



THESIS PROJECT

1987

THOMAS G. JOLLY



MULTI-PURPOSE ARENA
MUNCIE, INDIANA



BALL STATE
UNIVERSITY

Arch
1977
10/10/77
10/10/77



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MULTI-PURPOSE ARENA



**MUNCIE,
INDIANA**



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ABSTRACT

Video technology has become a major aspect of athletic events, and it should be incorporated into the design of an arena. Most arenas do not provide space for television cameras at locations which are capable of producing a desirable picture for the audience at home. As a result, platforms have to be constructed or some seating has to be removed in order to place the cameras at favorable locations. I feel that this problem could be avoided if video technology was incorporated into the design of an arena. Since television networks pay large sums of money in order to acquire the right to broadcast athletic events, then the most up to date technology concerning audiovisual communication should be incorporated into the design of an arena.

The use of video technology has proven to be effective in other aspects besides television entertainment. Video technology can be used as a tool to help athletes better themselves. Since video technology can be a great asset in helping a team prepare for its opponent, then this technology, in its most developed stage, should be incorporated into the design of an arena, with easy access to practice areas. Video technology can be an enjoyable and functional asset to people that participate in the experiences of an arena; therefore, it should be carefully considered in the design of an arena.



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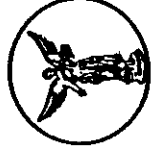
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SITE ANALYSIS

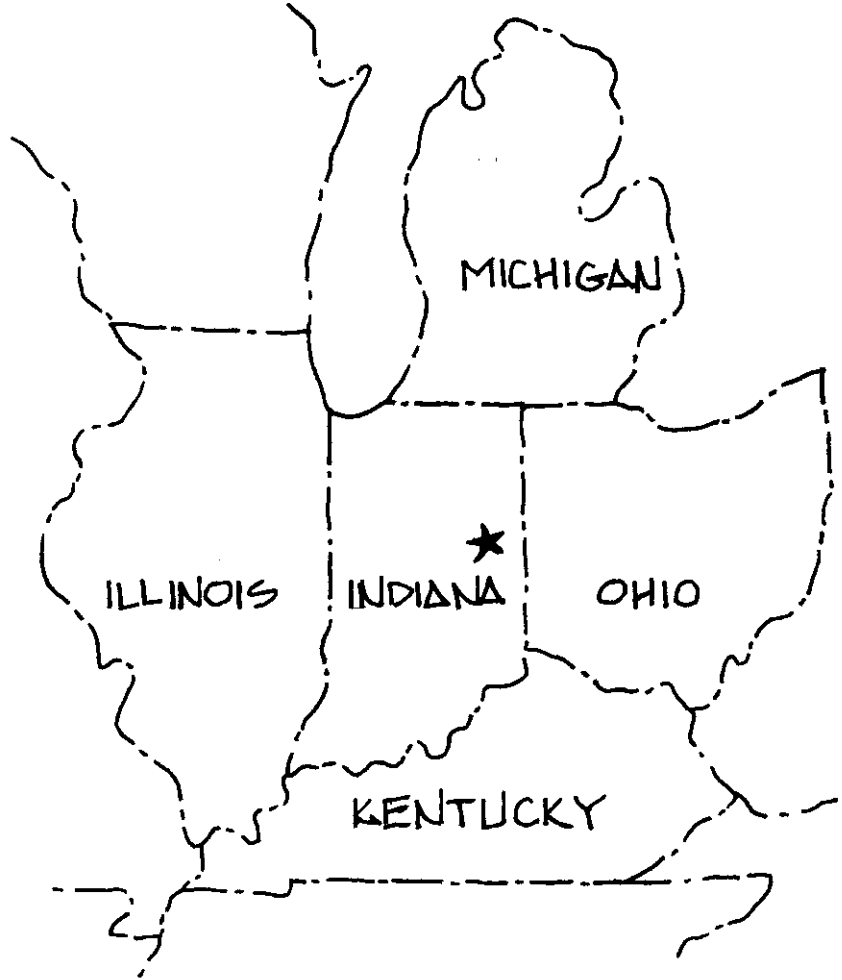


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REGIONAL MAP



MULTI-PURPOSE ARENA



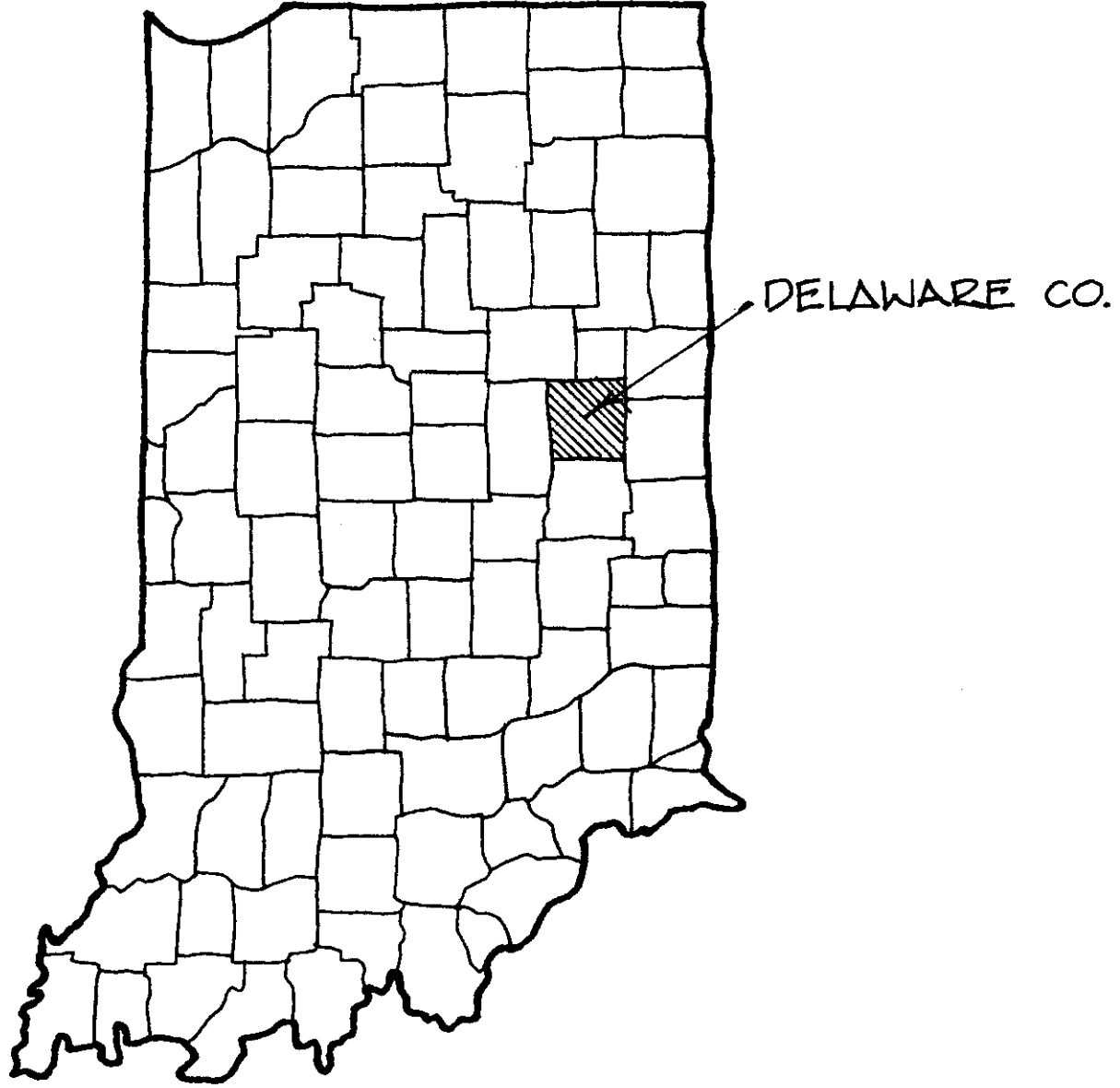
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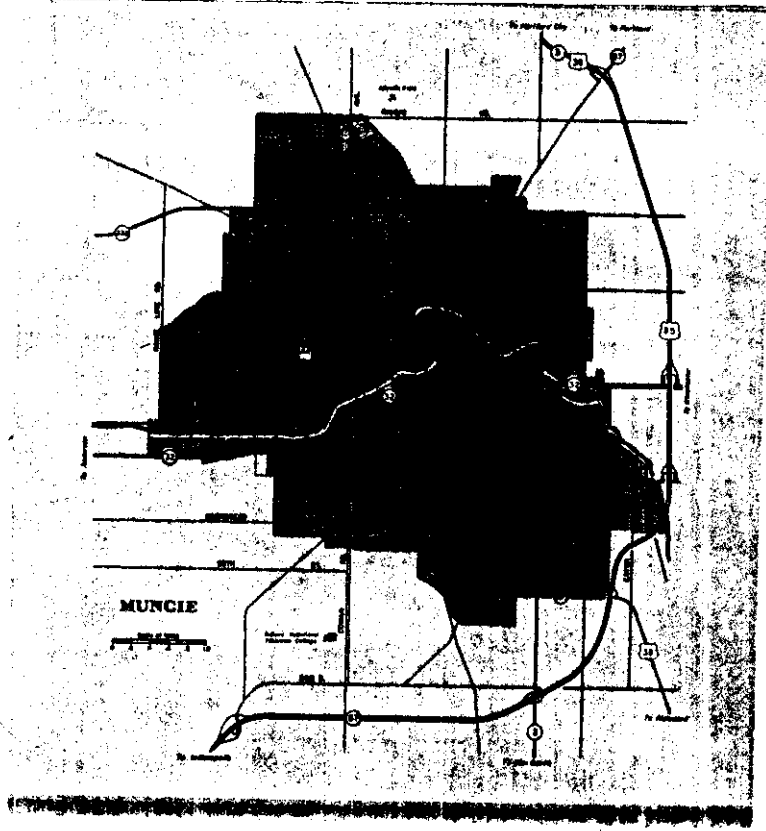
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CITY, MUNCIE



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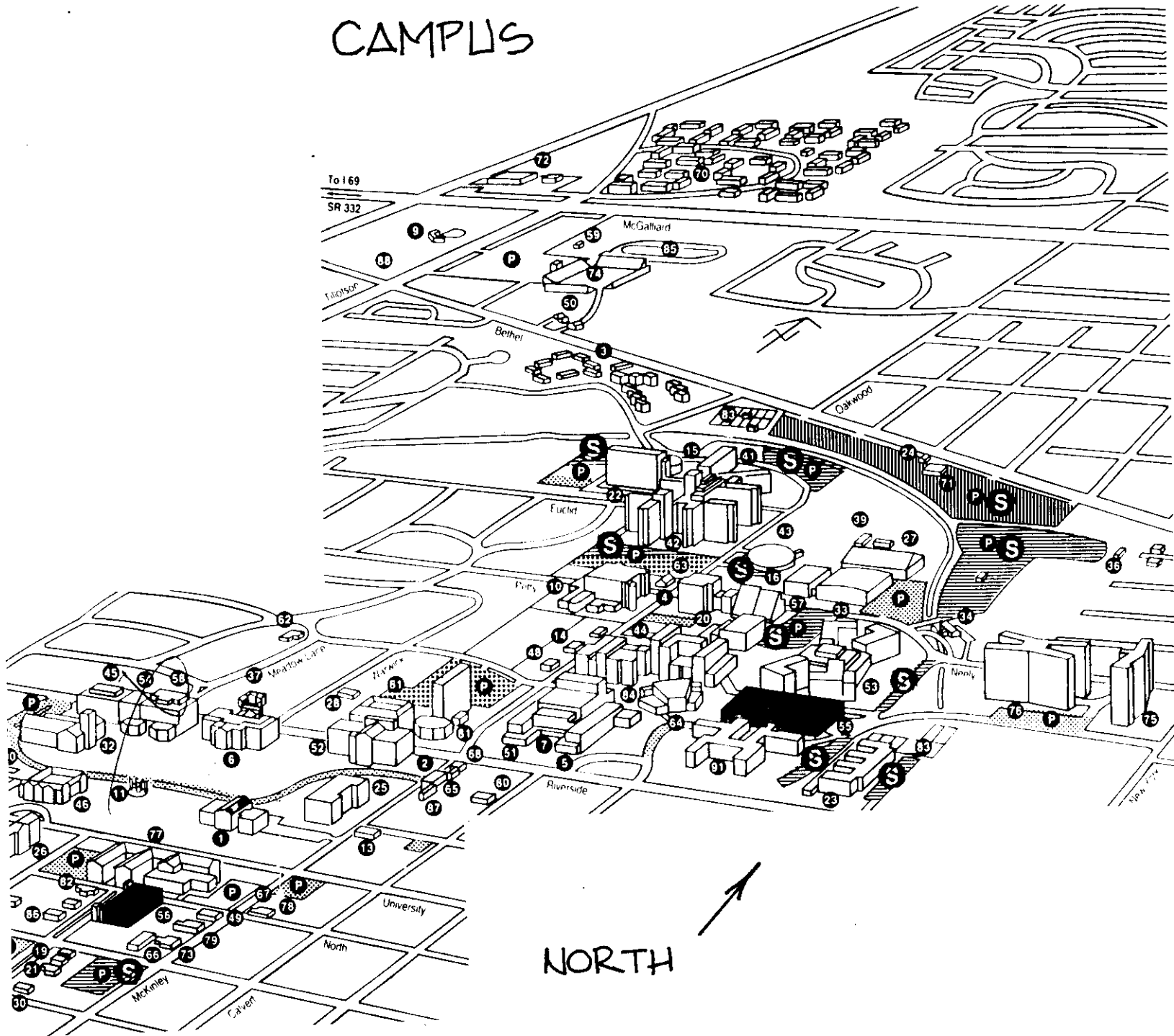
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CAMPUS



