SOUNDSHIP

AT

NAVY PIER

CHICAGO, ILLINOIS

CREATED BY

GEORGE EDWARD BRUNNER III

FEBRUARY 20, 1981
IN RECOGNITION OF

MY WIFE'S PATIENCE,

MY FATHER'S ENCOURAGEMENT,

AND MY MOTHER'S SUPPORT.
ABSTRACT

Soundship is an entertainment arena emphasizing jazz and rock music productions. The arena transforms itself from a variety, or mall of restaurants to a large auditorium, similar to a dinner theatre or Las Vegas showroom. In addition, ten bars and lounges, two outdoor auditoriums, and other numerous functions and support facilities are found throughout the Soundship project.

Soundship posses the ability to entertain 2,000 occupants in the main auditorium, dining 1500 of them, while comfortably seating another 2000 occupants in its bars and lounges. The main outdoor amphitheater will hold 7,000 occupants while the skydeck stage will cater good music to 1500. Soundship has the capability for audio and visual recording, resulting in the eventual production of records, tapes, and film production.

Soundship focuses on the need to fulfill the quality musical entertainment market. It is based on an atmosphere of fun, music, food, and spirits and revolves around fulfilling these functions. It's concept rests on financial foundations supported by the void in an otherwise lucrative industry. This reality coupled with the need to fulfill an ever demanding need for good entertainment are the basis for Soundship.

It is vitaly important that the renovating design fulfill its purpose successfully. The Soundship atmosphere must be whollistic, satisfying, and identifiable. With this attitude of spirit, Soundship shall create enjoyment, happiness, and intrigue.
That man is free who is conscious of being the author of the law he obeys.

T.H. Green
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Barnham's proposal for harbor facilities at the "mouth" of the Chicago River, designed to form the north side of the Grant waterfront scheme that centered on Grant Park, was predicated on the assumption of continued growth in the volume of miscellaneous waterborne cargo and passenger traffic. It was expected that both the lake and the river would share in this commerce, with the larger body of water taking the major portion, and since this proved true at least up to 1920, the city undertook to carry out this phase of the Burnham program two years after the plan was accepted. The result was a multi-purpose harbor structure that was built immediately north of the river in 1913-16 under the authority of the Chicago Harbor and Subway Commission, of which Edward C. Sharpkand was the chief engineer, William Artingstall the harbor engineer with Charles S. Frost, the Architect. Long known as Municipal Pier, this prominent feature of the Chicago shoreline is more modest in its dimensions than Burnham had intended but still very impressive in total size, with a length of 3,000 feet and an out-to-out width of 292 feet. The major part of this length (2,335 feet) is given over to dock and shed space in the form of two parallel double-level buildings separated by a central 80 foot driveway containing the double-track rail line that constitutes the Harbor Branch of the North Western Railway. The remaining length of the pier was originally devoted to office space at the shore end and to areas designed for recreation and public ceremonies at the outer end. This public space was served by car lines carried on elevated bridges at the inner edge of the dock buildings, a service that was included because of Burnham's insistence on public access to the recreational areas of the lakeshore. It was this association of facilities built for commerce and pleasure that gave the pier its unique character.

Municipal Pier flourished as a dock and recreational facility throughout the decade of the twenties, but the steady decline of passenger and general cargo traffic and the economic attrition of the thirties left it largely deserted by the time of the Second World War. Since American cities seldom sponsor public festivals and pageants, or enjoy a ceremonial life, the spacious recreational areas of the pier stood empty. The United States Navy used it as a training center for the crews of aircraft carriers in the wartime years of 1942-45, and the city leased it to the University of Illinois in 1946 to provide a campus for a two-year college, which survived in its watery setting until the university's own facilities were opened in 1965. The immense structure, with its floor area of more than a million square feet, redesignated Navy Pier after the war, was eventually converted to a cargo dock for ocean vessels, but on a much reduced scale beside its earlier status.

In 1975, Jerome Butler (the Chicago city architect) was asked to begin renovation on the Pier structures. Phase One, which included the easternmost end of the pier, was completed after one year of construction in time for the 1976 bicentennial. (Included in that project were the Terminal, Shelter, Recreation, and Auditorium structures). Since that time, the city has sponsored what has become known as 'Chicagofest', an annual event that draws up to 80,000 fans a day. The event is a musical tribute comprising approximately 15 different stage shows simultaneously. In addition, numerous restaurants serve as caterers, providing a sample of their menus. In conclusion, Phase Two promises renovation of the 2400' long sheds (two) and the promenade area in between.
NAVY PIER FACTS

The loading factors for which the steel frame was calculated were the city's standard: wind, 30 pounds per square foot; snow, 25 pounds, 200 for passenger areas, and 100 for recreation, office, and promenade areas. The cost of Municipal Pier was $4,000,000 at the time of construction, or about $42,000,000 at the 1971 price level.

The reconstruction of Navy Pier for handling the heavy general cargo of standard ocean freighters followed the opening of the Saint Lawrence Seaway in 1959. Chicago had become a port for ocean vessels, however, long before that date. The steamer Anna of the Norwegian Fjell Line made a trial voyage to the city in 1931, docking at the Montgomery Ward Warehouse on the North Branch of the Chicago River. The company established regularly scheduled service in 1933, and the Dutch Oranje Line followed shortly thereafter. The small size of the canals originally built to bypass the Saint Lawrence rapids limited these ships to a 258 foot length, 43 foot 6 inch beam, 14 foot draft, and 1,200 tons of cargo.

Architect Charles S. Frost not only designed Navy Pier Auditorium but with Cobb, designed the Chicago Opera House constructed between 1884-85 (Demolished 1912).
ChicagoFest will run Aug. 1-10 and 13-17 at Chicago’s Navy Pier on Lake Michigan. The setting offers the day-time beauty of the lake and the night-time spectacular view of Chicago’s skyline. More than 500 acts will perform at the 15-day festival. ChicagoFest has 16 entertainment areas offering continuous performances from noon to midnight each day.
CHICAGO – Chicago's third annual low-cost summertime entertainment extravaganza, this year promises to be bigger and better than ever.

Extended by 15 days, it takes place on Aug. 10 and 13-17, from noon to midnight each day, and offers a wide range of attractions for people of every age.

The site of the celebration is Navy Pier, located at the northerly end of the State Street Bridge. The 250-foot pier extends nearly one mile into Lake Michigan and is large enough to accommodate an average of 60,000 people per day. In addition to entertainment areas, there are such well-known eating spots as the Abacos, the Armos, the Lighthouse, and the Fish City.

Ticket prices remain the same as last year's: $3.90 in advance, $1 for seniors. Included in the price of admission, is the Chicago World Music Festival, which features top names such as Muddy Waters, Elton John, and Bob Dylan.

The Jazz Fest, featuring such top names as Sonny Rollins, Spyro Gyra, and the Brecker Brothers, will feature such top names as Muddy Waters, Elton John, and Bob Dylan.

For more information, call the Chicago Convention and Tourism Bureau at 333 S. Michigan Ave., Chicago, Ill. 60604.
Complete Sunday program

Main Stage
3 p.m. and 7:30 p.m., Crystal Gayle; Ray Stevens.

Chicago Tribune Rock Stage
1 p.m., Mad Fox; 1:45 p.m., M & R Rush; 7:30 p.m., Scott Wilk & The Wells; 9:15 p.m., Robin Lane & The Charnbusters.

Miller Jazz Stage
12:30 p.m., Rainbows End; 3:45 p.m., Denise Osso; 7 p.m., Faith Pillow; 9:15 p.m., Sonny Rollins.

Olympia/WMRT Blues Stage
Noon, Pocketwatch Paul; 3:15 p.m., Lonnie Brooks; 6:30 p.m., Tim Krekel & The Sluggers; 9:45 p.m., Delbert McClinton.

RC Cola/WLS Rock Stage
12:45 p.m., Show Zone; 3 p.m., Johnny Star & The Meteors; 6 p.m., Kicks; 7:30 p.m., Bobby Vee; 9 p.m., Buckinghams.

Hamm Country Stage
12:15 p.m., Dana Clark; 3:30 p.m., Plain Dealin; 5:45 p.m., Tara Graham; 10 p.m., Jerry Jeff Walker.

Los Hermanos Wine/WMRT/Chicago Magazine Variety Music Pavilion
12:45 p.m., Front Row Center; 3 p.m., Franz Benteler; 6 p.m., Fred Campeau; 9 p.m., The Chieftains.

Pepsi Cabaret
12:30 and 2:30 p.m., Opus Mime Ensemble; 1:30 and 3:30 p.m., Bobby Mess; 4:30 and 6:30 p.m., Robert C. Carleton/Unicorn Mime Ensemble; 5:30 and 7:30 p.m., Stardust Green Trio; 6:30 and 9:30 p.m., Gloria Morgan.

Unity Savings Comedy Showcase
12:30 and 1:30 p.m., Chicago Stand-Up Comedy Showcase; 1:20, and 4 p.m., On Pura; 3 p.m., Just Kidding; 4:30 and 7:30 p.m., Locomotion Vaudeville; 5:30 and 8:30 p.m., Snepek; 6:30 and 9:30 p.m., Ace Trucking Company.

Carte Blanche Ethic Stage
12:30 p.m., Spartans of Chicago in Concert; 4 p.m., Walter Cartwright.

7:30 p.m., Sheila McKenzie; The "Loop" FM 98 Cinema
Noon to 4 p.m., Cartoons, comedies, family films; 4 p.m., Help; 6 p.m., Buddy Holly Story; 8 p.m., Celebration at Big Sur; 10 p.m., Yes Songs.

Other attractions: Children's area and puppet theater; senior citizens' area; game Arcade; roller dancing; high-dive thrill show; fireworks; and laser show; fashion show; paddleboat rides; arts and crafts; Cubs baseball broadcasts; ballroom dancing and dancing demonstrations.

Admission: $5 per person; senior citizens with identification $1; children under 11 free if accompanied by an adult. Each ticket good for all entertainment offered during the day.

Parking: Soldier Field parking lot, $1.25; free shuttle bus service to and from Navy Pier, 11:30 a.m. to 12:30 a.m.; daily; Michigan Avenue underground garages at Grant Park, free shuttle bus service weekdays 6:30 a.m. to 12:30 a.m., weekends 11:30 a.m. to 12:30 a.m., regular rates; parking lots in the vicinity of Navy Pier.

Transporation: Free shuttle bus service to and from Chicago & North Western, Union, Rock Island and Illinois Central Gulf stations, weekdays 5:30 p.m. to 12:30 a.m., weekends 11:30 a.m. to 12:30 a.m.

Extra CTA bus service on Route No. 65 Grand Avenue connecting with CTA subway at Grand Avenue and State Street, at Grand and Milwaukee avenues, and with buses on Michigan Avenue.

A telephone information number, 936-1111, will provide daily information and festival updates. Shadow Traffic radio stations will announce crowd bulletins.

Complete Monday program

Main Stage
7:30 p.m., Chicago Symphony Orchestra; Erich Leinsdorf, conducting.

Chicago Tribune Rock Stage
1 p.m., Next Movement; 4:15 p.m., Poison Furler; 7:30 p.m., Fontiverher; 9:15 p.m., Heartsfield.

Miller Jazz Stage
12:30 p.m., Matthew Klein Ensemble; 3:45 p.m., Tune Time; 7 p.m., Eldee Young Ensemble; 9:15 p.m., Sonny Rollins.

Olympia/WMRT Blues Stage
Noon, The City Blues Band; 3:15 p.m., Eddie Shaw & The Wolf Gang; 6:30 p.m., Tim Krekel & The Sluggers; 9:45 p.m., Delbert McClinton.

RC Cola/WLS Rock Stage
12:45 p.m., Mirage; 3 p.m., Rampage; 6 p.m., Kool Ray & The Polariots; 7:30 p.m., Bobby Vee; 9 p.m., Buckinghams.

Hammer Country Stage
12:15 p.m., Piker Flats; 3:30 p.m., Cadillac Cowboy; 6:45 p.m., Greg Le Satre; 10 p.m., Asleep At The Wheel.

