

**ARCHITECTURE AND OTHER MUSIC**  
*A Building For Musical Performance in  
the Age of Electronic Reproducibility*

A Master's Degree Project  
by  
Katherine A. Wagner

Faculty of Environmental Design  
The University of Calgary  
Calgary, Alberta, Canada

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## ABSTRACT

Musical performance, as a cultural ritual tied to time and place, has historically been linked with an architecture for performance. Traditionally the relationship of architectural form to musical performance has been based on the acoustic environment. With the advent of electronic technology, acoustics may be displaced as the dominant factor connecting performance and architecture. The theoretical and physical parameters of musical performance have been redefined with the opportunities provided by the electronic capabilities. However, these changes were not reflected in the architecture for performance.

## ARCHITECTURE AND OTHER MUSIC

*A Building For Musical Performance in  
the Age of Electronic Reproducibility*

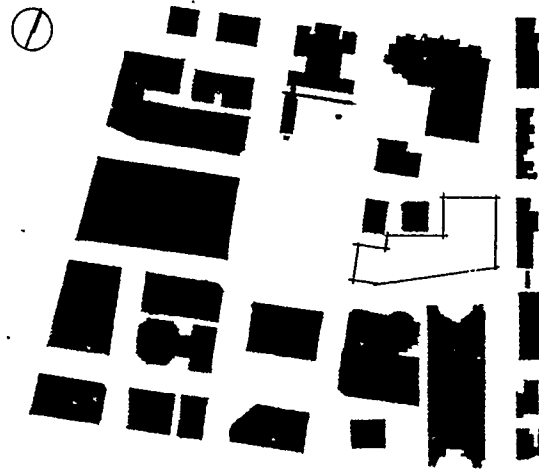
The master's degree project presents a design that re-establishes a link between architecture and contemporaneous musical performance. Acknowledging the cultural relevance of ritual, the design evolved from the definition of a methodology that referenced the structure of twentieth century musical composition and performance. Emphasis was placed on an experiential understanding of the element of time, common to architecture and music, and the implications of temporal perception and movement on the development of an architecture for performance. The text exemplifies these investigations while the architectural drawings and model are the proof of concept. The composition of text, drawings and model form a complete representation of the master's degree project.

A There is an historical connection between musical performance and architecture in the Western world. Compositions from different stylistic eras have musical expressions that require different performance environments. Composers "...usually wrote music for particular building types — the Gothic cathedral, the Baroque church, the palace theatre - and often for particular buildings, so that not only was the music written to be technically appropriate to the acoustic ambiance, but in addition the buildings were frequently contemporaneous with the music and stylistically akin." (Forsyth, p. 129) The dissolution of patronage in

A/1 *Changes in the nature of musical expression and the place of musical performance in twentieth century western society have brought into question the form of an architecture for performance.*

B/2 *The master's degree project was an investigation of the relationship between architecture and contemporary musical performance and how this understanding might inform an architecture for performance.*

*The site chosen for an architecture for performance is situated within the civic precinct of Edmonton, Alberta. The civic center*

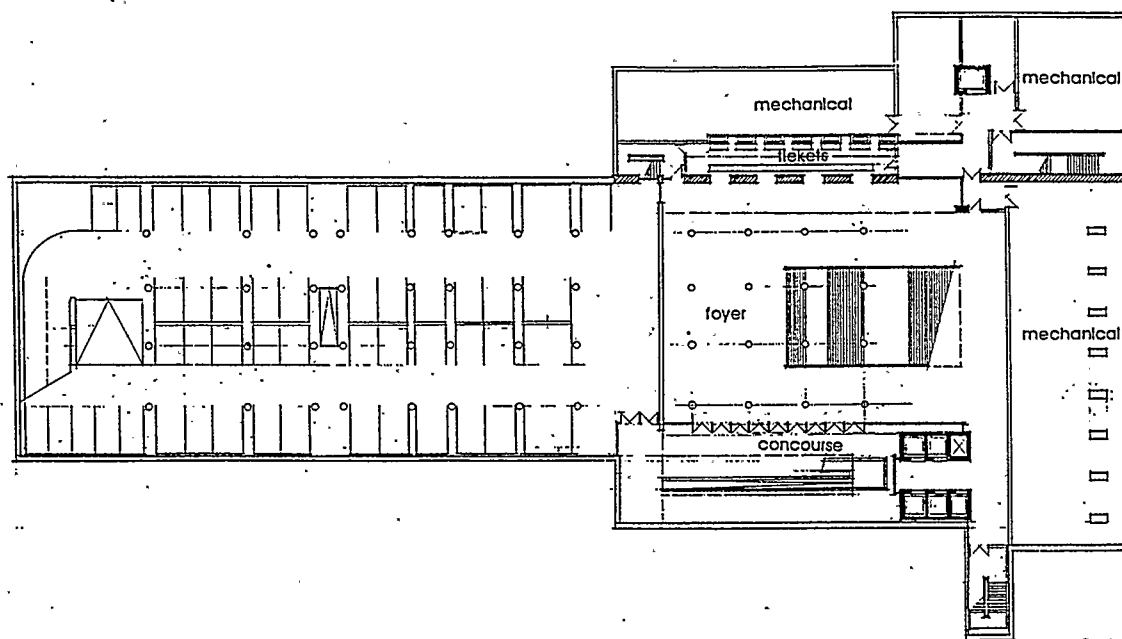


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*revolves around Churchill Square, the focus of public ritual. The square is located on the juncture of two city grids, although the resultant trapezoidal shape of the Square was altered in 1950 with the realignment of the street on its eastern edge. This street forms the western perimeter of the project site. The project site extends from the civic square one block east. The original City Hall (circa 1913) is located on the site at the south west corner. The old City Hall was situated parallel to the original street grid and consequently now stands back of the realigned street edge. The interim space formed provides for mature plantings in a*

the Romantic era (1820 - 1920) of music exposed an enthusiastic public to musical performance. The popularity of musical performance heralded a new freedom for composers who, "...had been liberated from church or private patronage — and thus from a prescribed architectural setting for their music — and music became democratized with the growth of a concert going public. This, together with the progressive

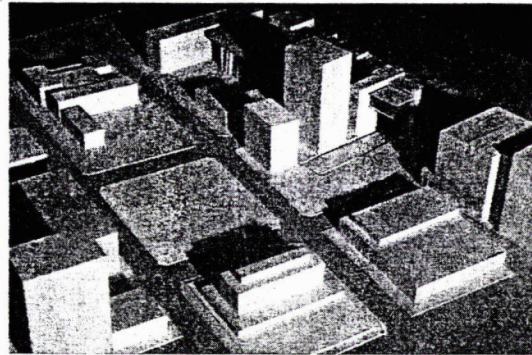


-3.0 PLAN

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accumulation of music from different periods, meant that new musical works became part of an expanding repertoire that might be performed in a range of circumstances and locations. The kinship that had in previous centuries existed between nondramatic music and its visual-stylistic context became in the nineteenth century somewhat tenuous." (Forsyth, p. 129) By the twentieth century performance spaces no longer enhanced the acoustic and aesthetic requirements of the contemporary musician.



*green space and subterranean access to the city subway system. The plantings provide a sense of natural enclosure to Churchill Square that is reinforced by the hard edge of the surrounding building facades.*

*Although the Square has an informal planting and pathway system, there is a formal axis of alignment between the new City Hall (1992) to the north and the Centennial Public Library to the south. Other buildings of cultural interest that surround the Square and the project site are the Citadel Theater, Edmonton Art Gallery and the Law Courts. The northern half of the project site block is occupied by two office towers, unarticulated struc-*

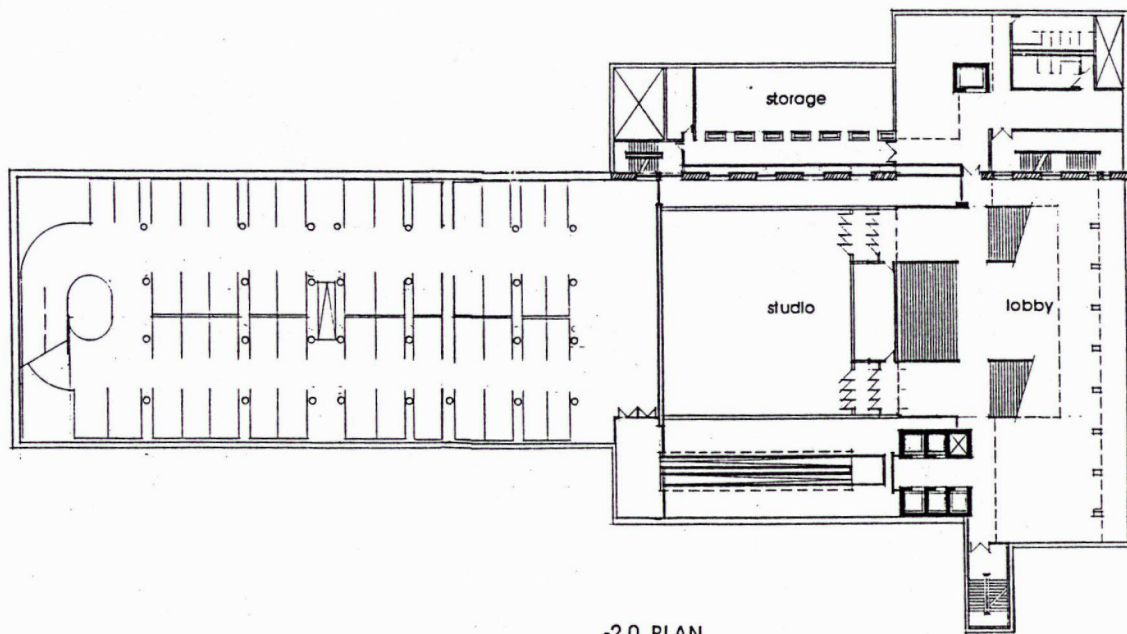
## ARCHITECTURE and OTHER MUSIC

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*tures enclosed in reflective glass curtain walls. These are monolithic in character although the outer skin is reflective glazing. The eastern edge of the block is the figurative termination of the civic precinct. This boundary is established by the Law Courts and Canada Place. The northern and southern edges of the site are demarcated by two one way roads, moving from Churchill Square toward the site and westward toward the City Hall.*

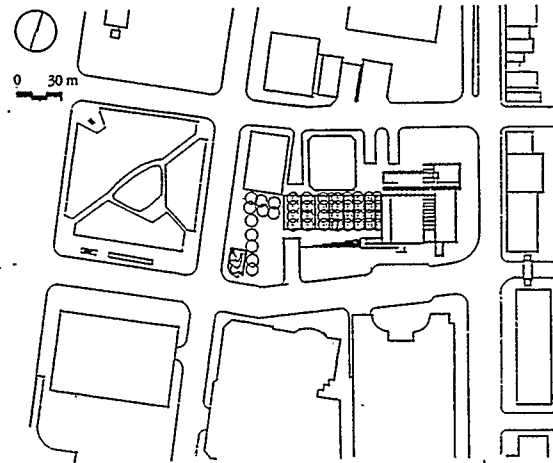
*The massing of the project acknowledges the historic architectural precedent on the site, leaving the western edge free from*

B New music is broadly considered to have begun in 1945, a time when investigations in musical composition were diverse. Since 1945 music has become increasingly pluralistic as composers have utilized electronic technology for theoretical and mechanical inspiration. Many of the new works require electronic equipment to bring them to fruition, the computer as an intrinsic component of the performance process.



