YELLOW HILL FLIGHT PARK

THESIS PROJECT 75-76

DALE SOLLENBERGER
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PROPOSAL

I look at my thesis year as a chance to prove to myself that I can make good working tools of what I've learned through four years of Architectural training. A thesis project must test my abilities to be worthwhile, yet I look for a project that is also meaningful and interesting to me personally. Since I have an avid interest in aviation, I tried to combine both interests into one package. After searching most of the summer, I've found a project that fills the goals I have tried to set down.

My proposal for a thesis project is to design "a center for unpowered flight" or simply a flight park. It is to be an environment to enhance, cater to, and further develop the sport of nonmotorized flight. This could conceivably include any craft from a sailplane to a hang glider.

Flying the winds of "sky surfing", although still in its early stages of developing, is a sport which has increased in popularity at a very rapid pace. Facilities for this sport are either non-existent or exist as a poorly functioning substitute.

This "Flight Center", unlike an airport, is much more recreational in character. An airport has a primary function to the airplane, similar to that of a service station. The flight center's air traffic isn't in and out again and again. It is more of the nature of free flight, similar to that of birds. The slow pace, gracefullness of gliding and soaring is the spirit of this site.

The site itself is located in southeastern Indiana along State Highway 52 between Metamora and Brookville. This site not only provides easy access to hills that would be favorable to flying, ut it is centrally located between Indianapolis, Muncie, Dayton, Cincinnati, and Louisville.
Facilities on the ground would have several functions to fulfill, which have yet been lacking and untapped. Although these functions vary, they are very similar in character, and would have to be dealt with in a manner to keep the spirit of the sport its reason for existence. Facilities like a central administration office, club headquarters, commercial center, a service/storage area, and spectator center are some of the possibilities of such a flight center.

The goal of this project is to develop a total environment for the developing sport of free flight. Ideally, I'd like not only to solve a problem that has been given little thought to, and badly needed, but do it in a way that I myself can say it was a worthwhile thesis project.
PERSONAL OBJECTIVES

I've had a long, avid interest in aviation as a hobby. The gracefulness, beauty and daring of soaring birds have had a far reaching fascination into my thinking and imagination. Flying like a bird, feeling what it feels, matching its fun, has only recently been attainable. It is challenging both mentally and physically, but the feeling of free flight makes it a sport that has high rewards. Since I am more or less the client, the program has my ideas of what a flight center should be. One objective is to accurately meet my expectations of this facility and my skills in Architecture. Of course, other objectives I would like to meet would be to provide a facility that is readily available for participation in this sport by people of similar interests. For problems inherit in a flight center of this type, I would like to provide logical solutions that enhance the enjoyment of the sport. Mainly though, I would like to display the spirit of free flight in the scheme of the facility.
STATEMENT OF NATURE OF THE PROJECT

This project in simple terms is an exercise in the development of an environment for a midwestern scale motorless flight center. This type of development has been relatively untouched and newly spawned.

Changes in recent years in the physical and mental demands of work have emphasized the need for challenging and satisfying leisure pursuits.

Although a few "flight parks" exist to some extent in Colorado and California, none are adequate.

The midwest, though admittedly lacks the scale of mountains of the west, has several places where excellent flying is obtainable. The midwest too, lags behind the western states in popularity and acceptance of the sport, but is quickly catching up.

This facility in essence could be a focal point in the midwest for recreation and development of motorless flight. Unpowered flight though of a different scale here, still has the same special characteristics that are essential to the fulfillment of such an environment. I would like to produce an environment that could establish a new mode of thinking in relation to a flight center.

The availability and accessibility of such a facility hasn't been a problem in the past because of the only recent popularity of the sport in the midwest. This will be more of a problem in the near future. The southern states have a couple of unorganized spots in Chattanooga and in the east in the Appalachian Mountains.

A location for this type of facility would be limited and critical, not only because of lack of hills and size, but from a standpoint of having
people interested in flying within easy access. Flying enthusiasts would easily travel several hours to fly at such a facility. This facility would be one of a few, welcomed and well used.