Los Hermanos Wine/WMRT/Chicago Magazine Variety Music Pavilion
12:45 p.m., County Harmonoio; Leisure; 3 p.m. (To be announced); 6 p.m., Chicago Brass Quintet; 9 p.m., The Chieftains.

Pepsi Cabaret
12:30 and 2:30 p.m., Eddie Fritz; 1:30 and 3:30 p.m., Jim Ridgley; 4:30 and 6:30 p.m., The King's Manor; 5:30 and 7:30 p.m., Joe Vito; 8:30 and 9:30 p.m., Buddy Charles.

Unity Savings Comedy Showcase
12:30 and 1:30 p.m., Chicago Stand-Up Comedy Showcase; 1:30 and 4 p.m., Flying Karamazov Brothers.

3 p.m., Just Kidding; 4:30 and 7:30 p.m., Locomotion Vaudeville; 5:30 and 8:30 p.m., Snepek; 6:30 and 9:30 p.m., Ace Trucking Company.

Carta Blanche Ethic Stage
12:30 p.m., Spartans of Chicago in Concert; 4 p.m., Walter Cartwright.

The "Loop" FM 98 Cinema
Noon to 4 p.m., Cartoons & comedies; family films; 4 p.m., American Hot Wax; 6 p.m., The Last Waltz; 8 p.m., Rock & Roll High School; 10 p.m., Concert for Bangladesh.

Admission: $3 per person; senior citizens with identification $1; children under 11 free if accompanied by an adult. Each ticket good for all entertainment offered during the day.

Parking: Soldier Field parking lot, $1.25; free shuttle bus service to and from Navy Pier, 11:30 a.m. to 12:30 a.m.; daily; Michigan Avenue underground garages at Grant Park, free shuttle bus service weekdays 5:30 a.m. to 12:30 a.m., weekends 11:30 a.m. to 12:30 a.m., regular rates; parking lots in the vicinity of Navy Pier.

Transporation: Free shuttle bus service to and from Chicago & North Western, Union, Rock Island and Illinois Central Gulf stations, weekdays 5:30 p.m. to 12:30 a.m., and weekends 11:30 a.m. to 12:30 a.m.

Extra CTA bus service on Route No. 65 Grand Avenue connecting with CTA subway at Grand Avenue and State Street, at Grand and Milwaukee avenues, and with buses on Michigan Avenue.

A telephone information number, 936-1111, will provide daily information and festival updates. Shadow Traffic radio stations will announce crowd bulletins.
How to see ChicagoFest with the least aggravation

By Sam Smith

Shortly after noon Friday, the ominous-looking White City tow truck pulled into view and stopped next to a police car.

In the next half hour, four of the cars normally driven by the city's finest, complete with police markings, were towed away to places known only to a chosen few.

The incident should be a lesson not only to the police but to all citizens: If you park too close to Navy Pier for ChicagoFest, you'll be looking for another way home.

ChicagoFest '80, the Lakefront Festival of epicurean delights, potions to imbibe, and sounds for all tastes, can be fun for the entire family—and single people, too—if you take time to think about what you're doing and where you're going.

If you live farther from Navy Pier than Lake Point Tower or do not like bicycle riding, public transportation may be your best answer. The CTA has increased its bus service (routes 28, 36, 65, and 15) and subway service, and shuttle buses serve festival goers to railroad stations.

If you drive, try to avoid the pier and its environs.

The least expensive parking ($1.25) is at Soldier Field, where shuttle busses run to and from Navy Pier about every 10 minutes during the day and evening.

Several parking lots are within walking distance of the festival site, but most have increased prices for the next two weeks, with some charging up to $8. The parking lots south of the pier area near the Lake Shore Drive S curve have generally been cheaper than those to the north.

It also pays to beware the vagaries of Mother Nature.

Dr. Edwin Miller, Department of Health medical director, says a good breakfast, with protein foods such as eggs, is a good start.

Friday, as thousands of people began lining up at 7 a.m. under sunny skies for the 11 a.m. gate opening, free admission, and "Bozo's Circus" program, it was clear that the first-aid tents would be busy. Several dozen persons, including many children under the age of 10, were treated for sunburn, headaches, and cuts.

Doctors advise people to wear comfortable clothing, especially shoes and stockings or socks.

Dr. Miller also said people who are sensitive to the sun should bring a hat and sunblock lotion. Others, after spending time at the east end of the pier, suggested bug spray to fight the gnats that sometimes descend on that area.

Lake breezes tend to cool the pier at night, so you might bring a sweater. But, in general, bring as little with you as possible, since the entertainment stages and food and beverage booths are spread out over a one-mile area. There also are several giveaways that could load down the bargain-happy festival goer.

Women should avoid carrying bags or purses if possible, and men should guard their wallets. Police have assigned undercover officers to combat pickpocketing and purse-snatching, but several cases have been reported already. Many pocketbooks also have found their way to the police command post.

The three first-aid areas offer air conditioning for persons who get ill in the heat, as does the senior citizen oasis, which also provides cool drinks and comfortable seating. There is special bus transportation along the pier for seniors and an infant care center for parents whose children have accidents.

Festival officials planned to announce information about crowding on shadow traffic stations and a hot-line number, 300-1111. That will include announce-
ChicagoFest food
A selective guide

Key
- Food booths  • Restrooms

North

 Tribune Maps
BUILDING TYPES ANALYSIS

The objective of this analysis is to draw parallels and information from other similar building types. Soundship does not fit into existing types of buildings, but rather borrows design constraints from various building types. Primarily three building types have been studied: restaurant/bar/lounge design, kitchen/servery design, and auditorium design. Although the program involves housing as responding to a need for two entertainers suites, this type of building analysis has been omitted from the program as it lacks significant importance in the overall Soundship concept.

The analysis is an orderly building type employing simple concepts graphically and overall conclusions summarized. Each analysis includes a project description and primary floor plans of importance to the study.
ORCHESTRA HALL
MINNEAPOLIS, MINNESOTA
ARCHITECTS: HAMMEL GREEN AND ABRAHAMSON, INC.
AND HOLZMAN PFEIFFER ASSOCIATES

Orchestra Hall is characteristic of auditoriums noted for acoustics.

First, is the typical rectangular shape imposed by Cyril Harris (acoustical consultant for the Kennedy Center). Almost identical dimensions of height, length, and width; the same number of tiers (balconies) and seats provide in part for excellent acoustics. In addition, careful selection of interior finish materials and their applications—heavily plastered surfaces for reflection and projection of sounds and thickly upholstered seats and carpet for absorption of sound. Oak was used where appropriate (seat backs, flooring and paneling of stage), a steel frame and brick outer wall, that doubles as the back stage wall, serves as a good, solid sound projection shell. In addition to the outer shell there is an inner wall of concrete with circulation in between. The balconies are supported on cantilevered steel beams spanning from the outer wall through the inner wall to extend into the auditorium. A forty-eight inch deep pre-stressed concrete single-tee unit system is underneath a four inch reinforced top slab acting as a horizontal diaphragm to transmit wind loads to outer wall. Finally, the quiet mechanical system offering year round forty-five percent humidity is a zoned, low-velocity aperatus.
Plan showing the layout of a kitchen designed to supply 1000 meals over a period of 2 hours. To counter problems of food storage in a hot climate, the installation includes a large proportion of refrigerated storage space. Although the kitchen is operated on a self-service (cafeteria) basis, the layout is similar to that of a 'service' restaurant.
PHASES RESTAURANT
BERNARDSTON, MASSACHUSETTS
ARCHITECTS: DRYMNEY ROSANE ANDERSON

Phases Restaurant is a paradox: a sophisticated dining environment on a rural site in the Berkshire Hills, which looks out over an old orchard to a panoramic view east, south and west. An entrance gallery-lounge-bar element runs through the building as a slate-paved street, with a skylighted courtyard at the center. At a level four feet higher, and separated by a low parapet wall, are two dining rooms which can be separated by low modular panels (designed to double as waiters’ stations) to provide private dining space. For further flexibility, the courtyard can be stripped of its furnishings to permit it to be used as a theater.
THE FOUR SEASONS
NEW YORK, NEW YORK
ARCHITECT: PHILIP JOHNSON

The Four Seasons management went all out; instead of having only normal design fees for an architect or other designer they had a sculptor, Richard Lippold; a graphic designer, Emil Antonucci; a landscape architect, Karl Linn; an industrial design team, Ada Louise and Garth Huxtable who designed the tableware and service; and a lighting consultant, Richard Kelly.

Most of the color in The Four Seasons comes from the flowers and plants, the linen, waiter's uniforms, menus, the dress of the feminine diners, and the spectacular paintings. Otherwise the background is kept to the neutral beiges and black with such materials as metal, leather, horsehair, wool carpets, marble, travertine, and bronze. Exceptions are the Lippold wire sculptures and the looped curtains (see photographs). The latter are really made of individual anodized chains of yellow-brass, and copper-anodized aluminum. Developed and executed by Marie Nichols, they have the advantage of requiring practically no maintenance. The lighting, while theatrical, is not spectacular for it washes the walls with light without spraying reflections in the ceiling. It picks out works of art, outlines and emblazons plants and makes people stand out with a distinct glow. While it is possible to read menus without special effort or fixture lighting, the large rooms do not seem to have a high level of illumination. A grid criss-crosses the high ceilings supplemented with spotlights and Edison Price Darklights. Bucket lights in the floors and plant boxes illuminate the plants without highlights. Dimmers are used to vary light intensity hourly and seasonally.
The design brief for Berni Inns is to provide an intimate comfortable atmosphere with some standard layout for functional purposes. Because of rapid expansion most branches have been adapted from existing properties and the Tredegar Arms is typical. The premises includes three restaurants, one at ground floor and two at first level. There are two entrances each served by a small aperitif bar and a third bar is located on the upper level.

Based on reproduction styling, the furniture is of polished wood with wheelback chairs, divided into small groupings by screens. Old lamps and bric-a-brac are used to create atmosphere and the tall ceilings have been reduced to more comfortable proportions by the construction of a mock gallery housing a plough and imitation sacks of grain.
STUDIO 54
NEW YORK CITY
ARCHITECTS: BRIAN THOMPSON

It was designed half a century ago as an opulent setting for Verdi and Puccini. After World War II, it became a radio and then a television studio and now, in a third incarnation, this venerable theater has been transformed into one of New York's busiest discotheques, bathing patrons nightly in an enchanting, throbbing, mind-bending array of light and sound.

Studio 54 fits with surprising ease into the forms of the past. The sloping floor of the orchestra has been covered over and brought right up to the edge of the dance floor which is located on what had been the stage. Around the dance floor are rearrangeable seating units covered in silver vinyl and 1200 square yards of a high gloss finish also covers the elaborate detail on the ceiling of the entry lobby.

But much of the original remains. Most mechanical services were already there, plaster work and ornament in some areas was cleaned and left as is, and the original chandeliers still grace the lobby.

The most elaborate changes, of course, are in the stage lighting designed by Jules Fisher and Paul Marantz. The range of possible lighting effects - effects that heighten the sensation of the dancer as performer - seems almost inexhaustible.
Our boat leaves from the Jackson Park Beach at 6:15. My date and I are anxious and excited to see what we’ve heard so much about. As we are boarding the hydrofoil, we decide to sit outside in front of the cabin. It’s a warm July evening and the cool breeze and lake mist spraying off the boat hull will be refreshing. The schedule says it’s a fifteen minute ride, time enough for a beer from the ship bar while watching the marvelous Chicago shoreline fly by. Conversation between Gayle and I centers around the evening ahead. After all, I dished out a couple of hundred for the night's festivities and for someone my age (25) that's a lot. Tonight Neil Young is going to record an album with Crazy Horse. We thought we would be a part of this show, especially in a place like the Soundship. I've seen pictures of it and it’s really something – pretty dynamic. We're getting close enough now that I can start to make out its' features. It is just like the pictures but more impressive. As we cruise closer, its size becomes even more impressive. The mechanical towers and spires with their modern skeletons rising above and beyond the waters. The streamlined canvass, bridges, catwalks, and ropes connect the towers. Many flags and lights mimic and accentuate the feelings of the cruise. It is all at once modern, yet decidedly historic, even ancient. From the point the Soundship stands on, the perspective of Chicago blends into the skyline of the Soundship itself. Looking east, the Soundship touches the sky while floating on a vast body of water, surrounded in a sense by the blue of the world.