-2.0 PLAN

There are two discernible parameters of new music. The first is the lack of conceptual unity between the new music and the music of the traditional European tonality. Without a focus on triadic tonality and with the opportunities provided by electronic technology, composers were able to create new images of time that were discontinuous. This implied a new understanding of time; a series of nows without a clear quality of linearity linking past, present and future.



*building form. Existing plantings remain and combine with new to lead into the outdoor performance terraces. The terraces may also be accessed from the sloped surface of the ramp. This entails a move from gravel across a threshold of water to the fields of moss beyond. The terraces step down towards the outdoor plaza. The outdoor plaza is the space between the studio and the cantilevered performance hall above. Foot traffic enters the building below the performance canopy and across the plaza, under the suspended media screen facade. Movement into and out of the building on the ground plane parallels the circulation systems for vehicles and pedestrians underground. A*

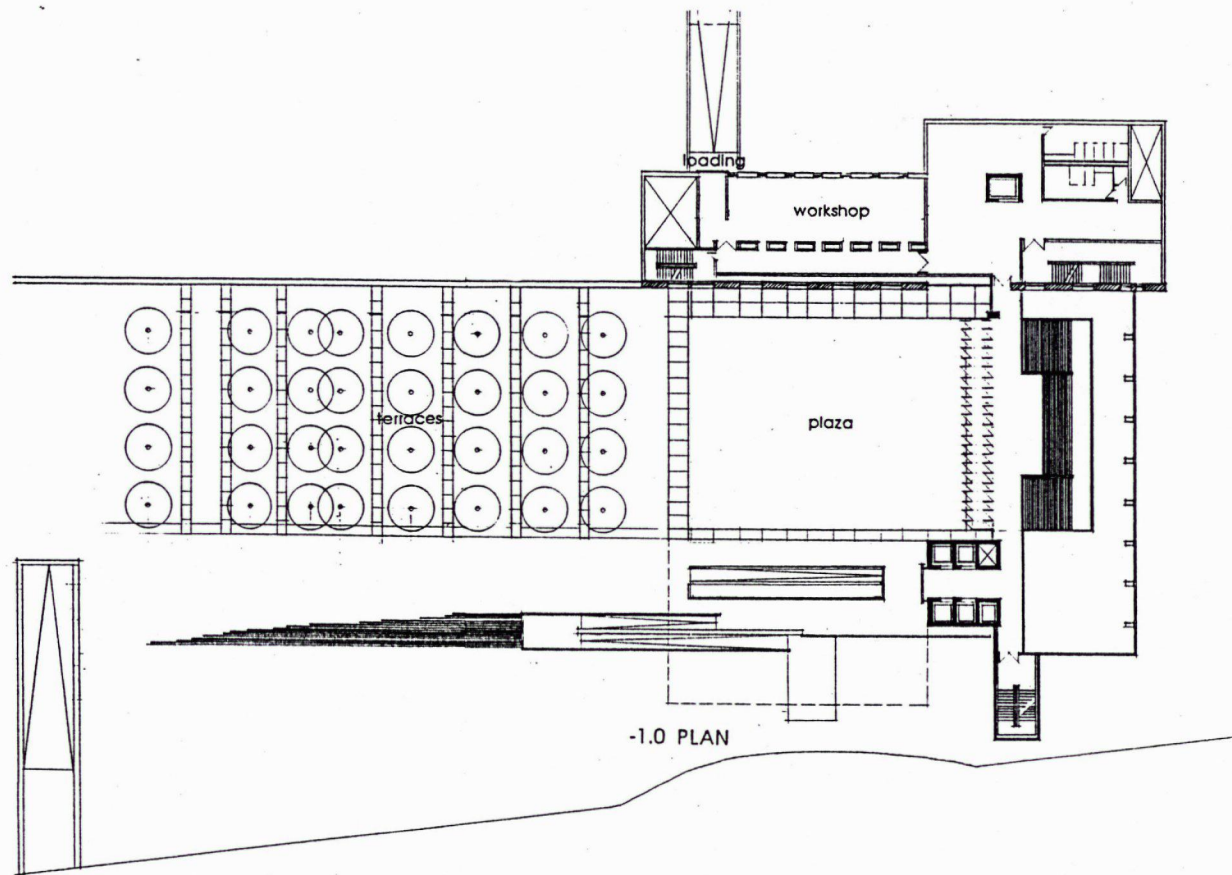
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*link to the Light Rail Transit station is located on the plaza beneath the ground level drop-off and ramp. Building access from the parkade is up and into the lobby beneath the plaza entrance.*

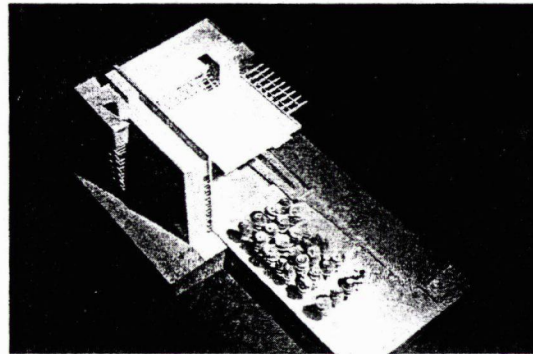
*The performance canopy is surfaced with sheets of copper that are suspended from the structure above. The eastern enclosure to the plaza is composed of a series of translucent panels of glass. When activated, this screen can project images of sound and light to the plaza and civic square. The architecture provides for*

Performance is the second characteristic similarity between new music styles. Performance is a component of the composition and is included in the creative expression of the composer. The composer unites time and space in the musical experience to communicate to the audience. The complexity of presentation





possibilities is as varied as the new music styles. The technological advances in sound production and reproduction provided the possibility for a visual essence that produced, but was not creating the sound. This introduced perceptual difficulties because, "By transporting sound from its original environment to the neutral space of the loudspeaker, these media, disposing of the visible relationship between the sound its source alienate the listener from the sound." (Bruinsma, p. 89)



*the unfolding of a cultural ritual before society.*

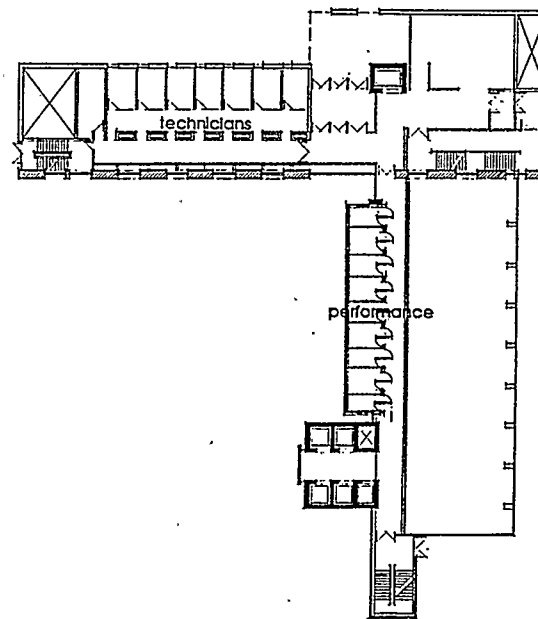
*C/6 To design an architecture for performance, music and musical performance served as the paradigm of abstraction, for, "since there is a theoretical relationship between music and architecture, is it not also possible that current trends in music theory and composition are a relevant departure point for architects to incorporate a deeper level of cultural meaning into the built environment." (Ferriby, p. 77) Architecture and musical performance are process oriented. Each is the public presentation of the culmination of a creative process. In his study of the relationships between architectural and musical composition,*

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*Robert Dorgan (1990, p. 362) states that, "the architectural connections to the musical world are more than just a graphical convention of abstracting and representing ideas in different artistic mediums. They share fundamental connections in the creative processes of structural expression and conveyance of ideas an assemblage of elements in time and space - building musical structures in time and composing architectural structures in space. It is beyond the mere semantic links of the synonymous terminologies of each medium - structure, form,*

Listening is the primary musical activity, allowing the ability to experience the primary illusion, the auditory expression of the composition. Comprehensive listening is necessary to the musical experience. In the past this was ensured through listener participation in the performance; ancient Greek audiences participated as part of the chorus. Up until the Renaissance playing and listening were activities that were part of the

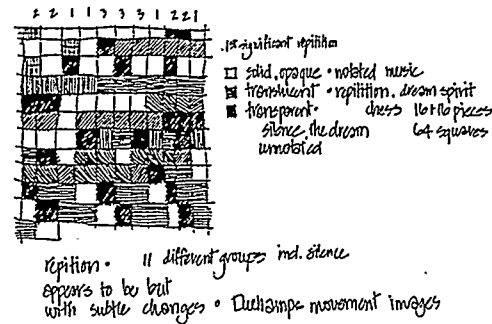


GROUND PLAN

complete performance experience. From the Baroque period to the 1600's the seating configuration integrated audience and performers. Performance spaces were arranged with the audience facing a central aisle, listeners were surrounded by musicians and choral groups. A unique and elaborate separation between audience and performers evolved during the Renaissance. As performance spaces increased in size the stage was fixed at one end of the spatial axis, facing the audience. Social norms dictated that the audience members be silent, passive receptacles for the performer, and the performance is separated into a creation time and

silence: to hear (through concentrated act of listening)  
that which we are not usually conscious of, to dream

unnotated space: to see (through concentrated act of looking)  
that which we are not usually conscious of, to dream



line, point, repetition, rhythm, balance, space, theme (and variation), etc., that these combinations of notes into chords and phrases and of materials into architectural elements and assemblages occur. The connections are beyond the rhetoric of the dialogues employed to discuss and weigh these artistic ideas, but rather are central to the methods and processes we employ in creating works in either medium." The first step in the design process involved the identification of a contemporary composer to investigate on the basis of composition structure and musical expression. The process proceeds with reference to a logical set of rules understood as a dynamic sequence of events structured

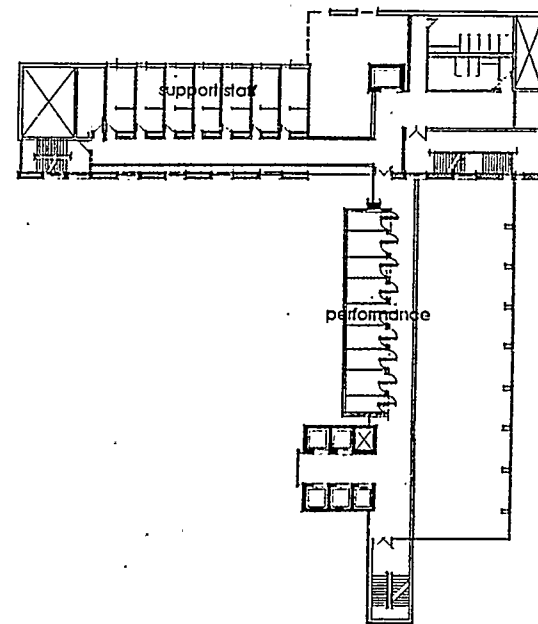
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in time.

