*This thesis is submitted to the faculty of*
*Virginia Polytechnic Institute and State University*
*in partial fulfillment of the requirements for the degree of*

# Master of Architecture

# geld zuviel

A small Building

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. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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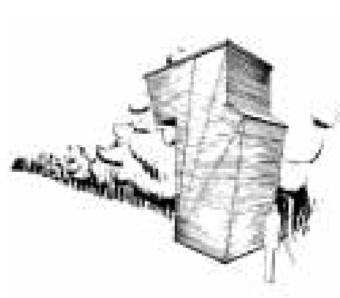
# abstract

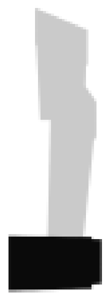
*Geldzuviel: A small Building* is a presentation of the design, construction, speculation, and observation of a small wooden tower.



# animation

Turn brouchure over and flip through the pages for an animation.

*A tour around the building, starting on the north side and moving around to the west, then south, and ending on the southeast*



*Shadows on the ground at one hour intervals of June, 8 begining at 8:00 a.m.*

# geldzuviel

The word Geldzuviel is a German colloquialism used by my grandfather and father and learned by me in my youth. It is a composition of two German words; geld, meaning *money*, and zuviel, meaning *too much.* Geldzuviel is used as a criticism and to describe a philosophy, referring to *what was possible with what was available*. It was chosen as the name for the building of which this project is about because it refers, in part, to thoughts about appreciation and wastefulness.

Geldzuviel, as a reference to wastefulness, could be construed as an argument for functionalism; suggesting that if a design satisfies a function with such a strictness that nothing but the requirements are afforded, it would not waste. This translation is, in a way, the projects' antithesis. I propose that through an *understanding* of the minimum requirements to satisfy the objective of a design, a freedom of design is afforded and can be exercised to fulfill a desire.

The engineer, Corradino D'Ascanio was invited by Enrico Piaggio in 1915 to design a small motorcycle to be produced and sold in Italy. D'Ascanio writes,

> "Not being a slave to motorcycle traditions, I thought that the 'car' should serve those who, like myself, had never been on a motorbike and who hated how difficult they were to ride. I began rummaging around a little and one Sunday a basic idea came to me, the most important question was to climb onto the vehicle comfortably, something that had already been resolved for the lady's bicycle. I considered much more comfortable and rational the seated position over the straddled one, then one needed to deal with facilitating the handling control to it's maximum. One needed to take note of the vehicle's use for the citizen, that one must be able to ride it without taking ones hands off the handlebars, I placed the gear-changes on the handlebars. One other thing: one [must not] dirty ones hands and trousers, one of the most common inconveniences of the motorcycle. So, my little motorbike had to have the engine covered, isolated from its rider, a unique complex with the back wheel. As a consequence of that I created the transmission without chains, with link-change included within the wheel-engine group. Another solution dictated by my experience in aeronautics: the monotube as a support for the front wheel instead of the forked one originally for ordinary cycles. And, prime novelty, I introduced a body-work which eliminated a system of tubes. Another demand: the spare wheel. I remember that many times, while driving my car, I saw motorcyclists at the side of the road at work with the inner tube punctured and the rear wheel dismounted from it's rim; I decided that, basically, a puncture for a motorcyclist shouldn't be on par with a problem for a mechanic. I wanted my motorcyclist to have something in common with the car driver. And so I tried to create the simplest 'car' possible."[1]

The minimum-automobile Corradino D'Ascanio writes about is called the Vespa. It is said to be the vehicle that put Italy on wheels and is still produced today in many countries, although not the United States.

# geldzuviel

The design of the Vespa *(fig.-1)* is unique in that it's inventor used as a model a design that far exceeded the limitations and functions of the desired product. By asking what a minimum car is D'Ascanio, who also invented the helicopter, made a kind of maximum motorcycle, outside the boundary of motorcycle limitations and systems. The design of the Vespa exhibits a condition where a desire is thought of as a minimum requirement.

Seemingly at the opposite pole to thoughts about minimum requirement is the mid-eighteenth century English garden folly. In the mid-eighteenth century the English folly was used by architects as a vehicle for discourse about architecture and were the playthings and showpieces of noblemen and aristocracy. From Anthony Vidlers essay on *The History of the Folly* one can read,

> "The ancient word *folle* was used primarily to refer to 'lewd, unchaste and wanton' behavior, and, while an obsolete term in the eighteenth century, the folly certainly held within it the connotations of libertine, eroticism and pornography. Here the folly became less an example of bad, than a not-so-secret harbinger of the impossible desired." 2

The folly buildings were small and built independent form other buildings. The folly harbored the dreams of their owners, but with the means they afforded their dreams. This asks at what price a desire is afforded and when is a desire in need. In this sense, the folly, which by definition lacks typology, becomes a type of minimum building.

My initial attraction to the folly was how it displayed an independence. The folly could be kitsch without criticisim. Seemingly free from scrutiny because it does in full knowledge what is considered foolish. Using photographs of mid-eighteenth century English garden follies and my imagination, I see the folly alone as an object 'placed' in a terrain. Alone but free.

Turner Brooks, *(Fig.-2)* an architect of Starksboro, Vermont takes the idea of a building being an object in the landscape further by suggesting that a building can offer a direction, and in doing so will lead the imagination to think of its ability to move. These strategies, of making a building as an object or appear as a type of vessel that moves, is an attempt, I believe, to make a building exhibit *a desire* for an intimate relationship. That like some machines, buildings can reflect through thier form or *body* the relationship a human is to have with it. I suspect this desire for a relationship can be motivated by the design to a point that a building will display a personality.