The basic objectives then of this unpowered flight center would be:

A. To provide a high quality, well respected center that would meet the future needs of the midwestern area.

B. Located within easy access of Indianapolis, Dayton, Louisville and Cincinnati.

C. Provide facilities to meet the needs of beginner thru upper intermediate flyers.

D. Provide education and safety in the sport.

E. Provide a research center.

F. Provide an environment for a common meeting ground, in which to increase skills in flying.

G. To integrate into the site and take full advantage of the natural surroundings.

H. To encourage interaction between pilots and people drawn to the site by interest in flying or through other activities.
HISTORY

From the beginning of time, man has been obsessed with the desire to fly like a bird. Birds were a constant source of inspiration to man, in his attempt to imitate birds. They studied the flight of birds, measured wingspreads, calculated comparative body weights, wing manipulation and flying balance. Imitation of birds seemed unattainable, but man kept trying to fly. The "Father of Gliding" was a German pioneer named Otto Lilienthal.

"To conceive a flying machine is nothing, to construct one is little, to fly is everything." Lilienthal had the first public glider flights and inspired others to build machines in many parts of the world. Lilienthal flew in 1891, by launching himself into the air by a springboard. He then went off the hills in Berlin and finally to the 200 foot Rhinow Hills.

Both hang gliders and sailplanes consider Lilienthal as their pioneer. Both have developed tremendously, but hang gliders still hang from their craft, while sailplane pilots lie horizontally in their craft. The Wright Brothers placed the pilot horizontally in his glider in July 1901. Wright's new control system allowed the pilot to steer the craft, instead of shifting his weight. At the end of the war, restrictions were put on motored airplanes, turning people's attention to motorless flight. With continued accomplishments new records are often broken. Currently the distance record is 907.7 miles, gain of altitude of 42,303 feet. Sailplanes are enjoying a renewed popularity, because of good management of the soaring society of America.

Hang gliding didn't come into being until 1950, when Mr. Rogallo, working for N.A.S.A. developed a special kite. N.A.S.A. looked at its possibilities as a recovery system for the space capsule. Upon re-entry the
capsule could steer and land where it wanted. News of this "kite" leaked out to people, mostly in California, who were able to construct crude kites from bamboo sticks and plastic.
The 1-35
Going Places

Sailplane Criteria
1. Tow launched
2. Conditions: Soaring/Thermaling
3. Clearance: Takeoff/Landing
4. Licence
5. 15 to 1 - 45 to 1 Glide Ratio
CLIENTS

On a project of this scope, which involves a relatively new idea, it has a definite lack of clients who are willing to invest. Though glider ports do exist and are financially stable, none meet its full potential, consequently, a non-traditional approach is looked on, with interest, but with little idea on just what the facility should be. The program has been collected from my input as a knowledgeable person in this sport and as a client. Of course input from many other interested parties went into making it a complete program.

Two groups have expressed interest in the project. The state park system and the Midwest Soaring Organization consisting of clubs in Indianapolis, Dayton, Bloomington, Seymore, Louisville and Cincinnati.

One alternative would be club ownership. The club would purchase property by issuing stock to club members. With a club membership of over one hundred members, one hundred shares could be bought. Those buying stock would be allowed access to the facility and privileges at a much reduced rate. Others would pay a flat daily fee, something like snow skiing.

The second alternative would be state ownership. The state park system in its master plan indicated a major shortage in this area of recreational facilities. This might be part of a larger network of public land for special uses. Money can be obtained two ways; assistance from Federal programs or via state budget.

Federal money could come from the Department of the Interior, Bureau of Reclamation or Outdoor Recreation.

The Park Department could also submit a request for a budget, which is done very two years. This budget includes capital improvements like land
acquisition and operations. This report should be submitted in August to be reviewed by the legislature in January, with the money appropriated in July.