D/9 The parallels between process and performance were explored leading to the design of a computer animation sequence that resulted in an understanding of the site, program and architectonic definition. This interpretation provided the beginning of an architectural form that was understood on the basis of the relationship between architecture and musical performance and lead to an architecture for performance. The architecture reflected the nature of the process for, as Louis Kahn stated,

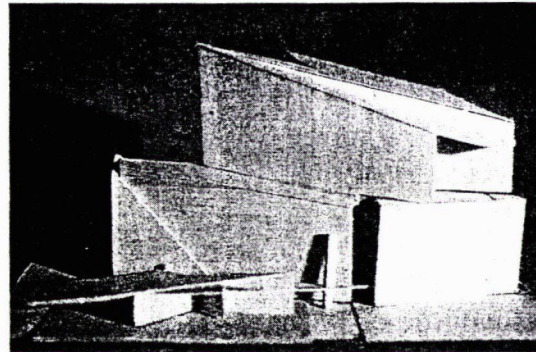
absorption time, as with much electro-acoustic music performance, but also the composer/performer has stepped down from the raised stage and become a human being who interacts on a personal level with the audience. The flavour of that interaction is central to the experience of the music itself. In contrast to the idea of listening to computer music being a cold 'staring at the speakers' experience, the audience can



+1.0 PLAN



actually experience the person's work in the best possible form." (Garton, p. 142) The redefinition of the performance space brought the audience into the centre of the time and space experience. Musicians and composers of the new music such as Satie, Cage and Tudor attempted to reunite performers and audience with the result that "...they have overturned the traditional view that music is performed at a specific time in a proscenium space which separates performers and audience." (Delehanty, p.36) A new understanding of the live performance and the performance space arose from the complexities of music in the age of its



*"Each space must be defined by its structure and the character of its natural light. ...An architectural space must reveal the evidence of its making by the space itself." (As quoted in Brownlee, p. 148 - 149) The process was based on an interpretation of the qualities of light and its possible relationship to performance. A computer animation study was designed to investigate the relationship between time structures and visual form. Contextual shadows incidental on the project site were mapped to provide spatial input that could be organized in time. Real clock time as datum was abandoned and replaced by the notion of duration. The solar calendar and subsequent light and*

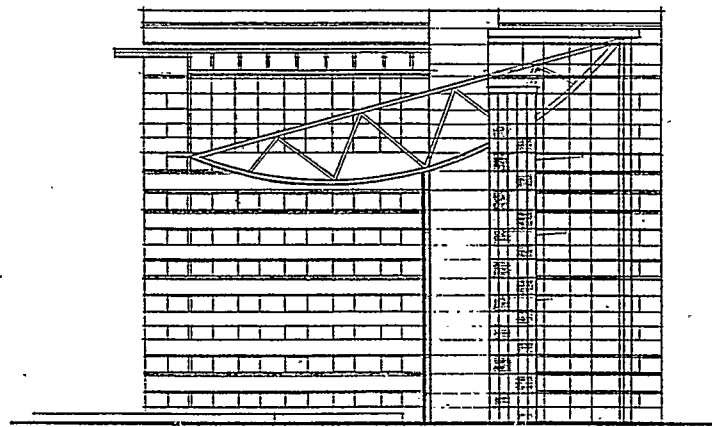
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*shadow in context were the means of witnessing the passage of time. Temporal order was established by adapting the proportional rhythms of seasonal days, acknowledging the significance of the solstices and equinox in ritual performance. The study reflected ideas coalesced from contemporary musical thought; temporal simultaneity, duration, apparent repetition and rhythmic patterns, and cultural ritual. The layering of images produced a spatial modeling based on the composition of movement and light, a composition that may be theoretically placed between the disciplines of architecture and music.*

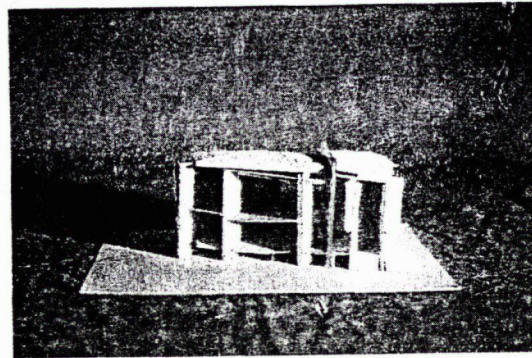
electronic reproducibility.

C Architecture and musical performance are aesthetic experiences that share the common element of time. Architecture is experienced through imaginative perception and movement by the self-conscious indi-



SOUTH ELEVATION

vidual. This movement is not a metaphor but the actual displacement of the body throughout the building, suspension of real time as the observer interprets the architectural experience. Appreciation of architectural form is a perceptual experience which has a temporal basis. Consequently imaginative interpretation of form has duration. Duration is fundamental to any experience and it is the temporal quality which differentiates experience from other thought and sensual processes. In contrast the concept of musical movement is an embodiment of the movement of time. Although the perception of hearing one note followed by another is



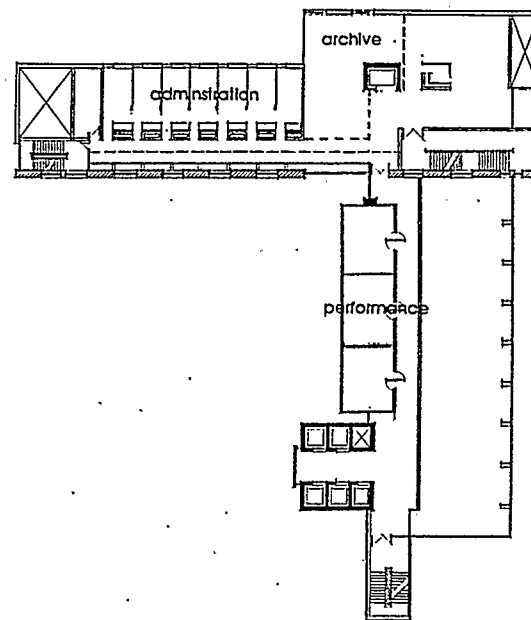
*E/11 Program was introduced to bring the artifact into the realm of architecture. The functions contained in the building were understood on the basis of inherent meaning. The requirements of a concert hall in the late twentieth century were understood with respect to ideas of performance, ritual and architecture. (Angelil, 1990). The two basic program sections were identified as support spaces and the dependent performance spaces. The former were the functions pertaining to the physical and poetic operation of the building. These included spaces such as dressing and technical rooms that were directly related to the staging*

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*of a performance. Because these activities are undertaken on a repeating schedule, governed by the clock, they were defined as existing in the everyday world, a temporal order that is simple. Performance, occurring in spaces and time between the day to day world was understood to have a complex temporal order composed of multiple images. The past, present and future overlap in a psychological present where time has duration but not regulated units of passage. "Not everything in this life can be counted out. Beyond the practical and social world of clock ordered events there is the inner world, the world of feeling, the*

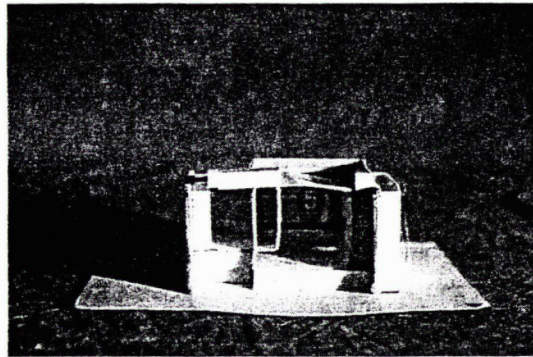
described as movement of sound, nothing of substance is actually moving. Unlike the architectural experience no object is being displaced in space; it is a different note which is perceived, not the movement of a single note from one position to another.



+2.0 PLAN



Musical time becomes defined by memories and the perceptual duration of the musical experience. The temporal quality of the experience is modified as familiarity and expectation contribute to the imaginative perception as, "...the work unfolds in time. Even when one first hears it memory intervenes to establish connections between its various parts so that understanding of the work evolves during the course of its performance." (Nattiez, p. 37) Through imaginative perception time becomes a layering of temporal images which are themselves an experience of time passing. What is common to all who participate in the musical



*musical world, where we live - in a swirl of overlapping presents, a flux where events happen at a multiplicity of unit speeds, where the units themselves are subject to distortions, and where uncounted episodes, unit-free durations, are a larger part of our experience." (Erikson, p. 177) When these interpretations were applied to the computer model, spatial relationships were identified based on layers of space and time. These sectors were modified and elaborated with architectonics.*

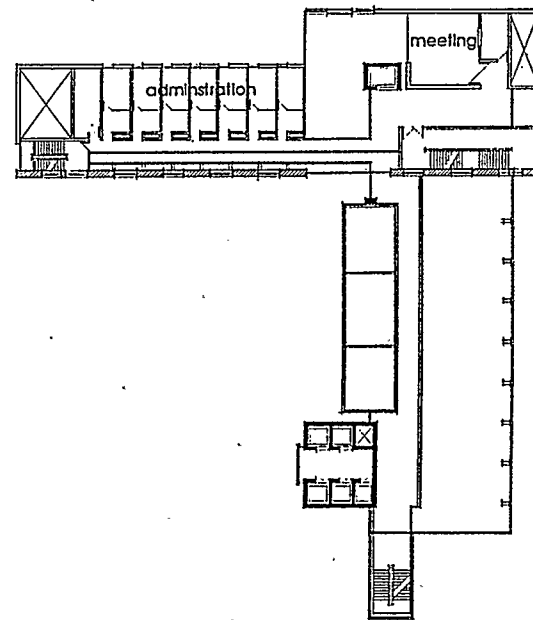
F/13 The building form evolved from an understanding of the relationship of light and architectural structure to the program-

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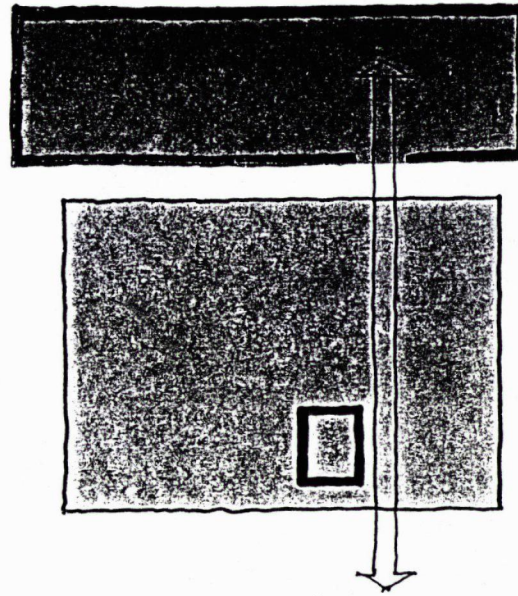
*matic considerations. The performance realm was framed on the north and south, resulting in three sectors that were associated with qualities of light and structure. Three qualities of light; transparency, translucency and opacity, were associated with parts of the building program and linked to the spatial artifact from the computer modeling. Performance was understood to be a realm associated with translucency, a quality of light between transparency and opacity. This lead to associations of transparency and opacity to the framing sectors. As the qualities of desired light were assigned, the nature of the architectonic*

experience is the way in which music organizes the sense of time. The listener in the performance space is involved in the performance with the suspension of disbelief; a suspension of the reality of time and space. Time is the single component that is contained in the experience of both architecture and musical performance.



