Actors perform. Dancers perform. Orchestras perform. Buildings perform? The first three examples are easy to understand, but the fourth example is less evident. Actors, dancers and musicians who make up an orchestra are people who execute a creative idea before an audience. A building can perform as a shelter for the people and items within its confines, but this is not the same. Function is only one part of a performance; other elements are required to perform, as would an actor including time, place, participants, scenario, clothing, sound and movement. All architecture must be able to execute a motif for the enjoyment of the people who use it, view it or pass by it. Goethe paraphrased Schelling stating, "Architecture is frozen music."
A possible origin of performance

Early people survived on a tenuous web above the effects of the natural world. Any flaw or disturbance in this weaving was a matter of life and death, where the existence of the entire tribe was at stake. Therefore, this safety net needed strengthening in many ways: procreation, hunting, gathering, development of skills, evolution of tools and practice of the skills with these tools.

Many anthropologists and historians believe this aforementioned practice led to the introduction of ritual in early society, which enacted relationships and served as unconscious guidelines for behavior. By observing the traits of their prey, hunters gained insight on how best to hunt these animals. After a successful hunt, the tribe would gather around the campfire and the hunters would illustrate the day's activities in a mock battle. One warrior dressed in the skin of the recently killed prey would imitate the beast's movement while his fellow hunters would approach and "slay" him in a symbolic dance. Therefore, it became common for the tribe to celebrate successful hunts with a feast and victory dance because the tribe had survived another day.

These early tribes became aware of forces that affected their health, safety and ability to hunt and gather. These forces, such as weather and seasonal changes, were supernatural forces that produced desirable or undesirable situations. If the tribe failed to obtain meat for an extended amount of time, the people would believe they had upset these supernatural beings. Yet, the tribe perceived a connection between the victory dances performed after a successful hunt and the acquisition of meat. At this point, the hunters would perform their ritualistic dance around the campfire to
appease the gods and ask for a triumphant hunt.

From these rituals, others would appear to mollify the gods of disease, famine, flood and many others. Soon, anthropologists saw almost all transactions between humans as performative or as enactments of relationships with specific purposes. The wedding ritual redefines the interaction between the bride and groom, the extended families and society in general. The O.J. Simpson murder trial clearly illustrates the effect of a performance on society. The media frenzy surrounding the ritualized judicial system brought the murder into the homes of many people and America waited breathlessly for the outcome to be announced, guilty or not guilty. Performance has infused almost everything humans do including architecture.

Proposed Project

In order to illustrate that architecture performs, evaluation of the proposed Albert Kahn National Theatre Performance Center will consider its expression of the elements of performance. This center will be a combination of performance spaces including musical and dramatic events, while providing for future expansion of a dance theatre.

The project begins with an existing lyric theatre, the National Theatre designed by Albert Kahn in 1911. The National Register of Historic Places list the theatre, but requires significant restoration because it is in a greatly deteriorated state. The National Theatre has a seating capacity of 1,500, including the balcony. The original function of the theatre was for vaudeville performances and the projection of motion pictures. Therefore, the theatre contains all necessary support spaces for these applications. However, adaptation of these spaces is necessary to meet current theatrical stage production spatial requirements. Other adaptations will include bringing the theatre up to current accessibility requirements. The
concert hall addition will complement the existing lyric theatre and provide a greater range of performance spaces.

The concert hall will provide an acoustically sound space for various musical genres to support traveling groups and local artists. The lobby will be an extension of the existing theatre lobby. Supporting spaces shall include a café, gift shop, exhibition gallery, rehearsal spaces, green room, instrument storage, hydraulic pit and administrative offices for the complex.

ELEMENTS

As performance evolved, activities such as dance, drama and music demonstrated several common traits or elements that appear in most societal and cultural arenas. Oscar G. Brockett and Franklin J. Hildy provide a list of these "performative elements" in their book, History of the Theatre:

- Time
- Place
- Participants
- Scenario
- Clothing
- Sound
- Movement
- Function

Each activity utilizes a combination of these elements to provide the desired effects of the artist's vision. How this combination of conventions is treated distinguishes one kind of performance from another.

