SAHARA BOARDWALK HOTEL/CASINO

Resort Hotel and Casino

Atlantic City, N. J.

Brandan DeCaro

1980

Professor

Robert Fisher
At this time the author would like to thank the following people for their assistance in this project:

1. The Atlantic City Department of Planning and Development for all of the vital information they supplied me with.

2. My friends and family; especially Babs and De, Tommy, Lynn, Sandy, Stace, and Julie.

3. Budweiser and Miller for keeping my sanity.
Abstract

What is this book?

This book is the culmination of an Architectural Thesis project conducted at Ball State University. An entire school year was devoted to this project. The object of this thesis is to take a self-chosen project through such stages as problem definition, research, design development, and final design.

How to use this book!

This book is arranged so that only the information of prime importance is included in the body. This was done to give the uninformed reader a quick overview of the project and solution without having to read the entire volume. Further concerning the background data and research is located in Appendix I. The evolution of the final design is represented in Appendix II. The author would encourage the reader to consult both of these appendixes.
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   B. schematic
   C. preliminary

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Project: The Sahara Boardwalk Hotel/Casino is an actual project which had obtained approval to begin construction at the time my thesis project originated. The Sahara site was chosen because of its desirable location and ease in obtaining pertinent data. The original intention was to make the project as realistic as possible but certain compromises were necessary which are stated in the program of this project.

Site: Located near one end of the casino district adjacent to the boardwalk and beach. The site is in close proximity to the airport and major vehicular artery into Atlantic City. It is about 2 1/4 acres and comprises mainly of sand.

Program: Multifunctional building with both night-type entertainment and outdoor summer activities. The project consists of a 250 room hotel along with a casino. Several restaurants, bars, convention spaces, entertainment areas and sports facilities are required. Two types of shopping space are needed to respond to both the street and boardwalk.

Constraints: The small size of the site was a major constraint since nearly 1/2 million sq. ft. of buildable space was desired. This meant that keeping the building from becoming too massive or too tall became a major problem. For similar reasons sub-level parking also acted as a major constraint.

Solution: Views to and from site were considered extensively throughout the design of the project. The building is also oriented for maximum solar and wind control. Concern was displayed in
designing the project in context with Atlantic City, and the imagery already created by its unusual characteristics.
1
SITE
ANALYSIS

*Sahara
*Boardwalk
*Hotel/Casino
SUMMARY

"Atlantic City is located on Absecon Island on the Southeast coast of New Jersey. Surrounding terrain, composed of tidal marshes and beach sand, is flat and lies slightly above sea level (see fig. A & B)."1

Atlantic City has excellent automobile access (see fig. B, C, & D). "In addition, Allegheny Airlines, Eastern, Delta, Braniff and Northwestern Orient have requested permission from the FAA to operate regularly-scheduled flights to the Atlantic City Airport in Pomona. If granted, air service to the area should be excellent. If denied, Philadelphia International Airport would be relied upon for primary air access with connecting commuter service to Atlantic City's bader field. Passenger rail service from Philadelphia as well as bus service from major eastern cities is currently available to Atlantic City. In addition, the city is also considering the development of modern high-speed rail service to further enhance its accessibility."2

"Atlantic City encompasses within its corporate limits an area of 7,640 acres, or 11.94 square miles. Most of the terrain is consumed by waterways, tidal wetlands, and marshlands, with hardly 1/3 (about 2500 acres) representing the buildable surface of the land (see fig. E)."3 Atlantic City's most unique physiographic characteristic is its 3.41 miles of sandy beach. Along the beach and down the inlet runs a wooden boardwalk. The boardwalk is 4.11 miles long and approximately 60 feet wide. Its surface is composed of 5 sections of diagonal pine decking, 12 feet in width (see fig. F).

The buildable land adjacent the boardwalk has developed into the prime resort district in Atlantic City (see fig. G & H).
North of this is the city's central business district. Districts zoned for casino usage and the locations of the proposed casinos are shown on figure I.

