THESIS

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INTRODUCTION

BACKGROUND - OBJECTIVES

In selecting a thesis project I sought to satisfy several goals at once. These goals or objectives center around my desire to explore several areas of interest that had been untouched by previous design experiences.

The general area of the Monroe Reservoir in Southern Indiana is perhaps one of the most beautiful and as yet undeveloped areas in Indiana. Much of the land is wooded and steeply sloped. Previously all my design experience has been on essentially flat sites, and I felt that it would be important to deal with a sloped site.

Probably the most important objective of my last year was to explore a building type that I have not dealt with previously. The building type had to also be compatible with the potential of the site.

Lastly, I have been concerned with alternative energy and energy conservation for several years yet no opportunity to explore these areas has existed. The use of solar energy on this site is a practical necessity since no other energy source exists.
PROPOSAL

Mid-career education has already established itself as an area of major importance and expansion. Short term extensive training and reorientation is used extensively by corporations to improve their executive and sales personnel. Coupled with this is the need by other commercial and public groups for flexible spaces for short term conferences and seminars.

It will be assumed that a large corporate client has selected a site on the north shore of Lake Monroe in Monroe County, Indiana. This facility will serve the needs of the owner and will be made available to others on a space available basis. The site was chosen for it's natural beauty and it's potential for various forms of recreation that are possible.

This conference facility will provide the necessary isolation required for successful operation, yet it will have rapid access to major cities through the Bloomington airport.

The design will be in harmony with nature, yet meet the desires of man. Alternate energy uses are to be an aspect of design since this is the only way man may ultimately solve the larger question of his survival on a limited earth.
PROJECT DESCRIPTION

It is assumed that a large corporation has chosen this site for a conference center that will be used in the training and mid-career education of its executive and sales personnel. This facility will be used for training periods varying from a few days to two weeks. Other users such as local companies, unions, clubs, etc., will be encouraged to rent space for their functions. This facility will have the advantage of a full range of teaching aids not available in a hotel meeting room.

PROGRAMS & USERS

The major assumption about mid-career education and initial training of executives is, the maximum amount of learning needs to take place in the shortest amount of time. An individual who is subjected to this type of situation needs to be in an environment that supports him in this endeavor. The people who will receive such training experiences, it can be assumed, are highly motivated and desire to succeed. The tendency is for these individuals to work themselves to a point where complete change in activities is necessary. A variety of modes of relaxation are therefore required. Not only is a variety of recreation needed but the most advanced techniques in audio-visual
presentations should be used to guarantee the most productive use of time.

Junior level management and trainees will be subject to the longest continuous periods of training. The main purpose is to orient these people into the operation of the corporation and train them for higher level positions. These people will be able to be away from their jobs for the longest periods of time.

Middle level managers cannot usually be spared for long periods of time from their jobs, consequently they will be involved in shorter (1 week) sessions, or when transferred or promoted.

Senior executives cannot be away from their responsibilities for more than short periods and need communication facilities during their absence. These people will use this center as a central location for meetings and conferences with representatives from other parts of the corporation.

Sales personnel will hold major corporate sales meetings to introduce new products and techniques to their salesmen. Most of these sessions will require a large space and display-exhibition area.

Almost as important as the content of the seminars is the sharing of ideas and problems by the participants. It is through such sessions that an exchange of ideas by people having equivalent jobs in different parts
of the corporation can occur. This is considered to be almost as productive in increasing employee efficiency and morale as the sessions that occur during the day. By having conferences in an isolated area this socialization process is encouraged and enhanced. In the same respect the presence of families could be a deterrent to the process. The parking facilities should be located such that it is out of the way for a participant to get his car. This tends to discourage his leaving in the evening for a trip into the town. Removing a person from his family and daily routine greatly enhance his ability to absorb information and makes the educational process more effective.

