MUD CREEK COMMUNE

THOMAS A. JEFFS
SPRING 1979

[Signature]
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INTRODUCTION

MUD CREEK COMMUNE
IS A SELF SUFFICIENT COMMUNITY FOR 20-30 PEOPLE. IT HAS BEEN DESIGNED TO PROVIDE SIX FAMILIES WITH THEIR TOTAL FOOD AND ENERGY REQUIREMENTS WITHIN TEN YEARS.

IT SHOULD ALSO PROVIDE FOR THEIR TOTAL NEEDS IN LESS THAN 50 YRS.

THE INITIAL GOALS OF THIS STUDY WERE TO DEAL WITH MAN'S NEEDS AND THEIR RELATION TO THE ENVIRONMENT. IDEALLY, THIS PROJECT WOULD TAKE FROM THE EARTH ONLY WHAT IT COULD USE. THEN IT WOULD RETURN ITS WASTE TO THE EARTH.

ABSTRACT

IN A USEABLE FORM, HOPEFULLY, THIS WOULD CREATE A MUTUALLY BENEFICIAL CHAIN THAT COULD CONTINUE INDEFINITELY.

AS A COMPLIMENTARY SET OF GOALS; THE BUILDING SHOULD BLEND WITH ITS ENVIRONMENT; IT SHOULD BE ENERGY CONSERVING; IT SHOULD BE BUILT OF LOW TECH MATERIALS; IT SHOULD UTILIZE A PASSIVE ENERGY SYSTEM; AND IT SHOULD BRING MAN IN TOUCH WITH HIS WORLD WITHOUT DESTROYING THAT WORLD IN THE PROCESS.

THE FINAL DESIGN OF THE BUILDING IS BASICALLY TWO STRUCTURES BUILT ON
EITHER SIDE OF A LONG LOW HILL AND CONNECTED BY A TUNNEL ON THE WARM SOUTH IS THE BARN AND ON THE SHELTERED NORTH SIDE IS THE BARN.

THE HOUSE IS COMPOSED OF THE PUBLIC AREA WITH ITS LIVING SPACES, KITCHEN, AND DINING ROOM. IN A SEPERATE WING ARE THE SIX FAMILY QUARTERS WHERE EACH PERSON HAS THEIR OWN PRIVATE SPACE. THESE TWO SECTIONS ARE JOINED TOGETHER BY UTILITY TYPE SPACES INCLUDING: LAUNDRY, PUBLIC TOILETS, COMMON STORAGE, THE MECHANICAL SPACES, AND THE GREENHOUSE.

THE BARN HAS ANIMAL PENNS, GRAINS STORAGE, MILKING & SLAUGHTER SPACES, A SMOKEHOUSE, EQUIPMENT STORAGE SHEDS AND A COMPLETE MECHANICAL AND WOOD SHOP. THE FOLLOWING PAGES TELL HOW THE GOALS WERE ACHIEVED AS THE PROJECT DEVELOPED.
SITE ANALYSIS
SITE ANALYSIS

This section will introduce you, the reader, to the site and acquaint you with my reasons for ordering the site.
MUD CREEK COMMUNE IS LOCATED IN BOONE COUNTY INDIANA. CENTRALLY LOCATED, IT IS ONLY A FEW HOURS DRIVE FROM ANY PLACE IN THE STATE. AND IT IS LESS THAN A HALF HOURS DRIVE FROM INDIANAPOLIS.
Located in the North Central part of Boone County, the commune is easily reached from US 421 and SR 39. It is almost 50 miles less than 15 miles from Lebanon, the county seat.
SITE ANALYSIS & CLIMATE

SITE: 556 ACRES TOTAL

- 211 ACRES FOREST
- 35 ACRES PASTURE
- 200 ACRES ROW CROPS

MUD CREEK:

- Flows north from south
- Seasonal use for power possible
- Water is pure enough to support delicate life forms - clams, perch, trout

WOODLANDS:

- Trees include maple, beech, hickory, oak, walnut, cottonwood, sycamore

FRUIT:

- Apple, grape, peach

SOILS:

- Medium to heavy, clay loam

PERENNIAL:

- Grasslands with some scattered trees

SURROUNDING AREAS:

- Almost identical in all directions
- In general, they are flatter, have fewer trees
SITE ANALYSIS: SOILS, SLOPE, DRAINAGE

SOILS:
All soils on the site are among the most productive in Boone County, therefore their use is determined by other factors like drainage slopes (%), aspect, temperature, and the like.
SITE ANALYSIS PLANNING CRITERIA