The city enjoys a relatively mild climate due to the moderating influence of the Atlantic Ocean. As a result spring starts later, summer is cooler, autumn is later and winter much milder than elsewhere at the same latitude. The prevailing winds are also affected by the ocean (see fig. K). Land and sea breezes "occur when moderate or intense storms are not present in the area, thus enabling

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Normals, Means, and Extremes

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the local circulation to overcome the general wind patterns. During the warm season, sea breezes in the late morning and afternoon hours prevent excessive heating."4 "Precipitation on the average, is moderate and well distributed throughout the year, with June the driest month and August the wettest."5 Thunderstorms are usually a summer phenomena. Severe storms and hurricanes occur during the fall and winter as a result of storms moving up the eastern coast of the United States.
The site for the Sahara Boardwalk Casino and Hotel is located near the end of the Casino District. It is bounded by Pacific Avenue on the north; Hartford Avenue to the east; Albany Avenue to the west; and the Boardwalk to the south. For further information concerning the site consult Figure J-0.
major routes
to Atlantic City
PROPOSED CASINOS

1. Resorts International
2. Great Bay
3. Caesars World
4. Bally (Park Place)
5. Mayflower
6. Morton Metroplooe
7. Boardwalk Regency
8. Benihana
9. Atlantic Plaza
10. Penthouse
11. Len Zisman
12. Playboy
13. Portman
14. Sahara
15. Sheraton Seaside
16. Captain Starns
17. Ambass. Deauville/Ramada
18. Golden Nugget
19. Trans Expoc
20. Holiday Inn
21. Claridge
22. Ritz
23. Ocean One
24. Aquarius
25. MGM/Hilton/Harrahs
26. Hotel Association
27. Dunes
28. Prime
29. Golden Gate
30. Vormado
31. American Leisure
32. Floatel
33. Crystal Palace
34. Resorts Chalfonte
35. Cavanaugh Communities
36. Lady Luck
37. Palace
38. N.Y. Ave. Casino
Site - 2.26 acres
Site Area - 98,460 sq. ft.

A. 15 ft. setback (for sidewalk) required for 3 sides of site.

B. One level below grade maximum due to high water table.

C. Boardwalk to south of site 1/2 level above grade.

D. No setbacks allowed for 35 ft. above grade.

E. Maximum height for building 385 ft.

F. Football field for size comparison.
2 PROGRAM

*Sahara
*Boardwalk
*Hotel/Casino
Design Criteria

To make this project a more reasonable thesis design, I have decided to reduce the space requirements by 50%. This was done to insure a well developed product since the actual building (600,000 sq. ft.) would be too large to develop properly. There are three regulatory agencies that deal with casinos in Atlantic City. They are:

1. Atlantic city zoning regulations (map 13)
2. Cafra (coastal area facilities review act)
3. N.J. casino control commission

Casino Control Commission
- Minimum of 250 rooms at least 325 sq. ft.
- Minimum of 20,000 sq. ft. of dining entertainment and indoor sports
- Minimum of 12,500 sq. ft. of meeting space
- Casino open until 4 a.m. weekdays and 6 a.m. on weekends
- Lawful games are: Blackjack, Craps, Roulette, Baccarat, "Big Six," and Slot Machines
- Maximum 30,000 sq. ft. casino area (not reduced)

Source: Casino Perspective
Summary of Spaces

I. Hotel
   1. Lobby ........................................ 7,040 sq. ft.
   2. Guest rooms and corridors .................. 119,500
   3. Indoor sports ................................ 3,300

II. Entertainment
   1. Casino/support areas ......................... 34,660 sq. ft.
   2. Restaurants .................................. 21,750
   3. Bar/lounge ................................... 6,780
   4. Administration ................................ 1,990

III. Convention Space
   1. Lobby ......................................... 3,880 sq. ft.
   2. Meeting, banquet ............................. 13,400

IV. Shopping
   1. Boardwalk shops ............................. 25,000 sq. ft.
   2. Mall .......................................... 15,000

V. Back-of-House/Parking
   2. Parking ...................................... 70,500
      Total .......................................... 333,350 sq. ft.
      + .05 walls, circulation, mech circ. 350,018 sq. ft.

VI. Exterior Spaces ............................... 33,450 sq. ft.
HOTEL - 250 Guest Rooms

Lobby

The hotel lobby must set the mood for the entire hotel. "This space, more than any other, will create the first and usually the most lasting impression,"6 for the hotel's guests. It should be spacious, bright, and comfortable. It must be both a transitional space as well as a relaxing, static space. Circulation to other areas of the hotel should be apparent and efficient.