+3.0 PLAN

D John Cage was a preeminent modern composer interested in exploring the philosophical and aesthetic boundaries of contemporary music. Early in his career, Cage became interested in the notion of silence and sound and time or duration as the common shared element. He wanted to explore these issues that had arisen as the result of technological advances in the making and manipulation of sound. These studies were focused on the perceptual understanding of time, not elements pertaining to acoustics such as pitch, harmony or



*structure was also developed. Opacity was associated with mass and limited perforations within the mass to allow the penetration of light to the building interior.*

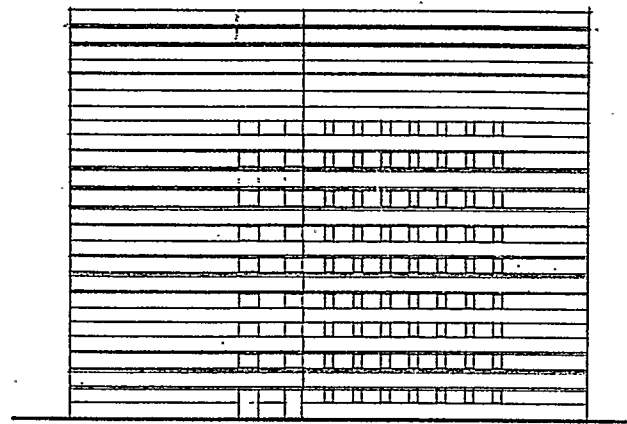
*The mass of the framing space provided the metaphorical and physical support for the suspension and containment of the performance realm. This frame was deeply rooted in the ground and has the character of solidity and strength in its form, massing and materials. Concrete floors and beams serve as cross bracing to the masonry and concrete walls. In contrast, the performance spaces were cantilevered from the mass of the vertical supports*

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*to emphasize the condition of the suspension of time and space. Translucent glass panels were hung from the floor structure to reinforce this impression. The upper performance space was supported in part from roof beams spanning between the framing mass and the bow trusses to express the connection between the frame and performance and highlight the suspended structural condition of the space. The combination of translucency and structure provides for a dynamic play of light and shadow throughout the interior of the performance realm and onto the framing wall behind. To elaborate the second frame, an attenu-*

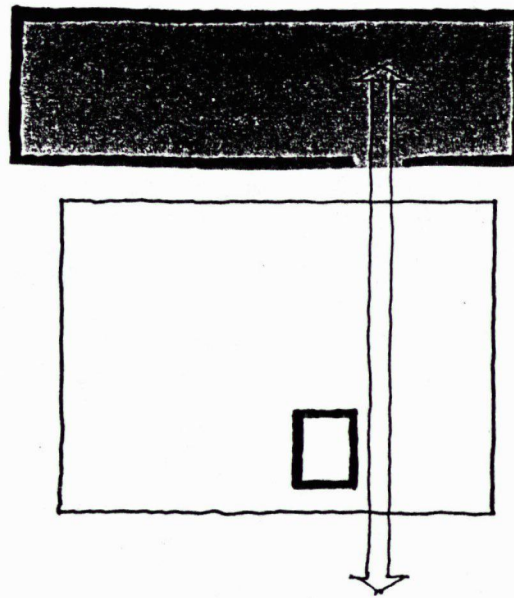
frequency. The structural processes John Cage developed to create music provided an appropriate parallel for the investigation of the temporal qualities of musical performance and architecture. In 1945, Cage wrote "Music For Marcel Duchamp," a film score for a sequence designed by Marcel Duchamp. Cage was given an exact length of time to fill with music and reflect the expression of the visual images; the piece became



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an investigation of time and space. An elaborate layering of rhythmic structures ensued, reflecting Cage's investigations into sound, silence and duration. To Cage, "structure, which is the division of the whole into parts; method, which is the note-to-note procedure; form, which is the expressive content, the morphology of the continuity; and materials, the sounds and silences of the composition, are all determined....," by his compositional philosophy. (Watkins, p. 561) The significant expression of the temporal ordering of this composition was the apparent repetition of sound. It is the layering of heard and remembered sound that



*ated skeleton of steel structure supported panels of transparent glass. This skin wrapped around the stairwell to emphasize the delicate quality of transparency and the elusiveness of its expression, dependent on a tracery of structure for elaboration.*

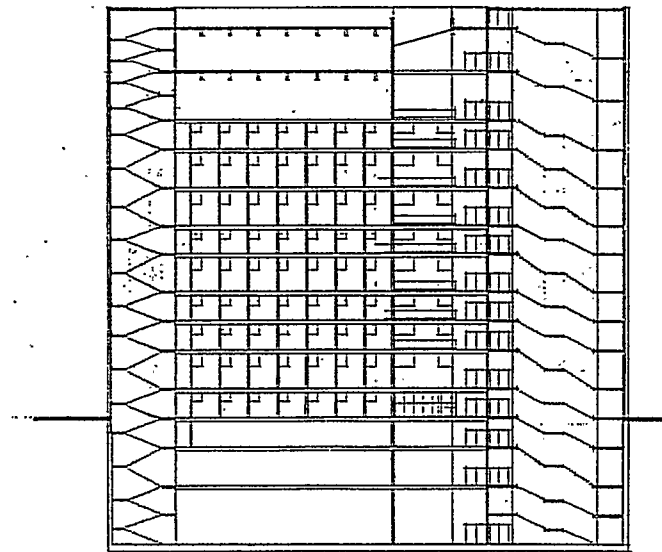
*The field of opacity was the realm containing the secular functions that support the presentation experience. These activities act as a frame for the ritual of musical performance. Therefore a framing wall was designed to serve as backdrop to the performance spaces and encloses the pragmatic activities of day to day functioning. The framing wall was articulated as a*

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*structural mass with perforations that provide for the penetration of light. The elaboration of the wall was a reflection of the proportional systems used throughout the building. The datum of proportions was established from the time sequence designed for the computer process and subsequently used to determine the main form of the architecture. This south facade incorporates a rhythmic module system of recessed and flush Tyndall stone panels. The choice of Tyndall stone reflects a civic precedent for facing buildings of public import. The new Edmonton City Hall (1992) incorporates recycled Tyndall stone from the previous*

contributes to the perception of repetition. However the procession of time denies an exact repetition of any experience. An understanding of Cage's approach to musical structure and his interpretation of the place and nature of music in the age of electronic reproducibility influenced the architectural compositional process.



EAST WEST SECTION

E Musical performance in Western society is a cultural ritual, as, "there is a direct line of evolution from ancient myth and ritual, to theatre, literature, and the visual arts, to film, and to television. Obviously these are analogous and historically parallel to the evolution of music from oral, to notated, to electronic media." (Johnson, p. 13) Cultural rituals occur at crucial points in the solar year resulting in a seasonal temporal order, an apparently repeating pattern based on a time sequence, a recognition of human identity. Rituals performed

*city hall built in 1955. Horizontal and vertical spacing of the masonry and fenestration on the facade facing the performance plaza followed a larger building order. The proportioning system on the remaining three sides of the enclosure adhered to this main system while fenestration provides a connection to the spaces and functions behind the facades. Where the play of light and shadow articulates the texture of the south facade; the tinal stone bands are flush with concrete panels to allow an articulation of colour in the softer north, east and west light. The overall proportioning system for structure visually ties the framing enclosure to other realms of the building and ensures the*

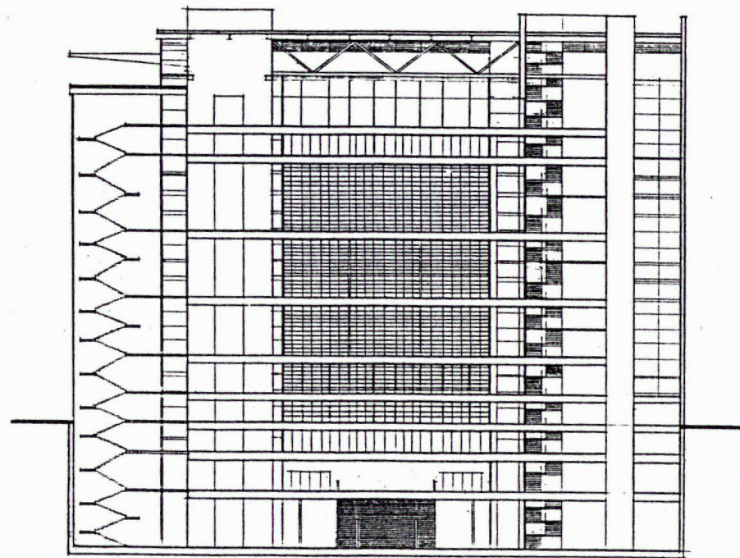
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*reading of the frame as a supporting mass.*

*Because the secular activities are predicated by a routine, repetitive schedule that is dominated by the clock, they are not considered cultural rituals. The sense of time in this sector of the building is regulated by the clock. This is the realm of apparent repetition. Rooms on every floor are determined by the same structural system and spacing although the activities contained within may change from floor to floor. Similarly the vertical spacing of the floor plates appears to be consistent because the*

with respect to critical points in the seasonal year are of a public character and expressed in the public sector. It is the sense of public ritual that validates musical performance in the twentieth century for, "While most would defend the continuing need to probe both empirically and theoretically the infinity of possibilities in the domain of sound, ...the need to find and connect with an audience has come to be an increasing



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expressed concern." (Watkins, p. 686) These events have a well defined beginning, middle and end; they take place in a clearly framed space. It is the framing or enclosure that demarcates the ritual and establishes an experience separate from everyday life. Therefore the performance as public ritual embodies a state of being during which participants understand there is a suspension of secular social and temporal relationships. This is analogous to the astronomical equinox, being on a threshold, between what has come before and what is to follow. Victor Turner (1986) applies the concept of liminality to this state of being. In the

*difference is minimal. A rhythmic sequence determined the structural spacing. The vertical and horizontal spacing in the framing wall was rhythmically tied to the dynamic established within the performance realm. The floor plates within the wall that do not connect with a performance floor are linked to the framing floor below by means of a set back in the circulation corridor. A tertiary relationship was established in the program spaces that acknowledged the varying circulation requirements and desired degrees of privacy. In plan the same function is located on one floor, the spaces are truly repetitive. However a progression of functions occurs as spaces more directly con-*