WOODS
356 ACRES
PREFERABLY TO NORTHERN AREAS
SOIL IS GOOD ANYWHERE

HOUSING
37 ACRES
LOCATED NEAR CENTER OF SITE
WINTER PROTECTION FROM WIND
WINTER EXPOSURE TO SUN
SUMMER EXPOSURE TO WIND
SUMMER PROTECTION FROM SUN
ACCESSIBLE WITHOUT NEW ROADS

CROPS
50.5 ACRES
FLAT TO NEARLY FLAT GROUND
EXPOSURE TO SUN
ABUNDANT MOISTURE IN SOIL

VEGETABLES
5 ACRES
FLAT TO NEARLY FLAT GROUND
EXPOSURE TO THE SUN
FROST PROTECTION

FRUIT TREES + BUSHES 24 ACRES
PROTECTION FROM COLD WINDS
POSSIBILITIES FOR FROST PROTECTION
EXPOSURE TO SUN

PASTURES
29 ACRES
KEEP AWAY FROM THE NEIGHBORS
TO AVOID SHELL PROBLEMS
WINTER WIND PROTECTION
SHADE NEEDED DURING SUMMER
WATER SUPPLY DESIRABLE
AWAY FROM ROADS TO PREVENT THE
SITE ANALYSIS

Conclusions:

Building Site: 23 Acres
Central Location
Contextually Sound
No New Roads Are Needed
Vegetables: 10 Acres
Near Building Site
Protection From Cold Winds
Fruit Trees: 24 Acres
Near Building Site
Winter Protection
Summer Exposure
New Pasture: 48 Acres
Ease Access To Building Site
Summer Shade
Winter Shelter (Will Have)
Now Crops: 145 Acres
Uses Southwestern Exposure to Sun
Maintains High Wind Area
Pond: 2 Acres
Near Building Site
Sheltered From Winter
Open To Winter Sun
Shaded From Summer Sun
Forest: 224 Acres
Used To Block Winds & Summer Sun
Provides Privacy
Building Materials
SITE ANALYSIS

BUILDING SITE
- SOUTH SLOPE OF HILL
- GOOD DRAINAGE SOIL
- 0% - 12% SLOPE
- ROAD ACCESS

ALTERNATIVE BAJI LOCATIONS
- SITES AWAY FROM HOUSES WOULD ALLOW INCREASED EXPANSION ROOM

FORD
- LAY OFF OF ROAD
- EAST FROM FORD CREEK

HARDWOODS ARE FOUND ON SLOPES
- THICKER ON THE EDGE OF THE RIVER
- WHERE THE FORD IS
- LOWER ORDER TREES & THICK BUSHES - ALTHOUGH THEY SERVE THEIR PURPOSE THEY ARE LESS DESIRABLE AND SHOULD BE REMOVED

TRAILS
- HUMAN BUILT: TRAILS
- ANIMAL: EDGES OF FOREST & FIELD

SUN LIVING
- BY LOCATING SITE JUST NORTH OF VEGETABLE FIELD, LESS TREES NEED TO BE THINNED OUT TO ALLOW SOME SUN TO GET THROUGH
CONCEPTS AND SCHEMATICS
CONCEPTS
AND
SCHEMATICS

THE CONCEPTS ARE A
RESTATEMENT OF MY
GOALS.

AFTER MY BUILDING
TYPE STUDY ON COM-
MUNES (SEE APPENDIX)
I DISCOVERED THAT COM-
nUNES HAVE HAD TWO
BASIC HOUSING TYPES;
FAMILY AND GROUP.

IN THE FAMILY TYPE,
FAMILY UNITS WERE
MAINTAINED WHETHER
IT WAS AN ACTUAL
FAMILY OR NOT. IN
THE GROUP TYPE EVERY
MEMBER IS PART OF
ONE BIG FAMILY.

IT WAS DECIDED AT
THIS STAGE TO MAKE
THIS A FAMILY COM-
MUNE OF SIX FAMIL-
IES OF 4 MEMBERS
EACH (IDEALLY).

THE SCHEMATICS
SHOW THREE CHOIC-
ES FOR HOUSING:
THE FAMILY DWELLINGS
SEPARATELY ATTACHED
TO THE PUBLIC AREA;
THE FAMILY DWELLINGS
ATTACHED AS A
GROUP TO THE PUBLIC
SPACES; AND THE
FAMILY UNITS COM-
PLETELY DETACHED
FROM THE PUBLIC
SPACES AS WELL AS
EACH OTHER.

