The Fort Wayne Ariadome
Fort Wayne Indiana

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Professor Paul Laseau
Mr. Bob Kingsley
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THE FORT WAYNE ARIADOME

The name of this project tells quite a little about one feature of the project. The first part of the name, "aria," is an Italian word meaning the air; and "dome" refers to the roof over the arena. Putting the two together gives the notion of an air dome. The project is precisely that, an arena covered with a pneumatic dome.

The project is more than an arena. It has an exhibition space, Allen County High School Hall of Fame, retail space, and a parking structure. The arena has 9,200 permanent seats; basketball will hold approximately 11,200, and hockey games will seat almost 9,900 spectators. The exhibition space and Hall of Fame areas are intended to provide a drawing item to the arena, and to provide a means of interest for people during intermissions, before, and after the main attraction. The retail space is used as a connector with the downtown area of Fort Wayne. The parking structure is designed to hold approximately 700 cars for both employees and visitors of the arena.

The location of the arena is the southwest corner of the Central Business District in Fort Wayne, Indiana. The site is easily accessible by car or on foot from the downtown area. Hopefully an arena such as this can bring vitality and life to a struggling but improving city core.

This thesis project is not simply the attempt to solve an architectural issue of creating a glorious arena. However, this thesis project is an attempt to make an arena more people oriented, and to create a facility that has an attraction that will draw people into it all day long, not just when a special event occurs. This is a people oriented arena, and not just another pretty building.
THANKS...

...to my loving wife, Linda, for her patience, understanding, and motivation to make this project and my entire collegiate career possible.

...to my daughter, Meridith, for allowing me to be away from her so much these past few months.

...to Professor Paul Laseau for his guidance and sharing his ideas and wisdom, particularly during the developmental stages of this project.

...to Professors Robert Koester, Sonny Palmer, and Rod Underwood for blessing me with fruitful juries and most constructive criticism.

...to Bob Kingsley for his help in the presentation of this project.

...to God for blessing me with his presence, guidance, and gifts that helped make these past five years a lighter burden.
PROBLEM STATEMENT & GOALS

The problem was to design a multi-use arena that would primarily be used for basketball and hockey games. A secondary function of the building is to provide an exhibition area for local, free exhibits along with a permanent Allen County High School Hall of Fame exhibit. The problem also expanded to include as much retail space as possible to help tie this facility with the downtown population. There is a good amount of parking already available, but there did need to be some additional parking provided.

The real design problem then is the blending, or molding, of the above statements into one homogeneous facility. In most cases, arenas are separate statements in themselves, however; this thesis problem was to examine the possibilities of expanding the secondary functions of an arena. The primary function is the sporting event itself; the secondary functions are those that involve the people who come to see the event. This thesis problem was an attempt to question what do the people do before, during breaks, and after the sporting or main event. Is only the event itself the main attraction? Or is the entire experience a reward? Those questions were the key to the whole problem. They led to the following goals for the project.

* To examine the relationship between an urban district and the large mass of an arena.
* To examine the problems and possible solutions of how to handle a very large volume of people.
* To experiment with the elements of scale on a very large dominating form.
* To provide spaces to see and experience, and things to do before, during, and after an event.
* To experiment with making an arena an outward expression of openness rather than an inward attitude of shelter and protection.
* To integrate the three main functions of the building (retail, exhibition, and arena) into one homogeneous structure, both in appearance and experience.
SITE ANALYSIS SYNOPSIS

The following is only a synopsis of the important, or crucial, facts concerning the site. Great importance should be placed on the word "facts." The site provides the designer with facts, items that must be accepted as givens. For to change them would be either a falsification of conditions that already exist, or a result would be the destruction of a natural system already functioning. With that in mind, I will discuss the facts that this site presented to me, the designer.

Most important is the location and surrounding established ecosystem. The site is located in the southwest corner of the Fort Wayne Central Business District. The site is basically surrounded
on three sides by business districts. To the north, south, and southeast are all small businesses, with low volumes of customers. To the northeast is the Central Business District which contains all of the high volume commercial business of the downtown area. Many large offices are within this area. A high percentage (70 - 75%) of all Fort Wayne downtown activity, commercial and office, is within a five or six block walk of this site.