<table>
<thead>
<tr>
<th>Lobby</th>
<th>Sq. ft.</th>
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<tbody>
<tr>
<td>1. General circulation and meeting 1/4 sq ft. a room</td>
<td>3500</td>
</tr>
<tr>
<td>2. Exhibition/display 1/2 sq. ft. a room</td>
<td>1000</td>
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<tr>
<td>3. Lounge/Seating area 6 sq. ft. a room</td>
<td>1500</td>
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<tr>
<td>4. Front desk/reception</td>
<td>220</td>
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<tr>
<td>5. Coat room (for nonguests)</td>
<td>220</td>
</tr>
<tr>
<td>6. Storage for valuables (safe-deposit)</td>
<td>60</td>
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<tr>
<td>7. Suitcase storage</td>
<td>100</td>
</tr>
<tr>
<td>8. Public restrooms (in addition to casinos)</td>
<td></td>
</tr>
<tr>
<td>A. Mens</td>
<td>150</td>
</tr>
<tr>
<td>B. Women</td>
<td>150</td>
</tr>
<tr>
<td>9. Manager's Office</td>
<td>140</td>
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</tbody>
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GUEST ROOMS - 250 @ average 400 sq. ft.

The guest room must be a flexible space due to the variety of guests that will stay at the hotel. It must serve as both a living and meeting space. It should have a pleasing exterior view.

1. Standard room 214 @ 325 sq. ft. 69,550 sq. ft.
   - 1-2 guests
   - Bath @ 50 sq. ft.
   - Closet @ 14 sq. ft.
   - Balcony

2. Suites, 24 @ 650 sq. ft. 15,600 sq. ft.
   - Larger parties and business meetings
   - 2 baths @ 100 sq. ft.
   - 2 closets @ 28 sq. ft.
   - 2 balconies
3. Deluxe Suites 12 @ 1300 sq. ft. 15,600 sq. ft.
   - Luxury accommodation
   - 2 baths @ 100 sq. ft.
   - 4 closets @ 56 sq. ft.
   - Balconies

4. Corridor and Storage 75 sq. ft. a room 18,750 sq. ft.

SPORTS FACILITIES (indoor)

1. Indoor swimming pool 700 sq. ft.
2. Whirlpool 100
3. Openspace and decking 1500
4. Locker rooms (used by exterior spaces also)
   A. Mens
      Sauna, lockers, restrooms 500
   B. Womens
      Sauna, lockers, restrooms 500

EXTERIOR SPACES (not included in total)

1. Swimming pool - 3000 sq. ft.
2. 2 tennis courts - 14,400 sq. ft. (60' x 120')
3. 2 shuffleboard courts - 1050 sq. ft. (60' x 10')
4. Deck - 15,00 sq. ft.
   - Dining, sunbathing, recreation

CIRCULATION

Vertical circulation through the hotel will be achieved with passenger elevator, service elevators and fire stairs. The passenger elevator should be designed as an exciting space.

1. 4 passenger elevators
2. 2 large service elevators
3. 2 fire staircases
ENTERTAINMENT

"In that the casino is the focus of all activity, it must be the most elaborate and ambitiously designed of all spaces in the resort. To promote continuous activity, it should be removed... from the diurnal cycle. The lighting level should always remain low. There should be no clear circulation through the casino so that there will be a maximum interface between guests and casino activities."  

Casino Summary

1. Games: 30,000 sq. ft. total (see appendix)
   A. Blackjack (3'6" x 5' x 3') 60 @ 100 6,000 sq. ft.
   B. Craps (12' x 6' 3') 8 @ 200 sq. ft. 4,800 sq. ft.
   C. Roulette (single-8' x 6' x 3') 8 @ 900 sq. ft.
   D. Big six (6' x 3' x3') 3 @ 150 sq. ft. 450 sq. ft.
   E. Slot machines (3' x 1'8" x 1'6") 9,000 machines 9,000 sq. ft.
   - 1 slot/10 sq. ft and min. 6' aisle
   - Combination of 5¢, 10¢, 25¢, and $1.00
   F. Baccarat 3 @ 150 sq. ft. 450 sq. ft.

2. Game support areas (close to games)
   A. 6 counter booths 6 @ 60 sq. ft. 360 sq. ft.
   B. 8 change booths 8 @ 40 sq. ft. 320 sq. ft.
   C. Currency counting, room & vault 200 sq. ft.
   D. Coin counting room 400 sq. ft.
   E. Coin storage (valuted) 250 sq. ft.
   F. Credit office & waiting area 600 sq. ft.
   G. Accountants offices 2 @ 140 280 sq. ft.
   H. Conference office 200 sq. ft.
   I. Waitress stations/storage 250 sq. ft.