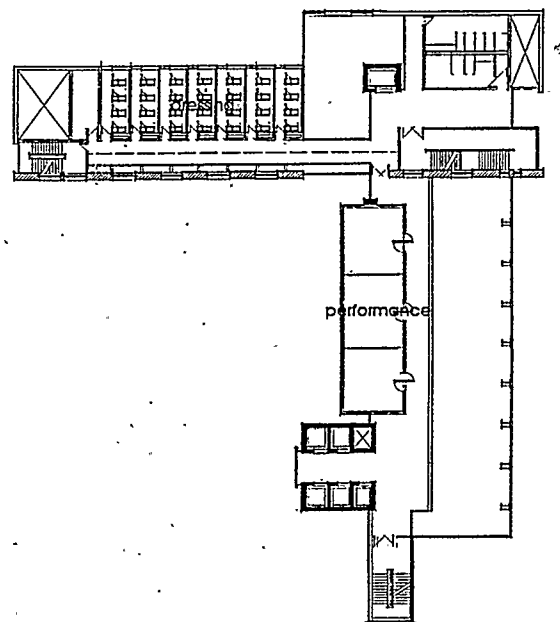
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*nected to the fruition of the performance are located closer to the top of the building. There is a parallel sense of vertical movement to that expressed in the performance spaces.*

*Electronic reproducibility has provided for a change in the way in which musical performance is notated and stored. All information can be stored on tape, "DAT (digital audio tape) is currently the most cost-effective means for storing high-quality digital audio. The development to the Digital Data Storage format*

technologically advanced society performance genres are characterized as liminoid, acknowledging the diversity of presentation types in contemporary culture. Spatial framing and the suspension of real time are key elements of the ritual; space and time cannot be separated in the understanding of performance. According to Turner the time during which the ritual takes place is called liminal time. Liminal time is



+4.0 PLAN

understood as a series of nows with past, present and future together forming a multi-perspectival consciousness. Because space is experienced with relation to time, a new perception of time necessarily leads to a new understanding of space. The space in which the ritual takes place is called liminal space. The liminal space is established by a framing process that allows for the ritual process to transpire in full public view. This space is firmly defined and understood by the participants in the ritual, although it may be permanent or situational, in place only for the duration of the ritual. The ritual space is in direct contrast to

*(DDS) has made possible the storage of non-audio data, such as text and scanned images, on DAT." (Bauman, p. 503) The space for the storage of electronic notation is a center for artificial memory, a paperless archive. The digital audio tape, as physical presence of the transitory musical experience is meaningless and acquires a kind of presence by absence in much the same way that Henry M. Sayre (1989) qualifies the photograph. The tape is not the literal communication of the complete experience but a kind of continuous present as the sound is available for repeated listening. The sound information on tape is considered performance when it is accessed from the spaces in the performance*

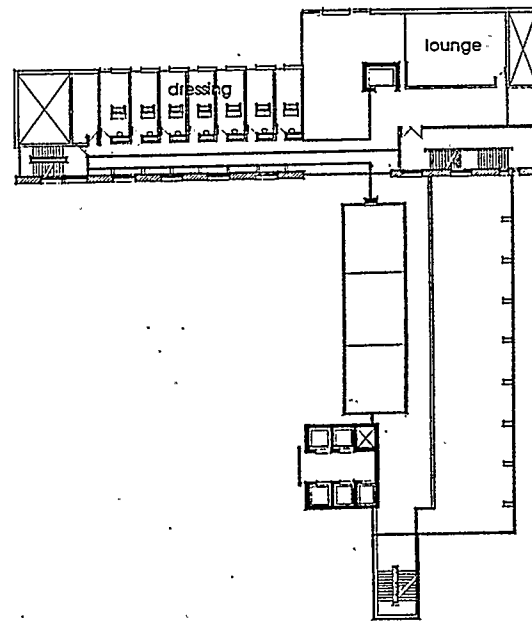
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*realm, in this way becoming part of the occasion of performance. Therefore the archive was at once separate from and a contingent part of the experience. This poetic conundrum was resolved spatially in architectural plan and section. The archive was located at the foundation of the performance realm in section. It represents the beginning of the performance process that culminates in the performance spaces above. In plan the archive was located at the termination of the circulation spine that moves between the quotidian frame and the performance spaces. At all levels above the foundation, in the quotidian frame, the archive*

quotidian space where common experiences of everyday life occur. The architecture for performance becomes musical space, contributing to the musical experience.

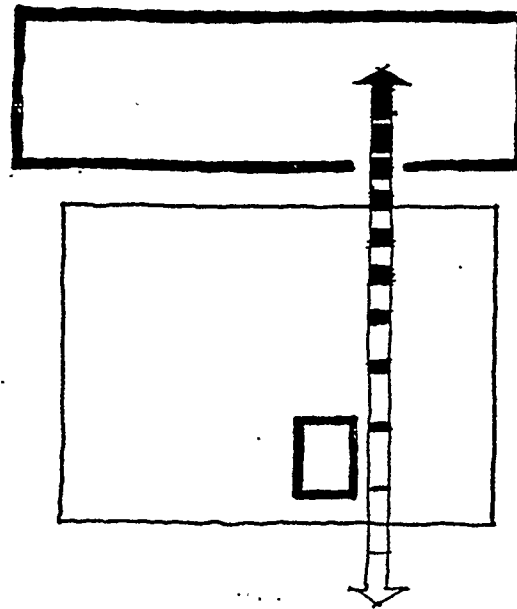
F In the late twentieth century, acoustics need no longer be the single determining factor in the definition



+5.0 PLAN



of architectural form of the musical performance space. The architectural form of the traditional black-box performance space was based on the acoustic requirements of a previous musical style. With the stylistic plurality in new music it became clear that the traditional concert hall did not respond spatially or acoustically to the performance requirements. It follows that, "...there will be a need for increasingly flexible or varied buildings for music, to accommodate composers' highly individual scoring techniques....As the composer increasingly specifies a context for his work, from the enclosed room, to the city streets, to



*exists as void, a presence by absence.*

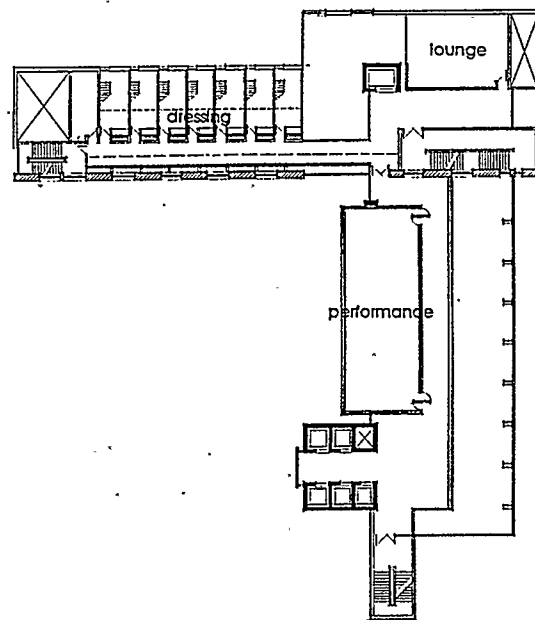
*Performance spaces and the spaces comprising the ritual frame are connected by a circulation spine. This spine limits the access from quotidian spaces to performance realm, penetrating through the framing wall at the same point throughout the building. This establishes the perception of crossing a threshold from one realm into another. It is as if a bar of space was displaced from the three sectors and moved out towards the south in order to break through the wall to provide access and maintain solidarity at the same time. Consequently the architectonic definition of the bar*

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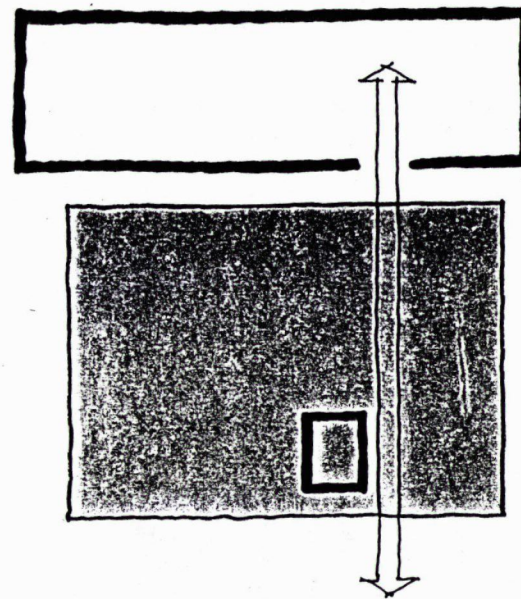
*was based on the three qualities of light that enhance the spaces it links. However, along the spine, light was related to experiences of movement and the spaces that are being moved between. Elevators and lobbies are enclosed, massive structures with limited views to the exterior. The experience of time suspended was accentuated with the loss of visual clues as to whereabouts and distance traveled. In contrast, the stair that projects out beyond the performance spaces was enclosed in a transparent structure of glass and steel. The stair was the furthest point from the solidity and mass of the quotidian frame and expresses the*

nature itself, the traditional concert hall may become a museum for old masters." (Forsyth, p. 327) As electronic capabilities have allowed for a redefinition of musical performance, they have also affected the way in which architectural form and acoustics are related. Technology provides the ability to modify and adapt sound to space so that an acoustically appropriate space could be produced to respond to the perceptual



+6.0 PLAN

parameters of a particular performance. "Any sound event reacts according to the acoustical conditions around it. One can aim at promoting the acoustical quality to the status of a musically controllable parameter, and consequently conceive rooms in which acoustical conditions could vary. Therefore one can either use a mechanically changing room (like, for example the Espace de Projection in IRCAM), or use an electroacoustic system (sound capture, diffusion, loudspeakers) that artificially recreates in the space the desired acoustical conditions." (Bloch, p. 253) To represent an artistic expression that itself utilizes sound



*transparency of this realm.*

*The field of transparency was the southern most edge of the building. To be truly transparent, this was an implied edge defined by the extension of the roof of the performance space above and the enclosed staircase. From this edge, the performance realm of translucency extends north.*