Immediately upon leaving the boat dock we enter a gangplank leading up and into a two story part of the building. We find ourselves inside a large, stately old room with many columns. It appears to have been a space lifted right out of a king's mansion, complete with high ceilings and decorated with the royal colors. We decide to move on and head for a path leading to the great space! We wind over and through columns, beams, and other paths before we find ourselves on the roof of the 'shelter building'. En route, we were treated to a verbal description of the different restaurants and their various menus for the evening. After selecting our dinner choice, we punched it in along with our tickets at the menu center, midway along our path.

Before embarking on one of the 'stairways to heaven' our dinner captain as he is called, has notified us that our table reservations are confirmed. He gives us directions enclosed in an envelope (cruise plan) and bids us farewell. Turning around, the skyline of Chicago once again appears, with the Miesian Lake Point Tower directly in front of us. We step off into the elevator of the tower to go higher yet. After stopping we walk through another glass tube arriving at an outside promenade. The promenade is actually a lookout point, where we can see everything. A few minutes pass and we enter the core of the tower. Walking down a circular flight of steps leads us through a long, dimly lit corridor. As we walk on, the darkness fades to light bringing us to the end of our journey. Next, we step through the end of the tunnel with the most marvelous view of all confronting us. We are at least one hundred feet above the many restaurants and lounges, perched on a mere catwalk. An exhilarating, breathtaking and exciting view. We seem to be enclosed inside the body of some marvelous beast, but the dimly lit enclosure of this space promises something more in the future. For now though, contentment is watching the crowds below, relaxing and enjoying themselves. They seem to be walking down alleys and miniature streets, choosing their enviroment and atmosphere. We descend into the shadows to follow the fun.
Once we've enjoyed cocktails and dinner (a five course meal in the Taiwanese restaurant) we venture to several other bars. One of the lounges shows old time silent pictures while another displays the talents of a stand up comic. We were headed towards one of the other restaurants when we were besieged by a voice from the heavens. It asked all to take their assigned seats at the appropriate table (this was included in our 'cruise plan'). We altered our course, only enough to grab a couple of Margaritas on the way, and finally arrived at our destination, the Mexican restaurant. We had just ordered another drink when we heard a low drone in the distance. It slowly began to crescendo and become ever more encompassing. It was about this time when the walls surrounding us slowly began to rise revealing other restaurants and lounges. As the walls rose, the light disappeared with equal speed, quickly becoming dark. Intensely the sound began to surround us with ever more power. With the last of the evening's blackness came the words, "Would you please welcome, Mr. Neil Young".

An all encompassing sound of clapping filled the air, quickly drowned out by a mass of sound and light from the front. And so the real Soundship came to life.
I suppose like any new entertainment facility, the proof of success comes only with success. But first, I would like to explain why success appears so eminent with Soundship. Since the middle sixties, modern music (jazz, rock, etc.) has been able to fill the seats of athletic stadiums and concert halls very easily. Modern music has been finanically lucrative to its entertainers and promoters for more than two decades. With the additional help of the recording industry, television and movie industry, modern technology, and public support equalling sports of all kinds, modern music has become as American as apple pie.

Any description of what Soundship is or could be would lack accuracy without an existing building type. It is curious to note however, that there are not buildings, or auditoriums that have been constructed to facilitate this type of entertainment. It is also true that there is no franchised or 'typical' building type (including restaurants) that cater to the live performance of music. A typical retort to this proclomation would be that sports facilities house these musical events just as easily as a sporting event, that the financial requirements have not allowed a structure exclusively for the performance of modern music. Another argument would be there are already numerous restaurants (some franchised) and bar/lounges that cater to the needs of musical performance. My response to these arguments are multi-fold. First, the sports stadium will not always be so easy to fill. In addition, the optimum distance for good stage views and descent acoustics falls short of those opportunities available to the stadiums. In accessing the importance with which restaurants place on live music, it can categorically be stated that it acts little more than a 'loss-leader'. Bars and lounges are typically too small in physical size to make an appealing financial return. Typically bars and restaurants support a second string lineup of semi-professional talent. The clubs of Las Vegas utilizing casinos, hotels, restaurants, and bars are the only building type that can support a lucrative entertainment scenario.

Another similar type of facility would be the dinner theatre. These two often are seasonal or are at a diminutive scale in comparison with rock/jazz needs, as are refurbished theatres for this purpose. I am not trying to suggest that these clubs, bars, or restaurants do not offer sophisticated modern music at least occasionally. But occasional should and could become permanent - in both design and concept while attracting financial investment.

Soundship came to me as an idea about six years ago when I realized the potential a vehicle of this type offered. I saw at the time a vacuum in the entertainment business. To describe the Soundship might begin with the idea that it is nothing more than a mall of bars and restaurants that transform and become an auditorium for the performance of modern music. It draws on the dinner theatre idea, the Las Vegas showroom, the jazz club/bar, etc. It must be realized however, that several important differences exist. First, the entertainment must cater to the modern music listener, (but not limit itself to that type of show only). Secondly, to financially gain supportive interest in the Soundship project, the lack of occupant load due to acoustics and visual accessibility must somehow be compensated for. Enter an additional building type. The visual and acoustical recording for television and movies must be incorporated into the Soundship concept. Without little additional expense, this important feature expands and broadens the financial as well as popular appeal, notoriety, and promotional advantages.
Originally Soundship was perceived as a more whollistic conceptional entity. To be included were hotel rooms to accomodate a major proportion of auditorium occupants. Additional activities originally considered were retail outlets such as a record shop, saunas and spas, and a pool. The original concept was also much larger in terms of occupant load, resulting in a larger number of bars and restaurants and a larger performing area, among numerous other secondary shops.

The reasons were manifold for not using the original scale requirements and other activities mentioned. First was the concern for a metropolitan area to sufficiently support a facility of this type. New York, Chicago, and Los Angeles are ideal locations (for possible future expansion, also). While Chicago was chosen for accessibility from Muncie, Indiana, the utilization of the existing Navy Pier was originally chosen for its site. It originally appeared to me on an oceanic survey revealing nothing about the physical nature of the existing structure. Upon immediate investigation I determined that the quality, beauty, minimal use, recent renovation and low financial return would easily accomodate the Soundship concept.

Another unique feature of Soundship is the sound reinforcement system. A sound reinforcement system consists of high wattage amplifiers for powering quantities of large speakers. The control of the S.R.S. is done manually with a sound engineer(s) operating a complicated control and mixing board. The acoustical problems generated by S.R.S. are generally atypical, however some comparisons between typical acoustical design and S.R.S. design can be drawn.

The transformation from numerous dining and drinking spaces to one large space for musical entertainment poses unique problems. The intent to create several restaurants and bars arises for two distinct reasons. First, the ability to offer distinct atmospheres different from one another allows for both freedom of environment and menu. In this manner the occupant becomes a participant with the ability to choose mood and atmosphere. Secondly, the scale required to financially accept a suitable size audience would be incongruous with the scale required for an intimate restaurant setting. We should assume a double usage of space, that is restaurant/lounge and auditorium/concert hall due to the requirements needed to house at least 2,000 occupants. Hence, the need for a scale/space transformation.

Jazz and rock are now most often performed with S.R.S., typically catering to large crowds averaging 20,000 fans. In those large crowds are a minority of people who are willing to pay a premium for a comfortable, enjoyable, and functional environment, superior to the archaic, 'make-shift' opportunity now available. The stage primarily needs to assist in reproducing sound while being able to accept varying, elaborate stage sets. Secondly, the ability to offer space for a permanent sound reinforcement system and a high quality lighting system must be adequate.

The contents of the program fall into five basic divisions. The loading, unloading, and storage of equipment, food, and beverages should be considered as group 1. Group 2 consists of food preparation and dishwashing facilities. Group 3 are the restaurants and lounge/bar areas, group 4 the stage, command control tower and other acoustically related construction. Group 5 includes living suites for the entertainers, general offices, and employee lounges.

Other supplemental but equally important areas of discussion include site access via boat and elevated trains, and an inventory of 'exterior' site qualities.
In conclusion, the Soundships' success will depend solely on its effective overall character, and the efficiency and quality of its product. My interest is to create the character and atmosphere, the basis responsible for creating the product. It is with this attitude that I have explored the possibilities of Soundship.
OWNERSHIP AND MANAGEMENT

The Public Building Commission of Chicago acts to lease the pertinent Navy Pier land in return for a fixed profit percentage.

The George Brunner Jr. Company, Inc. operate, maintain and otherwise create in whole the environment of Soundship. This corporation coordinates all other corporate entities and its ultimately responsible for the success of the project.

W. Clement Stone is financier, acting to supply an initial (base) payment for renovation costs. Repayment occurs via a fixed profit percentage.

The Insurance Corporation of America acts to loan, the remainder (50%-75%) of the needed sum. In return, the Interlochen Arts Academy receives a fixed profit percentage.

W. Clement Stone is board chairman of both the Interlochen Arts Academy and the Insurance Corporation of America.

CLIENTELE

The general public of legal age (21 years old in Illinois).
FUTURE REUSABILITY

The Navy Pier Auditorium has served numerous functions and fulfilled a variety of uses in the past sixty-five years. Originally designed to be a space for public enjoyment via dance and music hall, the auditorium became a space for the U.S. Navy, and at one time served as an architectural design studio. For the summer of 1980 the pier is being used for entertainment with a predominant utilization of amplified music. In short, the space is beautiful and majestic enough to be used for anything from a chapel to a gymnasium, to a library. Due to the character, ambiance, and flavor of the structure, it has in the past offered much diversity in function and use.

The hope and intent on success of the Soundship rest partly on its ability to change and grow. First, an auditorium with the function and ability to present music requiring sound reinforcement systems is a change in auditorium concepts and presentations in itself. An auditorium that promotes current and progressive music, unique to the current state of the art. Secondly, the multi-purposed capabilities of the auditorium offer a wide variety of functions; restaurants, theatres, and lounges.

There is a metamorphosis on a small scale in the way each single space changes in character, and on a larger scale in the way the smaller spaces combine to form one large space. Yes, the new and old Navy Pier (Soundship) has and will speak of change. It is the style and character of the pier that at once has made its preservation possible while once again promoting change within its use.
FACILITY COST ESTIMATE

Quality of Construction: Superb

New Construction Calculated for January 1981 = $172/15,000 sq. ft. $2,580,000

Renovated Construction Calculated for January 1981 = $55/125,650 sq. ft. $6,910,750

Contingencies (10% of Construction Costs) $949,075
Administration Costs (2% of Construction) $189,815
Professional Fees (8% of Construction) $759,260

TOTAL - - - - - - - - - - - - - - - - - - - $20,879,650

* Estimate based on Sonny Palmer's Facility Programming Notebook
** Calculations include exterior site work on existing pier.

FINANCIAL INCOME

Large capacity 'Rock' music shows (17,000-20,000 persons) usually cost $50-60 in entertainment (band) fees at 1980 prices (average band-rock-fees). These figures translate into $3/person for entertainment at the above rates. A 2,000 seat capacity arena for $60,000 would equal $30/person for entertainment.
* Assumption: entertainment costs are at 50% of total costs.

Conclusions:
For a single performance max. entertainment costs =

Per Person Costs:
$30.00 entertainment
$10.00 (rent) and profit
$10.00 food all you can eat and drink
$10.00 liquor
$60.00 total per person

Good jazz and or rock in typical 2,000 seat auditorium (1980 price)
$4.50 entertainment
$4.50 rent and profit
$6.00 food
$10.00 liquor all you can eat and drink
$25.00 total per person

* Average price = $45/person (halfway between expensive and cheap)

FINANCIAL PAYBACK

Profit/Person $5.00
4000 Occupants/day $20,000.00
Profit/ Week $100,000.00
Month $400,000.00
Year $5,200,000.00

Assuming interest on principal is $5 Million Total Debt = $25,879,650
CONCLUSION: 5 year payback
THE SOUNDSHIP PROGRAM

The purpose of the architectural program is to determine the needs of the client by preparing a study organized around the descriptions and needs of different spaces. This then serves to identify common goals, problems, and establish a sense of purpose and concept to the architect. The program stage is utilized as a 'lead in' to define the conceptual architectural format, resulting in a series of schematic design proposals.