*fig.-1*

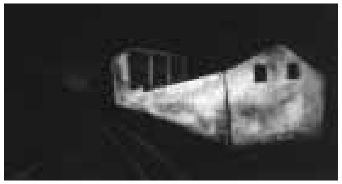


*fig.-2*

# geometry

The form of Geldzuviel was developed by extruding the design of a two dimensional geometry. This geometry *(fig.-3)* was thought of as the elevation of a building.
The geometry is generated from a point of origin twenty-one feet below the ground. From this point a vertical datum line is projected. Also from the point of origin, two lines, one on either side of the vertical datum line, project up at ten degrees making a twenty degree angle between them. An eight foot line perpendicular to the vertical datum line crosses at a point where each end connects with the two ten degree lines which begin from the point of origin. This eight foot line serves as the base line of the building. Vertically, from here the elevation of a building was designed. The building design is meant to, among other duties, provoke imagery of the building being the result of a severe shift. Because the design is contained within a twenty degree angle placed symmetrically on a vertical datum line, masses could be asymmetrically balanced to produce this effect.

The choice to pitch the boundary of the design from vertical is two fold. One, by pitching the boundary of the building from vertical more volume on the interior of the building was afforded. The cost of this volume was the cost of the added material (very, very little). And two, the structure of the building could accept, at a maximum, the cantilevers generated by the ten degree lines.
Within the framework generated above the eight foot base line a variety of building types can be designed. *(figs.-4,-5,-6)*

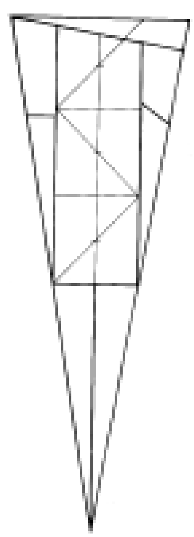
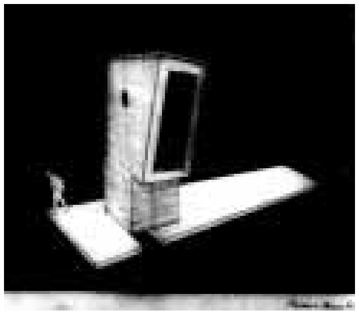
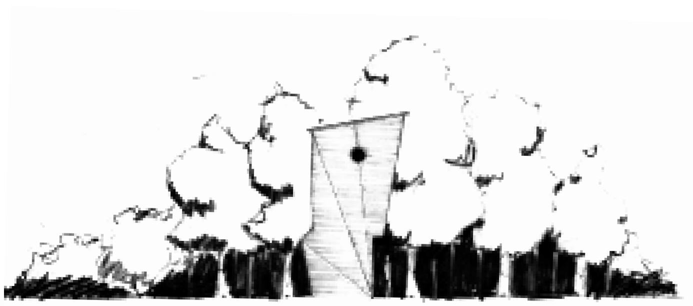


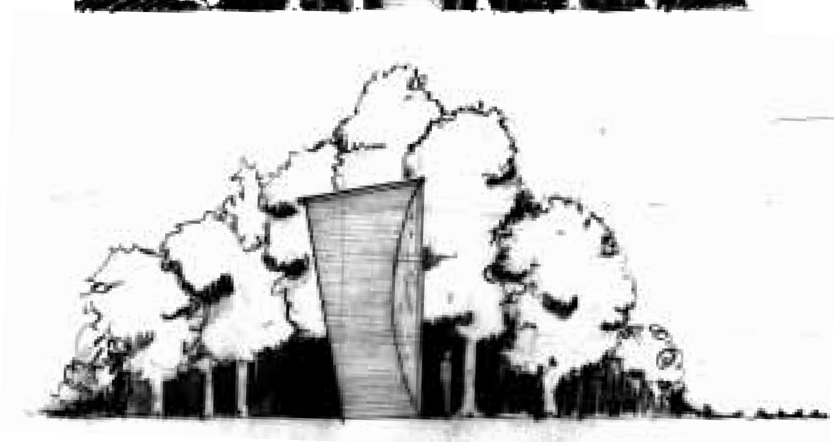
*fig.-3*

# alternates



(fig.-4)

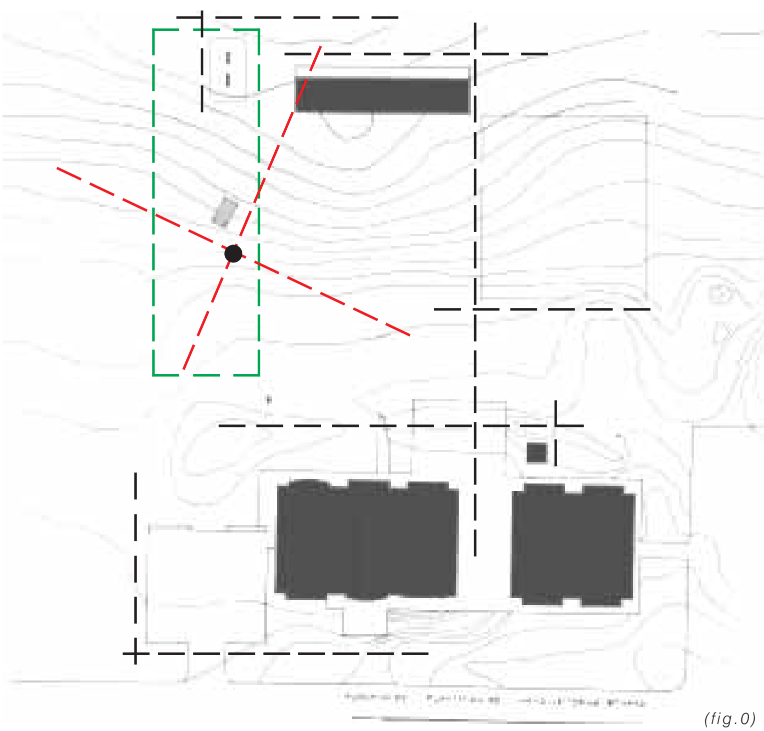




(fig.-6)

