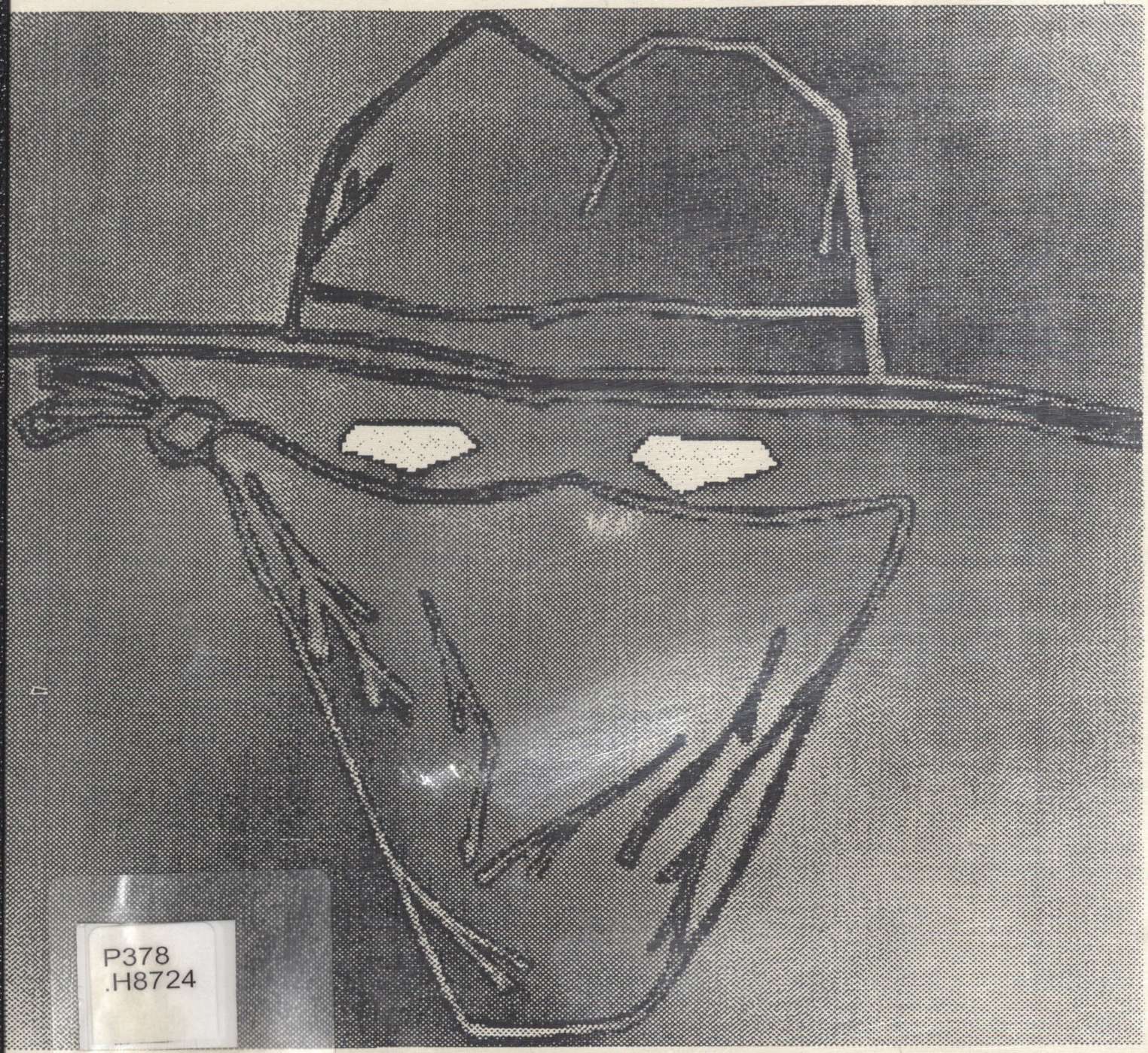
KOOTENAI FOOTBALL STADIUM

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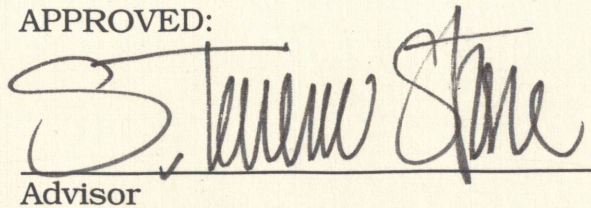
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of

Bachelor of Architecture

APPROVED:



Advisor

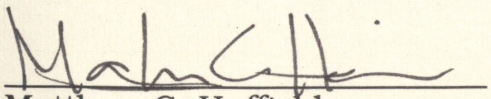
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Matthew C. Huffield

Dedicated to:

My beautiful wife Nicole and daughter Hailey,
and to our second child due in May 8, '95.

Thanks for the support!

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THESIS STATEMENT

PURPOSE OF THESIS

Structural innovation is very intriguing to me; I feel that structure is the basic element in every large scale stadium that is being built now, or has ever been built. Stadiums along with bridges are today the best ways to explore new advances in structure because of the spans that have to be achieved. Because of the similar types of construction between them, and the importance of bridges to the city of Spokane, I have chosen to use the strucural ideas of both.

There are numerous additional issues that can be dealt with in modern stadiums. Some of which are, to create a stadium that will be used for more that just viewing of sports (make it economically viable for the community), by providing other activities. Also, using parking structures and public transportation as a way to solve the problem of an enormous structure in the middle of a vast sea of parking lots and landscaping.

PROJECT GOALS

- Create a landmark for the city of Spokane.

- Reduce the number of on grade parking by using the existing parking in the city and to use parking structures to reduce the amount of walking time and to urbanize the stadium.

- Provide activities other than sports to contribute to the economic viability of the city.

- Structural innovation, create a stadium that uses the newest construction techniques and even those that haven't been invented.

PROJECT SCENARIO

The city of Spokane, Wa. has been selected as the new home of the National Football League expansion team, The Spokane Outlaws.

The proposed site for their new stadium is located on the North bank of the Spokane River, opposite of the downtown business district. The site is bounded by Howard and Lincoln Streets on the East and West, and Boone and Mallon Avenues on the North and South.

This part of the city is full of landmarks and historical buildings; such as, Riverfront Park, which is where the 1974 World's Fair was held. The Architectural fabric of the North bank consists of mostly brick masonry structures; such as, Broadview Dairy and The Flour Mill. The dairy is still being used as such, and the mill has since become an office building, a home for nick-knack shops, and restaurants.

The approximately 20 acre site is currently the location of a coliseum that is being used for the local hockey and basketball teams, and is 940 ft by 940 ft. Because of the size and location of the site, there will have to be a heavy constraint on the area allowed for parking. This means that parking structures will have to be used for most, if not all, of the required parking.