3. Public restrooms (for casino only)
   A. Mens 2 @ 450 sq. ft. 900 sq. ft.
      10 wc. 16 urinals, 10 lavatories
   B. Womens 2 @ 450 900 sq. ft.
      12 wc., 12 lavatories, 150 sq. ft.
      powder room.
4. Administration summary (for casino/hotel)
   A. Casino manager 140 sq. ft.
   B. Assistant manager 130
   C. President 160
   D. Administrative assistant 130
   E. Vice president 2 @ 130 sq. ft. 260
   F. Personal manager 130
   G. Public relations manager 150
   H. Publicity manager 130
   I. Conference room - 2 small 400
   J. Restrooms for administration
      - mens 150
      - womens 150
      - president 60
RESTAURANTS

A variety of restaurants are necessary to meet the varying needs of the users of the hotel/casino. Both formal and informal dining will be required. The restaurants should be designed to fulfill the requirement of all possible dining situations. They should also be designed to profit from the attractions of the project. They should be designed to fulfill the requirements of all possible dining situations.

1. Steakhouse rooftop restaurant
   - Steak and ribs type menu
   - Informal breakfast, lunch
   - Semi-formal dinner
     A. Seats 200 a 14.5 sq. ft. 2,900 sq. ft.
     B. Bar 400
     C. Reception area 100
     D. Kitchen and storage (31% of restaurant) 1,100
     E. 2 restrooms 300
   - Ocean view

2. Coffee/cafeteria
   - Informal all meals
   - Dinner type meals
   - Carryout/tables (waitress service)
   - Off main lobby, visual connection to casino
     A. Tables: seat 250 @ 10 sq. ft. 2,500 sq. ft.
     B. Serving counter, take-out 800
     C. Kitchen (uses many of the main kitchen facilities; connection necessary) 23% of cafeteria

3. Gourmet restaurant/Cabaret showroom
   - Semi-formal breakfast
   - Formal lunch, dinner
   - Elaborate gourmet menu
   - Becomes cocktail showroom after dinner
   - View of casino and ocean both desirable
     A. Tables seat 500 @ 15 sq. ft. 7,500 sq. ft.
     B. Stage 800
     C. Band pit 500
     D. Dressing rooms/storage/mechanical 800
     E. Main kitchen/storage (40% of rest.) 3,000
     - Food storage - food preparation - garbage - dishwashing - waiters area - service bar - cooking area - salad area - bake shop - room service - waitress bar
BARS/LOUNGES

The same versatility required in the restaurants is necessary in the bar and lounge spaces. They should also profit from the major attractions of the project. They should in fact help support these attractions.

Bars/lounges

1. Casino lounge (also waitress station)
   - Opening into and overlooking casino
   - Comfortable seating at tables and bar
   - Live band at night
     A. Tables to seat 150 @ 10 sq. ft. 1,500 sq. ft.
     B. Bar with stools for 40 (includes cir.) 1,350
     C. Stage for bands 250
     D. Backstage room 150
     E. Restrooms - uses casino's
     F. Liquor storage/refrigerator 300

2. Discotheque
   - Visual contact with casino
   - Acoustical separated
   - Elaborate sound system, acoustics, and lighting
     A. Tables for sitting 100 @ 10 sq. ft. 1,000 sq. ft.
     B. Dance floor 600
     C. D.J. room/music storage 80
     D. Bar with stools for 25 1,000
     E. Liquor storage, refrigerator 250
     F. Restrooms - men & women 300
CONVENTION SPACES

Convention spaces are necessary in addition to the entertainment spaces previously mentioned. These convention spaces will be used for large private meetings and dinner affairs. These spaces should be flexible to handle the variety of size and function of these affairs.

LOBBY/EXHIBITION

The lobby will serve as a gathering area for the meeting spaces. The lobby has to meet the needs of the convention guest before and after his scheduled meetings. It will also act as exhibition space for the conventions. Strong visual contact to the hotel lobby/casino area is necessary to promote the public entertainment available at the hotel.

Lobby - 3800 sq. ft.

1. Gathering/circulation 2,100 sq. ft.
   - with bar service
2. Exhibition/display 1,200
3. Public restrooms 250
   - Mens
   - Women (including powder room) 250

MEETING/BANQUET SPACES

These spaces will have to serve a variety of functions from business meetings to dinner affairs. Distracting views and sounds must be eliminated to promote a isolated environment. To service affairs of varying sizes one large space that subdivides is a necessity.
Meeting Banquet Spaces - 10,500 sq. ft. total
Seats total of 700-800 people

1. Large banquet hall
   seats 400-450 people
   6,000 sq. ft.
2. Medium banquet hall
   seats 200-300 people
   3,000
3. Small banquet hall
   seats 100-120
   1,500

Kitchen/Storage - 28% of banquet space 2,900 sq. ft.
(will use many of the main kitchen facilities; connection necessary)

*Note: Hotel rooms might open to provide smaller meeting spaces.
SHOPPING FACILITIES

Boardwalk shops

The preservation of Atlantic City's boardwalk area is essential. Small craft shops, specialty shops, souvenir shops, and food vending stands are typical of the boardwalk regent. The boardwalk development should act as allure into the facility to passing pedestrians. The character of the existing boardwalk must be retained in these new facilities.