# siting

The immediate region surrounding the site is a state owned, university controlled research *park, (fig.0)* with agricultural science buildings, agricultural land for testing and growing animal feed, engineering laboratories, and the College of Architecture and Urban Studies' Research and Demonstration Facility (R.D.F.).
The structure is sited in the region in such a way that it subtly activates the immediate terrain. The neighboring buildings, street, and other installations conform to a ninety degree axis; everything is perpendicular to the street. Even the geometry of the utility boxes. Geldzuviel is oriented perpendicular to the solar axis. It's form is 'wrenched' in the geometry of the neighboring buildings in the region.
The terrain of the site falls from the south to the north at about 3/4 of an inch per foot, or a 13 percent slope.



*(fig.0)*

*research testing grounds boundry*
*axes of Geldzuviel*
*axes of region*

# foundation

Geldzuviel and its foundation are two disparate things. The foundation can be thought of as a kind of generic platform, or a foundation type upon which various building types can be built. The foundation is made of two components; a building platform and the piers that support it.

The building platform is thought of as a unit and was assembled in the shop at R.D.F. using sixteen unseasoned 1 1/4" x 7 1/4" x 8' white oak boards, two 2 1/4" x 12' seasoned poplar boards, and one 4' x 8' sheet of 3/4" pressure treated plywood. The platform, also thought of as a 'perimeter beam', has two major structural components. Four laminated beams that make a perimeter load bearing component and four 3/4" pressure treated plywood gussets that make a tension component. The poplar boards, which triangulate the square platform, resist torsion, but more importantly serve to support the spatial desires of the ground level floor. From an outside square made of four oak boards, additional boards were laminated to these one upon the other working clockwise from the interior, each board lapping over the end of the proceeding board. (fig.2) Waterproof construction adhesive, lots of clamps, and 16d and 8d galvanized spiral nails were used for the laminating process. Nails were driven from the interior of the perimeter to avoid their presence on the exterior of the building. The interior of the perimeter beam is not seen from within the building. The top-outside-center of each side of the completed perimeter beam was found, and a chalk line was pulled diagonally from center to center. Where the chalk line crossed the interior edge of each beam, a plumb line was drawn. These plumb lines showed where to place the pieces of poplar diagonal bracing. One sheet of 4' x 8' x 3/4" pressure treated plywood was cut into four right triangles, making four gussets that would later be nailed to the top side of the perimeter beam and across the four poplar 2" x 8" boards. Throughout the assembly process of the building platform great care was taken in making the unit a perfect eight foot square. The trueness of the building platform would determine the ease or difficulty of the tower assembly.

Once the building platform was completed it was allowed to sit inside the shop until the foundation piers were installed on the site. When ready, the building platform would be lifted by a tractor and carried to the site and placed on the piers.

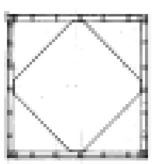


*fig.1*

# foundation

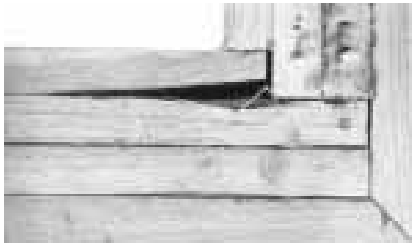


fig.2

(fig.3)

# foundation

The building platform is supported by eight piers. These piers are modified Mobile Home Anchors that resist both compressive forces generated by live / dead loads and tensile forces generated by wind loads.
A Mobile Home Anchor *(fig.4)* is a 5/8 diameter painted steel rod with two helical discs spaced at a particular distance apart and welded about the lower end. These helical discs make the Mobile Home Anchor act like an auger or screw and it's this thread like nature that makes the anchor able to resist incredible forces. On the upper end of the anchor is a bracket for attaching a metal strap that connects the object (in most cases a mobile home) to the anchor. Its intentional application, as its name suggests, is to anchor mobile homes to the earth in the event of severe lift due to wind load. For the anchor to lift from the ground it would either unscrew itself or lift vertically with it a disproportionately large amount of soil; the deeper the anchor, the greater the resistance. At only 30" deep in 2500 p.s.i. soil an anchor can resist five tons of tensile force. Since this principal works in tension, its potential to work in compression is greater; for the anchor to move downward it would have to be threaded downward.
The idea then, was to design a saddle that could accept a beam and then weld this saddle to the top of a mobile home anchor. The saddle needed to 'pinch' and hold the beam *(fig.7)* on both sides of each corner and be strong enough visually to carry the building platform as an entity separate from the tower. The building platform needed to be its *own* but in service to the tower; to satisfy this desire the saddles' geometry needed to contrast the building platform and the geometry of the tower form which sat on the building platform. The visual lightness of the 5/8" diameter rods supporting a disproportionately large building would make the building seem buoyant. The saddles pinching the building platform would read as though they were not so much acting in compression, but in tension; seeming to keep the building from moving laterally or vertically.
I designed a saddle that would accommodate the aforementioned wishes and function with the ephemeral characteristics associated with the towers' program and site. The saddle is graphically strong *(fig.5)* and heavily rusticated with fastening hardware. Duplex headed nails array the perimeter of a one foot diameter semicircle and a galvanized carriage bolt with a stainless steel fender washer mark the center of the shape. The design was drawn digitally and sent via on-line services to a water jet machine at the Radford Arsenal. Using 3/16" 'mystery-scrap' steel, the water jet precisely cut 16 perfect examples of the design. Taking these 16 pieces, I made 8 saddles, and welded these saddles to an off the shelf mobile home anchor. *(fig.6)*