The Soundship program was written at a earlier date in the thesis followed by the current program entry. Peculiar to this project was its lack of 'type casting'. Anotherwords, nothing of this type of structure has been designed before, resulting in the designing of a program. Secondly, the renovation of an existing structure has resulted in certain program restraints. These two qualifications under which the program was constructed have determined the following revised program. These spaces will progress in program order by floor level while moving east to west. Each space is keyed to a number in the program, on all drawings, and the model. First number zero thru six represent floor levels (hereafter referred to as decks) and second number one thru thirty-five represent space from east to west.
EXISTING SQUARE FOOTAGE DATA
PROPOSED SQUARE FOOTAGE DATA
RESTAURANT DINING ROOM CHARACTERISTICS
LOUNGE/BAR CHARACTERISTICS

EXTERIOR SITE DECKS
(0-1) Rail Arrival and Departure Area
(0-2) Starboard and Port Courtyards
(0-3) Gangplanks
(0-4) Nautical Arrival and Departure Areas
(0-5) 'Tie-Down' Seating Areas
(0-6) Soundship Bowl and Stage

MICHIGAN DECK (Level 1)
(1-1) Starboard Entertainers Suite
(1-2) Loading Platforms and Dock
(1-9) Port Entertainers Suites
(1-10) Soundship Managers Office
(1-11) General Cargo Storage
(1-14) Soundship Offices
(1-15) Beverage Storage
(1-16) Food Storage
(1-17) Crews Mess, Lounge, and Convenience Area
(1-18) Starboard Galley
(1-19) Staff Restrooms
(1-20) Clean-Up and Dishwashing
(1-21) Port Galley
(1-22) Starboard (Female) and Port (Male) Restrooms
(1-23) Michigan and Randolph Bar
(1-24) Wrigley's Cubs Bar
(1-25) Stage
(1-26) AH So Restaurant
(1-27) Harem's Hideaway Restaurant
(1-28) The Wedge Restaurant
(1-29) The Conning Tower Restaurant
(1-30) The Ships Hold Restaurant
(1-31) The Conning Tower Command Center
(1-34) Servery Points
(1-35) Arcade

BRIDGE DECK (Level 2)
(2-1) The Northwestern Bar & Lounge
(2-2) For And Aft, Starboard And Port Restrooms
(2-3) Reception and Reservation Desk
(2-4) Captains Bridge Bar and Lounge
(2-5) The Stockyards Bar and Lounge
(2-6) Speakin' Easy Bar and Lounge
(2-7) The Backstage Review Bar and Lounge
(2-8) Bozo's Circus Bar and Lounge
(2-9) Balcony Seating
(2-10) Promenade
SKY DECK (Level 3)
(3-1) Chicago'Orleans Bars, Lounge, and Stage
(3-2) Starboard and Port Restrooms
(3-3) Skydeck Concert Facilities

ARRIVAL, SIGNAL, AND CLOUD DECKS
(4-1) Male and Female Restrooms
(4-6-2) O'Hare's Tower Bar and Lounge
(4-6-3) Roebuck's Perch Bar and Lounge
EXISTING SQUARE FOOTAGE DATA

Total site square footage: 292' X 663' = 193,596 Sq. Ft.
59% of site without structure: = 114,222 Sq. Ft.

Building square footages:
- Michigan Deck (level 1) 54,628 Sq. Ft.
- Bridge Deck (level 2) 80,170 Sq. Ft.
- Sun Deck (level 3) 49,328 Sq. Ft.

TOTAL = 184,126 Sq. Ft.

PROPOSED SQUARE FOOTAGE DATA

Total site square footage: = 207,096 Sq. Ft.
62% of site without structure: = 127,722 Sq. Ft.

Building square footages:
- Michigan Deck (level 1) 54,628 Sq. Ft.
- Bridge Deck (level 2) 80,170 Sq. Ft.
- Sun Deck (level 3) 49,328 Sq. Ft.
- 2 Towers (3 levels) 7,200 Sq. Ft.

TOTAL = 191,326 Sq. Ft.
RESTAURANT DINING ROOM CHARACTERISTICS

Restaurant space consists of five dining rooms which mechanically change and open into the one auditorium or 'great space'. This occurs after the dinner hour, just prior to the evening's first opening act. Dinner is served buffet style on the Michigan Deck while drinks are served continuously thru showtime. Like the bars and lounges, each of the five dining spaces will emit a different atmosphere, each offering a different menu. Circulation and buffet service occurs in the outer promenade/circulation 'ring'.

Bain-Marie buffet service requirements for each self service cafeteria:

<table>
<thead>
<tr>
<th>200 Occupants</th>
<th>400 Occupants</th>
<th>600 Occupants</th>
</tr>
</thead>
<tbody>
<tr>
<td>3' - 0&quot;</td>
<td>3' - 0&quot;</td>
<td>4' - 6&quot;</td>
</tr>
<tr>
<td>2' - 6&quot;</td>
<td>4' - 0&quot;</td>
<td>5' - 6&quot;</td>
</tr>
<tr>
<td>3' - 0&quot;</td>
<td>4' - 0&quot;</td>
<td>6' - 0&quot;</td>
</tr>
<tr>
<td>(2 level</td>
<td>(2 level</td>
<td>(2 level</td>
</tr>
<tr>
<td>3 cu.ft.)</td>
<td>4 cu.ft.)</td>
<td>4 cu.ft.)</td>
</tr>
<tr>
<td>8' - 0&quot;</td>
<td>12' - 0&quot;</td>
<td>16' - 0&quot;</td>
</tr>
<tr>
<td>1 gal</td>
<td>2 gal</td>
<td>3 gal</td>
</tr>
<tr>
<td>@ 18' length</td>
<td>@ 25' length</td>
<td>@ 32' length</td>
</tr>
</tbody>
</table>

LOUNGE/BAR CHARACTERISTICS

Service in the bar and lounge areas serves several purposes. Primarily, it is a 'holding' area for occupants prior to opening and service of restaurant facilities. Secondly, it is an area that serves a distinctly different purpose than the auditorium/restaurant space. Both entertainment and bar/snack service differ in scale and service than the auditorium/restaurant space. While the bar/lounge areas are open primarily continuously with a variety of entertainers, the auditorium/restaurant space is open at certain times only.

A major intent of the lounge areas are a variety in style and atmosphere to create interest and intrigue. The names and impressions created by atmosphere will reflect different aspects of the Chicago area as well as nautical motifs. Following is basic data pertinent to the understanding of the bar/lounge areas.

<table>
<thead>
<tr>
<th>Key</th>
<th>Floor Level</th>
<th>Bar/Lounge Name</th>
<th>Entertainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>Bridge Deck</td>
<td>The Stockyards</td>
<td>Country/Western</td>
</tr>
<tr>
<td>3-1</td>
<td>Sun Deck</td>
<td>Chicago'Orleans</td>
<td>Jazz Stage</td>
</tr>
<tr>
<td>4-6/2</td>
<td>Arrival, Signal, and Cloud Deck</td>
<td>O'Hares Tower</td>
<td></td>
</tr>
<tr>
<td>1-23</td>
<td>Michigan Deck</td>
<td>Michigan &amp; Randolph</td>
<td></td>
</tr>
<tr>
<td>4-6/3</td>
<td>Arrival, Signal, and Cloud Deck</td>
<td>Roebucks Perch</td>
<td></td>
</tr>
<tr>
<td>1-24</td>
<td>Michigan Deck</td>
<td>Wrigley's Cubs</td>
<td></td>
</tr>
<tr>
<td>2-1</td>
<td>Bridge Deck</td>
<td>The Northwestern</td>
<td>Rock-N-Roll</td>
</tr>
<tr>
<td>Key</td>
<td>Floor Level</td>
<td>Bar/Lounge Name</td>
<td>Entertainment</td>
</tr>
<tr>
<td>-----</td>
<td>-------------</td>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>2-4</td>
<td>Bridge Deck</td>
<td>Captain's Bridge</td>
<td>Piano Bar</td>
</tr>
<tr>
<td>2-6</td>
<td>Bridge Deck</td>
<td>Speakin' Easy</td>
<td></td>
</tr>
<tr>
<td>2-8</td>
<td>Bridge Deck</td>
<td>Bozo's Circus</td>
<td>Band (Concert)/March</td>
</tr>
<tr>
<td>2-7</td>
<td>Bridge Deck</td>
<td>Backstage Review</td>
<td></td>
</tr>
</tbody>
</table>
(1-1) STARBOARD ENTERTAINERS SUITE (4,800 sq ft)
PURPOSE: Ability to comfortably accomodate members of the entertainers and or their entourage.
DESCRIPTION: Five bedroom accommodations including five individual baths with showers. Each bedroom contains queen size bed, nightstand, television, dresser, closet, and phone. All bedrooms have access to a main living area. Included in this area are comfortable seating and entertaining space for small parties and a small area with a table for dining. Immediately adjacent to the living area is a make-up and dressing area, equipped with proper lighting, mirrors, and counter space.

(1-2) LOADING PLATFORMS AND DOCK (4,160 sq ft)
PURPOSE: To receive large quantities of sound and stage equipment for the entertainers performance (typically delivered by semi tractor/trailer), to receive food, beverages, and other supplies, and to remove wastes, all on a daily basis. In addition, hookup for mobile recording and radio vehicles.
DESCRIPTION: Necessity for four loading platforms to accomodate semi-trailer size reefers (8W X 4'12'H) without incurring structural damage to building. Dock area must accomodate the necessary room to maneuver an 8'W X 10'L electric supply shuttle (similar to airport luggage cart) with room for temporary storage. Must have vertical circulation corridor.
(1-3-9) PORT ENTERTAINERS SUITE (4,800 sq ft)
Identical to the Starboard Entertainers Suite with the addition of jacuzzi in the living area.

(1-10) SOUNDSHIP MANAGERS OFFICE (4,800 sq ft)
PURPOSE: To comfortably accomodate the manager and his secretary in quite solitude.
DESCRIPTION: Book storage and file area, comfortable desk with seating for two in front of manager, ability to task lighting, views, sunshine, and noiseless surrounding. Must be close to other offices but separate.

(1-11) GENERAL CARGO STORAGE
PURPOSE: Storage for outdoor tables and chairs and excess storage props.
DESCRIPTION: Minimal lighting and no heating requirements or windows. Close access to loading docks and vertical circulation, access to outdoors, preferably a north and or west location for wind shielding and lack of need for south exposure.

(1-12-14) SOUNDSHIP OFFICES (9,600 sq ft)
PURPOSE: Offices 1-10 to accommodate head chef and bartender, accounting and inventory staff. Offices 1-11 to house talent coordinator, promoter, and secretaries. Office 1-12 to have two graphic artists for in house promotional and advertising services.
DESCRIPTION: All offices should have indirect access with one another with the employee lounge/conference area in an adjacent vicinity. Spaces should contain task lighting, views, ventilation, sunlight, and sound isolation characteristics.

(1-15) BEVERAGE STORAGE (19,200 sq ft)
PURPOSE: The storage of all beverages, alcoholic and non-alcoholic.
DESCRIPTION: To include vertical circulation as well as access to loading dock (must be accessible by hand cart to all bars). Must be refrigerated, maximized storage for kegs of beer, shelving for wine and liquor storage (although liquor need not be refrigerated, it serves more as a secureable store for excess in quantity - otherwise stored in individual bars). Preferably north and or west exposure, well insulated, and security safe. One and one-half week capacity.

(1-16) FOOD STORAGE (11,200 sq ft)
PURPOSE: Ability to freeze and refrigerate all necessary foods.
DESCRIPTION: Refrigerator leads to freezer (occupying 320 sq ft). Both must be well insulated, preferable north and or west orientation, secureable, maximized shelving and hangers in freezer for beef sides. Must be adjacent to kitchens. Vegetable storage (3 deliveries/week 190 sq. ft. Dry goods store (3 days supply) 290 sq. ft. Low temperature refrigeration (7 days supply) 100 sq. ft. Cold room - daily delivery of perishable food 150 sq. ft. Goods entry area including weighing and checking 180 sq. ft. All of these have 7' interior height.