One other possibility does seem to be more feasible. The state park system could buy the land, with private enterprise investing in the site improvements. This facility would be one of specialized facility in a part of unlimited possibilities.
FINANCIAL

The budget of this flight center has a great deal of flexibility in its present stage. Since no real clients exist, I am in a position of having to set a budget for which there is no past projects to relate to. Small county airports like Muncie or Anderson might offer some information to size of the budget for some comparison. In this case, going over a budget won't result in rehashing the drawing to cut the costs down. I would like to set what I think is a reasonable and competitive budget for the purposes of designing with it in mind, and also to cost out the job to see how close it will come to meeting the budget. The budget of this project will be

The Indiana State Park System and the Midwest Soaring Organization have expressed interest in a project of this scale but mostly as imaginary clients, possibly as potential clients.
The front desk is the introduction point of the whole complex. From this point you can receive all park information, park clearance (which is clearance to fly certain hills, judging from your ability) and hangar rental. The desk must be at a vantage point where the park officials may control the area. It must also be of easy access to the entrance of the center. It should also have strong ties with the weather center and administrative offices.

The character of this space, more so than any other space must convey the spark of excitement that exists in motorless flight. This introductory space is the first to greet not only the pilots, but spectators, people with questions and those interested enough to learn to fly. The spirit of the space must sell the complex. Excitement in the colors, visual displays, and visual access to the pilots themselves. The sun and view should share the space with the people. People should feel comfortable in this space, not like outsiders in an automated office. Visual stimulation can also come from the milling of people through this exhibition space. In this space spectators are transformed into an active role, instead of the inactive role they are used to. They are allowed to share in the experiences of pilots flights into a world of competition: The Pilot vs. the Wind.
FLIGHT OFFICE (Administrative)

These offices control the money flow both in and out, in an effort to make the facility turn a profit. Cash flow from rental space, lodging, school, books, flight passes etc. and pay out expenses. Mainly the club officers are the administrative heads, because of their knowledge and participation in the sport.

Unlike the typical office, these aren't occupied on a daily basis.

The offices are fairly open to each other, like a close network with visual reference to the front desk. In this space the quietness is its main feature. I see little sunlight penetration into the space, while small indirect lighting provides light for the space. A soft glow of comfort, without extravagant richness which might portray an executive office. Rough wood finishes give it an appeal as a family room to employees. Employees need not feel compelled to work at a desk.
FLIGHT OFFICE (Weather Information Center)

The weather center houses all the basic equipment for forecasting and receiving the current weather by teletype from the National Weather Center in Indianapolis, Indiana. They also have their own equipment for general existing conditions. These are important in telling which hills will be open and what the flying conditions will be: specifically for soaring and thermalling. This space will feel much like an equipment room, but without some of the rough edges. It is a space where man and machine come together for a conference. It feels like a "functional" space. The space will be of a size to accommodate about ten pilots. Visual clues of this space need to be present from the front desk. This space will act somewhat as a discussion center and tall story corner, like a pilots lounge. The hills and sky are the major view in the space. They act as a backup to the machines, giving it an "at home" feeling.
CLUB HEADQUARTERS

The functional requirements of this space or spaces are multifaced. A flight school, which takes people through introductory lectures and ground school before actual flying begins. The school also shows films for advanced techniques in flying and for safety in the sport. A conference room for monthly meetings, club functions and business meetings. A project space for building, repairing, experimenting with club equipment. A book center which retails books and magazines for the flight school and interested people, also literature pertaining to the safety and development of motorless flight.

The character of the flight school would have to reflect the professionalism of the staff. People entering should have a related mind, without apprehension, as is the case in a lot of college classrooms. Soft textures with indirect, controlled sunlight entering the room highlighting one wall as to indicate the front. Informality is keyed by random placement of lounge chairs. The room's quietness keeps it from competing with outside noise. Control lighting allows films and slides to be shown without undue aggravation from hidden switches and sunlight.

The conference room is again a quiet room with a character exhibited much like the school space. It is a relaxed atmosphere with the ability to allow people to warm up to continued conversation.

The project room is a space already built for possible expansion. It is a work space with the ability to mask loud noise made by the projects. Direct visual access to views outside helps projects finish faster, in their attempt to get in the air. An almost "Pioneers in the aviation field" feeling
prevades the space. Professionalism is expressed by the openness of the space to be watched by spectators. The openness also allows working while watching the flying and activities of their friends.

The book center is not a library. It is open to the front desk allowing continual milling about by interested people. Its character is much in keeping with that of a book store and a new periodical room in a library. Browsing people flow through easily, with the ability to sit and read always open. Half barriers and/or carpet shape the space from just circulation space.