IN ANY OF THESE
SCHEMES THE BARN(S)
COULD EITHER BE
ATTACHED OR SEPER-
ATED FROM THE PUBLIC
AREAS. IT WAS NOT
UNTIL LATER IN
SCHEME FOUR THAT
I GRASPED THIS IDEA.
CONCEPTS

ROLE AS AN ARCHITECT
TO DEVELOP ALTERNATIVES FOR MEMBERS
& DEVELOP THEIR CHOICES

BUILDING SYSTEMS CHOICES
CONVENTIONAL WOOD FRAME
BRICK BEARING WALLS
SOIL CEMENT

BUILDING ORGANIZATIONAL CHOICES
BARN PLUS HOUSE (HOMES)
SEPARATE BARN

FARM AND HOUSE (ADDITION)

BARNS PLUS PUBLIC PLUS PRIVATE (FIELD)

BARNS FAMILY DWELLING

PUBLIC SPACES

BUILDING SYSTEM MODULE 10'-12'

BUILDING ORGANIZATIONAL PATTERNS
PUBLIC TO PRIVATE
LOUD TO QUIET
ACTIVE TO PASSIVE

ENERGY AUTONOMY

FIREPLACES - MAIN SOURCE
LOG, NATURAL GAS - HOME MADE
WIND - SUPPLEMENTAL
MUD CREEK, MECHANICAL

HILL FOR INSULATION & WIND PROTECTION DURING THE COLD MONTHS

SITE

BUILDINGS SHOULDN'T BLEND IN
WILDLIFE TRAILS & HABITATS SHOULD BE MAINAINED & EXPANDED
PRESENT ROADS SHOULD NOT BE EXPANDED, MORE THAN NECESSARY
The next three pages are rough sketches of the three alternatives. Each sketch deals with mass form and the environment. Scheme 2 changes the most for the presentation and latter develops into scheme 4.
Forest Scheme #3

More sheltered location for barn but access road would have to be cleared.

Field theory of location as presently used by some communities - private units offer less to encourage use of public facility.

It would be easier to build this scheme into the hill since it would otherwise be expensive to build.

Forest

Dirt Road
Scheme 2 was chosen over the others because of the connection between the major parts while still maintaining a fair and equitable housing distribution. This scheme will be developed as Scheme 4 in the next section.

The building systems study was meant to be a comparison between themselves. At the jury it was received as a straight analysis of each system and declared highly prejudiced and inaccurate. In either case the categories are good ones for this type building.
GENERAL REQUIREMENTS
MATERIALS SHOULD BE FOUND ON SITE
MATERIALS SHOULD BE WATER PROOF
THEY SHOULD BE RE-USABLE
LOW TECHNOLOGY REQUIRED FOR BUILDING CONSTRUCTION
LOW TECHNOLOGY REQUIRED FOR MATERIALS PRODUCTION
RE-USABLE MATERIALS
IT MUST BE POSSIBLE TO ADD PERSONAL TOUCHES WHILE CONSTRUCTION IS TAKING PLACE
RESIDENTS SHOULD BE ABLE TO PERFORM THE CONSTRUCTION THEMSELVES

BUILDING SYSTEM CHOICES
1. CONVENTIONAL WOOD FRAME
2. BRICK BEARING WALLS
3. SOIL CEMENT BRICKS

WOOD FRAME
- LOW COST MORTAR MATERIAL
- NOT WATER PROOF
- REUSABLE
- LOW TECH CONSTRUCTION

+ CAN BE MADE FROM ON-SITE MATERIAL
+ WATER PROOF
+ REUSABLE
+ LOW TECH CONSTRUCTION
- HIGHEST TECH PRODUCTION OF 3 CHOICES
+ COURSING CAN BE PERSONALIZED
+ LOW MAINTENANCE

GOOD THERMAL PROPERTIES
SOIL CEMENT BRICKS

CAREFUL DETAIL
- LOW TECH PRODUCTION OF MATERIALS
- CAN BE PERSONALIZED
- LOW MAINTENANCE
- GOOD THERMAL PROPERTIES
- DETAILS SIMILAR TO BRICKS
- RESIDENTS CAN CONSTRUCT IT...
DESIGN DEVELOPMENT
AFTER JURIES AT THE END OF FIRST QUARTER TWO ISSUES SEEMED MOST IMPORTANT. FIRST WAS THE CONNECTION BETWEEN THE HOUSE AND BARN. SECOND WAS THE CREATION OF LIVING UNITS OF EQUAL ESTEEM IN THE EYES OF THE INHABITANTS. THAT IS THEY SHOULD BE CREATED TO AVOID PETTY DISPUTES OVER WHOSE LIVING UNIT IS IN THE BEST LOCATION.