(1-17) CREWS MESS, LOUNGE, AND CONFERENCE AREA (9,600 sq ft)
PURPOSE: For staff meetings, employee lounge and eatery, and multi-purpose recreation/entertaining space.
DESCRIPTION: Typically contains large conference table to double as dining table. Should have ventilation, sunlight, views and immediate access to offices and kitchens.
PURPOSE: Food preparation areas, kitchens utilizing various types of ovens, roasters, and boilers, servery for bain - marie carts, and capacity for 1800 dinners.

DESCRIPTION: Access to serving points of primary concern, adjacent to Port Galley (fry and grill kitchen). Circulation must be orderly and ample, sufficient working space, food flow paths considered, physical relationship to food preparation areas. Good ventilation and lighting must accompany the ability to keep the kitchen clean easily.

Kitchen Requirements: Lighting = 37.2 lumens/ft, 9 convection ovens, 6 large deep fryers, 6 boiling tables, 9-20 gallon boiling pans, 3 steamers each 22 cubic foot, 2 large grills, 3-30 quart mixers, 12 preparation sinks, 3 pot wash sinks, 3 hand wash sinks, 9 preparation tables, and 7500 square foot.

Vegetable and Salad Preparation: Lighting = 400 lux or 37.2 lumens/foot, benches/tables = 128 square foot, sinks = 10 square foot (27" X 20" X 15"), 2 75 pound potato peelers, each 24" X 18", 2 floor standing shredder/slicers each 30" X 18", 2 floor standing potato washers each 30" X 18", 6 refuse sack holders, and storage.

Pastry Preparation: Lighting, limited glare index of 25 typ.

Tasks: Hot sweets, cold sweets, pastry work, bakery items, and post cooking work. Benches/tables = 115 square foot, sinks = 5 each 24" X 18" X 12", 2 mixing machines each 110 quart 36" X 24", 2 bench mounted dough dividers, 2 bench mounted pastry rollers each 37" X 64", 2 motor bench mounted pie machines, 2 60 foot refrigerators, 2 pastry ovens with total of 7 decks (80 sq ft), 2 proving ovens, 2 boiling tables (total of 9 rings), 5 cooling rack mobiles (tiered), 2 scales (measuring to 28 pounds minimum), 4 sugar bins, 5 refuse sack holders, and storage.

Meat and Fish Preparation: Tasks: dressing poultry and game, fish preparation, raw meat, and butchery items, cooked meats, and preparation of cold drinks. Benches/tables = 130 square feet, sinks = 5 each 24" X 18" X 12", 2 floor standing chopping blocks each 48" X 24", fish preparation = 5 30" cold slabs, 2 electric meat saws, 1 floor standing mincing machines 24" X 18", 2 slicing machines each 24" X 18", cold store in preparation area = 45 feet and 2 refuse sack holders.

Cooking: Steam ovens should be capable of raising the water to boiling temperature within 30 minutes, with automatic water supply. Cooking tests designed to check the working performance include:

a. Steam cooking of a full load of potatoes within sixty minutes.

b. Cooking of steamed pudding with standard ingredients within two hours.
Boiling Top: A boiling top for operations such as boiling, stewing, steaming or frying may be in the form of:

a. Individual electric plates or open gas burners of various sizes.

b. A solid top having fast heat in the center reducing to simmer heat at the edges.

c. A griddle plate for direct cooking and shallow frying.

Oven usage depends on the cooking times required for different dishes and the number of shelves and trays which can be accommodated. Although ovens are usually quoted in cubic capacity the most critical measurement is the usable shelf area which, for most purposes, relates to shelves separated by a clear space of 150mm.

General Purpose Oven: In large kitchens it is often more convenient to separate ovens from the boiling tops. The ovens may then be mounted on stands at a convenient working height or stacked one above the other in tiers of three to save floor space. Dimensions are similar to those for ranges and loadings, for the ovens only, are approximately:

- Working capacities of oven may be calculated from the food densities:
  
<table>
<thead>
<tr>
<th>Food Type</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meats</td>
<td>130-160 kg/m³ (8-10 lb/cf)</td>
</tr>
<tr>
<td>Poultry</td>
<td>110-130 kg/m³ (7-8 lb/cf)</td>
</tr>
<tr>
<td>Trayed Up Dishes</td>
<td>65-75 kg/m³ (4½ lb/cf)</td>
</tr>
</tbody>
</table>

Forced-air Convection Ovens: The use of a fan to circulate hot air enables heat to be transferred more rapidly and more evenly distributed than in ovens of conventional design. As a result, shelves may be placed nearer together giving greater batch loadings and reductions of up to 40 percent in conventional cooking times can be obtained. In primary cooking, the convection oven can be used for a wide range of purposes-roasting, frying, grilling, baking, etc. and this oven is also particularly suitable for fast end cooking and reheating of frozen food. For the latter purpose the normal reheat time is 24 minutes. In large sizes the oven is usually mounted on a stand at a convenient height whereas small units may be bench mounted. Tiered units are also manufactured to standard or special designs.

Roasting Cabinet: Consisting of an insulated cabinet having large doors, adjustable sliding shelves and a drip tray at the base. Variations include ovens for spit roasting of small joints and poultry.

Rotary or Reel Ovens: To ensure even heating the reel oven incorporates rotating shelves which travel round vertically through the oven space averting out any temperature variations between the upper and lower regions.

Microwave Oven: In the microwave oven energy is supplied to the food by electromagnetic waves of high frequency which cause an increase in molecular motion resulting in heat generation within the material. The electromagnetic spectrum producing this effect covers the frequencies from 300 to 300,000 megahertz.

Steaming Ovens: The supply of steam may be provided from a separate generator or boiler and regulated by valve or be generated within the appliance. The temperature of the steam is determined by its pressure and steam ovens may be grouped into:

a. atmospheric pressure type (100°C).

b. semi-pressure type operating automatically at a slightly higher pressure of 3-45 kN/m² (½ lb/sq in) giving temperatures of about 102°C (215°F);

c. pressure steamers in which high pressures of the order 34-48 kN/m² (5 lb/sq in) are used with temperatures of 109°C (227°F) enabling rapid heating and cooking of food.
High pressure steamers are used extensively for cooking raw and prepared frozen vegetables, for steaming fish, meat and poultry, and cooking puddings. The 'Jet Cooker' is a small pressure cooker operating at higher pressures (103 kN/m² or 15 lbs/sq in) used specifically for fast heating of frozen foods.

Boiling Tables: The space required for boiling generally exceeds the top areas available on ranges and supplementary boiling tables may be provided to extend these areas. Boiling and simmering burners and plates are available in various sizes and combinations or in the form of solid tops. The table is supported on a stand which usually incorporates storage space for pans and pots.

(1-19) STAFF RESTROOMS (320 sq ft)
DESCRIPTION: 160 sq ft for both male and female. Must be easy to clean, durable, and good access.
Consisting of:
- Water Closets: 4-Male 5-Female
- Urinals: 2-Male
- Lavatories: 5-Male 5-Female
- Drinking Fountains: 2 Total

(1-20) CLEANUP AND DISHWASHING (960 sq ft)
PURPOSE: Cleanup and dishwashing.
DESCRIPTION: Collection area for unsorted tableware prior to sorting and scraping – 8' length. Stacking area for tableware sorted and stacked for manual washing – 12' length. Loading into rack for machine washing – 6' length. Draining and drying in racks or baskets after washing and sterilizing – 12' length. Unloading baskets and racks for clean crockery awaiting removal – 8' length. Continuous track width – 2'-6"
- Kitchen Utensils
- Preparation
- Cooking: Pan Wash
- Serving
- Dining room crockery and cutlery
  - Dining room
  - servery
  - Scraping
  - stacking
  - washing
  - draining
  - stacking

Pan Washing Facilities: Special facilities for washing the pots and pans used in the kitchen and servery are generally necessary where over 200 to 300 meals per day are produced and this is normally a manual process requiring deep sinks—preferably double sinks with separate washing and rinsing/sterilizing bowls. The size of sink appropriate will be determined by the size of utensils used in the kitchen, bain-marie containers, etc. and the standard range is from 750 x 500 x 380 mm deep (30" X 20" X 15") to 1500 x 750 x 600 mm deep (60" X 30" X 24") with rim heights normally fixed 865mm (34") above floor level.
(1-21) PORT GALLEY

PURPOSE: A kitchen based on the grilling and frying of foods.
DESCRIPTION: Adjacent to Starboard Galley, access to serving
points of primary concern, physical relationship to food preparation
areas. Good ventilation and light must accompany the ability to
keep the kitchen clean easily.
Shallow fat frying/Deep fat frying: Shallow fat frying is carried
out in a pan or on a fixed or mobile frying surface known as a
griddle. The frying process is a rapid one and can be used repeatedly
during the meal period and to supply food to order. For deep fat
frying, food is immersed in 100 to 150mm (4" to 6") depth of fat.
Although portable vessels can be used, purposely designed units are
almost always installed because of the risk of fire and the need to
confine oil splashing and fumes.
Hot Cupboard: Cabinets used to keep food warm and to heat receptacles
and plates prior to service are collectively described as hot
cupboards. The internal temperature is maintained at about 76 to 88
°C (170-190°F) to avoid damage to crockery and excessive drying of
food. Heat may be applied to the bottom, sides or shelves. The
standard hot cupboard has sliding doors on one side only but 'pass-
through' units, with doors on opposite sides, are used between the
kitchen and servery. Mobile units are increasingly used for convenient
handling.
Grilling Equipment: The process of grilling is reliant on radiant
heat obtained from an intensive source such as red hot tiles,
plates or wires or incandescent charcoal. Heating may be applied
from above (salamandering), below or on both sides as in toasting.
The area need not be enclosed and is generally mounted at a convenient
height between shoulder and bench level (900 to 1400mm). Grillers
may also be incorporated under the tops of ranges. The area generally
required for grilling is approximately 0.001 m²/meal (1-5 sq in)
but is dependent on size of dishes and the extent to which grilled
items feature in the menu.

(1-22) STARBOARD AND PORT RESTROOMS (1,000 sq ft)
DESCRIPTION: Restroom facilities far surpass code minimums.
However, substantial additions have been made.
Code Minimums;
Bathroom Facilities
Water Closets 5- Male  8- Female
Urinals 6- Male
Lavatories 6 Male 9 Female

(1-23) MICHIGAN AND RANDOLPH BAR

(1-24) WRIGLEY'S CUBS BAR

(1-25) STAGE

(1-26) AH SO RESTAURANT

(1-27) HAREMS HIDEAWAY RESTAURANT

(1-28) THE WEDGE RESTAURANT

(1-29) THE CONNING TOWER RESTAURANT
THE SHIPS HOLD RESTAURANT

THE CONNING TOWER COMMAND CENTER

This space serves two separate functions that at times are interdependent upon each other—hence their need for a physically close or connected relationship. The display, recording, and control of sound and sight are primary functions this space provides. As the success of the Soundroom depends upon reliable and accurate entertainment, 'command control' must be able to serve the needs of the entertainer.

Location: Auditorium Center, 2/3 back between stage and last row. Platform floor height should be between 6' and 10' above surrounding floor.

Equipment:
2 - 70 mm Projectors 3' X 5' each
2 - Film storage platters 5' diameter each
2 - Rewind Tables 6' X 24' wall space - total
1 - Film safe 3' W. X 5' H. X 5' 1
3 - Generator/Ampifiers 3' X 12' projection only
2 - 16 Track sound boareds 4' X 7' each
2 - Record Turnables 1' 6" X 3' total
6000 W. (RMS) total in power Amplifiers 5'L X 3'W X 8'H
2 - Preamps located in sound boards
1 - Tuner located underneath sound boards
1 - Regular format reel to reel tape deck 1"
1 - Large format reel to reel tape deck 1:
   (both tape decks in a 2"W X 2'D X 6'H Rack)
1 - Television Camera w/fixed tripod 6'D X 6'6"
1 - Video tape camera, storage, power and tripod 4'D X 6'H
1 - House lighting/stage lighting board (also controls restaurant stage flies) 2' X 3'
Radio and Television Mobile Hook-Ups (Exterior)
Storage Facilities

SERVERY POINTS
See Restaurant Dining Room Characteristics

THE ARCADE

THE NORTHWESTERN BAR AND LOUNGE

FOR AND AFT, STARBOARD AND PORT RESTROOMS

RECEPTION AND RESERVATION DESK
The ticket, information, and coat check desk provide those three services. This area is located near all common entry points on the main level (bridge deck) and should be visibly as well as physically accessible to all.