Other users vary greatly in their needs. Much of the flexibility required for all previously mentioned users applies to the requirements of other companies, clubs, professional organizations, and unions that need conference spaces.

**CONTEXT**

The site is located on the north shore of Lake Monroe, specifically sections 31,32, and the west part of 33 in Salt Creek Township of Monroe County, Indiana. This site is accessed by State Highway 446 and is about 7 miles from Bloomington. It is about 1 hour and 15 minutes from the Indianapolis airport. Alternately
it could be accessed by commuter flights to the Bloomington airport. The site is across a small inlet from the State Recreational facilities at Paynetown. These facilities include marina, beach, picnic sites, and camping. Shuttle boat service already exists from Paynetown to other parts of the lake and the Natural Resource Dept. is receptive to the idea of extending this service to the proposed project. Availability of such recreation facilities and the isolation of this site make it ideal for an intensive learning situation.

The majority of this site is zoned for business by the county. Adjacent land on the north is a designated forest reserve and owned by the Federal Government. This area will remain in its undisturbed state indefinitely. Topographically the site is a steep, wooded slope. The tree cover is mixed young hardwoods (less than 12'). The slope becomes more gentle near the water and ends about 12' above the waterline in an eroded embankment. This area of southern Indiana is particularly noted for the spectacular foliage colors in the fall and it attracts tourists from all over the world.

**ATTITUDES-GOALS**

The singular most appealing aspect of this site is
the woods slope and its relationship to the lake. A major priority of this design will be to protect the natural condition of the slopes as much as possible. The soil is very susceptible to erosion which not only destroys the land but silts up the lake. This is an extremely shallow lake and will not tolerate much silting. The site will be developed in a manner that does not induce more erosion and provisions will be taken to halt erosion that is occurring.

It is imperative that this nation live within its energy resources if it is to survive. For this reason solar energy will be explored for a portion of the space conditioning and water heating. The proximity of the project to the water and the south-west slope will greatly enhance this potential. These factors were an important site selection criteria on a regional-local scale.

While it is desirable to provide an environment that is separate from many problems and distractions of daily life, it must be remembered that some people will spend as much as 2 weeks here. There must be a sufficient range of activities and environments to prevent boredom. A contrast to the intense mental, sedentary activities must be provided.

Since many diverse groups will be using this
facility, many concurrently. A maximum of flexibility and adaptability is required in the conference spaces. The service facilities (food etc.) also must respond to the changing nature of the uses.

Circulation is a major organizing factor and should allow rapid orientation of the individual. The graphic system should compliment the overall organization and not act as the organizing element.

**TECHNICAL SERVICES**

1 @ 400 Sq. Ft. or 2 @ 200 AV storage
1 @ 500 Sq. Ft. technical services
1 @ 1000 Sq. Ft. control center close circuit TV

This is a support facility that provides duplicating, graphic, and consultation services. The main function is to directly support the conference director with the technology to make his program successful. Included is a color CCTV studio and master control.

Equipment needs: Duplicating machines, graphics tables, photo lab, TV studio.

**ADMINISTRATION AND SECRETARIAL SERVICES**

5 @ 100 Sq. Ft. for Dept. Heads
1 @ 200 Sq. Ft. for Director
1 @ 300 Sq. Ft. for Secretary
2 @ 80 Sq. Ft. for Storage

The administrator, assistant administrator, and two secretaries, they will require space to perform the
various functions required to support and manage the whole center. Storage for a large volume of records and schedules is also required. These offices are essentially private spaces. Offices will have to be provided for the various visiting program directors as well as the permanent staff equipment needs.

Equipment needs: Desks, chairs, filing cabinets.

HOTEL ROOMS

100 to 120 @ 220 to 300 Sq. Ft.
One to two people

This is a private living space, independent from all other spaces. It is used for sleeping, small scale socialization, studying, personal hygiene, relaxation, and storage of personal property. Each room needs a view of the lake yet have complete visual and acoustic privacy. A bath-shower, toilet, and lavatory necessary for each room. Room temperature and ventilation should be controllable by the occupant.