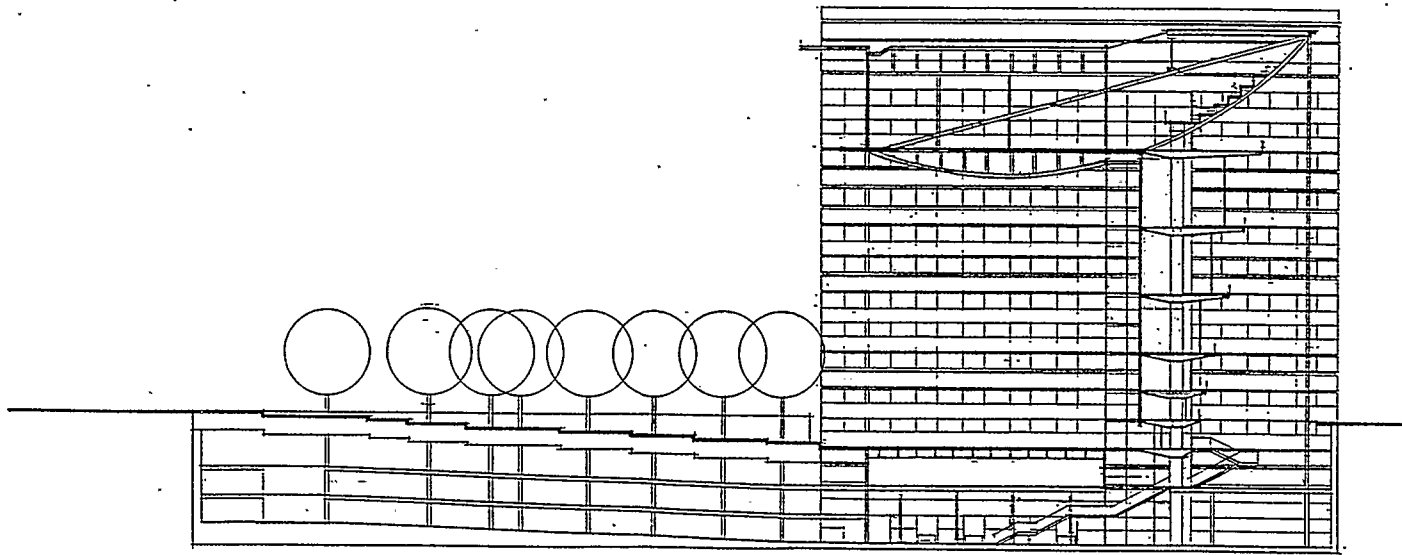
*Performance, identified as occurring within a space and time separate from and framed by the secular world, was understood to be enhanced by translucent light. Musical performance estab-*

#### ARCHITECTURE and OTHER MUSIC

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*lishes a dream-like experience when the everyday world is left behind and the musical presentation incites individual memory and recognition. The translucent quality of the light that enters these spaces reflects this character of the experience. The incidence of natural light into these performance spaces reinforces the interpretation of the passage of time that is linked to ritual and the seasons. The architecture emphasizes the temporal aspect of listening to music when memory modifies the impression of the passage of time. The translucent quality of the light in these spaces and the limited views to the outside encourages the*

technology, it is appropriate to accept an electroacoustic system for sound transmission in the performance space. Acoustic malleability becomes a component of the performance. New music composers such as Pierre Boulez, "...would like to see acoustics that can be recomposed and reconstituted, and don't necessarily depend on a given place. Acoustics that can be grafted on a given place you're working in, either

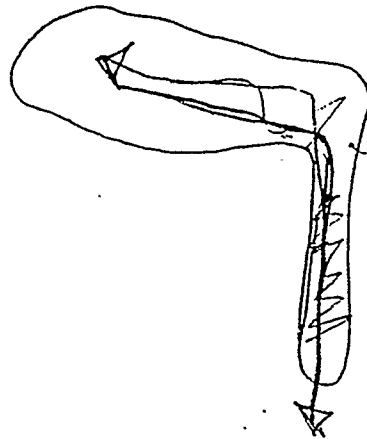


EAST WEST SECTION

to improve them or change them. That's what was done at Avignon in 1988 for the open air representation of Repons, in the Carriere Callet. There we had virtual acoustics mastered by electro-acoustic means." (As quoted in Suner, p. 117) Electro-acoustic sound transmission addresses the issues of plurality and technology in new music because, "Today's multipurpose concert halls offer so many diverse programs that it is difficult to achieve perfect acoustics for all occasions....To create the best possible acoustics in these chameleon like facilities, designers are turning to a controversial technology known as electronic

*incitement of imaginative perception.*

§/18 *Technology as a source for creative inspiration and acoustic manipulation in musical performance defined a poetic realm that set the spatial parameters for performance. Performance was considered to occur anywhere within this realm. The spatial essence in section was extracted from the resultant form from the computer process; a volume that moved up and out toward the civic square. The sense of metaphorical movement outward towards the civic square symbolizes the intrinsic connection of society and the ritual of musical performance. The*

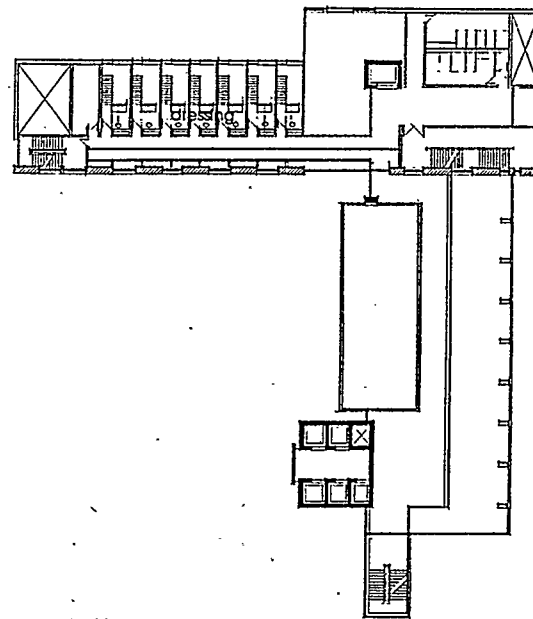


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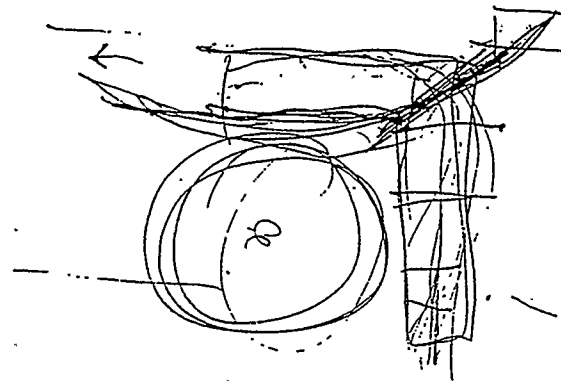
*vertical performance spaces were articulated as a single translucent space that defines the back limit of performance on the site. The transition from the vertical to the horizontal spaces was accomplished with a single gesture that allowed the extension of the horizontal platform out over the plaza below. Architectonic expression of this abstraction took the form of a truss that incorporated the angle of the move from vertical to horizontal and provided for the cantilever of space out toward the civic square.*

architecture. ...The technology essentially dissociates sound reflections from the physical environment, making acoustics largely independent of architectural form and eliminating the need for movable, sound-absorbing elements. ...Although Purists may still decry electronics in the concert hall, a new generation of concertgoers—accustomed to nearly flawless sound from compact disk players at home—may come to



+7.0 PLAN

appreciate or even expect such sound at live performances." (Dorris, p.85) In the late twentieth century the question becomes not will there be performance, but rather, what will be the nature of this performance and the space within which it is presented. Therefore, many contemporary artists have proposed that, "...centres of experimental music must be established. In these centres, the new materials, oscillators, turntables, generators, means for amplifying small sounds, film phonographs etc. be available for use. Composers at work using twentieth century means for making music. Performances of results. Organization of sound for



H/20 Although the ability to electronically reproduce sound is not inherently good or bad, this technology has impacted the traditional nature of performance and the space in which performance occurs. The focus became the unification of listener and technology for a contemporary ritual of musical performance. Performance spaces take many forms to accommodate the variability of the performance space requirements of new music. What differentiates these spaces is the degree to which the performer would be accommodated. The musical performance ritual in modern society takes many forms, which may or may not necessitate performers. From the broadcast of tape or digital

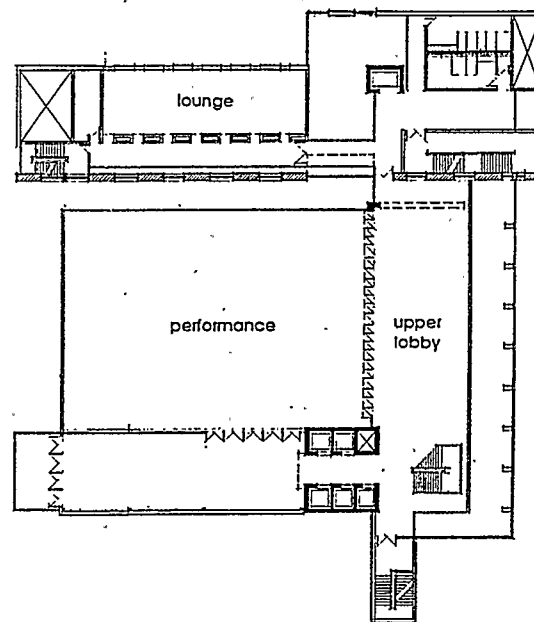
## ARCHITECTURE and OTHER MUSIC

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information to live performance, the electronic performance realm seeks to accommodate many possibilities while still acknowledging the relevance of the listener in the performance space of the ritual.

The foundation of musical performance in the age of electronic reproduction is the recording studio. The studio is a space remote from, and yet intrinsic to the musical performance. The creative work undertaken in the studio would necessarily be performance in nature only when it is presented to society, a presentation that

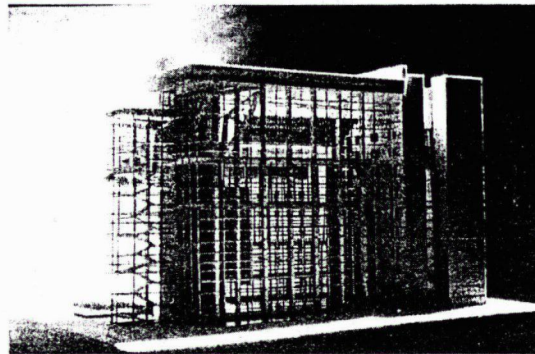
extra-musical purposes." (Cage, p. 18) The architecture for musical performance should provide for spaces that recognize the distinct qualities of the new music compositions. This implies a series of performance spaces to accommodate the intent of the composer and provide for an appropriate performance presentation. Therefore the composer is presented with an opportunity to unite space and time in the cultural ritual.