Boardwalk shops

Rentable commercial area 25,000 sq. ft.
- Food vending - souvenir shops - craft shops - specialty shops - cafe - game room

Shopping Mall

Due to the seasonal climate of Atlantic City additional shopping facilities are necessary. These facilities should be contained in a semi-controlled environment. The stores would carry a more expensive line of merchandise and cater to the more affluent hotel guest. Since the casino is still the major attraction of the project, visual access is desirable from the mall.

Shopping mall

Rentable commercial space 15,000 sq. ft.
- Clothing stores
- Hotel support: gift shop, barber shop, beauty parlor, book & magazine store, etc.
BACK-OF-HOUSE/FACILITIES

1. Facilities for staff
   - bar - rest. - casino - hotel - segregation
     required (by job)
   A. Mens locker rooms/bathrooms 3 900 sq. ft.
   B. Womens locker rooms/bathrooms 3 900
   C. Cafeteria 400
   D. Uniform/cleaning goods storage 400

2. Back-of-house facilities
   A. 2 loading docks/shipping receiving 1,000 sq. ft.
      @ 4 sq. ft. a room
   B. Shipping and receiving office 100
   C. Storage - furniture - linens 5 sq. ft. 1,250
      a room
   D. Records storage 300
   E. Maintenance shops 400
   F. Boiler room 2,250
   G. Water heater tank 250
   H. Transformer vault 400
   I. Air handling, fans, etc. 700
   J. Fuel storage 300
   K. Refrigeration compressor room 800
   L. Mech. system for pools 200
PARKING

A parking structure will be needed since there aren't any facilities near the site. It will be a valet type service for quests of the hotel, while employees will park their own cars.

1. Guest parking
   A. 150 spaces & circulation @ 300 sq. ft.  45,000 sq. ft.
   B. Ramp (used by valets & employees) 3,000

2. 75 employee spaces & circulation @ 300 sq. ft.  22,500
MATRIX OF SPACES

- PROXIMITY REQUIRED
- PROXIMITY DESIRABLE
- VISUAL ACCESS DESIRABLE
- SYSTEMS CONNECTION DESIRABLE
- STRONG DISASSOCIATION

GUEST ROOMS
GUEST CORRIDORS
HOTEL LOBBY
HOTEL ADMINISTRATION
CASINO ADMIN.
CASINO
INDOOR SPORTS
STEAKHOUSE
CABARET
COFFEE HOUSE
CASINO LOUNGE
DISCOTHEQUE
CONVENTION/BANQUET
CONVEN. LOBBY
BOARDWALK SHOPS
SHOPPING MALL
EXTERIOR DECKS
GUEST PARKING
STAFF PARKING
STAFF FACILITIES
LOADING DOCKS
BACK-OF-HOUSE
PERSONAL GOALS

I. Energy conscious design
   A. Passive solar heating
   B. Use of cool ocean breezes

II. Design within the context of Atlantic City
   A. Boardwalk
   B. Beach

III. Use imagery of Atlantic City in design
   A. Boardwalk-wood decking, souvenir shops
   B. Beach-water, wand, sun
   C. Amusement piers-piers, rides neon

IV. Re-evaluate present casino design
   A. Casino as them amusement park

V. Grand hotel
   A. Open design concept for public spaces
   B. Open atrium
   C. Unifies design
CONCEPTS

- Hotel Rooms
- Meeting
- Shop
- Entertainment
- Sports
- A.D.
- Casino
- Parking
- Lobby
- Stores
3

FINAL DESIGN

*Sahara
*Boardwalk
*Hotel/Casino
SUMMARY
Final Design

I. Program responses: separate into two major areas

A. Podium
   1. Parking underground - 150 spaces
   2. 1st level - public
   3. 2nd level - public
   4. 3rd level - semi public
   5. 5th & 6th level - semi private
B. Hotel tower - all rooms to view ocean
   1. Twelve levels single rooms - 216 rooms
   2. Four levels suites - 24 suites
   3. Four levels luxury suites - 12 luxury suites
   4. Roof top restaurant