Since it [architecture] is music in space, as it were a frozen music. —Schelling

If Schelling's philosophy is a basis for evaluating structures, architecture must follow Brockett's "performative elements." Therefore, the elements need definition in terms of architecture.
Time

Time is multi-dimensional as it plays out within a performance. During the ritual of a church service, time takes on two different points of reference, immediate and eternal. The immediate time lasts for the duration of the ceremony, while the eternal time defines the relationship between the human and the divine. Dramatic performances bend and warp the reality of time allowing months and years to pass in a mere moment. Other aspects of time depend on period in which an event transpires, breakfast normally occurs in the morning, most of Salvador Dali's paintings are from the Surrealistic period or the Persian Gulf War took place in 1991. Additionally, time...
can refer to the beat or rhythm of the music whether it is flowing or syncopated.

In architecture, time reacts to many of the same concerns as other performance arts. People classify buildings by their stylistic period, Gothic or Neo-Baroque. The year of construction identifies a structure in relation to other structures within the area. The hours of operation set up by the owners of the organizations within buildings help serve the clientele. Finally, a building can establish a rhythm, which can carry throughout the entire building, creating a cohesive whole.

**Place**

Place can define a space in which an event occurs or a location in the world. These spaces vary with each performance depending on the nature of the event. Spaces can be specifically built for events or spaces can be found. If an event is mobile, the place can change within the duration of the show such as the processions of the cycle and morality plays. Depending on the event, a stage can become any place only limited by the imagination of the scenic artist.

Since performances occur in all societies, places of performance are in almost every place on earth. Some of these venues take the shape of theatres and concert halls, while others are parks, city squares, cafes or factories. Armand Gatti created a play about a person from the Spanish Civil War, but performed the play in an abandoned factory. Gatti explains the dynamic of performing in a factory:

With this kind of subject, it's mostly the **place**, the architecture that does the writing. The theatre was located not in some kind of Utopian place, but in a historic place, a place with a history. There was grease, and there were acid
marks, because it was a chemical factory; you still see traces of work; there were still work-clothes around; there were still lunch-pails in the corner, etc. In other words, all these leftover traces of work had their own language. These rooms that had known the labor of human beings day after day had their own language, and you either used that language or you didn't say anything. . . . That's why I wrote in an article "a play authored by a factory."

This demonstrates that almost any spaces can become a place of performance without being specifically designed for those events. However, most of the major cities in the world have one or more spaces specifically designed for performance.

**Participants**

Participants appear self-explanatory referring to the cast, crew and audience. However, several other considerations emerge when accounting for the context of the place. The building must coexist with its neighborhood and community both human and inanimate. If traveling companies are involved, the number of participants grows to include roadies, drivers and many other personnel associated with the tour. Maintenance personnel require access to spaces unseen by the public, but necessary for the public's comfort. Many of the audience members are responsible for funding the construction of the building or a specific project presented at the venue. These financiers are special participants who require individual care. Together, all the participants including the structure create a performance that is worth remembering.
Scenario

Scenario is the most difficult element to define; yet, it is no less important than the other elements. Concisely, the scenario is the agenda, goal, text or rules. The script lays out the actions of the actors and anticipates the reactions of the crowd. A good script is well formed and well received, but a bad script can cause riots. The opening of Le Sacre du printemps by the Ballet Russes in Paris met with cries of sacrilege and riots following its première. The architectural scenario would correlate to the concept that drives the design and informs the participants about the events within the building.

Clothing

Costumes create a fantasy world on the stage encouraging the audience to leave reality behind and enter this new world at least for a short time. Orchestras dress uniformly to emphasize the music rather than the musicians. Audience members dress according to stature impressing others with their dignity and apparent wealth.

Clothing for architecture is the cladding of the building and its spaces. These claddings vary from the fantastic to the ordinary; from the low tech to the high tech; from the inexpensive to the expensive. Frank O. Gehry’s Guggenheim in Bilbao, Spain represents a fantasy world, while Jean Nouvel’s L’Institute du Monde Arabe in Paris, France creates a high tech solution to a structures cladding.

Sound

Every performance relies on the element of sound even the mime on the streets of New York reacts to the applause of the crowd. In fact, Composer John Cage performed his piece 4'
33", which is 4 minutes and 33 seconds of silence, before an audience creating music from the coughs and stirrings of that audience. Although, these are rare cases, most performance uses sound conventionally and attempt to avoid noise.

Acoustics of a space can be the most important factor in design, but designers often neglect it because of lack of knowledge, time or budget. In most building types, acoustics is not a driving force behind design, but designers should investigate its effect on the users. Offices require a balance of sound transmission and background noise to create a desirable work environment, while warehouses usually require little to no acoustical evaluation because of the minimal amount of human habitation of the space.