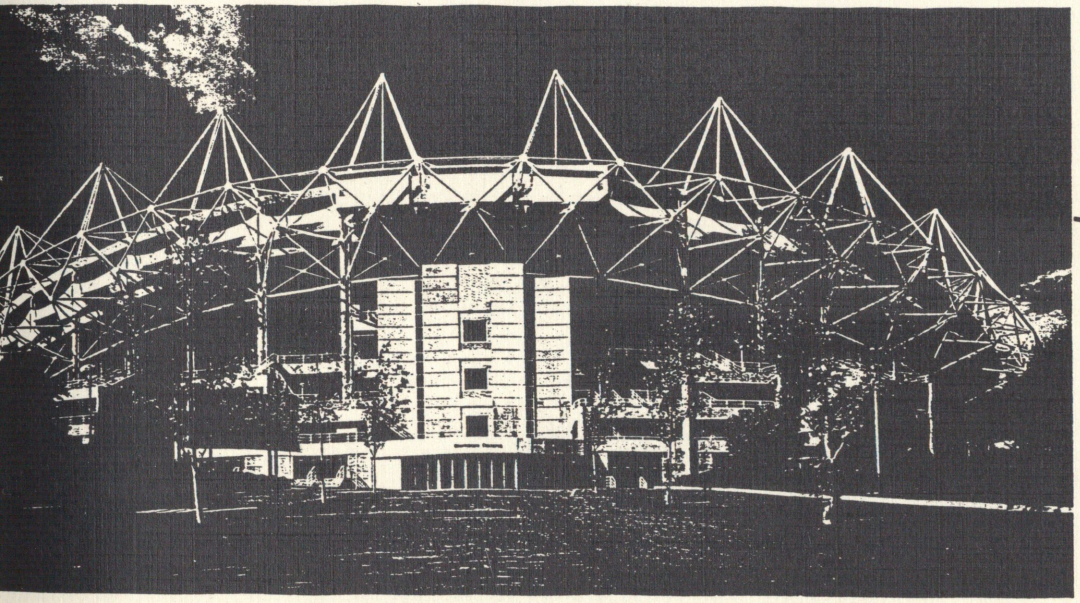
Pedestrian traffic will be very important because of the proximity to Riverfront Park and the addition of the public trolley system that will run from Wall St. and Sprague Ave., in the business district, to the South-East corner of the new site. This site creates a great chance to connect the North bank of the river to the South bank and the business district.

The building itself is to be a multipurpose facility for the city, its local sports teams, and the new football team. The events and uses will consist of football, soccer, hockey, basketball, and exhibition space.

Finally, the stadium should become a landmark for the city of Spokane, by providing activities other than sports. The stadium should become an important part of the city and increase the pedestrian traffic through Riverfront Park and onto the North bank of the river.

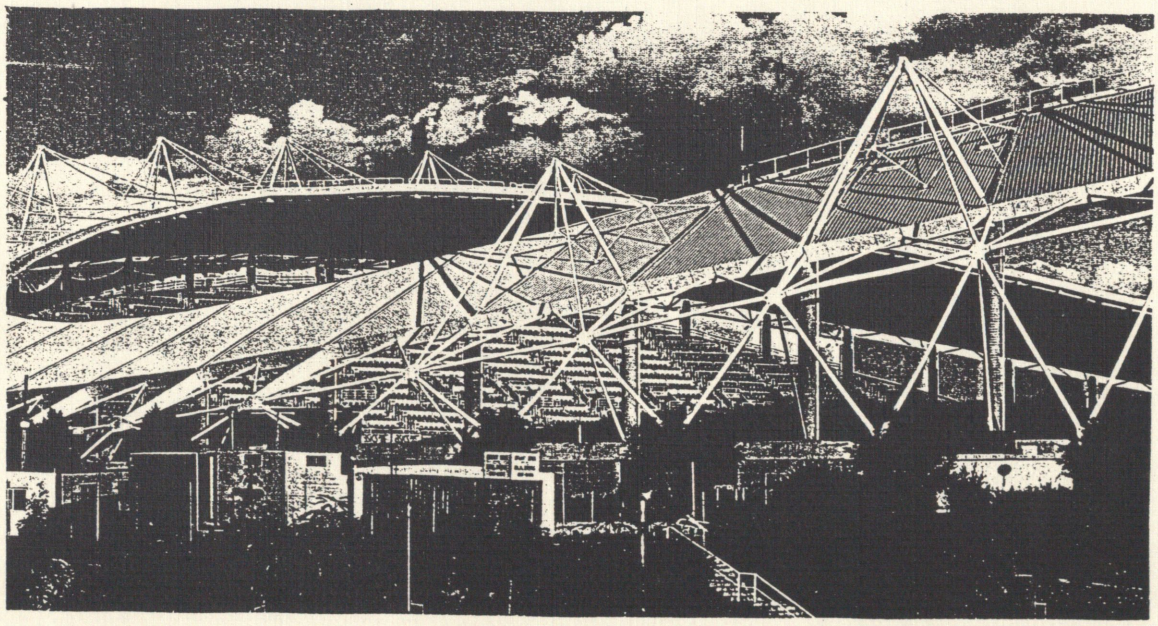


CASE STUDIES



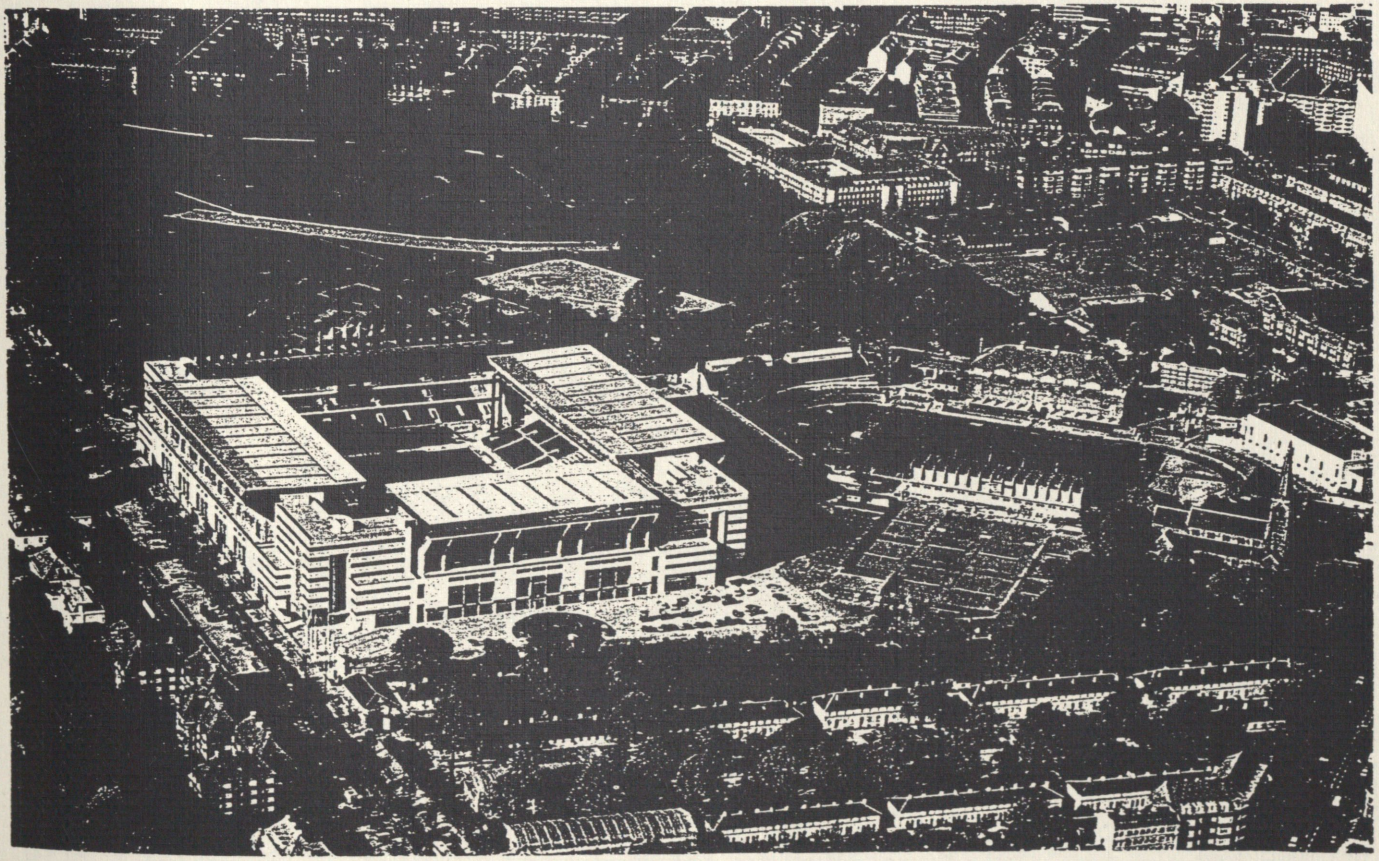
SIDNEY'S RUGBY STADIUM

This 40,000 seat stadium only had one purpose, to enable the greatest amount of spectators to enjoy the game. That meant to have as many people as possible to sit around the 50 yd line. The continuous cantilever roof is for dramatic effect.



