
- Located either inside lobby or at building entrance
- Provide a separate window for pre-ordered tickets
- Sufficient space for equipment storage and users
- Security cameras to monitor transactions
- Complies with ADA standards
- Adequate heating and air conditioning
- Efficient task lighting
- Automatic locking door to enter space
- Adequate number of internet/phone connections
- Security equipment for monetary transactions



Spatial Analysis

Production Office

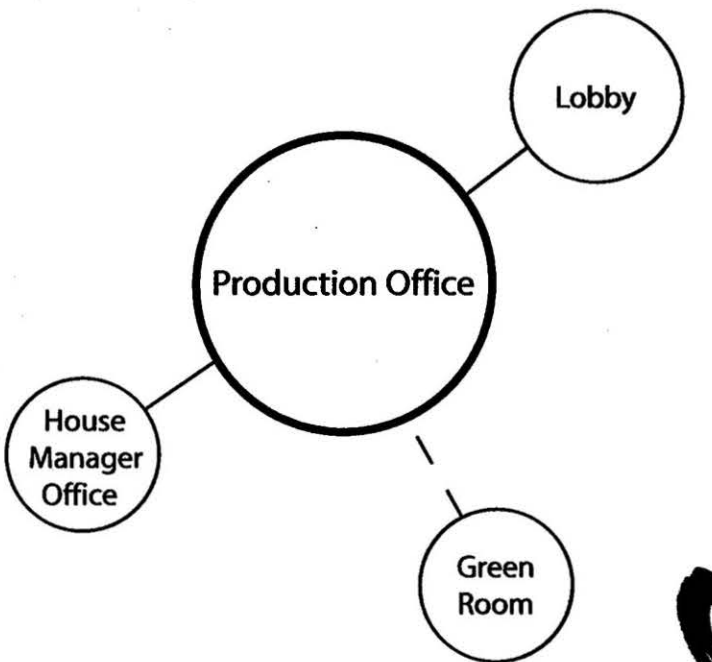
Description:
This space will serve as an office for show production activities

Activities:
Phone communication, internet use, sending/receiving faxes

Users:
Company manager, stage manager, assistants, facility personnel

Size:
200 square feet

Design Considerations:
- Multiple phone, data, fax, and internet connections
- Sufficient space for equipment and users
- Adequate heating and air conditioning
- Efficient task lighting
- Separated space for various production teams
- Movable furniture for different arrangements
- Adjacent to House Manager's Office



Spatial Analysis

House Manager's Office

Description:

This space will serve as an office for the Manager of the performing arts center.

Activities:

Phone communication, internet use, sending/receiving faxes

Users:

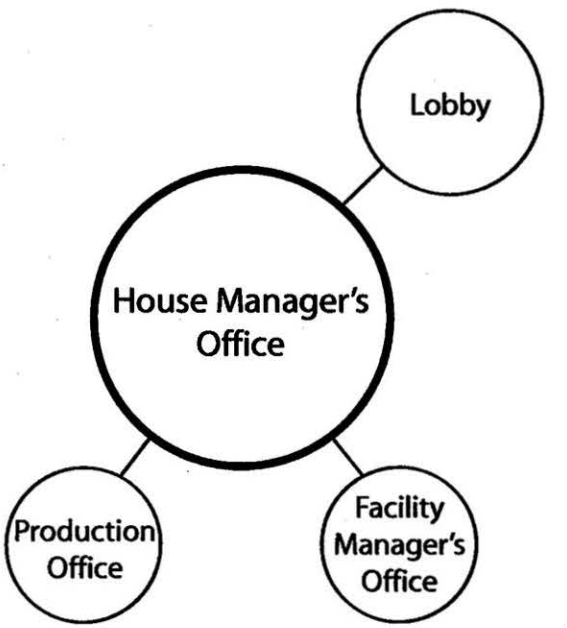
House manager, facility personnel

Size:

120 square feet

Design Considerations:

- One phone, data, fax, and internet connection
- Sufficient space for equipment, storage, and personnel
- Adequate heating and air conditioning
- Adjacent to Production Office
- Carpeted with aesthetic lighting
- Flexible furniture arrangement
- Window views
- Privacy
- One tackable wall surface



Spatial Analysis

Facility Manager's Office

Description:

This space will serve as an office for the Facility Manager of the performing arts center.

Activities:

Phone communication, internet use, sending/receiving faxes

Users:

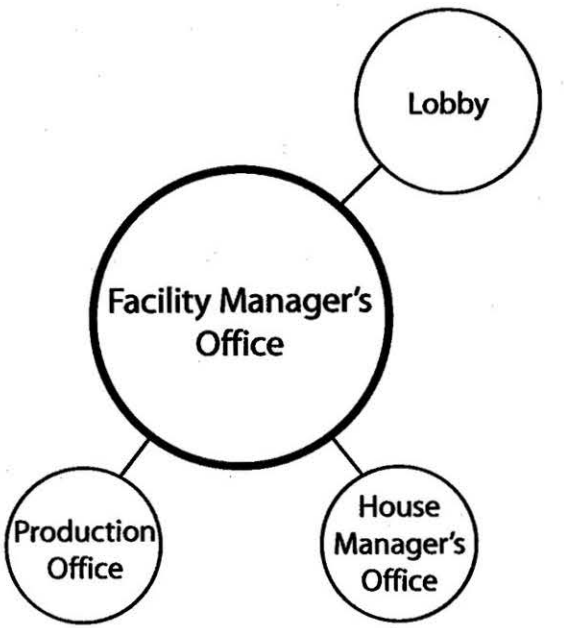
Facility manager, facility personnel

Size:

140 square feet

Design Considerations:

- One phone, data, fax, and internet connection
- Sufficient space for equipment, storage, and personnel
- Adequate heating and air conditioning
- Adjacent to House Manager's Office and Production Office
- Carpeted with aesthetic lighting
- Flexible furniture arrangement
- Window views
- Privacy
- One tackable wall surface



Spatial Analysis

Security Office

Description:

This space will serve as an office for security personnel

Activities:

Monitoring, phone communication, internet use

Users:

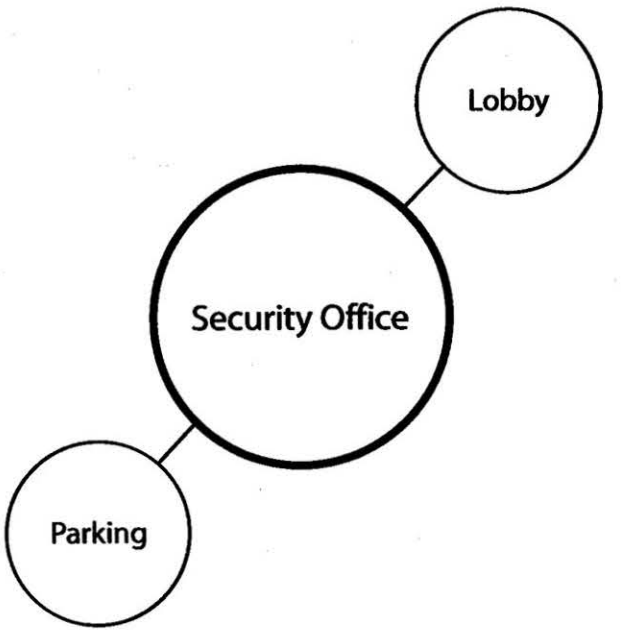
Security officer

Size:

150 square feet

Design Considerations:

- One phone, data, fax, and internet connection
- Sufficient space for equipment, storage, and personnel
- Adequate heating and air conditioning
- Carpeted with aesthetic lighting
- Flexible furniture arrangement
- Window views
- Privacy
- Automatic locking doors
- One tackable wall surface



Spatial Analysis

Men's Public Restroom

Description:

This space will serve as a restroom for patrons of the center

Activities:

Washing, cleaning, drying, applying cosmetics

Users:

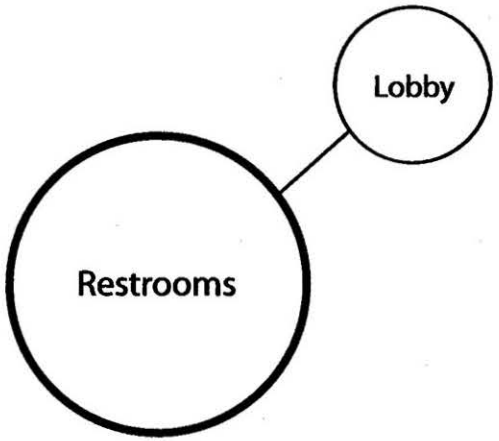
Visitors, guests, facility personnel

Size:

1,000 square feet

Design Considerations:

- Complies with ADA standards
- Required number of plumbing fixtures by code
- Room finish materials should be low maintenance
- Directly accessible from Lobby
- Adequate lighting and ventilation
- Adjacent to Janitor Room
- Avoid locating restrooms or other major plumbed facilities adjacent to the wall of the house or stage, to ensure acoustic sound isolation



Spatial Analysis

Women's Public Restroom

Description:

This space will serve as a restroom for patrons of the center

Activities:

Washing, cleaning, drying, applying cosmetics

Users:

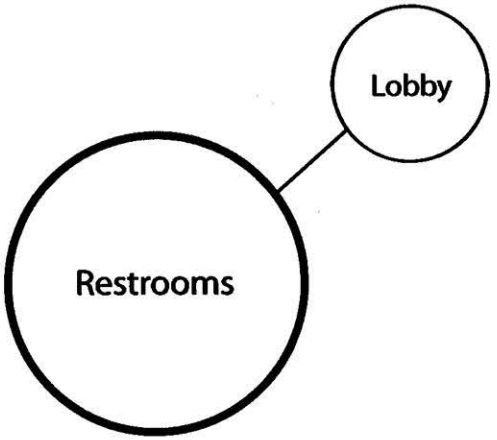
Visitors, guests, facility personnel

Size:

1,000 square feet

Design Considerations:

- Complies with ADA standards
- Required number of plumbing fixtures by code
- Room finish materials should be low maintenance
- Directly accessible from Lobby
- Adequate lighting and ventilation
- Adjacent to Janitor Room
- Avoid locating restrooms or other major plumbed facilities adjacent to the wall of the house or stage, to ensure acoustic sound isolation



Spatial Analysis

First Aid Room

Description:

This space will store first aid equipment

Activities:

Storage

Users:

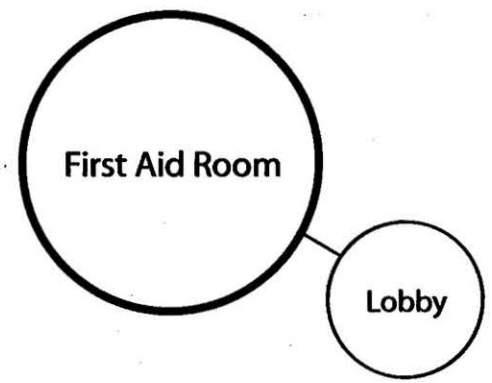
Facility personnel

Size:

150 square feet

Design Considerations:

- Efficient task lighting
- Directly accessible from Lobby
- Adequate lighting and ventilation
- Sufficient space for storage and equipment
- Adequate ventilation
- Built-in shelves



Spatial Analysis

Janitor Room

Description:

To provide storage for janitorial equipment and supplies

Activities:

Storage

Users:

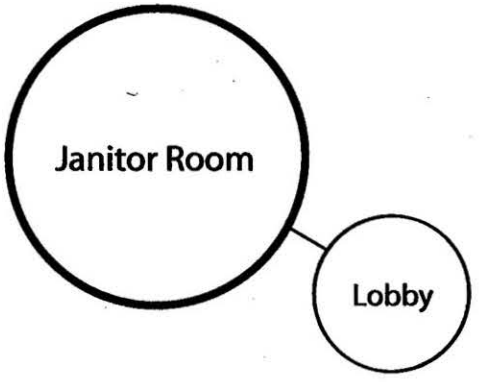
Facility personnel

Size:

200 square feet

Design Considerations:

- Efficient task lighting
- Directly accessible from Lobby
- Adequate lighting and ventilation
- Sufficient space for storage and equipment
- Adequate ventilation
- Built-in shelves
- Room finish materials should be low maintenance



Spatial Analysis

Reception

Description:

This space will serve as the entry point to the restaurant facility

Activities:

Greeting, socializing, waiting

Users:

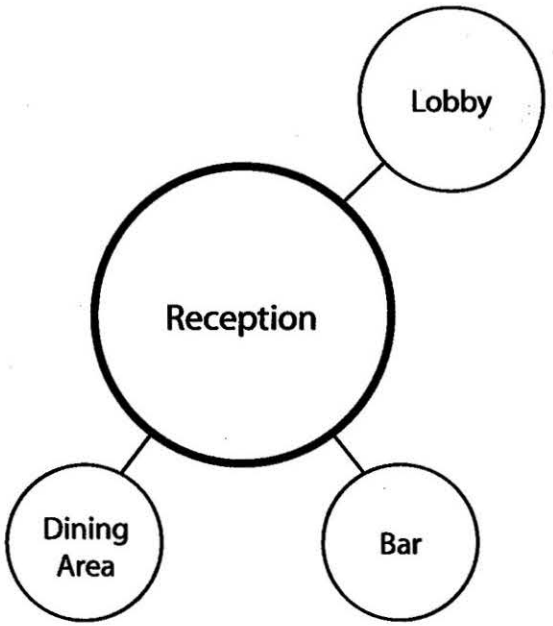
Hostess, patrons

Size:

100 square feet

Design Considerations:

- Patron should have view of dining area
- Hostess at front to greet patrons is preferred
- Materials should be aesthetically pleasing
- Lounge area for waiting customers is recommended
- Space should be adjacent to Lobby
- Sign with restaurant menu



Spatial Analysis

Bar

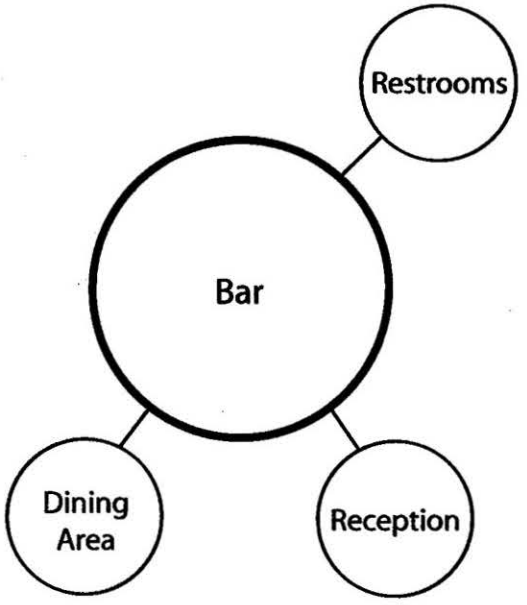
Description:
This space will be used to serve meals and beverages to customers

Activities:
Ordering, drinking, eating, socializing

Users:
Customers, restaurant personnel

Size:
150 square feet

Design Considerations:
- A customer activity zone of 18 to 24 inches should be provided to allow for seating, standing, and access
- A general circulation zone of at least 30 inches should be provided
- If a supplementary drinking surface or shelf is provided, a smaller activity zone of 18 inches is suggested in front of the shelf
- The shelf can be 10 to 12 inches deep
- A minimum of 36 inches should provide space for one bartender to serve and another to circulate behind him
- A spacing of 12 inch stools on 28 inches centers is suggested
- Decorative lighting



Spatial Analysis

Dining Area

Description:

This space will provide seating for customers in the restaurant

Activities:

Eating, drinking, socializing

Users:

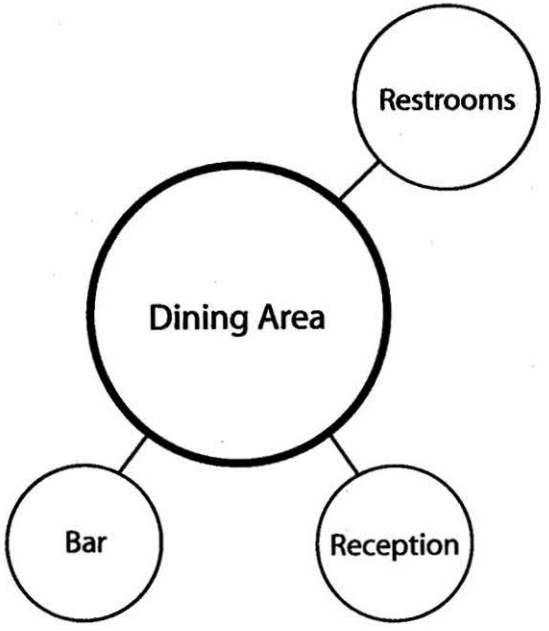
Customers, restaurant personnel

Size:

900 square feet

Design Considerations:

- Environment should be aesthetically pleasing
- Adequate heating and air conditioning
- Decorative lighting
- A variety of table sizes should be provided
- Flexible seating arrangements
- High turnover rate is preferred
- Clear traffic lanes
- Window views
- Use of natural daylight



Spatial Analysis

Men's Restroom

Description:

This space will serve as a restroom for restaurant customers

Activities:

Washing, cleaning, drying, applying cosmetics

Users:

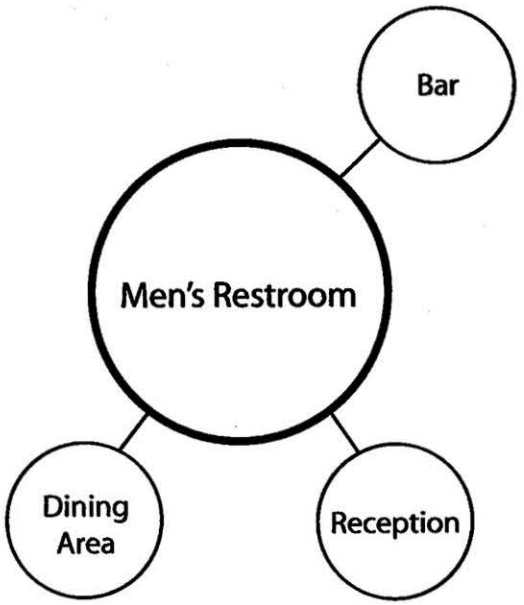
Customers, restaurant personnel

Size:

200 square feet

Design Considerations:

- Complies with ADA standards
- Required number of plumbing fixtures by code
- Room finish materials should be low maintenance
- Directly accessible from Dining Area and Bar
- Adequate lighting and ventilation
- Adjacent to Janitor Room



Spatial Analysis

Women's Restroom

Description:

This space will serve as a restroom for restaurant customers

Activities:

Washing, cleaning, drying, applying cosmetics

Users:

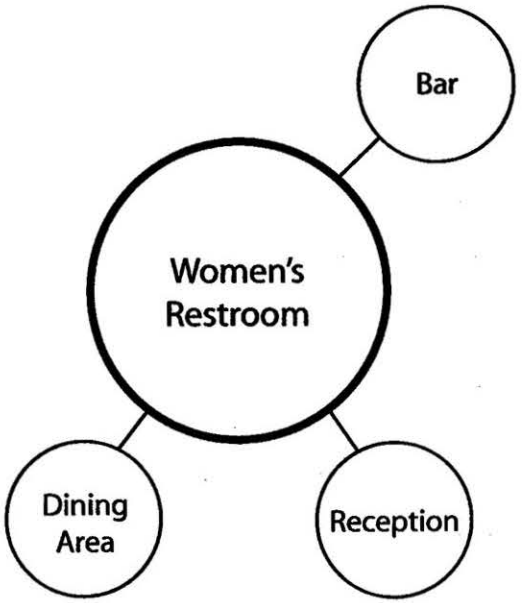
Customers, restaurant personnel

Size:

200 square feet

Design Considerations:

- Complies with ADA standards
- Required number of plumbing fixtures by code
- Room finish materials should be low maintenance
- Directly accessible from Dining Area and Bar
- Adequate lighting and ventilation
- Adjacent to Janitor Room



Spatial Analysis

Kitchen

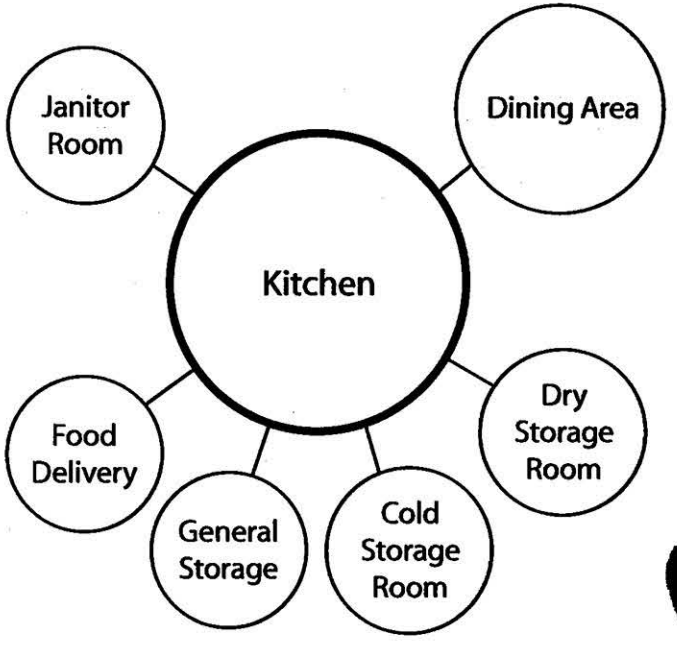
Description:
This space will serve for meal preparation

Activities:
Cooking, preparing

Users:
Restaurant personnel, Manager

Size:
350 square feet

Design Considerations:
- Room finish materials should be low maintenance
- Adequate ventilation
- Efficient task lighting
- In close proximity to Janitor Room
- Directly accessible from Dining Area
- Use of natural day light
- Work centers separate from circulation thoroughfares
- Eliminate partitions whenever possible



Spatial Analysis

Liquor Storage Room

Description:

This space will provide storage for alcoholic containers and beverages

Activities:

Storage

Users:

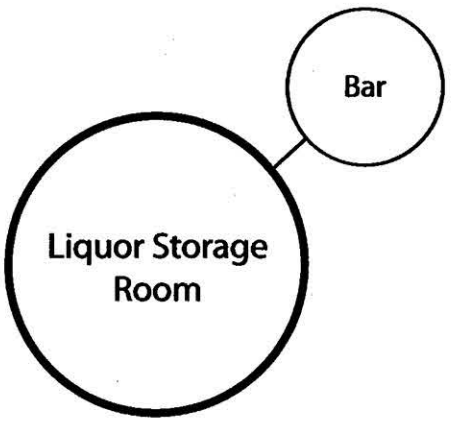
Restaurant personnel, Manager

Size:

50 square feet

Design Considerations:

- Automatic locking doors
- Adequate ventilation
- Efficient task lighting
- Adjacent to Bar
- Built in shelves



Spatial Analysis

General Storage

Description:

This space will provide storage for miscellaneous equipment and supplies

Activities:

Storage

Users:

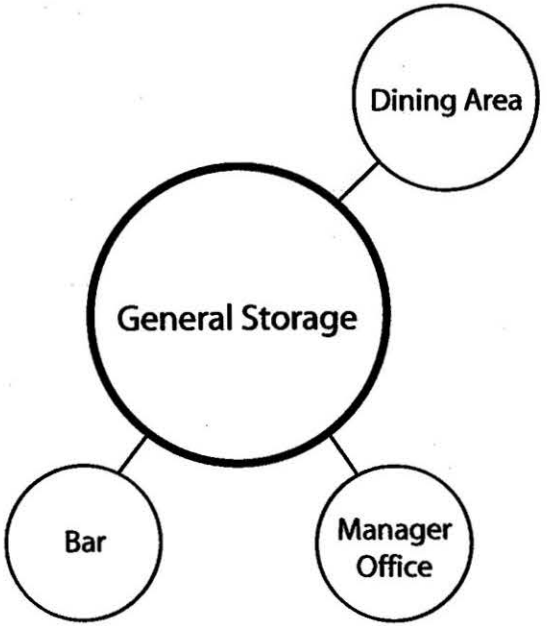
Restaurant personnel, Manager

Size:

100 square feet

Design Considerations:

- In close proximity to Dining Area and Kitchen
- Automatic locking doors
- Adequate ventilation
- Efficient task lighting
- Built in shelves



Spatial Analysis

Dry Food Storage

Description:

This space will provide storage food items to be kept at room temperature

Activities:

Storage

Users:

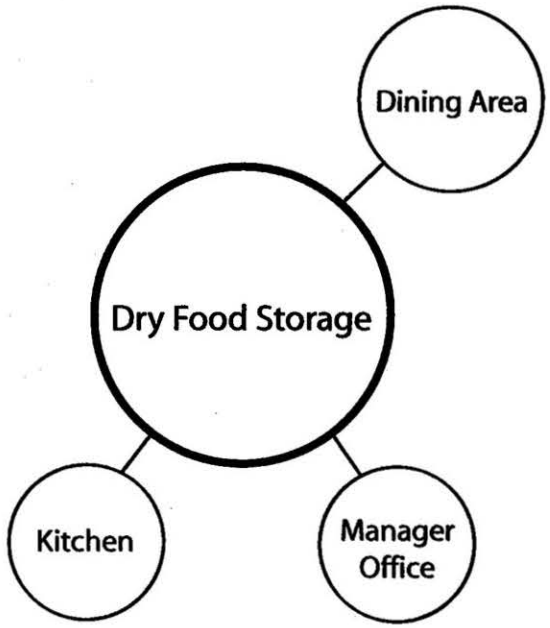
Restaurant personnel, Manager

Size:

80 square feet

Design Considerations:

- In close proximity to Dining Area and Kitchen
- Automatic locking doors
- Adequate ventilation
- Humidity control
- Efficient task lighting
- Built in shelves



Spatial Analysis

Cold Food Storage

Description:

This space will provide storage food items to be kept at a chilled temperature

Activities:

Storage

Users:

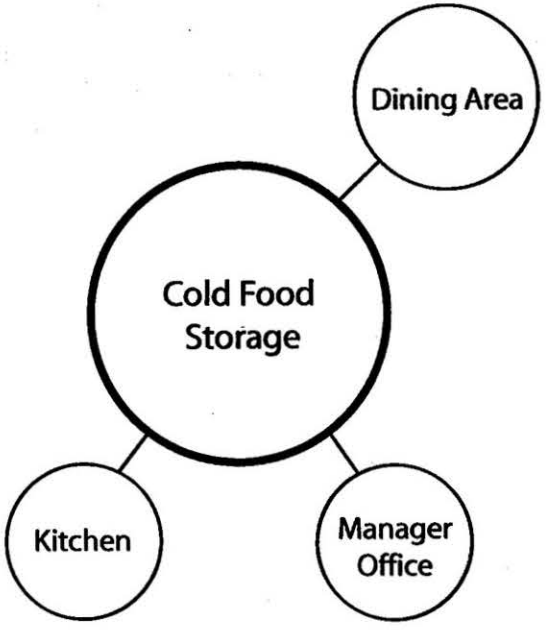
Restaurant personnel, Manager

Size:

80 square feet

Design Considerations:

- In close proximity to Dining Area and Kitchen
- Automatic locking doors
- Adequate ventilation
- Controlled temperature
- Efficient task lighting
- Built in shelves



Spatial Analysis

Food Delivery Reception

Description:

This space will provide an area for receiving food delivery items

Activities:

Loading, inventory, unpacking

Users:

Restaurant personnel, Manager

Size:

100 square feet

Design Considerations:

- Should be in proximity to Storage Rooms, Kitchen, and Bar
- Level changes should be minimized for easy movement
- Room finish materials should be low maintenance
- Space should be secured
- Adequate ventilation
- Efficient task lighting

Spatial Analysis

Restaurant Manager's Office

Description:

This space will serve as an office for the Manager of the restaurant

Activities:

Phone communication, internet use, sending/receiving faxes

Users:

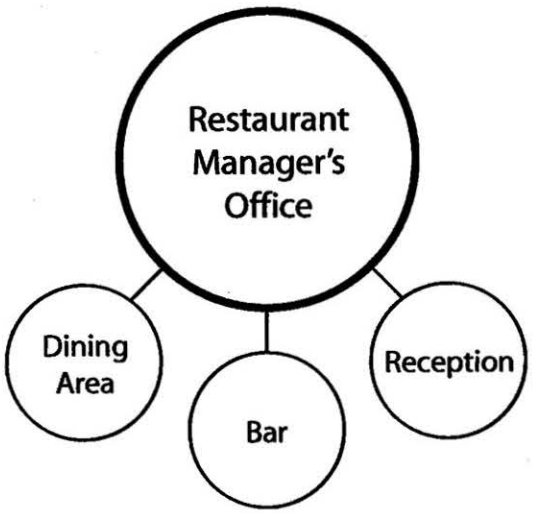
Restaurant manager, restaurant personnel

Size:

150 square feet

Design Considerations:

- One phone, data, fax, and internet connection
- Sufficient space for equipment, storage, and personnel
- Adequate heating and air conditioning
- Space should be in close proximity to Dining Area and Bar
- Carpeted with aesthetic lighting
- Flexible furniture arrangement
- Window views
- Privacy
- One tackable wall surface



Spatial Analysis

Break Room

Description:

This space will provide an area for the restaurant personnel to relax

Activities:

Lounging, eating

Users:

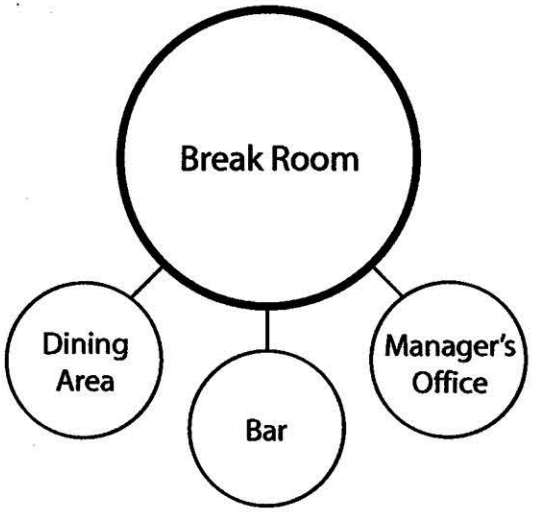
Restaurant personnel, Manager

Size:

250 square feet

Design Considerations:

- Adequate heating and air conditioning
- Sufficient electrical power connections
- Should be in close proximity to Manager's Office
- Materials should include carpet and efficient task lighting
- Windows views is preferred
- Use of natural day light is recommended
- Individual lockable accommodations are recommended
- A small kitchenette is preferred



Spatial Analysis

Janitor Closet

Description:

To provide storage for janitorial equipment and supplies

Activities:

Storage

Users:

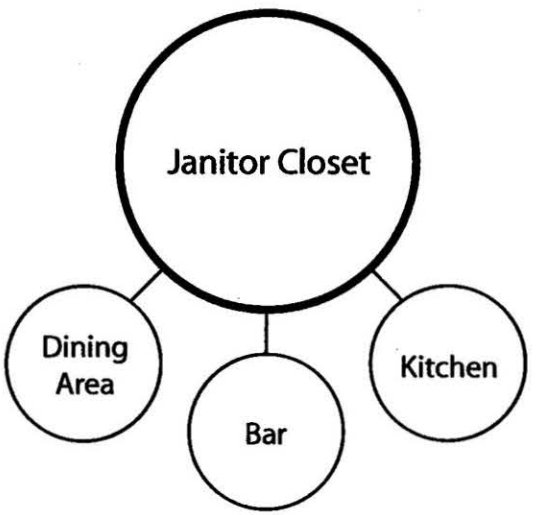
Facility personnel

Size:

50 square feet

Design Considerations:

- Efficient task lighting
- Directly accessible from Lobby
- Adequate lighting and ventilation
- Sufficient space for storage and equipment
- Adequate ventilation
- Built-in shelves
- Room finish materials should be low maintenance



Spatial Analysis

Proscenium Theater Hall

Description:

The space will serve as a multipurpose theater for Broadway and dance performances

Activities:

Sitting, standing, socializing, observing

Users:

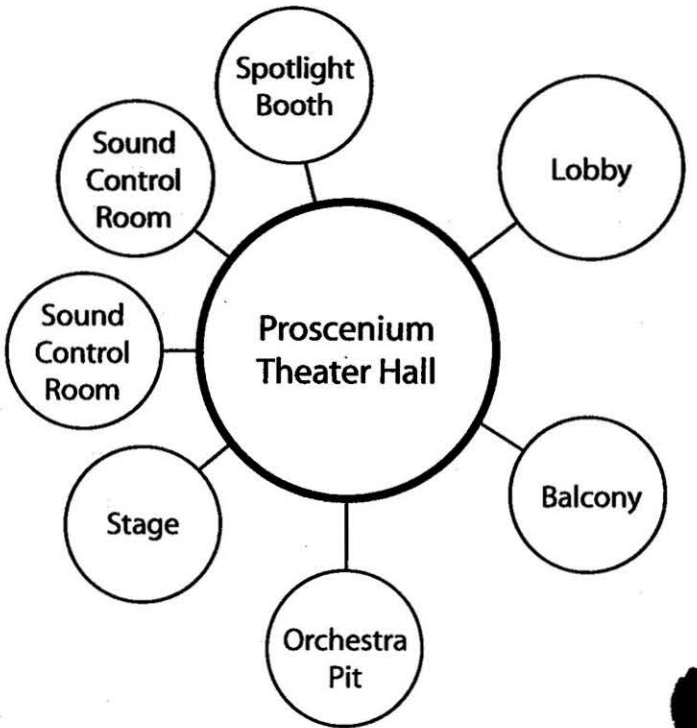
Performers, patrons

Size:

7,500 square feet

Design Considerations:

- Efficient circulation with sufficient number of exits
- Balcony
- Decorative incandescent lighting
- Adjustable absorptive and reflective acoustic materials
- 65 foot maximum seating distance
- Staggered seating
- 600 seats
- Adequate sight lines
- Aesthetically pleasing finish materials
- Maintain a comfortable temperature and humidity level
- Enter theater through vestibule
- ADA accessible at all levels
- Whenever possible, sound and light locks should be designed into the entry of the auditorium



Spatial Analysis

Proscenium Theater Stage

Description:

The space which houses the performance, presenting the act to the audience

Activities:

Acting, dancing, singing, speaking

Users:

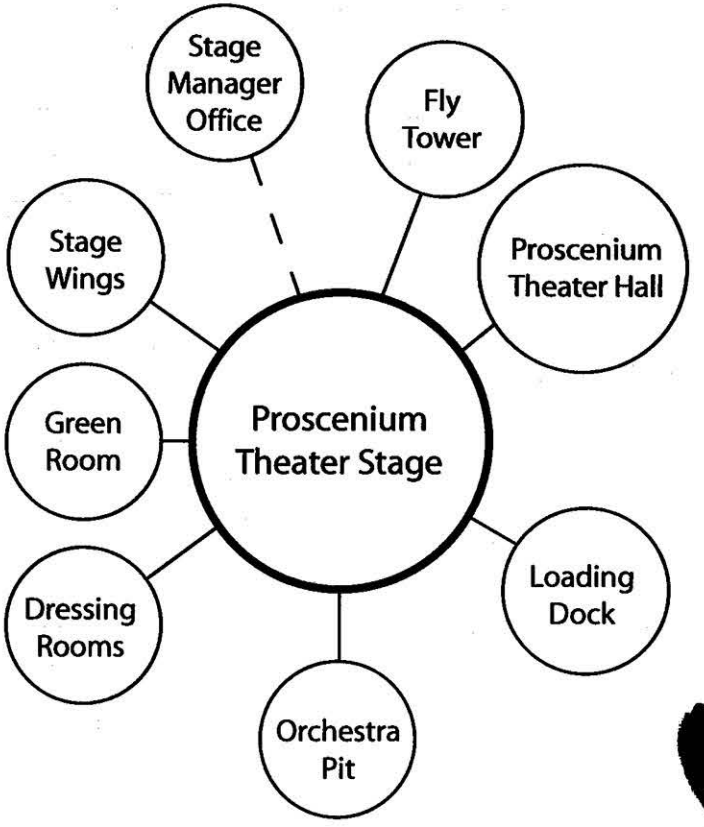
Performers, facility personnel

Size:

3,000 square feet

Design Considerations:

- Use large door to load scenery onto stage from loading dock
- Sufficient electrical power connections
- Proscenium width typically 40-50 feet wide
- Proscenium height typically 24-32 feet high
- Minimum stage depth should be 35 feet
- Rear crossover to connect stage left and stage right
- Maximum occupant load permitted on the stage is 15 sq ft per occupant
- Ideal stage height above first seat row is 2'-6" to 3'-6"
- Sound isolation from adjacent spaces
- Stage floor should be constructed of resilient wood material for dance
- A means of egress is required on each side of the stage
- A fire curtain to separate the stage from the audience



Spatial Analysis

Stage Wings

Description:

This space serves to provide ample space for scenery and performers not in view of audience

Activities:

Storage, scenery movement, preparation, costume changing

Users:

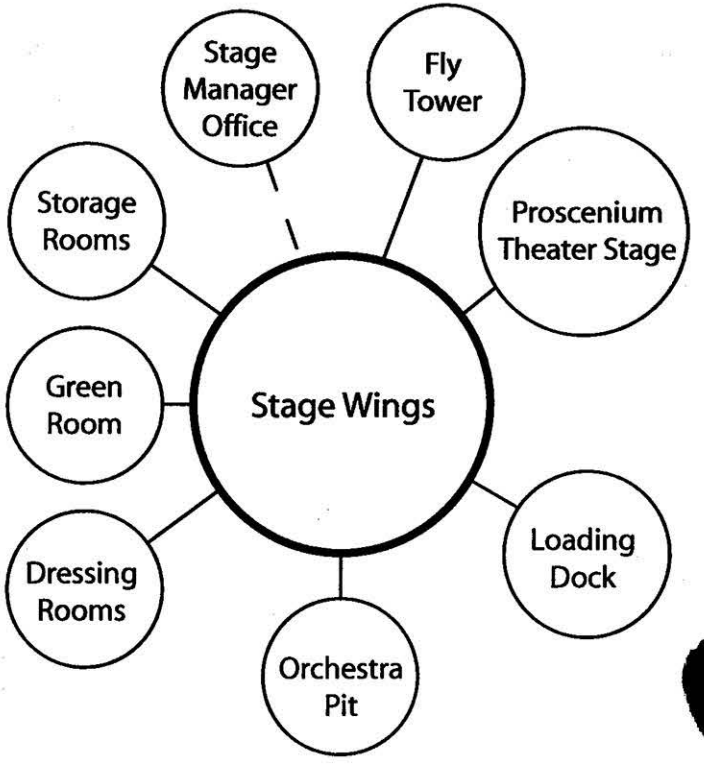
Performers, facility personnel

Size:

700 square feet each

Design Considerations:

- Easily accessible from Loading Dock and other necessary spaces
- Sufficient electrical power connections
- Must accommodate an assembled group of performers
- Directly accessible from dressing rooms
- Width of 15-20 feet is preferred
- Floor should be constructed of resilient wood material



Spatial Analysis

Orchestra Pit

Description:

This space provides an area for the orchestra during drama and dance performances

Activities:

Singing, playing, sounds effects

Users:

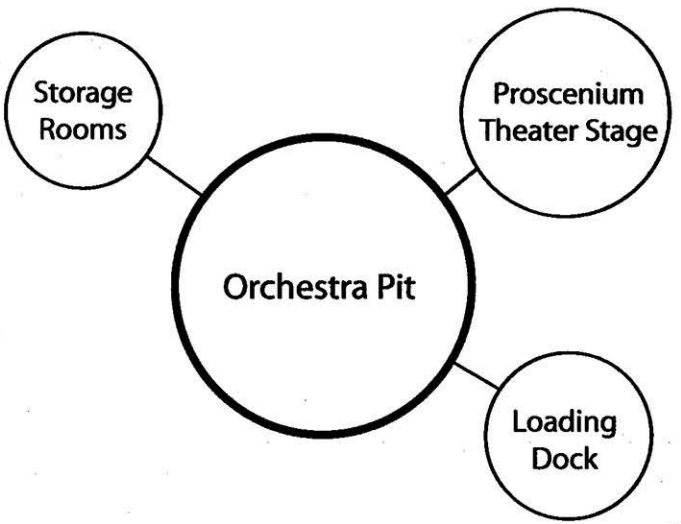
Musicians, performers

Size:

600 square feet

Design Considerations:

- No more than 30 percent of the area or 12 feet of pit depth extend under the stage lip
- Depth of pit should be sufficient enough to hide orchestra from audience view
- A movable pit floor is a highly desirable feature
- Large pits may have multiple lifts, allowing flexible pit configurations
- Pit may be used with seat wagons to provide additional audience seating
- Railing around pit should be high enough to hide orchestra, yet low enough not to interfere with sight lines
- The railing is typically a pipe frame with a mixture of visually solid, sound-transparent material and sound-diffusing elements



Spatial Analysis

Trap Room

Description:

A space located under the stage for equipment and scenery storage

Activities:

Storage

Users:

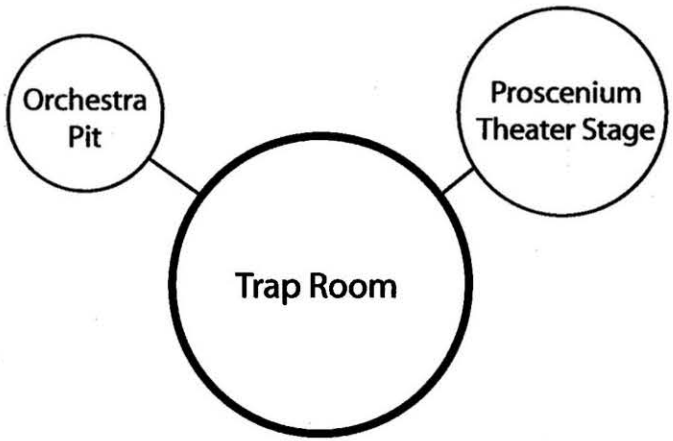
Performers, facility personnel

Size:

3,000 square feet

Design Considerations:

- The trap room should be accessible by the orchestra pit lift
- The room should be equal in size to the stage
- The stage floor may be built of module pieces is sometimes desirable, giving access to trap room below stage
- Efficient task lighting
- Sufficient space for storage and equipment
- Finished aesthetic materials not necessary



Spatial Analysis

Fly Tower

Description:

The volume above the proscenium opening where scenery is stored when not in use.