To the west and slightly southwest of the site is the beginning of a wide belt of residential housing that surrounds the core of Fort Wayne. The housing within a five or six block distance
of this site is comprised of mostly lower to low-middle class people. The houses are small, moderately maintained, and very vernacular in appearance. Vegetation does exist in this area. The site is buffered from this district by an area of parking lots that serve several nearby offices.

The nearest building to the south of this site is the main post office in Fort Wayne. This facility already has the potential for drawing people to the area; this could be a real plus for the site in attracting people.

Transportation and vehicular traffic are shown on the accompanying diagram. The site fronts the major east-west highway (U.S. 24) and is only a couple of blocks from the major north-south highway (U.S. 1 & U.S. 3) that cut through Fort Wayne.

The site currently has no vegetation, is moderately sloped from the southeast to the northwest, and is surrounded immediately by a mixture of buildings of various heights, open spaces, and parking lots. Several small framed views onto the site exist from nearby streets. The best views from the site are to the northeast and to the southwest. The northeast view is of the Fort Wayne skyline with its few tall buildings. The southwest view is of the residential area with a good amount of trees that soften the view.

The only other major fact about the site is
where the people are expected to approach the site from and in what volume. Over half of the pedestrians are expected from the Central Business District because of the several parking garages located there. The remaining pedestrians will be equally divided from the northwest area and the southeast area.

Briefly summarizing, the key issues, or facts, given by this site are the surrounding areas, the transportation patterns, the views from and especially onto the site, and the pedestrian access expectations.
BUILDING TYPE STUDY SYMOPSIS

The intent of this section is not to deliver a step-by-step analysis of a particular or several arenas, but rather the intent is to describe the significant findings whether they relate to a particular arena or arenas on the whole. The emphasis should be placed on the problems confronting the designer, rather than each individual solution.

The first matter of concern in an arena has to be the seating pattern. The arena that is able to give the most people the best possible view of the entire action will be the most satisfying to the spectator, who is a paying customer. The optimum condition is an elliptical arrangement.

An Elliptical Seating Pattern
Other Seating Patterns
that satisfies a great number of spectators, as far as sight lines and sight coverage of the playing surface are concerned. From the elliptical arrangement, other arrangements are derived, but all are less satisfactory in visual respects.

Conditions that affect the decision are what type of structural system will be used; how many people are to be seated; will balconies be used; and what type of events are to be housed in the arena.

The second most important consideration is the relationship between the arena floor and the ground plane. Raising or lowering the arena with respect to the ground causes several resulting situations. If the arena is raised above the ground plane, more emphasis is placed on the space below the seating and the area under the arena floor. This situation does result in a problem of access to the seating by the spectators. Structure can be given more visual emphasis in this type of arrangement.

When the arena is at, or near, the ground plane, access to the seating is best achieved. People can move either up or down with reasonably little effort. Access to the arena floor itself is best achieved in this arrangement. This may be necessary depending upon what kinds of events the arena plans to hold. This arena to ground plane relationship also begins to shift visual emphasis from the area beneath the seating to the rim of the seating and even the roof itself.
The third and final arrangement, arena below ground plane, is most commonly used where the arena is a separate facility with few or no secondary functions happening simultaneously. Easy access to the arena floor is very difficult to achieve. Access to the seating is very good in this arrangement. Visually, more emphasis is placed on the roof of the structure. Some emphasis may be given to the rim of the seating as well.

Many examples can be found of all three of the above mentioned arrangements, each suited to a particular set of problems or needs.

Several other points were brought out during the building type analysis. Egress from the structure is far more important than access. This relates to both the parking of vehicles and pedestrians. People will tend to come to a place like this in bunches or groups over a relatively longer period of time. Egress will occur almost at once when an event is concluded. People want to leave as quickly as possible. Facilities where other functions occur are far more successful at softening this tidal wave of people as they attempt to leave.