LOOKING AT ALL THE PRELIMINARY SCHEMES IN TERMS OF WHETHER THE BARN MIGHT CONNECT EASILY OR NOT I COULD QUICKLY ELIMINATE SCHEME 3. THIS IS BECAUSE OF THE LACK OF LOGIC IN FORCING PEOPLE TO WALK OUTSIDE TO REACH THE PUBLIC SPACES JUST TO GET TO A TUNNEL TO WALK TO THE BARN.

THIS SCHEME ALSO TENDS TO ISOLATE THE FAMILIES FROM EACH OTHER CAUSING A LOSS OF "COMMUNITY" THAT WOULD COME FROM LIVING UNDER ONE ROOF. ALSO THE CLOSER ONES MIGHT BECOME MORE DESIRABLE.

ANALYSING SCHEME 1 IN TERMS OF THE BARN CONNECTION, IT COULD EASILY BE DONE, BUT THERE IS NO CLEAR LOCATION FOR IT. IN FACT, THERE SEEMS TO BE NO CLEAR LOCATION REASON FOR THE LIV.
ING UNITS EITHER.

FOR THESE REASONS BOTH SCHEME 1 & 3 WERE REJECTED.

SCHEME 2 ON THE OTHER HAND WAS DESIGNED AROUND THE CONNECTION IDEA FOLLOWING THE EUROPEAN AND NEW ENGLAND PRECEDENTS. THE EQUALITY IDEA WAS ALSO A MAJOR ISSUE IN THIS SCHEME WHICH IS WHY THESE UNITS ARE MORE NEUTRALLY LOCATED.

THIS SCHEME WAS CHosen FOR THESE REASONS
REALIZING THAT THE OTHER SCHEMES HAD SOME GOOD POINTS OTHER VARIATIONS OF SCHEME TWO WERE TRIED.
NOT SEEING OTHER MORE PROMISING VARIATIONS, FURTHER STUDIES OF SCHEME 2 WERE MADE IN PLAN SECTION & ELEVATION.
LOOKING FOR NEW GEOM- OPMENT OF SCHEME ETRIES. THE DEVEL- NUMBER FOUR.
After coming up with the new scheme, I tried to picture it with a series of thumbnail sketches. This is also a good time to start looking at some major details with sketches.
When designing the family quarters, I tried to keep it small but comfortable. It had to be kept small for two major reasons: cost and to discourage its use as a place for the family to "hang out". Costs include both construction and operation, and the family should use the public areas to forge themselves with the others into one large family.
With a few more changes, these family units are placed around a newly designed public area. Among other things, this creates a maze of halls to be dealt with.
TO SORT OUT THE CIRCULATION PROBLEM A RATING SYSTEM WAS DEVELOPED. 1.0 IS MOST HEAVILY TRAVELED WHILE 5.0 WOULD BE THE LEAST USED. ON THE NEXT FOUR PAGES ARE PLANS & SKETCHES THAT USE THIS SYSTEM TO TRY TO DEVELOP THESE CIRCULATION SPACES.
STUDY OF SPACE AT THE ENTRANCES TO FAMILY UNITS
WORKING ON THE SPACE BETWEEN THE UPHOLSTERED AND PLANTED SPACES.
arch or retreat

SPACE BETWEEN UNITS

UP TO FAMILY UNIT ENTRANCES

greenhouse
pitch roof to catch sun

SECTION STUDIES
warmer day, bright idea

summersun

UP TO FAMILY UNIT ENTRANCES

winterwind either leave out every nth one or make it close to all right in

they might want to be movable as opposed to fixed

SKYLIGHT IDEA

MORE SECTION STUDIES
ELEVATION STUDIES
WITH DIFFERENT ROOF LINES
This large scale facade study is good for checking detailing. It should be accompanied by a section to test constructability.
While working on the above mentioned section it became apparent that several of the things I wanted to do required high tech solutions. This was the last in a series of major problems that suggested I seek a new scheme. Some of those other problems were: too much circulation space, the public space felt to institutional, the basement garages were not really needed, and finally, it blended with the environment like a leaky oil tanker on white river.
At this point I was really disgusted with the project. Somehow I was not meeting my goals or the clients' needs. Then, on a plane to Phoenix, the ideas started to come together. But I was still having problems with the design for the family units.

Sometime around the middle of January professor Dan Woodfin suggested I look at a book by Christopher Alexander, called a pattern language. This book attempts to give solutions to human environment problems based on historical precedent. For example it discusses entries and how they have been created throughout history. Then, the book suggests a minimum of what is required. The designer is then free to use the minimum to build a solution as the design requires.