NORTH



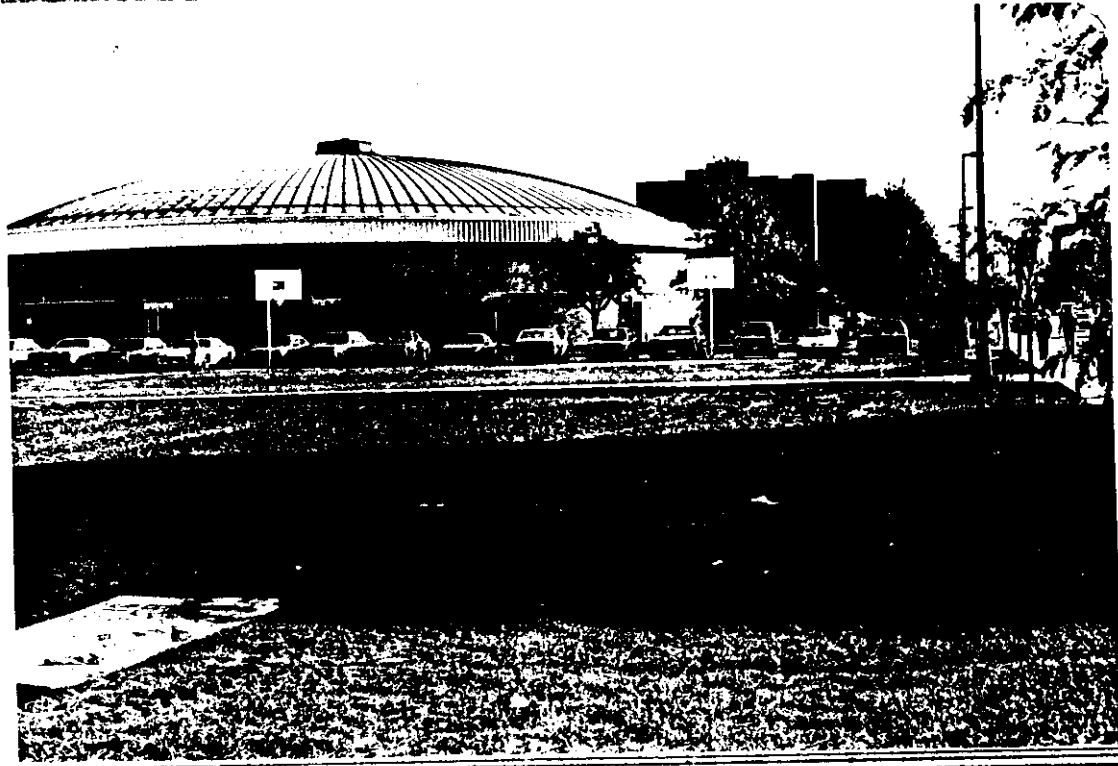
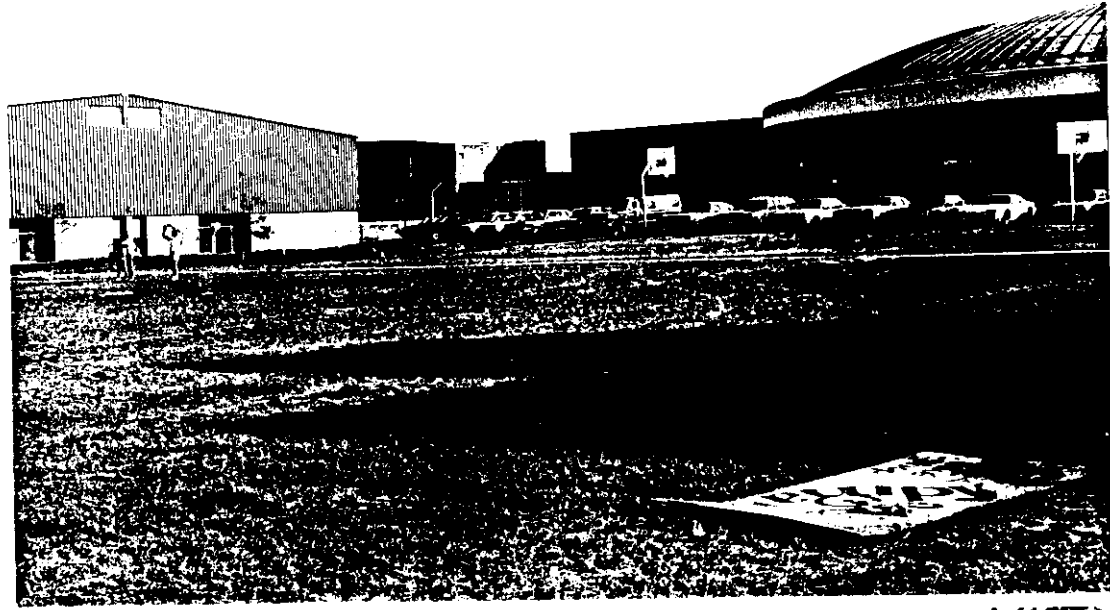
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CONTEXT

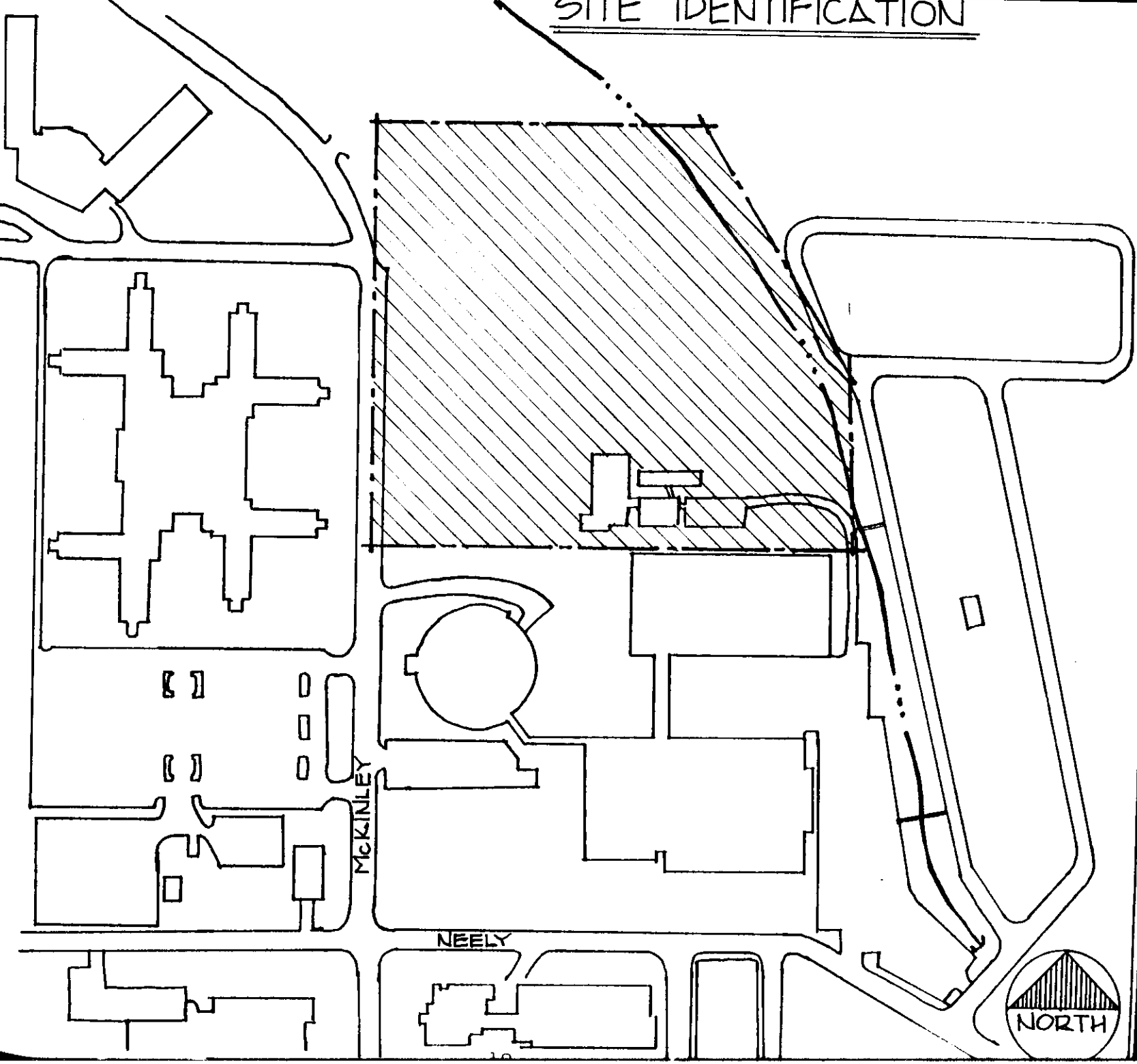


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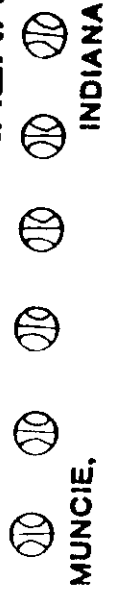


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SITE IDENTIFICATION



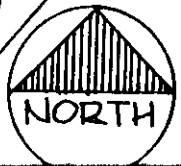
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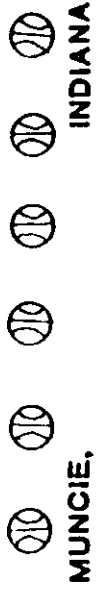


BUILDING IDENTIFICATION

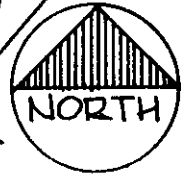
1. Johnson Hall
2. Laffollette Hall
3. Lewellen Aquatic Center
4. Architecture Building
5. University Gym
6. Field Sports Building
7. Human Performance Lab



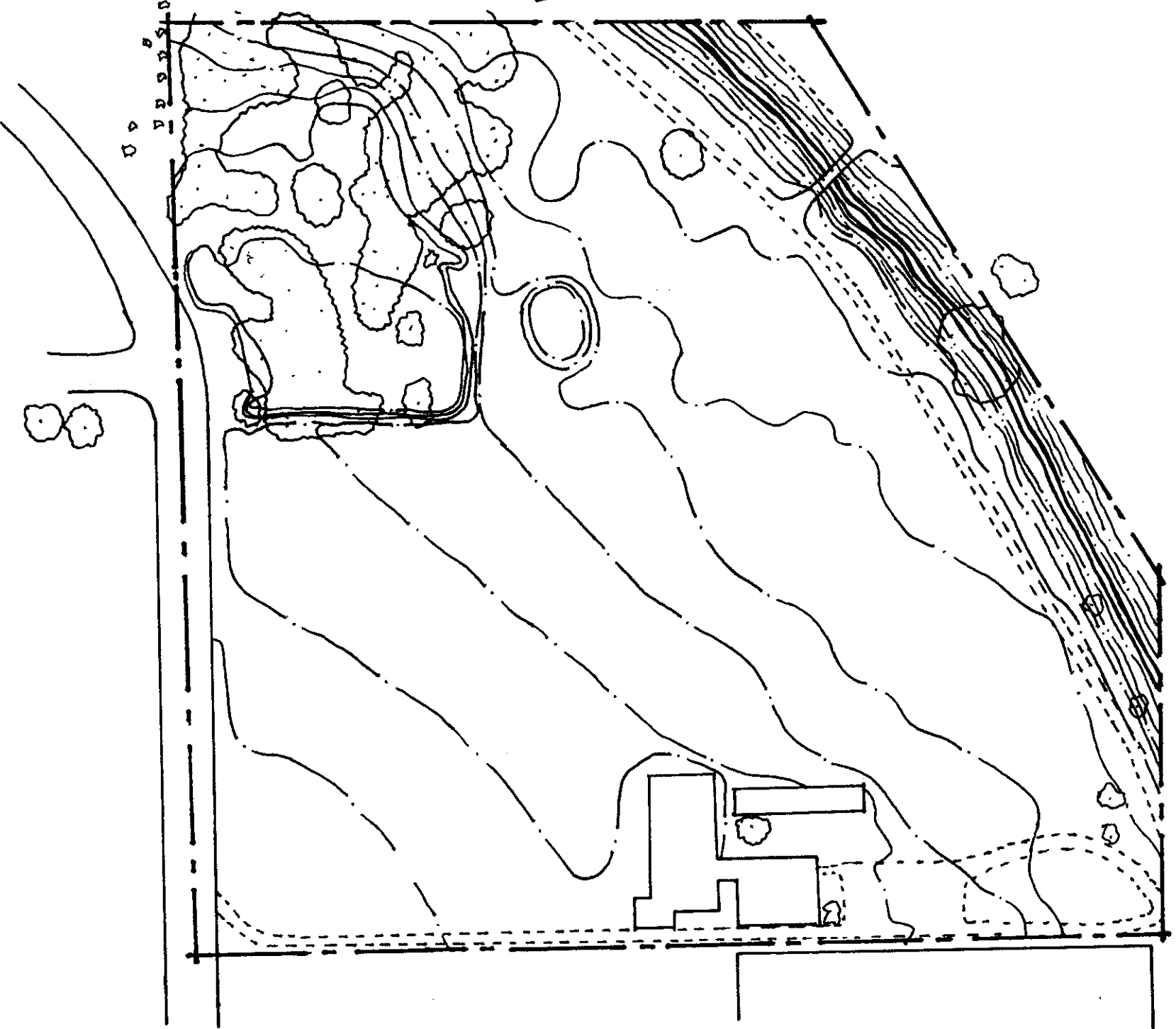
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SITE