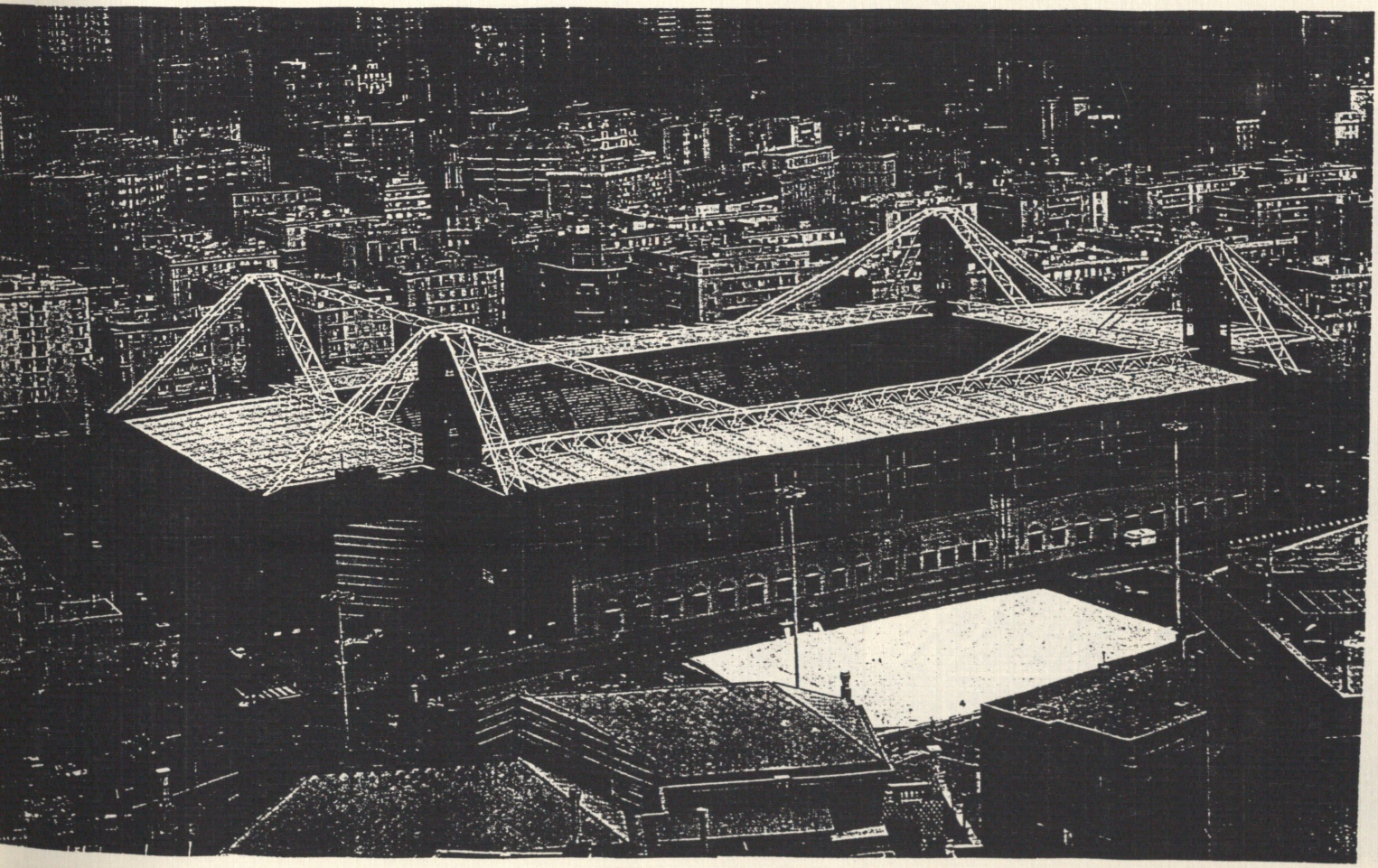
PARKEN - DENMARK'S NATIONAL STADIUM

The 40,000 seat stadium is made up of 4 grandstands that are separated at three corners by office buildings, that were used to help fund the building. It is located in the center of the city in an area of thriving public activity both before and after the games. It is an excellent example of a stadium fitting into the context of the city, but it is not very dynamic formally



MASSARI STADIUM GENOA, ITALY

The 44,000 seat stadium stands within the dense fabric of the city not as a remote object. This stadium fits well into context and still is able to make the statement as a structural piece of architecture. The corner towers are used for vertical circuation



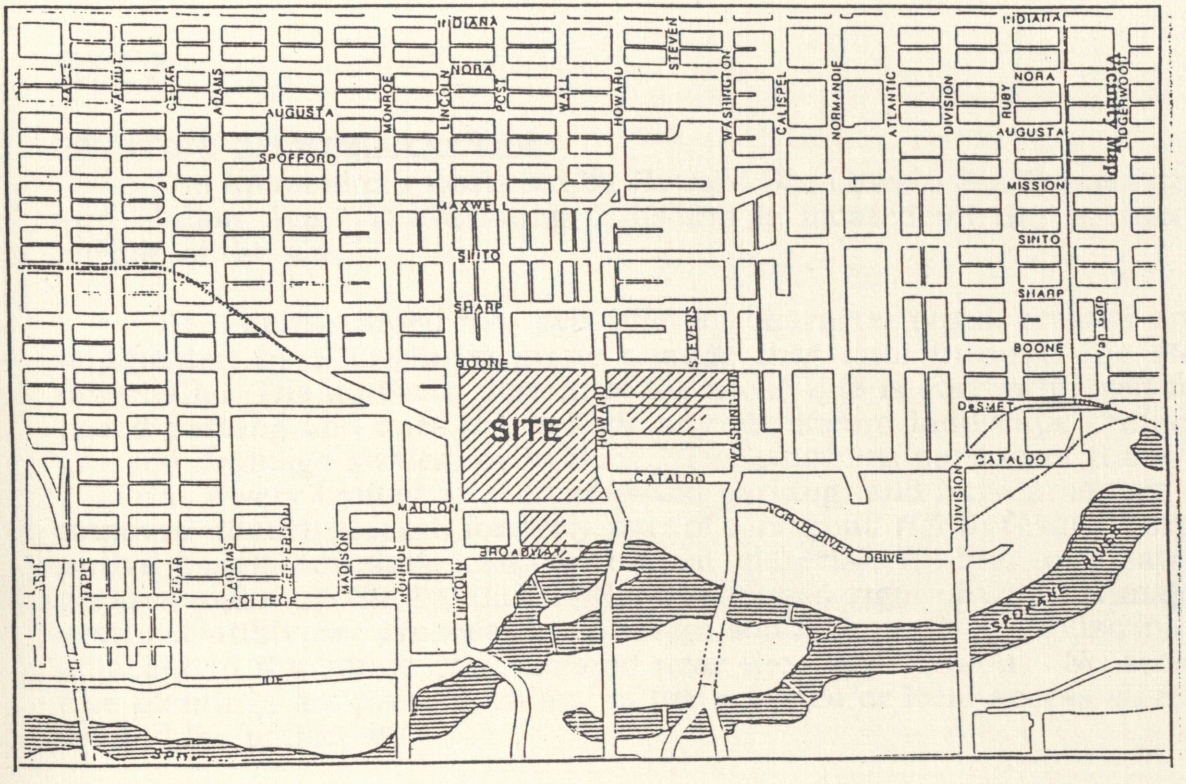
BAC DE RODA - FELIP II BRIDGE

This bridge in Barcelona uses 2 pairs of vertical and inclined arches to support 2 hanging piazzas that connect to parks on either side of a rail yard that the bridge spans. It becomes an object with an identity of its own.