+8.0 PLAN



Ⓒ Technology has provided the twentieth century with the ability to record and repeat exactly the same aural presentation information at will. Consequently, "...what is still of greater significance vis-à-vis the technological factor changing the parameters of the 'live performance' is the way that studio reproduction has reversed the conceptual expectation of 'realism' as it applies to 'recorded' and 'live' music. That is to say that whereas initially the 'recording' was expected to be a faithful representation of the original 'live'



*occurs in the ritual spaces above. Consequently, the recording studio was placed beneath the main performance hall in section, remote from natural light. The incidence of natural light into the space was restricted to parallel the essence of the fundamental programmatic activities. Electronic sampling, copying and re-configuring of the musical information results in a layering of time that denies the evolution of the passage of time. The lack of direct natural light into the studio reinforces the perception of a continuous present.*

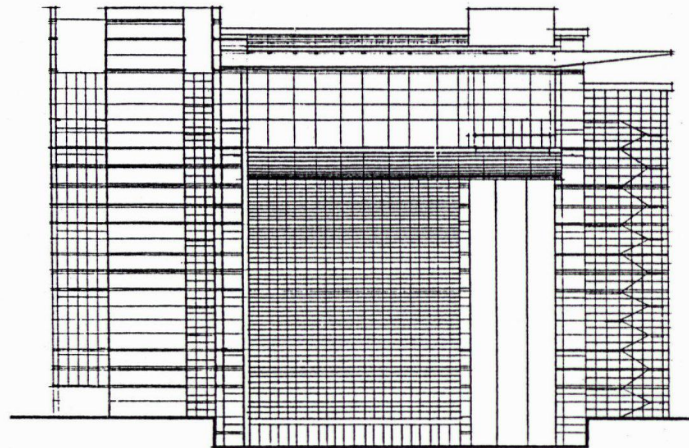
*The translucent spaces that comprise the vertical column of the*

## ARCHITECTURE and OTHER MUSIC

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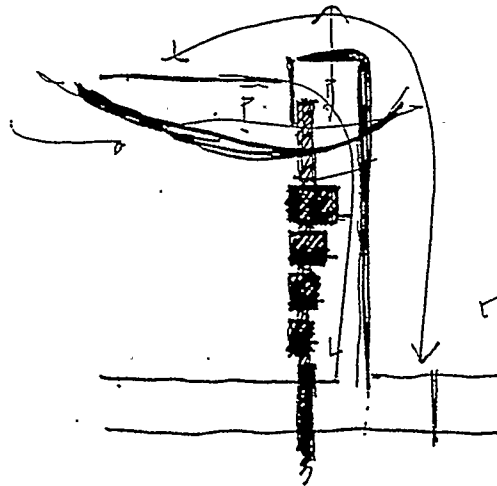
*performance realm were designed for listening. Existing within the technological domain of the building, these spaces allow the listeners complete control of the electronic acoustic qualities of the rooms. These spaces may be used to access information from the musical archive or for presentation of a performance. The rooms begin as spaces for individuals and increase in size on successive levels. What is common to these spaces is the way that light modifies the performance experience. Light enters the rooms through an electronic screen that faces the public plaza. The screen is comprised of layers of planes of glass, between*

performance now it is the 'recording' of the studio performance which is deemed to be the 'original' and the live performance is merely a substandard albeit visually complete copy." (White, p.4) The greater portion of the population of Western culture is exposed to music as the result of the ability to transmit and record sound. The audience arrives at the performance with aural expectations based on home or car audio



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system capabilities. The technically perfect copy is the basis for expectation of the musical performance. The dynamics of the performance presentation are consequently subverted as viewers expect to hear and experience exactly what they have heard outside the performance space. The concert has become the glorification of the recording while the recording is the acoustically perfect aural experience. Electronic reproducibility is an acknowledged component of musical performance and as such "the essence of this development lies not so much in our increasing ability to model and invent, but rather in the ways in which



*which electronic information is transmitted. The screen filters the character of incidental light and electronically modifies the sound qualities of the rooms. The electronic screen allows the projection of audio and video images to the plaza and stepped terraces beyond. When not in use, the screen is translucent, behind which the inhabitants of the rooms may be discerned. The electronic capabilities of the age combine with the architecture to become dynamic components of the musical performance.*

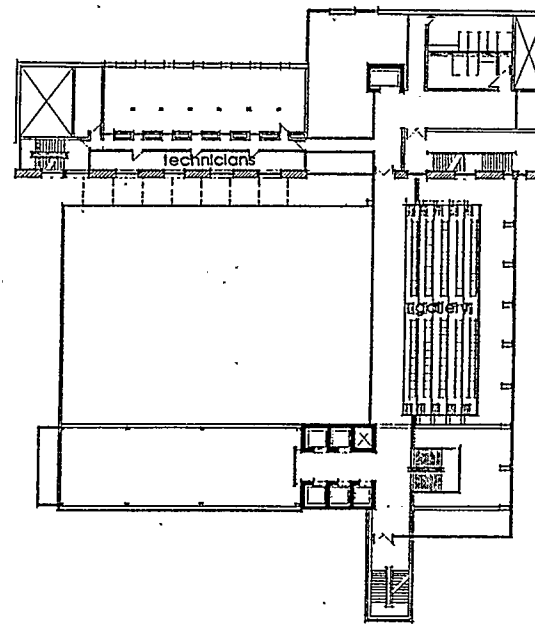
*The performance space that is cantilevered above the outdoor plaza offers the greatest flexibility for musical performance. It is*

#### ARCHITECTURE and OTHER MUSIC

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*within the horizontal column of the electronic screen and provides similar technology for control of sound as found in the vertical performance spaces. Enclosure is translucent glass that provides the appropriate light qualities and sensitivities to sound. This was not to be a black-box performance space hidden within the massive form of the late-nineteenth century concert halls. The gesture of form and translucent materiality reinforce the nature and significance of musical performance in the age of electronic reproducibility. Glass is also an appropriate material for the enhancement of sound within a space. In the explanation for his*

we'll relate to one another in this new domain—as soon as we allow technology to intervene in the process within the culture. The sense of ritual, as an occasion uniting time and space, is the appropriate focus, for, "Whatever space and time mean, place and occasion mean more. For space in the image of man is place, and time in the image of man is occasion." (Van Eyck, p.49) Architecture is linked to the sense of occasion

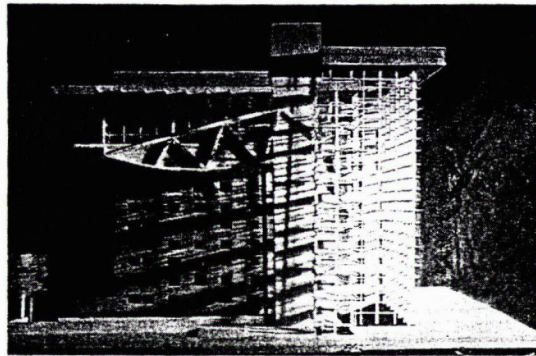


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by providing the space for the unfolding of the ritual.

H It is the sense of public ritual that validates the performance. Performance spaces that support the presentation of new music provide a forum for authenticity. A new notion of performance space within the limits of the technological capabilities and creative imagination of the composer is necessary to establish this forum. Within the paradigm of a new poetics of performance is the idea of a dissolution of traditional



*Nara Convention Hall, Arata Isozaki states that glass, "...as a finishing material for the interior of the concert hall, not only reflects sound, but is similar to fiber-reinforced board in its ability to absorb sound. In addition, by corrugating its surface at the level of the audience, the glass can be made to refract sound, reflecting it at various angles for a very rich acoustic quality." (Isozaki, p.25) The glass also enables the occupants to perceive the structural members that suspend the space above the plaza. This reinforces the position of performance in the technological society as occurring in a ritual space that is disconnected from the everyday world; a place where clock time is suspended. The*

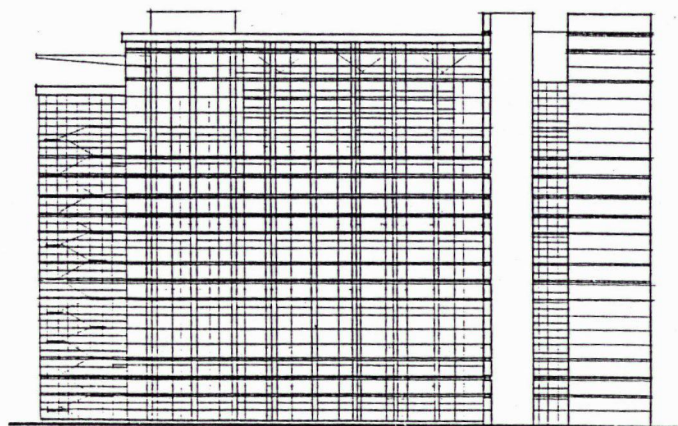
#### ARCHITECTURE and OTHER MUSIC

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*glazing on the north wall of the concert hall highlights the reveal that separates the cantilevered space from the structural wall. The bow truss was thrown into relief against the translucent glass panels on the south facade. The play of light and structure is dynamic and modifies the interpretation of the space from within. This was the largest interior space for performance. The lack of fixed seating allows the composers and performers to define the orientation and spatial composition of the performance.*

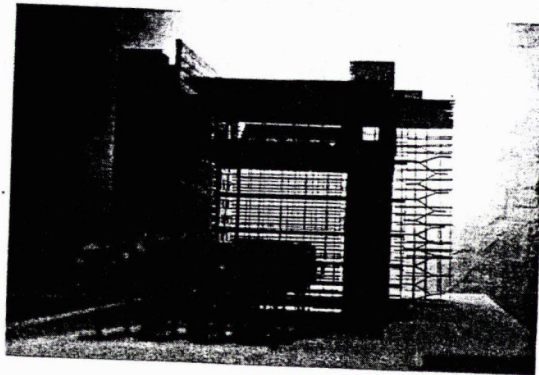
*The gallery is a unique space in the performance realm. Sus-*

distinctions between art and life. The distinguishing factor of the performance is the spatial framing and the presence of an audience. Because the idea of the original implies a single existence in space the musical performance may occur in only one ritual space and time. A work of art may not be considered separately from ritual as "the unique value of the 'authentic' work of art has its basis in ritual, the location of its original



WEST ELEVATION

use value." (Benjamin, p. 32) Consequently authenticity is tied to the idea of ritual and the presentation of the performance within the ritual frame. However the new music is not specifically associated with a ritualistic architectural frame. The preponderant existence of concert halls modelled after the nineteenth century form have denied the evolution of performance and its position in society. Performances of new music have attempted to attain authenticity through presentation within the traditional concert hall but have succeeded only in compromising the expression of the music because, "...adopting the traditional concert



*pended one floor above the main performance platform, the gallery provides further possibilities for performance. Views from the gallery out through the roof glazing to the cityscape establishes a unique character for this space. Performance in the large hall may include the gallery as seating for audience or performers, however it is not necessary that the two spaces be utilized in tandem. Located at the junction of the horizontal and vertical columns of the performance sector, the gallery is at once part of the larger platform and the vertical performance spaces below. The raked seating provides closure to the lobby below. The lobby is an ethereal space enclosed in glass, vertically connecting*

## ARCHITECTURE and OTHER MUSIC

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*the performance spaces that are cantilevered off the support structure. These performance spaces are interior spaces within the lobby that also act as the facade between the lobby and the plaza. The attenuated structure and translucent glass panels combine with incident light to provide an ever changing play of shadow against the massive Tyndall stone wall behind.*

*The architecture for performance was a composition of structural mass and light, reflecting in its form, the process of its making, and the relationship between architecture, use and culture.*

paradigm often creates a context which effectively counteracts the musical intentions of the composer. The challenge is to create a presentation context designed to work with the music, not against it." (Garton, p. 140) In this way the architecture becomes part of performance, designed to enhance the intent of the presentation providing for the unfolding of the cultural ritual in the age of electronic reproducibility.