Equipment needs: Trundle bed or bed and sleeping couch, desk, 2 lights, 2 lounge chairs, 1 desk, hanging storage, and drawer storage, TV.

MEETING ROOMS

2 @ 400 Sq. Ft.  20 to 45 people  20X20  22X19
2 @ 350 Sq. Ft.  20 to 40 people  22X16
5 @ 170 Sq. Ft.  12 people  19X9
These have all the requirements that the conference rooms have except they have a minimum of visual-aids.

Equipment needed: Tables, chairs, chalk boards, tack boards, CCTV outlet

AUDITORIUM

1 @ 2,200 Sq. Ft. 49X45 100-240 people
Projection room 400 Sq. Ft.

This is a large scale meeting room for slides, movies, or lectures. It should also accommodate two way question and answer discussions. This is the most formal space. No outside view is desirable and total mechanical climate control is necessary.

Equipment needs: Lecturn, microphones, P.A. system, tack space, chalk boards, variable lighting, projection screen and booth, and control room.

LOBBY

1 @ Approx. 1,000 Sq. Ft.

The lobby is a connecting and receiving space for the other activities. Reception activities take place here and space for about 100 people who could be waiting at one time. Registration takes place as two separate activities. First in registration for the rooms. Second is registration for the conference. These are separate activities and take different
amounts of time. Socialization can occur on a one to one basis or in larger groups and different types of spaces need to be available in the larger space. Reception requires an appropriate counter and secretarial facilities. Major activities occur throughout and during the day and evening, except after midnight and before seven in the morning. The lobby should be a welcoming space and allow the visitor to discover other parts of the building without causing frustration or embarrassment. Protection from the entry of winter winds which causes the lobby to cool off quickly should be a major priority.

Equipment needs: Tables, chairs, couches, trash containers, public phones, counter for reception, storage, secretarial supplies for reception desk, public rest rooms, and coat room by restaurant 400 Sq. Ft.

LOUNGE

1 @ 800 Sq. Ft.

This is a quiet reading, socializing space where people can go in the evening or between meetings. It should be out of the main stream of traffic yet easily identifiable and located. Views to the lake and woods should be controlled so the room has a more intimate small scale feeling. It could be located near the bar so that drinks could be brought in or served in the evening. Chairs should be really comfortable.
Equipment needs: Chairs, tables, lamps

**RECREATION-INDOOR** 4000 Sq. Ft.

Swimming pool -- 1250 Sq. Ft.

Natatorium - 15' high over 1 meter board
- adequate ventilation - 80°F min.
- maintenance closet

Pool - end decks should extend 13'-15'
- sides minimum of 5'
- access to filter room for delivery of bulk chemicals
- pool-recreation office control area

Locker facilities - serve pool, sauna, deck and weight rm.

Mens - 450 Sq. Ft. 25 - 30 lockers 18"x4'
- 4 showers @ 16 Sq. Ft. each
- drying space @ 50 Sq. Ft.
- 4 sinks @ 50 Sq. Ft.
- 2 toilets
- 1 urinal

Womens - 450 Sq. Ft. 25 - 30 lockers
- 4 individual showers
- 4 change rooms
- hair dry & make-up 100 Sq. Ft.
- 2 toilets

Sauna - 50 Sq. Ft.
- 2 (3 people) mens & womens 25 Sq. Ft. ea.

Billiards lounge -
- billiards 2 tables 15x20/table 600 Sq. Ft.
- table tennis 2 tables 23x24 720 Sq. Ft.
- Controlled by recreation office
Recreation control office - 100 Sq. Ft.
- physical and visual control of pool, lockers, billiards, and ping-pong areas
- storage of equipment 50 Sq. Ft.