CAPTAINS BRIDGE BAR AND LOUNGE

THE STOCK YARDS BAR AND LOUNGE

SPEAKIN EASY BAR AND LOUNGE
(2-7) THE BACKSTAGE REVIEW LOUNGE
(2-8) BOZO'S CIRCUS BAR AND LOUNGE
(2-9) BALCONY SEATING
(2-10) PROMENADE

(3-1) CHICAGO ORLEANS BAR AND LOUNGE AND STAGE
(3-2) STARBOARD AND PORT RESTROOMS
(3-3) SKYDECK CONCERT FACILITIES

(4-1) RESTROOMS MALE AND FEMALE
(4-2-6) OHARE'S TOWER BAR AND LOUNGE
(4-3-6) ROEBUCKS PERCH BAR AND LOUNGE
TRANSPORTATION

Accessibility to the site is by one of two methods, either by elevated trains using the existing CTA tracks, utilizing new 'cars' or by hydrofoil boat. The following tabulates all necessary information along with a bus schedule and map for accessibility to the west end of Navy Pier.

<table>
<thead>
<tr>
<th>Transport type</th>
<th>Percentage use</th>
<th>@ Capacity</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrofoil Train</td>
<td>Day 25 Night 75</td>
<td>100/Boat</td>
<td>Summer</td>
</tr>
<tr>
<td></td>
<td>Day 75 Night 25</td>
<td>20/Train</td>
<td>(April-Sept)</td>
</tr>
<tr>
<td>Hydrofoil Train</td>
<td>Day 0 Night 0</td>
<td></td>
<td>Winter</td>
</tr>
<tr>
<td></td>
<td>Day 100 Night 100</td>
<td></td>
<td>(Oct-Bar)</td>
</tr>
</tbody>
</table>

* Roundtrip hydrofoil time is 30 minutes = 200 people/hour/boat.
* Roundtrip train time is 10 minutes = 120 people/hour/train

Hydrofoil Departure Points:

- Chicago Yacht Club
- Jackson Park (6000S)
- Lincoln Park (5600N)
- Navy Pier Rail Shuttle

BUSINESS HOURS

11 AM - 3 AM Al-a-cart
11 AM - 6 PM Al-a-cart
6 PM - 3 AM Ticket Price

Monday, Tuesday, Wednesday
Thursday, Friday, Saturday
Closed Sunday

User costs are tabulated and billed by two methods. The ala-cart method is employed when no major band is playing in the evening. When a major musical group is performing, dinner and show costs are purchased in a joint sum.
Sec. 3601 (a) Height. No penthouse or other projection above the roof in structures of other than Type 1 construction shall exceed 28 feet in height above the roof when used as an enclosure for tanks or for elevators which run to the roof and in all other cases shall not extend more than 12 feet in height above the roof.

(b) Area. The aggregate area of all penthouses and other roof structures shall not exceed 33 1/3 percent of the area of the supporting roof.

(c) Prohibited Uses. No penthouse, bulkhead or any other similar projection above the roof shall be used for purposes other than shelter of mechanical equipment or shelter of vertical shaft openings in the roof. Penthouses or bulkhead used for purposes other than permitted by this Section shall conform to the requirements of this Code for an additional story.

(d) Construction. Roof structures shall be constructed with walls, floors, and roof as required for the main portion of the building.

Sec. 3602 Towers or spires when enclosed shall have exterior walls as required for the building to which they are attached. Towers not enclosed and which extend more than 75 feet above grade shall have their framework constructed of iron, steel, or reinforced concrete. No tower or spire shall occupy more than one-fourth of the street frontage of any building to which it is attached and in no case shall the base area exceed 1600 square feet unless it conforms entirely to the type of construction requirements of the building to which it is attached and in no case shall the base area exceed 1600 square feet unless it conforms entirely to the type of construction requirements of the building to which it is attached and is limited in height as a main part of the building. If the area of the tower or spire exceeds 100 square feet at any horizontal cross section, its supporting frame shall extend directly to the ground. The roof covering of spires shall be as required for the main roof of the rest of the structure.

Skeleton towers used as radio masts and placed on the roof of any building shall be constructed entirely of non-combustible materials when more than 25 feet in height and shall be directly supported on a non-combustible framework to the ground. They shall be designed to withstand a wind load from any direction as specified in Section 2311 in addition to any other loads.

Additions, Alterations, and Repairs: More than 50 percent. When additions, alterations, or repairs within any 12 month period exceed 50 percent of the value of an existing building or structure, such building or structure shall be made to conform to the requirements for new buildings or structures.

Historic Buildings: Repairs, alterations, and additions necessary for the preservation, restoration, rehabilitation or continued use of a building or structure may be made without conformance to all of the requirements of this Code, when authorized by the building official provided:

1. The building or structure has been designated by official action of the legislative body as having special historical or architectural significance.
2. Any unsafe conditions as described in Section 203, will be corrected in accordance with approved plans.
3. Any substandard conditions will be corrected in accordance with approved plans.
4. The restored building or structure will be less hazardous, based on life and fire risk; then the existing building.

Table No. 33A

When the square feet per occupant are not given for a particular occupancy it shall be determined by the Building Official, based on the area given for the occupancy which it most nearly resembles.

Exceptions: 1. The occupant load on an area having fixed seats shall be determined by the number of fixed seats installed. Aisles serving the fixed seats and not used for any other purpose shall not be assumed as adding to the occupant load.

2. The occupant load permitted in a building or portion thereof may be increased above that specified in this Section if the necessary exits are provided. An approved aisle or seating diagram may be required by the Building Official to substantiate an increase in occupant load.

In determining the occupant load, all portions of a building shall be presumed to be occupied at the same time.

Exception: Accessory use areas which ordinarily are used only by persons who occupy the main areas of an occupancy shall be provided with the exits as though they were completely occupied, but their occupant load need not be included in computing the total number of occupants for the building.

Overcrowding. The number of occupants of any building or portion thereof shall not exceed the permitted or posted capacity.

Benches, Pews, Booths. Where benches or pews are used, the number of seats shall be based on one per person for each 18 inches of length of the pews or benches. Where booths are used in dining areas, the number of seats will be based on one person for each 24 inches or major portion thereof of length of booth.

Mixed Occupancies. The capacity of a building containing mixed occupancies shall be determined by adding the number of occupants of the various portions as set forth in Table No. 33A.

More Than One Purpose. For determining exit requirements the capacity of a building or portion thereof which is used for different purposes, shall be determined by the occupant load which gives the largest number of persons.

Exit Obstruction. No obstructions shall be placed in the required width of an exit except projections permitted by this Chapter.

Posting of Room Capacity. Any room having an occupant load of more than 50 where fixed seats are not installed, and which is used for classroom assembly or similar purpose, shall have the capacity of the room posted in a conspicuous place near the main exit from the room. Approved signs shall be maintained in an legible manner by the owner or his authorized agent, and shall indicate the number of occupants permitted for each room use.

Changes in Elevation. Within a building, changes in elevation of less than 12 inches along any exit serving a tributary occupant load of 10 or more shall be by ramps.

Exceptions: Group R, Division 3 Occupancies and along aisles adjoining seating areas.

Reviewing Stands, Grandstands and Bleachers, For special provisions applicable for reviewing stands, grandstands and bleachers, see Section 3321.
"Soundship at Navy Pier" is located on the easternmost end of Navy Pier, in what is now the auditorium portion of the pier structures. The site was chosen for its dramatic relationship (with respect towards views) of the Chicago skyline and Lake Michigan. Location of the present auditorium structure is farthest east of any point in the immediate Chicago vicinity. This affords two fantastic views: to the east an endless panorama of sky and water and to the west the magnificent Chicago skyline. The site (or portion thereof - the auditorium) offers a beneficial seclusion peculiar to the reuse of the structure. This outermost mode of the pier will offer good reason to restore the once existing rail system utilizing a smaller and more sophisticated 'trolley' to transport the user. In conjunction with the rail system will operate a marine type of transportation. In short, reaching the site (approximately 3000 feet from the shoreline) will become an experience in itself or rather, part of a much larger experience.
The first step in the construction process was the driving of three rows of piles (21,000 Oregon timber pilings ranging from 20 to 27 feet in depth) on each side of the pier area, piling which then formed the support for the dock walls of massive concrete. Outside the wall line, timber sheet piling was driven around the entire periphery of the walled area to retain a protective fill of sand, clay, and rock which was placed by means of scows and hydraulic dredges. The piling is held in place by two devices, one a system of lateral steel tie rods extending under the concrete walls, and the other a rock fill on the outside face low enough to clear the bottoms of laden vessels. The steel columns of the various pier buildings are supported by footings resting on independent pile clusters.
SOLAR RADIATION

Sun Time and Shadow Construction for Chicago

**Latitude = 41° 8' = 42°, Longitude = 87° 6' = 88°**
Declination of the sun (max) (42° latitude calculated)

<table>
<thead>
<tr>
<th>Date</th>
<th>Declination (Solar Angle)</th>
<th>Solstice (Angle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 21</td>
<td>71°</td>
<td>122°</td>
</tr>
<tr>
<td>May 21 (July 21)</td>
<td>68°</td>
<td>118°</td>
</tr>
<tr>
<td>April 21 (August 21)</td>
<td>60°</td>
<td>105°</td>
</tr>
<tr>
<td>March 21 (September 21)</td>
<td>48°</td>
<td>90°</td>
</tr>
<tr>
<td>February 21 (October 21)</td>
<td>37°</td>
<td>75°</td>
</tr>
<tr>
<td>January 21 (November 21)</td>
<td>28°</td>
<td>62°</td>
</tr>
<tr>
<td>December 21</td>
<td>24°</td>
<td>56°</td>
</tr>
</tbody>
</table>

[Diagram of a city with streets and buildings]

[Scale bar for measurement]
### Environmental Data

#### Degree Days (Base 65)

<table>
<thead>
<tr>
<th>Month</th>
<th>Degree Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>1209</td>
</tr>
<tr>
<td>February</td>
<td>1044</td>
</tr>
<tr>
<td>March</td>
<td>890</td>
</tr>
<tr>
<td>April</td>
<td>480</td>
</tr>
<tr>
<td>May</td>
<td>211</td>
</tr>
<tr>
<td>June</td>
<td>48</td>
</tr>
<tr>
<td>July</td>
<td>0</td>
</tr>
<tr>
<td>August</td>
<td>0</td>
</tr>
<tr>
<td>September</td>
<td>81</td>
</tr>
<tr>
<td>October</td>
<td>326</td>
</tr>
<tr>
<td>November</td>
<td>753</td>
</tr>
<tr>
<td>December</td>
<td>1113</td>
</tr>
</tbody>
</table>

#### Prevailing Direction and Wind Mean Speed (M.P.H.)

<table>
<thead>
<tr>
<th>Month</th>
<th>Direction</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>E</td>
<td>1</td>
</tr>
<tr>
<td>February</td>
<td>E</td>
<td>11</td>
</tr>
<tr>
<td>March</td>
<td>E</td>
<td>12</td>
</tr>
<tr>
<td>April</td>
<td>SSW</td>
<td>11</td>
</tr>
<tr>
<td>May</td>
<td>NNE</td>
<td>9</td>
</tr>
<tr>
<td>June</td>
<td>NE</td>
<td>8</td>
</tr>
<tr>
<td>July</td>
<td>August</td>
<td>NE</td>
</tr>
<tr>
<td>August</td>
<td>N</td>
<td>9</td>
</tr>
<tr>
<td>September</td>
<td>October</td>
<td>N</td>
</tr>
<tr>
<td>November</td>
<td>December</td>
<td>E</td>
</tr>
</tbody>
</table>