Many building types require extensive evaluation of acoustics including auditoria, concert halls, theatres, churches, gymnasiums and the growing trend for sports arenas to act as concert venues. In each of these cases, the space must promote the sound of the specific event, while virtually eliminating any noise. Manipulation of the reverberation time, which is the time in seconds for the sound level to decay 60 decibels after the source ends, promotes the sound of a performance. Reverberation time is directly proportional to the volume of the space and inversely proportional to the total sound absorption within the space. Music, drama, lecture and opera have different acoustical requirements concerning reverberation time that fluctuate significantly even within each category. For instance, the center frequency (500-1000 Hz) reverberation times for a contemporary orchestral performance ranges from 1.4-1.7 seconds, while organ music ranges of 2.0-3.4 seconds.

The definition of noise is unwanted sound, yet noise can provide cover for other noises. However, in spaces designed specifically for performance noise is unwanted in any form. Much of the noise is controllable through mechanical
and structural considerations. Physical isolation and structural mass helps eliminate structure-born noise, while air introduced into a space at low velocity through mechanically isolated ducts helps eliminate both structure and air born noise. However, certain noises are inherent to all performances as illustrated by John Cage’s composition of 4’ 33”. Yet, the only way to eliminate noise from the audience is the audience and that defeats the purpose of the space.

**Movement**

Everything moves whether it is perceptible or not. Movement within a performance can be critical to the expression of the idea. Certain performances rely solely on movement, the mime trapped within a box does not need to state that it is in a box; its movement tells the story. Similarly, many contemporary dance choreographers create dances that require no music to
illustrate the concept of the design.

Movement can be subtle and imperceptible to the eye. Musical movements are portions of a whole composition usually set apart by a change in the music. This change creates actually movement within the piece that is perceptible to the ear. Rhythm, dynamics, and pitch combine to create change and movement within a musical movement. Architecture utilizes movement in much the same way as music does by creating rhythm. Physical maneuvering such as a dancer uses is possible with the technology today, but most structures rely on repetition and contrast to create rhythm. The façade of a structure can move through physical undulations of the skin, by repeating an architectural or structural element or by manipulation of these elements. Spaces within a building move in different ways according to the horizontal and vertical circulation. Together, perception of movement within a structure is both perceptible to the ear and the body as it maneuvers around and through the building.

**Function**

Performance has many functions depending on the motives of the creator. Performances can entertain, teach, enlighten, empower, entertain, promulgate and preach. If talented enough, the creator of a performance can(149,233),(879,269) do all these things at once, providing the audience entertainment with a message. An architect can create a similar message in the concept of their building. Gehry’s Guggenheim is a direct reflection of the landscape in the Basque region of Spain, which functions as a museum.

Each building has a direct function depending on the program set forth by the owner. A museum displays artwork. A school helps teach people. A concert hall entertains with music. These buildings function on another level as well. They create an environment through their systems to achieve comfort for those who use the building. If these systems do not work properly, the building fails to function.
The site of the proposed Albert Kahn National Theatre Performance Center is located in the downtown area of Detroit, Michigan. More specifically, the theatre fronts Monroe Street between Farmer Street and Library Avenue just off Campus Martius. It is the only remaining structure of the historic Monroe Block, which was the turn of the century "avenue of entertainment." At this time, the site contains a small surface parking lot, a deteriorating parking structure with first floor retail and two multi-story office buildings. The addition will replace all structures on the site except the National Theatre.

The City of Detroit is in the process of rebuilding the downtown area utilizing existing resources and creating new assets. Currently, there are temporary casinos within the downtown area and the construction of permanent casinos is underway. Comerica Park, home of the Detroit Tigers, opened
in the spring of 2000 and Ford Field, future home of the Detroit Lions, will open within two years. Many Detroit cultural venues and districts are within walking distance of the proposed site including the Detroit Institute of Art, the Fox Theatre, Joe Louis Auditorium, Cobo Hall and Greektown. During the construction of the sports arenas, the Gem Theatre was relocated and several other theatres underwent some restoration work. This places the performance center in a district that encourages the arts and cultural expression.

Several blocks across Monroe Street from the Campus Martius to Randolph Street have been leveled with the wrecking ball and are being prepared for future construction. Campus Martius is a civic project that Mayor Dennis Archer intends to become the “best public space in the world. The new growth within the city provides an excellent opportunity to re-establish the National Theatre as a keynote in Detroit's revitalization.
The initial exploration began with the investigation of sound, an intimate part of the concert hall addition. Creating a direct expression of sound, which propagates from a source according to the inverse square law, became the guiding force in this scenario. This idea created an acoustical bubble that can be seen in plan and elevation.