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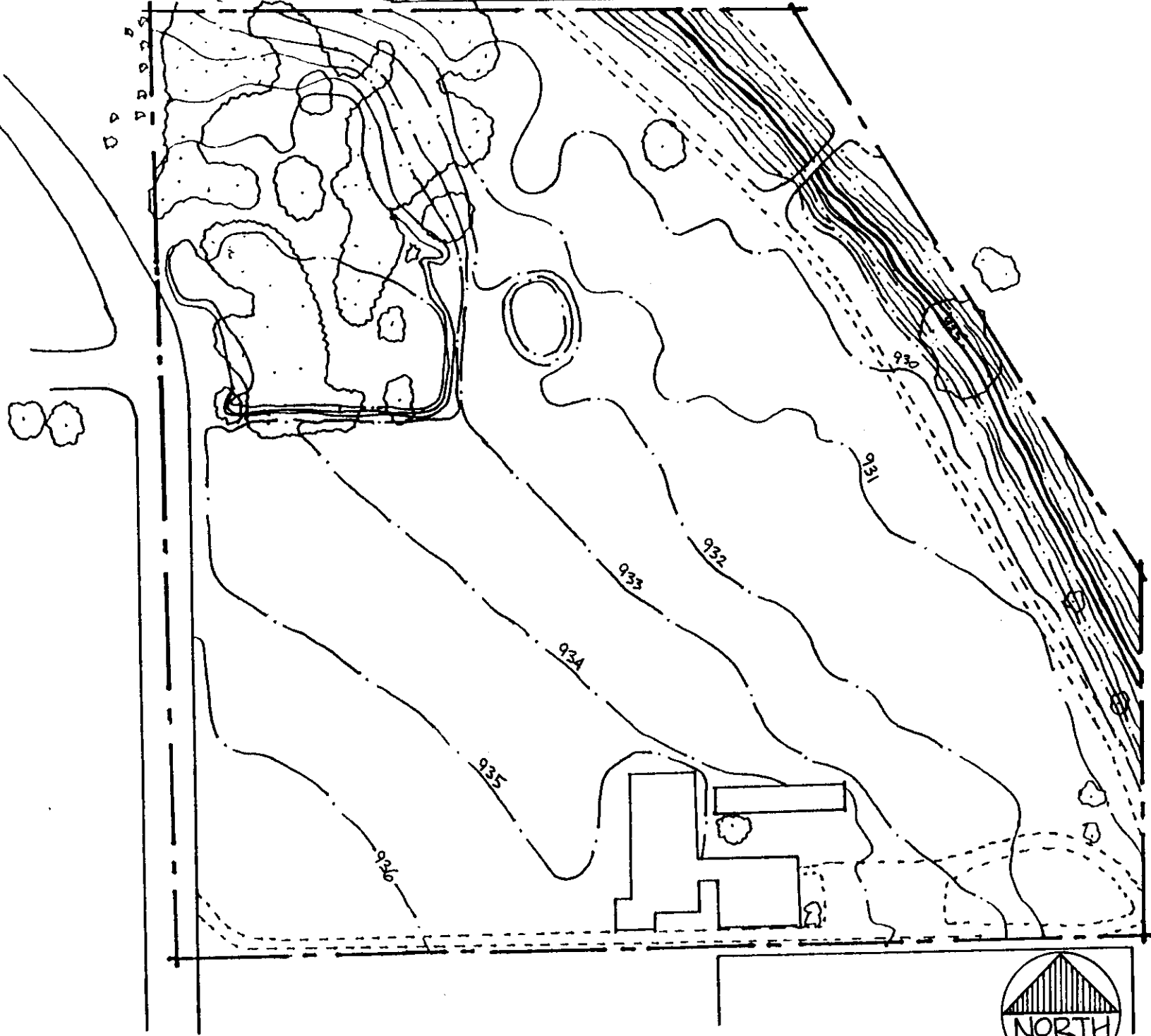


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TOPOGRAPHY



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VEGETATION

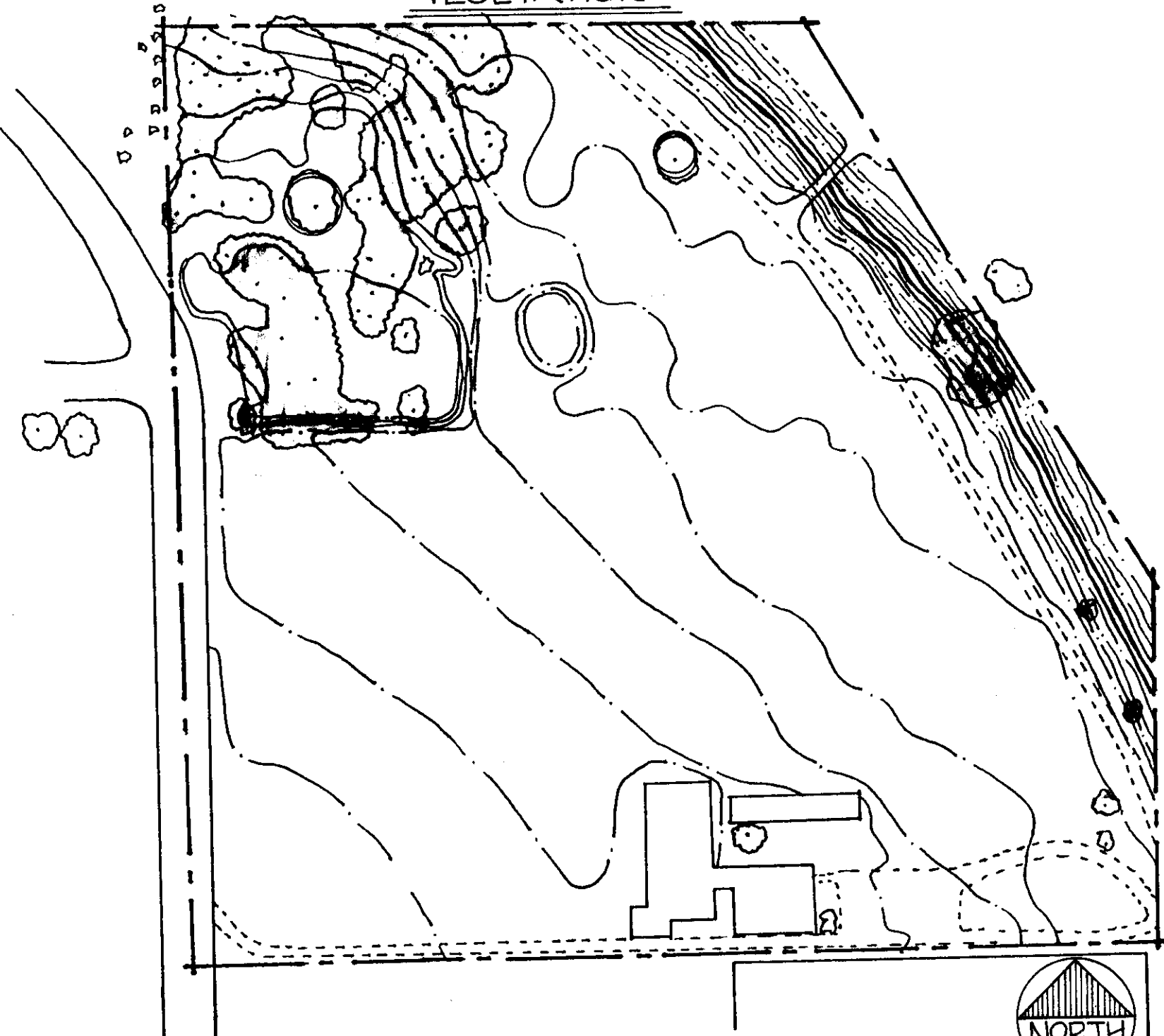
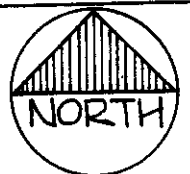


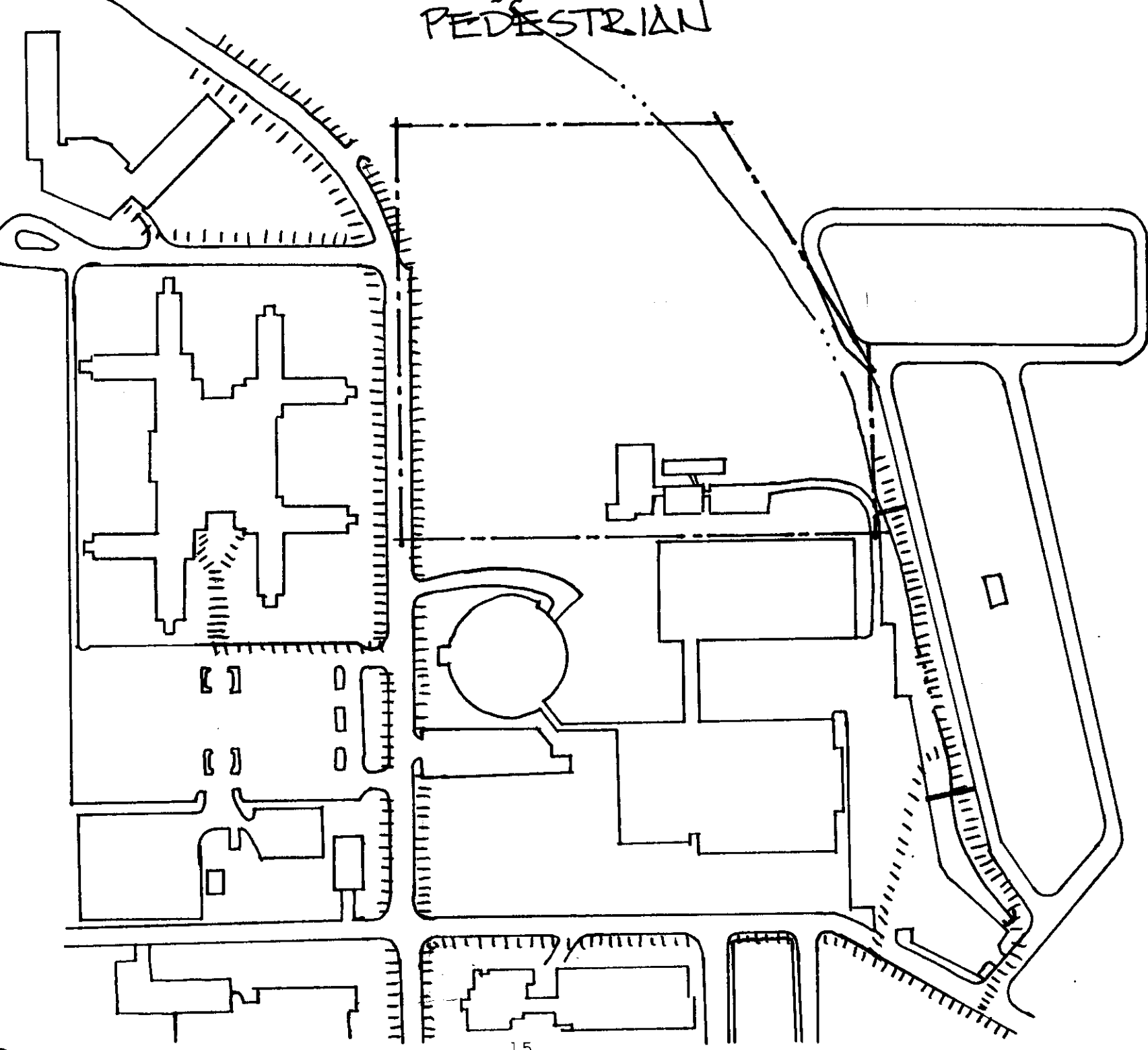
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PEDESTRIAN