PROJECT BACKGROUND


DIANA
NORA
AUGUSTA
SPOFFORD
MAXWELL
SINTO
SHARP
BOONE
MALLON
SITE
HOWARD
STEVENS
WASHINGTON
CALISPEL
NORMANDIE
ATLANTIC
DIVISION
RUBY
MISSION
DeSMET
CATALDO
NORTH RIVER DRIVE
SPOKANE RIVER
MONROE
LINCOLN
WALL
POST
ADAMS
MADISON
CEDAR
MAPLE
WALNUT
COLLEGE
BROADWAY

SITE

EXISTING SITE CHARACTER

The Arena site is bordered by Howard St., Lincoln St., Boone Ave., and Mallon Ave. The existing Coliseum is located on the northern portion of the site.

The site is divided into two different character types, created and augmented by a landform grade change that cuts through the site diagonally. The northern portion of the arena site is currently used for paved parking and does not include any significant landscape buffers, grassed drainage swales, or lighting. The southern portion of the site contains a very limited amount of paved parking, and large amounts of unpaved disturbed land, formerly part of a railroad right-of-way. Large native basalt outcrops, railroad ballast material, rubble, and native grasses make up the balance of the abandoned right-of-way. A major overheat utility line crosses the site from south to north. Landscaping adjacent to the site is concentrated near the Civic Theater. No street tree plantings are present on any of the arterials or local access streets around the project site.

SITE CONTEXT

The site is bordered by commercial and light industrial development. Residential development is present within a few blocks to the north and west. The Spokane River is a very short distance to the south of the Stadium site, although is not visible from the site itself. Views to the north, east, and west are limited by nearby commercial and light-industrial operations. Views to the south reach to the South Hill and include major portions of Riverfront Park, the Downtown Area and distant hills to the southeast. Boone, Lincoln, and Cataldo serve as local access streets. Pedestrian access to the site is easily made from Riverfront Park to the south. Pedestrian traffic within the project area is largely limited to the perimeter of the site, with sometimes heavy traffic on the southern edge, due to seasonal activities within Riverfront Park.

SITE OPPORTUNITIES AND CONSTRAINTS

The stadium's proximity to Riverfront Park and the river environment presents a great opportunity for integration of the stadium into the park. As a northern extension of Riverfront Park, the stadium could draw upon the mature landscape of the park and greatly enhance the landscape of the north riverbank.

Views to and from the site are dramatic. From the Downtown, the north bank and the Stadium site are a dominant part the a viewshed that includes Riverfront Park as a foreground, the near north bank as a mid-ground, and the North Hill-Five Mile plateau as a back-ground. From the site, Riverfront Park and the Downtown core are the dominant elements of the viewshed, framed by the nearby Flour Mill and other brick structures in the area.

Elevation change on the site takes place along an abandoned railroad right-of-way, and may be easily incorporated by placing concourse-level entries to the facility north, and event level entries south. Service access to the event floor level should be from the west.

SITE DESIGN ELEMENTS

Pedestrian Plazas, Spaces, and Access

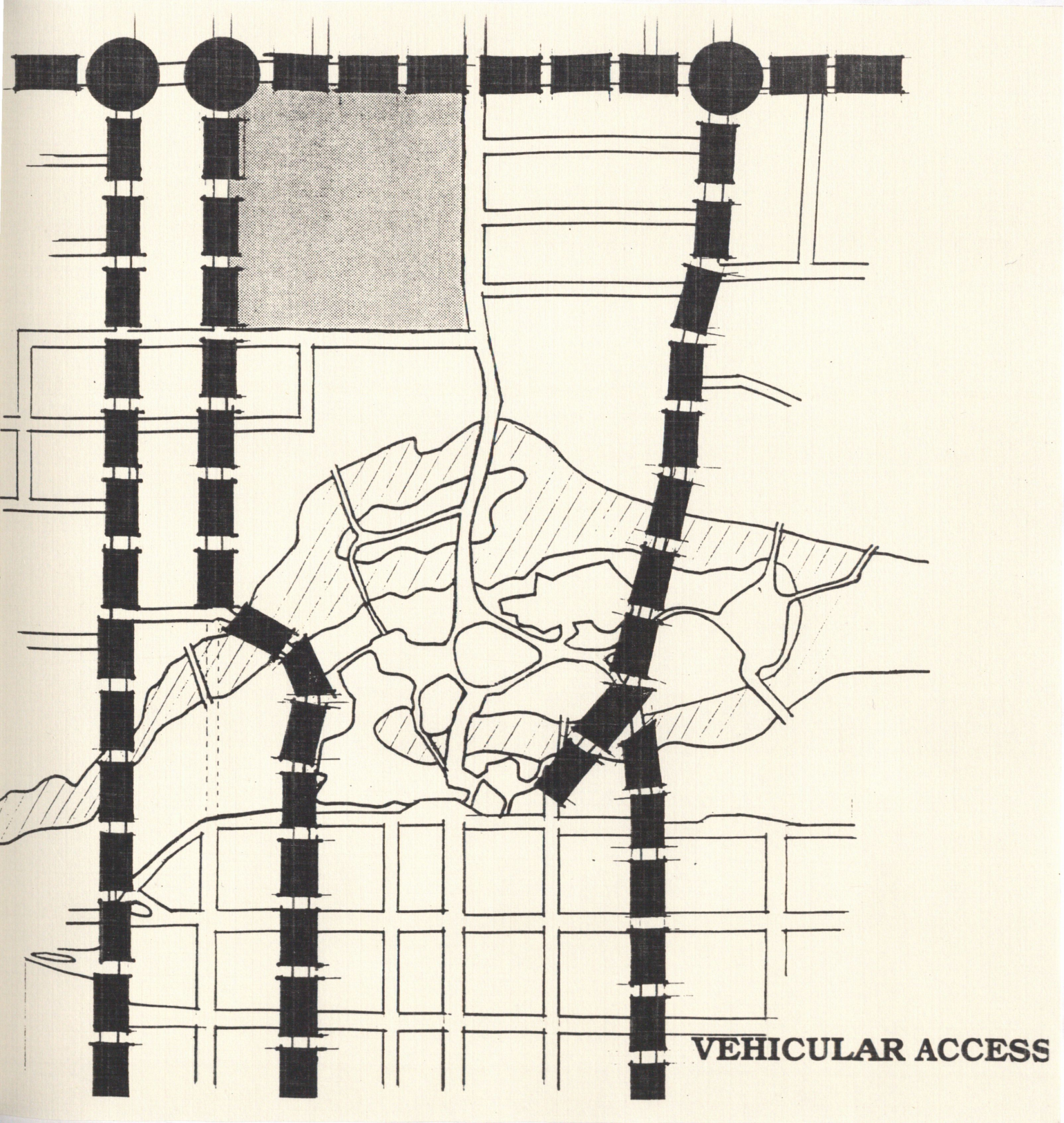
For Pedestrian spaces to function effectively and efficiently, several important relationships and considerations must be considered. These relationships and considerations include:

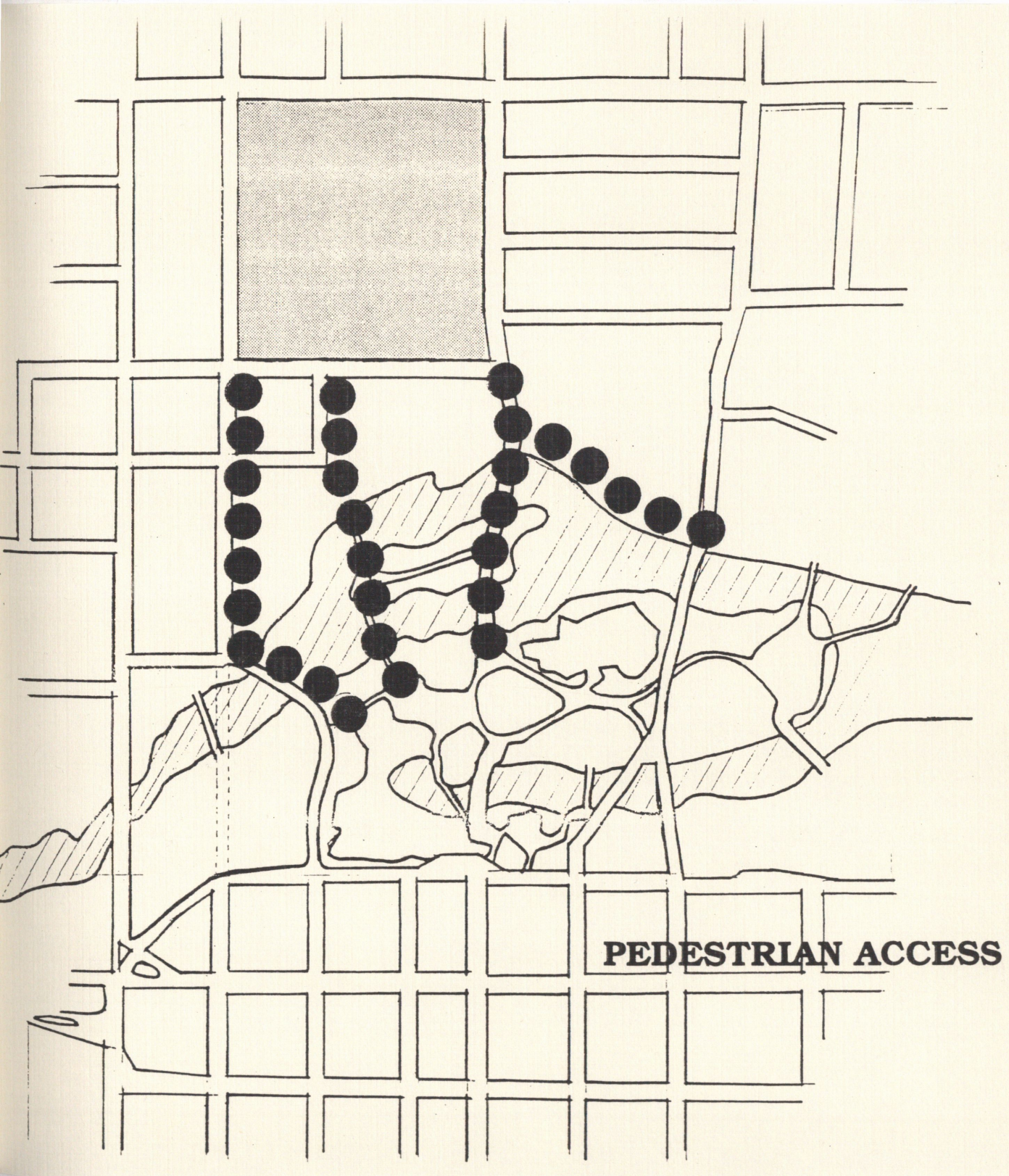
- The proximity of major entry plazas to provide automobile transit drop of points.
- Some level of protection from the elements, including trees, wind breaks, etc.;
- Adequate lighting to provide guests a sense of security.
- Easy and safe access from major parking zones.
- Designed to accommodate large crowds.