*Annual NNE 10

#### Mean Number of Hours of Sunshine (30 year average)

<table>
<thead>
<tr>
<th>Month</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>126</td>
</tr>
<tr>
<td>February</td>
<td>142</td>
</tr>
<tr>
<td>March</td>
<td>199</td>
</tr>
<tr>
<td>April</td>
<td>221</td>
</tr>
<tr>
<td>May</td>
<td>274</td>
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<tr>
<td>June</td>
<td>300</td>
</tr>
<tr>
<td>July</td>
<td>333</td>
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<tr>
<td>August</td>
<td>299</td>
</tr>
<tr>
<td>September</td>
<td>247</td>
</tr>
<tr>
<td>October</td>
<td>216</td>
</tr>
<tr>
<td>November</td>
<td>136</td>
</tr>
<tr>
<td>December</td>
<td>118</td>
</tr>
</tbody>
</table>

*Total 2,611 Hours

#### Mean Daily Solar Radiation (Langleys)

<table>
<thead>
<tr>
<th>Month</th>
<th>Radiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>96</td>
</tr>
<tr>
<td>February</td>
<td>147</td>
</tr>
<tr>
<td>March</td>
<td>227</td>
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<tr>
<td>April</td>
<td>331</td>
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<tr>
<td>May</td>
<td>424</td>
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<tr>
<td>June</td>
<td>458</td>
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<tr>
<td>July</td>
<td>473</td>
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<tr>
<td>August</td>
<td>403</td>
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<td>September</td>
<td>313</td>
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<tr>
<td>October</td>
<td>207</td>
</tr>
<tr>
<td>November</td>
<td>120</td>
</tr>
<tr>
<td>December</td>
<td>76</td>
</tr>
</tbody>
</table>

#### Mean Sky Cover, Sunrise to Sunset (In Tenths)*

<table>
<thead>
<tr>
<th>Month</th>
<th>Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>6.4 = 64%</td>
</tr>
<tr>
<td>February</td>
<td>6.2</td>
</tr>
<tr>
<td>March</td>
<td>6.1</td>
</tr>
<tr>
<td>April</td>
<td>5.8</td>
</tr>
<tr>
<td>May</td>
<td>5.3</td>
</tr>
<tr>
<td>June</td>
<td>5.2</td>
</tr>
<tr>
<td>July</td>
<td>4.3</td>
</tr>
<tr>
<td>August</td>
<td>4.6</td>
</tr>
<tr>
<td>September</td>
<td>4.7</td>
</tr>
<tr>
<td>October</td>
<td>5.0 = 50%</td>
</tr>
<tr>
<td>November</td>
<td>6.3</td>
</tr>
<tr>
<td>December</td>
<td>6.6</td>
</tr>
</tbody>
</table>

*Annual 5.5

*Ten is complete sky coverage
****SOLAR CALCULATION****


PROJECT NUMBER: 1    PROJECT NAME: SOUNDSHIP

****HEAT LOSS CALCULATION****

FOR ROOM 1

<table>
<thead>
<tr>
<th>PART</th>
<th>AREA OR L FT</th>
<th>U FACTOR OR UNIT</th>
<th>TEMP DIFF</th>
<th>TOTAL BTU/H LOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WALL N</td>
<td>9475</td>
<td>.416</td>
<td>68</td>
<td>268029</td>
</tr>
<tr>
<td>S</td>
<td>7050</td>
<td>.416</td>
<td>68</td>
<td>199430</td>
</tr>
<tr>
<td>E</td>
<td>9475</td>
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<td>268029</td>
</tr>
<tr>
<td>W</td>
<td>4708</td>
<td>.416</td>
<td>68</td>
<td>132954</td>
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<td>GLASS N</td>
<td>9475</td>
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<td>68</td>
<td>418795</td>
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<tr>
<td>S</td>
<td>9475</td>
<td>.65</td>
<td>68</td>
<td>418795</td>
</tr>
<tr>
<td>E</td>
<td>7050</td>
<td>.65</td>
<td>68</td>
<td>311610</td>
</tr>
<tr>
<td>W</td>
<td>4708</td>
<td>.65</td>
<td>68</td>
<td>207740</td>
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<tr>
<td>CEILING</td>
<td>0</td>
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<td>68</td>
<td>0</td>
</tr>
<tr>
<td>ROOF</td>
<td>155020</td>
<td>.297</td>
<td>68</td>
<td>1.02239E+06</td>
</tr>
<tr>
<td>FLOOR</td>
<td>140650</td>
<td>.416</td>
<td>18</td>
<td>1.05319E+05</td>
</tr>
<tr>
<td>DOORS</td>
<td>0</td>
<td>0</td>
<td>69</td>
<td>0</td>
</tr>
<tr>
<td>INFRTH</td>
<td>708</td>
<td>32</td>
<td>69</td>
<td>32973.4</td>
</tr>
</tbody>
</table>

TOTAL FOR ROOM 1 = 4.35392E+06 BTU/H

TOTAL BLDG HEAT LOSS= 4.35392E+35 BTU/H

****YEARLY HEAT LOSS****

<table>
<thead>
<tr>
<th>MONTH</th>
<th>LOSS/DAY</th>
<th>DEGREE DAY</th>
<th>BTU/MONTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAN</td>
<td>1.53656E+06</td>
<td>1113</td>
<td>1.71632E+09</td>
</tr>
<tr>
<td>FEB</td>
<td>1.53656E+06</td>
<td>949</td>
<td>1.45831E+09</td>
</tr>
<tr>
<td>MAR</td>
<td>1.53656E+06</td>
<td>829</td>
<td>1.24317E+09</td>
</tr>
<tr>
<td>APR</td>
<td>1.53656E+06</td>
<td>432</td>
<td>6.63845E+08</td>
</tr>
<tr>
<td>MAY</td>
<td>1.53656E+06</td>
<td>177</td>
<td>2.71922E+08</td>
</tr>
<tr>
<td>JUN</td>
<td>1.53656E+06</td>
<td>39</td>
<td>5.99305E+07</td>
</tr>
<tr>
<td>JUL</td>
<td>1.53656E+06</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AUG</td>
<td>1.53656E+06</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SEPT</td>
<td>1.53656E+06</td>
<td>90</td>
<td>1.39301E+08</td>
</tr>
<tr>
<td>OCT</td>
<td>1.53656E+06</td>
<td>316</td>
<td>4.8559E+08</td>
</tr>
<tr>
<td>NOV</td>
<td>1.53656E+06</td>
<td>723</td>
<td>1.11102E+09</td>
</tr>
<tr>
<td>DEC</td>
<td>1.53656E+06</td>
<td>1051</td>
<td>1.61505E+09</td>
</tr>
</tbody>
</table>

TOTAL YEARLY HEAT LOSS= 8.75753E+09
### HOT WATER REQUIREMENT

1000 people using hot water

<table>
<thead>
<tr>
<th>Cltr Area</th>
<th>Cltr BTU/YR</th>
<th>System Efficiency</th>
<th>Water Temp Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 sq ft</td>
<td>0</td>
<td>0</td>
<td>65</td>
</tr>
</tbody>
</table>

620000 gallons per month

7.2E+06 gallons per year

3.2487E+08 BTU/Month

3.89844E+09 BTU/Year

0 Cltr BTU/YR

3.89844E+09 BTU/ADDITIONAL

Solar Capacity = 0 %

### INTERNAL HEAT GAIN

2030 people being considered

982000 BTU/H HUMAN GAIN

1260 BTU/H MOTORIZED APPLIANCE GAIN

4000 BTU/H ELE & GAS GAIN

### SOLAR WINDOW GAIN

<table>
<thead>
<tr>
<th>Month</th>
<th>Gain/Mth</th>
<th>Wndw Area</th>
<th>Shade X Eff</th>
<th>Mth Heat Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>19319</td>
<td>9475</td>
<td>.35</td>
<td>6.4066E+07</td>
</tr>
<tr>
<td>Feb</td>
<td>20503</td>
<td>9475</td>
<td>.35</td>
<td>6.7993E+07</td>
</tr>
<tr>
<td>March</td>
<td>26628</td>
<td>9475</td>
<td>.35</td>
<td>6.8407E+07</td>
</tr>
<tr>
<td>April</td>
<td>16302</td>
<td>9475</td>
<td>.35</td>
<td>5.4061E+07</td>
</tr>
<tr>
<td>May</td>
<td>14250</td>
<td>9475</td>
<td>.35</td>
<td>4.6593E+07</td>
</tr>
<tr>
<td>June</td>
<td>12974</td>
<td>9475</td>
<td>.35</td>
<td>4.3025E+07</td>
</tr>
<tr>
<td>July</td>
<td>16333</td>
<td>9475</td>
<td>.35</td>
<td>5.4164E+07</td>
</tr>
<tr>
<td>Aug</td>
<td>20615</td>
<td>9475</td>
<td>.35</td>
<td>6.8364E+07</td>
</tr>
<tr>
<td>Sept</td>
<td>26744</td>
<td>9475</td>
<td>.35</td>
<td>8.8859E+07</td>
</tr>
<tr>
<td>Oct</td>
<td>29788</td>
<td>9475</td>
<td>.35</td>
<td>9.8757E+07</td>
</tr>
<tr>
<td>Nov</td>
<td>21470</td>
<td>9475</td>
<td>.35</td>
<td>7.1199E+07</td>
</tr>
<tr>
<td>Dec</td>
<td>17337</td>
<td>9475</td>
<td>.35</td>
<td>5.7493E+07</td>
</tr>
</tbody>
</table>

Total Yearly Window Gain = 7.82817E+08

Total Yearly Heat Gain = 4.74786E+10

### SOLAR COLLECTOR HEAT GAIN

<table>
<thead>
<tr>
<th>Month</th>
<th>BTU/SF/Mth</th>
<th>Area</th>
<th>Efficiency</th>
<th>Total BTU/Mth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>22579</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>Feb</td>
<td>24754</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>March</td>
<td>22881</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>April</td>
<td>30566</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
<td>31953</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>June</td>
<td>32171</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>July</td>
<td>37484</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>Aug</td>
<td>40818</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>Sept</td>
<td>39535</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>Oct</td>
<td>39261</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>Nov</td>
<td>25034</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
<tr>
<td>Dec</td>
<td>19755</td>
<td>0</td>
<td>.5</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Yearly Collector Heat Gain = 0
**Thermal Storage**

Storage Medium: None  
8.33 BTU/H Storage Capacity  
Storage Temp Diff: 4°F  
Hourly Heat Loss: 4.35392E+06 BTU/H

Volume Calculated: Carry Over Was Entered  
1 Hrs of Carry Over: 5307.55 None of Storage

**Auxiliary Fuel Requirement**

<table>
<thead>
<tr>
<th>Month</th>
<th>Loss/Mth</th>
<th>Int Gain</th>
<th>Cltr Gain</th>
<th>Add. BTUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>1.71232E+09</td>
<td>6.40666E+07</td>
<td>0</td>
<td>1.64626E+09</td>
</tr>
<tr>
<td>Feb</td>
<td>1.45331E+09</td>
<td>6.79931E+07</td>
<td>0</td>
<td>1.39031E+09</td>
</tr>
<tr>
<td>March</td>
<td>1.24371E+09</td>
<td>6.84076E+07</td>
<td>0</td>
<td>1.17477E+09</td>
</tr>
<tr>
<td>April</td>
<td>6.63845E+08</td>
<td>5.40615E+07</td>
<td>0</td>
<td>6.09784E+08</td>
</tr>
<tr>
<td>May</td>
<td>2.71992E+08</td>
<td>4.65933E+07</td>
<td>0</td>
<td>2.25399E+08</td>
</tr>
<tr>
<td>June</td>
<td>5.99303E+07</td>
<td>4.39255E+07</td>
<td>0</td>
<td>1.59054E+07</td>
</tr>
<tr>
<td>July</td>
<td>0</td>
<td>5.41643E+07</td>
<td>0</td>
<td>-5.41643E+07</td>
</tr>
<tr>
<td>Aug</td>
<td>0</td>
<td>6.33645E+07</td>
<td>0</td>
<td>-6.33645E+07</td>
</tr>
<tr>
<td>Sept</td>
<td>1.32231E+08</td>
<td>8.86896E+07</td>
<td>0</td>
<td>4.96113E+07</td>
</tr>
<tr>
<td>Oct</td>
<td>4.35392E+08</td>
<td>9.37579E+07</td>
<td>0</td>
<td>3.86933E+08</td>
</tr>
<tr>
<td>Nov</td>
<td>1.11926E+09</td>
<td>7.19997E+07</td>
<td>0</td>
<td>1.03962E+09</td>
</tr>
<tr>
<td>Dec</td>
<td>1.61505E+07</td>
<td>5.74938E+07</td>
<td>0</td>
<td>1.55756E+09</td>
</tr>
</tbody>
</table>