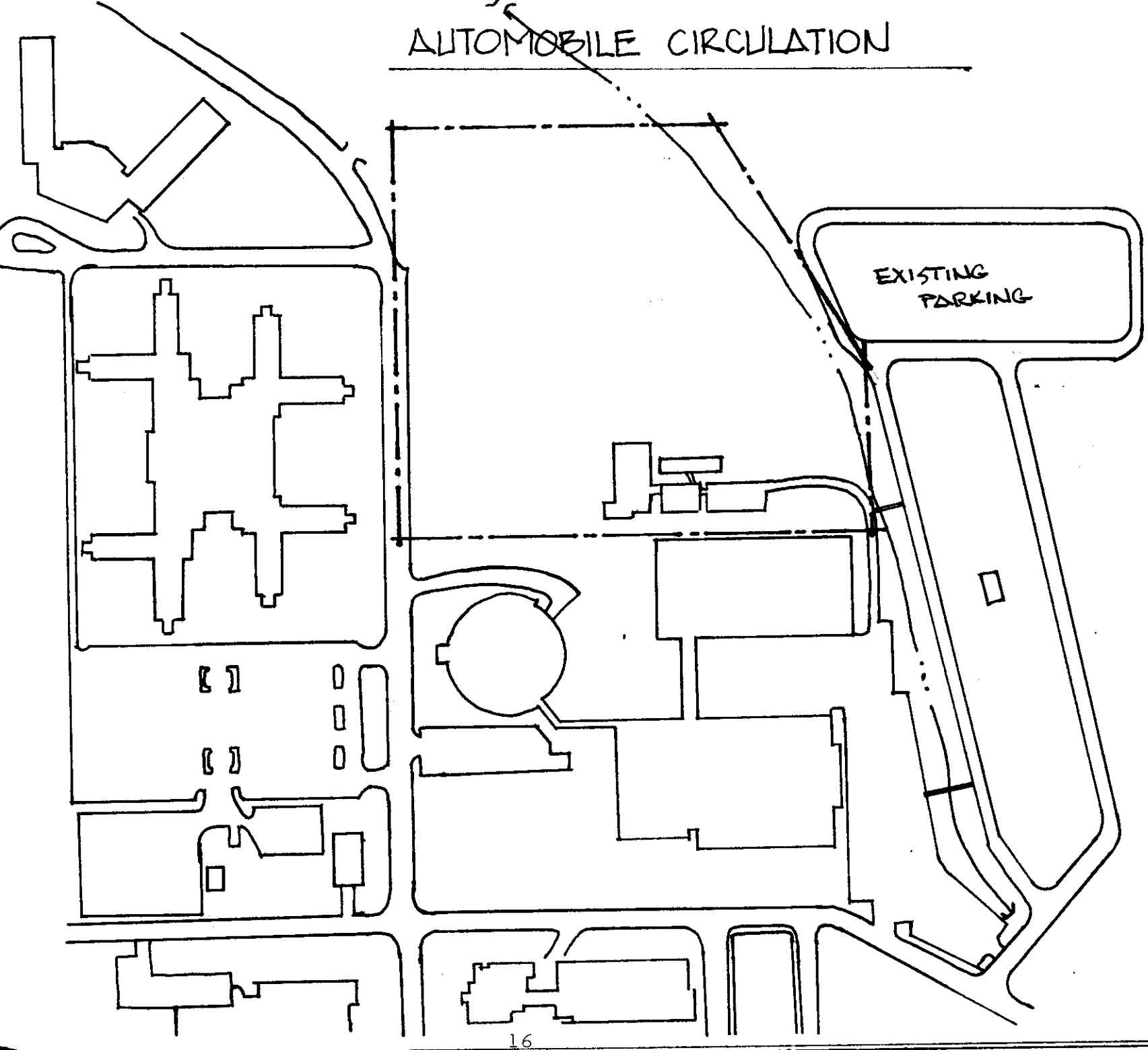


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AUTOMOBILE CIRCULATION

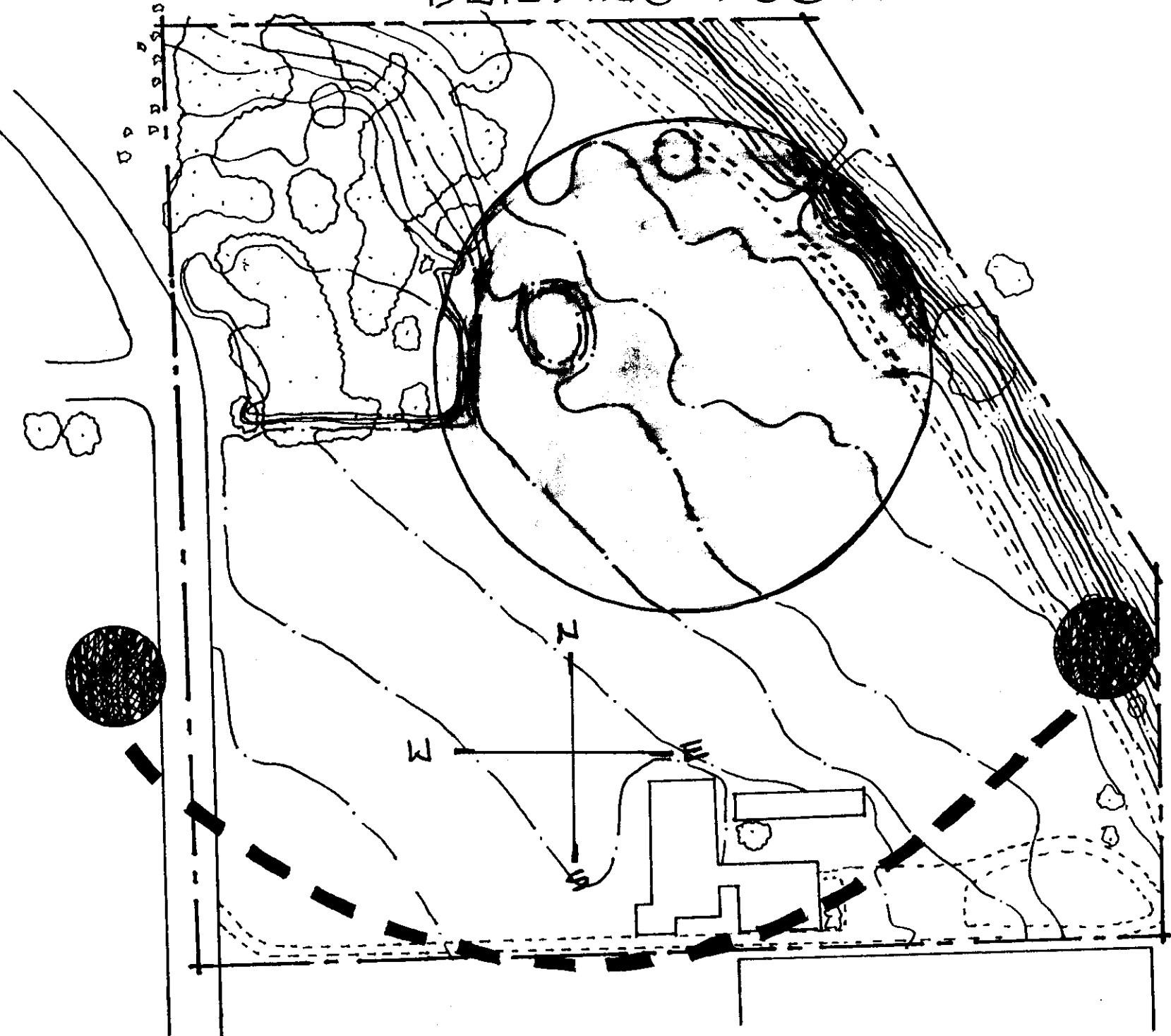


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BUILDING FOOTPRINT



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RESEARCH



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Audiovisual technology, which allows sporting events to be televised to the home audience, and instant replay to the live audience, has become a major aspect of athletic events. This research involves the issues of audiovisual technology and its application to arenas.

Through my research of arenas thus far, I have found that most do not provide space for television cameras at locations which are capable of producing a desirable picture for the audience at home. As a result, platforms have to be constructed or some seating has to be removed in order to place the cameras at desirable locations. I feel that this problem could be avoided if video technology was incorporated into an arena.

The use of audiovisual technology has proven to be effective in other aspects besides television entertainment. Video technology can be used to help athletes become better. By researching audiovisual technology, I have become more qualified to present new ideas in which this technology can be incorporated into an arena. The use of audiovisual technology can be helpful in providing a complete and more enjoyable environment for the people that participate in the experiences of an arena.

I have been given a tour of three arenas in order to learn their adaptability for television broadcasting. My analysis of these arenas was beneficial to my research of video technology. I have made initial contacts with professionals in the field of television technology, and I have sent questionnaires to four major television networks. This allowed me to make accurate decisions concerning the professional aspect of television technology. William Pickett, vice-president of the Lexington Center, has sent me information to help me understand the requirements of television broadcasting. These requirements have directly effected the design of my arena in the schematic stage.

I have conducted and documented several interviews, and I have sent fifty questionnaires to various people in order to support my hypothesis statements and to understand how desirable features may effect the design of an arena.

George Finkel, executive producer for college basketball at N.B.C., has given me permission to travel to an arena in the Midwest region and observe his crew prepare to televise a college basketball game. This will allow me to understand more completely, the equipment that is used to televise a basketball game, and it will help me to explore new ideas in which audiovisual technology can be used in an arena.



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ARCH. 451
PROFESSOR STAN MENDELSON
OCTOBER 2, 1986

THOMAS G. JOLLY

HYPOTHESES

Since television networks continue to pay large sums of money to universities in order to acquire the right to broadcast collegiate, athletic events, then the most up to date technology concerning audiovisual communication should be incorporated into the design of an arena.

Since universities can acquire additional income from renting their arena for different functional uses, then the arena should be designed as a multiple use facility, which is easily adaptable to the different functions.

Since audiovisual aids have become a great asset in helping a team prepare for their opponents, then this technology, in its most developed stage, should be incorporated into the design of an arena, with easy access to practice areas.

Since arenas have the potential to be a dominant architectural element of dynamic form that is aesthetically pleasing and exiting in scale, then the approaches to the arena should be addressed in the design of the site, and this inward focus should continue from the site towards the playing court.



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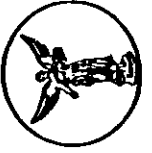


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OBSERVATIONS, BUILDING TYPE STUDIES, AND COMMENTS



MULTI-PURPOSE ARENA
MUNCIE,
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STRUCTURE	Market Square Arena
LOCATION	Indianapolis, Indiana
DATE COMPLETED	1976
PRIORITY USERS	Indiana Pacers (basketball) Indianapolis Checkers (hockey)
OTHER FUNCTIONS	Concerts Ice Shows High School Basketball Tournament Circus
SEATING CAPACITY	16,904 (basketball) 18,125 (concert)
FLOOR AREA	200' x 85'
FLOOR-CEILING HT.	95'
ARCHITECTURE FIRM	Hubert, Hunt, & Nickhol Phone # 221-1576

SIGNIFICANT DISCOVERIES

On September 30, 1986, Rick Fuson, vice-president of the Indiana Pacers, gave me a tour of Market Square Arena. He made the following comments concerning the design of an arena:

- * Circulation of this facility is too narrow
- * Takes 10-12 hours to convert from ice hockey to basketball
- * Not enough female restrooms
- * Suggests that handrails be installed in aisle
- * Has excellent sightlines towards playing court
- * Temporary curtain is desirable for small crowds
- * Desirable to have ticket office at ground entry
- * Service entry is weak - 1 lane ramp off 1 way st.

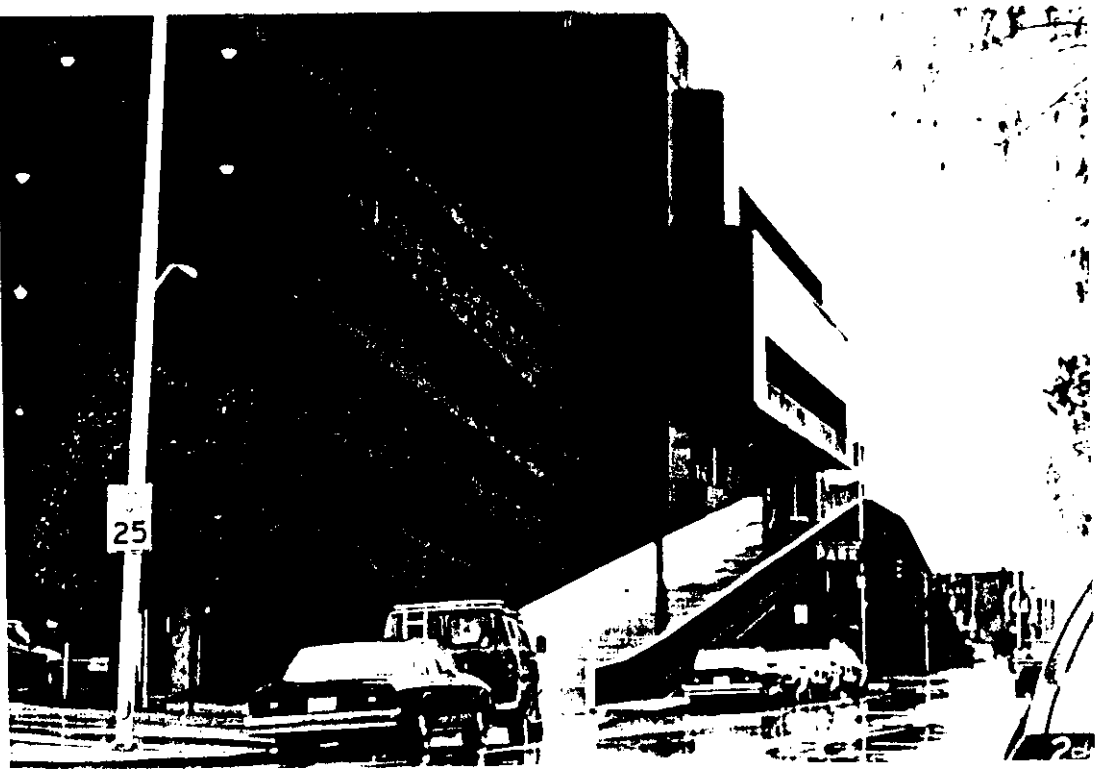
Mr. Fuson suggested that I observe this facility while it is being used, so I could understand how an arena functions. He gave me an complimentary pass to see the Indiana Pacers play. This experience will be very beneficial in my research of arenas.