Activities:

Raising and lowering of stage scenery

Users:

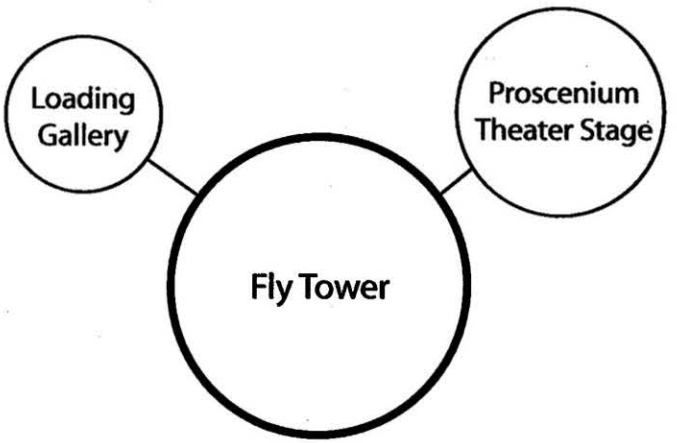
Facility personnel

Size:

3,000 square feet

Design Considerations:

- Fly tower is required to have automatic smoke vent
- A steel framework grid is contained within the fly tower to support theatrical rigging
- Fly loft should be three times the height of the proscenium opening
- Only one means of egress is required to provide access to the fly galleries, grid-iron, and catwalks that service the technical stagecraft
- The fly tower stores a series of battens, to which scenery pieces may be attached
- One wall of the fly tower will serve as the 'Rigging Wall' for the arbors.
- The loading gallery will be housed within the fly tower



Spatial Analysis

Spotlight Booth

Description:

This space houses the lights used during theatrical performances

Activities:

Follow spots for actors and performances

Users:

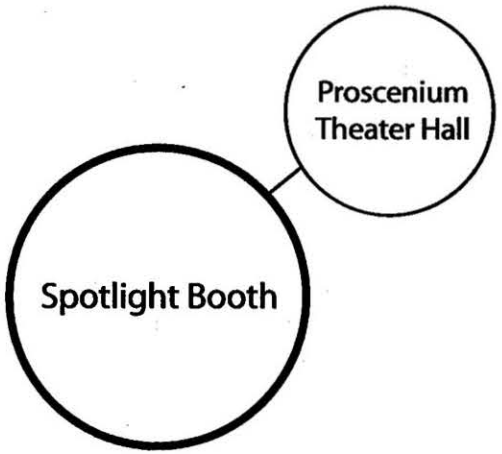
Facility personnel, Show crew

Size:

160 square feet

Design Considerations:

- This space is best located at the rear of the orchestra level as close to the centerline as possible
- The booth is typically located at the top level in the auditorium
- Equipment should be located in secured area
- Adequate ventilation
- Efficient task lighting
- Sound isolation construction materials



Spatial Analysis

Sound Control Room

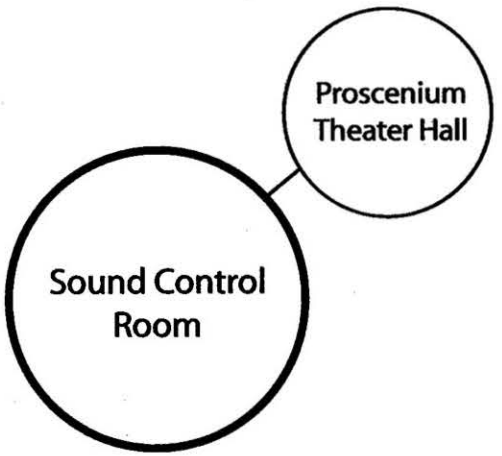
Description:
This space houses the sound equipment and mixing boards for the engineers

Activities:
Sound mixing

Users:
Facility personnel, Show crew

Size:
150 square feet

Design Considerations:
- Room may be located at rear of orchestra level
- Sound engineers generally prefer a position in house itself
- An area of removable seats is occasionally provided for the sound booth
- Power and audio wiring are routed to an electrical box at the in-house mix position so that sound equipment can be set at this location with minimal effort
- Generally, mix engineers prefer to be out from under any balcony overhang and as close to the center of the room as possible
- Adequate ventilation
- Efficient task lighting
- Space should be located adjacent to Lighting Control Room
- Equipment should be stored in secured area



Spatial Analysis

Lighting Control Room

Description:

This space houses the lighting control equipment for the engineers

Activities:

Lighting control

Users:

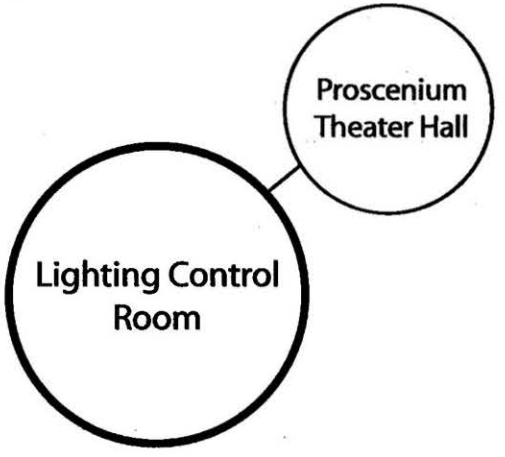
Facility personnel, Show crew

Size:

150 square feet

Design Considerations:

- This space is best located at the rear of the orchestra level as close to the centerline as possible
- The control room must be elevated above the last row of seats in the orchestra level to ensure that the operator has an unobstructed view of the stage
- Adequate ventilation
- Efficient task lighting
- Equipment should be locked in a room or case for security
- Space should be located adjacent to Lighting Control Room



Spatial Analysis

Cove Lighting Room

Description:

This space houses the lights used during theatrical performances

Activities:

Follow spots for actors and performances

Users:

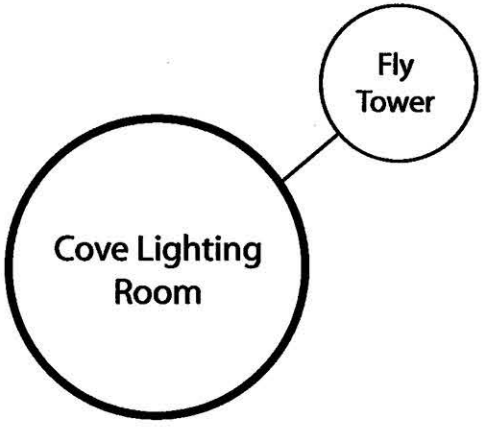
Facility personnel, Show crew

Size:

200 square feet

Design Considerations:

- This space is best located towards the proscenium opening
- The lights should be capable of lighting all portions of the performing area
- Lights should span across the width of the theater hall
- Equipment may be hidden or exposed to audience view
- The space is typically accessible only by catwalks
- Adequate ventilation
- Efficient task lighting



Spatial Analysis

Dimmer Room

Description:

This space will store the theater lighting system equipment

Activities:

Storage

Users:

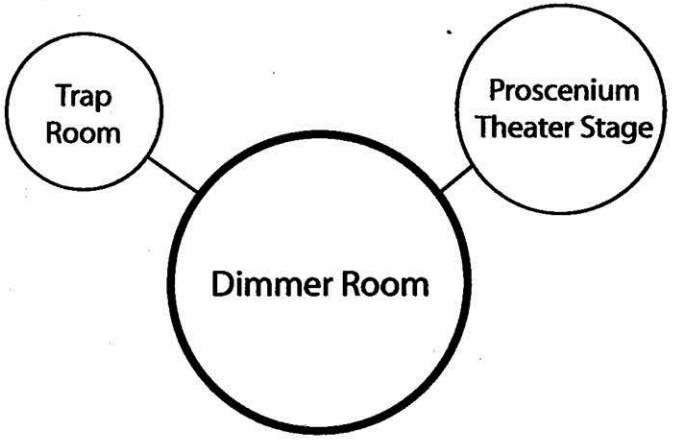
Facility personnel

Size:

100 square feet

Design Considerations:

- This room may share space with the trap room
- The dimmers for the theatrical lighting systems are typically housed in a central location near to the stage
- This space will have a large AC power load and a significant heat load that will have to be exhausted by the mechanical systems
- Most dimmer racks feature cooling fans which can be noisy, so this space should be appropriately isolated from the house and stage
- Efficient task lighting
- Equipment should be stored in secured location



Spatial Analysis

Rehearsal Room

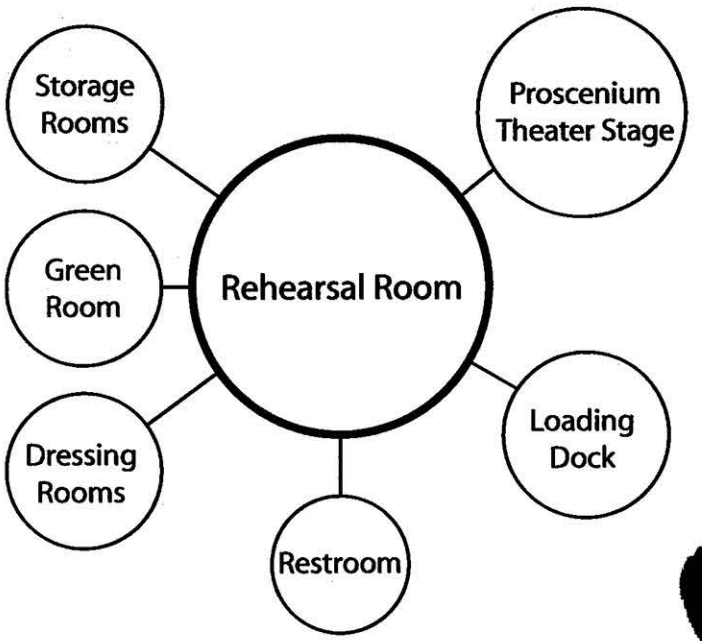
Description:
This space provides an area for performers to rehearse in a space offstage

Activities:
Performing

Users:
Performers, Show crew, facility personnel

Size:
3,000 square feet

Design Considerations:
- Rehearsal rooms should be in the same proportion and somewhat larger than the performing area on stage
- Walls should have large mirrors for actors to view themselves
- The number of rehearsal rooms is determined entirely by how much use is made of the building and how often the stage is available for rehearsal
- Acoustically, the room should reproduce stage condition as closely as possible
- The height of a rehearsal room is determined by its use
- Adequate heating and air conditioning
- Flexible lighting



Spatial Analysis

Permanent Storage Rooms

Description:

This space will provide storage room for equipment that belongs to the facility

Activities:

Storage

Users:

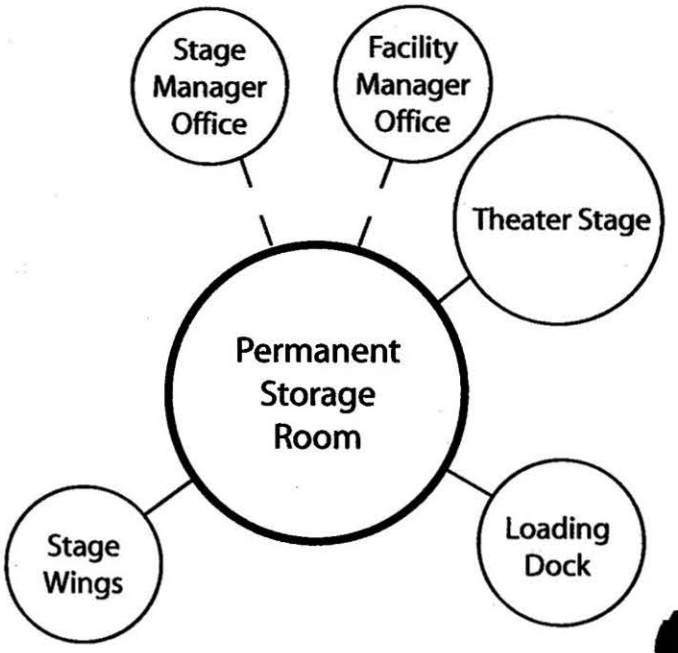
Facility personnel

Size:

800 square feet

Design Considerations:

- A variety of storage rooms are needed
- Adequate ventilation
- Automatic locking doors
- Adjacent to theater stage
- Efficient task lighting
- Low maintenance construction materials and finishes
- Security system
- Typically these rooms will be segregated according to function, with separate space provided for lighting, audio, rigging, and the like



Spatial Analysis

Temporary Storage Rooms

Description:

This space will provide storage room for equipment that belongs to the performance venue

Activities:

Storage

Users:

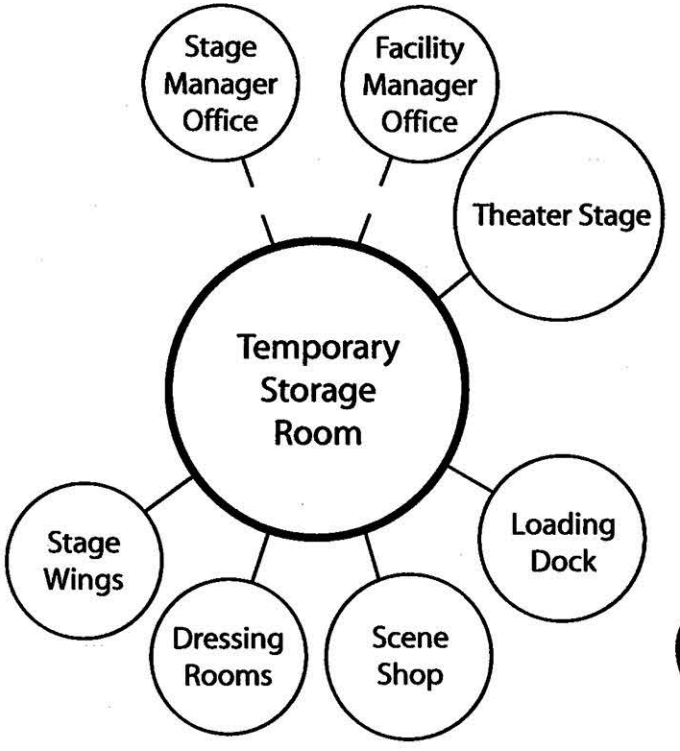
Facility personnel, Show crew

Size:

1,500 square feet

Design Considerations:

- Adequate ventilation
- Automatic locking doors
- Adjacent to Loading and Scene Dock
- Efficient task lighting
- Low maintenance construction materials and finishes
- Security system
- Large doors to store scenery pieces and equipment
- A storage room which is at the same level as the loading dock is preferred
- Should be in close proximity to Dressing Rooms



Spatial Analysis

Loading Dock

Description:

An unloading bay for stage scenery, equipment, and all other necessary performance material

Activities:

Loading, unloading, inventory, packing, unpacking

Users:

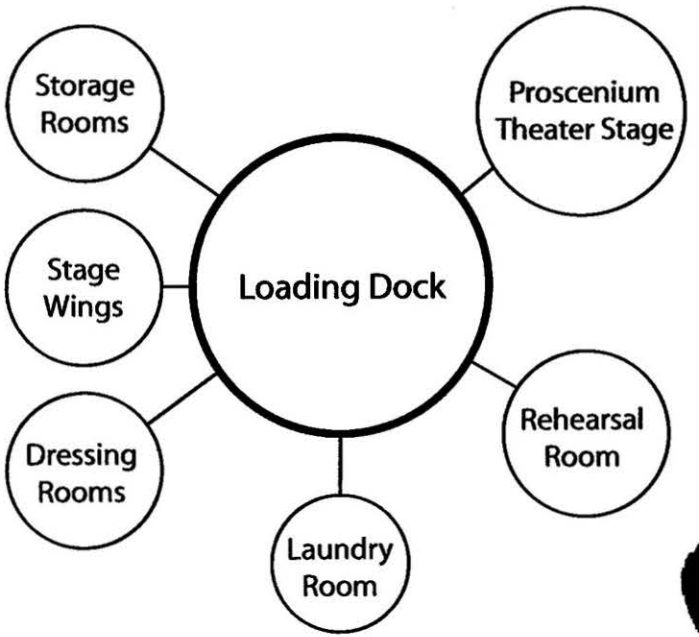
Facility personnel, Show crew

Size:

600 square feet

Design Considerations:

- Slope grade at dock should be minimal
- A minimum of three truck docks expedites unloading
- An overhead door at grade can accommodate production vans for small road shows
- A straight path from the loading dock's overhead doors to the stage's load-in access doors is best
- The dock size and layout should facilitate flow of equipment off the truck to department destinations
- Transitions between finished floor materials and between floor elevations must provide clear paths that allow large, heavy equipment to be rolled from dock to destination
- A hidden, direct access corridor from the loading dock to the front of house spaces is preferred



Spatial Analysis

Scene Shop

Description:

This space will provide a place to build and repair scenic elements.

Activities:

Assembly, repairing, preparation, construction

Users:

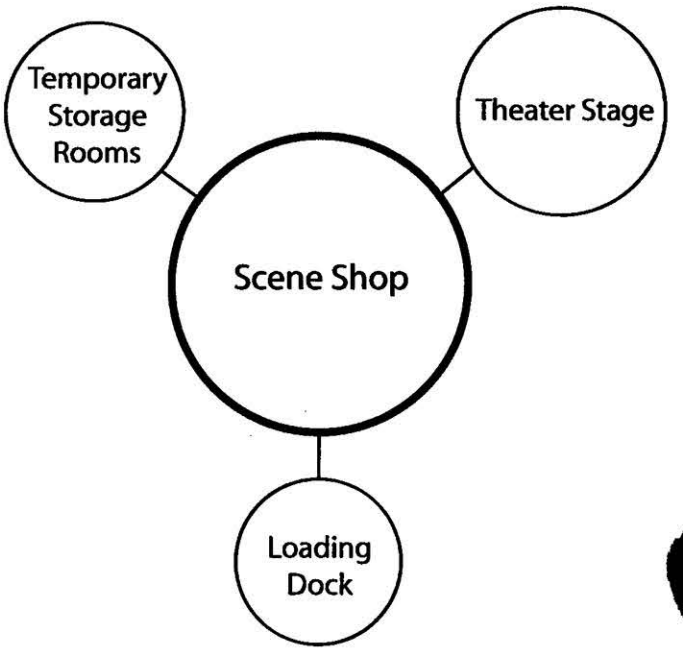
Facility personnel, Show crew

Size:

800 square feet

Design Considerations:

- Adequate ventilation
- Adjacent to Theater Stage
- Low maintenance construction materials and finishes
- Large doors to store scenery pieces and equipment
- Should be in close proximity to Loading Dock
- Sufficient electrical power connections
- Sound isolation from Stage area



Spatial Analysis

Dressing Rooms (1 men+1 women)

Description:

This space will provide an area for performers to prepare for the performance

Activities:

Dressing, applying make-up, preparation, rehearsal

Users:

Performers

Size:

600 square feet (each)

Design Considerations:

Design Considerations:

- The performer's work station and is ideally 3 ft wide, with a pinup corkboard for notes, reminders, and contact numbers
- Shelving and hanging rods are preferred
- Shower, toilet, and lavatory are recommended
- Adequate heating and air conditioning
- Sufficient electrical power connections
- Should be in close proximity to Stage
- Materials should include carpet and aesthetic lighting
- A lounge and windows for natural light are preferred
- Ideally Dressing Rooms are at stage level
- Individual lockable accommodations are recommended

Spatial Analysis

Star Dressing Rooms

Description:

This space will provide an area for performers to prepare for the performance

Activities:

Dressing, applying make-up, preparation, rehearsal

Users:

Performers

Size:

150 square feet (each)

Design Considerations:

Design Considerations:

- The performer's work station and is ideally 3 ft wide, with a pinup corkboard for notes, reminders, and contact numbers
- Shelving and hanging rods are preferred
- Shower, toilet, and lavatory are recommended
- Adequate heating and air conditioning
- Sufficient electrical power connections
- Should be in close proximity to Stage
- Materials should include carpet and aesthetic lighting
- Windows for natural light are preferred
- Ideally Dressing Rooms are at stage level
- Individual lockable accommodations are recommended

Spatial Analysis

Green Room

Description:

An informal space which is used by cast and crew after a performance to meet patrons

Activities:

Greeting, lounging, eating, drinking

Users:

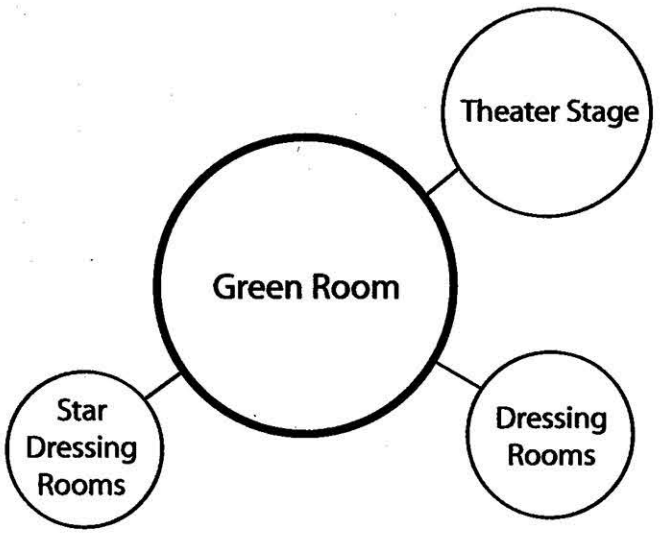
Performers, patrons

Size:

600 square feet

Design Considerations:

- Should be in close proximity to Stage
- Adequate heating and air conditioning
- Windows for natural light are preferred
- Materials should include carpet and aesthetic lighting
- A Lounge space is typical
- A small kitchenette is preferred
- Room should be security monitored



Spatial Analysis

Crew Room

Description:

This space will provide an area for the show crew before and after a performance

Activities:

Dressing, showering, lounging, eating

Users:

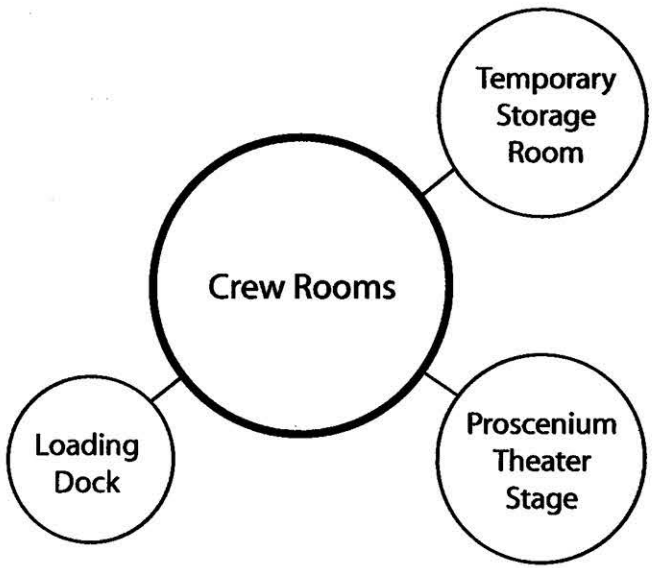
Show crew

Size:

1,000 square feet

Design Considerations:

- Shelving and hanging rods are preferred
- Shower, toilet, and lavatory are recommended
- Adequate heating and air conditioning
- Sufficient electrical power connections
- Should be in close proximity to Loading Dock
- Materials should include carpet and efficient task lighting
- Windows for natural light are preferred
- Individual lockable accommodations are recommended
- A small kitchenette is preferred



Spatial Analysis

Laundry Room

Description:

This space provides an area for crew to prepare performers clothing

Activities:

Washing, drying, folding, unpacking

Users:

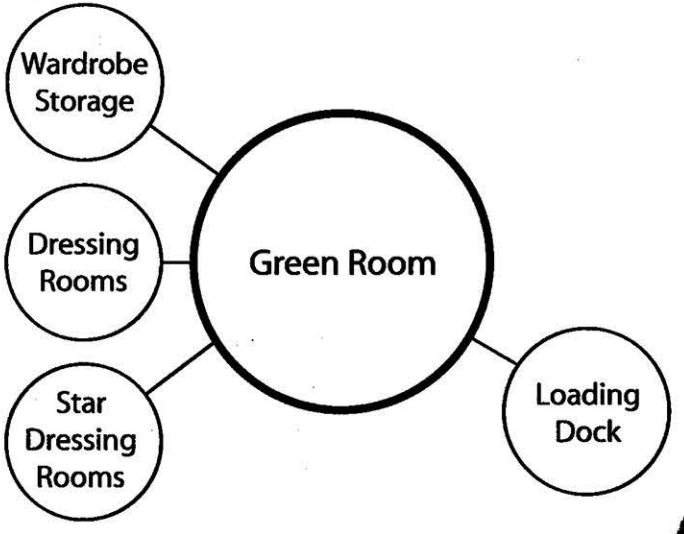
Facility personnel, show crew

Size:

100 square feet

Design Considerations:

- Room finish materials should be low maintenance
- In close proximity to Dressing Rooms and Wardrobe Storage
- Adequate lighting and ventilation
- Sound isolation from Stage
- Sufficient electrical power connections



Spatial Analysis

Private Restrooms

Description:

This space will serve as a restroom for performers and show crew

Activities:

Washing, cleaning, drying, applying cosmetics

Users:

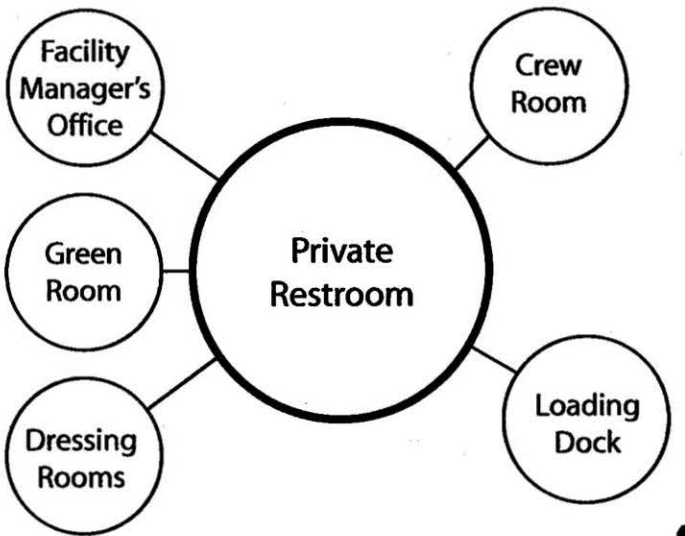
Performers, show crew, facility personnel

Size:

100 square feet

Design Considerations:

- Complies with ADA standards
- Room finish materials should be low maintenance
- Adjacent to Loading Dock
- Adequate lighting and ventilation
- Avoid locating plumbing spaces adjacent to wall of house or stage



Spatial Analysis

Wardrobe Storage

Description:

This space will provide storage space for performer costumes

Activities:

Storage

Users:

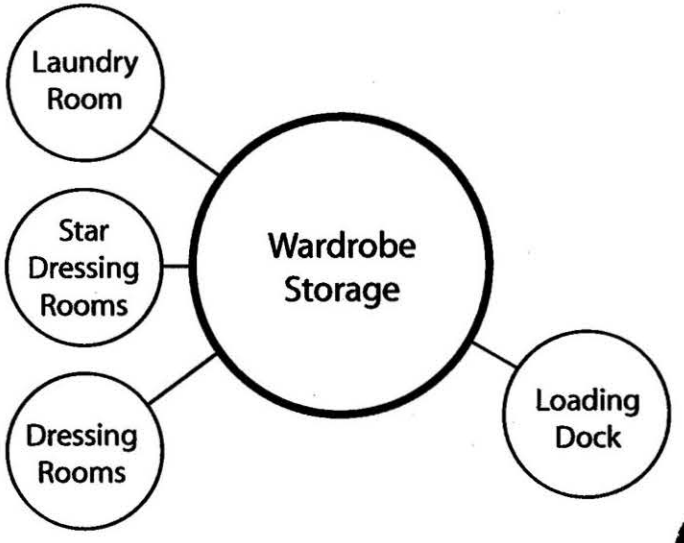
Show crew

Size:

200 square feet

Design Considerations:

- Room finish materials should be low maintenance
- In close proximity to Dressing Rooms, Laundry Room
- Adequate ventilation
- Shelving and hanging rods are preferred
- Efficient task lighting



Spatial Analysis

Make-up Room

Description:

This space will provide an area for performers to apply cosmetics

Activities:

Applying make-up, preparation

Users:

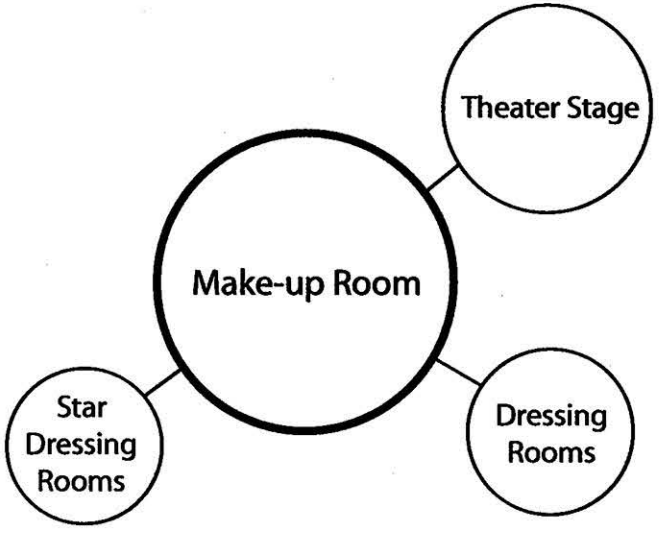
Performers, Show crew

Size:

150 square feet

Design Considerations:

- Adequate heating and air conditioning
- Adequate lighting
- Should be in close proximity to Dressing Rooms and Stage
- Individual work stations with mirrors and lights
- Aesthetic finish materials
- Sufficient electrical power connections
- Built-in shelves



Spatial Analysis

Janitor Room

Description:

To provide storage for janitorial equipment and supplies

Activities:

Storage

Users:

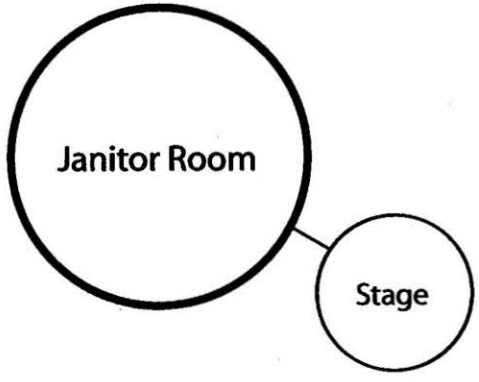
Facility personnel

Size:

60 square feet

Design Considerations:

- Efficient task lighting
- Directly accessible from Lobby
- Adequate lighting and ventilation
- Sufficient space for storage and equipment
- Adequate ventilation
- Built-in shelves
- Room finish materials should be low maintenance



Spatial Analysis

Theater Stage Manager Office

Description:

This space will serve as an office for the Stage Manager of the theater stage

Activities:

Phone communication, internet use, sending/receiving faxes

Users:

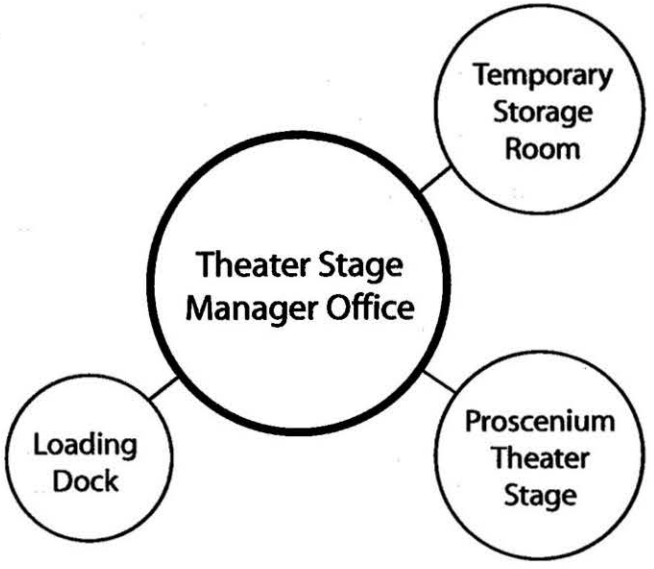
Stage manager, facility personnel, show crew

Size:

160 square feet

Design Considerations:

- One phone, data, fax, and internet connection
- Sufficient space for equipment, storage, and personnel
- Adequate heating and air conditioning
- In close proximity to Stage and Loading Dock
- Carpeted with aesthetic lighting
- Flexible furniture arrangement
- Window views
- Privacy
- One tackable wall surface



Spatial Analysis

Concert Hall

Description:

This space will serve as a multipurpose seating hall for musical entertainment

Activities:

Sitting, standing, socializing, observing

Users:

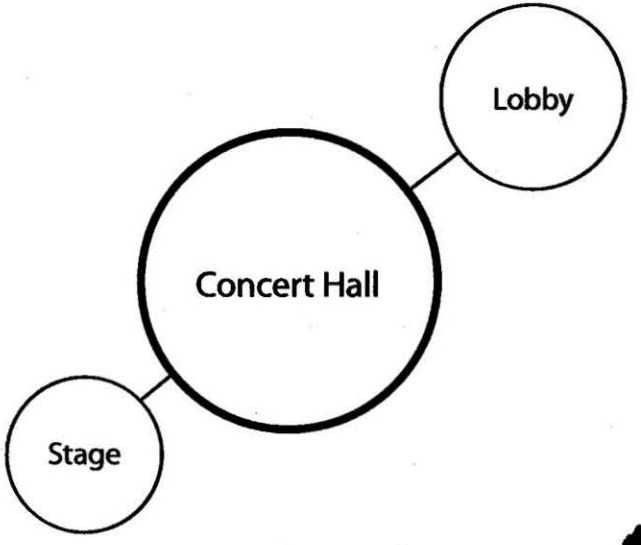
Performers, patrons

Size:

4,000 square feet

Design Considerations:

- Efficient circulation with sufficient number of exits
- Flexible seating arrangements
- Decorative incandescent lighting
- Adjustable absorptive and reflective acoustic materials
- Narrow Hall width, typically 80 to 90 feet
- Staggered seating
- 400 seats
- Adequate sight lines
- Aesthetically pleasing finish materials
- Maintain a comfortable temperature and humidity level
- Enter theater through vestibule
- ADA accessible at all levels
- Sound isolation from adjacent rooms



Spatial Analysis

Music Stage

Description:

The space which houses the music performers, presenting the act to the audience

Activities:

Playing instruments, yelling, conducting, listening

Users:

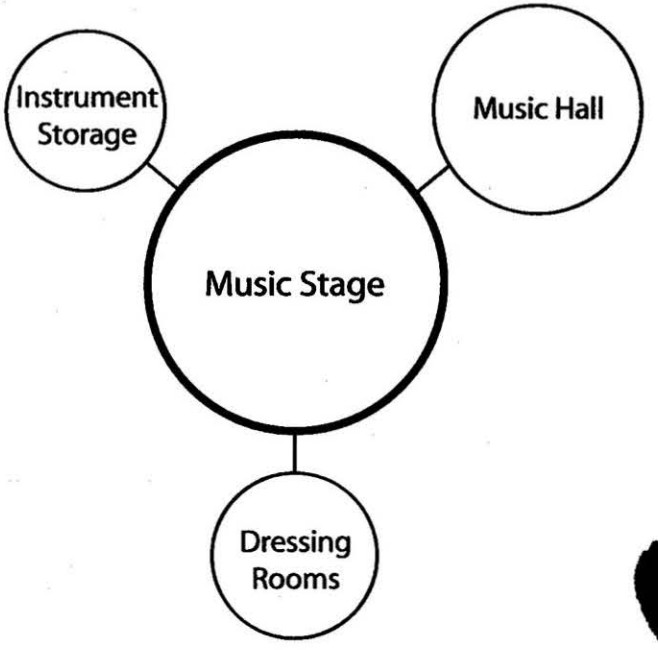
Performers

Size:

1,000 square feet

Design Considerations:

- Stage area averages 20 to 24 square feet per instrumental musician plus an additional 3 to 4 square feet per chorister.
- Stage widths range from 56 to 70 feet
- A flat floor with portable riser platforms is common in multiuse stage
- In dedicated concert halls, the chorus is often accommodated in a band of seats above and to the rear of the orchestra
- Shape of stage enclosure must be design to balance projection of all sounds, to audience and stage musician
- Easily accessible from Loading Dock and other necessary spaces
- Adequate stage lighting
- Sound isolation from adjacent spaces



Spatial Analysis

Cove Lighting Room

Description:

This space houses the lights used during musical performances

Activities:

Stage lighting

Users:

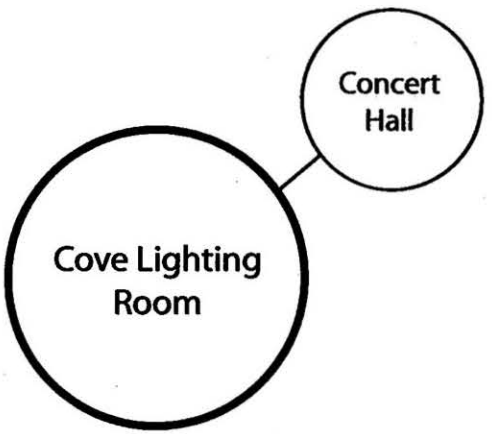
Facility personnel, Show crew

Size:

200 square feet

Design Considerations:

- This space is best located towards the music stage
- The lights should be capable of lighting all portions of the performing area
- Lights should span across the width of the concert hall
- Equipment may be hidden or exposed to audience view
- The space is typically accessible only by catwalks
- Adequate ventilation
- Efficient task lighting



Spatial Analysis

Sound Recording Room

Description:

This space houses the sound recording equipment

Activities:

Recording, mixing

Users:

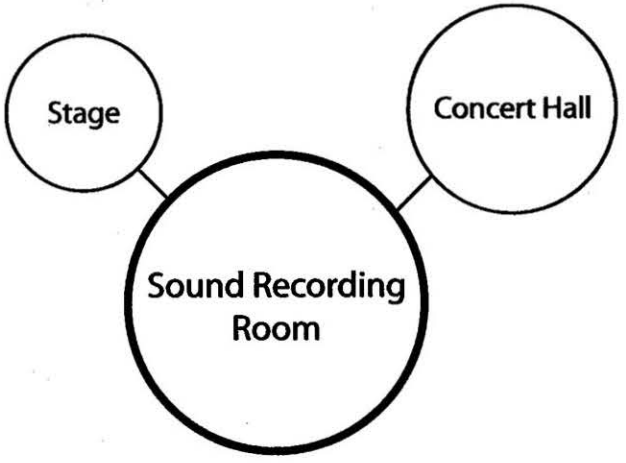
Facility personnel, Show crew

Size:

150 square feet

Design Considerations:

- Power and audio wiring should be routed to a location within the concert hall which is accessible for connection to a recording device and the operating personnel
- Adequate ventilation
- Efficient task lighting
- Equipment should be locked in a room or case for security
- Space should be located in close proximity to the Music Stage
- Space may be located adjacent to or completely separate from the stage
- Sound isolation from adjacent spaces



Spatial Analysis

Musical Instrument Storage

Description:

This space will provide storage room for instruments

Activities:

Storage

Users:

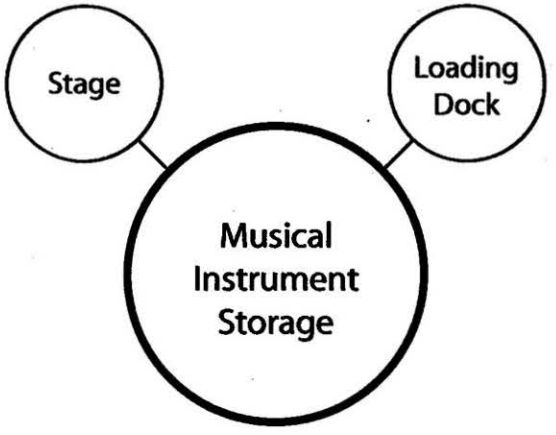
Performers, facility personnel, show crew

Size:

700 square feet

Design Considerations:

- Doors leading from the wings onto the stage should open wide enough to provide for the passage of a grand piano
- A variety storage lockers is preferred
- Sufficient space to store a piano
- Adequate ventilation
- Adjacent to music stage
- Low maintenance construction materials and finishes
- Security system



Spatial Analysis

Loading Dock

Description:

An unloading bay for stage scenery, equipment, and all other necessary performance material

Activities:

Loading, unloading, inventory, packing, unpacking

Users:

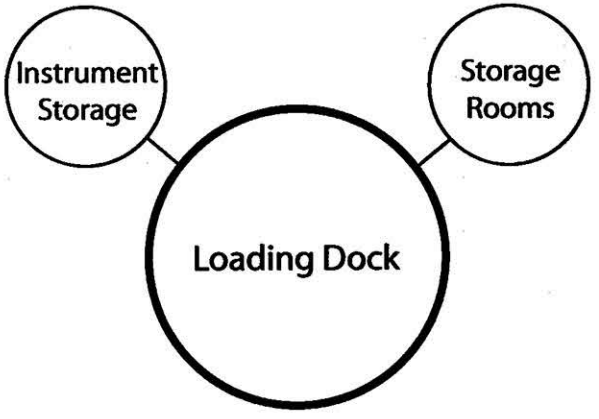
Facility personnel, Show crew

Size:

1,000 square feet

Design Considerations:

- Slope grade at dock should be minimal
- Space for one truck loading bay is sufficient
- An overhead door at grade can accommodate production vans for small road shows
- A straight path from the loading dock's overhead doors to the stage's load-in access doors is best
- The dock size and layout should facilitate flow of equipment off the truck to department destinations
- Transitions between finished floor materials and between floor elevations must provide clear paths that allow large, heavy equipment to be rolled from dock to destination
- A hidden, direct access corridor from the loading dock to the front of house spaces is preferred



Spatial Analysis

Permanent Storage Room

Description:

This space will provide storage room for concert equipment

Activities:

Storage

Users:

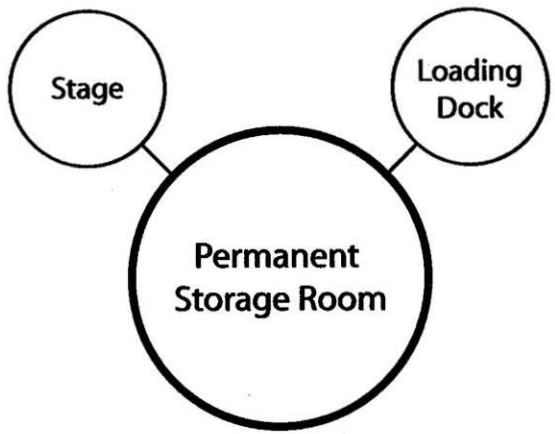
Facility personnel

Size:

1,000 square feet

Design Considerations:

- Space should be sufficient to store platform risers, chairs, and music stands
- Adequate ventilation
- Adjacent to music stage
- Low maintenance construction materials and finishes
- Security system
- This space is occasionally shared with the Musical Instrument Storage space



Spatial Analysis

Temporary Storage Room

Description:

This space will provide storage room for equipment that belongs to the performance venue

Activities:

Storage

Users:

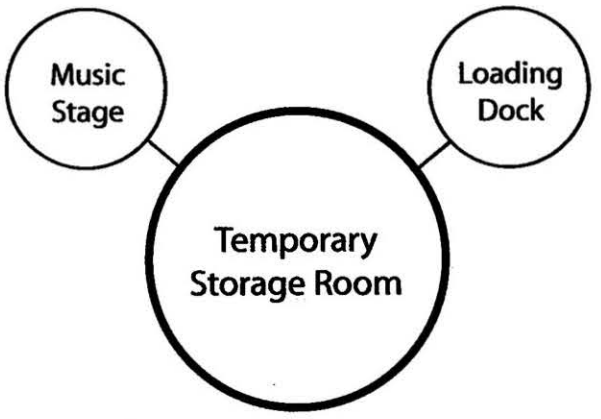
Facility personnel, Show crew

Size:

600 square feet

Design Considerations:

- Adequate ventilation
- Automatic locking doors
- Adjacent to Loading Dock
- Located in close proximity to music stage
- Low maintenance construction materials and finishes
- Security system
- Wide doors to store large music instruments and equipment
- A storage room which is at the same level as the loading dock is preferred



Spatial Analysis

Music Stage Manager Office

Description:

This space will serve as an office for the Stage Manager of the music stage

Activities:

Phone communication, internet use, sending/receiving faxes

Users:

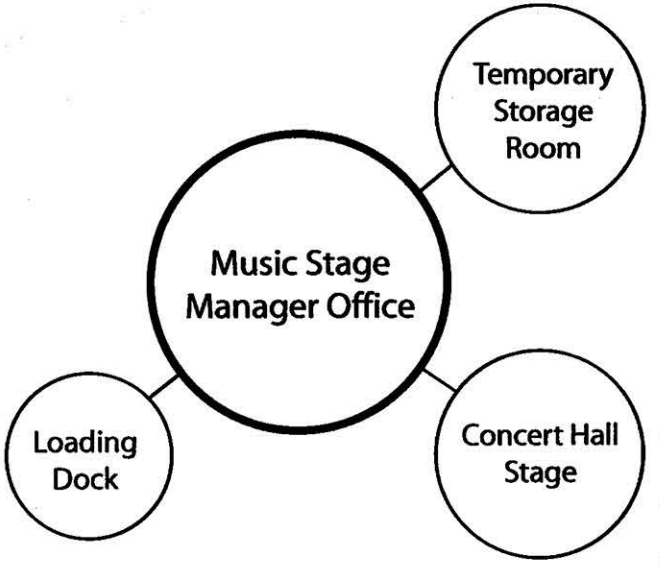
Stage manager, facility personnel, show crew

Size:

250 square feet

Design Considerations:

- One phone, data, fax, and internet connection
- Sufficient space for equipment, storage, and personnel
- Adequate heating and air conditioning
- In close proximity to Stage and Loading Dock
- Carpeted with aesthetic lighting
- Flexible furniture arrangement
- Window views
- Privacy
- One tackable wall surface



Spatial Analysis

Dressing Rooms (1 men/1 women)

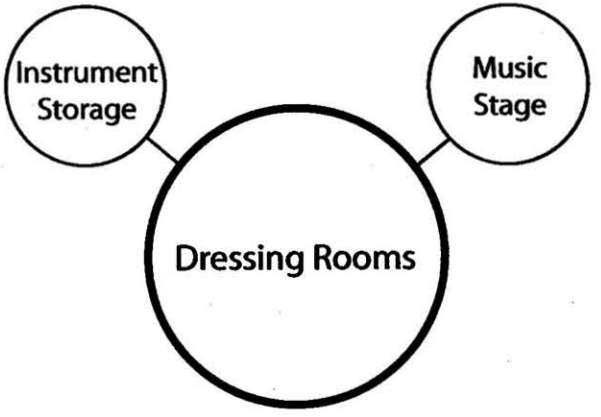
Description:
This space will provide an area for performers to prepare for the performance

Activities:
Dressing, preparation, rehearsal

Users:
Performers

Size:
800 square feet (each)

Design Considerations:
- Shelving and hanging rods are preferred
- Adequate heating and air conditioning
- Sufficient electrical power connections
- Should be in close proximity to Music Stage
- Materials should include carpet and aesthetic lighting
- A lounge and windows for natural light are preferred
- Ideally Dressing Rooms are at stage level
- Individual lockable accommodations are recommended



Spatial Analysis

Mechanical and Electrical

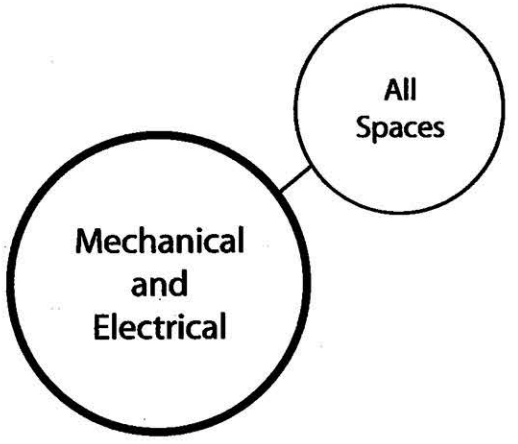
Description:
This space will house the heating, cooling, and other necessary mechanical equipment

Activities:
Maintenance, storage

Users:
Facility manager, facility personnel

Size:
1,500 square feet

Design Considerations:
- Mechanical rooms are generally at grade in a portion of the building that is structurally separate fro the portion of the building containing the theater itself
- Minimizing vibration transmitted to the structure by mechanical equipment is important
- Equipment, ductwork, and pipe work will need to be designed with appropriate vibration isolation in mind
- Long ducts runs are easy and cheap means of attenuating noise from HVAC systems
- Isolation tools may include inertia basis, isolation mounts/hangers, and floating floors
- Large transformers should be placed outside the building
- Avoid locating major plumbed space adjacent to the wall of the house or stage



Spatial Summary

Space (page)	**Area** (sq. ft.)
Lobby (33)	8,000
Ticket Box Office (34)	150
Production Office (35)	200
House Manager's Office (36)	120
Facility Manager's Office (37)	140
Security Office (38)	150
Men's Public Restroom (39)	1,000
Women's Public Restroom (40)	1,000
First Aid Room (41)	150
Janitor's Room (42)	200
Reception (43)	100
Bar (44)	150
Dining Area (45)	900
Men's Restroom (46)	200
Women's Restroom (47)	200
Kitchen (48)	350

Space (page)	**Area** (sq. ft.)
Liquor Storage Room (49)	50
General Storage Room (50)	100
Dry Storage (51)	80
Cold Food Storage (52)	80
Food Delivery Reception (53)	100
Manager's Office (54)	150
Break Room (55)	250
Janitor's Closet (56)	50
Proscenium Theater Hall (57)	7,500
Proscenium Theater Stage (58)	3,000
Stage Wings (59)	1,400
Orchestra Pit (60)	600
Trap Room (61)	3,000
Fly Tower (62)	3,000
Spotlight Booth (63)	160
Sound Control Room (64)	150

Spatial Summary

Space (page)	**Area** (sq. ft.)
Lighting Control Room (65)	150
Cove Lighting Room (66)	200
Dimmer Room (67)	100
Rehearsal Room (68)	3,000
Permanent Storage Room (69)	800
Temporary Storage Room (70)	1,500
Loading Dock (71)	600
Scene Shop (72)	800
Dressing Rooms (73)	1,200
Star Dressing Rooms (74)	300
Green Room (75)	600
Crew Room (76)	1,000
Laundry Room (77)	100
Private Restrooms (78)	100
Wardrobe Storage (79)	200
Make-up Room (80)	150

Space (page)	**Area** (sq. ft.)
Janitor Room (81)	60
Theater Stage Manager Office (82)	160
Concert Hall (83)	4,000
Music Stage (84)	1,000
Cove Lighting Room (85)	200
Sound Recording Room (86)	150
Musical Instrument Storage (87)	700
Loading Dock (88)	1,000
Permanent Storage Room (89)	1,000
Temporary Storage Room (90)	600
Music Stage Manager Office (91)	250
Dressing Rooms (92)	1,600
Mechanical and Electrical (93)	1,500
Total Square Footage (Net)	55,700
x 1.3	
Total Square Footage (Gross)	72,410

Case Study 1

Judy and Arthur Zankel Hall at Carnegie Hall

The space created for Zankel Hall was reclaimed from space below street level that was originally a 1200 seat recital hall and later, the Carnegie Hall Cinema. The goal of the project was providing a venue which presented a variety of performances, from classical chamber recitals to jazz and world music. Carnegie Hall personnel also wished to use Zankel to be used as a music education center, providing distance learning capabilities.

Zankel Hall was designed by Polshek Partnership in 1997. All the machinery, lighting, audio, and video systems were designed and chosen to meet specific requirements set by Carnegie Hall. The design feature most notable in this project is the use of the nine platform lifts, enabling the reconfigurable audience seating. The stage areas rely on mechanical screw-jack driven lifts instead of more recently developed machinery. The choice was based on their proven reliability, low maintenance cost, and safety.

The lighting and audio systems, however, employ state-of-the-art technology. The sound reinforcement system uses a digital mixing console with wireless control technology. Lighting systems also use Ethernet networking control, allowing the use of two completely separate control consoles. The use of technology in this facility was designed to avoid down time between events. The end result is a facility which balances innovation with reliability.

Figure B19: Zankel Hall interior

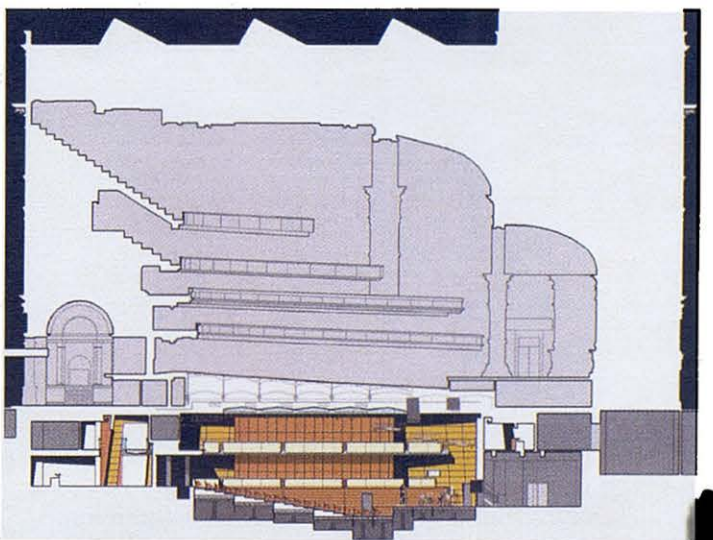


Figure B20: Building Section through Zankel Hall

Case Study 1

Judy and Arthur Zankel Hall at Carnegie Hall

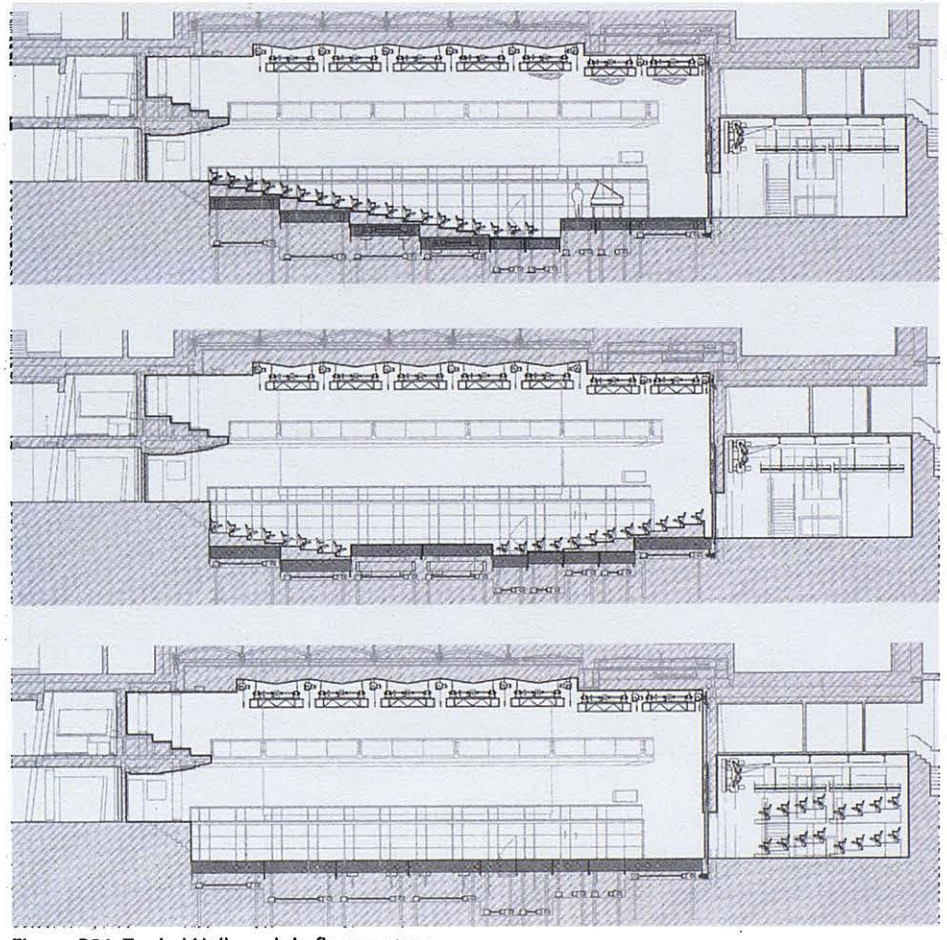


Figure B21: Zankel Hall module floor system

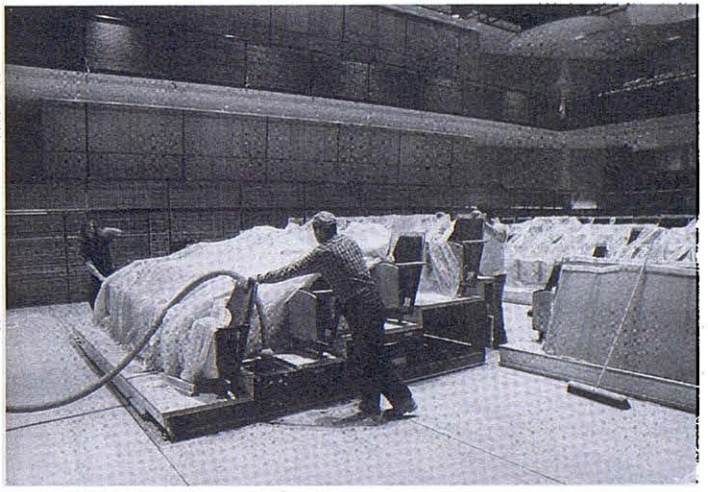


Figure B22: Module seat platforms

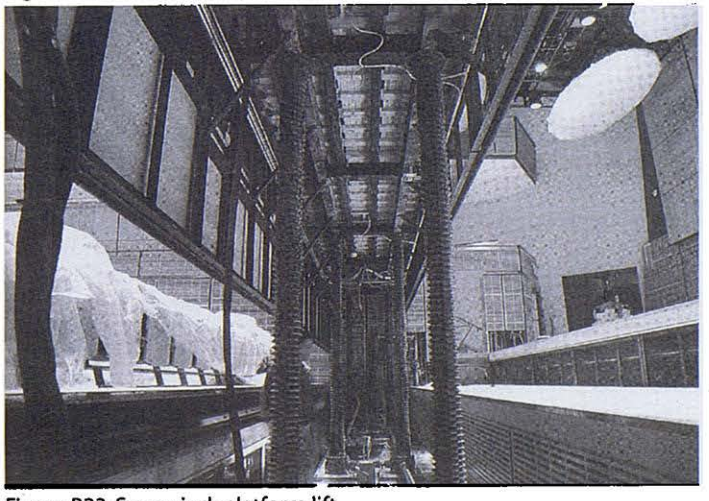


Figure B23: Screw-jack platform lift

Case Study 2

Parco della Musica Auditorium

Designed by Renzo Piano, the Parco della Musica Auditorium is a complex of musical performances located in Rome Italy. The design is unique in its use of three separated concert halls surrounding an outdoor amphitheater. Positioned around the open-air amphitheater, the three halls look like three enormous "musical boxes." The first of the halls is the Santa Cecilia with 2800 seats; the next is the Sinopoli with 1200 seats, and finally the Petrassi with 750 seats. The three concert halls are structurally separated to ensure soundproofing. The only joining element between the halls is the continuous lobby joining each building at the base. Each concert hall differs from one another in dimension and function. However, each is similarly characterized by an extreme flexibility and versatility of space. The flexibility of the halls allows each to be adjusted to suit the performance. In the Petrassi hall, the floor and ceiling can be moved to adjust the acoustic properties of the room. The materials used to construct the facility are all local, using red brick, travertine floors, and lead-shrouded roofs. To solve the problem of acoustics, the interior is constructed entirely of cherry-wood, achieving was may be called a "natural acoustic." The walls as the front and back of the middle hall are constructed with uneven brick work, as the texture of this surface has different sound absorbing properties than a smooth brick wall. The importance of acoustics was also extended to the design of the rehearsal rooms, dressing rooms, and the amphitheater. The various size and acoustical properties of this complex make it a unique flexible design.

Figure B24: Aerial site photograph

Figure B25: Santa Cecilia hall

Case Study 2

Parco della Musica Auditorium

Enclosing the outdoor amphitheater are the three large concert halls. The curving shell of each hall is constructed of a thin, wooden skin supported by trusses connecting to the structure behind. Most importantly, the integration of the amphitheater in combination with the various sized concert halls makes the complex extremely versatile and flexible. Renzo Piano states that the forms of the buildings are inspired by musical instruments.

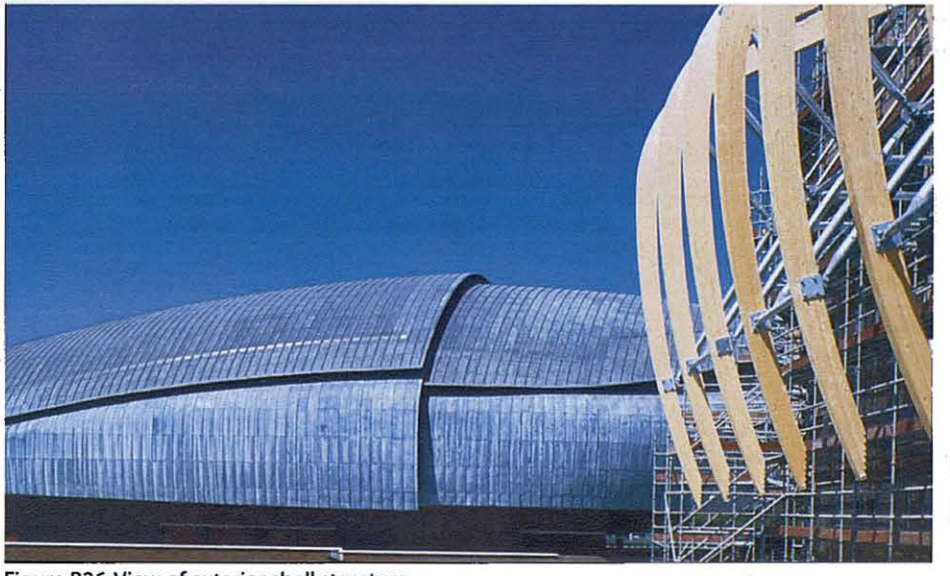


Figure B26: View of exterior shell structure

Figure B27: Exterior shell bracing

Figure B28: View of outdoor amphitheater

Case Study 3

Lucille 'Lupe' Murchison Performing Arts Center

Designed by Holzman Moss Architects, The Murchison Performing Arts Center is an award winning facility, located on the campus of the University of North Texas. The facility features the Margot and Bill Winspear Performance Hall, as well as the Lyric Theater. The Winspear Performance Hall is considered one of the finest concert hall is the world, having the acoustics designed by internationally renowned Christopher Jaffe. The hall's acoustics are varied with ten acoustical curtains, as well as three vertically adjustable, pentagonal clouds. The hall is planned to incorporate a Wolff pipe organ as the focal point of the hall, rising in front of the pentagonal glass block wall that extends from the orchestra level to the roof line. The glass block wall creatively integrates the use of natural daylight into the performance hall. As Holzman describes, "The Winspear Auditorium literally sings with this special body inside its protective shell. The armadillo metaphor is simply one of many examples of the improvisational nature of design at Holzman Moss Architecture."[1] The Lyric Theater is uniquely flexible, as the 400-seat hall features a flexible seating arrangement, allowing for traditional proscenium seating as well as thrust and in-the-round arrangements. Two balcony levels provide additional seating and staging options. An orchestra pit, accommodating of up to 60 musicians, is located in the Lyric Theater. The seating and acoustical design creativity of this performing arts center makes the facility uniquely flexible and accommodating to the needs of its users.

Figure B29: View of exterior

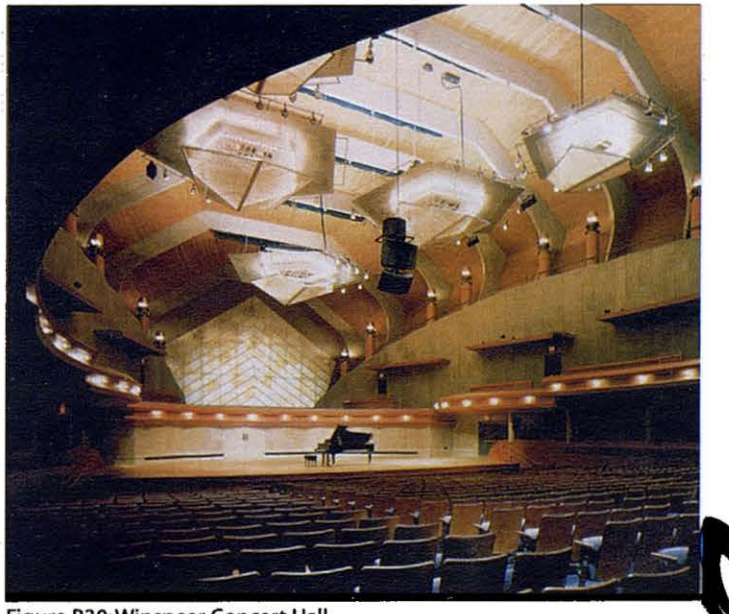


Figure B30: Winspear Concert Hall

Case Study 3

Lucille 'Lupe' Murchison Performing Arts Center

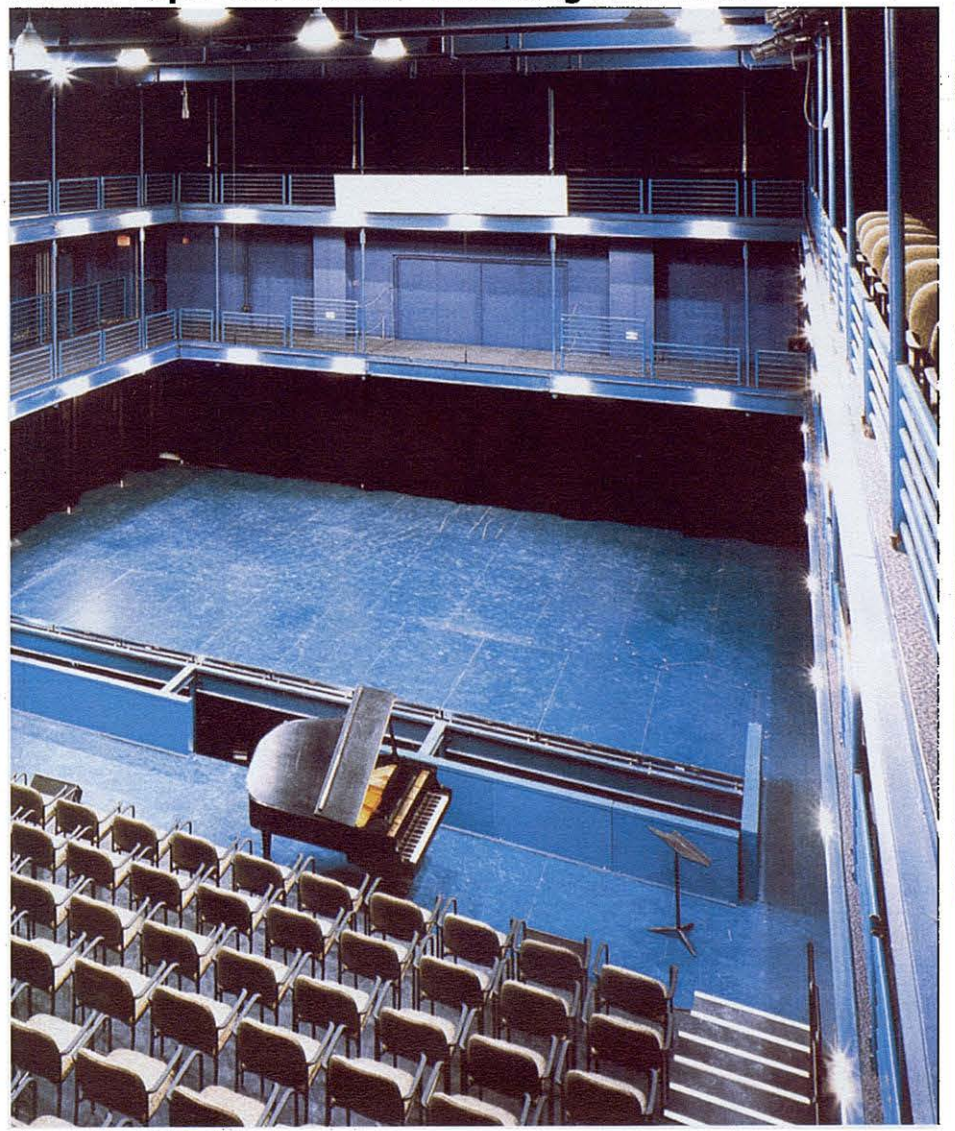


Figure B31: Lyric Theater

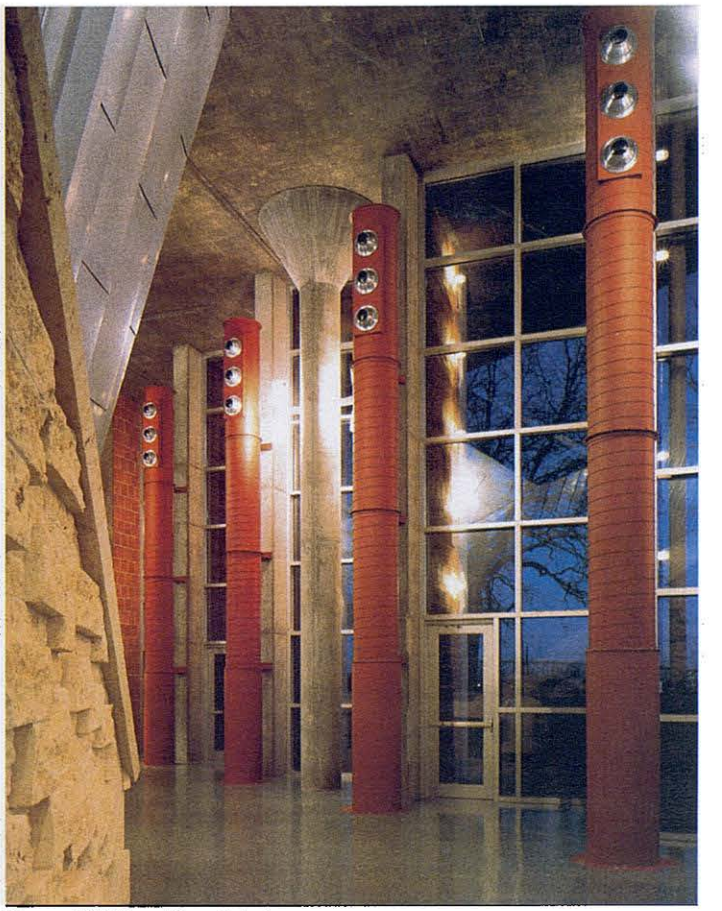


Figure B32: Murchison Interior

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Context

Context Overview

Nicknamed the "Hub City" Lubbock, Texas was founded in 1890, being named after Thomas Saltus Lubbock, a colonel and founder of the Texas Rangers. Located in the south plains, this area has become the 11th largest city in the state of Texas, and is home to numerous historical artifacts, cultures, and entertaining attractions. Lubbock's "Hub City" nickname is derived from the city being the economy, education, and health care hub of a multi-county region commonly called the South Plains. Upon the opening of Texas Tech University, the city was provided with a significant boost to its economy. Lubbock is located in a region known historically as the Llano Estacado, which is comprised of a large mesa that is relatively flat over most of the terrain; the area covers some 35,000 square miles. The region features numerous small playa lakes, and has a semi-arid climate, characterized by long hot summers and cold winters. The Llano Estacado is a region with an extremely low population density, and is covered mostly by large ranches and irrigated farms. As the area around Lubbock is the largest contiguous cotton-growing region in the world, local farms and ranches are heavily dependent on the irrigation water drawn from the Ogallala Aquifer. Located in "Tornado Alley", is subject to high winds and occasional sand storms. The city is at an elevation of 3,256 feet above sea level, and features hundreds of square miles of open undeveloped land with natural landscaping, open views looking out into the distance, and a quiet atmosphere. As of 2005, the U.S. Census estimated the population to be 209,737, and every year this number continues to grow.

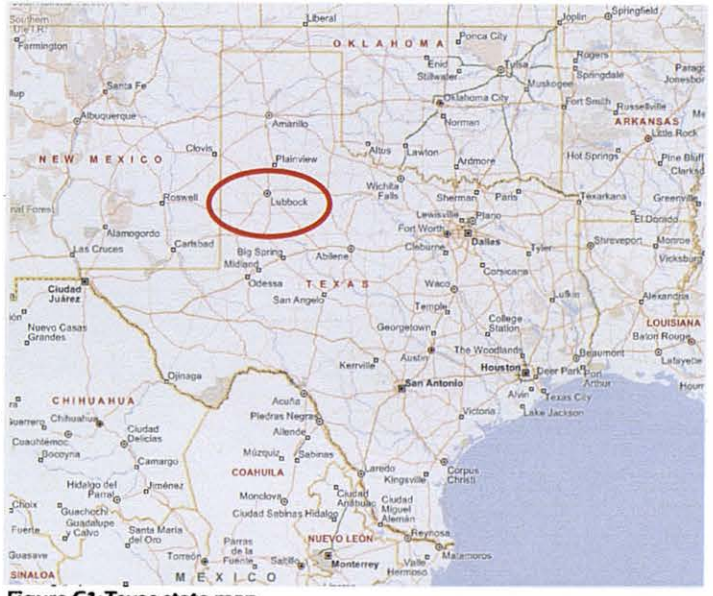


Figure C1: Texas state map

Figure C2: Downtown Lubbock

Context Overview

Texas is truly a culture with an appreciation for the musical arts. As a whole, the state of Texas stands tall as a star in the world of music. Texas music reverberates around the world, as the innovators of this music have blended diverse styles and crossed cultural boundaries. Lubbock is the birthplace of rock and roll legend Buddy Holly. The city is host to both a cultural center and an annual music festival. The city is also birthplace or home to numerous country musicians, many of whom have become very successful in the music industry. Lubbock is home to many other music events, including the National Cowboy Symposium and the Independence Day Festival. The Independence Day Festival, an annual event celebrated on July 4, is entirely free to the public, and is considered to be one of the largest free festivals in the state of Texas. These music events are a popular attraction among the people of Lubbock and the surrounding area. Other events include outdoor parades, live bands, cook-offs, and an evening fireworks program. The Texas culture is popular for its welcoming, friendly hospitality and an appreciation for musical arts. "The Lubbock Music Festival represents Lubbock's heritage in music and is a tremendous opportunity for the Lubbock community and surrounding areas to enjoy an incredible amount of music and entertainment." Throughout the year, numerous performances take place within the city's downtown depot district. The popularity of these events is unparalleled by any other attraction in the city.

Figure C3: Depot district music icon mural

Figure C4: Lubbock Music Festival logo

Context Overview

Demographics

Lubbock, Texas is a diverse, fast growing metropolitan area with an increasing level of development each year. The addition of new business markets and the increasing student body of Texas Tech University has significantly broadened the scope of people, income, and education. The University alone is one of the largest contributors to the city prosperity and future potential. Other large employers include Lubbock Independent School District, Texas Tech Health Science Center, and Lubbock County.

The city is within reasonable distance of several major Texas cities, with Dallas being the most prominent among Lubbock's neighbors. The average age of Lubbock citizens is below state average, with a high percentage of Caucasian and Hispanic races. The majority of Lubbock citizens have at least a high school degree or higher, with only a six percent unemployment rate. Lubbock economy is improving each year, with a considerable amount of development being planned around the completion of the Marsha Sharp Freeway.

Lubbock Races (2006)

White (Caucasian)	122,066	57.7%
Hispanic	64,412	30.4%
Black (African American)	18,373	8.6%
Asian	3,801	1.7%
American Indian	634	0.3%
Two or more races	1,901	0.9%

Table 1: Lubbock races

Population by Age

Under 18	24.9%
18 - 24	17.9%
24 - 44	27.6%
45 - 64	18.4%
65 and older	11.1%
Total Population (2006) - 211,187	
Median Age - 29.7 years	
Males - 48.6% Females - 51.4%	

Table 2: Lubbock age division

Education Level for 25 or older

High school or higher	79.5%
Bachelor's Degree or higher	26.6%
Graduate or professional degree	9.3%

Table 3: Lubbock education

Relationship Status for 15 or older

Never married	32.2%
Now married	49.4%
Separated	2.1%
Widowed	6.1%
Divorced	10.2%

Table 4: Lubbock marital status

Context Overview

Demographics

Development of the city has sparked tremendous business growth in the past decade. Growth of the city is extending outside Loop 289, with most major businesses located in West Lubbock or along the Marsha Sharp Freeway. Employment of women has increased over the past thirty years by 113%. Historically, Lubbock has had an unemployment rate below state and national average.

In the past 25 years, Lubbock has experienced a restructured labor force. While there has been a decline in the manufacturing sector, this has been offset by gains in the service, trade, and government sectors. The growth rate of employment in transportation and public utilities, along with insurance, finance, and real estate has risen significantly. The city of Lubbock predicts and projected growth rate of employment of 1% per year from 2000 to 2030. In 2000, the median household income average was $31, 844, while the median house value was $69,500. The median family income in Lubbock, TX for 2006 is $46,565.

The city has a master plan including all the goals planned for the 21st century. Goals include executing a well coordinated economic development plan which emphasizes business retention, business expansion, small business development, and international trade. The city is looking forward to significant growth and development in economics, education, land use, and health services.

Household Income (2000)

Under $10,000	11,488
$10,000 - $19,999	13,349
$20,000 - $29,999	11,779
$30,000 - $39,999	10,069
$40,000 - $49,999	7,738
$50,000 - $59,999	6,005
$60,000 - $74,999	6,239
$75,000 - $99,999	5,509
$100,000 - $149,999	3,244
$150,000 - $199,999	990
$150,000 - $199,999	1,238

Table 5: Lubbock income

Context Overview

Mackenzie Park

Mackenzie Park, located in the northeast portion of Lubbock, is named after Gen. Ranald Slidell Mackenzie. Gen. Mackenzie was a promising young army officer who commanded many battles throughout the southern plains. His trek through this region was part of a series of expeditions into the uncharted Panhandle region and Llano Estacado in an effort to drive renegade Indians back to their designated reservations.

The park is a 542 acre site, offering a variety of outdoor recreational events and activities. A swimming pool was constructed in 1921, with a municipal golf course opening two years later. Chairman of the State Park Board, D.E. Colp, recommended the establishment of a state park to the Lubbock Chamber of Commerce. 138 acres in this area of Yellow House Canyon were acquired in 1924 as Lubbock's first city-county park. In 1935, with approval from the State Parks Board, the city bought 450 more acres in Yellow House Canyon from Mollie D. Abernathy and P.R. Brown. This land, along with the old city and country parks lands, was deeded to the state and given the name Mackenzie Park. A Civilian Conservation Corps camp was established to construct road, bridges, recreation facilities, and new landscaping. In order to ensure proper maintenance and development, a bill was passed by the legislature, leasing the park to the city of Lubbock. Thus, Mackenzie Park is now operated by the Lubbock Parks and Recreation Department.

In addition to the golf course, recreation buildings, and camping facilities, the park contains a small entertainment attraction called Joyland Amusement Park. The park's most unique feature is the cultivated prairie dog town begun in 1937 through the efforts of K.N. Clapp, then chairman of the Lubbock Park Board. The board helped to save the black-tailed prairie dog from extinction. Completion of the Canyon Lakes projects in the 1980's added additional attraction to Mackenzie Park. Nearby Fair Park Coliseum and Livestock Arena house the annual Panhandle-South Plains Fair every year in September.

Figure C5: Mackenzie Park Aerial Photo

Context Overview

American Museum of Agriculture

In August 2001, a group of agriculture industry leaders from the South Plains gathered at the first meeting of the non-profit organization 'American Museum of Agriculture in Lubbock'. In 2002 the Lubbock County Historical Collection permanently loaned some exhibits to the American Museum of Agriculture. The museum, located at 1501 Canyon Lake Drive, opened its doors to the public in May 2002. The museum strives to preserve the history and tell the unique story of American agriculture. Today, the collection ranges from household items all the way to Moldboard plows and tractors. The American Museum of Agriculture currently displays restored tractors, a threshing machine, broadcast binder, combine, 71 pedal tractors, 300 die-cast toy tractors, and approximately 300 other artifacts and pieces of smaller equipment. In storage, the museum also has horse-drawn equipment, field condition tractors, threshing machines, combines, grain binders, mowing machines, grain drills, hay rakes, hay balers, cotton strippers and cotton trailers. Volunteers staff the museum and keep it open to the public. Staff manages the daily operations and fundraising efforts for the museum.

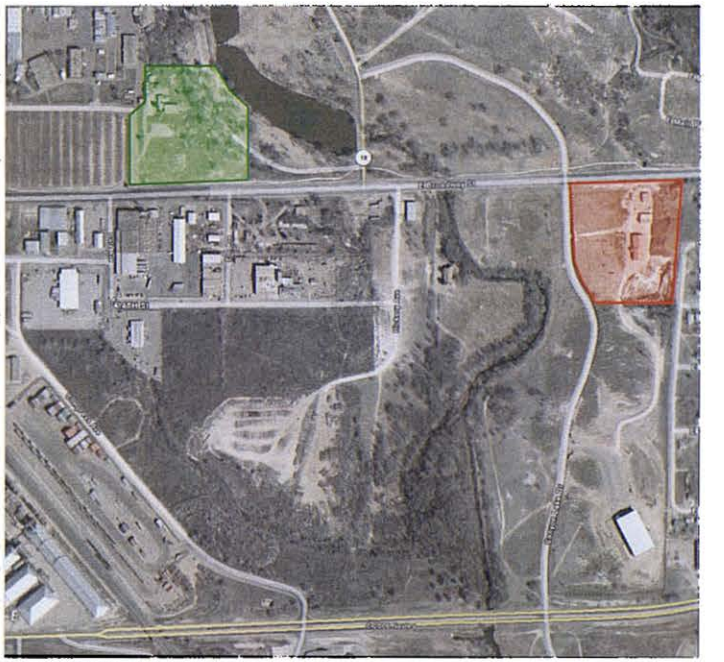


Figure C6: Aerial site photo

Figure C7: View of outdoor exhibit space

Context Overview

American Windmill Center and Museum

A non-profit organization was established in 1993 to acquire a large number of restored early windmills. The city of Lubbock provided a 28-acre tract of city park land in East Lubbock along with some buildings for indoor displays. The rarest windmills of the collection are exhibited inside the larger building while outdoor windmills are being erected on towers, many of which have pumps and tanks. The American Wind Power Center is the most comprehensive collection of historic windmills in the world. It will be a site long remembered and is our way of honoring those early settlers who struggled with difficult conditions, tempered with the life-giving water pumped by windmills. The center's extensive windmill collection contains an early windmill made in the 1860's, one of the first all-metal windmills, and many other examples of wind machines seldom ever seen. Many of these windmills have been donated to the Center by families from across the country who wanted to honor their early family or business heritage by displaying those mills in a permanent location. The facility is available for rent, catering awards ceremonies, employee parties, anniversary celebrations, class or family reunions, weddings, and receptions.

Figure C8: Aerial site photo

Figure C9: View of exhibit space

Context Overview

Joyland Amusement Park

Joyland Amusement Park began its legacy in the late 1940's with the original name of Mackenzie Park Playground. The park has entertained thousands of people through the West Texas area. In the late 1960's, the amusement park began to deteriorate along with the Mackenzie Park area. In need of extensive work and repair, Jimmy and Katie Dean purchased Mackenzie Park Playground. The first order of business was to change the park name to Joyland Amusement Park so everyone would associate it with the same old run-down amusement park. Starting with only 13 rides in 1973, the park has now grown to its present size with over 30 available rides and attractions. Joyland is now in its second generation of family operation. Long term plans for the park include adding thrill and water attractions, targeting the entire family. The park includes water attractions, roller coasters, carousels, food and snack bars, and exciting fun games. Joyland Amusement Park provides families with unforgettable memories. The park begins its season in March and remains open through the middle of September.

Figure C11: Aerial site photo

Figure C10: Panoramic view of park

Figure C12: Park waterslide

Context Overview

Archaeological Dig

On the northern tip of the site, an archaeological dig is being conducted under the direction of Professor Eileen Johnson. Professor Johnson currently serves as the Director of the Lubbock Lake Landmark program for Texas Tech University. The landmark is one of the few sites in North America with a complete record of human existence for the past 12,000 years. At the location of the Wells Fargo Amphitheater in Mackenzie Park, Johnson and term team of volunteers found a site that dates primarily from the last 4,000 – 5,000 years. Johnson claims to have discovered some new activities at the Mackenzie Park site, where they have now named two new stratigraphic units. The historical artifacts uncovered through this archaeological dig are being used to model the region by differing cultures, in determination to discover what was drawing people to this location. The team finds that water is a key resource, causing many people to gather concentrate around the springs. Professor Johnson works hard to protect this land that holds treasures of people, environments, animals, and plants on the southern high plains from being destroyed.