Total Auxiliary Heat Required: 7.97471E+09

Solar Capacity: 8.93879 M
PROJECT SUMMARY

PROJECT NAME: SOUNDSHIP            PROJECT NUMBER: 1

ANNUAL SPACE HEATING REQUIREMENT 8.75753E+09 BTUS/yr
ANNUAL DOMESTIC WATER HEATING REQUIREMENT 3.89844E+09 BTUS/yr
AUX FUEL REQUIREMENT, SPACE HEATING 7.97471E+09 BTUS/yr
AUX FUEL REQUIREMENT, WATER HEATING 3.89844E+09 BTUS/yr
TOTAL AUX FUEL REQUIREMENT 1.18732E+10 BTUS/yr
COLLECTOR MANUFACTURER NONE
HEAT ENERGY FROM WINDOWS AND INT 4.74786E+09 BTUS/yr
HEAT ENERGY FROM COLLECTORS 0 BTUS/yr
HEAT ENERGY FROM HOT WATER COLLECTOR 0 BTUS/yr
TOTAL CAPTURED HEAT ENERGY 4.74786E+09 BTUS/yr
SOLAR CAPACITY FOR HEATING 8.93979 %
SOLAR CAPACITY FOR WATER HEATING 0 %
CARRY OVER CAPACITY OF STORAGE 1 HOURS
VOLUME OF STORAGE 5807.55 NONE OF NONE
## Auditorium Acoustics

<table>
<thead>
<tr>
<th>Walls</th>
<th>Absorption Coefficient</th>
<th>Sq. Ft. Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125 Hz</td>
<td>4000 Hz</td>
</tr>
<tr>
<td>Brick</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Smooth Finish Plaster</td>
<td>.14</td>
<td>.03</td>
</tr>
<tr>
<td>New Panels</td>
<td>.85</td>
<td>.85</td>
</tr>
<tr>
<td><strong>Floors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Carpet on Concrete</td>
<td>.02</td>
<td>.65</td>
</tr>
<tr>
<td>Wood Deck on Frame</td>
<td>.35</td>
<td>.80</td>
</tr>
<tr>
<td><strong>Openings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balconys &amp; Entrys</td>
<td>.05</td>
<td>1.0</td>
</tr>
</tbody>
</table>

### Air Volume Absorption

(per 1000 cu ft. expressed in sabins)

\[ S = 7.2 \]

\[ S = 7.2 \]  \[ 1,021,680 \]

### Audience

(seated in upholstered seats or sq/ft sabins)

\[ .6 \]

\[ .85 \]

25,542

### Total Absorption - Sabins

<table>
<thead>
<tr>
<th>125 Hz</th>
<th>4000 Hz</th>
<th>125 Hz</th>
<th>4000 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>240</td>
<td>560</td>
<td>240</td>
<td>560</td>
</tr>
<tr>
<td>2800</td>
<td>600</td>
<td>2800</td>
<td>600</td>
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<tr>
<td>6800</td>
<td>6800</td>
<td>6800</td>
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<tr>
<td>190</td>
<td>6175</td>
<td>190</td>
<td>6175</td>
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<tr>
<td>5615</td>
<td>10267</td>
<td>5615</td>
<td>10267</td>
</tr>
<tr>
<td>1425</td>
<td>2850</td>
<td>1425</td>
<td>2850</td>
</tr>
<tr>
<td>204,136</td>
<td>7,356,096</td>
<td>204,136</td>
<td>7,356,096</td>
</tr>
<tr>
<td>15,325</td>
<td>21,711</td>
<td>15,325</td>
<td>21,711</td>
</tr>
</tbody>
</table>

### Outside Absorption

<table>
<thead>
<tr>
<th>125 Hz</th>
<th>4000 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>294,270</td>
<td>7,446,030</td>
</tr>
</tbody>
</table>

(80% perfect compared w/outside absorption & perfect 100% absorb materials)

### Power Source
- 3,500 W. RMS/CHANNEL (2)

### Optimum Reverberation
- .4/Sec

### Climate: Focusing and Creep

### Intensity Level
- 120 dB (110 dB Orchestra)
RESTORATION

DESIREs
MAX. ORIG. EXIST. STRUCTURE
REMOVE UNDESIRABLE NEW ADDIT.
USE ADDIT. TO COMPLETE STORY

GOALS
SAY MOST W/ LEAST
TURN 4 STRUCT. INTO 1 PROJECT
COMPATABILITY BTWN. OLD & NEW

DECISIONS
REVITALIZE EXIST. RAIL TRANSP.
MODERNIZE STAGE
NEW TOWER TOPS
USE OF STL. & FABRIC MATERIALS

RESOLUTIONS
PIER EXTENSION IN KEEPING W/ ORIG. BURNHAM PLAN
MULTI-USE AUDITORIUM
WHOLISTIC PROJECT
IMAGERY

DESIRES
ALLUSIONS OF NAUTICAL ARCH.
ALLUSIONS OF CHICAGO PLACES
A PLACE FOR FUN

GOALS
FUN, EXCITEMENT, BEAUTY,
SPECTACULAR, AWESOME, EXPERIENCE

DECISIONS
ADDITION OF NAUTICAL TRANSP.
OUTSIDE AUDITORIUM
TURN 4 STRUCT. INTO 1 PROJECT

RESOLUTIONS
NAUTICAL IMAGE
WHOLISTIC APPEARANCE
COMPLETE ATMOSPHERE

WINDY CITY
SPACE PLANNING

DESIREs
SERVICE & CLIENT CIRCULATION
REFLECT, EXIST, STRUCT
SIMPLICITY

GOALS
CLEAR DEFIN. OF FUNCTION
USABLE VARIETY
MAX. USABLE SPACE

DECISIONs
ZONING BY FLR. LEVEL & FUNC.
CIRCULAR MOTIF
VEHICULAR SERVICE

RESOLUTIONs
COMPLEX, APPEARANCE
SIMPLICITY OF CIRCULATION
VARIETY OF STYLE WITHIN
RIGID PLAN

\[ \begin{array}{cc}
  X & O \\
  X & O \\
  O & O & X \\
\end{array} \]

\[ \text{CIRCLE} \]

\[ \text{Diagram of building plan} \]
AUDITORIUM TRANSITION

DESIRES
SMALL/LARGE TRANSIT. OF SPACE, INCL. FUNCT.
LIGHT. & PHYS. CHANGES

GOALS
LEAVE ORIG. CHARACT. SAME MAX. TABLED SEATING
TRANSIT. AS PERFORMAN.

DECISIONS
5 REST. AS DIVISIONS
PERIMETER SELF SERVE
CONTROL TOWER TRANS.
BALCONIES = +SEATING

RESOLUTIONS
DIV. OF SPACE THRU MOVABLE CURTAINS, LIGHT, BANNER,
SOUND, LEVELS (HT.)
MOVABLE TOWER TRANS.
STAGE

DESIRS
DIV: BTWN STAGE & AUD.
LARGER SERVICE ACCESS
LARGER PHYS. APPEAR.

DECISIONS
REMOVAL OF PROSCENIUM
ABOVE ARCH & RESTROOMS
GLAZE BTWN PILASTERS

GOALS
PERFORM TYPE FLEXABLE
MOVABLE LIGHT & SOUND

RESOLUTIONS
INTEGRAL STRUCTURE FOR
ROOF, SOUND & LIGHT
VERSATILE STAGING
FLEX. CURTAIN SYSTEM
CONNING TOWER

DESIREs
IMPORT. OF LOCATION, FUNCT., CONTROL OF BARRIERS, APPEARANCE
MOTION TRANS. FROM SCULPTURE TO 'NAUTICLE'

GOALS
LIGHT, & SOUND
SPACE ECON., SIGHT LINES

DECISIONs
FUNCTION & VARIETY OF EQUIP. CAP.
LIGHTWEIGHT, STL. FRAME

RESOLUTIONs
NAUTICAL MOTION, LIGHT, DRAPE TRANSITION
MULTI-FUNCTIONAL
TOWERS

DESIRE

IMPORT. OF LOCATION W/ RESPECT TO APPEAR., EXIST. STRUCT. & NEW CONSTRUCTION

DECISION

3½ FLR. HT. LIGHTWEIGHT GLASS & STL. FRAME CONSTRUCT. 2 ELEVATORS & 1 STAIR

GOALS

HIGHLY VISIBLE FROM WITHIN/WITHOUT-TRANSP. ACCENTUATE HEIGHT/SPACE SAME PLAN-DIF. ATMOSP.H.

RESOLUTIONS

ROUND/SQUARE CONCEPT LEVEL CHANGE VISIBLE WITHIN (ATRIUM) 2 BARS ON DIF. LEVELS
ACOUSTICS & LIGHTING

DESIRIES

SOUND ISOLATION BY AREA. 100% ABSORPTION OF SND.
VARIED LIGHT TYPE & CAP.
SOUND REINFORCEMENT
SYST. (S.R.S.) UTILIZAT.

GOALS

MOBILITY OF SOUND & LIGHT

DECISIONS

LIGHT & SOUND CONTROL
PRODUCE POINT
MOVABLE PANEL SYST.

RESOLUTIONS

VARIETY OF LIGHT TYPES
CONTROL POINT IN AUDIT.
SND. ABSORP./LIGHT REFLEC.
PANELS
BAR/LOUNGE

DESIREs
VARIETY OF FUNCTION, IMAGE, MIN. MATERIALS/BROAD VOCAB.
LAYOUT
CIRCLE WITHIN SQUARE IDEA MAX. OCCUP. CAPACITY

GOALS
ABILITY TO CHANGE

DECISIONS
VERTICAL SERVICE CIRCUIT
PREFAB CONSTRUCTION

RESOLUTIONS
COMPLEX APPEARANCE/
SIMPLE FUNCTION
DISTINCT ATMOSPHERE
BOUNDARY, FIRM PLANS
EXTERIOR SPACE

DESIRES
EXTER. OPEN AUDITORI.
INTER/EXT. CONNECT.
NAUTICAL MOTIF

GOALS
REFLECTIVE OF EXIST.
STRUCTURE
MAX USE OF ROOF

DECISIONS
BOAT DOCK FACILITIES
PREFAB WINDOW MODULE
RAIL ARRIVAL-BRIDGE/AWN.
CANOPY, LIGHT SCHEME

RESOLUTIONS
FLOATING STAGE(MOVABLE)
CIRCULATION FROM LEVEL
2 TO LEVEL 1 (RAMPS)
OUTDOOR TABLED ARCADES
KITCHENS

DESIRES
FUNCTION & MAX. SPACE
VARIETY. OF SELECTION, SERVICE

GOALS
ABILITY OF CHANGE
CIRCULATION DOUBLED W/ STAGE, SERVERY

DECISIONS
MOBILE SERVERY
2 KITCHENS (2 FUNCTIONS)

RESOLUTIONS
MOVABLE EQUIP. IN CENTER, FIXED PERIM.
SEPARAT. OF KITCH. FUNCT.
PROMENADE

DESIRES
HALL AS ALLEY/STREET
MULTI-FUNCTION

GOALS
GOOD CLIENT & SERVICE
FUNCTIONS/CIRCULAT.

DECISIONS
REMOVABLE EQUIP.
UTILIZE FABRICS
SERVERY SPACES

RESOLUTIONS
SIGNAGE: DEF. OF FUNCT./ENTRY/STYLE
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