Exercise room - 400 Sq. Ft.
- weights
- machines
- relationship to lockers indirect

BAR/LOUNGE
1 @ 1,000 Sq. Ft.  Space for 100 people

This is an active and noisy area for socializing. It could also act as a waiting area for the restaurant. Both a bar and tables are necessary. Service will begin just before noon and will continue until late. Since this is primarily night time space, the view is not as important to the feeling of space. It can be more an inward looking place.

RESTAURANT
1 @ 2,500 Sq. Ft.
Capacity: 1-250 people in tables for 2, 4, 8, and 12

The place that is used for eating, can and should do more to reinforce the social atmosphere. People should be seated in larger tables to encourage conversation. Exterior view is important to provide a relaxing, comfortable environment. Seating should be flexible with as few fixed elements in the room as possible.
Service will vary from banquet to buffet depending on the time of day and event. Restrooms should be near the entrance and visible but not conspicuous. Easy access to kitchen.

Equipment: Tables, chairs, buffet line, waitress station, dish carts, access to coat room.

KITCHEN

1 @ 800 Sq. Ft. plus 200 Sq. Ft. storage
3 doors, 1 dishwasher, 1 helper

The kitchen will provide food for the restaurant at the three meal times plus a coffee and pastry cart that will be circulated in the halls by the conference rooms at break times. Sandwich service to the bar will be provided at noon only.

Separation of air for the kitchen and other areas is necessary to prevent odors from distracting people in the conference areas.

Equipment needed: Dishwashing machine, garbage area, dry food storage, refrigerated area, salad prep. area, hot food prep. area, food pick-up area, restrooms and sinks for employees (2).
CONTEXT

The area surrounding the Monroe Reservoir is generally hilly and has soil unsuited for agriculture. As a result it has remained almost totally undeveloped until recently. When the reservoir was completed in 1964, the State and Federal Governments purchased large tracts of land around the lake. These purchases coupled with severe zoning and sewage treatment codes have served to limit development of the remaining private lands. The net result is a lake surrounded by virgin hardwood forest. The State of Indiana has developed extensive public recreation facilities that adequately exploit the lakes potential for boating, camping, fishing, etc. Arrangements can be made with the State Department of Natural Resources to get long term leases on sites for commercial development if the project can get the proper approval. This process seems to depend on the political rather than the environmental aspects of the proposal.

From a psychological point of view, the general area can provide an isolated and total environment. The duality of lake and woods provide an environment that helps close off the individual from his day to day problems. In many ways this area gives the impression of a resort.
Despite its aura of isolation the lake area is only about an hour to an hour and a half from Indianapolis, and about ten minutes from the Bloomington airport. It is comparatively easier to access than French Lick, Indiana.
SITE ANALYSIS

The entire reservoir shore line was surveyed for likely sites. Criteria for selection of the final site were: 1) Access to existing recreation areas since the Dept. of Natural Resources is not sympathetic to adding any more. 2) Easy access to the major highways. 3) Favorable orientation of slopes for solar collection. 4) Open areas in the wooded areas so that existing tree stands would be preserved. 5) Favorable views of the lake.

A site was selected on the north shore near State Road 446 and across an inlet from Paynetown State Recreation area. Paynetown provides beach, boat dock, and picnic facilities. The State Dept. of Natural Resources was quite favorable about providing a shuttle boat service to any facility located on this site. It is a necessary part of the program of a conference facility to discourage the overnight participants from using their cars to leave in the evening. The shuttle boat service to Paynetown will provide a much needed evening activity.

The site itself is nearly 2 miles long and a mile deep. I evaluated the area to find the most favorable specific location to build. There were few locations that appeared suitable for convential buildings. The site analysis showed only two areas that were favorable and both of these were quite restricted.
The reservoir is a flood control project and serves to hold run off in the spring. The water level can be expected to rise 15' in the spring. This high water precludes placing the building near the normal water line.