# foundation

*fig.4*

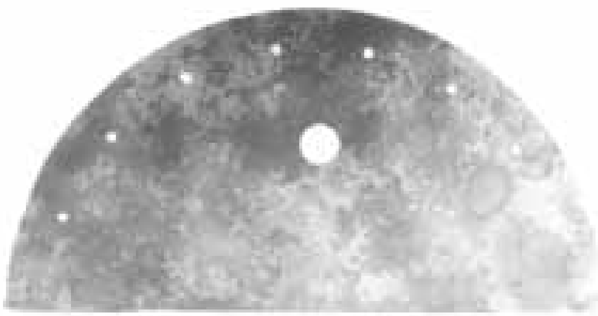
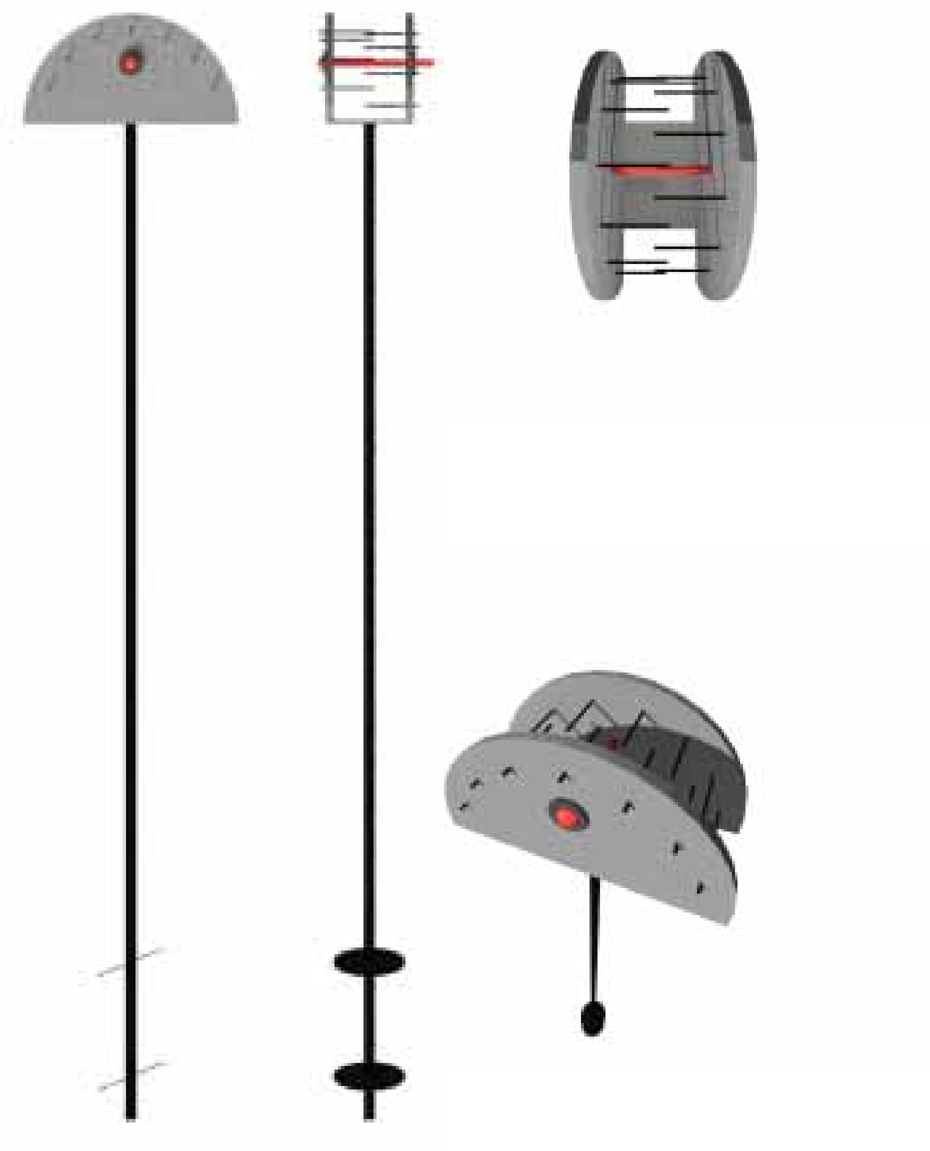


*fig.5*

*fig.6*

# foundation



(fig.7)

# foundation

The foundation piers needed to be installed on the site with such accuracy that the building platform could be 'dropped' into them without excessively manipulating the position of the pier or deflecting the shape of the building platform.

Two stakes were driven about two feet apart in what was determined to be approximately the southwest corner of the tower. A two by four was then nailed horizontally across them. This batter-board assembly was used as a point of origin and a well made pocket compass was placed on the level two by four to find due south. A string pulled perpendicular to the south axis of the compass determined the south face of the tower and the east-west axis. Using a transit to determine a level line, a second batter-board assembly was made on the southeast region of the tower about twelve feet away from the first batter-board. At this point a level string line could be made between the two horizontal two by fours. Perpendicular from this level string running approximately east-west, two strings were placed exactly eight feet apart. Batter-boards were placed around the perimeter to accept strings and a perfectly level, eight foot square made of yellow string was constructed. Using a red pen, the positions of the eight piers were marked on the strings.