The circular scheme would bounce most of the sound back to the center of the circle creating an acoustical environment that is not conducive to performance. It is possible to create an space that would work even in the spherical bubble.
However, other issues emerged that prevented the articulation of the space from continuing along this vein. One such issue was that the seating within this scheme created blind spots along the sidewalls preventing patrons from seeing the entire orchestra. Another issue was the overwhelming presence of the bubble in elevation, which swallows the National Theatre. This was unacceptable since the theatre is an historic structure. Therefore, the investigation moved on to the Second Movement.
Second Movement

During the Second Movement, Place became involved as the interior space began to react to the site. The site provides a unique geometric challenge with the existing theatre facades paralleling three streets, while the fourth street diverges at an angle. The exterior in massing still represents the direct ex-
pression of the acoustic bubble.

This scenario folded the circular scheme in upon itself creating a longer narrower performance space. Functionally, this limited the number of seats, but eliminated blind spots within the auditorium. Acoustically, the curved back wall of the space would bounce most of the sound back to the center of the circle resulting in the same problem encountered in the First Movement. However, the sidewalls provide more dispersion within the hall. The investigation moved on to the Third Movement.

**Third Movement**

The Third Movement moved away from the circular format toward an elliptical auditorium within the acoustic bubble. An ellipse has two focal points and may provide greater dispersion within the audience. This investigation worked with the circular seating arrangement of the previous two movements.

The resulting mixed geometries create a tension within the auditorium. This was not the desired effect within the most critical space of the project. Therefore, this investigation was quickly revised and moved on to the Fourth Movement.
Fourth Movement

The Fourth Movement combined plan revisions with sectional investigation. While still concentrating on the auditorium space, the public lobby began to be flushed out with box offices and a drop off. Seating became rectilinear while the choral stage became a balcony above the orchestral stage.

The section at this point is crude and undeveloped, but it reveals the fact that the rakes of the balconies are much too shallow. However, this error creates an opportunity to in-
crease the first floor lobby volume and floor to floor height.

Another discrepancy is the choral balcony's position above the orchestral stage preventing the propagation of the sound from the orchestra into the auditorium. Yet, the most disturbing factor is the acoustical ray trace that bounces from the doorjamb and creeps all the way around the auditorium. This fact eliminated this movement from further consideration. The investigation moved on to the Fifth Movement.
The Fifth Movement has two important changes. The first is the expression of the elevation, where the acoustical bubble is downplayed and elements of the original façade are brought into the vocabulary. The second important change is the restructuring of the auditorium. The ellipse is broken up with straight sections of wall providing more dispersion of sound with the auditorium. The lobby and some public ancillary
spaces continue development. Access from the existing National Theatre creates a link between the two venues and allows for the sharing of ancillary spaces. The renovation of the National Theatre required larger restroom facilities with accessibility, which the new link provides.

This is one of the more positive movements in both plan and elevation. Yet, the back of house areas are extremely anemic and require a lot of attention. The auditorium space remains constant throughout the next couple of movements, while the lobby and backstage areas are explored.

The drop off, which cuts beneath the corner of the building, is ineffective because the patrons must come out from beneath the overhang to reach the box offices and entrances. Two solutions present themselves, either eliminate the drop off or move the box offices and entrances to an area more convenient to the drop off. The investigation moved on to the Sixth Movement.

Acoustical Ray Traces, First Floor, Fifth Movement
Sixth Movement

The Sixth Movement fleshes out the lobby, exploring placement of café, gift shop and restrooms for both venues. The gift shop nestles between the box offices with easy access from both venues. The café slides into the corner providing the opportunity to create outdoor spaces for seating.

Articulation of the façade becomes more informed by the neo-baroque façade of the existing theatre. Tower elements and arches attempt to create cohesion between the
two venues paying tribute to the architecture of Albert Kahn.

The interior flow of the lobby appears constricted and forced. The geometry of the café and outdoor areas creates tension because of the rectilinear intrusions upon the curve. The backstage area is still undefined and requires immediate attention.

Externally, the central arch within the façade creates the illusion of an entrance, which flanks the arch rather than occurring beneath it. Upper floor fenestration allows for administrative offices, which overlook the main thoroughfare. Other possible solutions include moving the entrance beneath the arch rearranging the interior of the lobby creating a better flow. The investigation moved on to the Seventh Movement.
The Seventh Movement solidifies the section, reevaluates the lobby and fleshes out the back stage areas. The auditorium remains unchanged since the Fifth Movement. Within the lobby, the entrance moves beneath the central arch and aligns with the dome. The gift shop and café share the corner, which disintegrates and allows access to the patio area. Backstage areas include indoor garage and receiving, dressing
rooms, green room, rehearsal hall and guest reception.