Entryways, exits, restrooms, and other people related functions need to be clearly marked in buildings with heavy public use. Confusion should be planned for and avoidance of confusion is the best solution.

Arenas are also excellent opportunities for designers to combine systematic needs of the building into combined solutions. Structural, mechanical, and aesthetic needs can be very easily blended in this building type.

The parking structure required building type analysis also. Analysis showed that the best type of structure for this building type, an arena, is a one-way, self-park garage. One-way parking avoids considerable confusion and helps to direct people without giving them any choice. Self-park garages are recommended over attendant type garages for psychological rather than functional reasons. It takes just as long to walk to your car as it does for an attendant to go get your car, but waiting for an attendant causes tension. Most people will not even realize the amount of time they take in walking to their cars. Therefore, less tension!

Building type study is not a package of solutions to a variety of problems. Rather, it is a series of approaches to specific issues. Utilizing those approaches may lead to the same solution, but not necessarily so, since an arena, especially with an exhibition space and retail area, is a complex series of issues. Much debate must take place before the selection of a particular solution is made. Building type analysis clues the designer in on how to approach the eventual solution.
CONCEPTS, DEVELOPMENT, & FINAL SOLUTION

After completing the building type analysis and the site evaluation, working on this project in both plan and section simultaneously became quite apparent as a necessity. The first basic problem to be solved was that of zoning the site or locating the three major functions - arena, exhibition space, and parking. Retail space was a minor consideration in the beginning, but it played a more major role as the project progressed.

Four basic concepts were evaluated on the following basis - access to the site for pedestrians; relationship of arena location to the downtown business district; opportunities for retail space; and clear, unopposing circulation patterns for
Concept #2 (later rejected)

Concept #3 (later rejected)
both pedestrians and vehicles.

The concept chosen was selected for several reasons. The concept placed the arena at the front (nearest downtown) of the site. This gives maximum exposure to motorists using Highway 24. Simultaneously, this places the parking structure on the south end of the site, away from the maximum exposure area. This also serves to end the project and maintain the spatial definition of the site. The parking garage is also more closely related to the existing parking lots. This arrangement of parking and arena also helps to keep pedestrians and vehicles separated.

Clearly, the most difficult problem to solve was that of the arena to ground relationship issue. In this case, raising the arena gave several advantages, but it also created some problems. The advantages were the increase in overall height of the project; the allowance for a maximum amount of retail space; a good location for the exhibition space; and the possibility for easy access to the arena floor. The main disadvantage was the access to the seating for the spectators. As the final solution shows, spectators must first traverse one story in height before they enter the midpoint of the banked seats.

Before the final solution was achieved, the problem progressed through four geometrical changes. First attempts were for an elliptical seating pattern because that was the best pos-
arena down into the ground - less retail, less promotion of exhibition area.

a venue on grade gives opportunity for more retail space, three levels instead of two.

sible solution as far as sight lines were concerned. But the elliptical seating caused several severe and finally killing problems. The structure of the entire facility became very difficult, especially connections with other elements of the project. At this point in the project, the building read as three separate volumes - the arena, the retail and exhibition space, and the parking garage. Connections between those volumes were very difficult! The other crucial problem was the harmonizing of the three volumes, aesthetically and geometrically. Finally, this elliptical arrangement was tabled because of the problem of attaching the other two volumes to the elliptical
From this point forward, the solution seemed to depend on the simplification of the form of the arena. This would set up much easier volumetric connections and simplify the structure to a great extent. I should mention that the circulation spaces, which are a major factor in arenas, depended greatly on the structural setup. The cleaner the structure was to be, the cleaner the resulting circulation also tended to be.
The first attempt, or scheme, also has the exhibition space separated spatially from the arena with a glass covered area. This complicated the problems previously mentioned even more. But a solution to the relationship between the arena and the exhibition space was not to be found until the final scheme.