Figure C13: Panoramic site view

Figure C14: Aerial site photo

Figure C15: View of dig site

Context Overview

Neighboring Structures

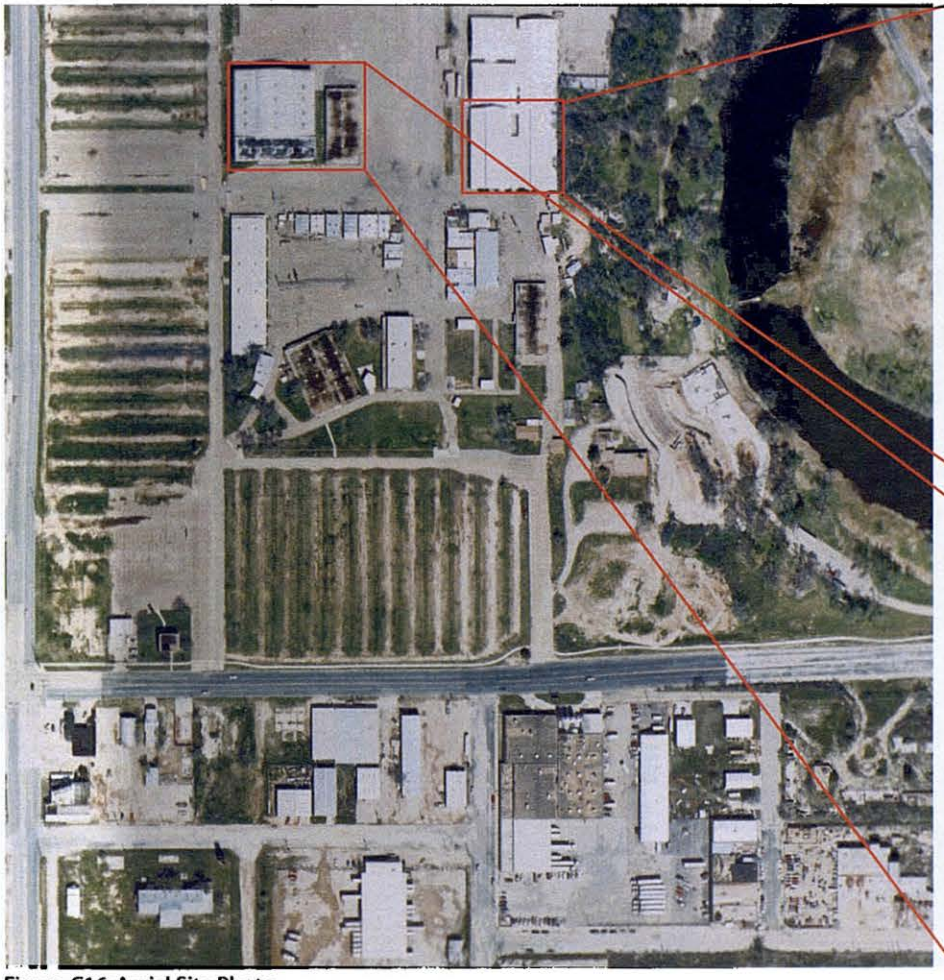


Figure C16: Aerial Site Photo

Figure C17: Cattle Barn

Figure C18: Trade Mart Building

Context Overview

Neighboring Structures

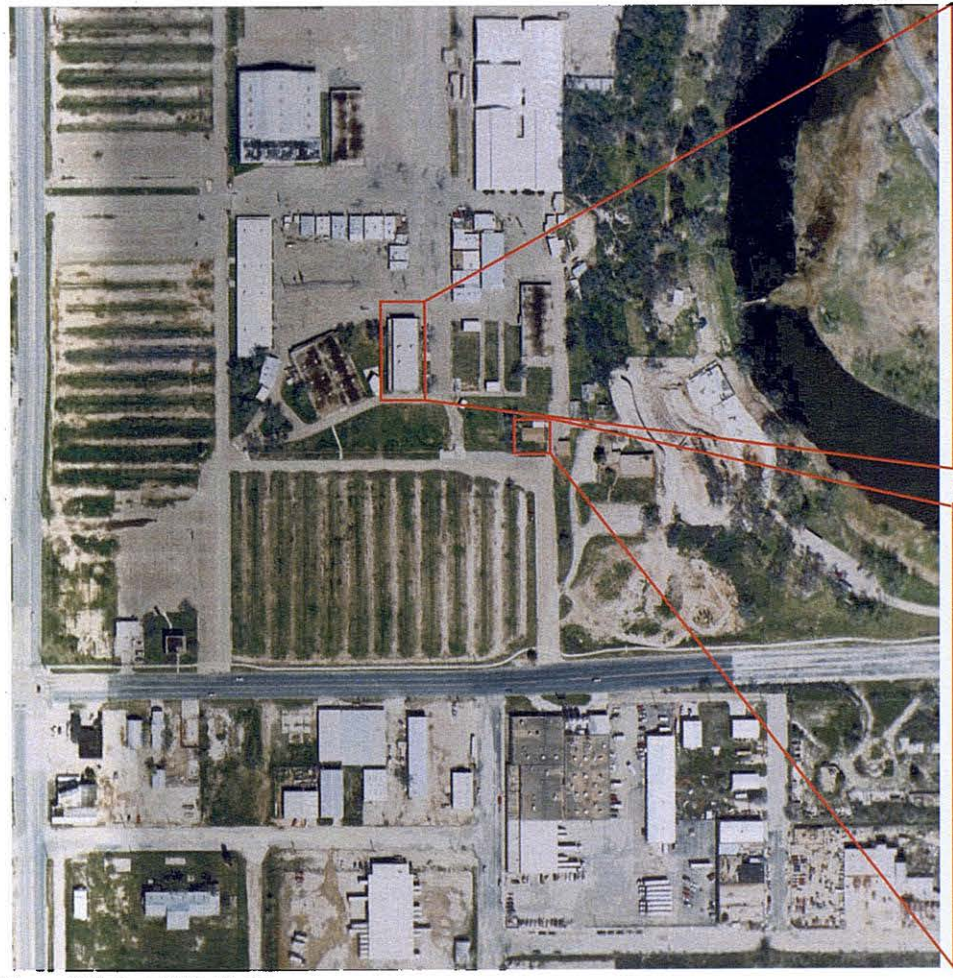


Figure C19: Aerial Site Photo

Figure C20: Merchants Building

Figure C21: House

Context Overview

Neighboring Structures

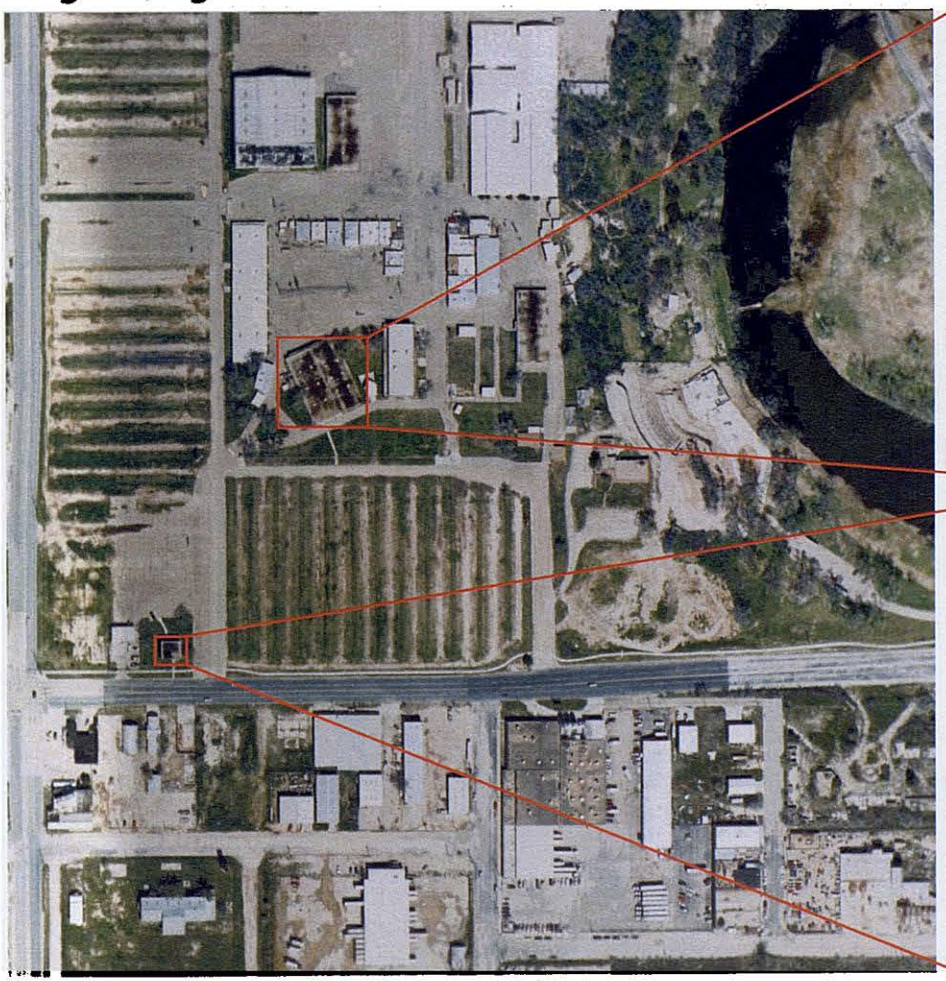


Figure C22: Aerial Site Photo

Figure C23: Women's Building

Figure C24: Southplains Fair Office Building

Context Overview

Neighboring Structures

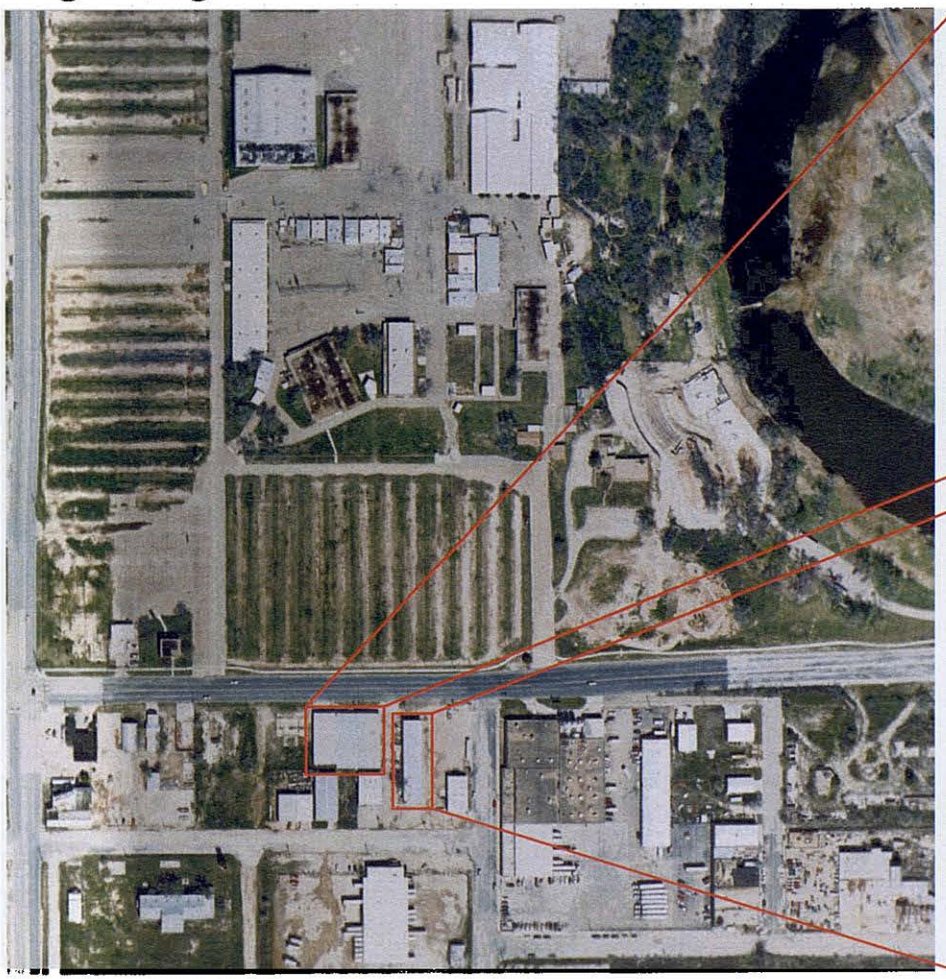


Figure C25: Aerial Site Photo

Figure C26: Inland Truck Parts and Service

Figure C27: Abandoned Store

Context Overview

Neighboring Structures

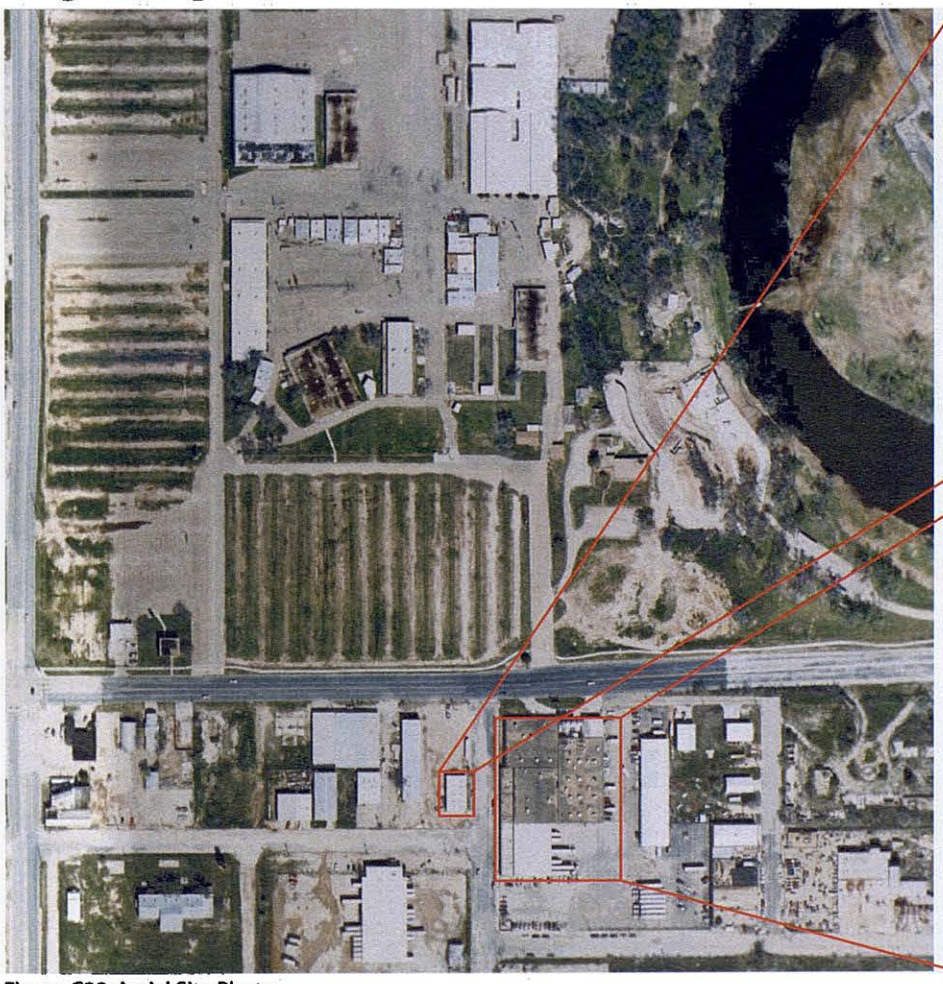


Figure C28: Aerial Site Photo

Figure C29: Hub City Spring Service

Figure C30: Mrs. Baird's Bread Factory

Context Overview

Zoning Ordinances

The zoning classification for this site as determined by zoning officials will be "C-2A" Restricted Local Retail District. As stated by the zoning ordinance, "The purpose of this district is to provide limited local retail and service commercial uses which serve one or several neighborhoods."

Yard setback under this code require the front yard to have a minimum of forty-three feet, or no less than the average setback established by the development on the adjacent lots. The setback on vacant adjacent lots shall be forty-three feet as well. There are no rear or side yard requirements unless the property is adjacent to any "R-1" or "R-2" zone properties. Cornices, eaves, sill, or canopies may extend two feet into any required yard. Unenclosed fire escapes, stairways, and balconies, covered or uncovered, may extend four feet into the required front or rear yard. There are no lot area requirements for lot width, area, coverage, or floor area ratio. C-2A zoning district states there shall be a maximum height limit of two stories, or twenty-four feet, only when the lot is adjacent to any "R-1" or "R-2" district.

The zoning ordinance requires theater facility parking to provide one space for each four seats. Restaurant facilities serving mixed alcoholic beverages are required to provide one space for each seventy-five feet of gross floor area. Recreational vehicles or trailers may be stored on paved parking lots, but on in any landscaped area.

Figure C31: Lubbock Planning Department logo

Context Overview

Zoning Ordinances

The "C-2A" Restricted Local Retail District zoning ordinance requires that five percent of the total development lot area shall be landscaped and permanently maintained. A minimum of three-quarters of the required landscaping shall be located between the buildings lines and the adjacent street(s). Remaining landscaped area may be located to the sides of the buildings, but shall be visible from adjacent streets. Interior courtyards will not be included in the required landscaping.

The Lubbock Planning Department defines parkway as "Any part of the public right-of-way lying between the curb or grade line of any public street and the abutting private property line." The zoning ordinance requires the parkway areas to be landscaped and permanently maintained. This is to be in addition to the landscaping required on the site. All landscaped area on the development tract and adjacent parkway shall have immediate availability of water or an irrigation system. Parkway irrigation systems adjacent to public streets can not spray onto adjacent street or gutters.

The "C-2A" zoning ordinance vision clearance requires the front yard to have no wall, fence, or other structure to be erected in any part of the yard that would be higher than a lines extending from a point two and one-half feet have the natural ground level at the front lot line to a point four and one-half feet above the natural ground level at the depth of the required front yard.

Figure C32: Lubbock Planning Department logo

Site Analysis

The site of the new performing arts center will be in Lubbock, located off of Broadway Ave, east of the I-27 highway. Downtown Lubbock is located west of the site, approximately half a mile from the proposed area for development. The downtown district is characterized by taller buildings and the popular Depot District. Access to the site is available via Broadway Avenue or Parkway Drive. Interstate Highway-27 and Loop 289 are each accessible to and from the site, with Broadway Avenue serving as the most convenient point of entry to both the highway and the site. Broadway Avenue is one of the older, historic streets in the city, being constructed mostly of brick within the downtown district. The name Broadway has a historic connotation of being affiliated with the theater district, particularly as the center of the professional or commercial theater in the United States.

Figure C33: Lubbock city map

The area directly surrounding the site is pre-dominantly an open field, including the Mackenzie Park directly to the North and East of the site, as well as the South Plains Fair grounds. The park features plentiful landscaping, open grass fields, and an existing lake which separates the park into halves. The site was chosen due to its sloping topography, extensive views of the surrounding area, and easy accessibility to and from the city. This region of the city features plentiful landscaping, with only a few scattered businesses that mostly serve as civic arts businesses. The beauty of the area is unknown to many local citizens, as there is little reason to visit the site with the current state of development.

Site Analysis

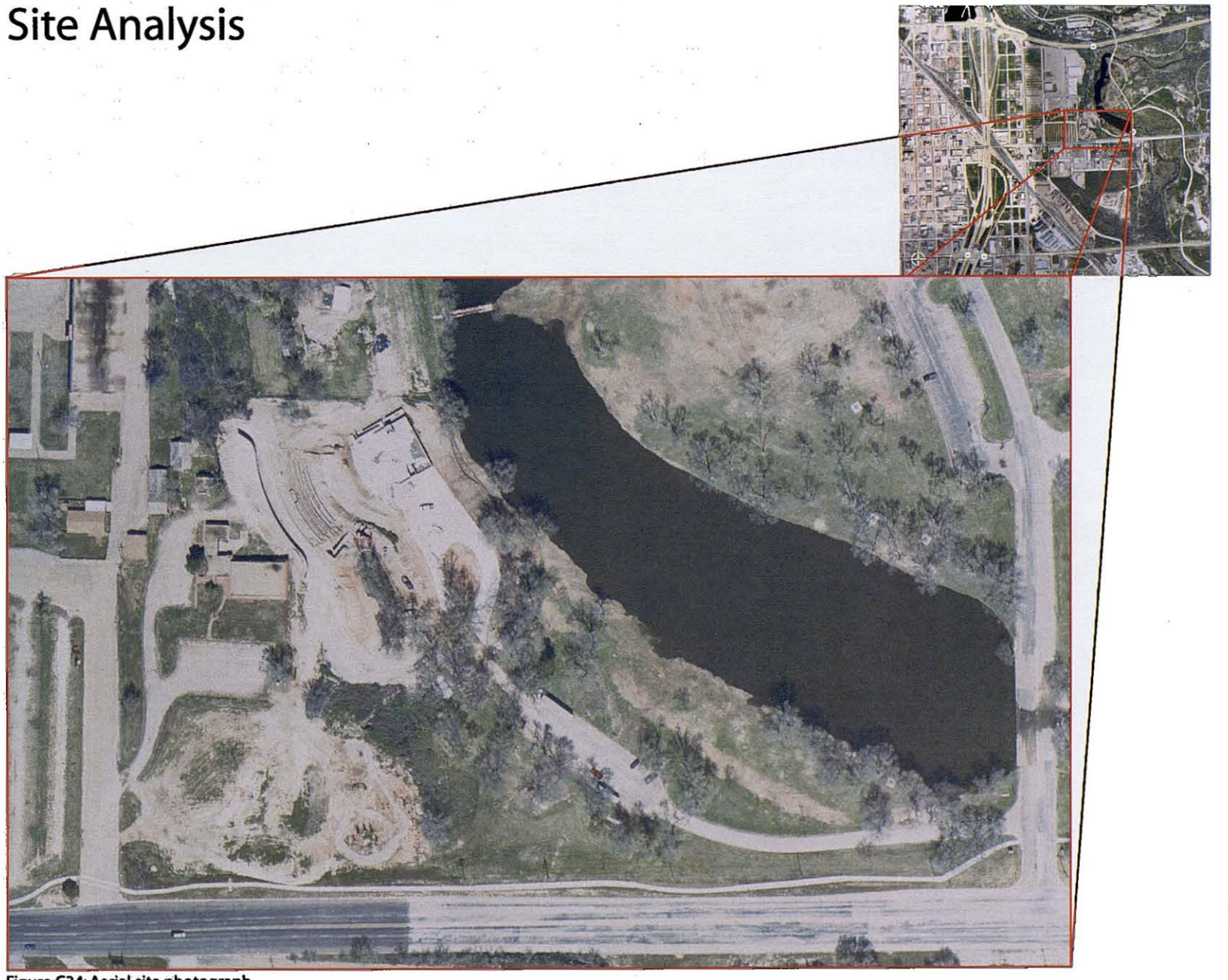


Figure C34: Aerial site photograph

Site Analysis

Topography

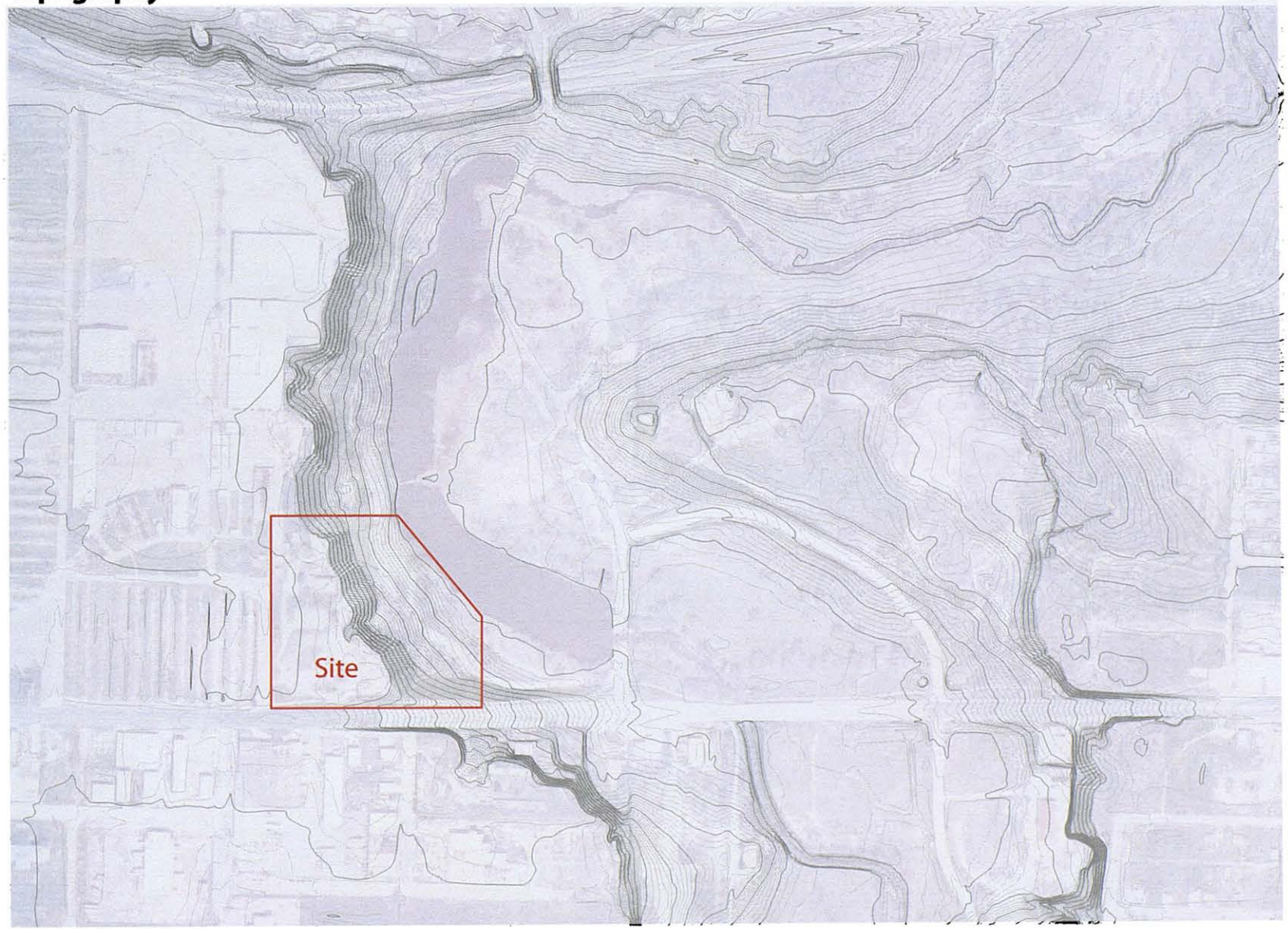


Figure: C35: Topo map

Site Analysis

Site Dimensions

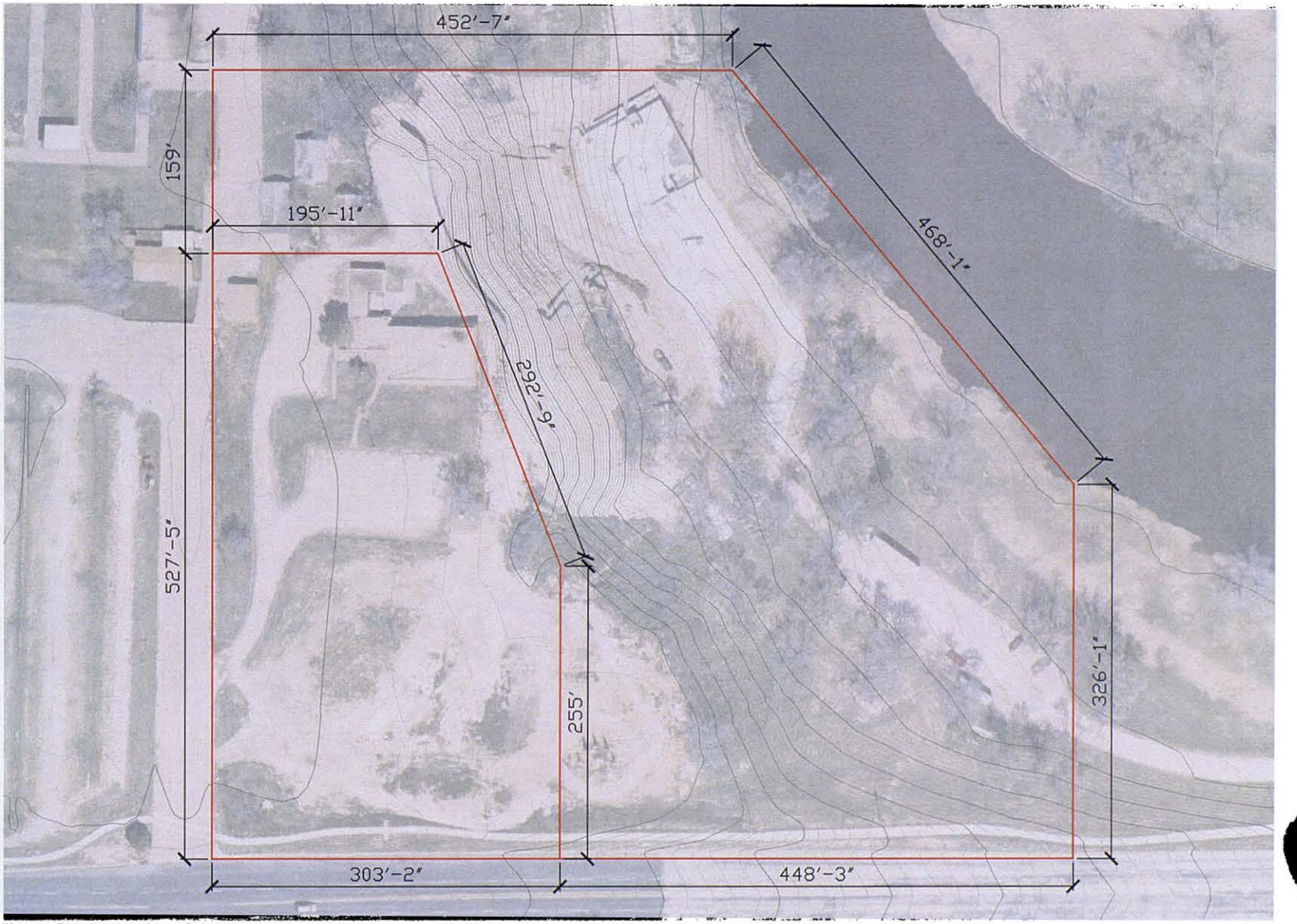


Figure C36: Dimensioned site

Site Analysis

Figure C37: Panoramic view of lake

Figure C38: Panoramic view of amphitheater

Site Analysis

The site is mostly undeveloped, with one structure located on the top side of the sloping terrain, as well as a recently constructed outdoor amphitheater located on the sloping terrain down towards the lake. The building located on the top side of the site is abandoned, with all the windows boarded up and the identifying signs removed. Based from the investigation of older photographic documentation, there was an additional building connected to the existing structure in place. The date of construction for these buildings is unknown, as is the use of the buildings in their original state. Currently, the addition once connected to the abandoned building has been demolished, leaving only the concrete foundation slab in place. A paved road leads up to the parking area which once served the abandoned structure at the top of the site. The existing parking lot contains 12 parking spaces, with additional parking to the site by accessing the Mackenzie Park entrance at the bottom of the site. The road leading to this parking lot also extends to connect with the entrance into the fair grounds site.

Figure C40: Aerial site photo

Figure C39: Panoramic site view

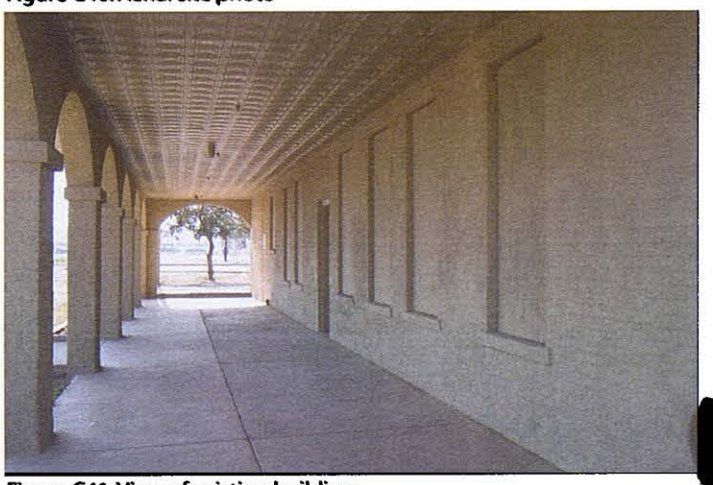


Figure C41: View of existing building

Site Analysis

The outdoor Wells Fargo Amphitheater is an existing structure which is to be integrated with the design of the Performing Arts Center. Together, the performing arts center and amphitheater will form a facility which caters to both indoor and outdoor performances, allowing more flexibility and adaptability to the building program. The existing building program is designed to accommodate events by the Texas Tech School of Theater, LISD Art & Music Programs, Lubbock Symphony, and various other commercial traveling companies. The amphitheater will be ideal during pleasant weather seasons, while taking advantage of the wonderful views looking to the East and North. The construction of the amphitheater was recently completed, now serving to house various events and performances. Designed by Carter & Burgess Architects, the facility is now property of the city of Lubbock. Due to insufficient funding, the complete design proposed by Carter & Burgess was unable to be constructed. The theater is directly accessible from the top entrance of the site off Broadway Ave., as well as from the park entrance.

Figure C42: Panoramic site view

Figure C43: Aerial site photo

Figure C44: Amphitheater seating

Site Analysis

Crossroads in Time Sculpture Garden

Located on the southern tip of the site, along Broadway Ave., is a sculpture garden consisting of artwork created by a local sculpture. These giant monoliths, a plow touching the sky, a fence too tall to climb, and a whirlwind tornado, all overlook historic Yellowhouse Canyon in Mackenzie Park. The sculpture garden celebrates 100 years of art, architecture, history, heritage and culture in the area and is the culmination of planning by the Millennium Advisory Committee. This seventeen-member committee was appointed by the Lubbock City Council in December 1999 to study and recommend how to commemorate the history, culture and heritage of Lubbock and the South Plains region. Local sculpture Steve Teeters of St. Eligius Studio is the artist for the garden, while Parkhill, Smith and Cooper served as the project consultants. The giant metal pieces featured in the sculpture garden are 15-20 foot high structures, depicting icons of the Old West and historical life on the plains. In 2003, ALON USA's President and CEO, Jeff Morris, stepped forward and donated $150,000 to assist in the construction of the amphitheater in Mackenzie Park. Because of their generous support, the Crossroads in Time Sculpture Garden is named in their honor.

Figure C45: Aerial site photo

Figure C46: View of sculpture pieces

Site Analysis

Vegetation

The existing site is characterized by a small variety of trees, most of which are common in both the surrounding area and Lubbock County. The top side of the site is mostly bare, with only a few scattered trees, one of which is directly next to the abandoned building one the site. The landscaping on the site consists of large areas of untreated dirt, with a few scattered patches of grass.

The tree located next to the abandoned building is an **Afghan Pine** (Pinus Eldarica). This is an evergreen species, ranging from 30-50 feet in height, with needles leaves. This specie of tree serves as a valuable wind break, and is attractive in groups. Some of the cultural requirements include full sun exposure, moderate watering, tolerant soil, and low maintenance.

Located on the northern tip of the site, between the amphitheater and the archaeological dig site is a **Mulberry** (Morus Alba). This is a deciduous species, ranging from 20-30 feet in height, with green ovate shaped leaves. The tree serves as an excellent dark green mass of foliage. Cultural requirements include full sun exposure, well-drained soil, moderate watering, and occasional pruning.

The site is mostly covered with **Siberian Elm** (Ulmis Pumila), located dominantly on the lower side of the site, scattered across the sloping terrain. The species is fast growing, with brittle wood that is subject to breakage. Height ranges from 25-50 feet, with green leaves that alternate is size and arrangement. Culture requirement include full or partial shade sun exposure, moderate watering, and pests removal maintenance. The specie can adapt to almost any soil texture.

Figure C47: View looking East across lake

Figure C48: View looking Northeast from amphitheater

Site Analysis

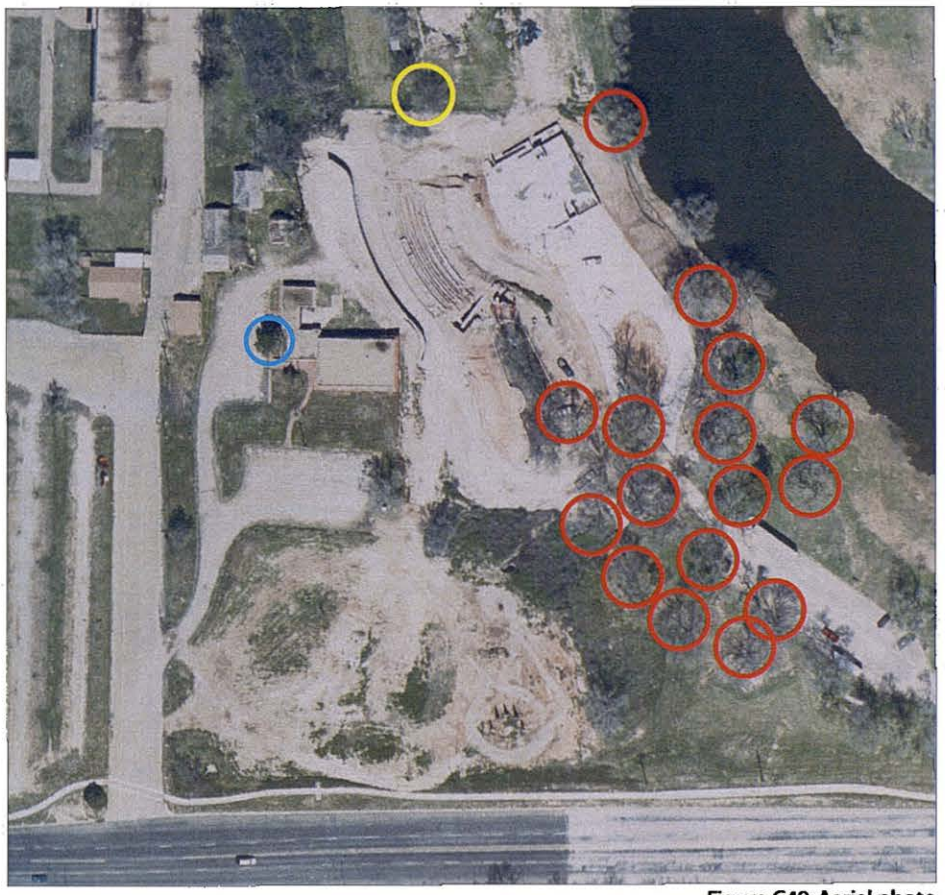


Figure C49: Aerial photo

Siberian Elm (Ulmis Pumila)

Afghan Pine (Pinus Eldarica)

Mulberry (Morus Alba)

Figure C50: Mulberry detail

Figure C51: Afghan Pine detail

Site Analysis

Climate

Lubbock, TX has a mild, semi-arid climate with long summers and a short cold season. On average, Lubbock receives 18 inches of rain per year on average, with the majority of precipitation occurring during the spring and summer seasons in the form of scattered thunderstorms. A small rainstorm can even cause significant street flooding with the city's current water collection system. The summer season is hot with a relatively low humidity, with temperatures at or above 90 degrees Fahrenheit (32 degrees Celsius) during the months of June, July, and August. Temperatures rising above 100 degrees are not uncommon, with a record high of 114 degrees F. occurring in 1994. October is typically the point in the season that temperatures will begin to drop down to a comfortable atmosphere.

Figure C52: View of Lubbock terrain

Winter is relatively mild, although temperatures below freezing are not uncommon. Snowfall averages roughly 9 inches per year, however it is uncommon for snow to stay frozen on the ground for longer then 24 hours. Snow in the form of frozen ice is more common, occasionally causing hazardous driving conditions in the city. High winds are typical, with gust rising into the 50-60 mile per hour range. Wind often causes the cold temperatures to seem significantly colder due to the wind chill factor. High winds occasionally cause sand storms in the area, turning the Lubbock sky brown with sand particles. Evening conditions can usually cool and peaceful, with extensive views of the Texas sunset.

Figure C53: View of Lubbock snow condition

Site Analysis

Climate Data

Lubbock	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Avg High	52.9	57.6	66.0	75.4	83.1	90.0	91.9	89.6	82.9	74.7	63.2	54.1	73.5
Avg Low	24.6	28.6	36.4	46.7	55.8	64.3	68.0	66.2	59.4	48.1	36.5	27.2	46.8
Avg Rain	.39	.68	.89	.97	2.35	2.75	2.37	2.51	2.60	1.86	.75	.53	18.65
Avg Wind	11.5	12.7	13.8	15.0	15.0	13.8	12.7	11.5	11.5	11.5	11.5	12.7	12.8
T-Storm (#)	-	-	2	4	9	9	8	7	5	3	1	-	47
Highest Temp	87	89	95	100	109	114	109	107	105	98	89	83	114
Lowest Temp	-16	-17	-2	18	29	39	49	43	33	18	-1	-2	-17
Avg Snowfall	2.4	2.9	1.5	0.2	-	-	-	-	-	-	-	-	0.7

Table 6: Lubbock weather

Site Analysis

Wind Analysis

Located in the South Plains region, Lubbock is frequently susceptible for high winds. The average wind speed is 12-15 miles per hour, while gusts can occur that reach speeds in excess of 50 miles per hour. Wind storms occasionally stir up sand particles and shift a layer of dirt and sand over the Lubbock County. The Lubbock sky is known to turn brown in these storms, causing sand to seep in the cracks and crevices of cars, buildings, and people.

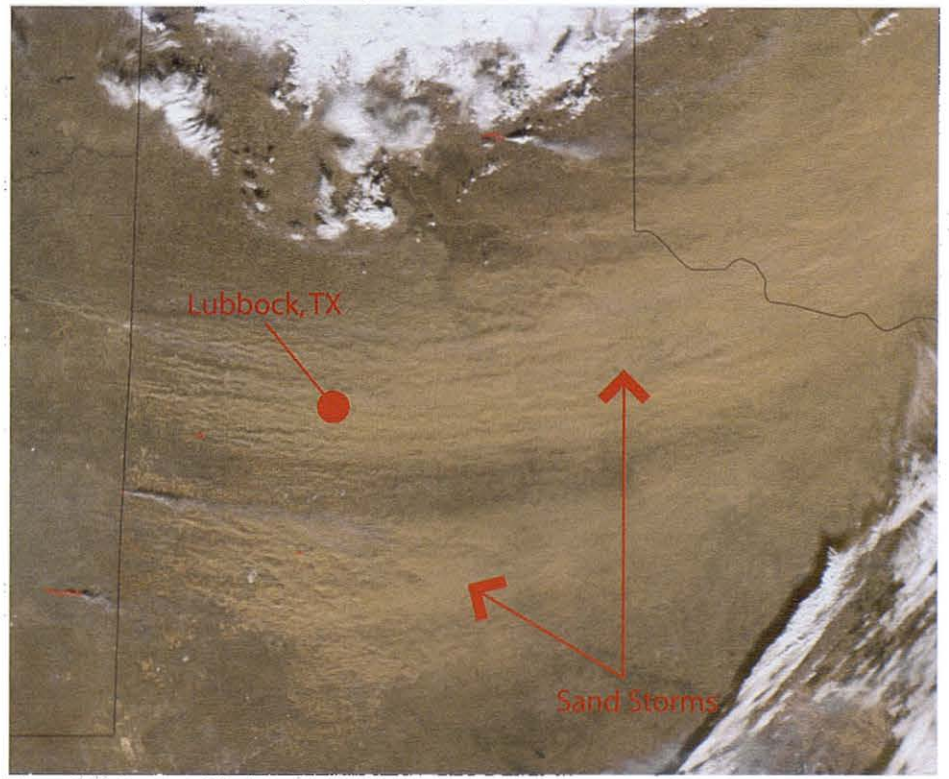


Figure C54: Texas aerial photo

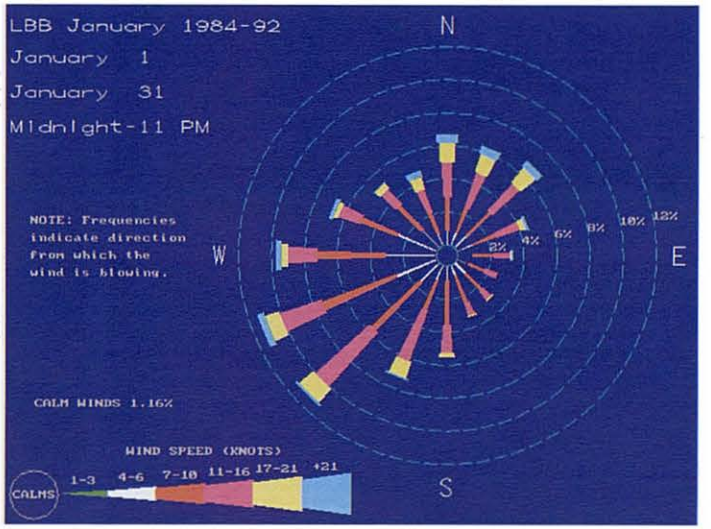


Figure C55: January windrose diagram

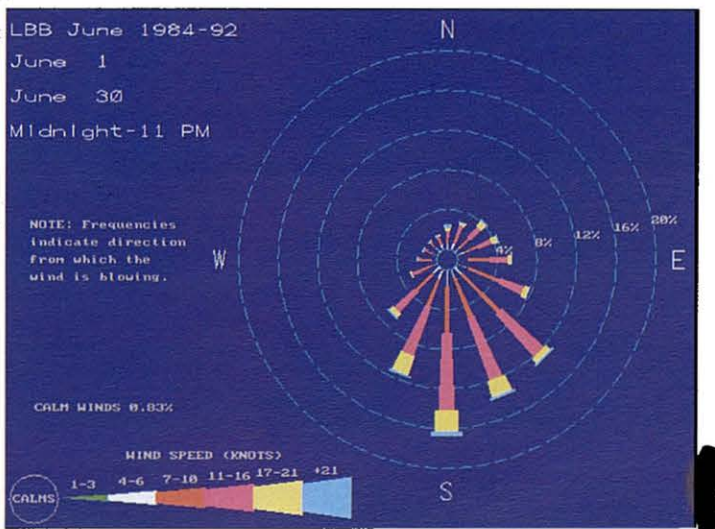


Figure C56: June windrose diagram

Site Analysis

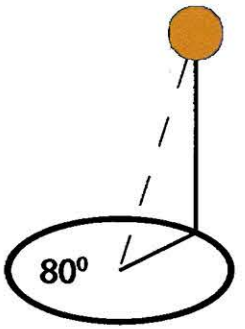
Sun Pattern Analysis

The Lubbock, TX warm weather season lasts for an extended time of the year, allowing many days of natural day light. Clear skies allow for an unobstructed view of the sun, lasting until late in the day during the summer season.