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SERVICE RAMP NOT
ADEQUATE BECAUSE TO
NARROW AND LOCATED
ON ONE WAY STREET

DESIREABLE TO HAVE
PARKING CLOSE TO ARENA



MULTI-PURPOSE ARENA

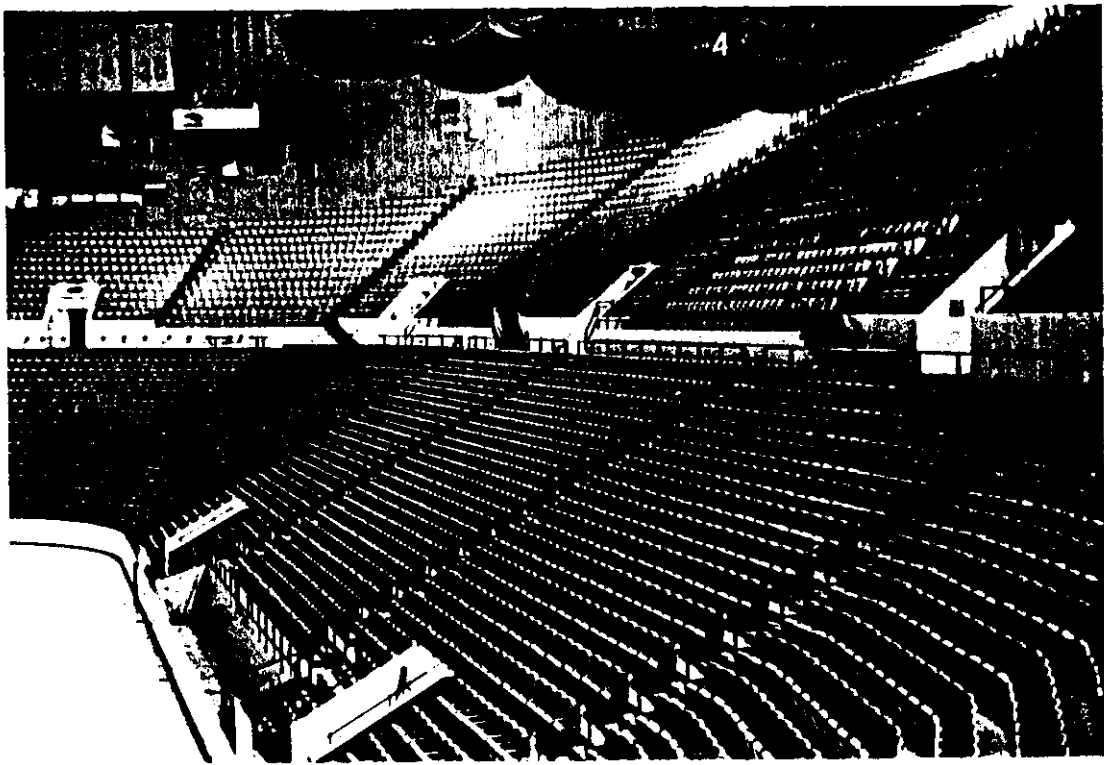


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INTERIOR SEATING HAS EXCELLENT SIGHTLINES



EACH SEAT HAS GOOD VIEW OF COURT



MULTI-PURPOSE ARENA



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LOCKER ROOM IS VERY
FUNCTIONAL
PROVIDES ADEQUATE
SPACE FOR EACH PLAYER

TRAINING ROOM ADJACENT
TO LOCKER ROOM.
SAUNA IS DESIREABLE



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(317) 639-6411

300 East Market Street • Indianapolis, Indiana 46204

GENERAL INFORMATION

Arena Floor: 200' long by 85' wide regulation hockey floor. All 4 corners 26' radius.

MSA Office Hours: 8:30 a.m. to 5:30 p.m., Monday thru Friday. Open during all events.

Catering Area: Located in the backstage area. Call Martin Waigand.

Dressing Rooms: 6 small with private bathroom (for one person) and 4 large (team rooms).

Air Conditioning: Yes

Piano tuner available thru Arena: Yes

Forktrucks: One 5,000 lb. gasoline - 15' height capacity
One 3,000 lb. gasoline - 13' height capacity, \$20/hour rental fee
One 5,000 lb. gasoline - 9' height capacity

Telephones: There are no telephones behind stage except an inter-office extension for Arena use. Telephone line orders to be coordinated thru Martin Waigand. There are two pay telephones backstage.
North - 635-0772, South - 635-0824

Pass Gate: 3rd level, southeast side. . .enter thru Garage close to the back-stage area.

Promotion: Your event will be advertised on the outside Arena Message Center when tickets are placed on sale. It will also be advertised on the inside Message Center at all MSA events preceding your show. You will be charged one fee of \$31.50 for the message board operator on the day of your event.



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TECHNICAL INFORMATION

Stage Size: 60' x 40' and 4' to 7' in height, maximum width, including PA platforms, 85'
Sound Wings - 12' x 16'
Barricade - 4' high constructed of reinforced Fibreglas

Type of Stage: Wenger portable

Vertical clearance of stage, floor to ceiling, at lowest point: 95'

Lighting Equipment: 10 Stationary Super Trouper Spotlights
House lights cannot be dimmed. . . Quartz on/off lights
Metal Halide game lights

Sound Equipment: Ducane

Power Available: 2 service, 600 amps, 3 phase, 110-208 volts
1 service, 400 amps, 3 phase, 110-208 volts
Main power location 50' to stage

Stage Door Entrance: 3rd level, southeast corner of the Arena. Door manned for entrance for all stage personnel.

Unloading/Loading: Dock serviced by a drive-up ramp located on New Jersey Street. Trucks cannot back up to stage as unloading area is 50" to the stage. Stage door opening is 16' wide and 12' high. Generally, only one truck can be loaded at a time.

Truck Parking: Contact Martin Waigand. Up to 7 trucks can park on median on Market Street just east of the Arena. Wabash Street on the north side of the Arena can accommodate some trucks or buses. Limousine parking is available in the Arena Garage. All parking must be arranged in advance through Martin Waigand. The City of Indianapolis heavily fines unauthorized vehicles.

Hanging Points: Permanent hanging points are 92' 10" from the floor.

Pyrotechnics: Must pass Indianapolis Fire Marshal's inspection day of the show. No propane allowed in the Arena. City permit and State license required. Contact Jerry Whitaker, Safety Director, for clarification and assistance.



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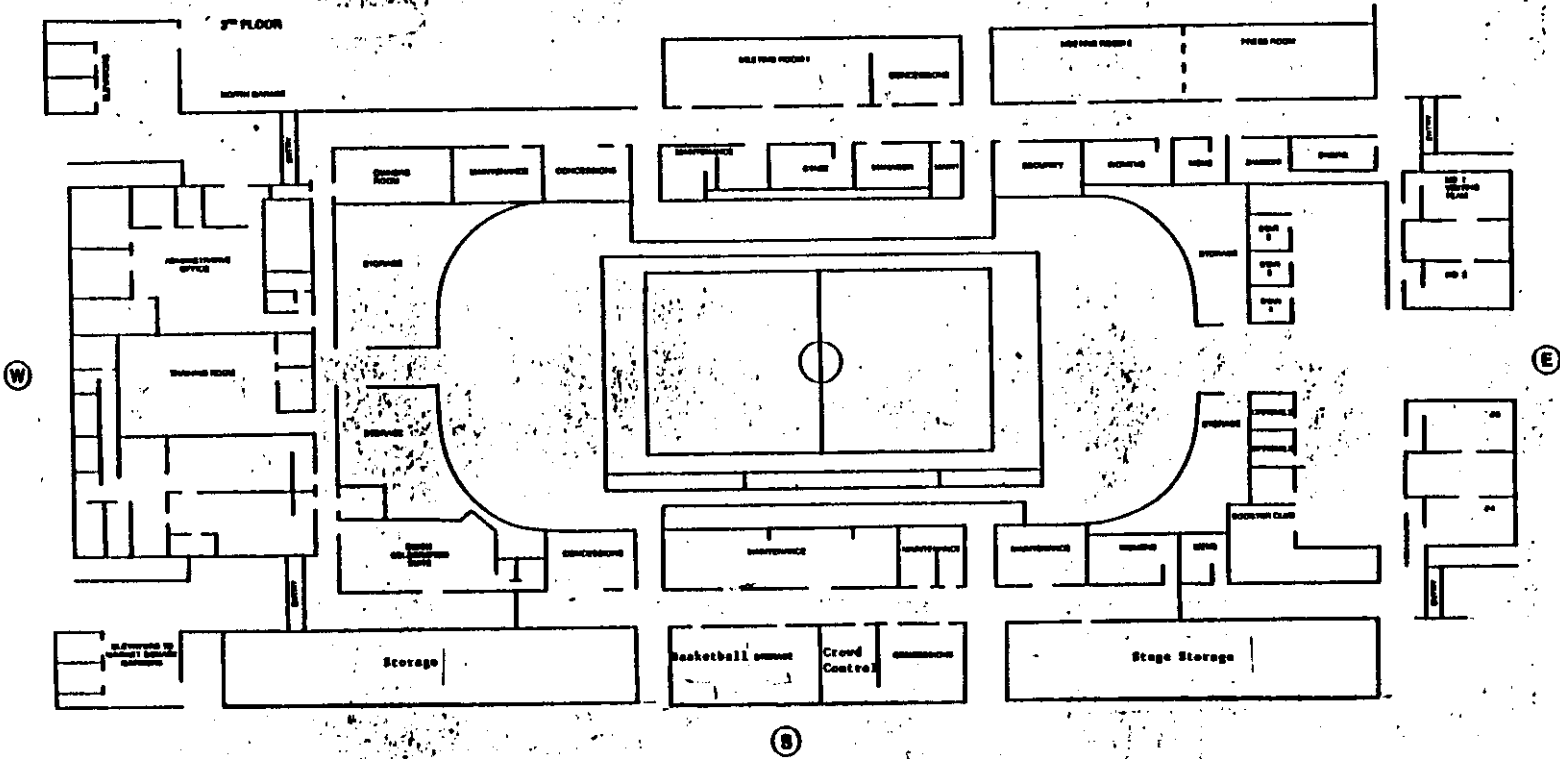
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MARKET SQUARE ARENA
3rd Level (Main Floor)



MULTI-PURPOSE ARENA
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STRUCTURE	Assembly Hall
LOCATION	Bloomington Indiana, (Indiana University)
DESIGNED	1957
STARTED CONSTRUCTION	1967
COMPLETED	1971
PRIORITY USER	Indiana University Basketball Team (men)
OTHER USERS	Volleyball team Wrestling team (practice only) Basketball team (women) Commencement Concerts
SEATING CAPACITY	17,357 (basketball) 20,000 (concert)
ARCHITECTURE FIRM	Eggar Partnership (New York)



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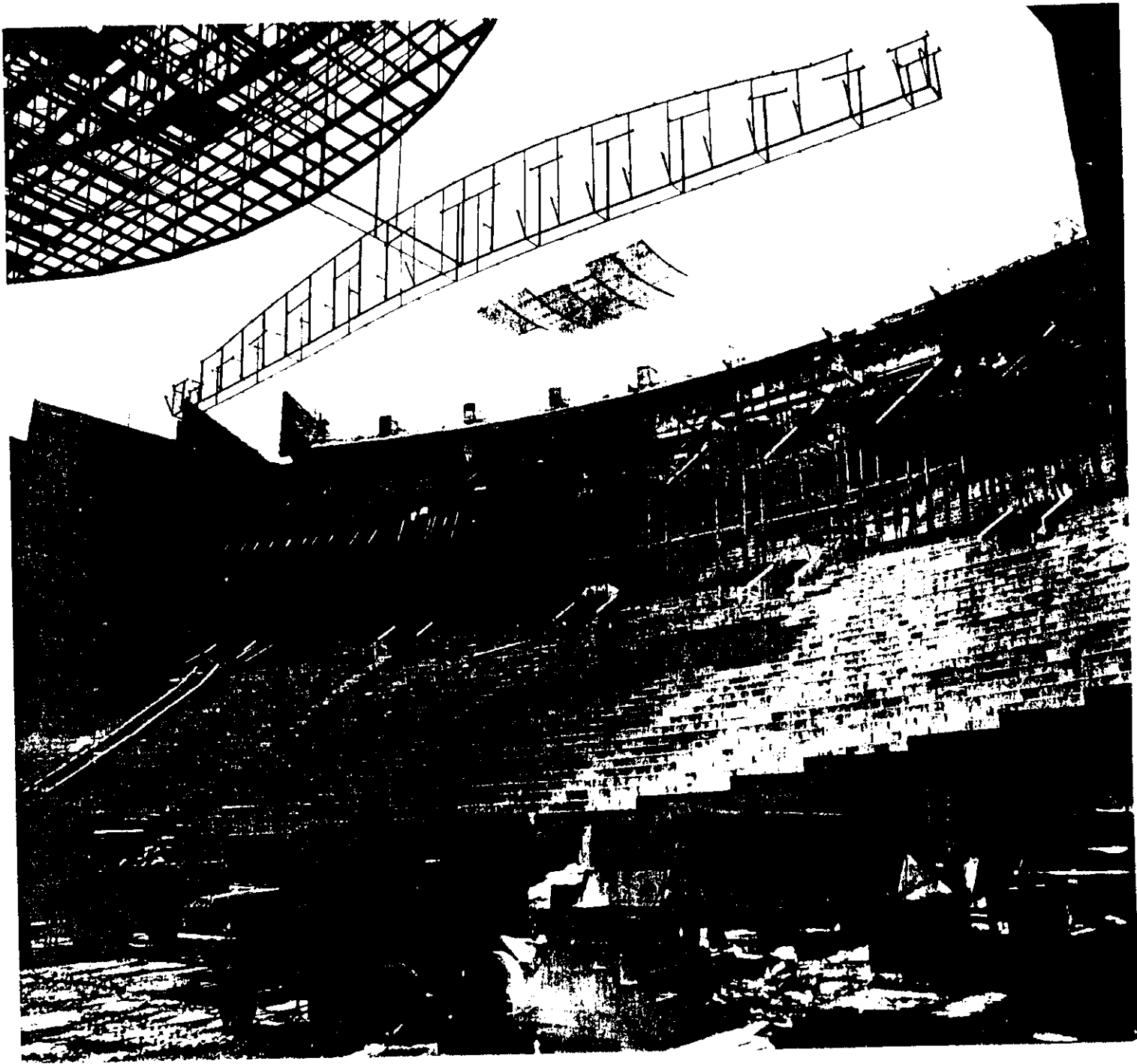