The second scheme was very similar to the first except that the ellipses was forfeited and replaced with an oval shaped seating arrangement. All that this really achieved was the straight sides to the arena, which possibly helped the structural problems out somewhat. By this time in the design process, the choice for a pneumatic roof had been made based on uniqueness and lower cost. When I refer to structure, I'm not necessarily referring to a giant system to hold up the roof. But I am referring to the post and beam system of supporting two floors of area and their roof. The oval improved the structure slightly, but still structural bays were a muddled mess. The problem of connecting the three volumes cleanly still was not solved.

Reaching this stage of development, the real breakthrough in the project occurred! I knew I was having difficulty connecting the rectangular volume of the exhibition space with the curvilinear volume of the arena. I sought to solve
that one simple problem. How do I get this facility to read as one place with a few different functions? The curved ends of the arena had always been the major contributors to this problem. I could have curved the rest of the facility, but the strong rectilinear setup of a downtown block system seemed to dictate against that notion.

The next approach, and this was not the final solution yet, was to dissolve the curved ends of the arena into three straight pieces. Actually, what happened was an octagon was split into two halves and pulled apart to approximate the curves of the oval scheme. This was the real breakthrough! The structural system simplified so
much that I found new excitement in the project. However, the exhibition and retail spaces were still separated by a glass enclosed space. This still presented the same problem of getting to act and look united. Another problem began to appear. As the geometry was evolving from the ellipse into eventually the octagon, the seating began to spread wider and wider. This caused the glass covered "neutral zone" to shrink considerably. But this problem was solved in the final solution.

The final scheme, and subsequent solution, is the purest formally and clearest in many, many ways. The arena was molded into a pure octagon
with the lower section of seating remaining an oval shape. The upper sections of seats flank the sides of the arena floor, thus putting a grand number of the spectators in prime viewing area. After toying with the notion of making the upper section a balcony, the idea was abandoned because of vertical circulation problems.

The nagging problems caused by the glass covered area between the exhibition space were very nicely solved in the final scheme. The notion of the space separating the two areas covered by glass was abandoned and the exhibition space was slightly tucked under the east bank of seats. This tied the two areas very closely together so that space, actually and visually, flows from area to the other. This notion is conceptually much stronger than the two separated spaces as has been attempted the entire project until this point.

The concept of both functions sharing space is even carried out in the facades of the building. Clearly, the building reads as one facility with two or more functions visible. This reads as the barrel of the octagon rising out of the rectilinear pieces of the exhibition and retail spaces.

The building does have a few special features. The corner columns of the octagon are hollow to
ENTRY AND ENCLOSURE

carry air up to the roof. Circular swinging doors are used to seal off the building. No space has been placed under the arena floor because of the technical difficulties caused by refrigerated floor slabs.

Finally, all things seemed to fall together. Everything became much clearer - structure, aesthetic unity of the pieces, circulation, and spatial concept. With that in mind, I proudly present the Fort Wayne Ariesdome...........
Exhibition Level
Concourse Level
East Elevation

South Elevation
West Elevation

South Elevation
SPACE IDENTIFICATION INDEX

1. ALLEN COUNTY HIGH SCHOOL HALL OF FAME
2. EXHIBITION OFFICES
3. CONCESSION STORAGE
4. CONCESSIONS
5. SOUVENIR SHOP
6. SOUVENIR STORAGE
7. MEN'S RESTROOM
8. LADIES RESTROOM
9. MECHANICAL
10. TICKET BOOTH
11. FIRST AID
12. HANDICAP ELEVATOR
13. FREIGHT ELEVATOR
14. EXHIBITION STORAGE
15. ADMINISTRATIVE OFFICES
16. OFFICE SUPPLIES
17. ENTRY LOBBY
18. OUTDOOR DECK
19. LOUNGE
20. RETAIL
21. PRESS ROOM
22. BUILDING SUPERVISOR'S OFFICES
23. HOME TEAM LOCKER FACILITY
24. VISITING TEAM LOCKER FACILITY
25. REFEREE'S LOCKER FACILITY
26. SHIPPING AND RECEIVING
27. EQUIPMENT STORAGE
28. ARENA STORAGE
29. MECHANICAL