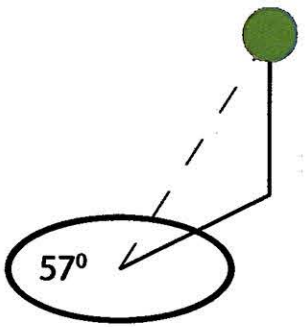
On average, the sunrise time during the June 21 summer solstice is 5:30 am, with a sunset time of 8:00 pm. The winter solstice date of December 21 has an average sunrise time of 7:45 am, with the sun setting at approximately 5:40 pm. The March and September equinox times consist of sunrise occurring at about 7:00 am, with a sunset time of 7:00 pm.

Sun Altitudes at 12:00 Noon

Summer Solstice



Equinox



Winter Solstice

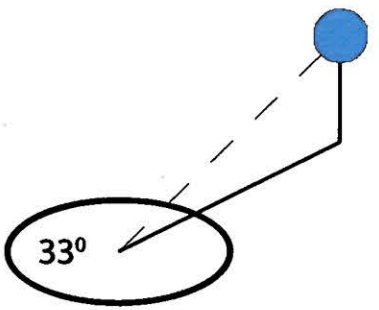


Figure C57: Sun diagrams

Site Analysis

Solar Path Diagram (Lubbock, TX)

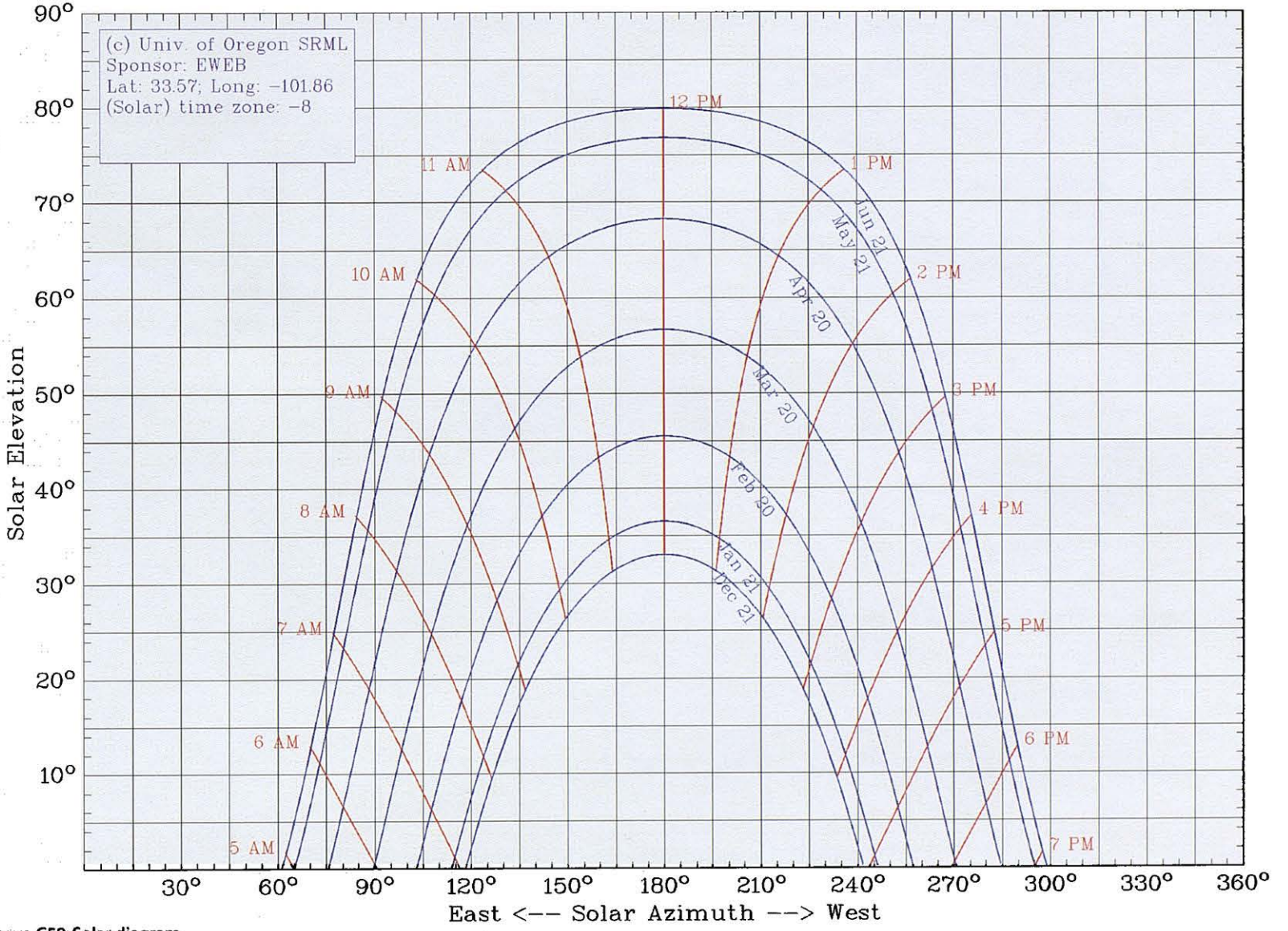


Figure C58: Solar diagram

Site Analysis

Soil Analysis

The type of soil on a site is an important factor in determining the flexibility and potential of a given location. The quality of soil determines the capacity of a specific type of soil to function, to sustain plaint and animal productivity, maintain or enhance water and air quality, and support human health and habitation. There are five essential functions in the performance of soil: regulate water, sustain plant and animal life, filter potential pollutants, cycle nutrients, and support built structures. These factors will determine the type of landscaping to be developed on the site, as well as the ability to support a man-made structure of significant size or weight.

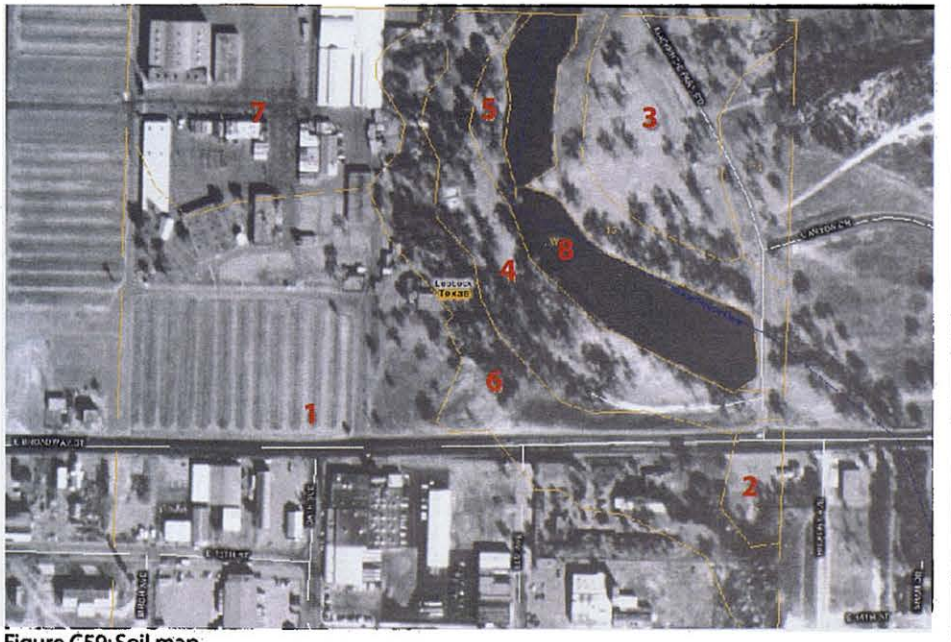


Figure C59: Soil map

Map #	Soil Type
1	Acuff
2	Arents and Pits
3	Berda Loam
4	Berda Loam
5	Bippus Clay
6	Potter - Kimbrough
7	Urban Land
8	Water

Table 7: Site soils

Site Analysis

Soil Erosion/Run-off

Upon building the new Wells Fargo amphitheater, large areas of the site are without landscaping or a retaining wall. The slope at the top of the site location is fairly uniform in elevation, while the hill leading down to the lake starts with a steep decline, gradually leveling out at the edge of the lake. The building of the new Wells Fargo amphitheater required grading of the existing topography, leaving areas of the site without landscaping or a necessary retaining wall. Considerable run-off and erosion of site occurs at specific areas of the site, leading to soil run-off that covers the rear entrance into the amphitheater from Mackenzie Park. Other areas of soil erosion have caused run-off to build up on to the ramps leading down to the bottom level of the amphitheater. Following heavy rain showers, a significant amount of dirt and soil builds up along the perimeter of the restrooms/mechanical rooms built at the base of the sloping hill. The site is in need of landscaping to prevent further erosion and run-off.

Figure C60: Panoramic view of site

Figure C61: Run-off onto sidewalk

Figure C62: Build-up around amphitheater utility/restrooms

Site Analysis

Drainage

The site is relatively flat on top, containing only a few minor areas of water puddles located in various spots on the site. The sloping hill moving down towards the lake is mostly undeveloped, leaving large tracts of land without landscaping. In heavy rain storms, water drains downhill towards the lake, causing significant soil run-off and erosion. The retaining wall located at the peak of the sloping hill on the site features evenly spaced drainage pipes for excess water along the high side of the wall. The ramps leading down to the amphitheater stage are sloped to prevent water puddles. Evenly spaced water drainage pipes are located along the ramp construction, draining excess water downhill. The amphitheater stage is currently a flat concrete surface, leading to large areas of water puddles on the stage surface in the event of a rain storm. The stage has one overflow drain pipe on the backside of the stage platform that drains directly to the ground below. The water level of the lake can easily rise in the event of a significant rain storm. However, the ground level leading from the lake to the amphitheater should be steep enough to prevent water overflow onto the amphitheater site.

Figure C63: Stage overflow drain pipe

Figure C64: Retaining wall drain pipe

Figure C65: Water drainage downhill on site

Figure C66: Water puddles on amphitheater stage

Site Analysis

Utility Locations

The existing site features several utility locations, with some located at the top of the site while other utility connections are located around the recently completed amphitheater. A site map provided by Carter and Burgess Architects identifies the location of a sewer line in close proximity to the abandoned structure at the top of the site. The abandoned structure is likely to contain several utility line connections. However, access to the building prevents confirmation of any specific utility connections. A straight row of power-line poles runs parallel to the entrance road entering the site. There are a few electrical box connections scattered one the site, which were identified during the on-site analysis. A natural gas tank is located near the lake, behind the amphitheater stage. There is also an electric generator adjacent to the stage, to include multiple electric boxes and transformers from Lubbock Power & Light.. Located behind the stage, there is also an insulated pipe, which appears to serve as a water connection faucet. Adjacent to the amphitheater seating are two restroom facilities, each featuring electric and water utility connections.

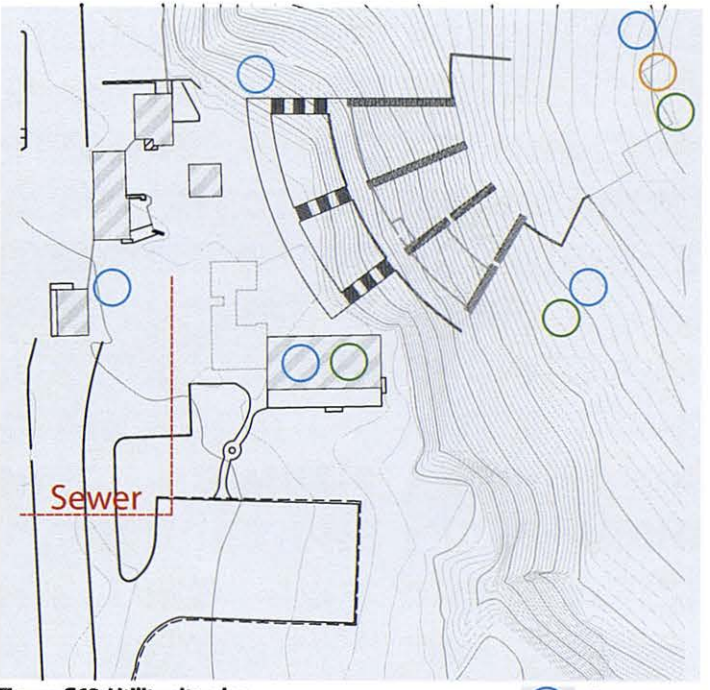


Figure C68: Utility site plan

Electric
Gas
Water

Figure C67: Panoramic view of power-line poles

Figure C69: Amphitheater electric generator

Site Analysis

Noise Generators

Noise pollution on the site is minimal, as the location is outside city limits and within the context of Mackenzie Park. Broadway Avenue runs east and west along the southern edge of the site, consisting of two lanes in each direction. The street traffic is low, with only a small number of compact cars and trucks passing by during the day. Noise from this street is almost completely absent once within the walls of the amphitheater. The only significant noise generating element is the South Plains Fairgrounds which is located west of the site. The area directly adjacent to the performing arts center site is used for parking during the fair season. The fair season only runs during the last week of September each year, leaving the remainder of the year without any significant noise pollution. At the bottom of the site, located along the river edge is a paved parking lot. The lot is normally empty, with only a small numbers of cars parked periodically throughout the day.

An electric generator and transformers are located on the backside of the amphitheater stage. The two electrical utility components are not housed within a room, leaving each exposed to noise pollution near the stage acting area. Existing restroom facilities located near the amphitheater seating could potentially being a noise problem during performances. Also located near the stage is a snack stand, with a front window to serve patrons. Each of these noise generating elements can be minimized in the amount of noise pollution generated with the use of landscaping, barrier walls, and operating times.

Figure C70: Mackenzie Park parking lot

Figure C71: Amphitheater snack stand

Contextual Issues

Sustainability

Goal:

The performing arts center should incorporate sustainable building techniques and principles in the design.

PR: Development of the site should be minimized to use only disturbed lands, brownfields, or building retrofits.

PR: Landscaping should be used to control site erosion.

PR: The facility should select materials and equipment which optimize building performance and maximize energy efficiency

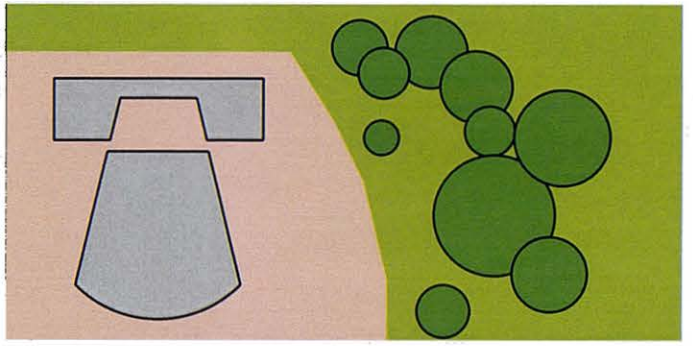


Figure C72: Developed versus Undeveloped

Supporting Statements:

"If possible, locate buildings in areas of existing development and consider renovating existing buildings and historic properties."

(WBDG)

"The most important characteristic of passive solar design is that it is holistic (it relies on the integration of a building's architecture, materials selection, and mechanical systems to reduce heating and cooling loads)."

(WBDG)

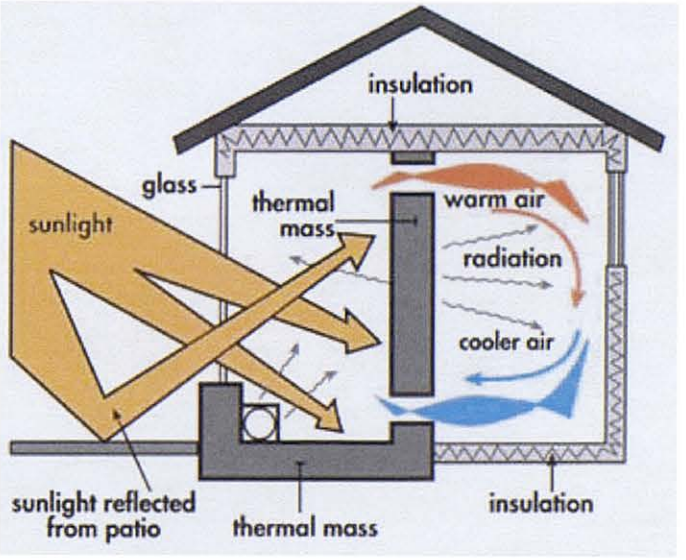


Figure C73: Passive Solar Design

Contextual Issues

Integration/Connection

Goal:

The facility should connect to the amphitheater, integrating the existing conditions and opportunities of the site.

PR: The new performing arts center should provide circulation connections to the existing amphitheater.

PR: The existing Mackenzie Park parking lot should be used to provide access to the facility

Supporting Statements:

"If possible, locate buildings in areas of existing development and consider renovating existing buildings and historic properties."

(WBDG)

"Incorporate transportation solutions along with site plans that acknowledge the need for bicycle parking, carpool staging, and proximity to mass transit."

(WBDG)

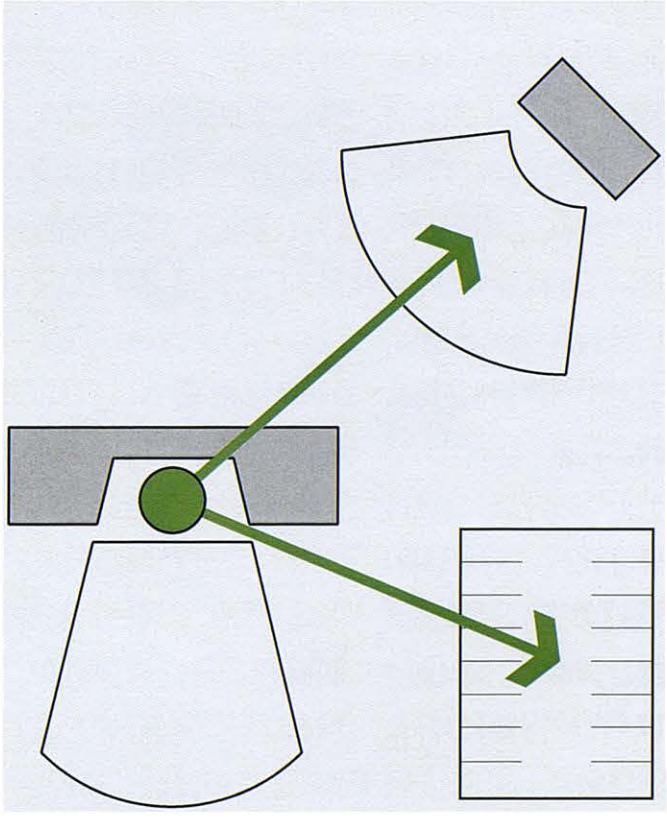


Figure C74: Connection to Existing Structures

Case Study 1

Lady Bird Johnson Wildflower Center

Designed by Overland Partners of San Antonio, this 54,000 square-foot complex opened to the public in April of 1995. The Lady Bird Johnson Wildflower Center is dedicated to teaching people about the environmental necessity, economic value, and natural beauty of native plants. The center supports research, education, and conferences at a complex in an Austin, Texas. The facility is a landmark and top attraction among visitors. The center is located on a 40 acre site, designed as a series of outdoor spaces, to include visitors' galleries, an auditorium, classroom, gift shop, conference facilities, and offices. "Demonstrating an ecologically sensitive approach to the development of a site with fragile environmental conditions, the buildings and the programs they support model 'total resource conservation' while showing the beauty and benefit of native landscape."[1] The buildings and gardens were designed to blend with the surrounding Texas Hill Country in Austin. Design elements include masonry walls, metal roofs, and deep overhangs. Semi-formal beds of native plants surround the center, with a natural trail leading visitors into the undisturbed landscape around the main complex. To the pride of the architecture firm and contractors, only one tree was lost during construction, showing the commitment of the design team to the sensitivity of the site. The facility also includes one of the largest harvesting systems in the United States, which is capable of collecting 300,000 gallons of rainwater per year. This water is used for on-site irrigation. The project has won numerous design awards for excellence.

Figure C75: Entrance to main courtyard

Figure C76: View of center surrounded with native plants

Case Study 1

Lady Bird Johnson Wildflower Center

Figure C77: View of landscape

Figure C79: View of gardens

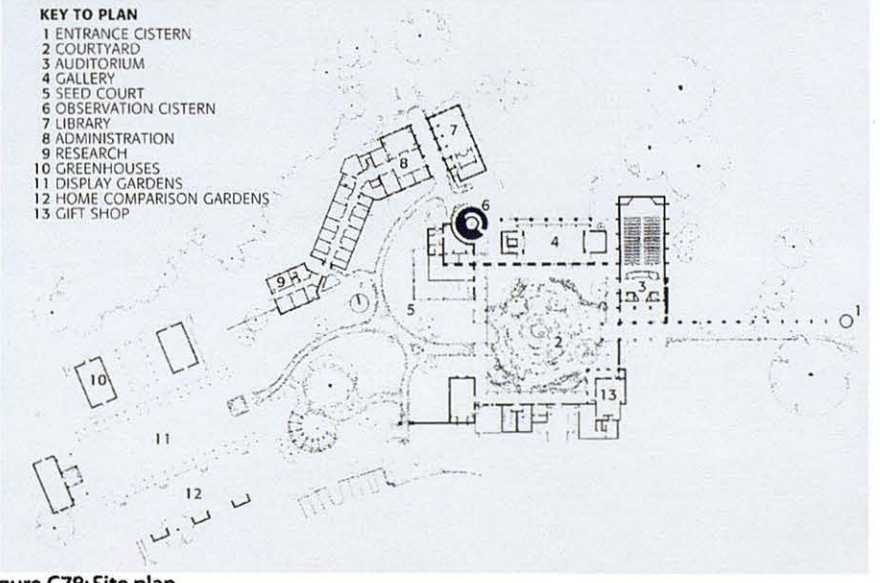


Figure C78: Site plan

Figure C80: View of Interior

Case Study 2

Riverbend Church

Riverbend Church, located in Austin, Texas, is one of several wonderfully designed facilities by Overland Partners. This 60,000 square feet church is an excellent of Overland Partners design philosophy which emphasizes sustainability, experience, beauty, and context. Each project is site and program specific, designed to be appropriate to their physical and cultural surroundings at the time in which they are built. Nestled in the Texas Hill Country, River Centre is Austin's newest alternative performing arts center. The worship space is designed to accommodate a wide range or performances, including Symphony Pops performances, television broadcast, audio recordings, and stage productions. The facility occupies a dramatic and steeply sloping site in the Westlake Hills, with the amphitheater seating taking advantage of the natural topography. Large windows against the back wall of the amphitheater space look out into the Texas country, with breathtaking views of the natural vegetation and wildlife of the Austin region. The facility always has the consistent use of natural daylight throughout the building, with the interior lighting adjusted to balance the abundance of sun light. The building is constructed of "warm materials," which include an extensive use of limestone, sandstone, and wood. Painted metal is used in the building, curving the form a flowing curve that creates a shell enclosing a small piece of the river below. Design awards for this facility include the Gold Nugget Award for Architectural excellence and the International Illumination Design Award.

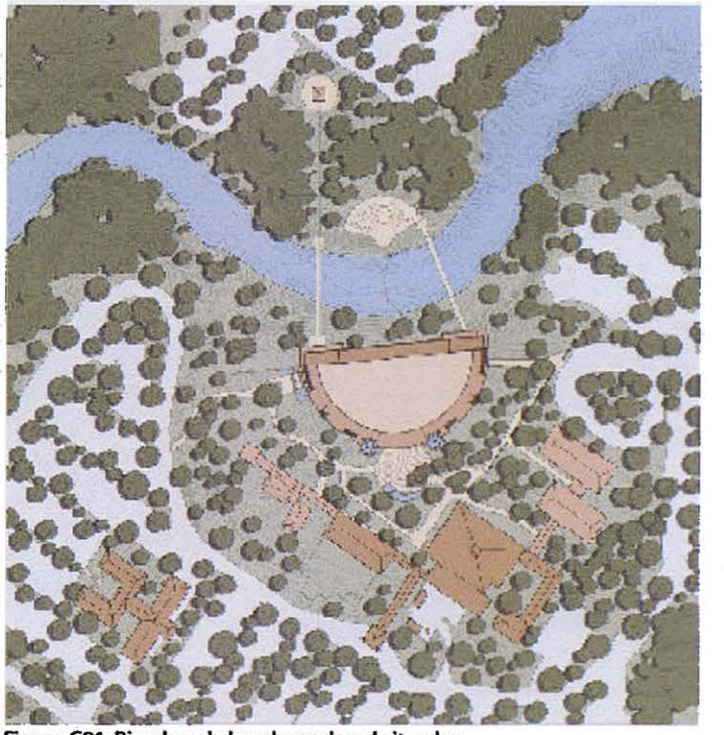


Figure C81: Riverbend church rendered site plan

Figure C82: Riverbend church rendered perspective

Case Study 2

Riverbend Church

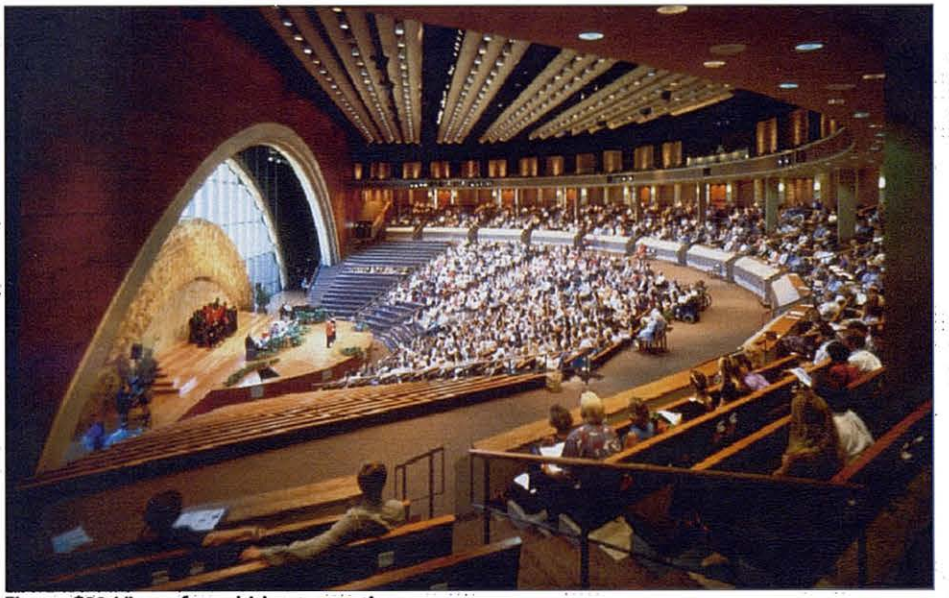


Figure C83: View of amphitheater seating

Figure C85: View of curving exterior form

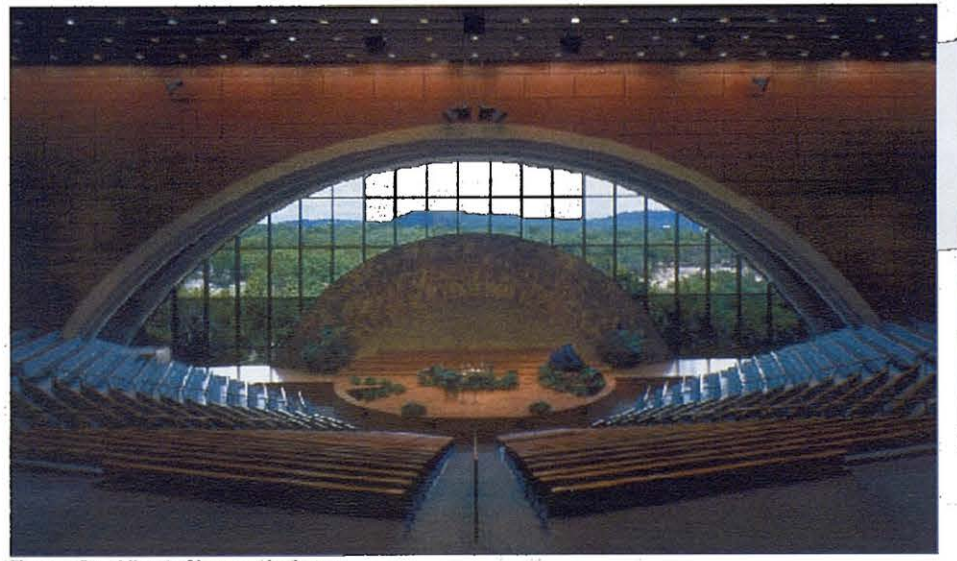


Figure C84: View of large windows

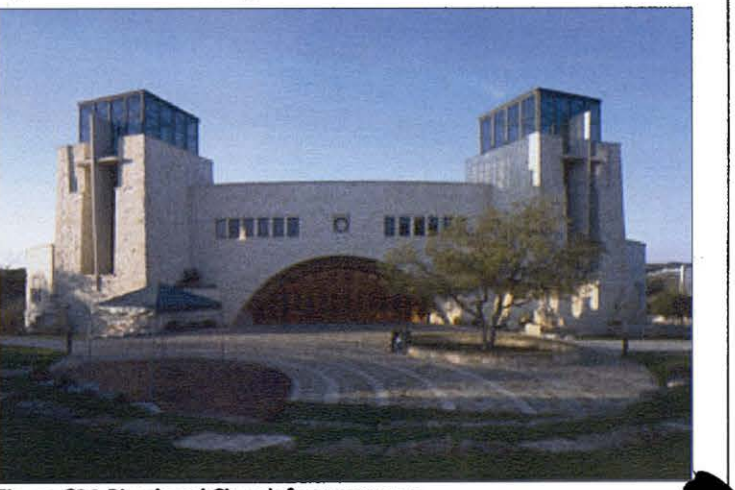
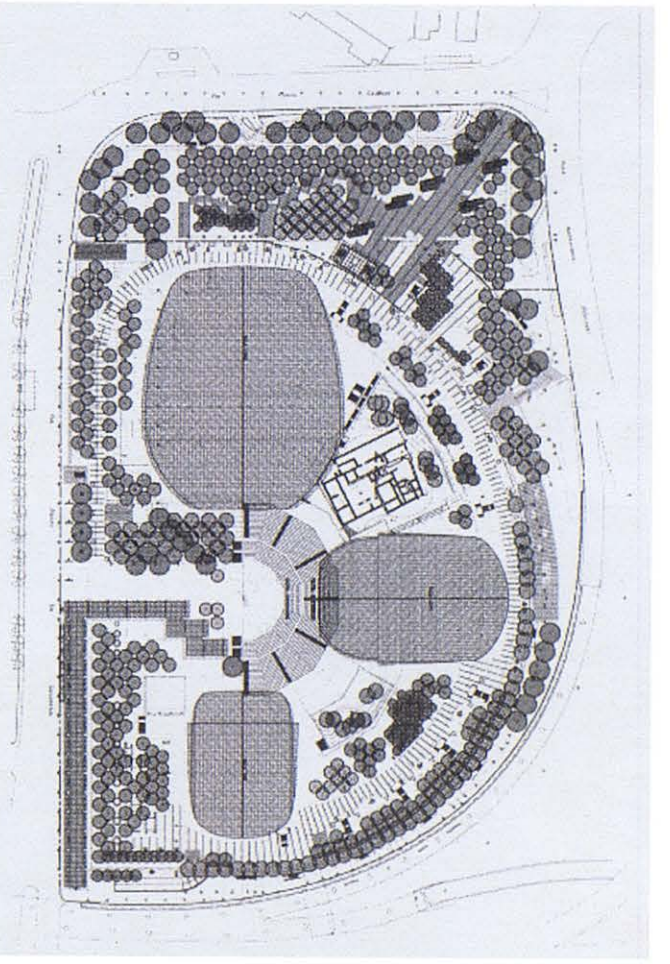


Figure C86: Riverbend Church front entrance

Case Study 3

Parco della Musica Auditorium

Designed by Renzo Piano, Parco della Musica Auditorium is a unique multipurpose concert hall located in Rome, Italy. Using the site once set as part of the 1960 Olympic Games, the musical complex consists of three large halls, built as separate, sound-proofed structures. The site proved to be of historic interest, as the remains of a villa dating from the 4-century BC were discovered during the construction. Therefore, the main foyer of the complex has to be adapted to this site, making room for a small archeological museum. The most unique feature of the design is the Roman inspired outdoor theater providing a stage for outdoor venues within the musical complex. The three separate halls concert halls, surrounded by dense vegetation, create an enclosed area for the open-air performances. As described by Renzo Piano, "the halls look like three enormous 'music boxes', whose colors and materials recall those of the domes dotting the urban landscape of Rome."[2] Each concert hall differs from one another in dimension and function, allowing flexibility in terms of size and acoustical quality. Most importantly, the outdoor amphitheater provides additional flexibility to the design, as patrons may enjoy outdoor performances at scheduled times during the year. The structure is built of local materials, including travertine, red brick and lead. The design also features shops and a restaurant, open to the public every weekend for concerts and informal gatherings.



Plan

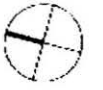


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Figure C87: Parco della Musica Site plan

Case Study 3

Parco della Musica Auditorium

The three halls are situated in a semi-circular form, separated to ensure soundproofing. Each concert hall is connected together at the base with a continuous lobby. The site features extensive landscaping with the majority of the site covered with greenery.

Figure C88: Aerial site photograph

Figure C89: View of three concert halls

Figure C90: Outdoor amphitheater

Context References

1 "Lady Bird Johnson Wildflower Center." Overland Partners Architects. 19 Oct. 2006 <http://www.overlandpartners.com/projects.aspx?intnum=0>.

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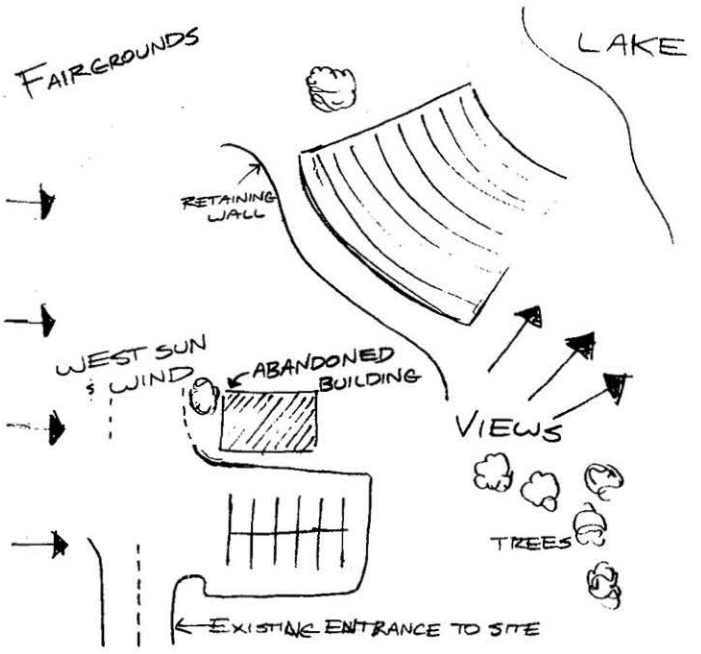
Schematic Design

Site Design Process

The initial design process for the performing arts center focused on investigating the positive and negative aspects of the selected site for this project. The site analysis conducted beforehand addressed important goals including views to and from the site, blocking the west sun and wind, as well as connecting to the existing amphitheater. As sustainability was an important goal of the design, using existing development was an important issue to be addressed.



The extensive development of the existing site allowed for a design proposal that could be accommodating to the immediate conditions. Several factors were easily manageable due to the accommodating site, such as avoiding disturbance to archeological dig locations, preserving on-site sculptural art, and using existing roadways for circulation to and from the site. The south plains fairgrounds also allowed the utilization of existing parking spaces necessary for this performing arts center.

The topography of the site included a significant change in elevation, leading down to the lake at Mackenzie Park. The site provided the opportunity for the building to have an unobstructed view toward East Lubbock, with Mackenzie Park directly visible and within short walking distance from the proposed site for the facility. The location uphill from Mackenzie Park also allowed for the building to stand as a prominent figure within the context of its surroundings.

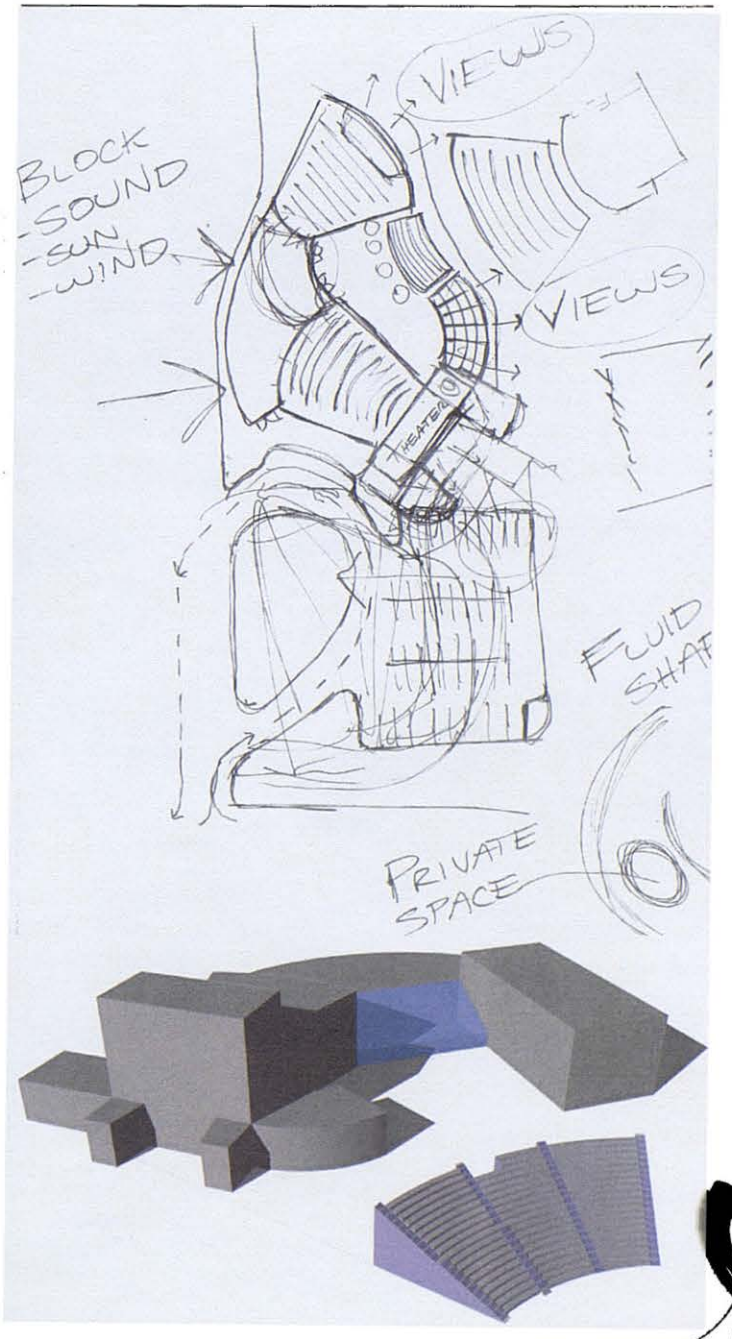
Schematic Design

Schematic Design Process

Schematic design involved the investigation of various building forms which may best suit the needs, goals, and issues with the selected site. Connecting visually to the existing amphitheater was an important goal of each design, while also addressing important factors such as the harsh Texas sun and high winds. Views to the east were also an important goal of the design, therefore early schematic designs focused on orienting the building as to best frame that view. If possible, a small courtyard area enclosed by the building itself was highly desirable for enjoying outdoor performances and serving as a break area during performance intermissions.

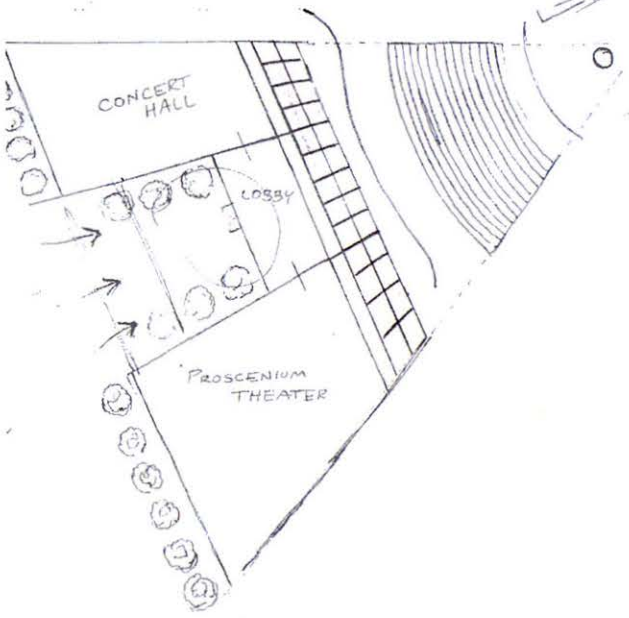
The building forms were derived from taking the traditional theater forms and arranging them in such a way as to create a dynamic building form, while still efficient enough to be functional. Early conceptual ideas included drawing an axis taken from the geometry of the existing amphitheater, then arranging the spaces of the building around that axis, while other concepts were completely playful and more abstract. Difficulty in the design were issues such as entrance into the building, location of shared spaces, site circulation, and views of the building from the street.

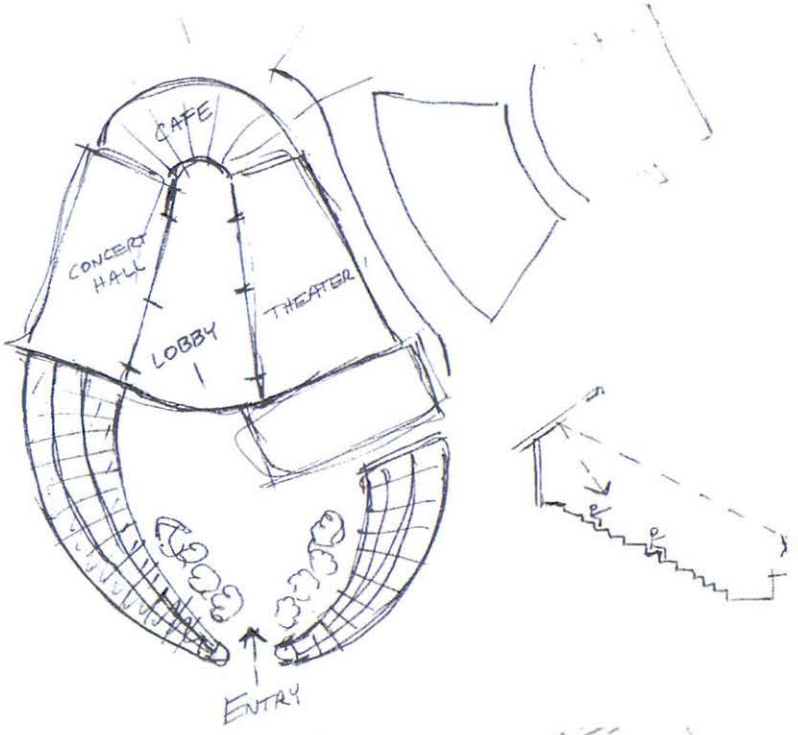
Several design schemes were developed, investigating the positive and negative qualities of each idea, to include the discussion summary and suggestions of others, to create a final design proposal.