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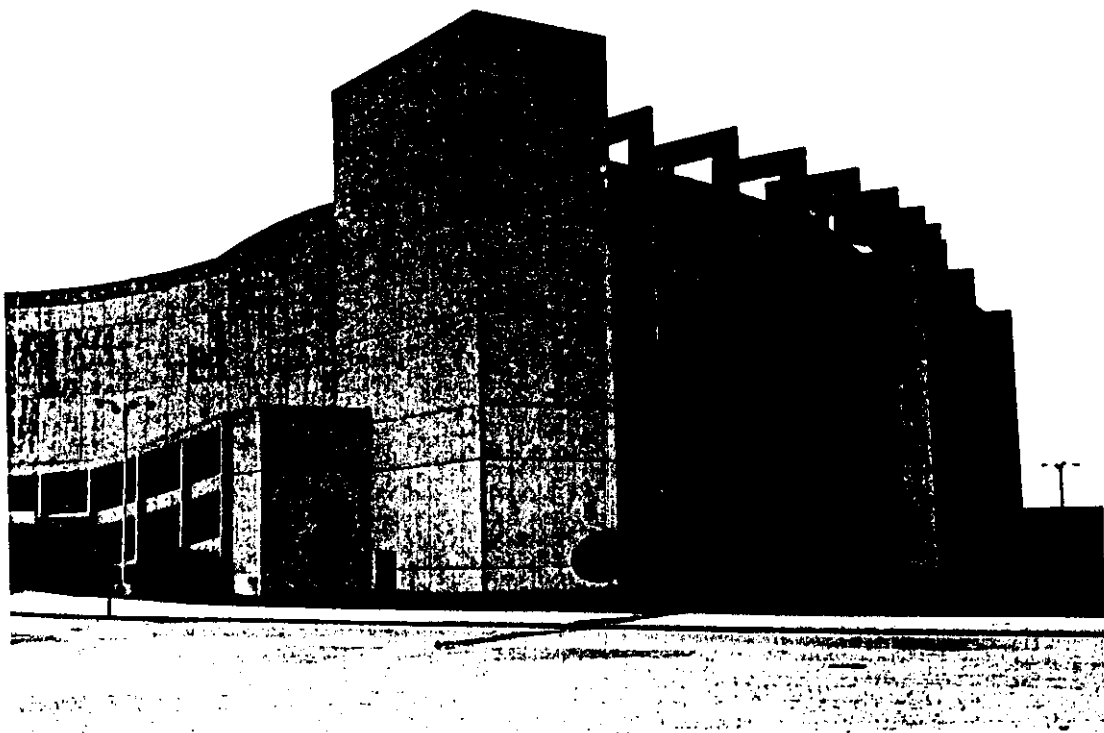


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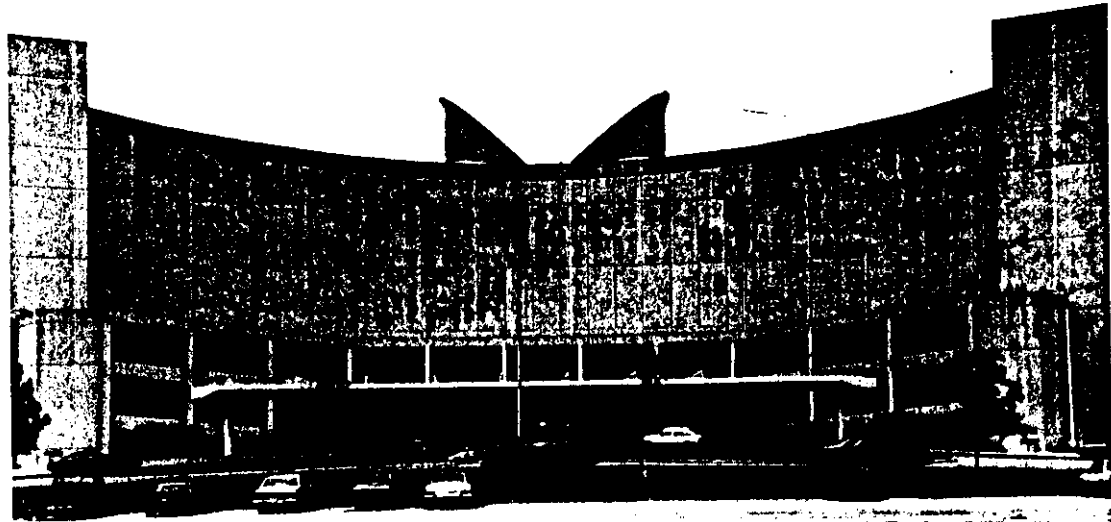


EXTERIOR VIEW OF
ASSEMBLY HALL IN
BLOOMINGTON, IN

BUTRESSES SUPPORT
WEIGHT OF ROOF.

INTERESTING FORMS
CONTRIBUTE TO ARCHITECTURE

GLASS INDICATING PEDESTRIAN
CIRCULATION IS DESIREABLE



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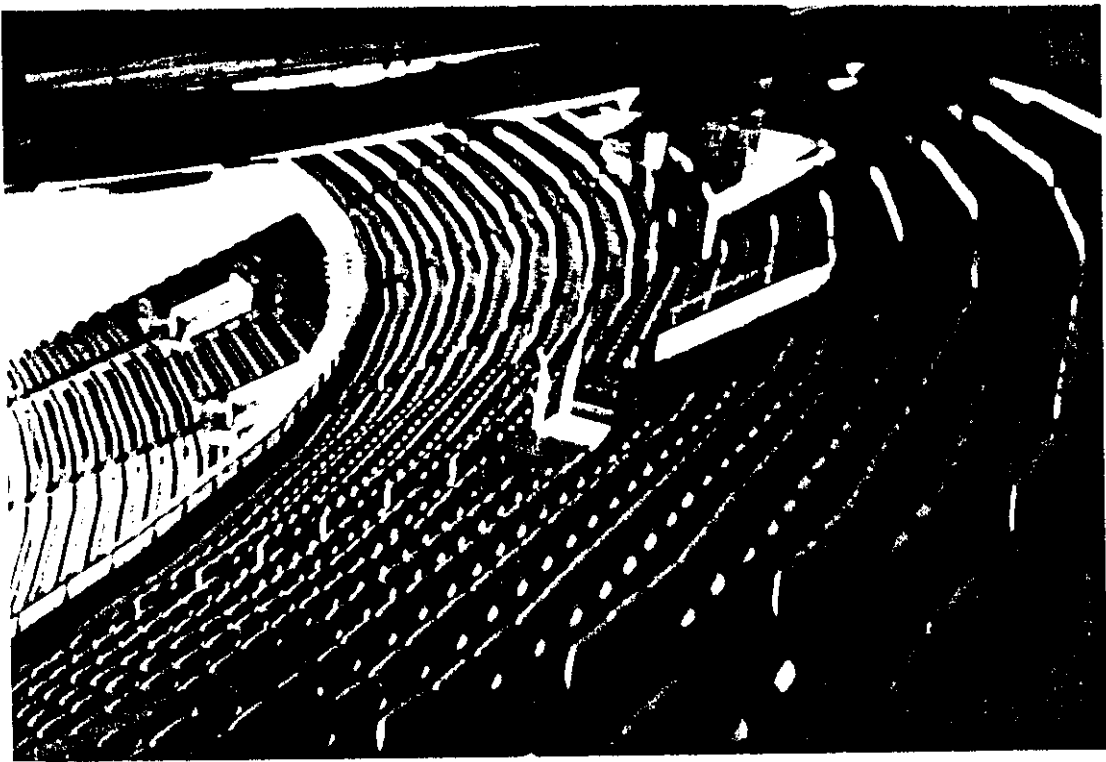


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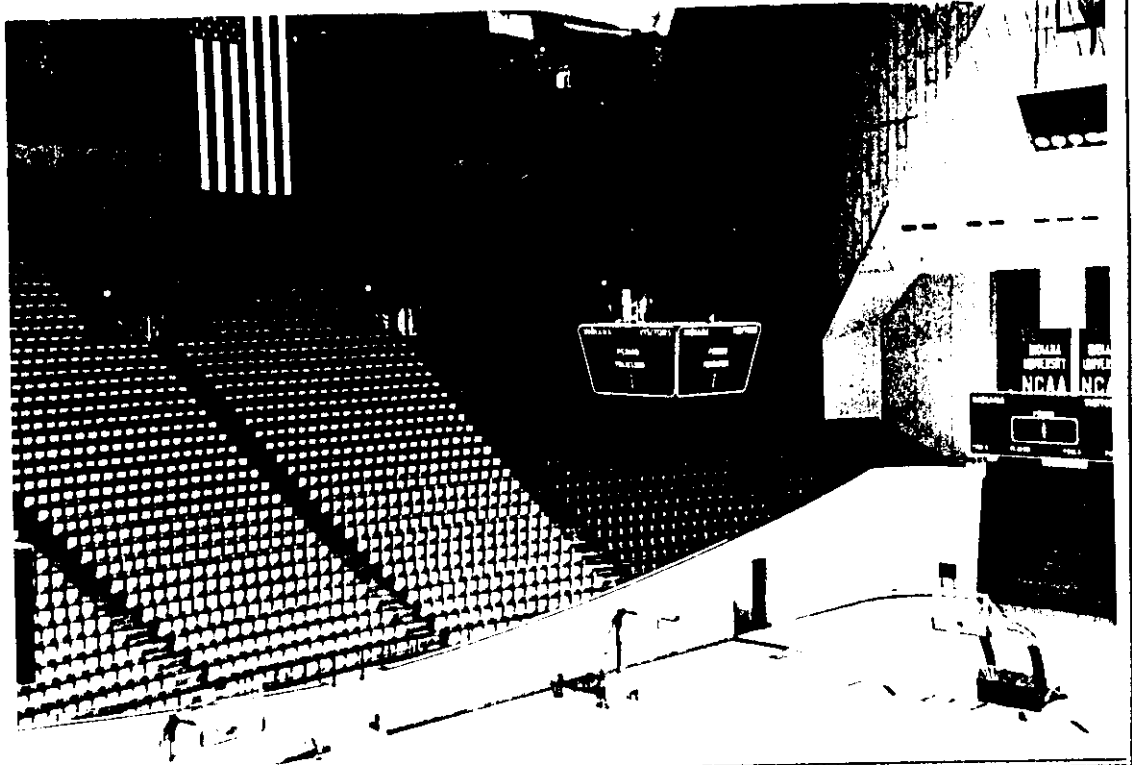
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VIEW OF BALCONY SEATING WHICH IS NOT DESIREABLE



TOP FIVE ROWS DO NOT HAVE VISIBLE ACCESS TO SCOREBOARD ON MAIN LEVEL.
SEATING WHICH ENCIRCLES PLAYING COURT IS MORE DESIREABLE



MULTI-PURPOSE ARENA



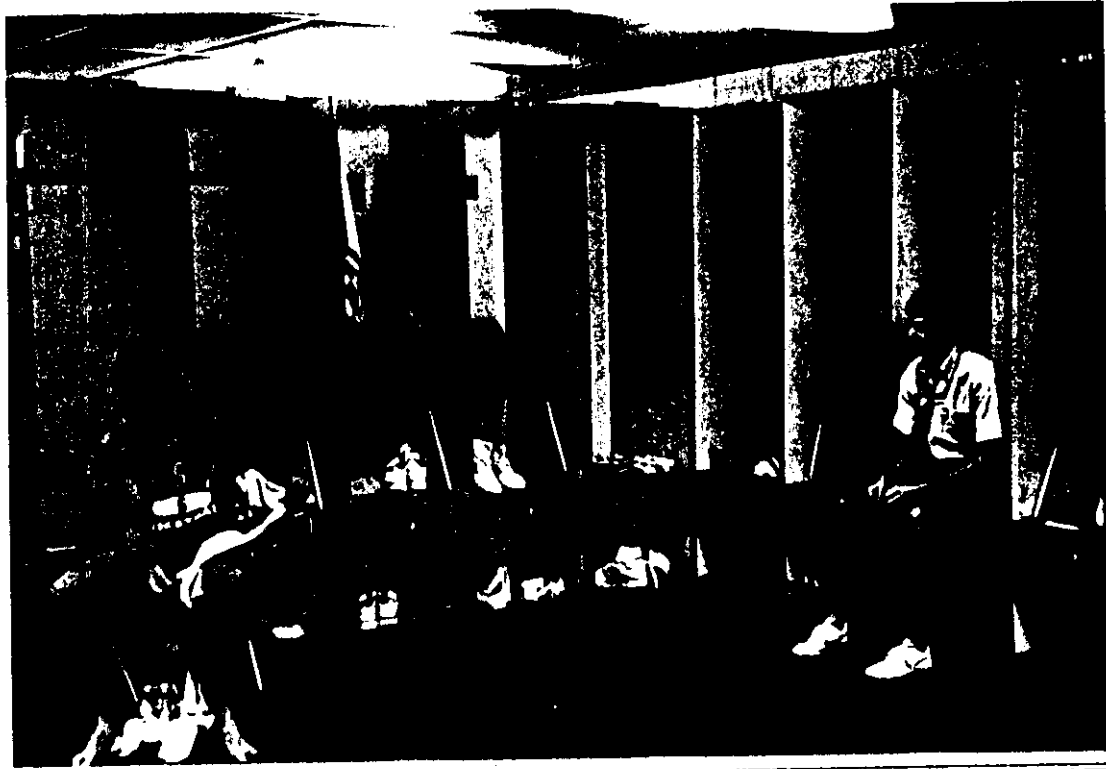
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HALL OF FAME AND
TROPHY DISPLAY CASES
IN LOBBY AREA IS
BENEFICIAL.