Although these red marks showed the exact position of the piers, installing the piers was still a matter of approximating close to these marks. From previous testing I found that the piers would easily deflect laterally in the soil up to an inch. This deflection would allow the 'eight-pier-grid' to conform to the exact eight foot square foundation platform. It is suspected that this forced deflection will add strength to the foundation assembly.

The foundation piers in the southeast and southwest corners are 30 in. deep, while the northwest and northeast piers run as deep as 52 in. Both types were twisted into the earth by hand using a five foot metal bar as a lever arm. (fig.8) The difference in depth accommodates the change in grade. The higher out of the ground the saddle is the deeper the helical discs of the lower end of the pier.

When the building deteriorates and is removed, what will it leave behind? Physically, what will it leave in the terrain as a memory of its existence? With this foundation system, when the building is removed from the site even the soil where the building stood will remain largely un-manipulated. In theory, it could still be considered undisturbed soil. The tower should leave no evidence in the terrain of its existence. This brochure is an artifact.

fig.8

# foundation

After the eight foundation piers were driven to the correct depth the batter boards and strings were removed. The eight freshly sandblasted steel saddles made a level plane and contrasted the slope they sat on. Together, they became an individual thing; an installation. *(fig.9)*

*fig.9*

A hydraulic lift was available and was used to move the 350 lb. building platform from the shop to the site (fig.9). The building platform was moved with little difficulty and sat alarmingly level and square on the piers. The weight and strength of the hydraulic lift made the coupling of the piers and platform relatively easy. *(fig.11)* After verifying the platform was level and square, duplex headed nails were driven through the saddles into the perimeter beam to keep the foundation assembly static while carriage bolts were installed. *(fig.12)*

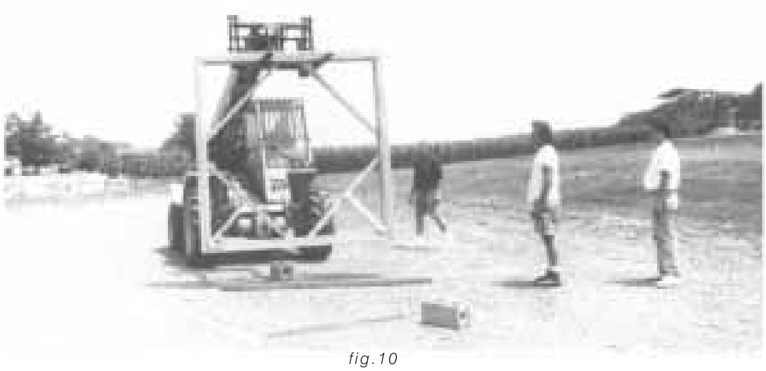


*fig.10*

# foundation

fig.11

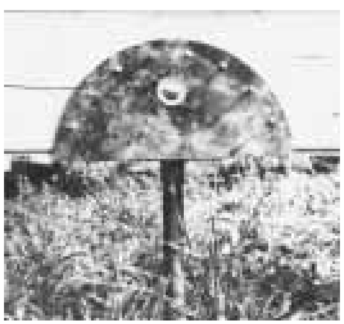


fig.12

# walls

The walls of Geldzuviel are made of 220 salvaged commercial two by four studs and fifty pounds of cement coated 16d nails.. The walls were built from fully dimensioned working drawings *(fig.13)* in the shop at R.D.F. and stored there until ready for assembly on the site. *(fig.14)*

Three types of two by four frame walls were used to construct Geldzuviel. The balloon wall, the leaning wall, and the semi-typical wall.

fig.14

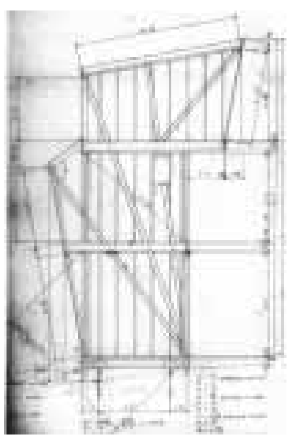


fig.13

# wall

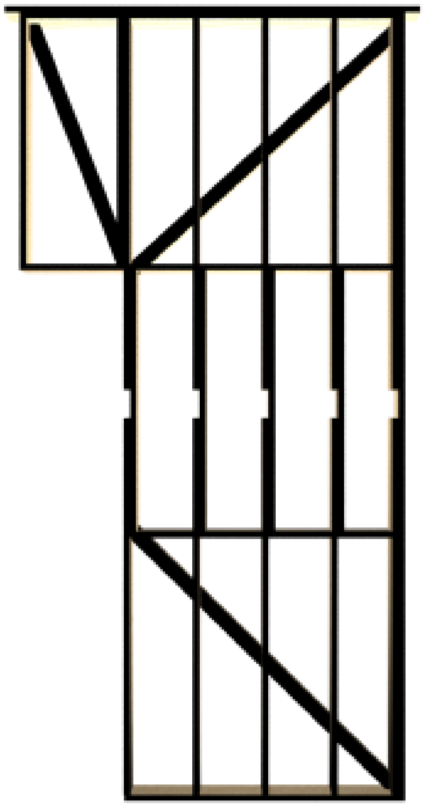


fig.15

The balloon wall *(fig.15)* occurs once in the tower. On the south face, starting at the building platform, a wall extends fifteen feet seven inches vertically. This wall is made of splicing / laminating two by fours together to make the desired span. A void mid-span in the splicing / laminating allows for loads from members of the intermediate floor structure to be carried by this wall. This wall does not carry compressive loads from either intermediate or upper floor structures, but rather helps carry lateral loads from the 'whole' structure. It was anticipated that this wall would carry a bit more than it does.