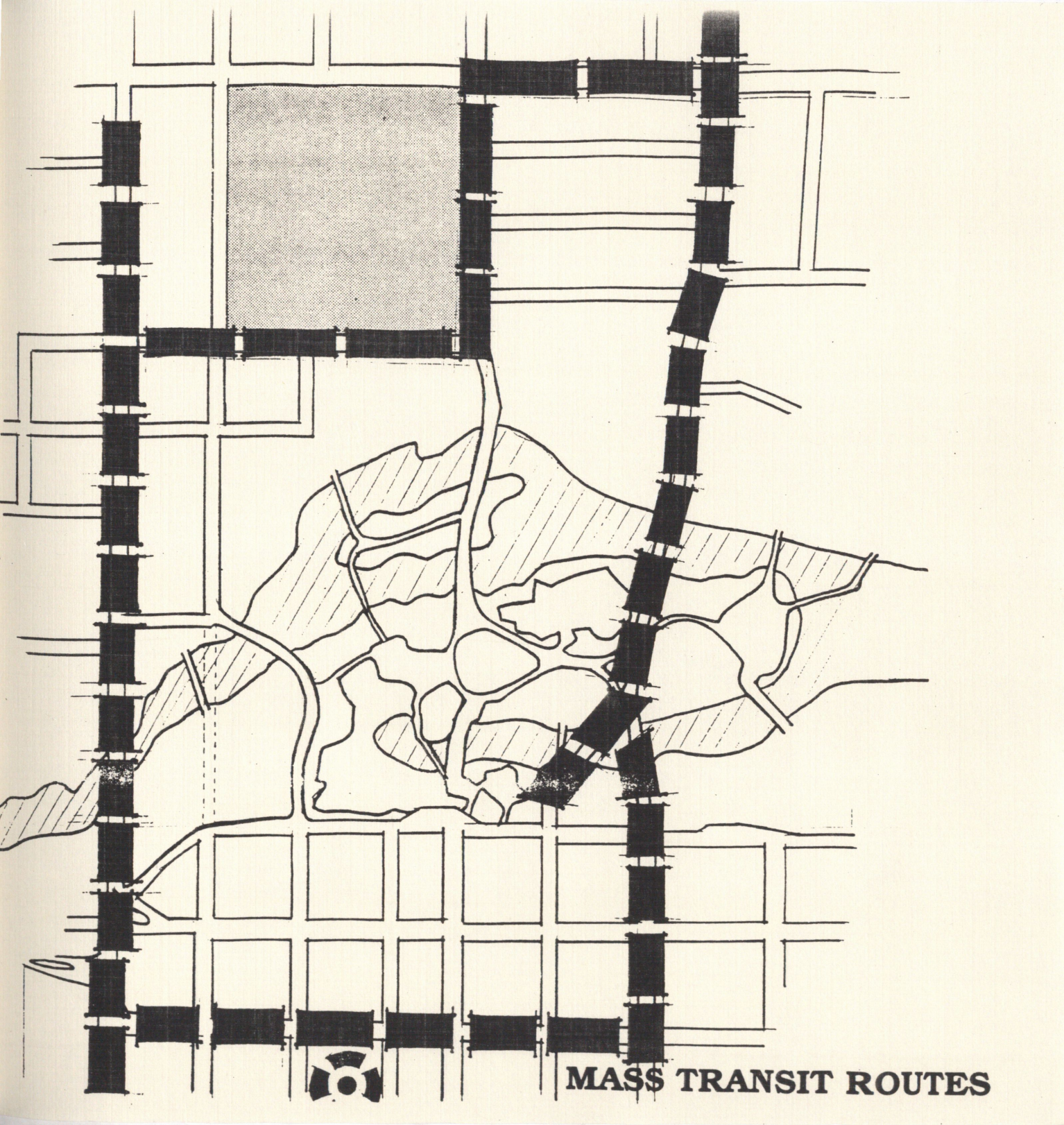
VEHICULAR ACCESS AND PARKING

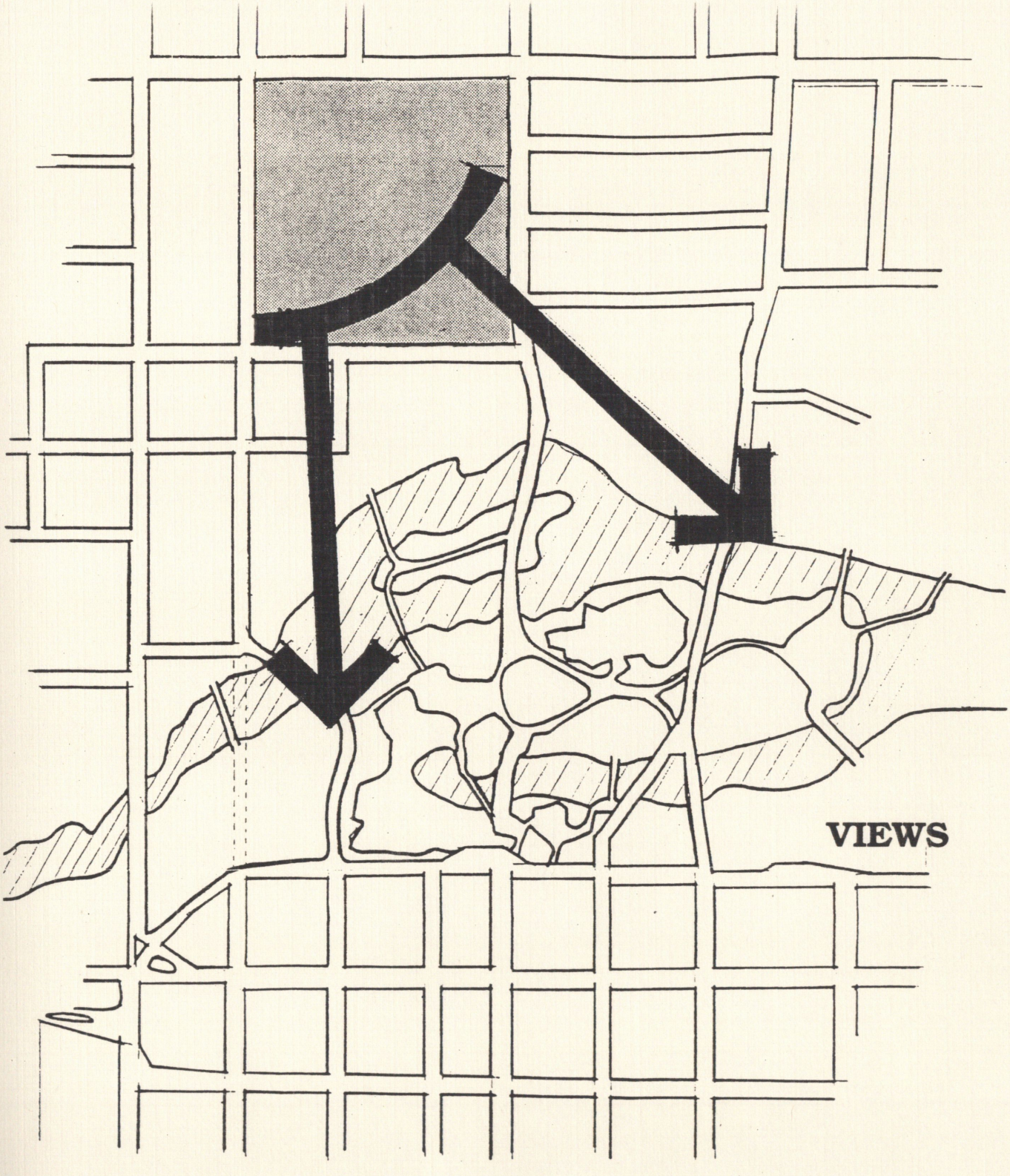
Access to the stadium area must be addressed on a large scale. It should be designed to minimize traffic conflicts. This can be achieved by controlling the number of entries and exits from the major parking areas, and locating entries and exits at adequate distances from intersections and other potential conflict points.

Street character of the existing streets that pass through the site should reflect a pedestrian character. This can be achieved by reducing the width of the vehicle area, increasing the width of sidewalks, and adding special paving materials, pedestrian scale lighting and furnishings, and limiting access during events. Streets that should be considered for redevelopment include portions of Howard, Mallon, and Dean, and Cataldo. The possible extension of Mallon Street from Howard to Washington should also be considered as "pedestrian friendly". Streets adjacent to the perimeter of the site should also be upgraded with street trees, similar to the Downtown core area.


VEHICULAR ACCESS


PEDESTRIAN ACCESS


MASS TRANSIT ROUTES


VIEWS



PROGRAM

PROGRAM SUMMARY

SPECTATOR FACILITIES

Seats		50,000
Public Toilets	Urinals	250
	Water Closets	109 men
		350 women
	Lavatories	120 men
		165 women
Concession Stands 13,500 sqft		
Novelty Stands		3,750 sqft
Ticket Windows		1,000 sqft
Turnstiles		
Premium Seat Lounges		7,200 sqft
Team Executive Box		120 sqft
Owner's Box		400 sqft
V.I.P. Box		320 sqft
	Sub total	26,290 sqft
		+ seats
		toilets
		circulation

PRESS

Working Press		3,000 sqft
T.V. Broadcast Booth	4 @ 320	1,280 sqft
Radio Broadcast Booth	3 @ 100	300 sqft
Scoreboard Op. Booth		240 sqft
Public Address Box		100 sqft
Statisticians Booth		240 sqft
Press Club		700 sqft
Player Interview Room	2 @ 300	600 sqft
Camera Platforms	20 @ 25	5,000 sqft
T.V. Production Studio		1,200 sqft
T.V. Van Parking		600 sqft
	Sub total	13,260 sqft

ADMINISTRATION OFFICES

Football		3,000 sqft
Hockey		2,000 sqft
Basketball		2,000 sqft
Stadium Management		200 sqft
Custodial Office		150 sqft
General Building Storage		3,000 sqft
Security Office		600 sqft
	Sub total	10,900 sqft

SERVICES

Stadium Management		5,000 sqft
Personnel Lockers		1,000 sqft
Field Maintenance Storage		
Football		5,000 sqft
Hockey		3,000 sqft
Basketball		3,000 sqft
Sound & Lights/Gen. Equip.		3,000 sqft
Loading Dock		1,000 sqft
	Sub total	25,000 sqft

PLAYING FIELD

Field		7,200 sqft
Home Team Club House		
Training		4,000 sqft
Equipment Storage		3,000 sqft
Laundry		1,000 sqft
Meeting Rooms	4 @ 200	800 sqft
X-ray		200 sqft
Football		13,150 sqft
Hockey		5,600 sqft
Basketball		3,000 sqft
Visiting Team		5,000 sqft
Officials		600 sqft
	Sub total	41,000 sqft

PHYSICAL PLANT		20,200 sqft
STADIUM CLUB		7,000 sqft
PARKING		1,050,000 sqft
	GRAND TOTAL	1,207,490 sqft + seating toilets circulation

SPECTATOR FACILITIES:

•Seating - 50,000 spectators

Maximum viewing distance -

208 yds

Practical viewing distance -

164 yds

Optimal viewing distance -

98 yds

Line of sight from the eyes of spectators in each row should be clear of the top of the head of the spectators in the row in front of theirs.

Row width should be 33 inches minimum.

Minimum clear seat way(distance between seats) should be 1.5 ft.

Seat width should be 18 in. minimum.

Formula for riser heights is:

$$N = \frac{(R + C) \times (D + T)}{D} - R$$

Where:

N = Riser Height

R = Height between eye and point of focus

C = Viewing standard - 6 in

D = Distance from eye to focus point

T = Tread depth

First row seats shall be no less than 7 ft. above playing field.