MEDICAL OUTLET

The need for this facility is precautionary measures, which hopefully won't have to be used. It is more of a way-station for injured people. Those not needing intensive, extended medical care can be treated and released. For others it will help in medical care until the proper people arrive.
COMMERCIAL CENTER (Dealer Showroom)

The dealers showroom should mainly consist of space to display three kites. Counter space for accessories is also needed. A small office could be included.

Sailplane dealers would only require a small office, since the planes would be located in outside hangers. Three dealers showrooms are needed. The work/repair shop must have the ability to open up to the outside allowing repairs to be easily made. Each dealer needs the repair shop in close relation to his showroom. Storage space for tools and spare parts is another requirement in the shop. Each dealer's space would rent at approximately $5.00 per sq. ft. per year.

A dealers showroom must visually express the mood of excitement of flying in order to help with sales. Special lighting accents and draws attention to the gist of different kite displays. The showroom and shop room is one working space in which the activity itself is stimulating. It gives the spectator a special working knowledge into a world that they have had to stand back watching from a distance. Here they see the working first hand of what a kite or sailplane actually is. Outdoor exhibits in a center mall give people a chance to ask questions and become more involved.
COMMERCIAL CENTER (Restaurant)

The restaurant or lunch room is to be a short order, medium-fast food service center, cafeteria style. Provisions for sack lunches, and carry out is a must. No waiters or waitresses are needed, just table clearance people. No counter top service is needed. Seating accommodates one hundred people, with built-ins as well as movable furniture as needed. Production areas should easily meet the demand with a fast, efficient, clean service. The space has easy access to pilots taking a break, people just walking in as well as lodging.

The atmosphere of the seating area is distinctly separate from service area. It's a place where everyone can get together by pushing tables together and freely talking or telling stories. Watching other people is another activity that takes place. Of course, outside activities of flying is of interest to people sitting in a loft area of the lunch room. Materials are primarily rough wood and brick. The balcony is open to the main floor, providing an open space which ties the two levels together.

Indirect lighting from the balcony filters through to the main space providing a natural light which highlights the wood and hanging plants. Incandescent spot lights accent tables and provide a warm light for overcast days or evenings, where the lunch room doubles as a relaxation center for those who have been flying all day.

Story telling becomes a favorite past-time as everyone relaxes. Sharing flying experiences is the basis of the stories. While some may be true others sound different but it's all a part of the sharing and dreaming that is wide-spread and well-nurtured here.
COMMERCIAL CENTER (Lodging)

Lodging in this type of facility would have to start out in a limited way, with room for expansion if needed. Lodging would be a break-even convenience run again by the administrative people for those who need it, not a private enterprise like Holiday Inn. Since this site is located within a two hour drive of several cities, the demand wouldn't be sufficient enough to warrant a Holiday Inn to invest money in a project this small.

Of the total number of people using the center only a small percentage (15%) would need such a service. This service could be broken down further into camping and indoor rooms, with the greatest use during the weekends.

I see lodging on the order of dorm rooms on a college campus. Renting of rooms would be for two or four people. Shower facilities would not be in each room but in a centralized spot, with both indoor and outdoor access.

These room's character change nightly depending on the patrons mood for the night. Rooms fit the scheme already present in the rest of the center, but comfort is the key. Comfort in the sense that soft materials are used to a great degree so occupants can arrange it to fit their needs. Anything from two in bed, with two on the floor with sleeping bags to everyone on the floor.
STORAGE

Hangers have always been the most functional, with the least time, money and planning spent on them. Instead of having to adapt the sailplane to the space, it should be reversed. The facility shouldn't be shoved away from other needs as is always done.

BUILDING CODES

This flight center would have to conform to the Indiana State Building Codes. It would have to be reviewed by the Administrative Building Council in Indianapolis.