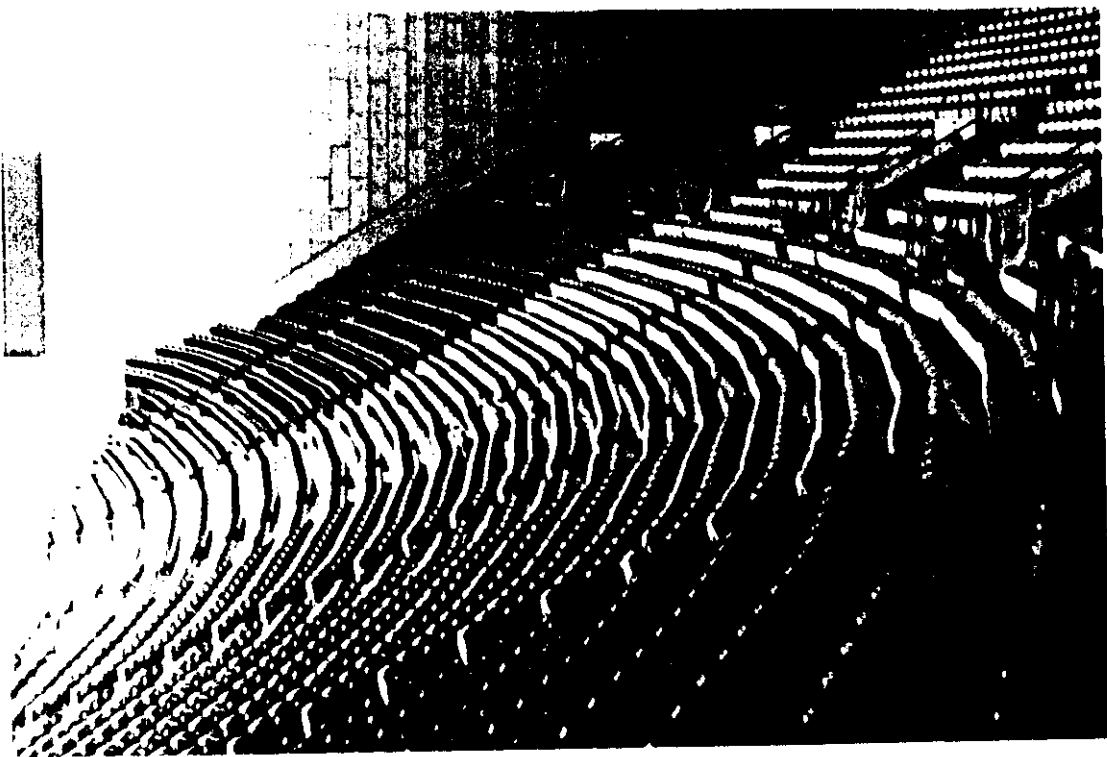
INDIVIDUAL LOCKERS WITH
STORAGE SPACE IS DESIREABLE



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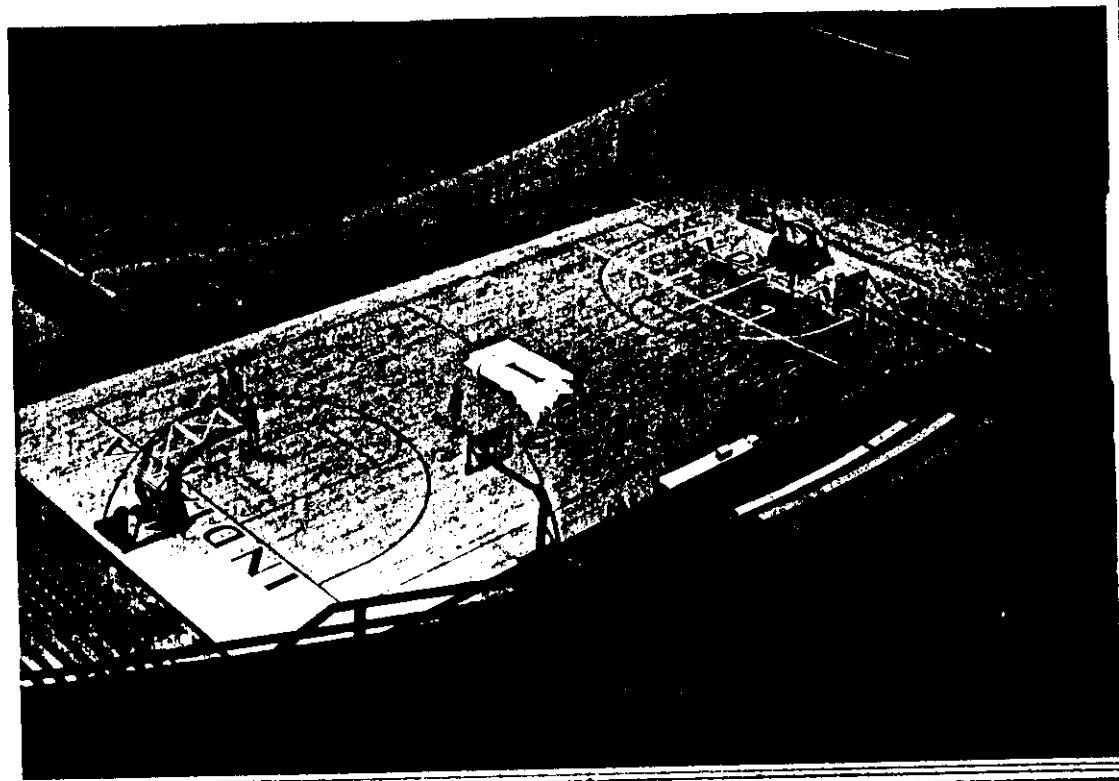


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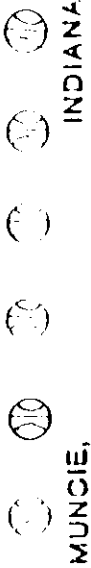


MAIN LEVEL SEATING

VIEW FROM BALCONY
NOT DESIREABLE



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SIGNIFICANT FINDINGS

On October 3, 1986, Chuck Crabb gave me a 2 1/2 hour tour of Assembly Hall. This helped me to learn about space requirements and relationships for a facility of this type. Some of the significant discoveries and Mr. Crabb's comments include the following:

- * Beneficial to have a room for high school recruits.
- * This space can be used for other purposes such as (hall of fame room, or meeting room).
- * Incorporate television wire into design so that T.V. truck can plug into building.
- * Press interview room should be close to locker area
- * Hospitality room for press
- * 11 room photo suite which press can use to develop film after the game.
- * The 12 concession spaces are adequate
- * Entrance area should be separate from concessions
- * Gift shop (\$350,000 last season)
- * Ticket sales open to exterior and interior
- * 14,700 theatre back chairs
- * Critical to have adequate storage space
- * Not good sightlines from every seat
- * Design for placement of television camera is in the balcony, which was pathetic (not placed here now)
- * Roof is supported with 57 cables (like a bridge)
- * WTTV televises home and away games
- * WTTV can set up in 3-4 hours
- * CBS, NBC set up in 2-3 days

Mr. Crabb gave me photographs and information concerning the construction of Assembly Hall.



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OBSERVATIONS CONCERNING SPACE SIZES

SEATING REQUIREMENTS (22" per seat)	60,000	SQ.FT.
MAIN FLOOR	17,000	SQ.FT.
LOBBY AREAS	12,000	SQ.FT.
MEETING ROOMS	1,250	SQ.FT.
HOSPITALITY ROOM	350	SQ.FT.
PHOTO SUITE	400	SQ.FT.
MEDIA ROOM	600	SQ.FT.
LOCKER ROOMS	6,700	SQ.FT.
GAME FILM ROOM	400	SQ.FT.
TRAINING ROOM	2,500	SQ.FT.
WEIGHT ROOM	2,500	SQ.FT.
LAUNDRY ROOM	500	SQ.FT.
OFFICIAL LOCKER	400	SQ.FT.
STAR DRESSING ROOMS	600	SQ.FT.
OFFICES	10,000	SQ.FT.