Row height will vary from 7 in. - 24 in.

Disabled seating will be provided for 1 % of total seating.

•Public Toilets

Urinals -	1 per 100 men
Water Closets -	1 per 230 men
	1 per 75 women
Lavatories -	1 per 3 men's fixtures
	1 per 2 women's fixtures

Based on 50 % male and 50 % female attendance.

Toilet rooms shall be provided for men and women on every concourse level and evenly distributed.

•Concession Stands

Concession stands should be evenly distributed on all concourse levels, and 15 linear ft of service space provided for each1000 spectators.

Food Court Areas - Space for food consumption should be provided on all concourse levels near concession stands and vendor commissaries.

•Commisary -

There should be 17,000 sqft of central storage for venders, and each concession stand should have space made for vendors to purchace there supply.

•Novelty Stands

2 main stores at 1000 sqft retail, and 4 small stands on each level at 500 sq. ft. minimum for each stand.

•Ticket Windows

There should be a minimum of 40 windows for event ticket sales, and 6 of those windows shall be accessible from the interior of the stadium lobby. Each ticket booth should be approximately 25 sqft

•Turnstiles

Turnstiles shall be covered with railings, and all turnstiles should be equipped with registering devices to count spectators. There should be 1 turnstile per 1500 seats with space for exiting the stadium and 100 sq. ft. of storage space near each entrance.

•Premium Seat Lounges (Suites)

There should be 60 - 70 suites provided with operable glazing on the interior side, and they should be near Stadium Club.

Team executive box - 120 sq. ft.

Owners Box - 400 sq. ft.

VIP Box - 320 sq. ft. For the visiting owner.

•Elevators

Elevators should be located where they give the best access to physically disabled, and reach from the press level to the field level.

PRESS FACILITIES

- Press Box

Working Press - Space shall be provided for 100 writers with tables. 3000 sq ft

TV Broadcasting Booth - Minimum of 4 required at 320 sqft. each

Radio Broadcasting Booth - Minimum of 3 required at 100 sqft. each

Scoreboard operator's Booth - 240 sq. ft.

Public Address - 100 sq. ft.

Statisticians space - Minimum of 240 sq.ft. and locate next to the working press

Press Club - Space shall be provided for the press members to eat and should be located near the press box.

Toilets - There should be separate toilets for the press in or near the press club and working press space.

Player Interview Room - Minimum of 2 required at 300 sqft., both should be at field level and one near each team locker room.

Camera Platforms - Platforms should be located in key positions at field level and at press level.

TV Van Parking - Parking should be located on the parking garage near the press box.

TV Production Studio - Studio should be near the TV van parking and at a minimum of 1200 sq. ft.

ADMINISTRATIVE FACILITIES

- Administrative Offices

  Basketball - 2,000 sq. ft.

  Hockey - 2,000 sq.ft.

  Football - 3,000 sq. ft.

- Stadium Operations Manager - 200 sq. ft.
- Custodial Office - 150 sq. ft.
- General Building Storage - 1,000 sq.ft.
- Custodial Storage - 300 sq.ft.
- Toilets - Toilets should be located on administrative level and field level for employee use only.
- Security Office - 600 sq. ft. For permanent security force.

  Crowd control office - Control office should be located near

  Security office - 1000 sq. ft.

SERVICE FACILITIES

- Stadium Maintenance - 5,000 sq.ft.
  - Personnel lockers - 1,000 sq.ft.
- Field Maintenance Storage -
  - Football - 5,000 sq.ft.
  - Basketball - 3,000 sq.ft.
  - Hockey - 3,000 sq.ft.
  - Sound and Lighting Equipment - 2,000 sq.ft.
  - Loading Dock -
    - located near freight elevator and with direct access to field.
  - General Equipment Storage - 5,000 sq.ft.

PLAYING FIELD FACILITIES

•Playing Field

The field should be the size of a soccer field with 15 ft min space around that for general work space during games.

•Field Entrances

There should be access for vehicles to the exterior of the stadium at the field level, with one being for large trucks at a minimum of 16 ft. and the others being 12 ft. min.

•Stadium Lighting

There should be a complete lighting system giving adequate lighting for all events provided.

•Score Board

A score board shall be provided for the stadium with replay monitor and adequate lighting system.

TEAM FACILITIES

- All team facilities should be located at field level with elevator access to press level and direct access to stadium floor.
- Home Team Clubhouse -

  The team clubhouse will consist of spaces that are similar to all teams and therefore should be shared by all teams

Training Room -	4,000 sq.ft.
Equipment Storage -	3,000 sq.ft
Laundry -	1,000 sq.ft.
Meeting Rooms (4 req.) -	200 sq.ft. each

Football -

Locker room (100 lockers) -	9,000 sq.ft.
Shower/Toilet -	2,000 sq.ft.
Coaches Locker room -	750 sq.ft.
Coaches Offices (6 req.) -	400 sq.ft. each
Video Room -	1000 sq.ft.

Hockey - 5,600 sq.ft

Clubhouse for hockey team will consist of lockers, shower room, toilets, coaches lockers/offices, and video room.

Basketball - 3,000 sq.ft.

Clubhouse for basketball will consist of lockers, shower room, toilets, coaches lockers/offices, and video room.

•Visiting Teams

Each should consist of lockers, training room, storage, and Coaches locker room

Football -	5,000 sq.ft.
Hockey -	2,000 sq.ft.
Basketball -	1,500 sq.ft.

•Officials Locker room - 600 sq.ft.

It should consist of lockers, toilets, and be completely separate from either teams locker rooms.

•X - Ray room - 200 sq.ft.

It should have direct access to the field and be adjacent to the home team training room.

PHYSICAL PLANT

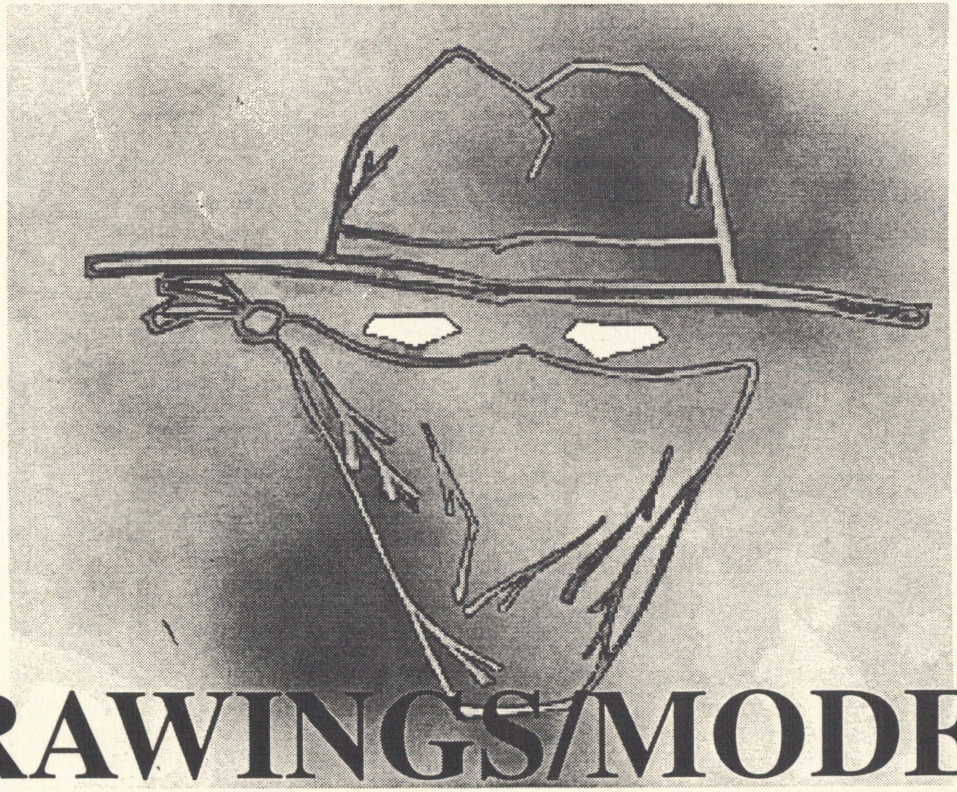
- Building engineer's office/Control room - 200 sq.ft.
- Mechanical/Electrical - 20,000 sq.ft.