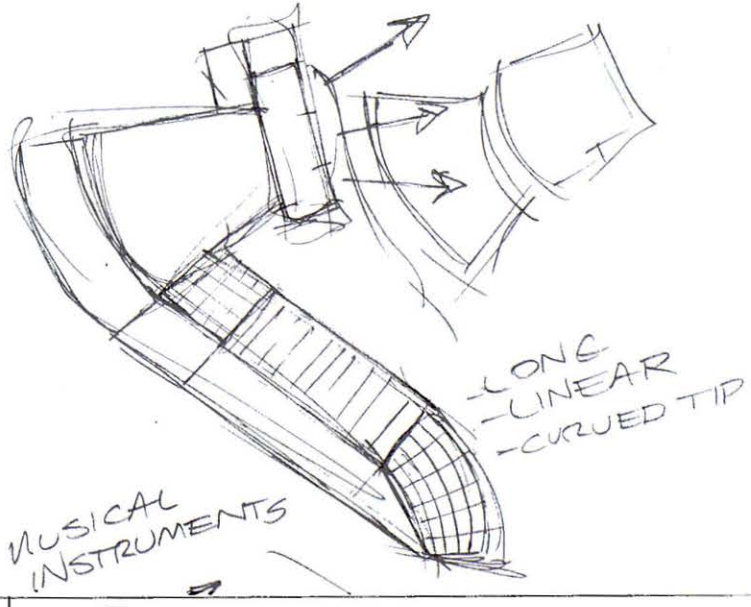


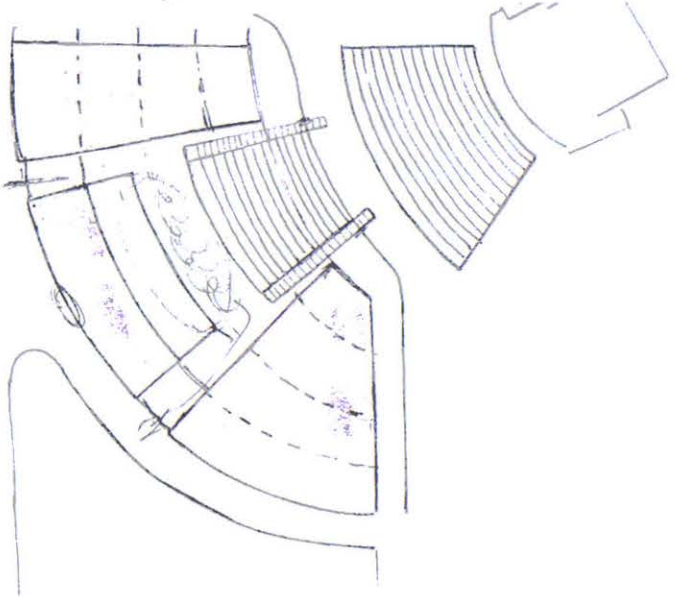
Schematic Design

Schematic Design Sketches



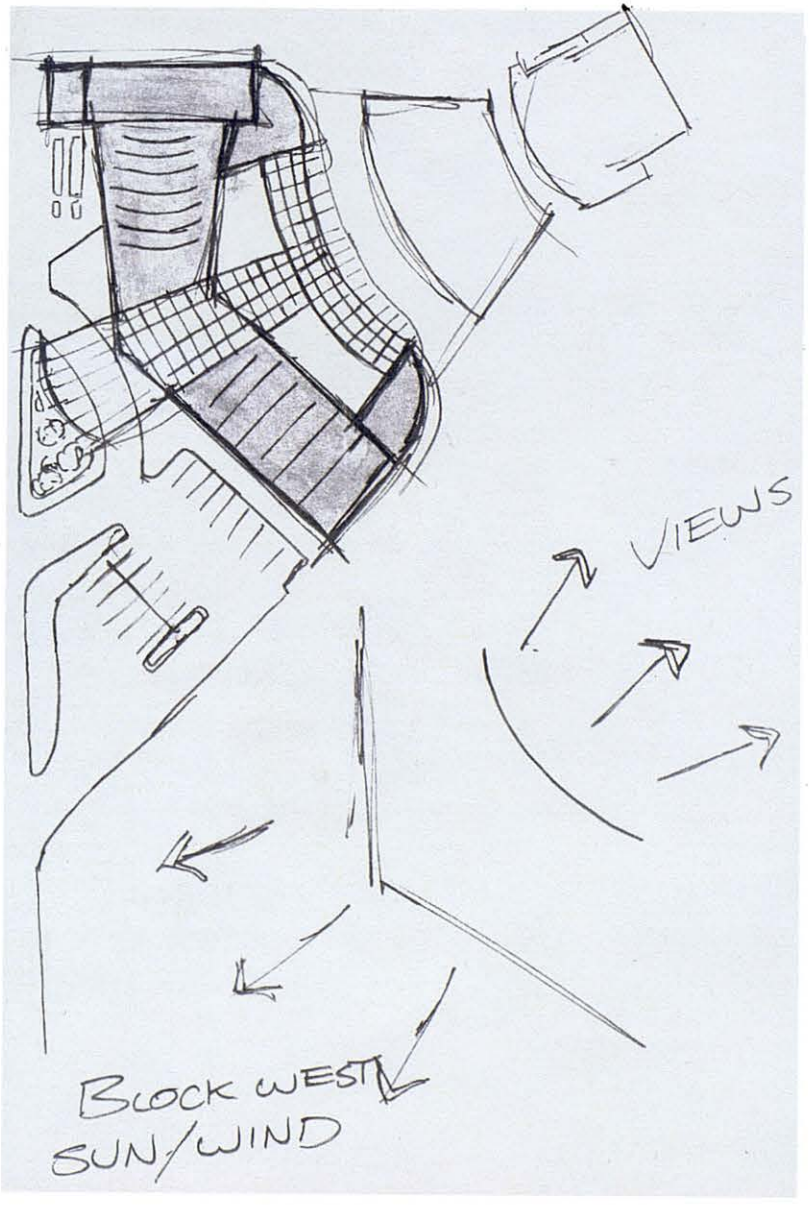


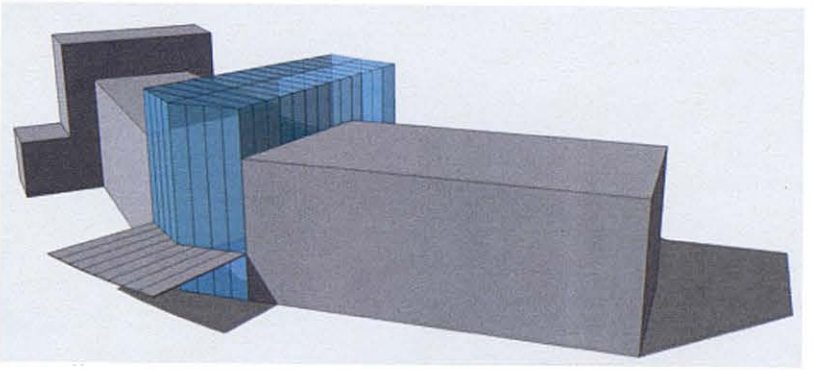


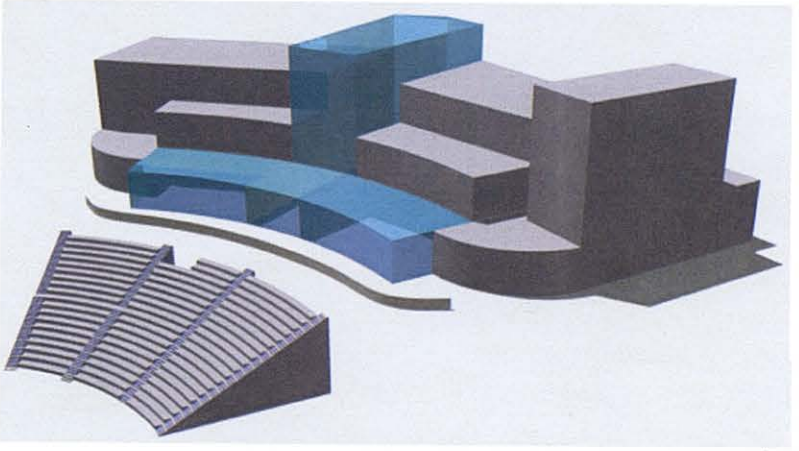


Schematic Design

Schematic Design Sketches

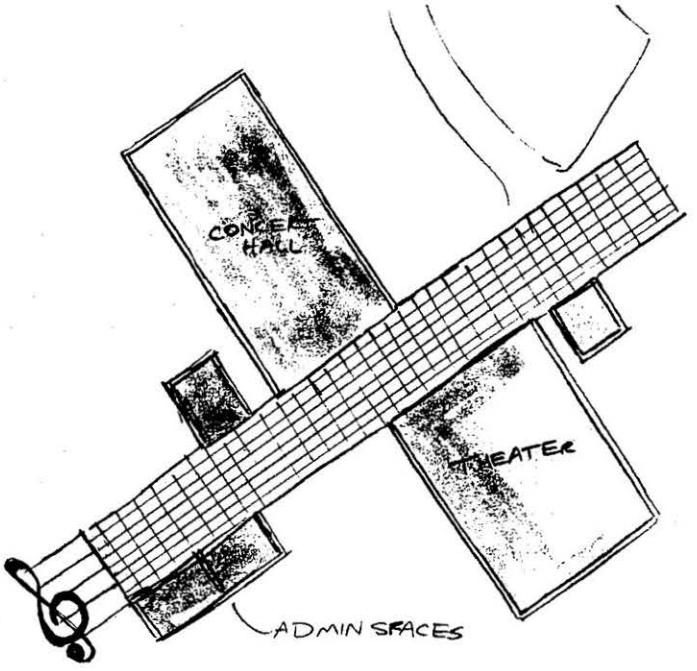






Schematic Design

Summary of Discussions/Suggestions
- Look at procession into building related to parking
- Look at truck accessibility
- Investigate shape of auditoriums
- Noise between theaters (buffer between)
- Use Centralized lobby
- Find new location for existing sculpture art
- Investigate activity outside & around site
- Locate auditoriums to provide access for trucks
- Develop using site topography with design



Using the preceding ideas and suggestions, a new schematic design concept was developed to address all of the issues related to the design of this project. The complexity of a peforming arts center, along with the restraints and goals of the site design, forced the need to develop a design which could take advantage of what the site had to offer.

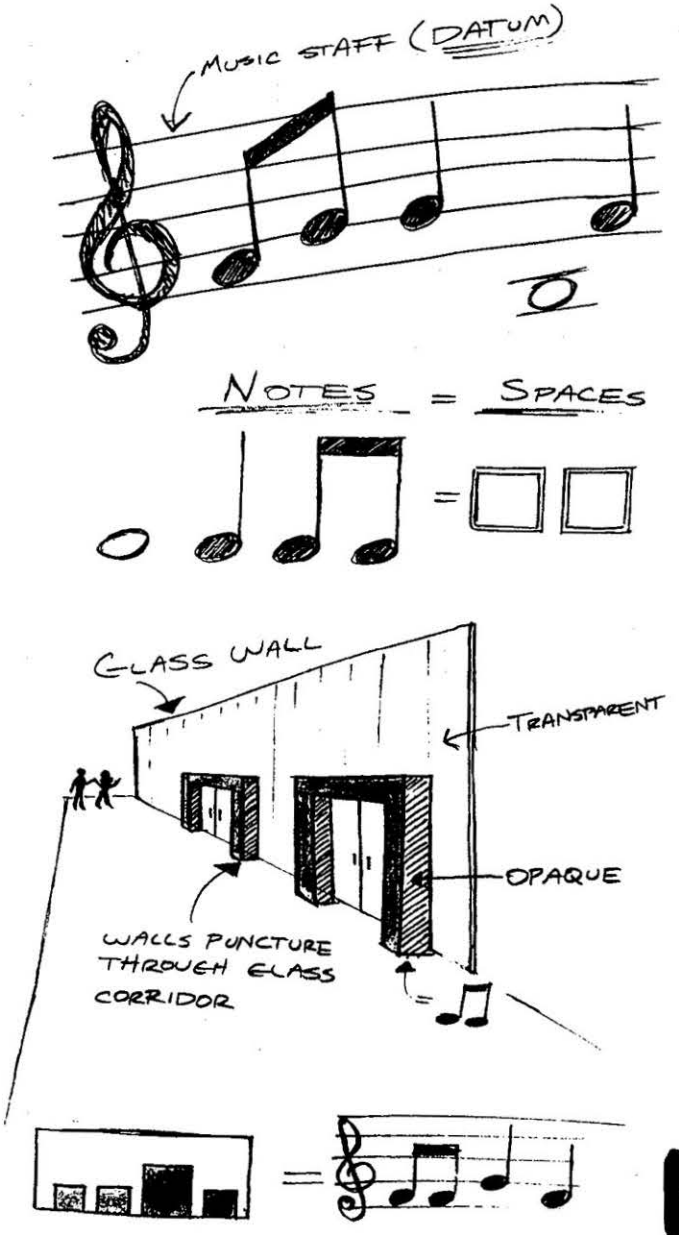
After looking more closely at the formal structure of music as the theoretical concept of the design, a new design was developed which answered several of the goals and needs of the project. Precedent research also brought several new ideas for the design of the auditorium spaces and facility in general.

Preliminary Design Response

Design Concept

The preliminary design concept for the performing arts center involved researching the formal structure, grammar, and terminology used in creating a musical composition. Factors in the composition were important, including design aspects such as repetition, rhythm, singularity, and sequence. Heavy, light, crescendo, decrescendo, and volume were also important grammar points shared between the arts of music and architecture.

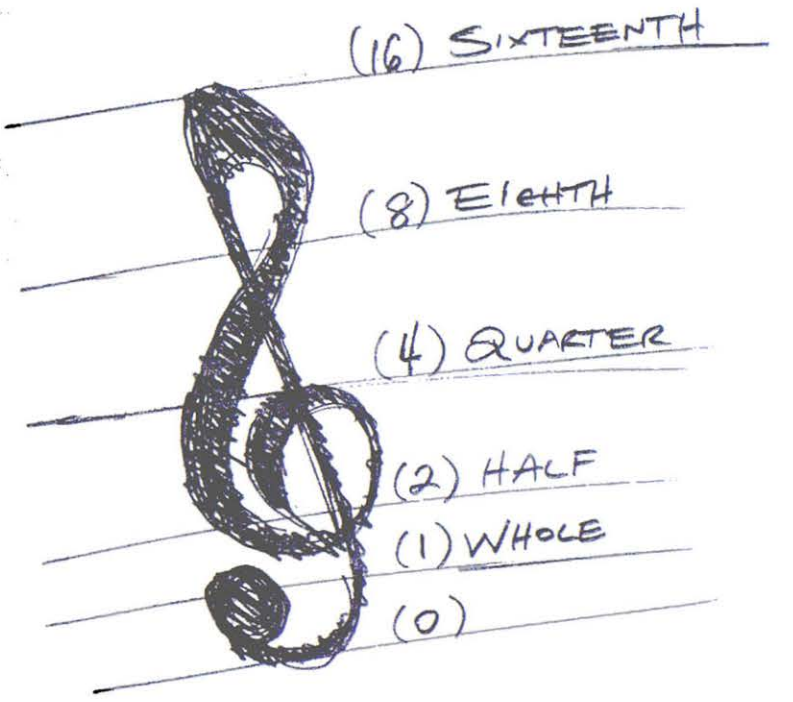
Most important to the design of this facility was the concept of designing with a datum. Music is designed around a datum which refers to a line, plane, or volume to which other elements in a composition can relate. The lines of a musical staff represent this datum, organizing a random pattern of elements through its regularity, continuity, and constant presence. To be an effective ordering device, a datum line must have sufficient visual continuity to cut or by-pass all of the elements being organized. This datum must also have sufficient size, closure, and regularity to be seen as a figure that can embrace or gather together the elements being organized within its field. In the design of this facility, the datum translates into the central lobby, which serves as an axis of organization to the design. An axis is the most elementary, yet most powerful means of organizing forms and spaces in architectural design. The lobby serves to bring each space of the building together, thereby creating a composition of masses similar to that of a musical composition of notes.



Preliminary Design Response

Design Sketches

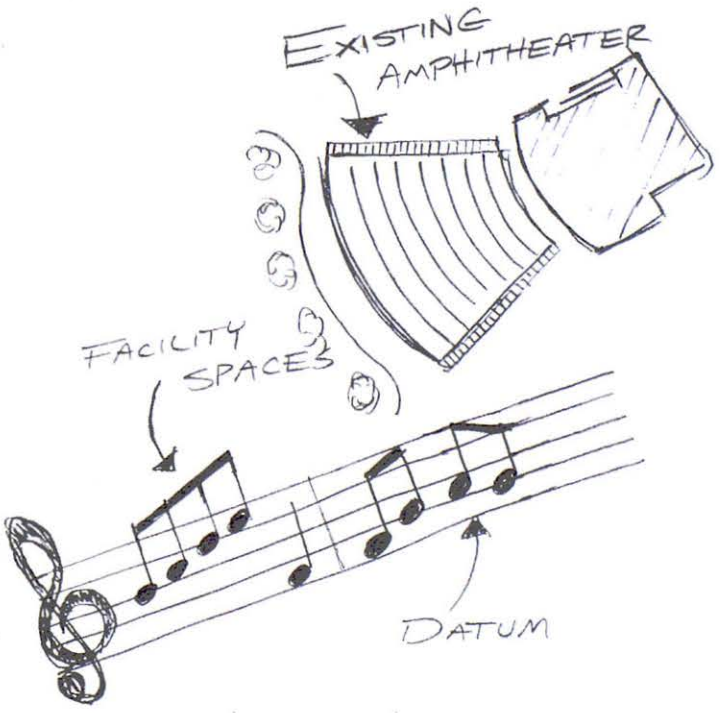
Music uses a formal structure consisting of whole, half, quarter, eighth, and sixteenth notes. This structuring system was translated into the design as the proportioning number system of the design. The layout of the building's structural grid is also spaced in such a way to fit the proportional numbering system as used in music composition. As an example, the bay between structural columns may be spaced sixteen feet apart, or some other multiple of this number.

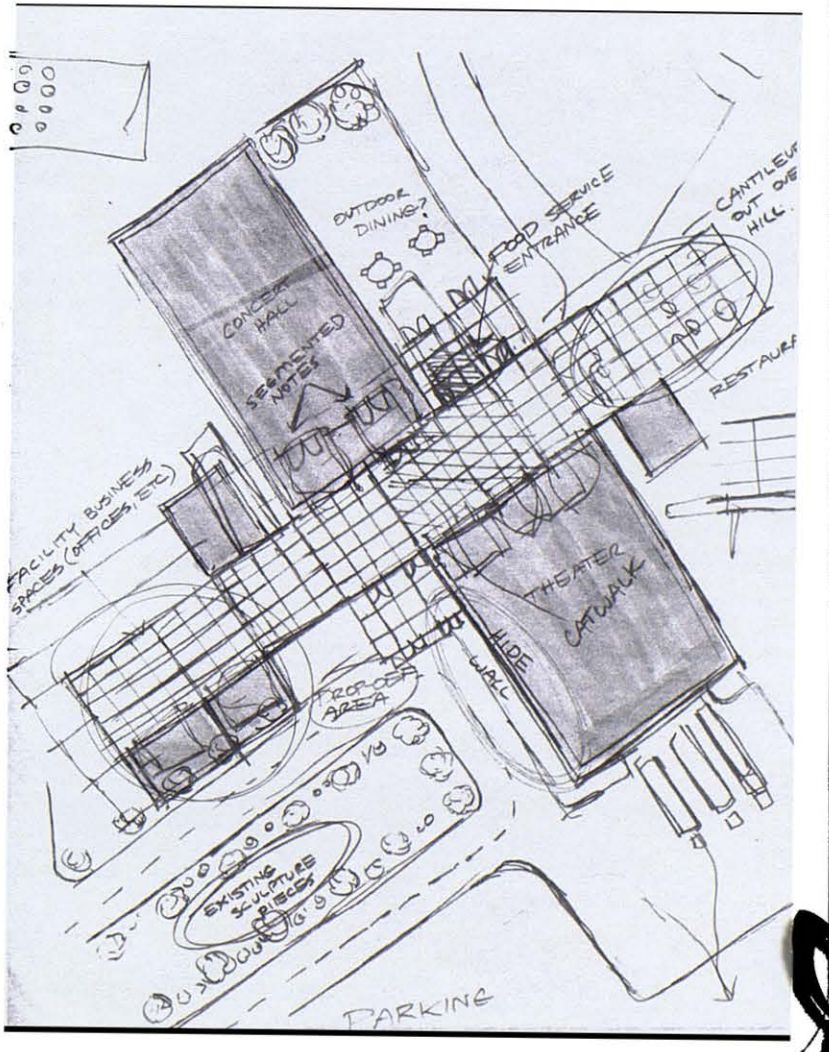


Preliminary Design Response

Preliminary Design Sketches

Using the datum as the unifying element of the design, the musical staff lines of the datum were placed on the site as the axis of the design. Each major space of the facility was then located as an element connected to the datum. Together, the spaces form a composition of spaces similar to creating a composition of notes on staff lines.

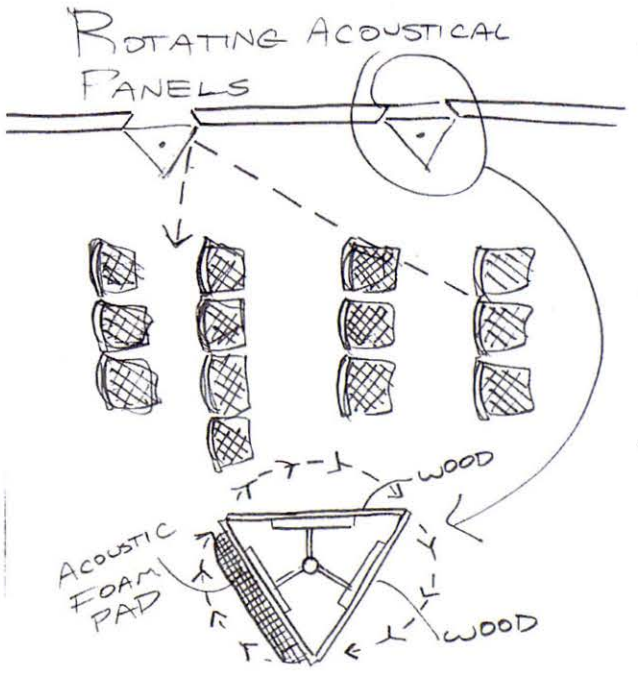


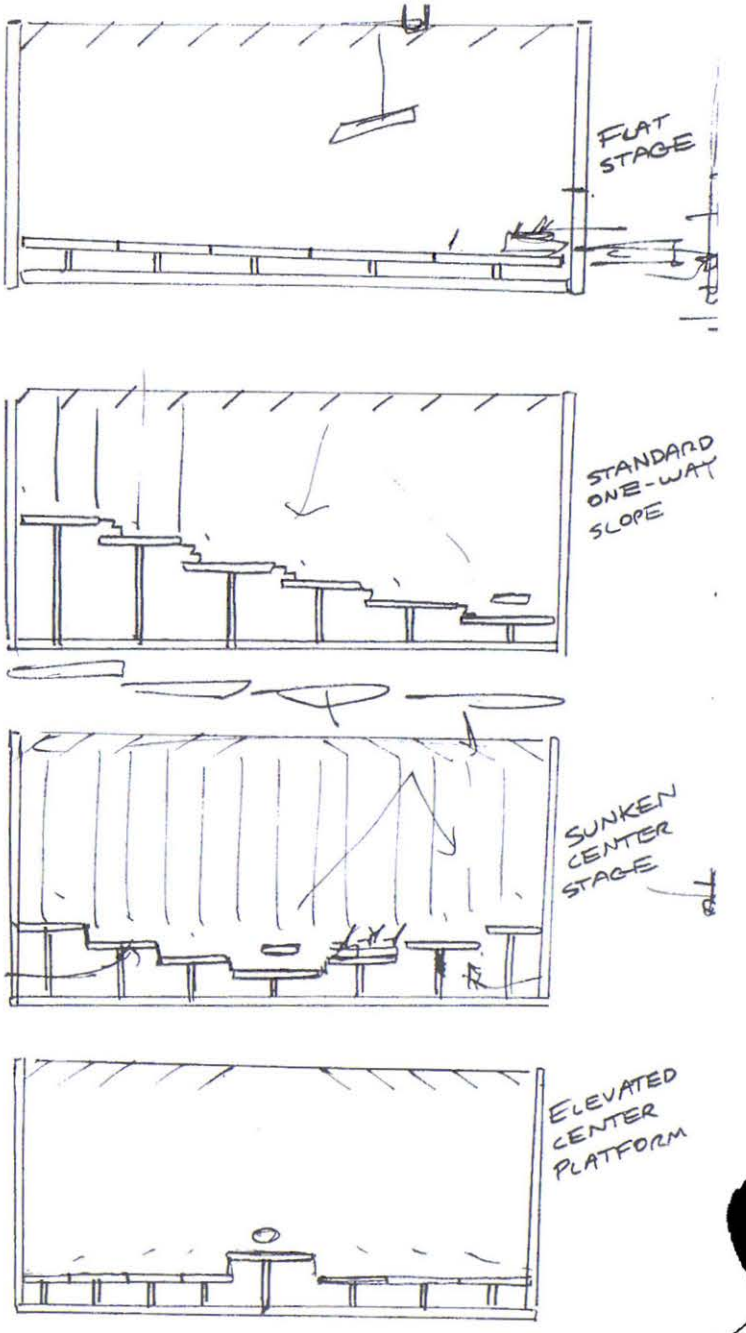


Preliminary Design Response

Design Sketches

An important feature of the design was acoustic and seating flexibility in the concert hall. An early concept created to achieve the acoustic flexibility was to use rotating panels that project into the concert hall space. Each surface of these panels would have a material used to either absorb or reflect sound in the hall. The rotating panel system would be turned so that a combination of different finishes could change the acoustic properties that room. Modular floor panels on hydraulic lifts were designed to achieve the seating flexibility desired.





Preliminary Design Response

Design Sketches

Another important feature of the design was how to integrate/connect the building the existing site. A unique quality of the site was the steep terrain. The Bill Clinton Presidential Library was an inspiration in the design of the performing arts center, using a cantilevered structure extended out over the sloping hillside. By doing so, the building would overhang past the edge of the slope, extending over the existing ramps. This would allow the patrons to walk under the building, creating a unique experience of being underneath this large building structure. As well, this then prevented having to completely redesign the existing ramps on site.

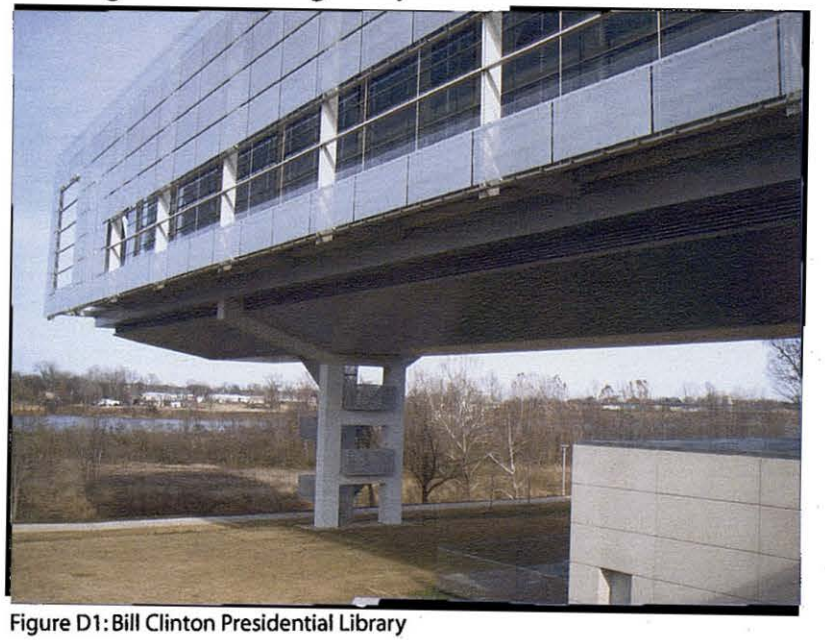
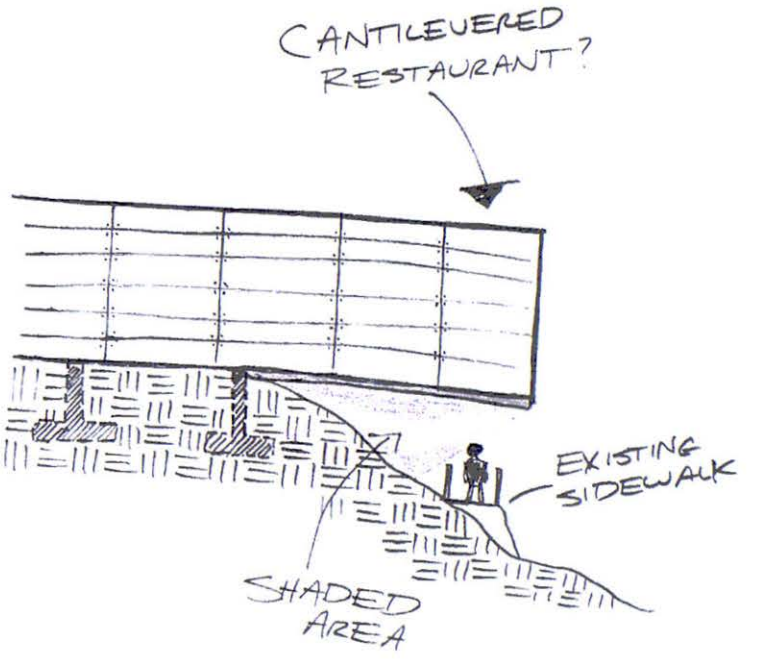


Figure D1: Bill Clinton Presidential Library

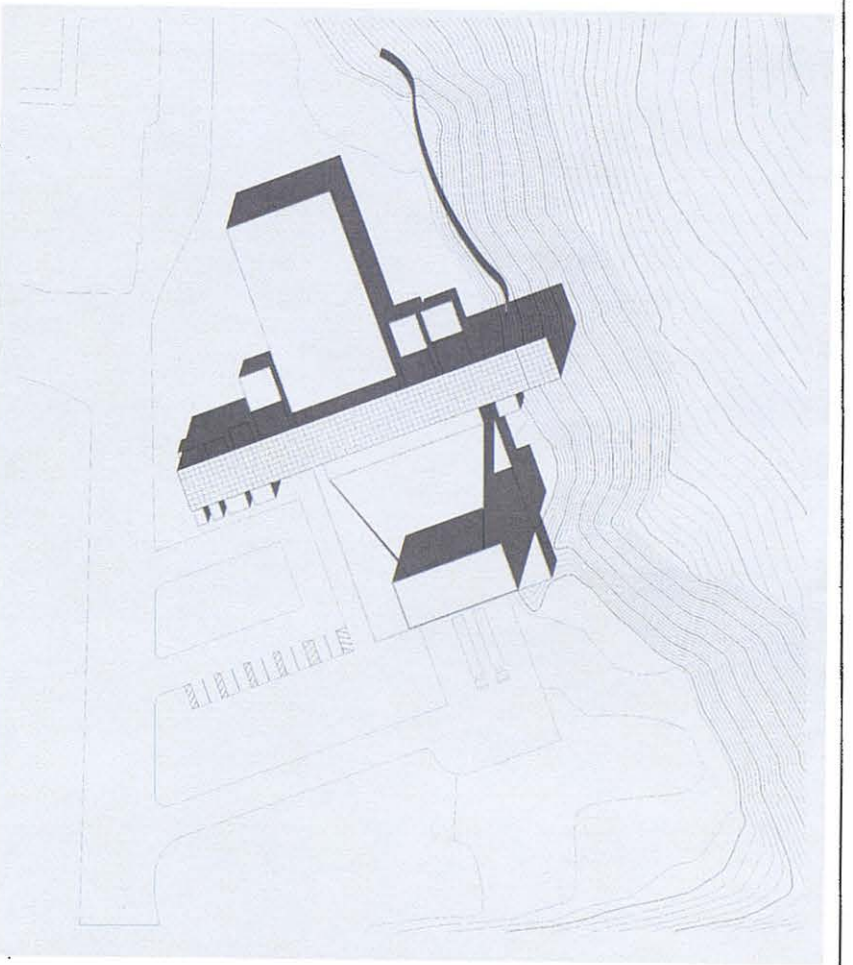


Preliminary Design Response

Design Presentation

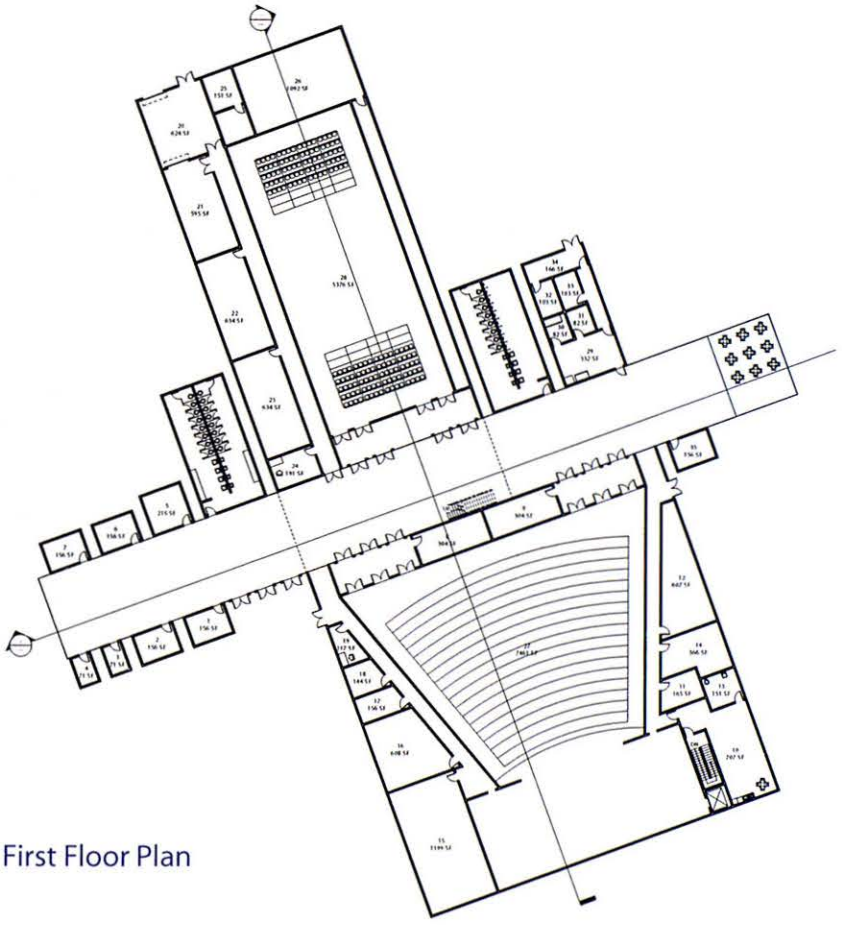
From the preliminary design sketches, a set of presentation drawings were developed to accurately study sizes, distances, and overall square footages . It was decided that the central lobby would use natural light, although the specific material was undecided until the most appropriate material could be selected with research. The datum connecting the building spaces was designed as a monumental structure to emphasize the importance and dominance of it as a gathering element to the design. The structure of the lobby became a primary focus in the design once the overall shape and size were developed for the preliminary review.

Several elements of the design were still in development at this point in the design phase. Material selection, structure, and vehicular circulation were to be further refined for the final design.