II. Main ideas

A. Two major orientations with different characteristics
   1. Orient north side to street and city
   2. Orient south side to boardwalk and beach
B. Exciting building desired
   1. Multi-level casino and adjacent spaces
      a. Different casino game on each level
      b. Most active games at bottom, passive games at top
   2. Large open atrium views into other spaces

III. Massing

A. Pyramid shaped tower to break up large mass
B. Sawtoothed glazed north and east elevations with glazed canopy at northeast corner
C. Raised tower off podium with glazed in sports area

IV. Energy concerns

A. Wind
   1. Tower stretched along east - west axis to repel winter winds
   2. Hotel rooms and sports level oper to south summer breezes
B. Sun
   1. Lean tower back to passively heat hotel rooms and sports
   2. Angle tower 45° for better solar orientation
C. Atrium acting as huge chimney
V. Exterior skin: high contrast to gain attention

A. Dark reflective solar glass
   1. Transparent at night to view in
   2. Opaque during day view out only
B. White opaque panels for high contrast

VI. Structure: see drawing

VII. Circulation: see drawing

* Note: consult appendix II for evaluation of design
1. Casino-Slot Machine Level
2. Casino-Crap Table Level
3. Boardwalk Shops
4. Boardwalk
5. Hotel Administration
6. Hotel Check-in
7. Hotel Shops
8. Coffee House Dining
9. Coffee House Kitchen
10. Auto Pick-up
11. Taxi Pick-up
12. Male Employee Locker Room
13. Female Employee Locker Room
14. Employee Cafeteria
15. Storage
16. Shipping-Receiving Office
17. Loading Dock
18. Employee Entrance
19. Waitress Service
20. Passenger Elevators
21. Service Elevators
22. Auto Ramp To Parking
23. Escalators
24. Beach
25. Leasable Retail
26. Discotique
27. Dance Floor
28. Casino Administration
29. Casino Lounge
30. Liquor Storage
31. Stage
32. Back Stage
33. Casino-Roulette Level
34. Casino-Blackjack Level
35. Casino-Peacock Level
36. Boardwalk Shopping Level 2
37. Boardwalk-Level 2
38. Mechanical Room
39. Exhibition
40. Casino Security
41. Convention-Banquet
42. Convention-Banquet
43. Convention-Ballroom
44. Service Pantry
45. Service Bar
46. Room Service
47. Kitchen
48. Storage
49. Convention-Lobby
50. Cabaret-Lobby
51. Cabaret-Dining
52. Cabaret Stage
53. Back Stage
54. Band Pit
55. Dressing Rooms
56. Kitchen
57. Outdoor Dining
58. Sports Lobby Level 5
59. Indoor-Outdoor Tennis 5
60. Outdoor Tennis 5
61. Shuffleboard 5
62. Sun Deck 5
63. Pool Lobby Level 6
64. Diving 6
65. Indoor-Outdoor Deck
66. Indoor Deck
67. Indoor-Outdoor Pool
68. Single Room
69. Patio
70. Bathroom
71. Washroom Storage
72. Observation
73. Connecting Suite
74. Suite Bathroom
75. Conference Suite
76. Adjoining Bedroom
77. Party Suite
78. Luxury Suite
79. Roof Top Restaurant
80. Mech. System & Shops 4
ELEVATION NW.
STRUCTURE
1. STEEL FRAME
2. CONCRETE COLUMNS
3. SPACE FRAME
4. STEEL TRUSS
5. SINGLE
6. SUITE
7. LUXURY SUITE
8. ALUMINUM PANEL
9. SOLAR GLASS CURTAIN WALL
APPENDIX I: RESEARCH

*Sahara
*Boardwalk
*Hotel/Casino
Introduction

The legalization of casino gambling in Atlantic City, New Jersey has recently gotten much publicity from the medias. Many of the existing hotels along with many new resorts are being planned to accomodate this new and exciting function. I have always been fascinated by the subject of gambling and since I now have the opportunity to become involved in a casino for Atlantic City I feel I should explore the function of these unusual buildings.

This paper then is being written to gain a knowledge of the function of a casino and convey this information to interested readers. I will, therefore, go into a detailed discussion of each of the major games played in casinos today. The rules, odds, hardware, space requirements, playing strategies, and necessary attendants will be analyzed. The casinos in Nevada will be used as models for this paper since it has been legal. European and Carribean casinos will also be studied to get a good over view of casinos around the world. The implications for the design of these new casinos will be briefly outlined as a conclusion to this paper.