STADIUM CLUB

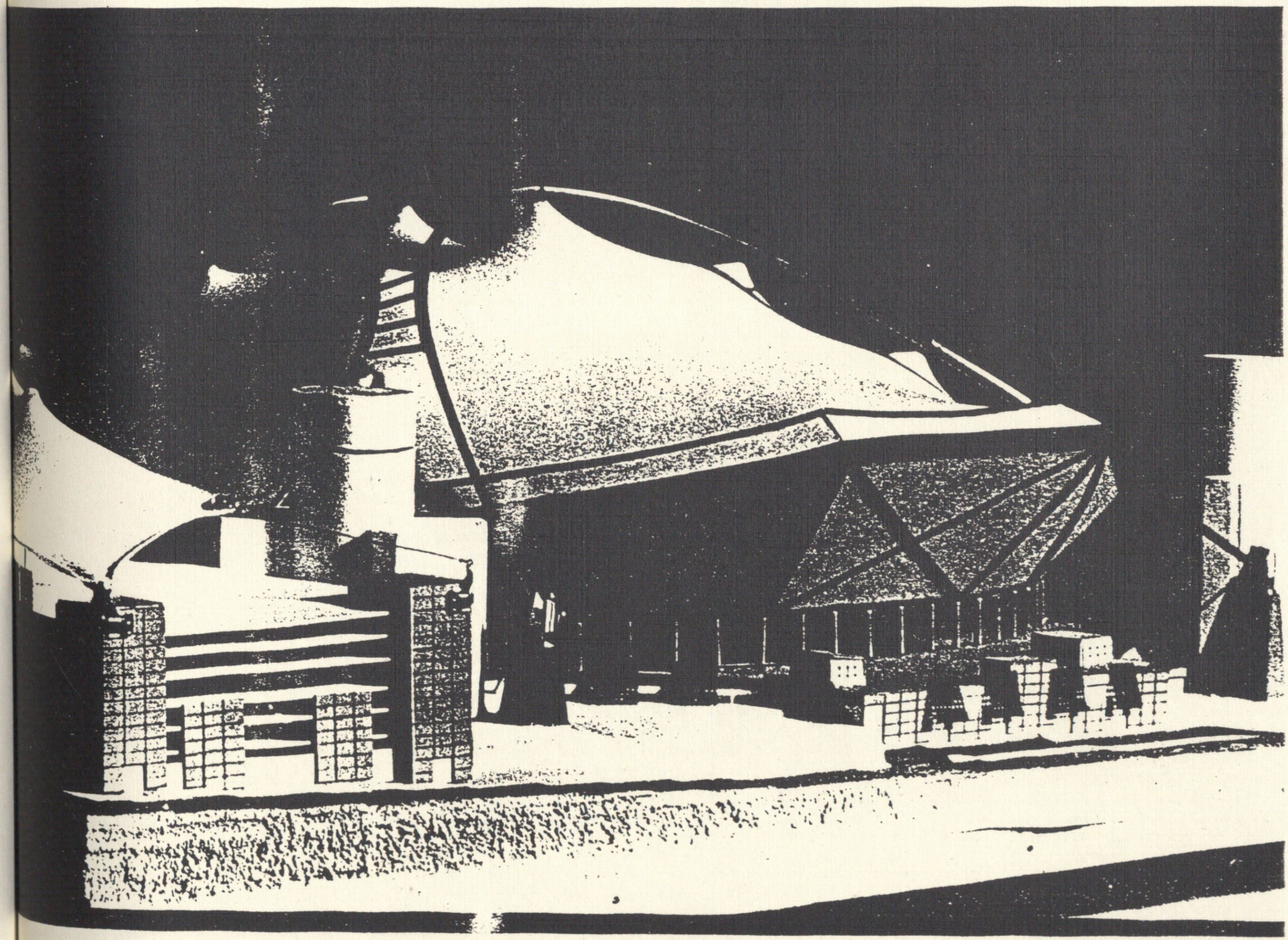
- Member's restaurant located near the premium seat lounges and should accommodate a minimum of 300 patrons.

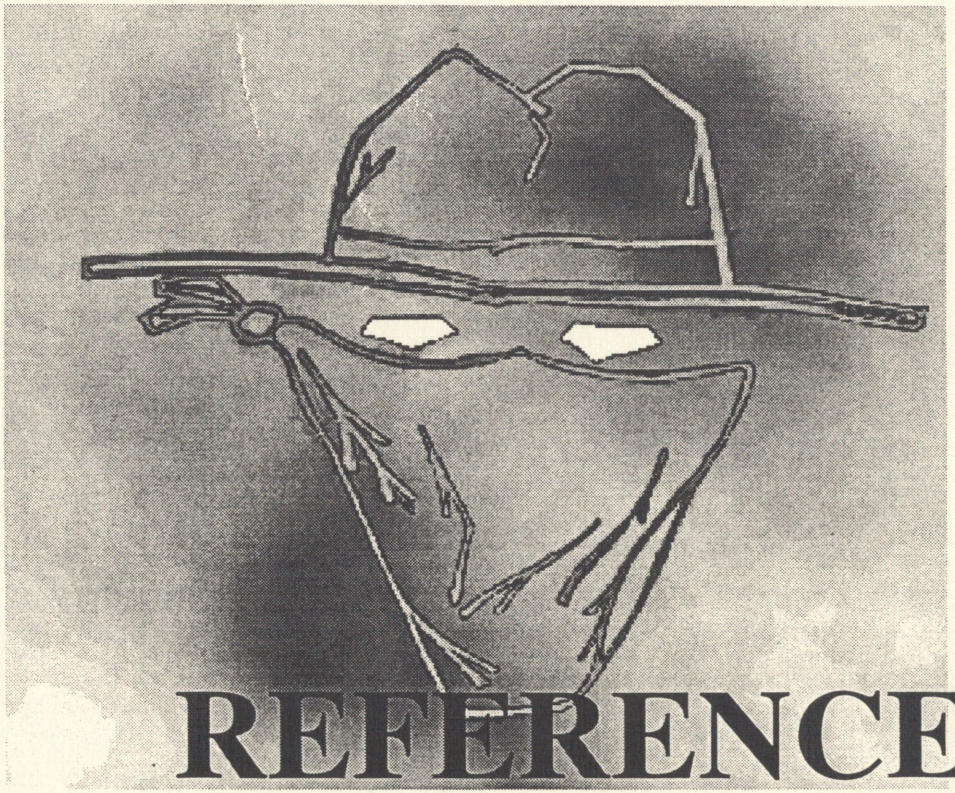
PARKING

- Each space shall be 8 ft. by 19 ft. minimum and 1 space is required for every 4 seats in the stadium.
- Only 1/3 of the spaces will be built on the site, the rest will be located in the downtown core of Spokane and other satellite parking areas; public transportation will be used to move people to and from the games.



DRAWINGS/MODEL





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2. Spectacor Managment Group. **Downtown Baseball and Stadium Sports/Entertainment Arena. A proposal to the City and county of San Francisco.** Philadephia- self published, 11 January 1989.

Site Description, Pages 14-18 is taken from:

1. **Spokane Veterans Memorial Arena Program,** ALSC Architects P.S. July 13, 1992.

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