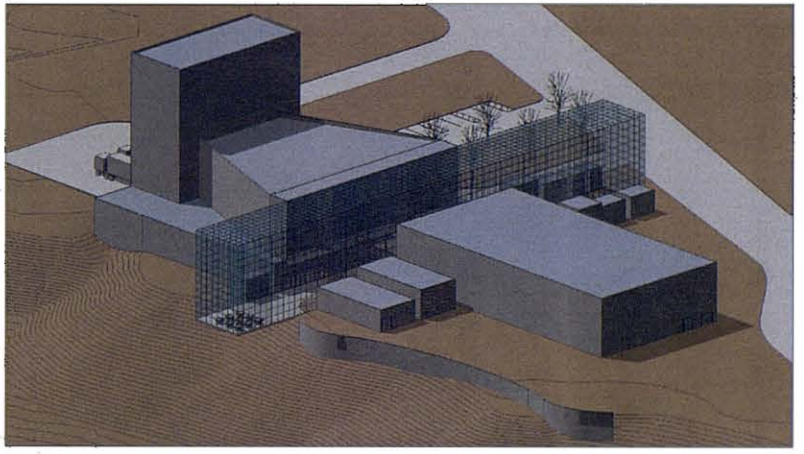


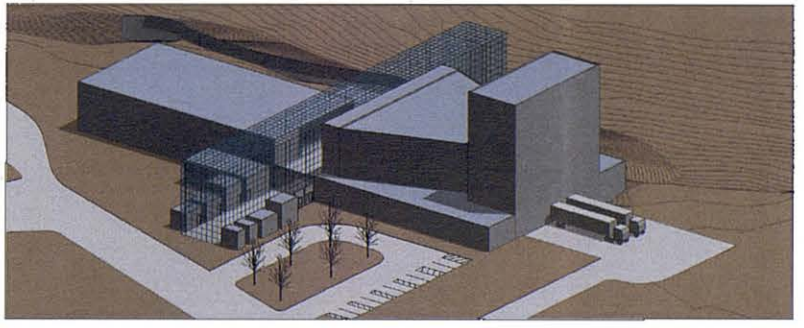
Preliminary Design Response

Design Presentation



First Floor Plan

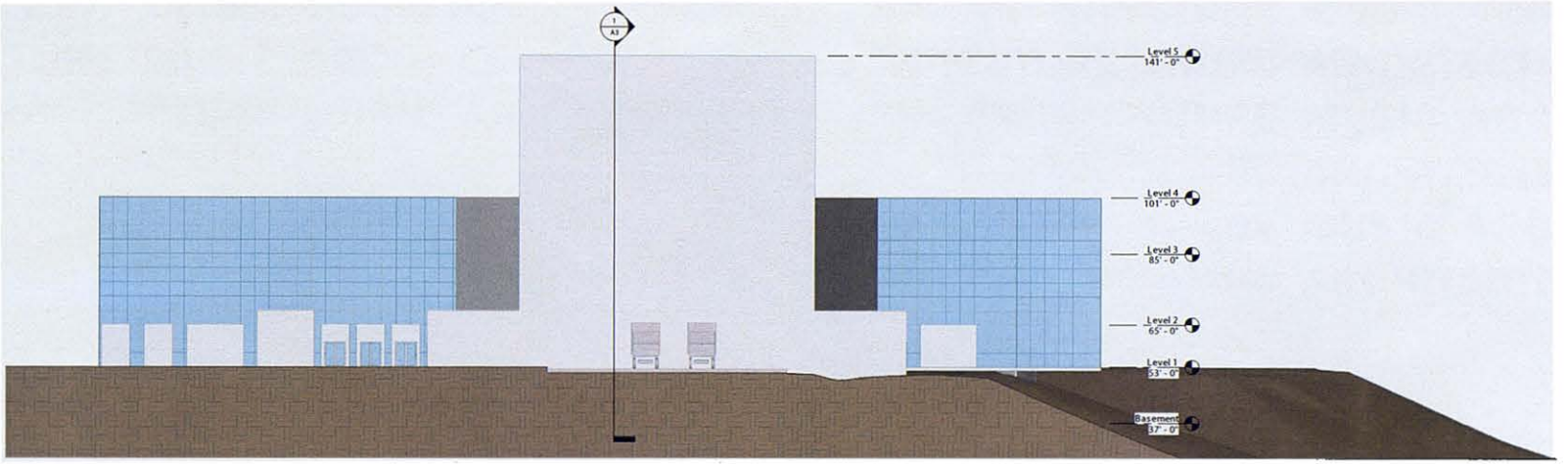




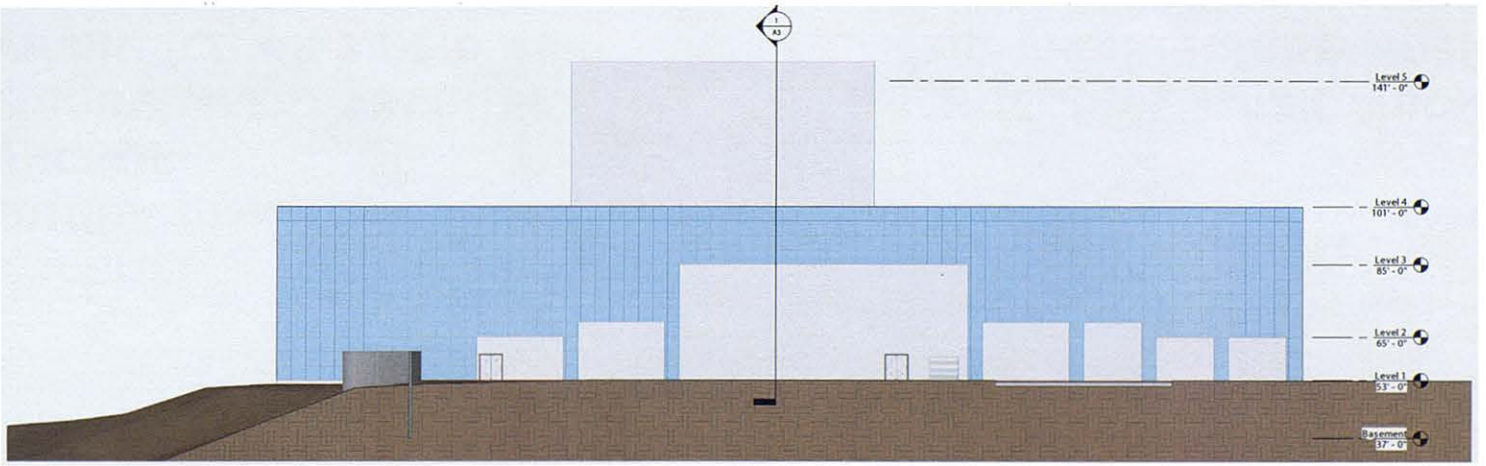
Preliminary Renderings

Preliminary Design Response

Design Presentation



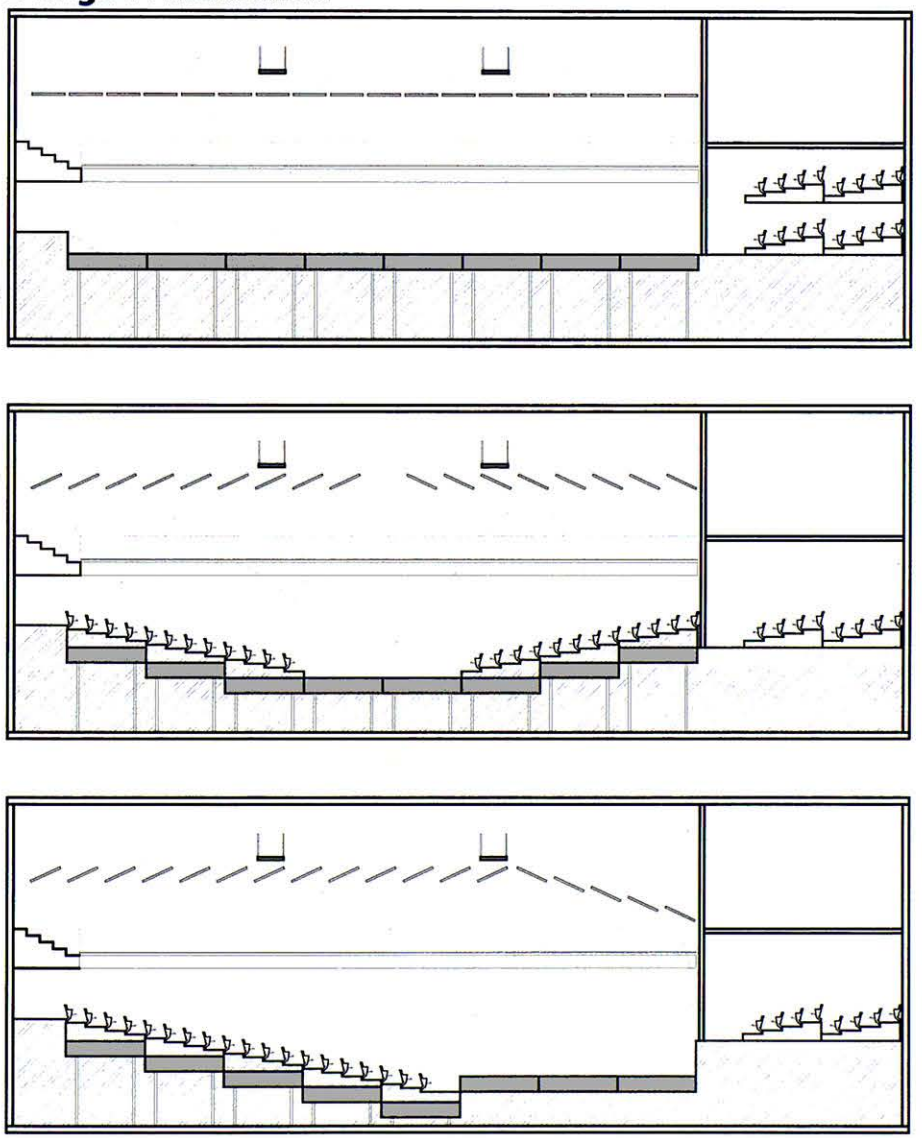
South Elevation



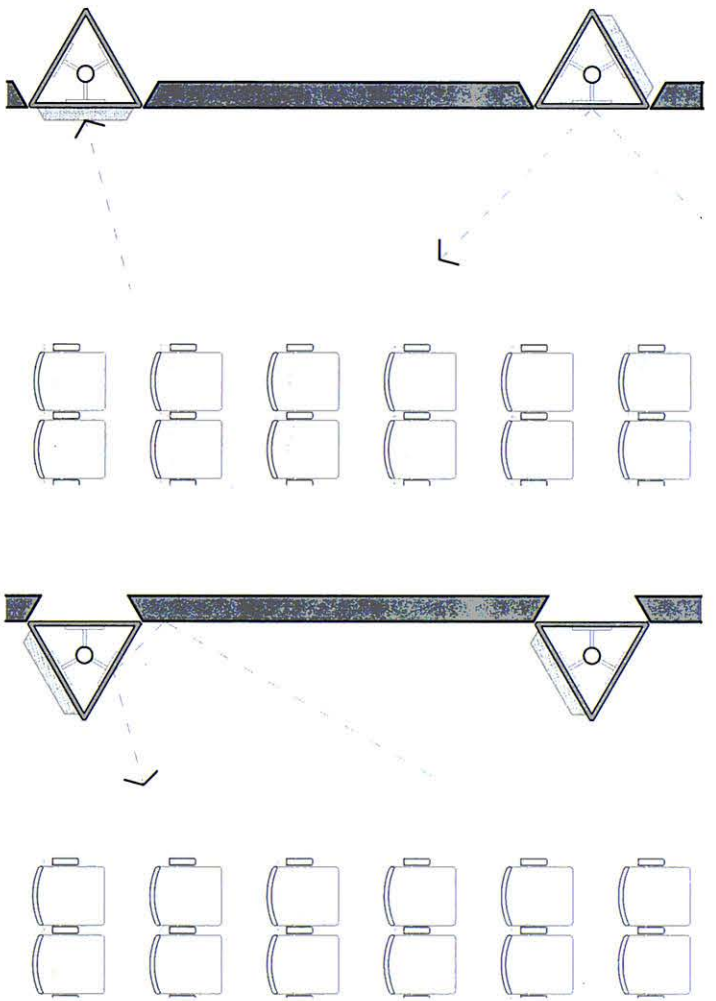
North Elevation

Preliminary Design Response

Design Presentation



Concert Hall Section Study



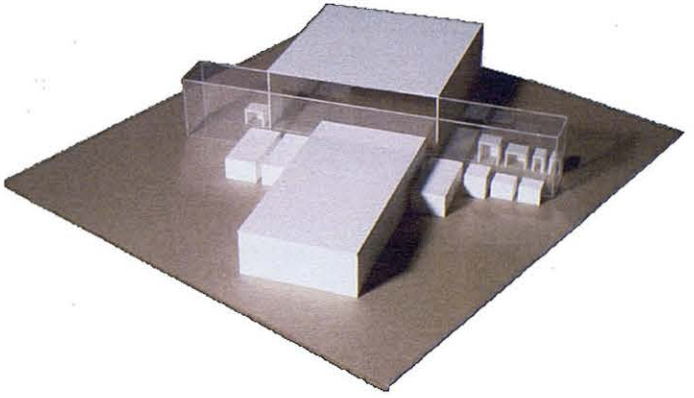
Acoustic Panel Study

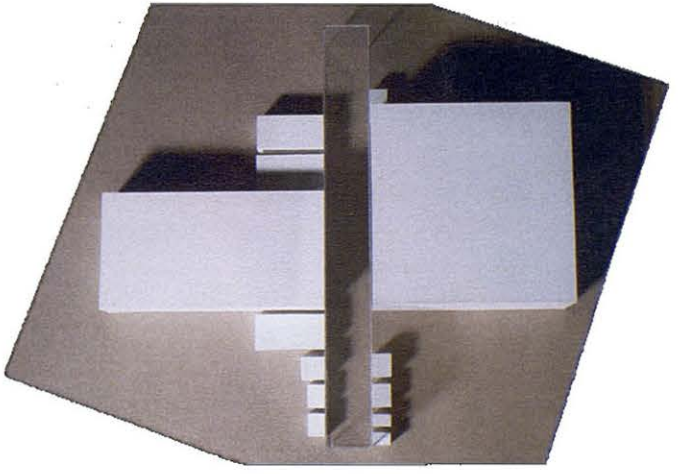
Preliminary Design Response

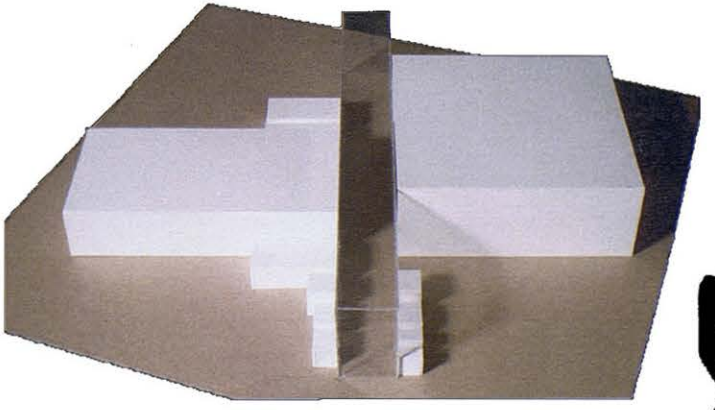
Summary of Discussions/Suggestions

- Cut back on glass material in Lobby space
- ADA Parking too far away from main entrance
- Provide service drive to kitchen
- Remove empty spaces between buildings
- Make entry grand
- Provide service drive to concert hall
- Look at skylights for roof
- Look at additional fire exits from theaters
- Develop height of stage house facing Broadway Ave.
- Look at mirroring floor plan
- Look at relationship of kitchen with where food is served
- Flip location of men's and women's restrooms

The preliminary design review involved addressing various design related issues, as well as a few code compliance standards. The summary of suggestions was used to correct and revise the preliminary design, allowing for a more fully developed design concept to be presented for the qualifying review presentation.







Qualifying Design Response

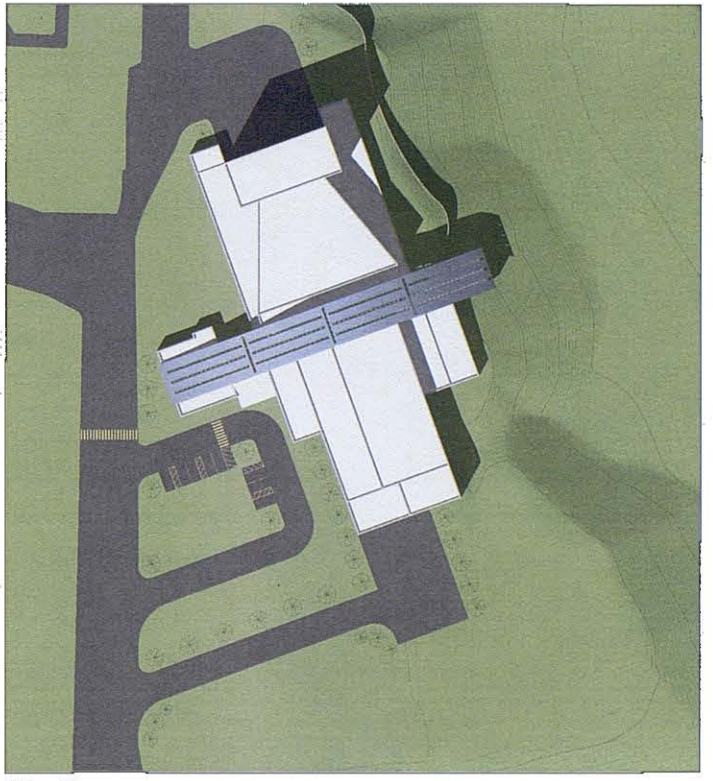
Design Development

Following the reviews and suggestions from the preliminary review, the design was developed into further detail. Issues such as materials, square footages, space location, and structure were resolved and presented for the qualifying review presentation. In order to achieve the transparency of glass for the lobby space, it was decided that Kalwall would serve as the best material for its insulation, structure, and light diffusion. A space frame structure was used to solve the issue of how to span the width and length of the large lobby area, yet still be able to form the curving shape desired.

Brick veneer with a stone base was selected as the exterior material for the building, chosen due to the surrounding architecture context and its modular building properties. The material, in combination with a cmu provides the best sound transmission control, while providing a strong aesthetic contrast to the Kalwall lobby material.

Cherry wood was selected as the interior material for both the theater and concert hall for its rich quality and good acoustical properties. The general seating arrangements of the theater and concert hall were finalized, locating the best location for handicapped seating.

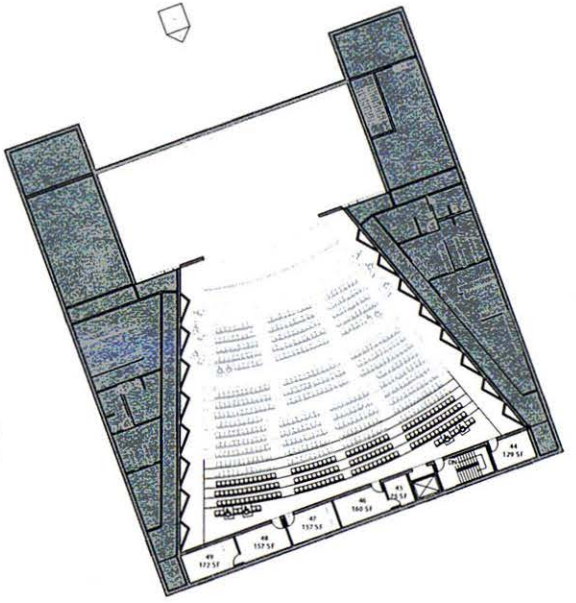
The site was more developed to accommodate the circulation of semi-trucks. Special attention was given to the building's entrance as to give a sense of grand entry into the building.



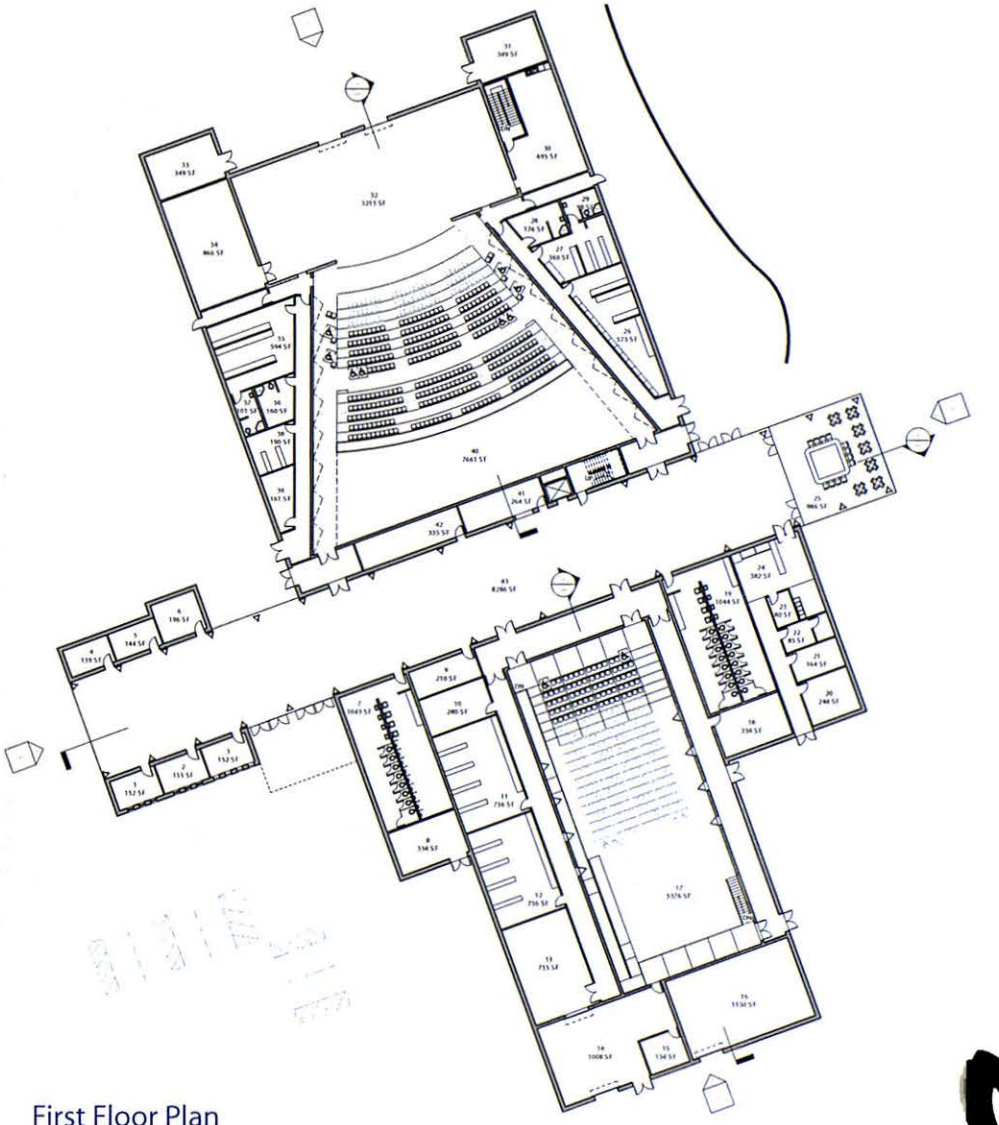
Site Plan

Qualifying Design Response

Design Presentation



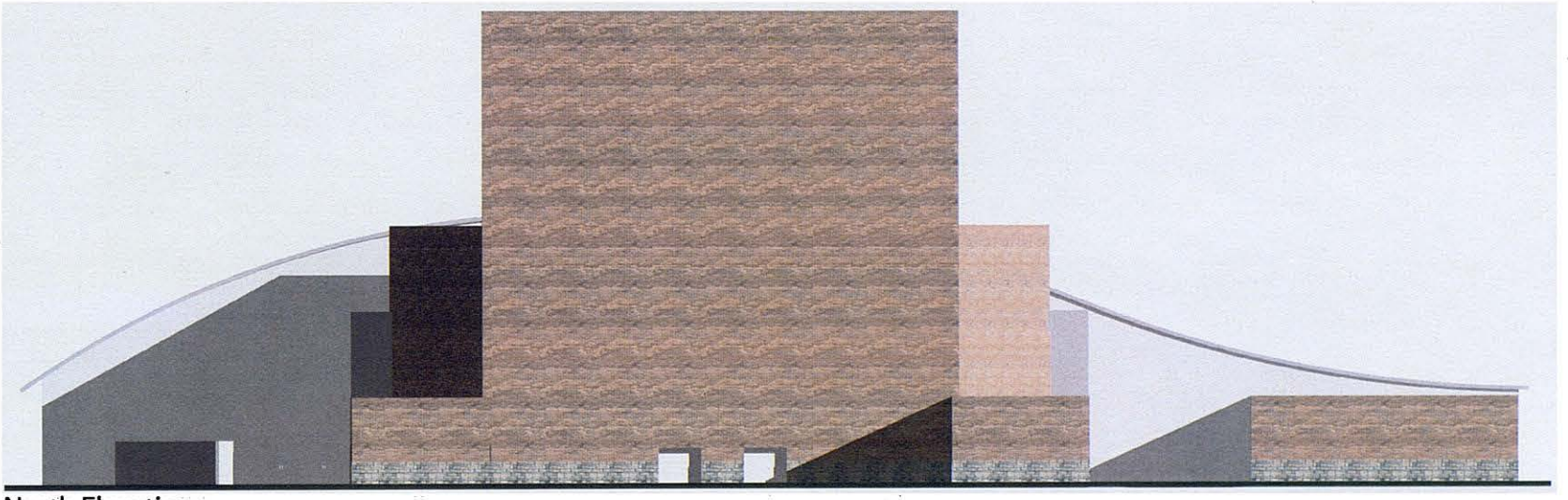
Second Floor Plan



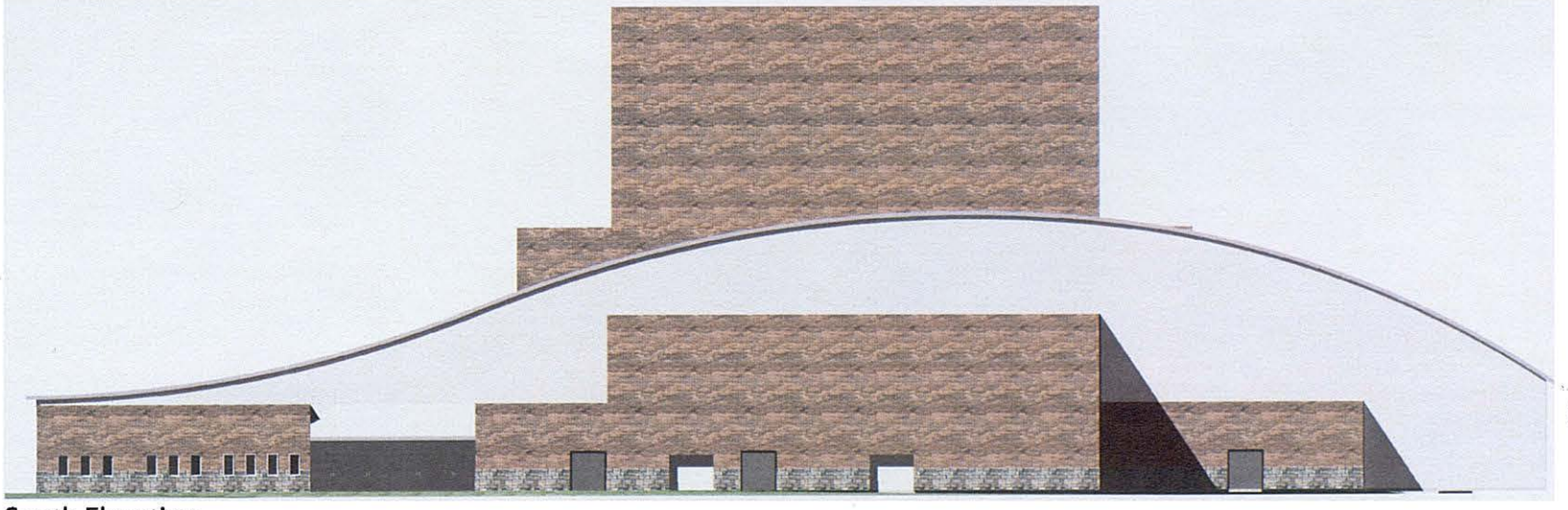
First Floor Plan

Qualifying Design Response

Design Presentation



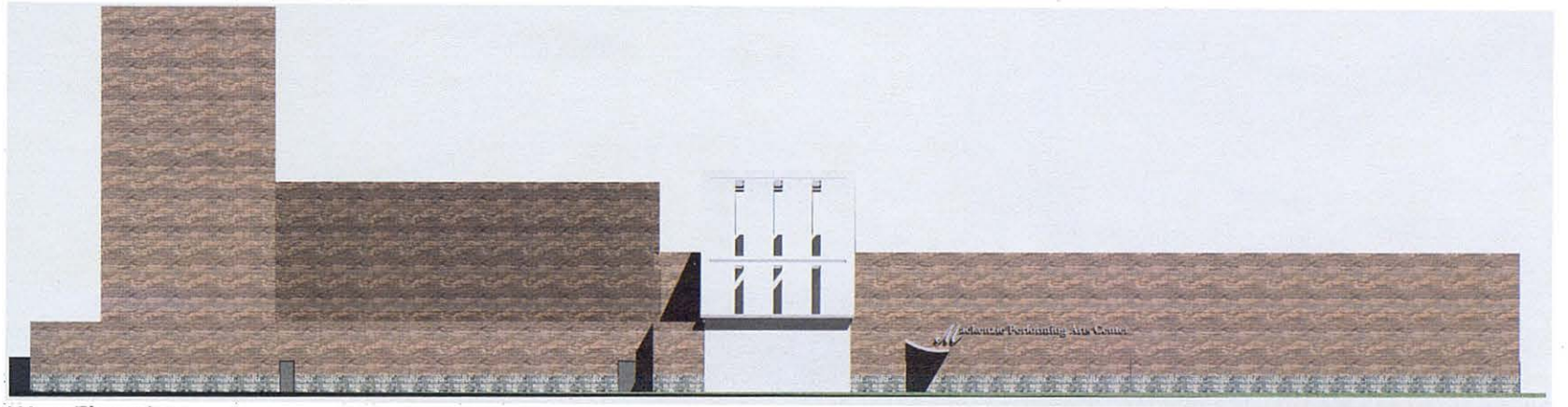
North Elevation



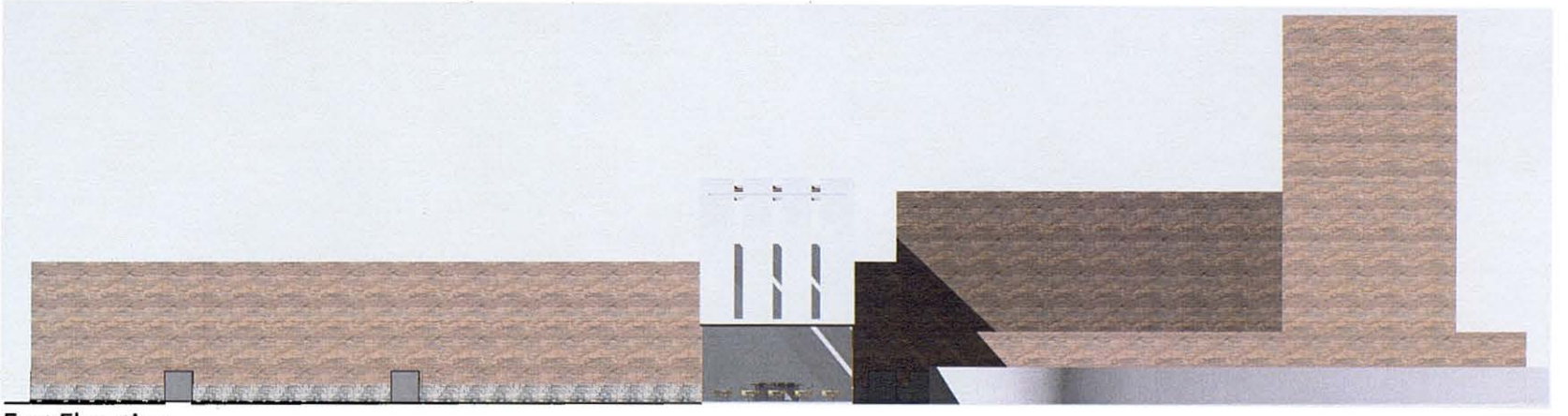
South Elevation

Qualifying Design Response

Design Presentation



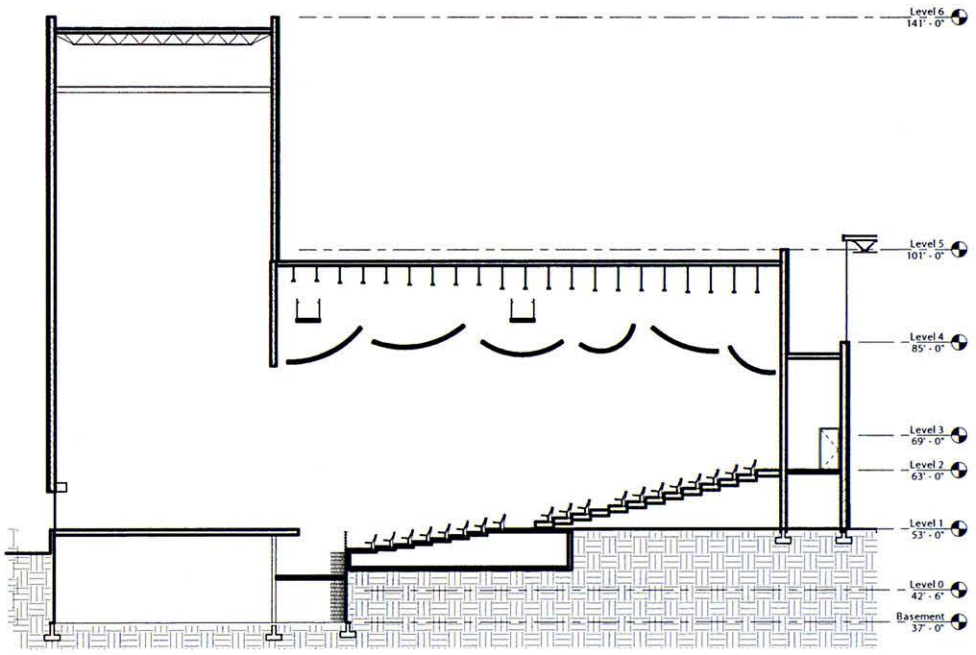
West Elevation



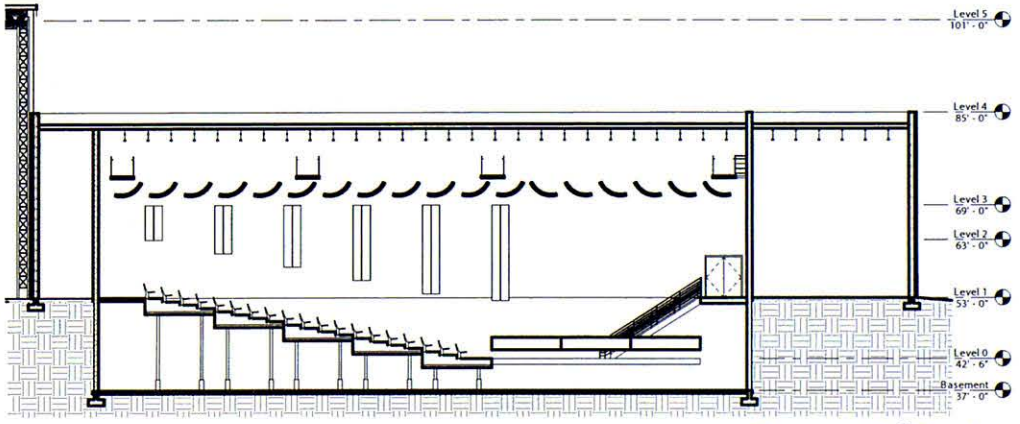
East Elevation

Qualifying Design Response

Design Presentation



Theater Section



Concert Hall Section

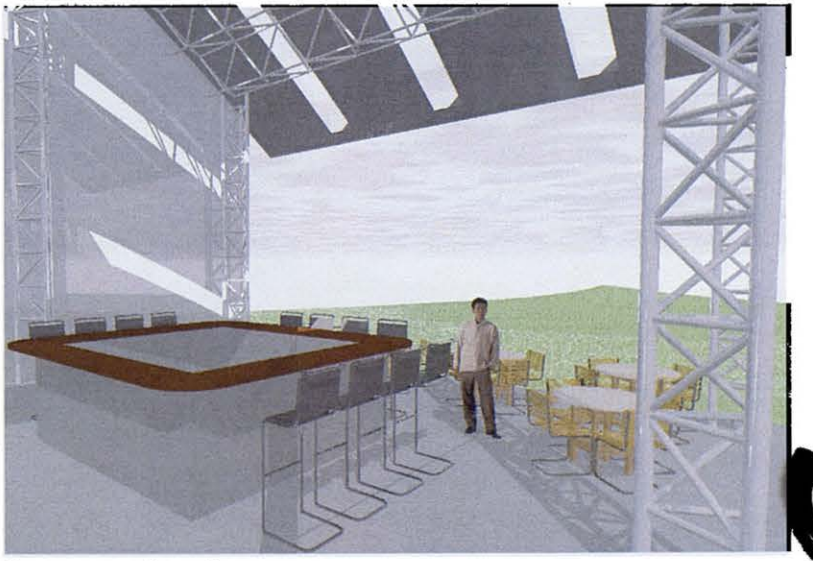
Qualifying Design Response

Design Presentation

Building Entrance

Lobby

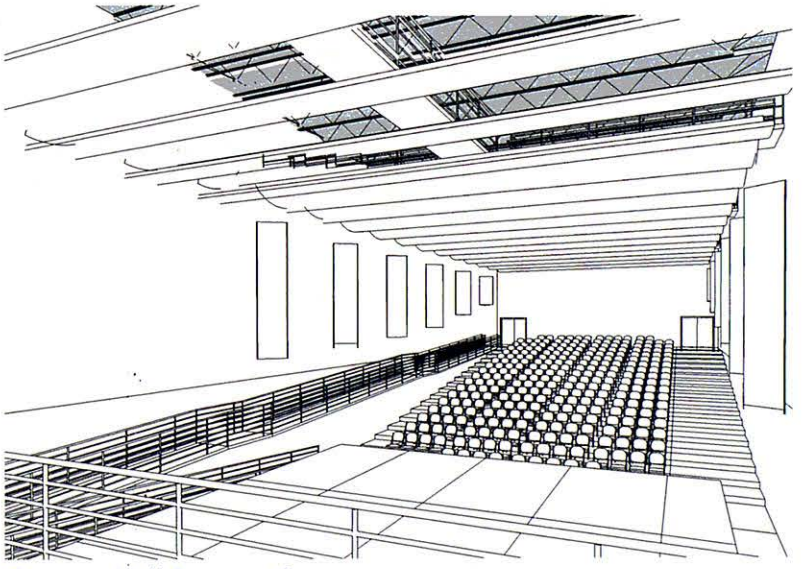
Cantilevered Restaurant

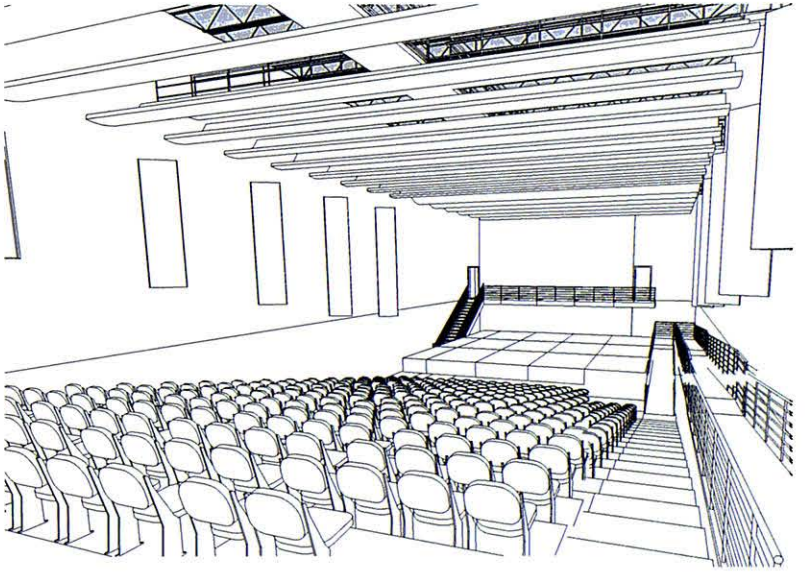


Restaurant Interior

Qualifying Design Response

Design Presentation

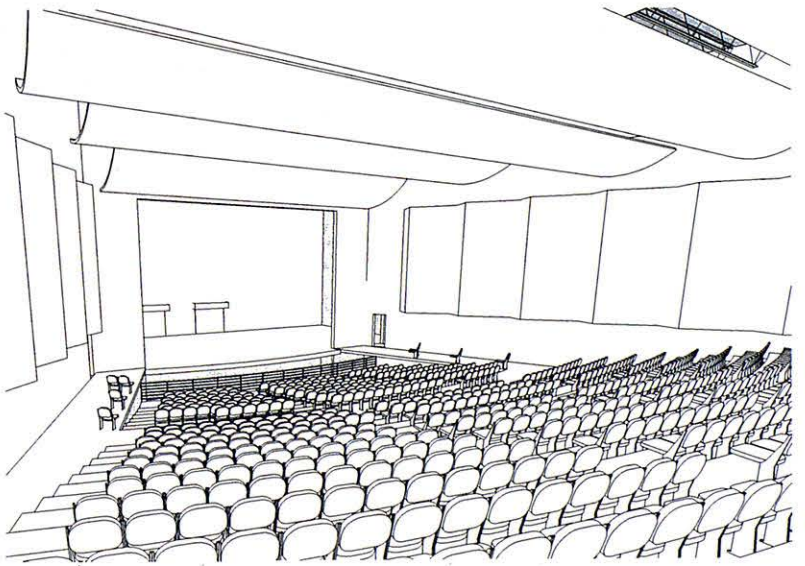


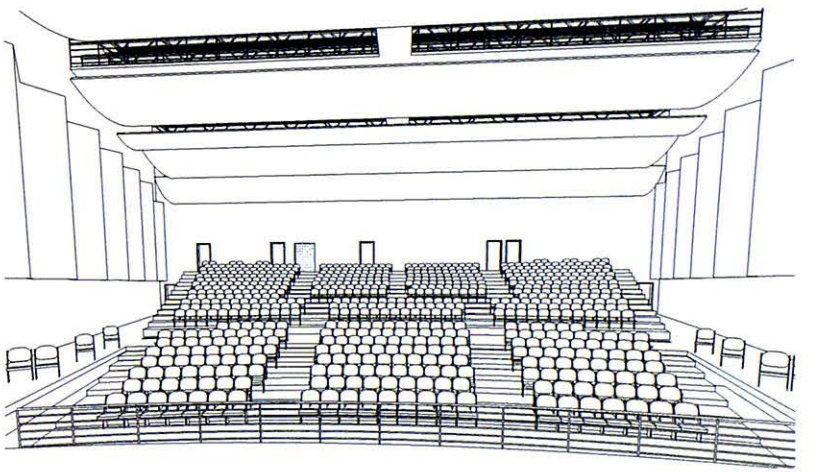


Concert Hall Perspectives

Qualifying Design Response

Design Presentation





Theater Perspectives

Qualifying Design Response

Summary of Discussion/Suggestions

Following the qualifying review, the jurors suggested various ideas to improve the presentation quality of the project. Suggestions included developing the landscaping design on the site, providing a sense of grand entry as one approached the front entrance. The theater and concert hall were also in need of finish material selections, as well as a lighting scheme to enhance the quality of the space.

For the final presentation, the site plan was in need of minor improvements to provide the most efficient solution to vehicular circulation on the site. Additional parking was provided close to the building, to include a section of paved parking on the existing fairgrounds. An area for the trash receptacles was also designated on the site with easy access points for the Lubbock waste trucks.

The restaurant located at the end of the lobby corridor was redesigned to include additional seating outdoors. The glass wall at the end of the corridor was recessed into the restaurant space, providing a small area for patrons to sit outdoors and enjoy the views of the building as it is cantilevered out over the hillside.

The existing amphitheater was more fully developed, being added to the final presentation drawings and renderings. Any additional changes were primarily directed at improving the graphic clarity of the drawings for the final presentation.

Design Proposal

Final Design Response

Design Conclusion

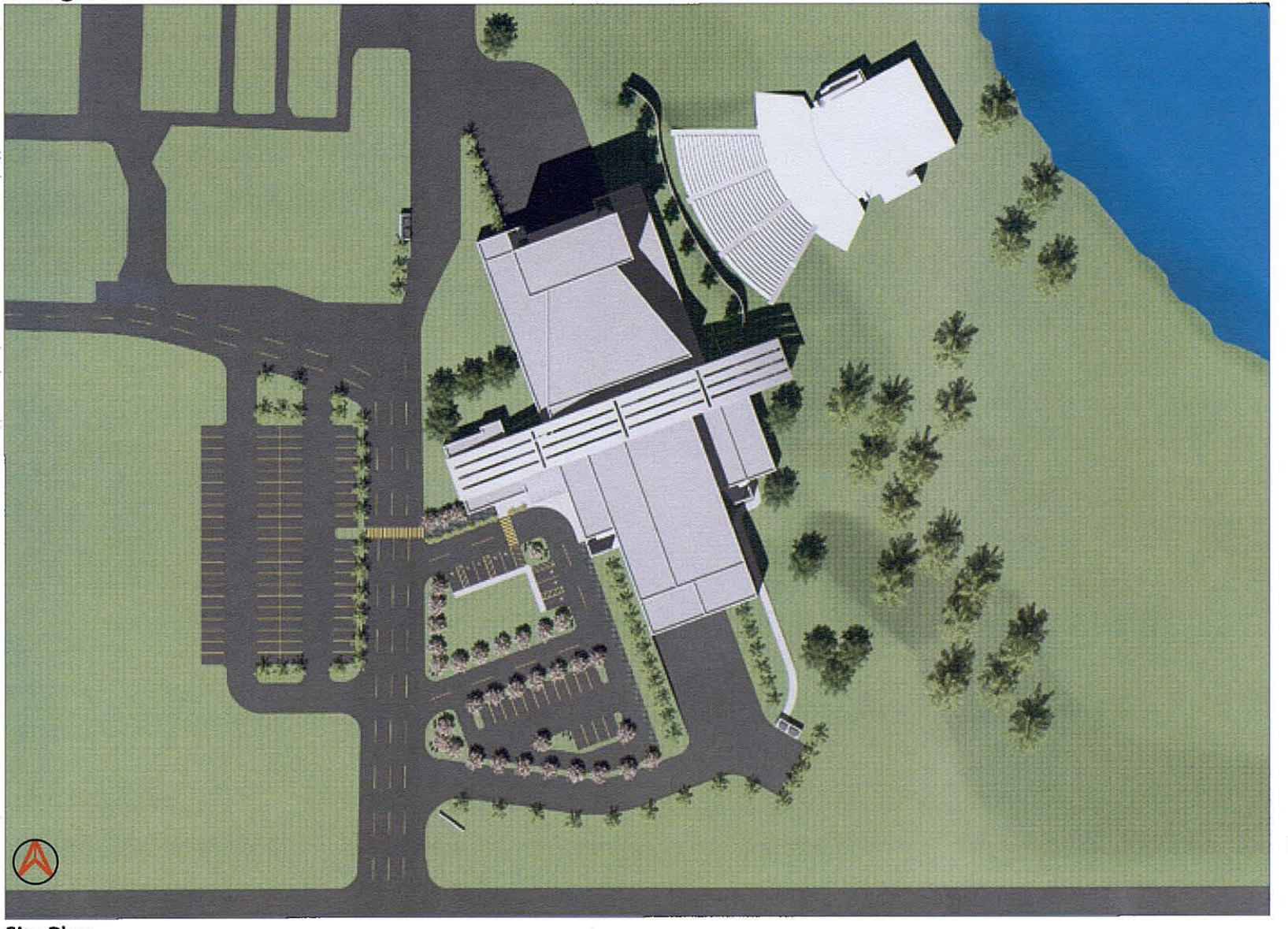
The final design proposal for the Mackenzie Performing Arts Centers includes many unique design features. The proscenium theater includes 7,593 square feet with seating for 723 people. The concert hall is 5,376 square feet with seating for 300 people. Each auditorium features a rich cherry wood finish with soft incandescent lighting. The concert hall also features a modular floor system with adjustable heights to accomodate for different seating and stage arrangements.

The central lobby runs down the central core of the whole building, rising up fifty feet at the highest point. This large space is constructed with a steel space frame structure, which follows the lobbyss dynamic curving shape. Kalwall allows for plenty of natural daylight to light the lobby interior. Voids in the roof allow sunlight to penetrate into the space, placing what are to represent musical staff lines running parallel down the length of the lobby space.

The site design features tree-lined islands which guide the visiting patron towards the building's main entrance. Guests will notice sculptural steel art pieces as they are guided toward the building, which are an existing contextual piece to this site. The restaurant cantilevered over the sloping hillside looks down onto an existing amphitheater. The performing arts center will serve as a new backdrop to the amphitheater, along with many new landscaping features to provide the site with a more comfortable atmosphere.