# wall

*fig.16*

The leaning wall *(fig.16)* occurs three times in the tower. Two sections of leaning wall are used for the ground level and intermediate level wall on the north face and one section makes the south face of the upper level.
The leaning wall is named as such because, when assembled in the structure of the tower, it is pitched at ten degrees from vertical. Building such a wall with conventional modern tools is of comparable complexity to building a wall that will stand vertical. Any difficulty with construction of this type of wall, as such with most construction, can be minimized with forethought. By accepting that a quota of cuts at an angle must be made and a number of pieces must be used, then the rest of the 'numbers' can be manipulated.

# wall

*fig.17*

The typical wall *(fig.17)* occurs seven times in the tower. These walls can be found vertically stacked on both the east and west sides and on the north side of the upper level.
The ground level and intermediate level walls of the east and west faces have packed studs on opposite ends. These packed studs act like load bearing columns that carry the beams above them. Diagonal bracing keeps the walls square until siding material is applied and strengthens the towers reading as an object by unifying the separate walls. This bracing technique was originally meant to have a second purpose, to serve as a place to end and begin pieces of siding material. This idea was not pursued for two reasons. One, the graphic strength of such a maneuver would be over powering and would break the siding material into 'pieces' instead of the desired 'skin'. Also, spanning the width of the tower with a single piece of siding material was structurally advantageous.

# beams

fig.18

The beams of Geldzuviel *(fig.18)* are made of unseasoned dimensional lumber purchased from a local lumber mill. The lumber offered by this mill seems to have been priced according to the distance away from the office where revenues are taken. There is an 'A' grade lumber, which is sold at a premium and is closest to the office. A 'B' grade lumber is next, and so on until the 'D' grade is found, some distance beyond the office. Some distance beyond the 'D' grade lumber I found a stack of dimensional lumber that could be used for the beams (and joists) of Geldzuviel. This lumber, which was cut from the yellow pine trees, was considered in bulk to be either too knotty or too twisted to be sold for construction. During a light summer rain one morning I sorted through this lumber and found pieces that would be suitable for the project. It took an hour to find enough material. It was a rewarding and memorable time.

# joists

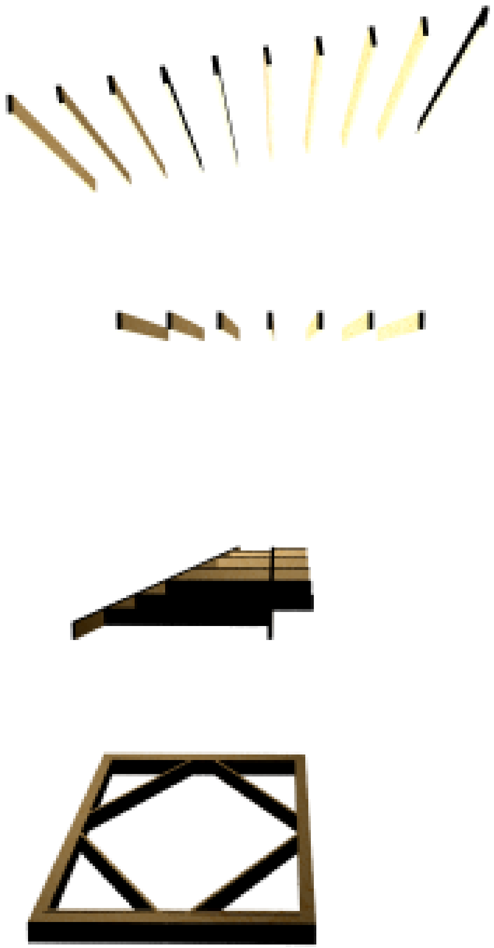


*fig.19*

The joists of Geldzuviel, *(fig.19)* like the beams, are made of unseasoned dimensional lumber purchased from a local lumber mill. The joist material is rough sawn two inch by six inch yellow pine. Roof joists are nailed to the top of the upper floor walls using cement coated 16d nails. Upper and intermediate floor joists are attached to main load bearing beams with galvanized joist hangers.

The original thoughts on the intermediate floor were that there would be no joists or plywood. Rather, this level would be made like a trampoline and act like a hammock for sleeping. This strategy was intising because of the structural difficulties it posed and the questionable effects that could result. After a great many drawings I determined the trampoline floor would be too expensive and compromise the structural integrity.

# rigid panels

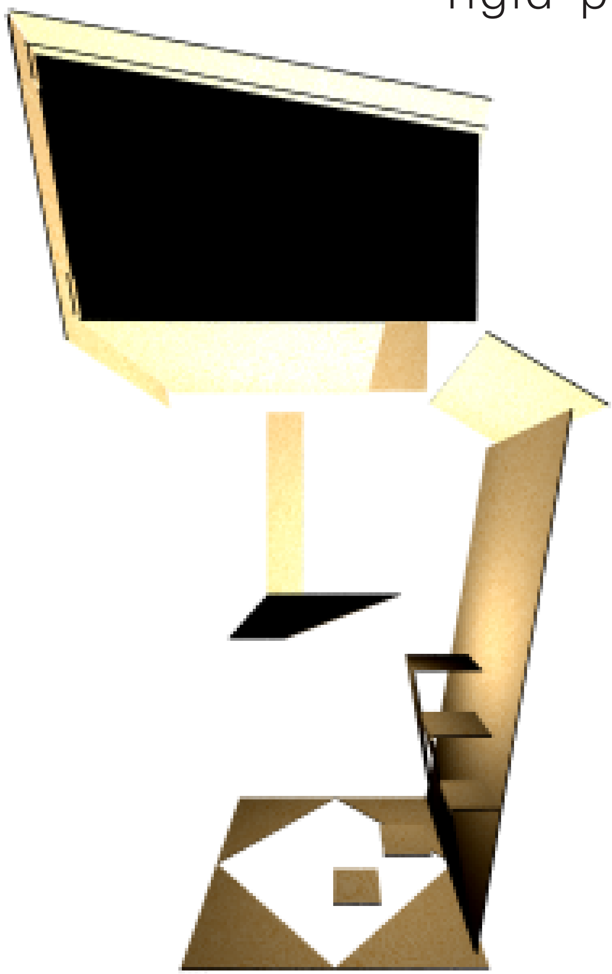


*fig.20*

The rigid panels in Geldzuviel *(fig.20)* are made of 9/16" oriented strand board sheets recycled from a project of the Department of Architecture and laid over wood framing. As presented earlier, one sheet of pressure treated plywood was used for gussets on the building platform.