Vegetation consists of hardwood forests that appear to be second growth oaks and maples. Parts of the site close to the shore and extending up into the wash are covered with tall grasses and weeds.
1. BUILD ON S.W. SLOPE
   * Properly a linear scheme along
     slope
   - FAVORABLE SUN VIEW RELATIONSHIP
   - COULD GET LOTS OF COLLECTOR SURFACE

3. EROSION UNLESS FERS ARE USED
   - WOULD HAVE TO CUT TREES THAT ARE THERE
   - FEWER SPECIAL OPTIONS?

- LONG COORDS 400´ TOTAL
  # OR VERTICAL DISTANCES BEST
  NOT COMPACT
2. BUILD ON WEST SIDE OF EITHER POINT

PROPOSED LINEAL SCHEME

- FAVORABLE SUN & VIEW RELATIONSHIP
- FEW TREES TO CUT

- SOME COLLECTOR SHADING
- LONG CORRIDORS
- FURTHER FROM ACCESS ROAD
3. Build on top of point

Could be a donut scheme or wing scheme

- Many special options
- Below building parking

- Bad view-sun relationship on east side
- Some collector shading
- Poor scale relationship if built above or on top of point
Build across Valley
Properly lined scheme

+ Favorable sun view relationship
  - Few trees to cut

Water flow problems

- Intermittent stream
  - 500'
- Few points of contact with earth
- Roof top parking (covered?)
  (Enough space)

- Shade out existing vegetation
- Structure expenses?
  210 cars @ 3600 f = $709,000
  11.67 f/ft → 22 ft
  60,000 ft²
- Present fit aesthetically with site and scale
FUNCTIONAL RELATIONSHIPS

CONFERENCE / AUDITORIUM COMPLEX

1) LINEAR

2) DONUT

3) MODIFIED LINEAR

INFORMAL SPACES

CONFERENCE ROOMS

BETTER
Functional Relationships.

Conference Room:

[Diagram of conference room layout]

Conference/Auditorium Complex:

1. Near
   - Class
   - Conf.

2. Further
   - Informal Spaces
   - Conf.

- Informal Spaces
- Conf.
FUNCTIONAL RELATIONSHIPS

CONFERENCE ROOM

PRESENTATION SURFACE

CLOSED VIEW

ADVANTAGES:

DISADVANTAGES:
LACK OF FLEXIBILITY

CLOSED VIEW

ADVANTAGES:
EASIER TO GET CIRCULAR TABLE ARRANGEMENT

DISADVANTAGES:
DIFFICULT TO WORK IN PLAN
FUNCTIONAL RELATIONSHIPS

AUDITORIUM:

NO VIEW - NO NATURAL LIGHT - NO NATURAL VENTILATION
ACTIVITY RELATIONSHIPS

ARRIVALS:
OVERNITE

ROOM REG.
CONF. REG.
ROOMS
LOUNGE
RETURN
ER

NON OVERNIGHT CROSS

CONF. REG.
CONF.
ROOMS
RETURN
LOUNGE

1) MAJOR PATHS VS MINOR

2)
10' x 32' x 32'  

1st story = 32' x 32'
CUBIC VOLUMES—HEAT LOSS APPROXIMATIONS

1 ROOM = 3000 ft

APPROX. 15' x 10' EXPOSED
150 ft x AT x U
AT = -10 - 70° = 80°F
U AVE = .08

150 x 80 x .08 = 960

960

300 = 3.2 BTU/ft

COLLECTION:

WINTER = +500 ft/ft HIR OR 200 BTU/400 BTU/DAY COLLECTABLE

EXAMPLES OF OTHER BUILDINGS:

YIELD VARIOUS RATIOS: 50%

1 ft 2/0.5 ft floor = space
1 ft 4/1 ft floor

1 ft 2/0.5 ft floor

1 ft 4/1 ft floor
TOTAL DAILY SOLAR INSOLATION

21st Day

June 500 - 550
Aug 450 - 500
Oct 250 - 300
Dec 100 - 150

AVERAGE TEMP

70°-75° → 72°
70°-75° → 72°
50°-55° → 52°
30°-35° → 32°

1 LONGLEY = 2.21 BTU/ft²/HR

DECEMBER

100 LONGLEY/Day = 12.5 LONGLEY/HR = .21 LONGLEY/Minute

.21 / Minute = .46 BTU/ft²/HR = 36.8 BTU/ft²/Day HORIZONTAL

FROM OCHENS ILLINOIS DATA: SUNFAX

2 = 180 BTU/ft²/Day

18,000 ft² Collector Available Minimum

(18,000 ft²)(180 BTU/ft²/Day) = 3,240,000 BTU/Day

114 gal/HR = probable hot water demand

114 gal/HR = 114(16) = 1824 gal @ 140°

85° DIFF X 1824 = 155,000
TOTAL BUILDING COLLECTION

Ratio - collector / floor: 1 - 5
1 - 8

60,000 ft² floor @ 1/5 = 12,000 ft²
@ 1/8 = 7,500 ft²

Available collector area:
15.05(12') = 180 ft² x 100 rows
18,000 ft²

9.30
55° approx.

11.30

3.16
-55°
SCANICON - DENMARK

PLAN

SECTIONS
RIYADH CONFERENCE CENTER - SAUDI ARABIA

CONFERENCE
AUDITORIUM
LOBBY

ROOMS
ROOMS

SECTION
SCHEMATICS

DEVELOPMENT -

One of the goals that I have sought with this project is to work with the natural form of the hills and to compliment these in order to have a structure that merges with the land rather than competes with the natural beauty of the site. Essentially the problem becomes how to make a very large building not become a vertical statement on a restricted site. Conceptually the hotel rooms as a unit would face the vast open view of the reservoir and span between the two ridges. In contrast the conference spaces need a much controlled and a less stimulating view. These spaces were placed lower in the valley and look into the woods. The building began to form a closure on the valley itself as the other spaces were organized around the central concept. It was apparent the building could form a dam for the intermittent stream that exists in the valley. The pond formed by blocking this stream further enhanced the tranquil nature of the view from the conference spaces.

The nature of the conference as an experience is to bring people together for a short period of time and present them with a concentrated learning experience. The intensity of the learning is enhanced
by the interpersonal relationships that develop outside of the programmed presentations. Simply stated the conversations and contacts that occur in the corridors and lounges are at least as important as the formal presentations. It was felt that the conference areas needed a central space to organize them and produce a strong unity. This central space could serve as a major organizing element for all the buildings function and help orient new arrivals. The need to orient various spaces toward the lake as opposed to others that needed to face a much more closed view helped give the atrium or central space more of a dividing or interface function. In other words, it helps make a transition between the two exteriors.
How to give a true focus?
CENTRIFUGAL SPACES COULD LOOK EITHER

1. CUT TO EXTERIOR
2. CUT TO INTERIOR SPACE THAT IS MUCH LARGER IF THERE IS A PROVISION FOR NATURAL LIGHT.
CRITICISM - SCHEMATICS

1. The entrance is weak and needs more development.
2. The interface between the hill and the upper floors needs study.
3. The form of the conference spaces seems arbitrary.
4. The atrium needs a focus and more refinement.
5. The parking scheme doesn't work with the slope.
CRITICISM - DESIGN DEVELOPMENT

1. As an overall statement too much restraint has been applied. Along with this is the need to develop the exterior spaces such as the terrace in front of the pool.

2. The pond has become too small and the policy of running the overflow/storm sewer under the building is very poor.

3. The elevator/stair well joints are poor and need more refinement.

4. The elevator lobbies on the upper floors need to be larger.
rush ridge
conference center
site plan
entry level plan
upper levels
sublevels
elevations
elevations
section
axonometric
Conference Center
Rush Ridge