Final Design Response

Design Presentation

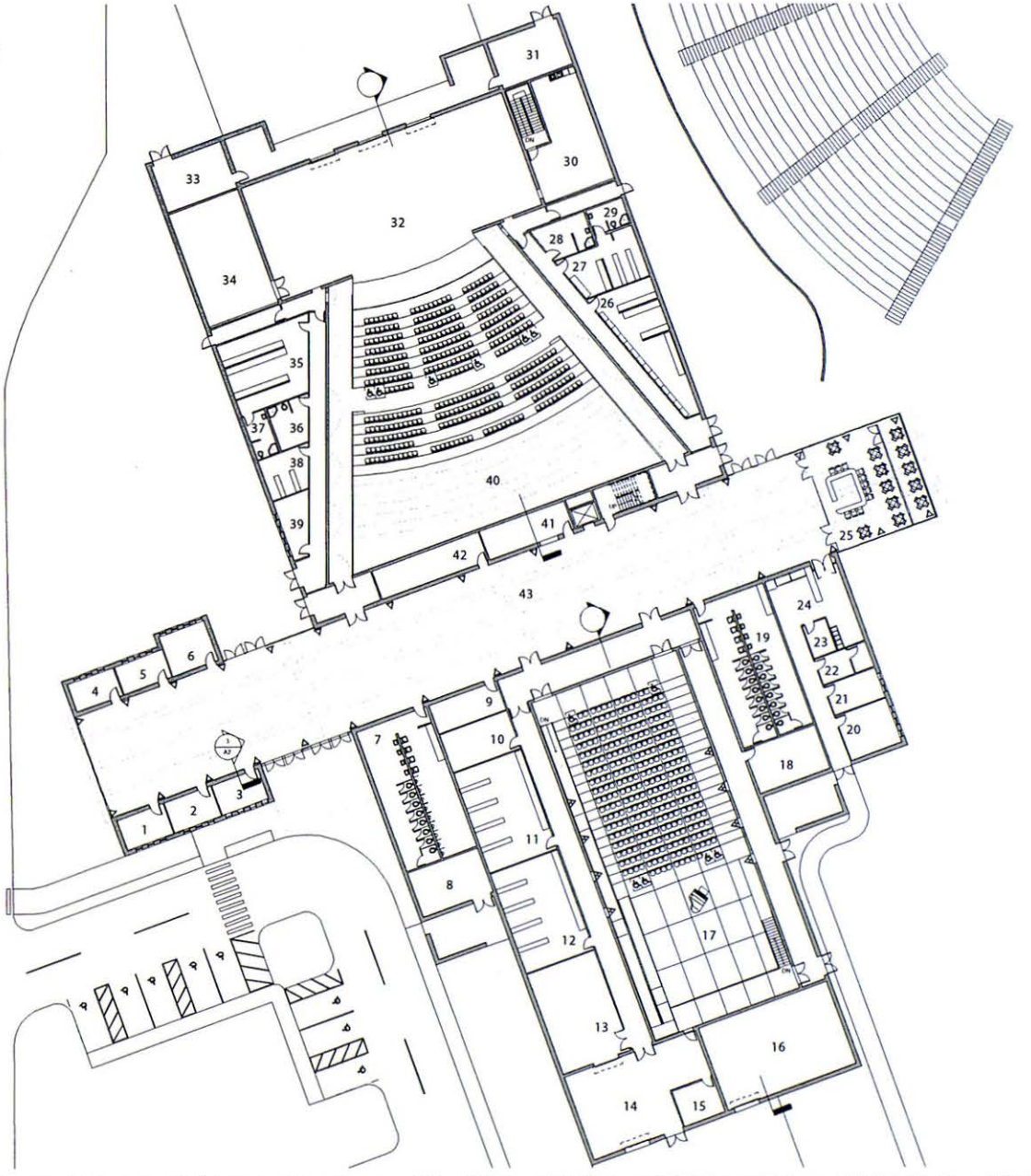


Site Plan

Final Design Response

Design Presentation

LEGEND:
1. First Aid
2. Security Office
3. Ticket Box Office
4. House Manager Office
5. Facility Manager Office
6. Production Office
7. Men's Restroom
8. Mechanical/Electrical
9. Janitor Closet
10. Stage Manager
11. Men's Dressing Room
12. Women's Dressing Room
13. Instrument Storage
14. Loading Dock
15. Sound Recording Room
16. Storage Room
17. Concert Hall
18. Mechanical/Electrical
19. Women's Restroom
20. Break Room
21. Office
22. Dry Storage
23. Cold Storage
24. Kitchen
25. Cafe
26. Dressing Room
27. Makeup/Wardrobe
28. Star Dressing Room
29. Private Restroom
30. Green Room
31. Mechanical/Electrical
32. Theater Stage
33. Mechanical/Electrical
34. Temporary Storage
35. Dressing Room
36. Star Dressing Room
37. Private Restroom
38. Wardrobe
39. Office
40. Broadway Theater
41. Coat Check
42. Storage
43. Lobby

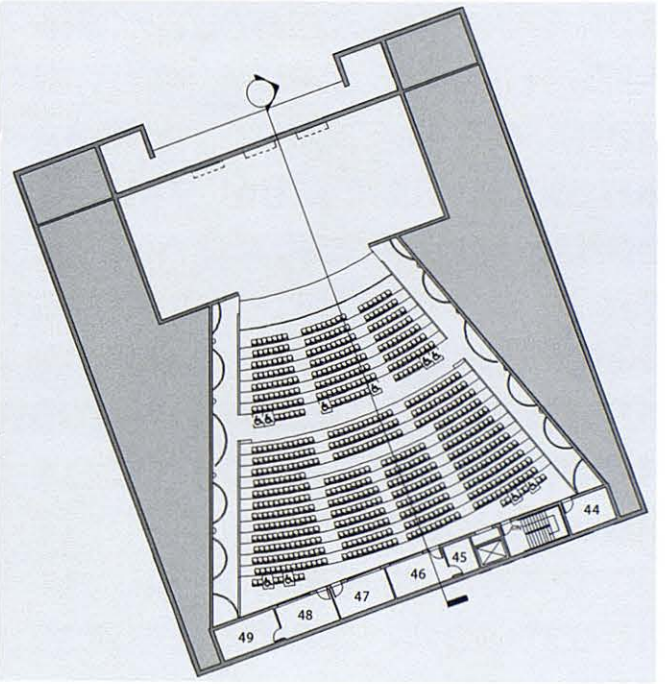


First Floor Plan

Final Design Response

Design Presentation

LEGEND:
44. Storage
45. Storage
46. Spot Light Booth
47. Light Control Booth
48. Sound Control Booth
49. Storage

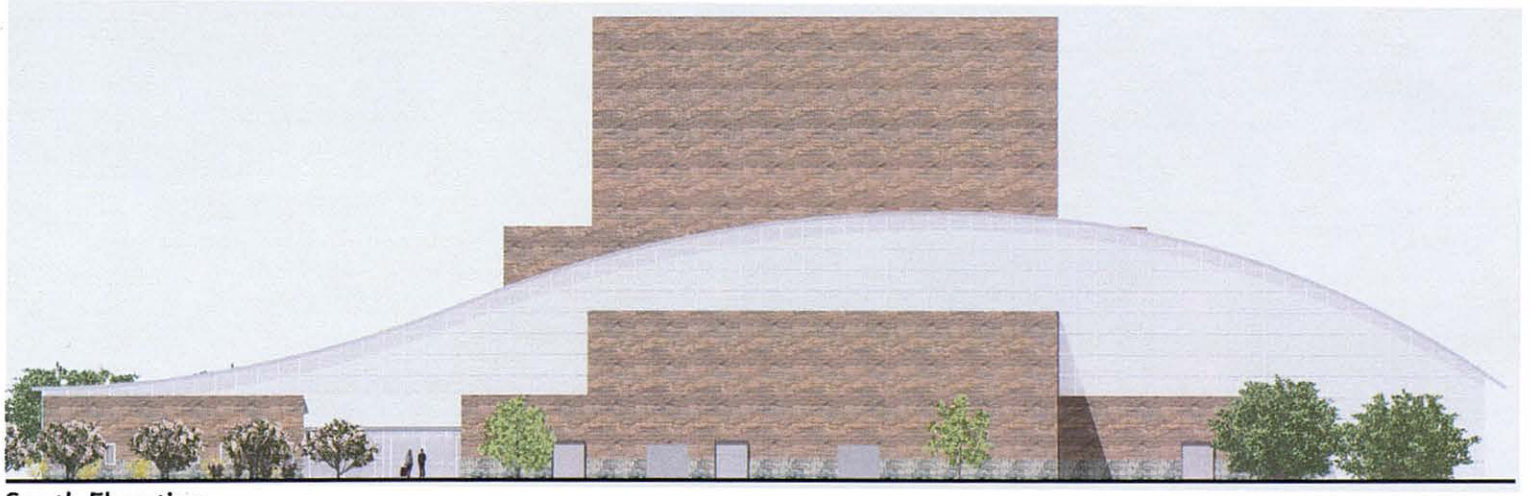


Second Floor Plan

Final Design Response

Design Presentation

North Elevation

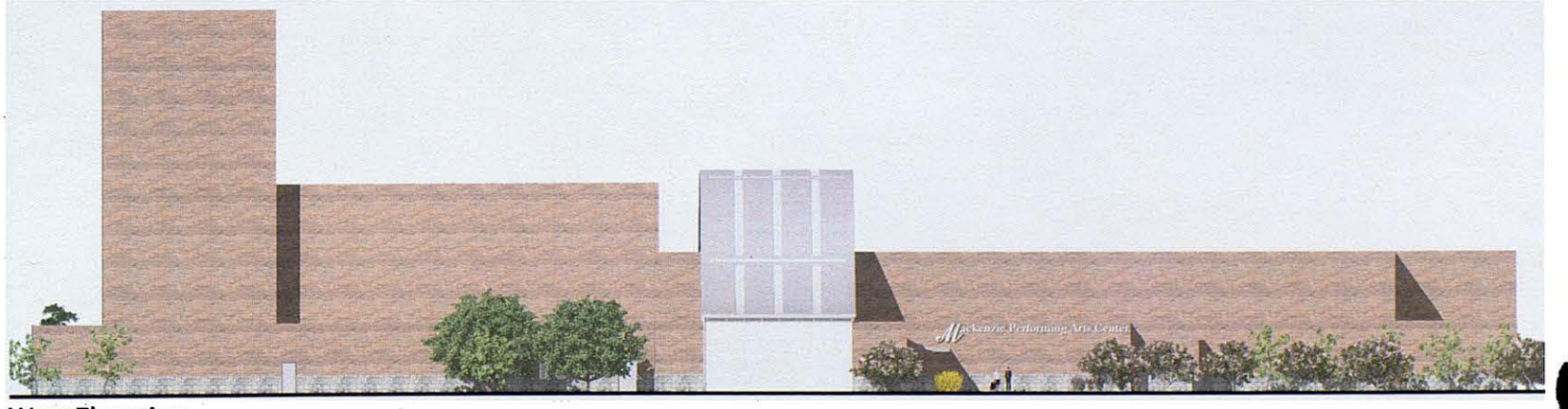


South Elevation

Final Design Response

Design Presentation

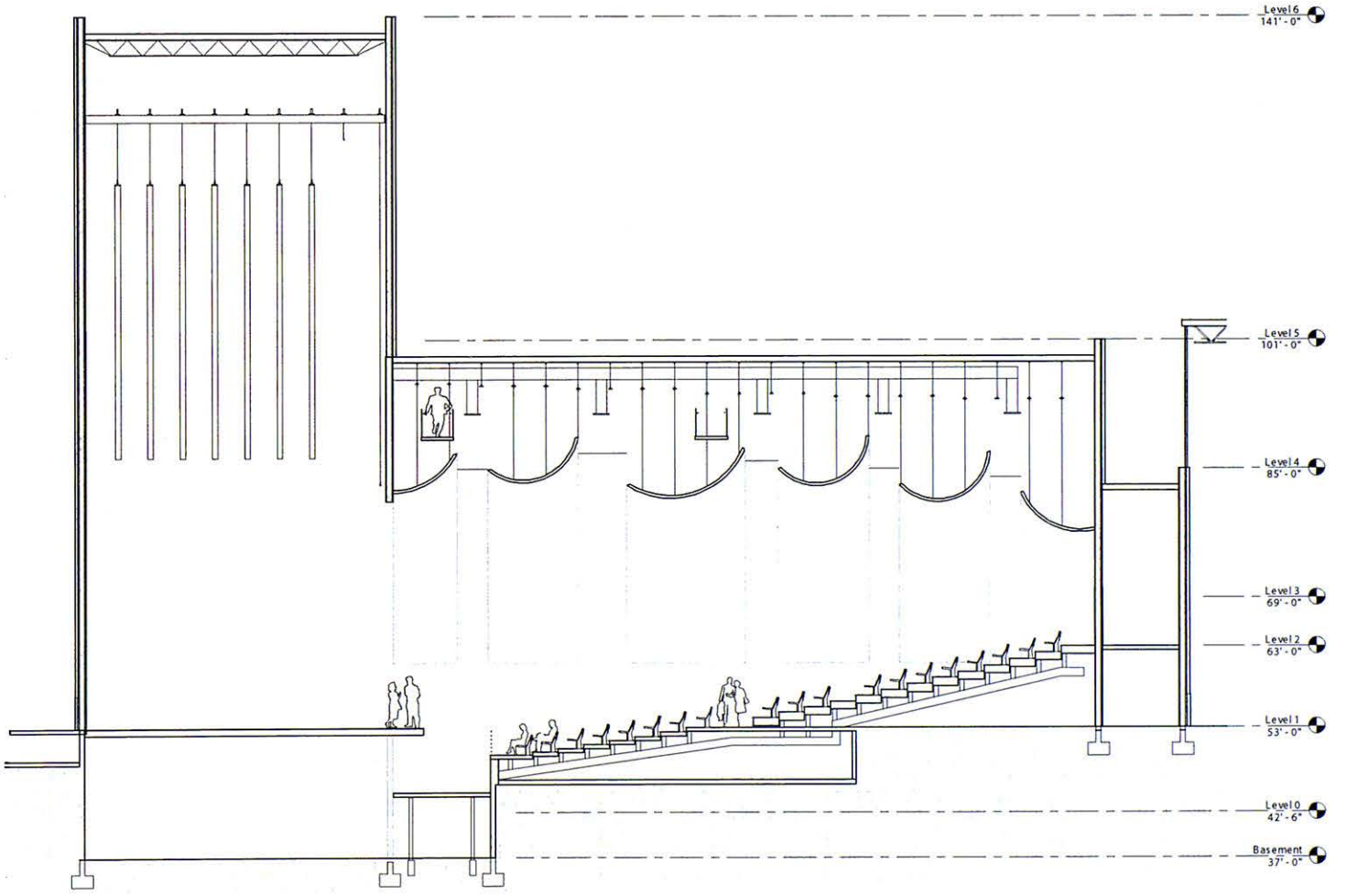
East Elevation



West Elevation

Final Design Response

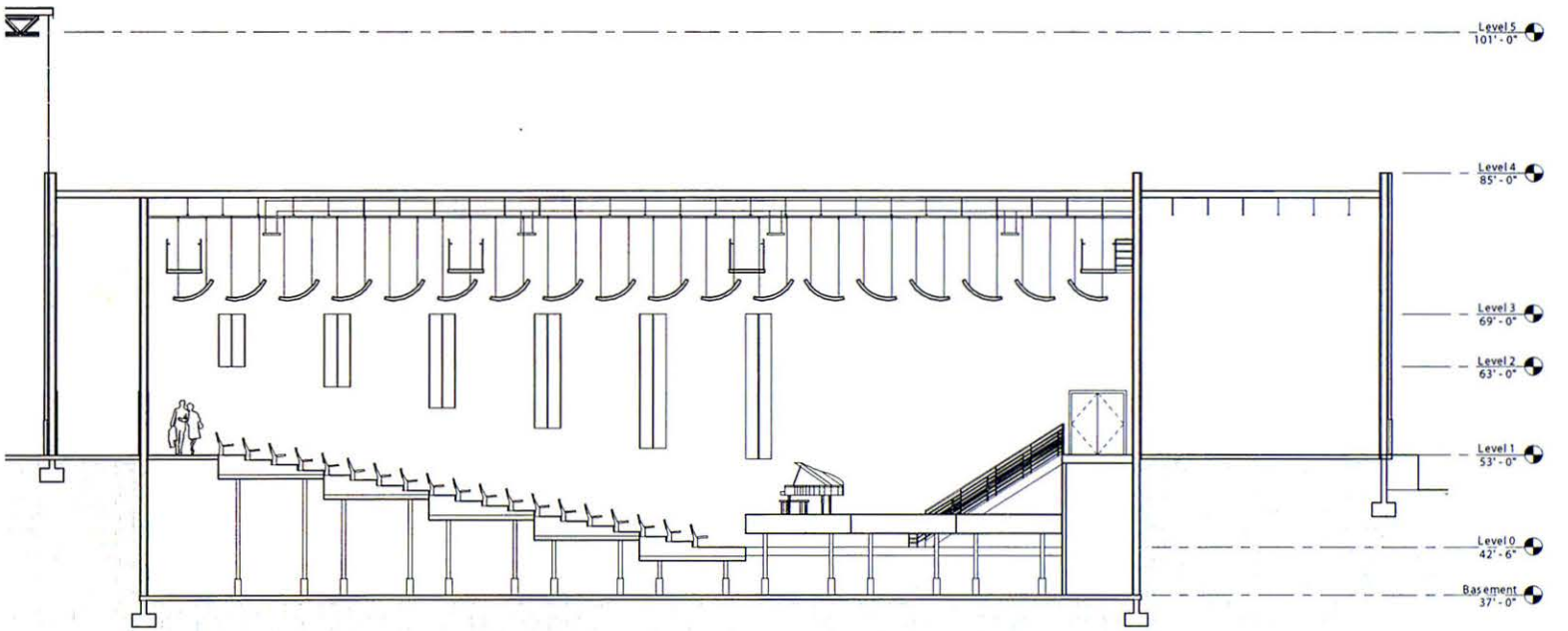
Design Presentation



Theater Section

Final Design Response

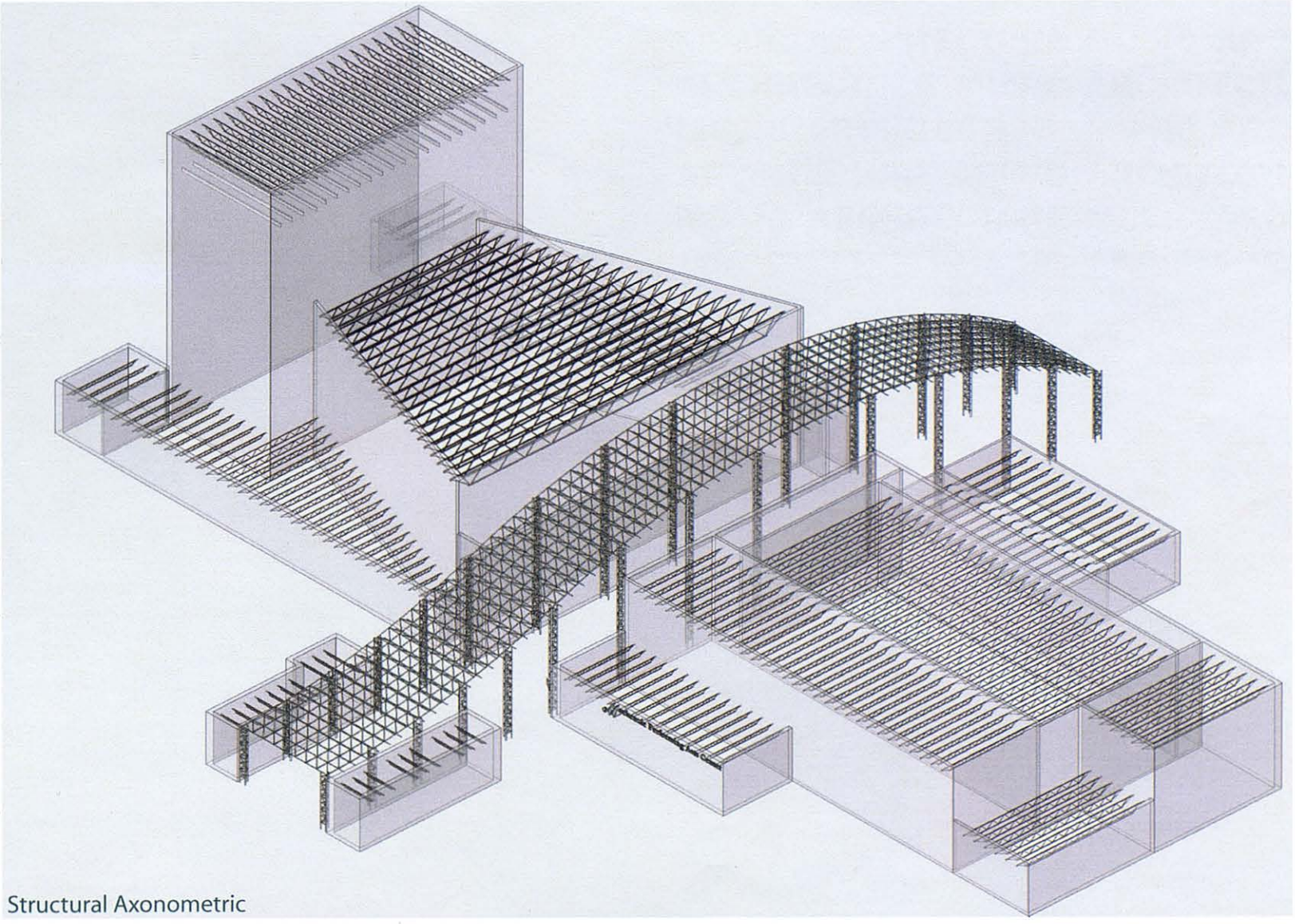
Design Presentation



Concert Hall Section

Final Design Response

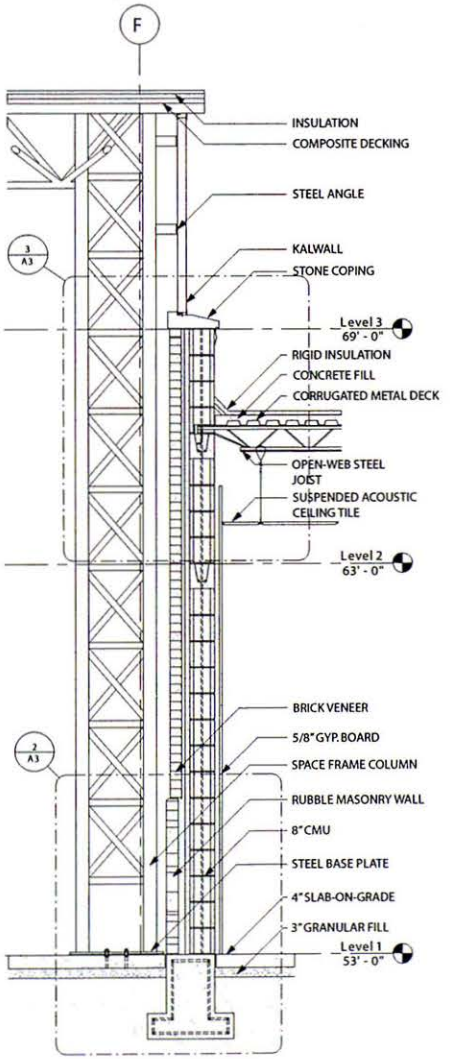
Design Presentation



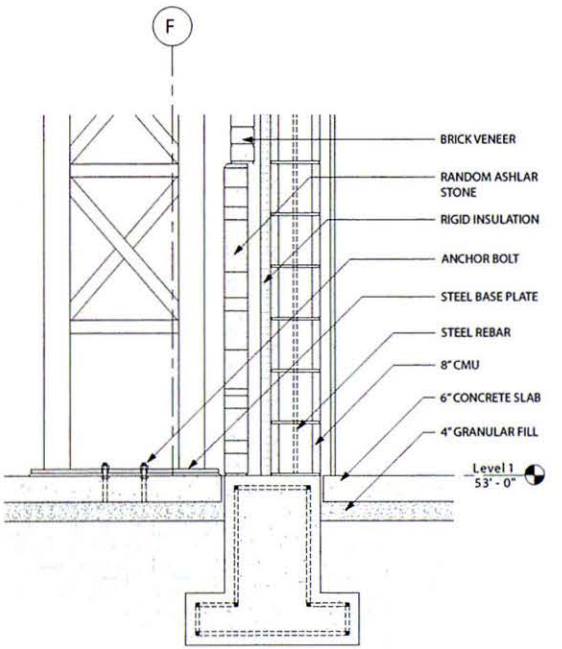
Structural Axonometric

Final Design Response

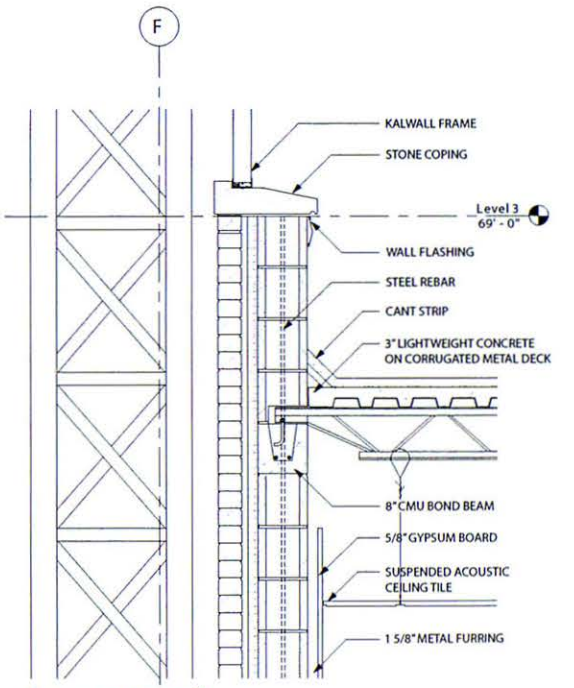
Design Presentation



Wall Section



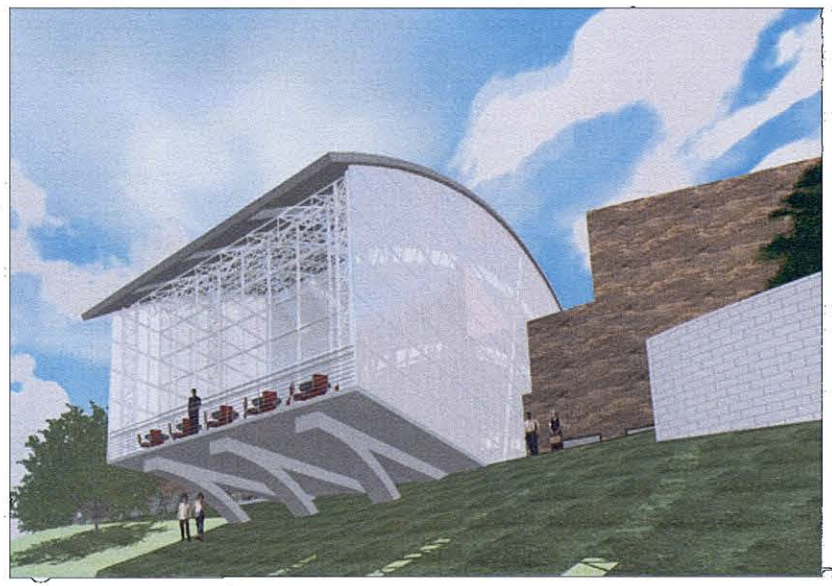
Foundation Detail



Parapet Detail

Final Design Response

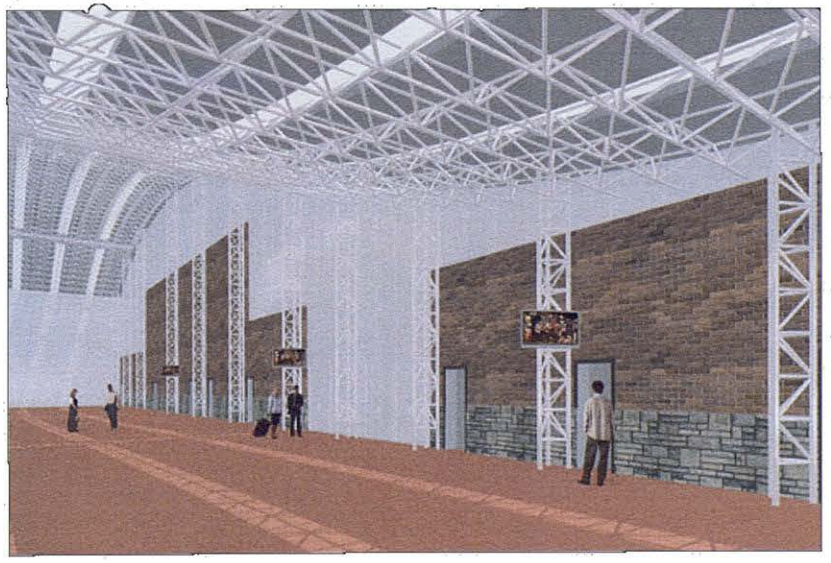
Design Presentation



Exterior Perspectives

Final Design Response

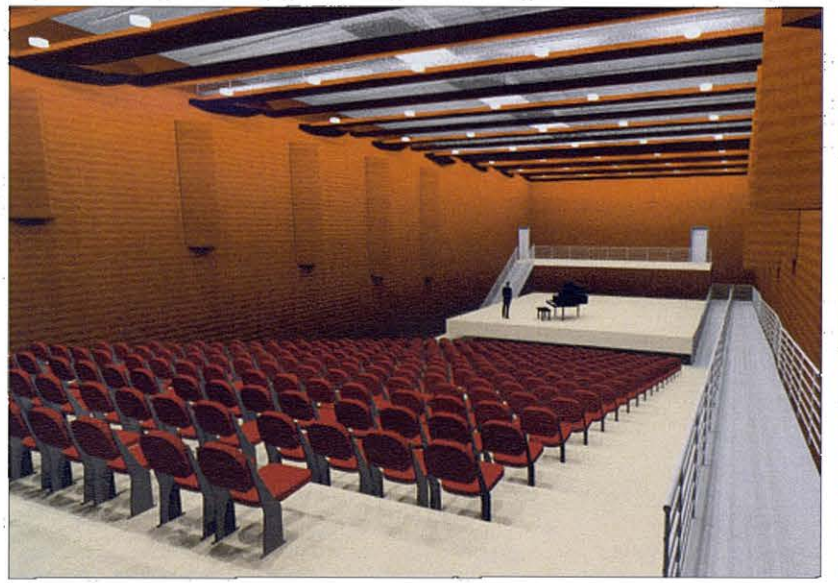
Design Presentation

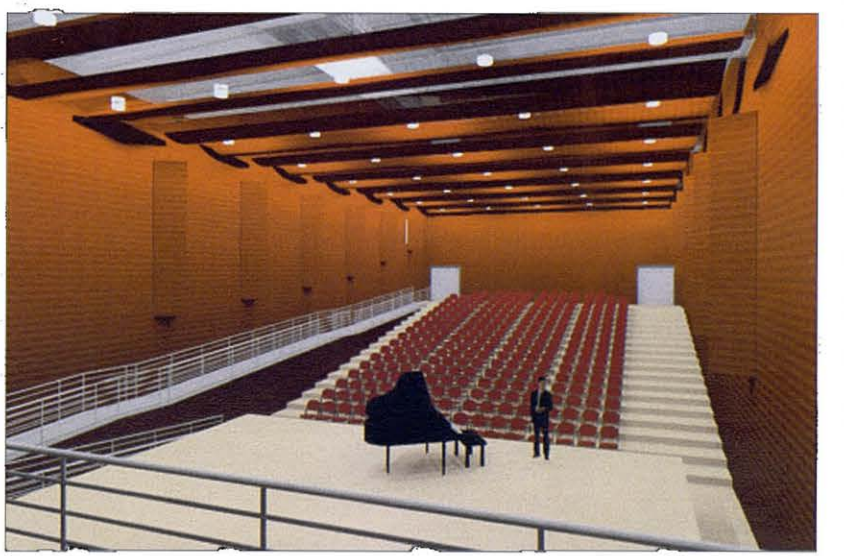


Interior Perspectives

Final Design Response

Design Presentation





Concert Hall Perspectives

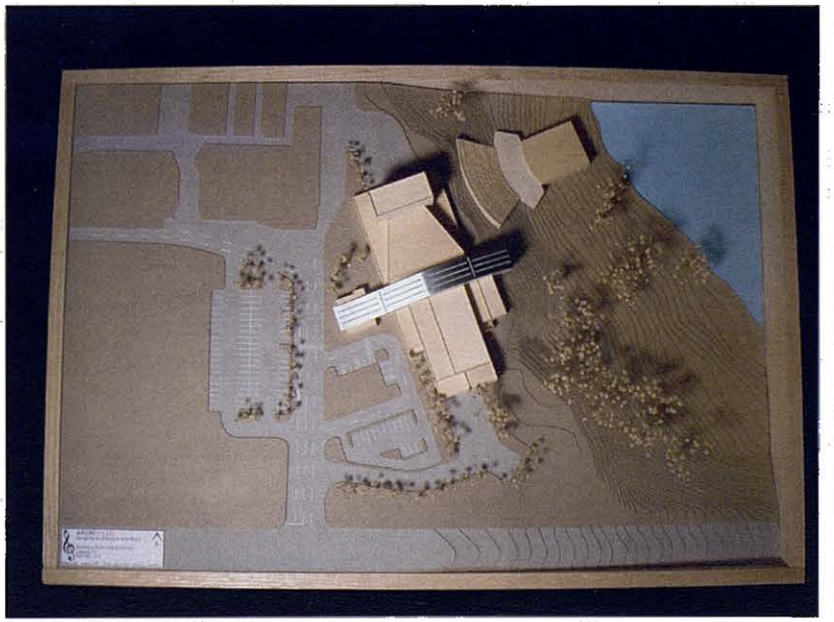
Final Design Response

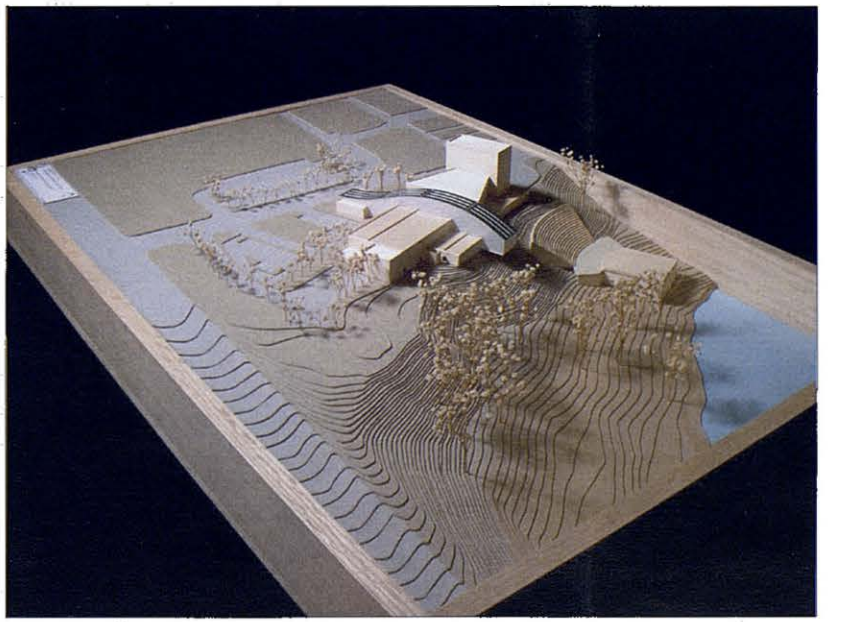
Design Presentation

Theater Perspectives

Final Design Response

Design Presentation

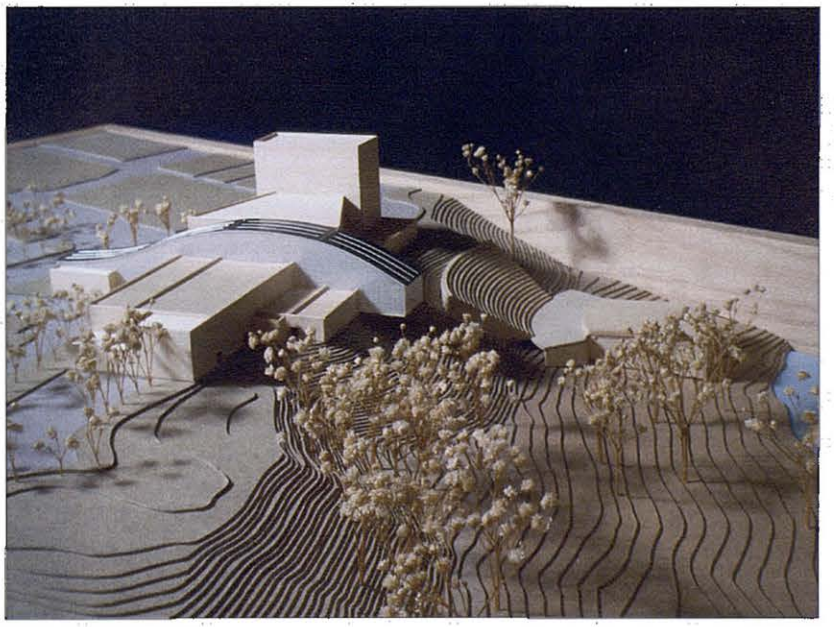


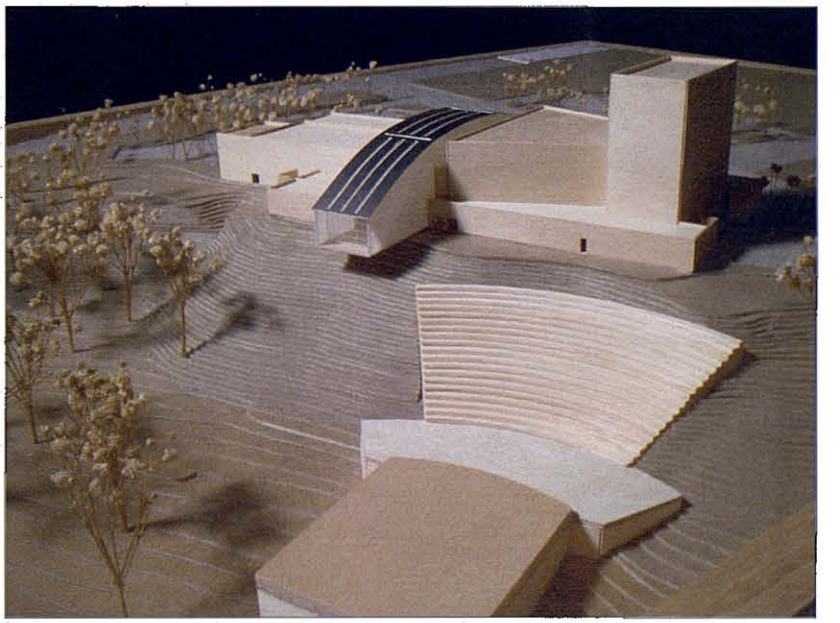


Physical Model

Final Design Response

Design Presentation

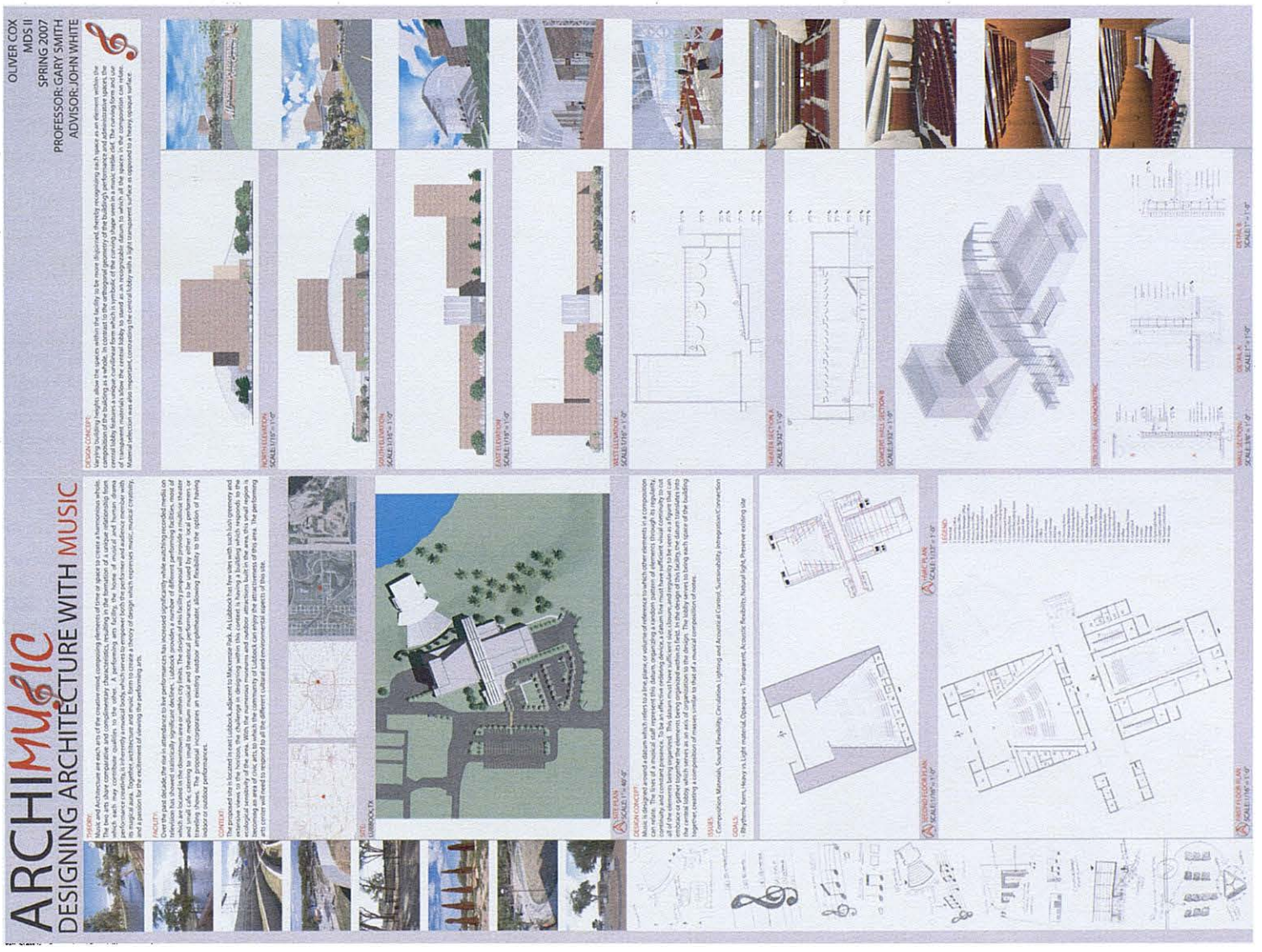




Physical Model

Final Design Response

Design Presentation



Design Proposal

Final Design Response

Personal Reflection

As I reflect upon the outcome of this project, I am pleased with the design that I have created, as I find it to be a compliment to the existing conditions and potential future development of this site. The project itself was very complex, with several design issues to be resolved. As this was my first attempt to design a performing arts center, the project provided me with an excellent learning experience into the complex world of designing performing arts theaters. In the end, I feel as though the project met all the goals that I set out to accomplish in designing this facility. This project provided an excellent learning experience for me, in terms of learning about structure, materials, lighting, and the movement of people inside a buidling.

Music is a unique art of sound creation, just as architecture is a unique art of building a structure. How one experiences music and dance inside of a theater is an important aspect of designing the architecture of a performing arts center. My hope for this design was to create architecture that was inviting, yet dynamic and unusual enough to spark visual interest to the guests who would visit the facility. As well, my choice to propose a design on this site was due to the aesthetic surroundings, a quality which few sites in Lubbock can provide.

This studio has opened my eyes into the world of designing practical architecture that fully answers the needs and goals of its users. Without the extensive research and guidance of my professors, developing the design for this project would have been impossible, therefore I am grateful for the knowledge that they have shared. From this project I have taken the knowledge that architecture should provide an enjoyable experience from every aspect of its design, not just in select areas where we choose to focus more attention. I hope that someday a project such as this will come to exist on this site, as I find everything about the site to be fitting for such a design.