Gambling is a very broad subject for research. Because of the space limitation involved in writing this paper, I won't cover the related subject fields such as: why people gamble, the legal aspects and the moral implication. I will not judge right from wrong in this paper but will simply evaluate various casino games in an attempt to discover further knowledge in this subject area.

Roulette

Roulette is one of the most fascinating casino games. "Roulette
has been the traditional mainstay of all gambling houses, legal or illicit." It originated in Europe where it is the most popular of all casino games. Roulette even has an "aura of European glamour. One envisions crystal chandeliers, dukes in tuxedos, beautiful women hovering over tables, fortunes won and lost the inevitable suicide on the Mediterranean." It is much less popular in American casinos because of the increased odds in the houses favor.

One of the probable reasons people are attracted to roulette is the beauty of the roulette table. At one end of the table there is a wheel made of highly polished mahogany about 22 inches in diameter. The wheel is balanced on a steel axis and revolves smoothly inside a polished mahogany bowl. The operator or croupier spins the wheel from a spindle made of highly polished metal. The wheel's perimeter is numbered one through thirty-six with half the numbers in red and half in black. There is also a zero, double zero, and sometimes a triple zero which are green. The double and triple zero wheels are used in the Nevada casinos and are the reason for the increased house odds. "A small ivory ball is thrown in a direction opposite to that to which the wheel is turning. When the ball finally comes to rest in one of the edge pockets, the wheel is still revolving slowly. The number and color of this pocket decides all bets."12

The remainder of the table is covered with felt and has an elaborate setting layout. The typical American roulette looks like this:
The various bets that can be made are listed below:

<table>
<thead>
<tr>
<th>Example</th>
<th>Odds</th>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>35 to 1</td>
<td>Straight Up</td>
<td>All numbers incl. 0 &amp; 00</td>
</tr>
<tr>
<td>B</td>
<td>2 to 1</td>
<td>Column Bet</td>
<td>Pays off on any number in that horizontal column.</td>
</tr>
<tr>
<td>C</td>
<td>2 to 1</td>
<td>1st Dozen</td>
<td>Pays off any number 1 through 12. Same for 2d &amp; 3d dozen. (as shown)</td>
</tr>
<tr>
<td>D</td>
<td>1 to 1</td>
<td>Red of Black</td>
<td></td>
</tr>
</tbody>
</table>

**STRAIGHT BETS**

**COMBINATION BETS**

<table>
<thead>
<tr>
<th>Example</th>
<th>Odds</th>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>17 to 1</td>
<td>Split</td>
<td>Pays off on either 11 or 12</td>
</tr>
<tr>
<td>F</td>
<td>11 to 1</td>
<td>Trio</td>
<td>Pays off on 13, 14 &amp; 15</td>
</tr>
<tr>
<td>G</td>
<td>8 to 1</td>
<td>Corner</td>
<td>Pays off on 14, 15, 17 &amp; 18</td>
</tr>
<tr>
<td>H</td>
<td>6 to 1</td>
<td>Five Numbers</td>
<td>Pays off on 0, 00, 1, 2 &amp; 3</td>
</tr>
<tr>
<td>I</td>
<td>5 to 1</td>
<td>Six Numbers</td>
<td>Pays off on 22, 23, 24, 25</td>
</tr>
</tbody>
</table>

The house advantage in the United States (zero and double zero) is about 5.26 percent. In Europe, however, the house's advantage goes down to 1.35 percent because of the single zero and prison rule which allows a player the option of withdrawing half his losses or to imprison his total bet for one more spin if the zero comes up.
Of course if a higher percentage is desired the roulette wheel can be rigged either electrically or mechanically. This will either attract the ball or repel it from entering the spaces adjacent to some of the numbers.

Many gambling system have been devised to play roulette, but as of yet none have been confirmed in assuring winning resluts. The "double'martingale"\(^{14}\) is a very simple system and is the basis of many other gambling systems. "It usually is played on one of the even-money departments - red or black, odd numbers or even , first 18 or second 18, doubling the bet if you lose and doubling again until you win an then dropping resolutely back, to the original bet. With this system, your're practically-certain of coming out a winner unless you get excited and start raising the bet when you win-and unless you fall into a very unusual streak of bad luck."\(^{15}\)

An American casino usually has several single roulette tables and often a few double tables. A single table is 8ft. long, 1 1/2 ft. wide, and 3 ft. high. A double table is exactly the same except it is 14 ft. long. One croupier per table is required along with one pit boss per shift. Since roulette is a very active game several feet are necessary around each table so that the players and spectators can stand several deep.