Although this book has been called a "cookbook," it has a great deal of validity, especially on projects of this scale and nature. Alexander and his staff also suggest patterns for the city environment & construction techniques. (See Appendix)
LINEAR SCHEME # 5

MODULI:
\[
\frac{10 \times 12}{10'' 
\text{ ORIENTATION}}
\]

CIRCULATION

KITCHEN

LIVING PASSIVE

LIVING ACTIVE

K. V. MOST ACTIVE
L. A. MOST ACTIVE
L. P. LEAST ACTIVE
D. R. ACTIVE FOR MEALS
PASSIVE FOR STUDY
QUIET THE REST OF THE TIME
SOME MEAL & CAMPING ACTIVITIES

AIRPLANE SKETCH WITH THE HILL
LINEAR SCHEME BLENDS MUCH BETTER.
made out bell pattern idea

plan

section

elevation

...
AIRPLANE SKETCH

IT REALLY AMAZE ME HOW THESE FOUR PAGES CONVERTED MY PROJECT. NOT ONLY DID THEY DESCRIBE A TRULY WORKABLE SCHEME THEY ALSO RENEWED MY INTEREST IN & EXCITEMENT WITH THE PROJECT.
Attempts at working out the hall construction. These were dropped for being too exotic.
THE NEXT SEVEN PAGES ARE ALL FAMILY UNIT STUDIES BASED ON A PATTERN LANGUAGE. THEY START OUT BEING TO LUXURIOUS BUT FINALLY REACH AN ACCEPTABLE AUSTERITY LEVEL WHILE MAINTAINING INDIVIDUAL PRIVACY AND COMFORT.
FAMILY

MASTER BEDROOM - 10'x12'
CHILDREN'S BEDROOMS - 10'x12'

1. MALE
   1. FEMALE

1. PRIVATE SPACES
   1. EACH PERSON

2. MASTER TOILET ROOMS
   1. PARENTS
   1. KIDS

6. CLOSETS & STORAGE
   1. EACH FAMILY MEMBER (10)
   1. GENERAL STORAGE
   1. LINEN & DIRTY CLOTHES
THE FINAL SOLUTION
DEVELOPING THE PUBLIC SPACES
FURNISHING THE SPACE TO HELP DEVELOP THEIR DIVERSITY I HAVE INCLUDED: LARGE & SMALL, HARD & SOFT, GROUP & PRIVATE, OBSERVING & PARTICIPATING, AND ACTIVE & PASSIVE SPACES. ANOTHER MAJOR CRITERIA WAS TO KEEP VIEWS FROM THE KITCHEN TO ALL PARTS OF THE BUILDING SO AS NOT TO ISOLATE THE PEOPLE WORKING.
Furniture Arrangements
Final Floor Plan
Early Roof Plan
BARN PROGRAMING

12,000 Bu = 32,000 lb
12 x 12 = 144

Seed Requirement

200 Bu → FP
50.5 Tonne → Hi 8.5 out
69.06 Tonne → Liquid
200 Bu → Lo Inside
4500 Bu = 250 Bu
9 x 5000 = 45,000
9.7 x 20,000 = 194
1728

1728 m² / 12 = 144

2.1 mph / 1020 ft
48 x 12 = 576
120 x 12 = 1440

CATCHMENT PARKING ( Sleek )

192 ft

Cage space 1000

Hay 10 tons = 200 bu x 8 = 1600 lb
Corn 3500 Bu = 282.3 m³ = 2830 x 3.14 x 10
Wheat 126 Bu = 103 m³ = 103 x 3.14 x 10
Oats 630 Bu = 518 m³ = 518 x 3.14 x 10
Rye 360 Bu = 290 m³ = 290 x 3.14 x 10

FARM EQUIPMENT

120 → 10 x 10 = 1000 lb
400 → 20 x 20 = 400 lb
150 → 10 x 15 = 1500 lb
170 → 10 x 17 = 1700 lb

CHICKEN

2000 x 10 / 4.2 = 1440

EAGLE

4000 x 4 = 1600

RABBIT

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LAYING OUT THE ANIMAL PENS
THE FIRST OVERALL PLAN. NOTICE THE ROOF PENETRATIONS, THE LIMITED PATIO DEVELOPMENT, AND THE BARN SHAPE AS THESE WILL CHANGE GREATLY. THIS DRAWING IS FROM THE MID-SMALLER PRESENTATION.