It also would have to be reviewed by Mr. Williams, the County Commissioner, in the area planning office in Brookville.
<table>
<thead>
<tr>
<th>FUNCTIONS</th>
<th>SQ. FT. REQUIRED</th>
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<tbody>
<tr>
<td><strong>FLIGHT OFFICE</strong></td>
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<tr>
<td>Park Clearance</td>
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<tr>
<td>Park Information</td>
<td>900 sq. ft.</td>
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<td>Hangar Rental</td>
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<td>Administrative Offices</td>
<td>500 sq. ft.</td>
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<td>Weather Information Center</td>
<td>900 sq. ft.</td>
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<td><strong>CLUB HEADQUARTERS</strong></td>
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<td>Meeting Room</td>
<td>600 sq. ft.</td>
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<td>Schools</td>
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<td>Book Center</td>
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<td>Project Room</td>
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<td><strong>COMMERCIAL CENTER</strong></td>
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<td>Dealership Showroom</td>
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<td>Work/Repair Shop</td>
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<td>Restaurant and/or Lunch Room</td>
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<td>Lodging</td>
<td>1,000 sq. ft.</td>
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<td>Other</td>
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<td><strong>MEDICAL OUTLET</strong></td>
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<td>GRASS RUNWAY</td>
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<td>Up Hill</td>
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<td>LAUNCHING</td>
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<td>PARKING</td>
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<td>MECHANICAL</td>
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</table>
Julian Allen
370 Strathmore Dr.
Dayton, Ohio 45429
299-1943

John Dean
128 Wellington Road
Indianapolis, Ind. 46260

Joe Bearden
1037 Thunderbird Dr.
Cincinnati, Ohio 45231
522-6060

Frank Silverman
2710 Kilgore Ave.
Muncie, Ind. 47304

Eugene McNay
4643 Rockwood Ave.
Indianapolis, Ind. 46208
283-1767

Soaring Society of Dayton, Inc.
Dayton Gliderport (3-½ mi. s. of Waynesville)
P.O. Box 581
Dayton, Ohio 45419
(513) 299-1943 - James Allen
Central Indiana Soaring Society
Terry Airport
Richard Deitchman
6320 Brixton Lane
Indianapolis, Ind. 46220
253-0310
c/o William L. Sprague
5833 Winthrop Avenue
Indianapolis, Ind. 46220
317-251-3453

Hoosier Soaring Club
Monroe County Airport (5 mi. sw of Bloomington)
James Allison
1127 East First Street
Bloomington, Ind. 47401
336-6671
c/o Russell East
4072 Grand Avenue
Bloomington, Ind. 47401
332-4120

Soaring Society of America
P.O. Box 66071
Los Angeles, Cal. 90066
213-390-4449

Black Forest Gliderport
Wave Flights Inc.
9990 Gliderport Road
Colorado Springs, Co. 80908
303-495-4144
Crystal Caverns
Chattanooga, Tenn. 37419
615-0097

Jim Robinson
Escape Country
Trabuco, Calif.

1965-1975 A Pivotal Decade in Indiana
An Expansion Program to Meet Indiana's Growing
Need for Conservation and Recreation
Master Plan for Acquisition and Development

Paul Brown
462 Elm Grove Drive
Dayton, Ohio 45415
277-7966

Southern Indiana
Photographed by Hartley Alley
Text by Jean Alley
Indiana University Press

A Guide To Southern Indiana
William and Gayle Cook 1972
Owen Litho Service Inc.
Spencer, Indiana

Coordination of Federal Outdoor Recreation Assistance Programs
United States Dept. of the Interior
Feb. 1968
Planning for Sport
Oct. 1968 A Report
Central Council of Physical Recreation
London, 1968

The Nature of Recreation
Richard Saul Wurman
Alan Levy
Joel Katz
MIT Press 1972

Planning for Leisure
K. K. Sillitoe
London, 1969

Dept. of The Interior
Bureau of Outdoor Recreation
Lake-Central Region
Roman H. Koenings
Regional Director
3835 Research Park Dr.
Ann Arbor, Michigan 48104

Restaurant Planning and Design
Fred R. Lawson
Architectural Press 1973

Food Service Planning: Layout and Equipment
Lendale H. Kotschevar
New York Wiley 1961

Graphic Standards

Time Saver Standards for Building Types
De Chiaro and Callender
McGraw-Hill Book Company
Location of a site was limited to the state of Indiana. Although the scale of the project would seem to dictate, bigger hills like Denver, or Chattanooga, information was easier to obtain, and Indiana has no facilities for hangliding to date.