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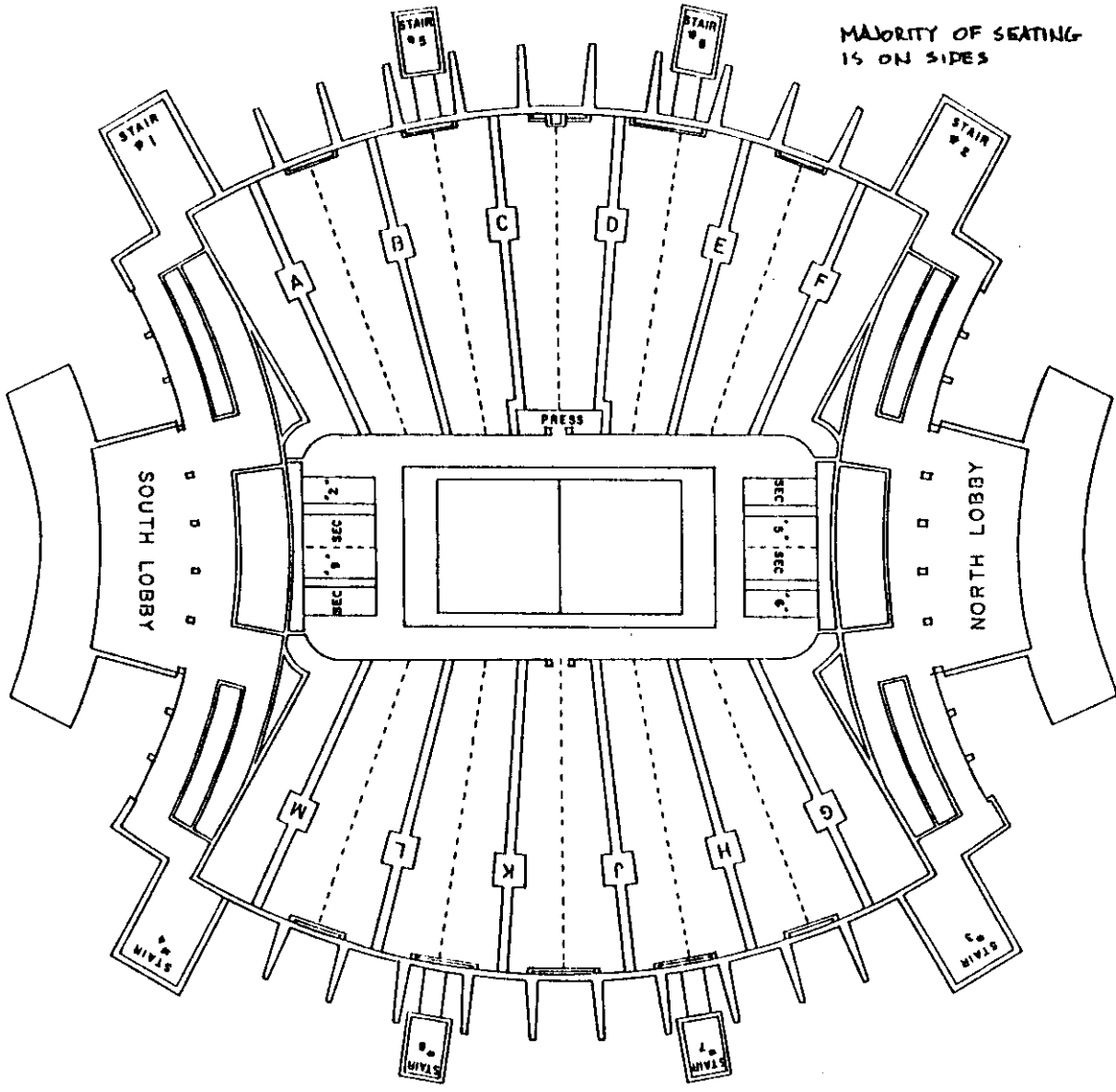
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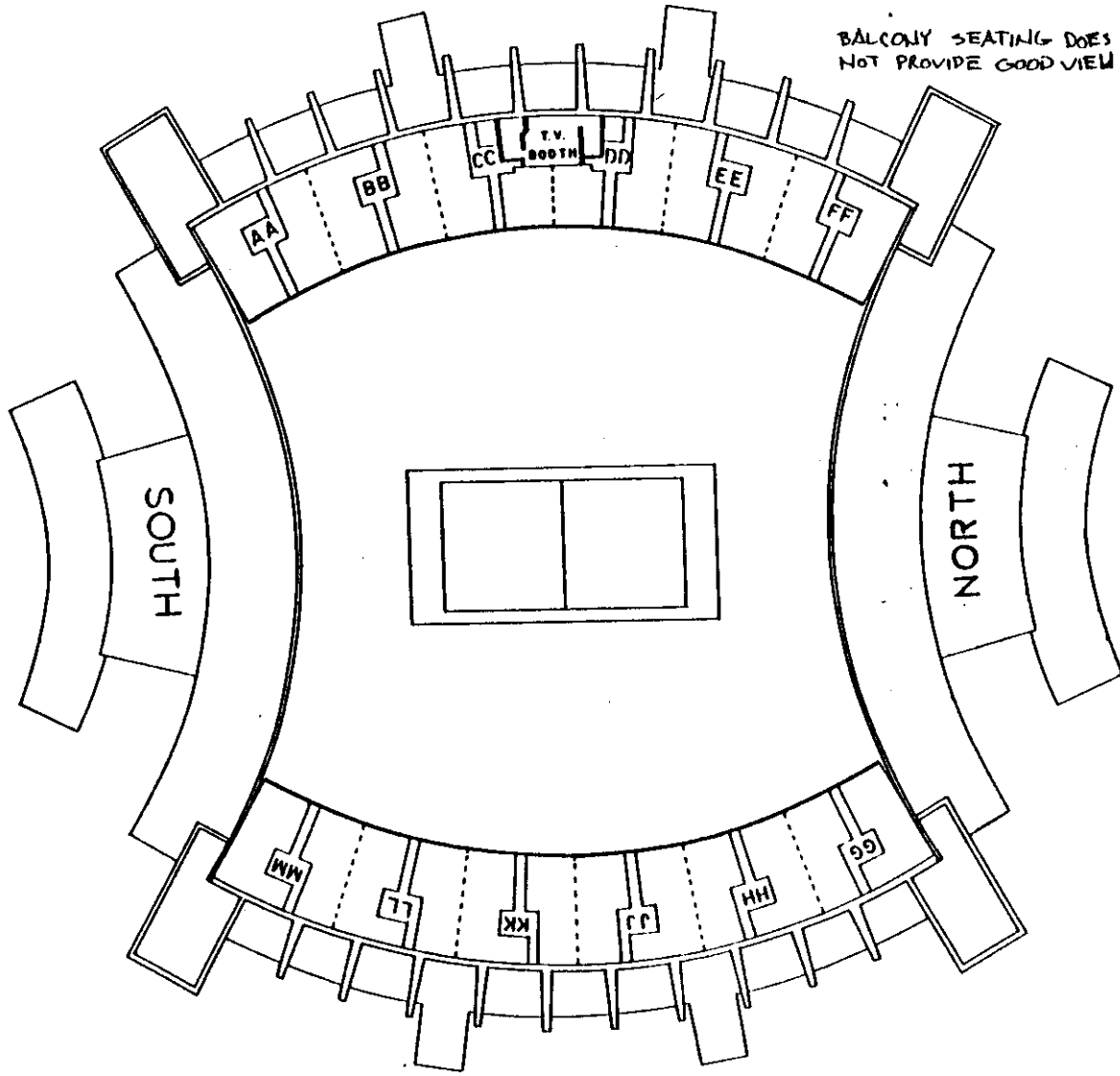


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BALCONY SEATING DOES NOT PROVIDE GOOD VIEW

SOUTH

NORTH

AA

BB

CC

DD

EE

FF

MM

LL

KK

JJ

HH

GG

T.V. BOOTH



MULTI-PURPOSE ARENA



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STRUCTURE Rupp Arena

LOCATION Lexington, Kentucky

PRIORITY USER University of Kentucky Basketball Team

OTHER USERS
 Concerts
 Rodeos
 Circus
 Ice shows
 High school basketball tournament
 Truck pulls

SEATING CAPACITY 23,000 (basketball)

SIGNIFICANT DISCOVERIES

On October 13, 1986, William Pickett, vice-president of the Lexington Center, gave me a tour of Rupp Arena. Some of his comments and other significant discoveries include the following:

- * Recently installed handrails for safety
- * Have multiple color chairs for television coverage
- * Parking for 2 television semi-trucks inside arena with access to arena floor
- * 8 star dressing rooms
- * 2 camera platforms (not at desirable location)
- * 10,000 theatre back chairs
- * Adequate circulation space
- * Security office at an entrance on ground level



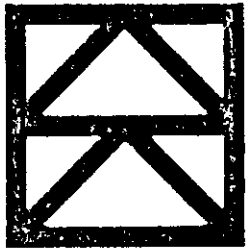
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**Lexington
Center
Corporation**

November 3, 1986

Mr. Thomas G. Jolly
3001 North Silvertree
Apartment 3-C
Muncie, Indiana 47304

Dear Tom:

Enclosed please find a copy of the "TV letter" that was sent to all networks telecasting from Rupp Arena this season. I have also enclosed a floor plan of the Arena and Exhibit Hall.

If I may offer any additional assistance, please let me know.

Sincerely,

THE LEXINGTON CENTER CORPORATION

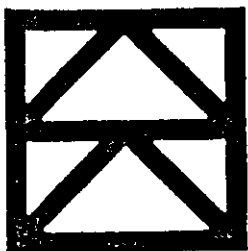
William H. Pickett
William H. Pickett
Vice President



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Lexington Center Corporation

Donn R. Bernstein
ABC Sports
1330 Avenue of the Americas
New York, NY 10019

October 29, 1986

RE: UK vs. LSU - January 18, 1987
UK vs. Navy - January 25, 1987

Dear Mr. Bernstein:

The following information is provided to assist you in your telecast of the above captioned.

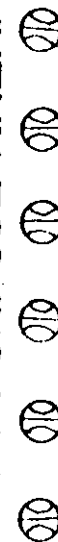
The game site is Rupp Arena, and the game site owner and operator is the Lexington Center Corporation.

The lease agreement between Lexington Center Corporation and the University of Kentucky contains provisions for the following assistance to T.V. producers:

1. 100 AMP single phase electrical disconnect service at truck dock (primary production vehicle parking).
2. Approximately 250 foot candles of game lighting, commencing one and one-half hours prior to tipoff. If you need full game lighting conditions prior to this please consult the attached schedule of services.
3. Two elevated camera positions; one each approximately 30 feet camera left and right of center court. Two additional mid-court locations are available at an additional cost. Please consult the attached schedule of services.



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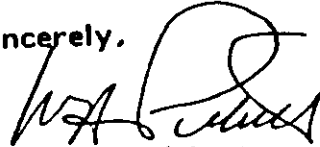


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Donn R. Bernstein
October 29, 1986
Page Two

Merrill Richardson, Director of Facilities, is your technical liaison at the Arena, (606) 233-4567. Mr. Richardson will be happy to assist you should you require additional information or services. A schedule of available services is attached. I suggest that you contact us as soon as possible in order to insure the delivery of the services you require. Please note that our payment policy requires that all services be paid for in advance. We will not provide any services or truck access until the prepayment policy has been met.

Sincerely,



William H. Pickett
Vice President

WHP:ljm

cc: Larry Ivy
Merrill Richardson

Attachment



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Electrical Services: Rates per telecast day and with service at truck dock.

<u>Service</u>	<u>Single/Phase</u>	<u>Three/Phase</u>
60 AMP	\$ 60	\$ 90
100 AMP*	\$100	\$150
200 AMP	\$250	\$350
400 AMP	\$500	\$750

*One (1) 100 AMP single phase service is provided at no charge.

Elevated Camera Positions:

You are provided two (2) elevated camera positions, one each approximately 30 feet camera left and right of center court.

Two (2) additional elevated camera positions located at mid-court with permanent pan mounts are available at an additional cost. (These positions may not be used with tripods.) This camera platform with one or both pan mounts is available for \$300 per telecast day.

Catering:

There will be a charge for providing power and/or equipment to service your catering requirements. If you will be provided this service please call for a quote.

Satellite Locations:

We do not have a permanent location for locating satellite dishes. If you will require same please contact us so we can block the space and determine your power requirements.

Full Game Lighting Conditions:

You will be provided full game lighting conditions 1½ hours prior to tipoff. If you require full lighting prior to that time we can provide the service for \$125 per hour of use. There is no proration for periods of less than one hour.

Payment Policy:

To ensure availability of service, please transmit your request to Merrill Richardson (606) 233-4567 along with payment in full. Service cannot be provided without prepayment.

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QUESTIONNAIRES / INTERVIEWS



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The following questionnaire was sent to various people.



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QUESTIONNAIRE

1. What is the best basketball arena that you have attended a game in?
2. What significant factor lead you to choose this arena?
3. Was there adequate space for spectator circulation?
Yes or No
4. Did each seat have a good view of the playing court?
Yes or No
5. Were there an adequate number of concession stands?
Yes or No
6. Were there an adequate number of restrooms?
Yes or No
7. Does your favorite team play in this arena?
Yes or No
8. While you are attending a game, does it bother you to have television cameras partially obstruct your view?
Yes or No



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9. Would you enjoy the opportunity to see instant replays on a large screen while you are attending the game?

Yes or No

10. Would large screens located in the lobby area, which displayed an interior view of the arena showing teams warming up and fans entering, increase your anticipation and excitement of entering the main arena?

Yes or No

11. Would you prefer to sit in theatre back chairs or bleachers to watch a basketball game?

12. Would you rather sit close to the court but behind the goal, or far away but on the side?



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Here are the conclusions of each question.

- | | | |
|-----|--|------|
| 1. | Omni - Atlanta, Georgia | 15% |
| | Market Square Arena - Indianapolis | 60% |
| | Assembly Hall - University of Illinois | 10% |
| | Other | 10% |
| 2. | Good sightlines | |
| | Interesting roof form | |
| | exitement of the game attended | |
| 3. | Yes | 65% |
| | No | 35% |
| 4. | Yes | 85% |
| | No | 15% |
| 5. | Yes | 88% |
| | No | 12% |
| 6. | Yes | 95% |
| | No | 5% |
| 7. | Yes | 36% |
| | No | 64% |
| 8. | Yes | 99% |
| | No | 1% |
| 9. | Yes | 100% |
| | No | 0% |
| 10. | Yes | 92% |
| | No | 8% |
| 11. | Theatre back chairs | 100% |
| | Bleachers | 0% |
| 12. | close | 95% |
| | far | 5% |

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CONCLUSIONS

When people chose the best basketball arena that they have been in, sightlines and interesting forms were the primary reasons. Their favorite team did not necessarily play in that particular arena. I think this is a significant discovery which proves the importance of a well designed arena. Adequate space for circulation, concession stands, and restrooms seems important. Television cameras which obstruct the view of spectators is not desirable. 100% of the people questioned thought that instant replay capabilities would be an enjoyable feature. Most people, especially people that go to a lot of games, thought that screens in the lobby area would add to the excitement of going to the games. Theatre back chairs are desirable as is seating which encircles the court.



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The following questionnaire was sent to professionals in the television industry.



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- 1) How far and high should television cameras be placed from the playing court in order to achieve a desirable picture for the audience at home?
- 2) What is the best arena in the Midwest to televise a basketball game concerning camera placement and adaptability?
- 3) How much area is required for a platform (two-camera) including cameramen?
- 4) How many cameras are normally used to televise college basketball games?
- 5) Are there any new technological developments concerning video cameras?
- 6) What broadcasting equipment is necessary to televise basketball games?
- 7) How much area should be provided for the trucks carrying the television equipment, and how many trucks are used?
- 8) Do you think that most fans would enjoy the opportunity to view a large television screen while attending the game, so they could see instant replays?
- 9) Have any studies been conducted to decide if fans would enjoy the opportunity to view a large television screen? If so, what were the conclusions?
- 10) Would you provide any questions that I have not included which you feel are necessary?



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Here are the conclusions of each question.

1. Not a hard and fast question. It cannot be too high or the arc of the ball is distorted and it cannot be too low or the players block the view. Twenty-five feet high from floor level is most desirable.
2. Not one singular arena. Each has a certain advantages and disadvantages. This is probably due to the lack of complete consideration for audiovisual communication in an arena.
3. Approximately 30 - 40 square feet per camera and cameraman.
4. During season five cameras are used, but eight cameras have been used in tournament games.
5. Yes all the time. Contact 975- 2112 for further information.
6. This is answered best in a letter sent by William Pickett, of the Lexington Center, which is included after these conclusions.
7. Normally two semi-trucks. 3000 - 4000 square feet is adequate.
8. Yes, very much so (unanimous)
9. Not to my knowledge. If arena provides this feature, most fans seem to enjoy it.
10. Make sure that loose wires do not have to be exposed when televising games. This is very beneficial to us and the fans.