The crude section provides for evaluation of sightlines and rakes of the balconies. As the rakes become steeper, the floor to floor height in the lobby increases allowing for the greater heights on the first and second floor. The upper floor's ceiling height is sufficient for patrons seated in the second balcony.

The problems with this scheme are functional. The outdoor dining area is located at the northeast corner of the building providing an undesirable exterior space during concert times. The space would be in the shade during most shows. Backstage, the flow of performers is hampered; access to upper and lower levels is restricted to one set of stairs and access to the reception room for visiting audience members is circumscribed. Code requires the addition of more fire stairs from the concert hall and backstage areas. The investigation moved on to the Eighth Movement.
The Eighth Movement explores the upper floors while revising the lobby and backstage areas. The northeast corner regains its identity, while the upper floor lobbies take shape. The balconies create an identical stack above the main floor.

The upper floors still require a lot of articulation in both
the lobby and backstage areas. An initial feint at offices on the third floor overlooking the north façade creates problems with access to stairs and restrooms. The balconies create acoustical problems including the still unresolved choral balcony, which overhangs the orchestra. The investigation moved on to the Ninth Movement.
Ninth Movement

The Ninth Movement is by far the most complete scheme. Many of the functional issues are resolved satisfactorily. The lobby entrance at the corner provides access from two streets and the parking structure across Randolph Street. A grand staircase cascades down terraced balconies providing visible access to the upper levels and providing patrons the chance to display themselves as the theatergoers of the past did. The balconies within the auditorium reflect the original balconies of
the existing National Theatre and the choral stage sits completely behind and above the orchestra. The performer's backstage areas flow better and provide access from the exterior for patrons and performers. The administrative offices are located backstage in the south-west corner providing natural light and a view toward the Renaissance Center and the Detroit River.

The plans provide a cohesive package that works for all participants including the performers, crew, administration and audience. The side lot provides room for future expansion of a dance theatre. The lobby could use some revision and clarification of spaces.

The Elevation changes engaged the movement element of performance. A regulated horizontal rhythm is reflected in the sinusoidal wave contrasted against the irregular vertical rhythm of the glazing mullions. The tower elements provide anchors at each end of the north façade. The section provides insight into the
sightlines of the balconies. The interior walls of the auditorium are constructed of wood upon a structural concrete system, which provides the mass needed for sound absorption. The wood gives the space a warm feeling and provides reflective surfaces to counteract the absorption of the audience members. The dome is nestled in a rigid moment frame, which provides space for the ventilation system. This system will provide copious amounts of air at a very low volume to prevent disturbance of the musical performance. The auditorium space is acoustically separated from the lobby, backstage and mechanical spaces to prevent structure-born noise from reaching the audience.

While the section functions well, the elevations appear
contrived and appliqué. The next step in development would investigate different rhythms reflected in the original façade of Albert Kahn's National Theatre.
The Unfinished Symphony

The Albert Kahn National Theatre Performance Center is a performance for all to enjoy. The design expresses the performative elements set forth by Brockett and Hildy. Consideration of these elements occurred throughout the design process. The façade moves, the lobby flows both horizontally and vertically and the circulation backstage provides performers easy access to the stage and their fans. The design plays off the neo-baroque façade of the existing theatre, while adding contemporary elements creating a tie between the past and present. This performance center is a significant addition to the renewal of the inner city of Detroit finding its place just off the “best public space in the world.

However, the most important space of this project is the auditorium of the concert hall. The nine movements create a great synopsis of the development of this space. The main element, which informed this space more than any other element, is sound. Investigation of the movement of sound throughout the space provided insight into the shaping of the space and the placement of balconies, seats and doors. The auditorium created the rest of the building from its exterior presence on the street to its circulation and placement on the site. The auditorium was the most successful investigation of the project.

The investigation into the performative elements illustrates that all architecture performs and can express itself through those elements. A McDonald's restaurant performs for the staff and patrons bringing a lively atmosphere to your dining experience. Each element can be applied to every building no matter how small and seemingly insignificant. Schelling stated that architecture was frozen music and this truly represents the Albert Kahn National Theatre Performance Center. Remember not all music is good music.
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