Possible sites were located first by use of U.S.G.S. typographical maps, then rated by site selection criteria listed as to the best area.

Site analysis had to happen at several different scales. Locations for hangliding, soilplanes and best site for the building were determined, by and elimination process.
within Indiana
prevailing winds
limited trees
hills open to wind
hill size
hill slope
open access
free of obstacles
easy access—major cities
HEIRARCHY OF LOCATIONS

1. Sites for Hang-Gliding
2. Site for Sailplane Airstrip
3. Location of Building Facility
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<tr>
<th>soil data</th>
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<td>MODERATE</td>
<td>RAPID</td>
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<td>MOD.</td>
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### Indianapolis

**Elevation 792 Ft.**

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### Louisville

**Elevation 477 Ft.**

<table>
<thead>
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<th>Temperature</th>
<th>Degree Days</th>
<th>Rel. Hum</th>
<th>Prec. Nor.</th>
<th>Wind</th>
<th>Average Number of Days of Sunup/Sundown</th>
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<tbody>
<tr>
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<td>Extreme</td>
<td>Base 65°</td>
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<tr>
<td>Minimum</td>
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### Cincinnati

**Elevation 869 Ft.**

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<th>Prec. Nor.</th>
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**Climate**

![Flight Park Diagram]

- **N** indicates the general direction of the wind.
15 knot wind
wind within 40° perpendicular to slope
stable air
hill slope 20°-45°

soarable area
3 times ht. of hill

soaring

N
**Determination of Capacity of Landing Area at the Flight Park, by Comparison of Existing, Safe Conditions. How many hanggliders can be in the landing area, and still have safe conditions in which to land?**

\[
\frac{7.14}{122,500} \times 875,000 = 42
\]

42 kites in landing area at one time

**Proposed Yellow Hill Flight Park**

**Existing Flying Site**

Rushville, Ind.
Hang-giders

Take-off/side-side
1 kite in air at one time

Existing flight plan
30 sec. av. flight time

Hanggliders
Flight area
CONCEPTUAL IDEA OF BUILDING

This building should perform 3 basic functions:

A. Commercial facilities
B. Flying facilities
C. Support facilities.

On another level, I wanted the building to be:

1. Spectator viewing center
2. Control and function of flying
3. Have an identity with the surrounding environment.
This scheme allows major circulation, which would be pilots carrying hanggliders to the hill, to move from parking area and pass by the building in such a way that maximum exposure to the activity generators of the building, are in easy visual access. Secondary circulation takes place inside the building.

Project areas have direct access to the outside while maintaining a close relationship to the schools. Any function that requires a view to the hanggliders, is placed to maximize that view. Support facilities are the north-side of the building where views are stronger to the natural forest area.
In an attempt to better organize the circulation patterns Concept #2 developed. Functional relationships remain the same, but still have weak points. Commercial Area Separation isn't resolved. Circulation Concept isn't developed. Entrance into a building is unresolved.
Concept #3 unifies the building, and shows a stronger way to move through the building. On axis entry doesn't work, but haven't resolved how to properly enter the building. Needed to look again, at how the building sits on the site. How you view the building.
Concept #4 reevaluates functional relationships and other factors that were weak in other concepts.
This scheme meets all the back requirements I set down, and works well on the site. Circulation is simple and strong. Entrance point now on axis, and is recognizable from auto entrance to the site.

Open space allow activities to relate and strengthen each other. View corridors to outside activities of flying is maximized.
A prototypical development such as this can allow me freedom to explore different avenues which might not be open with a fixed budget and other examples to learn from.

Elevations can symbolize the function of the building.
Schematic development improves on Concept #4.
The school/project is dominant element which circulation on either side.
Movement towards the back of the building to the outside is encouraged.
Exhibition and commercial spaces are combined, and allowed to open up into
school/project and entrance areas. The right side requiring closing up of
functions, opens up to outdoors via the lounge.
The kite set-up area has close access to lockers.
Strong symbolism of flight, prevades the elevations.

The idea was to symbolize, but not copy, the element essential to a hanglider. Large sweeping roof allow openness of functions inside. The weather/control center highest point in the building, could be thought of symbolically as the "Heartbolt" of a hanglider, and functionally it is the most important area in the building.