## REFERENCES

- Angelil, M. 1990. "Experimentation as Modus Operandi An Investigation of Design Process: The Los Angeles Art Park." *Journal of Architectural Education*, November: 37 - 44.
- Belkin, A. 1991. "Who's Playing? The Computer's Role in Musical Performance." *ICMC Proceedings*, San Francisco, 131 - 134.
- Benjamin, W. "The Work of Art in the Age of Mechanical Reproduction." In Handardt, J., ed., *Video Culture A Critical Investigation*. New York: Gibbs M. Smith, Inc., 1986.
- Bloch, G., G. Assayag, O. Warusfel et J.- P. Jullien. 1992. "Spatializer: From Room Acoustics to Virtual Acoustics." *ICMC Proceedings*, San Francisco, 253 - 256.
- Brownlee, D. and D. DeLong. 1991. *Louis I. Kahn: In the Realm of Architecture*. New York: Rizzoli, 148 - 149.
- Bruinsma, M. 1990. "Notes of a Listener." In Lander, D. and Micah Lexier, ed. *Sound By Artists*. Toronto: Art Metropole.
- Cage, J. 1990. "The Future of Music: Credo." In Lander, D. and Micah Lexier, ed. *Sound By Artists*. Toronto: Art Metropole.
- Delehanty, S. 1990. "Soundings." In Lander, D. and Micah Lexier, ed. *Sound By Artists*. Toronto: Art Metropole.
- Deleuze, G. 1988. *Bergsonism*. edited by Hugh Tomlinson and Barbara Habberjam. New York: Zone Books.
- Dorgan, R. 1990. "Music in Architecture / Architecture in Music." *ICMC Proceedings*, Glasgow, 361 - 363.
- Dorris, V. 1992. "Wired For Sound." *Architecture*, August, 85 - 86.
- Erikson, R. 1963. "Time Relations." *Journal of Music Theory*, Winter, 174 - 192.
- Ferriby, B. 1991. "Harmony and Discord." *Dimensions*, 5, 74 - 77.
- Forsyth, M. 1985. *Buildings For Music*. Cambridge, Massachusetts: the MIT Press.
- Garton, B. and Maria Helmuth 1992. "Composing the Output Interface." *ICMC Proceedings*, San Francisco, 139 - 142.
- Johnson, R. 1991. "Machine Songs I: Music and the Electronic Media." *Computer Music Journal*, 15 (2), 12 - 20.
- Keane, D. 1986. "At the Threshold of an Aesthetic." ed. Emmerson, S., *The Language of Electroacoustic Music*. London: MacMillan Press Ltd.
- Lansky, P. 1990. "A View From the Bus: When Machines Make Music." *Perspectives of New Music*, 28 (2), 103 - 109.
- Nattiez, J. 1989. *Proust as Musician*. trans. D. Puffet. New York: Cambridge University Press.
- Sayre, H. 1990. *The Object of Performance: The American Avant Garde Since 1970*. Chicago: The University of Chicago Press.
- Suner, B. and J.- P. Jullien. 1991. "Composing With Space." *L'Architecture d'Aujourd'hui*, 268, April 1991, 117.
- Turner, V. 1986. *The Anthropology of Performance*. New York: PAJ Publication.
- Van Eyck, A. 1982. "Building a House." In Hertzberger, H., A. van Roijen-Wortmann and F. Strauven, *Aldo Van Eyck*. Amsterdam: Stichting Wonen / Van Logum Slaterus.
- Watkins, G. 1988. *Soundings, Music in the Twentieth Century*. New York: Schirmer.
- White, L. 1987. *Lost in Music: Culture, Style and the Musical Event*. New York: Routledge & Kegan Paul Ltd.



# BIBLIOGRAPHY

- Angelil, M. "Experimentation as Modus Operandi: An Investigation of Design Process: The Los Angeles Art Park." *Journal of Architectural Education*, November, 1990, 37 - 44.
- Barthes, R. *"Image Music Text,"* trans. S. Heath, London: Fontana Paperbacks, 1984.
- Battcock, G., ed. *Breaking the Sound Barrier: A Critical Anthology of the New Music.* New York: E.P. Dutton Publishing Co. Inc., 1981.
- Bauman, M., G. Diener, and M. Mathews. "The International Digital ElectroAcoustic Music Archive." *ICMC Proceedings*, San Francisco, 1991, 501 - 504.
- Belkin, A. "Who's Playing? The Computer's Role in Musical Performance." *ICMC Proceedings*, San Francisco, 1991.
- Benamou, M. and Charles Caramello, eds. *Performance in Postmodern Culture.* Madison, Wisconsin; Coda Press, Inc., 1977.
- Beranek, L. *Music, Acoustics, and Architecture.* New York: John Wiley and Sons, Inc., 1962.
- Bloch, G., G. Assayag, O. Warusfel et J.-P. Jullien. "Spatializer: From Room Acoustics to Virtual Acoustics." *ICMC Proceedings*, San Francisco, 1991, 131 - 134.
- Bloomer, K. "On Concert Halls: Conversations with Ralph Kirkpatrick." *Perspecta The Yale Architectural Journal*, 1980.
- Brindle, R. S. *The New Music: The Avant-Garde since 1945.* New York: Oxford University Press, 1981.
- Brownlee, D. and D. DeLong. *Louis I. Kahn: In the Realm of Architecture.* New York: Rizzoli, 1991.
- Cage, J. *Silence, Lectures and Writings.* Middletown, Connecticut: Wesleyan University Press, 1961.
- Cage, J. *Music For Marcel Duchamp.* New York: Henmar Press, Inc., Edition No. 6728, 1945.
- Cage, J. *A Year From Monday, New Lectures and Writings by John Cage.* London: Calder and Boyars, 1968.
- Cook, N. *Music, Imagination and Culture.* Oxford: Clarendon Press, 1990.
- Deleuze, G. *Bergsonism.* eds. H. Tomlinson, and B. Habberjam. New York: Zone Books, 1988.
- Dorgan, R. "Music in Architecture / Architecture in Music." *ICMC Proceedings*, Glasgow, 1990, 361 - 363.
- Dorris, V. "Wired For Sound." *Architecture*, August, 1992, 85 - 86.
- Erikson, R. "Time Relations." *Journal of Music Theory*, Winter: 1963, 174 - 192.
- Ferriby, B. "Harmony and Discord." *Dimensions*, 5, 4 - 7.
- Forsyth, M. *Buildings For Music.* Cambridge, Massachusetts: the MIT Press, 1985.
- Foster, H. *The Anti-Aesthetic, Essays on Postmodern Culture.* Seattle, Washington: The Bay Press, 1983.
- Garton, B. and Maria Helmuth "Composing the Output Interface." *ICMC Proceedings*, San Francisco, 1991, 139 - 142.
- Goldberg, T. and G. Schrack. "Computer - Aided Correlation of Musical and Visual Structures." *Leonardo*, 19 (1), 1986, 11 - 17.
- Griffiths, P. *Cage.* London: Oxford University Press, 1981.
- Hertzberger, H., A. van Rooijen-Wortmann and F. Strauven, eds., *Aldo Van Eyck.* Amsterdam: Stichting Wonen / Van Logum Slaterus, 1982.
- Isozaki, Arata. "Nara Convention Hall." *Japan Architect*, 1992 - 93, 20 - 34.
- Johnson, R. "Machine Songs I: Music and the Electronic Media." *Computer Music Journal*, 15 (2), 1991, 12 - 20.
- Keane, D. "At the Threshold of an Aesthetic." ed., S. Emmerson. *The Language of Electroacoustic Music.* London: MacMillan Press Ltd., 1986.
- Kostelanetz, R. *Conversing With John Cage.* New York: Proscenium Publishers Inc., 1987.
- Lander, D., and Micah Lexier, eds. *Sound By Artists.* Toronto: Art Metropole, 1990.
- Langer, S. *Feeling and Form A Theory of Art.* New York: Charles Scribner's Sons, 1953.
- Lansky, P. "A View From the Bus: When Machines Make Music." *Perspectives of New Music*, 28 (2), 1990, 103 - 109.
- Leppert, R. and Susan McClary. *Music and Society: the Politics of Composition, Performance, and Reception.* Cambridge: Cambridge University Press, 1987.
- Lord, P. and D. Templeton. *The Architecture of Sound: Designing Places of Assembly.* London: Architectural Press Limited, 1986.

- McFarlane, S. "Architecture and Jazz." *RAIC Student Design Annual* 1991, 2 - 11.
- Nattiez, J. *Proust as Musician*. trans., D. Puffet. New York: Cambridge University Press, 1989.
- Osborn, Ed. "Local Conditions and Perceptual Concerns: Notes on Several Sound Works." *Leonardo Music Journal*, 1 (1), 1991.
- Pevsner, Nikolaus. *A History of Building Types*. Princeton: Princeton University Press, 1976.
- Shinoda, P., and D. Kesler, eds. *PRECIS, The Culture of Fragments The Journal of the Columbia University Graduate School of Architecture, Planning and Preservation*. Volume 6, Spring, 1987.
- Sayre, H. *The Object of Performance: The American Avant Garde Since 1970*. Chicago: The University of Chicago Press, 1990.
- Schechner, R, and W. Appel, eds. *By Means of Performance*. Cambridge, Massachusetts: Cambridge University Press, 1990.
- Scruton, R. *The Aesthetic Understanding, Essays in the Philosophy of Art and Culture*. Manchester, England: Carcanet New Press Ltd., 1983.
- Scruton, R. *The Aesthetics of Architecture*. Princeton, New Jersey: Princeton University Press, 1979.
- Stravinsky, I. *Poetics of Music*. Toronto: Random House of Canada, 1947.
- Suner, B. and J.- P. Jullien. "Composing With Space." *L'Architecture d'Aujourd'hui*, April 1990, 114 - 117.
- Supicic, I. *Music in Society: A Guide to the Sociology of Music*. Stuyvesant, New York: Pendragon Press, 1987.
- Tschumi, B. "Competition Entries: National Theatre, Tokyo / County Hall, Strasburg." *AA Files, Annals of the Architectural Association School of Architecture*, 13, Autumn 1986.
- Turner, V. *The Anthropology of Performance*. New York: PAJ Publication, 1986.
- de Visser, E. "Times and Silences." *Musicworks*, 50, Summer 1991, 37 - 39.
- Watkins, G. *Soundings: Music in the Twentieth Century*. New York: Schirmer, 1988.
- Wharram, B. *Elementary Rudiments of Music*. Oakville, Ontario: The Frederick Harris Music Co. Limited, 1969.
- White, L. *Lost in Music: Culture, Style and the Musical Event*. New York: Routledge & Kegan Paul Ltd., 1987.
- Wigley, M. "The Translation of Architecture: The Product of Babel." *Architecture Design*, 60, 1990.