The oriented stand board sheets provide lateral strength across the entire vertical dimension of the north walls and cover the interior / exterior of the upper level. A sheet of new oriented strand board was chosen as a finished surface for the intermediate level floor. Upper level floor is finished with recycled 3/4" exterior grade plywood and flat black exterior grade latex paint.

# frame

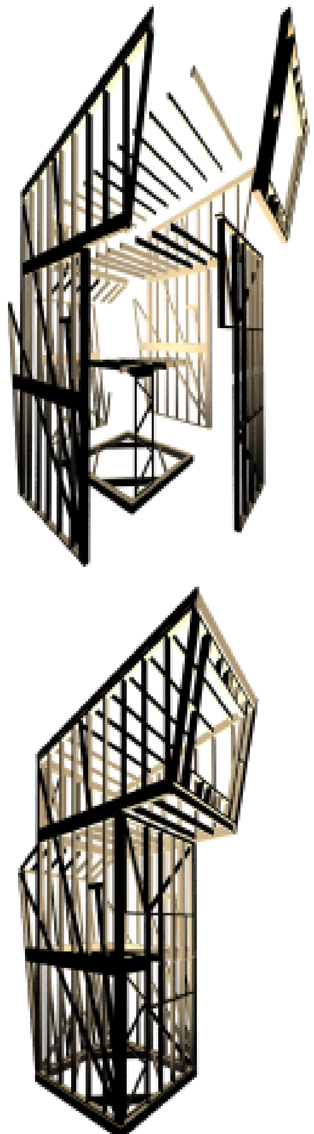


*fig.21*

The frame of Geldzuviel *(fig.21)* was assembled over a period of twenty days with the help of two friends, Mark Champion and Dave Connerley. The *actual* assembly time was considerably less, but due to time spent pondering and other obligations, the assembly process was lengthened.

# frame

fig.22

The first five walls of Geldzuviel were loaded from the shop at R.D.F. to the back of a pickup truck and driven to the site. The ground level east and west walls were nailed to the building platform exactly eight feet apart and the leaning wall on the north side fit perfectly between them. Next, the balloon wall was placed between the east and west walls. At this time the assembly of the four walls looked like the frame of a giant toilet. *(fig.22)*

Next, beams that carry the leaning wall and shed roof on the north side were nailed to the top side of the ground level east and west walls. Like the walls, these beams were made in the shop and driven to the site.

We completed the above work, in a leisurely fashion, on a Saturday.

# frame

fig.23

From the intermediate level floor joists we were able to prepare staging for the rest of the tower. We erected scaffolding, made a temporary floor at the intermediate level, and installed temporary bracing on the first level. The east and west intermediate level walls were lifted from the ground and nailed into the east and west intermediate level beams and into the balloon wall. The leaning wall on the north side fit perfectly between them. We noticed at this point that the frame had a *severe* 'wobbliness' about it. I had always suspected that Geldzuviel would let off a subtle tremor when climbing through it, and although I knew that as the structure closed the frame would stabilize, I feared the 'wobbliness' was something I had missed. I could *feel* though that the frame was as stable as it should be. I could *feel* it wasn't entirely the frame. The deflections seem to be accentuated by the foundation piers. The piers, regardless of depth are not static until about 12 inches below grade. From this point and above the pier can deflect as much as one inch laterally. This much deflection, when transferred vertically from sixteen feet is most noticeable.
We continued assembling as planned. Upper level beams were nailed into the top of the intermediate level walls and joists were hung with joist hangers between them. Plywood was then laid over the joists making it possible to stand on the upper level floor. *(fig.23)*
We completed the above work, in a leisurely fashion, on a Sunday.

# intermission

Standing on the small platform without walls, sixteen feet above the ground mentioned on page twenty-five, is emotionally charging. The feeling, I believe, is not produced by experiencing a view of the landscape, but from the space defined by the platform. Meaning, in the landscape of Southwest Virginia spectacular views are quite common and being only sixteen feet above the ground doesn't make a drastic change to one's *impression* of the landscape. One's position in the hierarchy of the things in the landscape does *feel* a change. I did not research this phenomenon but experienced it.

The upper level floor of Geldzuviel remained a platform for two weeks and during this period, usually in the evening, I would climb to the top and study the terrain beneath Foxridge apartment complex. I would study and follow the fall and rise in the terrain from as far away as I could see to the point where the apartments started, and then, imagine what manipulations were made in the terrain to make Foxridge what it is, where it is. I remember thinking what a colossal maneuver it is to reshape the terrain of the earth and that it seems to be a prerequisite for urban development in the United States.

Why do this?

Why, where it is not necessary, add the maneuver of reshaping the landscape?

Would a building not be more *of* a hill if the building respected the terrain of the hill?

What effects would there be if buildings didn't permanently manipulate the natural terrain of the earth? What would this physical distanciation between the manufactured environment and the organic environment do for the relationship between humankind and the earth?