**Craps**

"Bank craps is by far the most popular casino gambling game in the United States, and its sucess has spread to the Caribbean, South America, and Europe."\(^{16}\) The fact that it is such an action-packed game is the reason for it's popularity. Craps originally came from the ancient English dice game of hazard. The American Negroes of
the south are probably responsible for the game as it is played in the casinos today.

The game is known as bank craps because the house represents the bank and plays against all the players whether they be with or against the holder of the dice. Craps can also be played as a private game, but since bank craps is the form found in legal, modern casinos it will be the only form discussed in this paper.

Craps is played with a pair of transparent red or green cubes called dice. On each of the 6 sides of the die there are sets of dots representing the numbers 1 to 6. They are arranged so that the opposite sides of a die add up to 7 (6 is opposite 1, 5 is opposite 2, etc.). When two dice are thrown the dots on the upper surface of the dice are added together and this number is bet on. This number ranges between 2 and 12 with 36 different combinations of numbers possible.

Each player betting in the game has the option to roll the dice when his turn comes. This is one of the reasons for the game's popularity. "The player has a greater sense of participation than in most casino games because he can throw the dice himself when his turn comes." Expert players rarely toss the dice themselves. They usually bet with or against the tosser using the best odds to their advantage.

The game of craps is basically very simple. If the player gets a 7 or 11 (which is known as naturals) on the first toss of the dice he wins the money he has bet. If the player with the dice throws a 2, 3, or 12 (which is called craps) on the first toss he loses. If a player has thrown a natural or craps his next turn of the dice is again considered the first throw and the same rules apply again.
If a player throws and gets one of the remaining possible; 4, 5, 6, 8, 9, 10 that number becomes his 'point' to make. To win he must call his point number before he rolls a 7. If he rolls a 7 first, he loses his stake and possession of the dice. Of course the odds are both against throwing a natural and a point number.

Betting at a craps table is somewhat more complicated than roulette betting. All of the participants can either choose to bet with the dice or against the dice. If one bets the 'pass line' you will win or lose whenever the dice thrower wins or loses. This is known as betting with the dice and there is a 1.41 percentage in the favor of the house. To bet against the dice one places a wager on the 'don't pass line.' You will then win or lose when the house wins or loses, with one exception. When a 2 or 12 craps is called the house wins and you lose. Because of this stipulation there is a 1.40 percentage that the house will win. All kinds of other bets can be made some of which increase the houses odds (puckers bets) and some increase the players odds (come bets). There are far too many kinds of bets to discuss all of them in this paper. Some of the more common bets are betting th 'field', 'hard way' bets (making a number with doubles), under and over 7 bets and 'box number' bets.

Craps is played on a specially made curved, rectangular table. The table is about 10 feet long, 5 feet wide and 3 feet high. It's edges are built up another foot to offer a vertical surface to throw the dice against. Running around its edge is a grooved, wooden surface used to hold ships. The surface of the table is covered with green felt. The surface is covered with a white betting layout which is a diagram of all possible wagers. Standing along one
side of the table are the four casino employees needed to run the game. They are two dealers who place and pay off bets, one stickman who calls the game and slides the dice to the roller and the boxman who is in charge of the table. The only limit to the number of players at a table is the space available for them to squeeze into. Each table usually can accommodate at least 15 players along with the four casino employees. The crap tables are usually the most active parts of a casino.

**Slot Machines**

Slot machines or 'one armed bandits' are an unsophisticated form of gambling found exclusively in the United States. Charles Fey has been credited with inventing the first slot machine in San Francisco in 1895. They are considered by some experts to have the most ruthless odds of any form of gambling. It'll keep "from twenty eight percent to sixty percent of whatever into his maw."\(^{18}\)

A slot machine is made up of three or more reels. There are 20 or more symbols on each of these reels. Most of the slot machines manufactured today use fruit, bars, and bells as symbols. One must match up these symbols to act the machine to pay off.

Some of the usual pay offs are as follows:

- 3 plums \( \frac{1}{4} \) to 1 payoff  
- 3 cherries \( 5 \) to 1 payoff  
- 3 lemons \( 5 \) to 1 payoff  
- 3 oranges \( 10 \) to 1 payoff  
- 3 bells \( 8 \) to 1 payoff  
- Jackpot equals 3 bars \( 300 \) to 1 payoff

But the odds on getting a jackpot are said to be "2000 to 1 against the wonderful thrill."\(^{19}\) Of course the smaller payoffs are programmed to occur more frequently.