This approach when manifested is not too unlike Le Corbusiers' theory of *pilote*. Unlike Le Corbusiers' approach however, this strategies main concern is to preserve the permeability of the earths' surface below the structure of a building, to maintain the natural depressions and protrusions in the terrain whether subtle or drastic; to let water stand and collect where it may, let wind blow debris where it may.

Let there be mud.

# frame


fig.24

Raising the upper level walls and roof / ceiling joists required the help of two volunteers. The walls were placed in the bed of a pickup truck and backed as close to the building as possible. A canvas strap was looped around one of the studs in the wall and hoisted up by two people standing on the upper level floor. (fig.24) East and west walls were installed first, then north, then south. In the excitement of the assembly and with the anticipation of incoming rain clouds, we didn't check the newly installed walls for plumb and square. Taking diagonal measurements of the upper level walls showed that the parallelogram was off by nearly an inch and a half. After considering this condition for some time I said "so what", and we started installing roof / ceiling joists. The joists were a little skewed, because of the aforesaid problem, but in no way affected the project.

# frame

fig.25

I've been told many, many times that a wooden frame building loses something when it is sheathed; that the frame, alone, has an integrity that suggests a completeness. I have been witness to this condition and have a strong belief that many times it is true; that several wooden framed buildings are their *most* dignified when as a frame. This was not so with Geldzuviel. The frame, to me, was a thing unfinished.

# trim

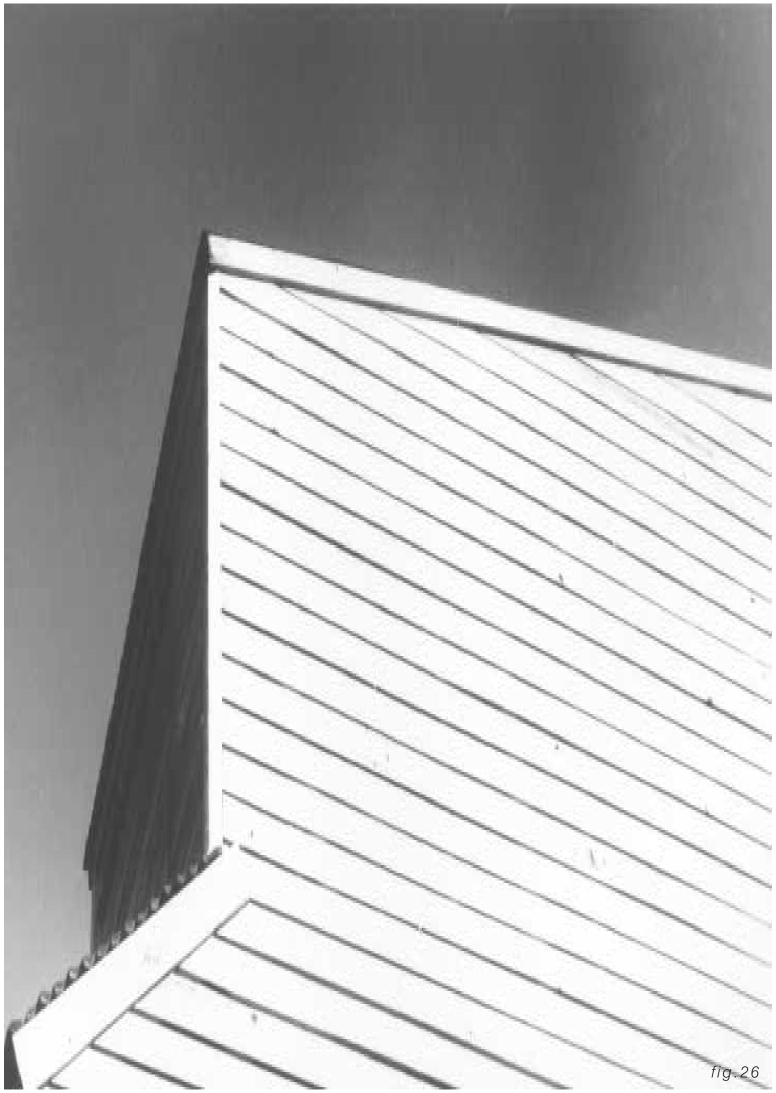


fig.26

There are several pieces of poplar trim on Geldzuviel. The trim acts in the traditional manner as a place to stop a field of material. In the conditions presented above, *(fig.26)* the trim pieces act as a place to stop the siding material. The pieces were designed graphically to accentuate the length of the upper roof and to accentuate the short, stubbiness of the lower roof.

# roof

*fig.27*

The roofs of Geldzuviel are made from off-the-shelf 30" x 144" sheets of corrugated galvanized metal sheets nailed over yellow pine rafters. The direction of corrugated roofing is turned perpendicular to the slope of the lower roof to maximize use of the material. This maneuver also enhanced the visual texture of both the metal roof and the poplar siding. The horizontal lines of the corrugated metal look as though they submit their direction to the powerful horizontal lines of the siding material on the northern side of the tower. The contrast in material is minimized by the allegiance of direction, bringing the contrast in texture forward.

# stair ladder assembly

fig.28

The stair in Geldzuviel is grafted into the ground level north wall and ground level east wall. It is made of salvaged commercial grade two by four pine studs and miscellaneous sized sheets of salvaged oriented strand board. From the middle of the east wall two equal sized platforms rise to meet a slightly larger platform on the leaning wall of the north side. From here the trail turns ninety degrees to the left and continues to rise. As they rise the platform size grows in length and width. The highest platform is approximately two feet square and serves as a landing for a ladder that continues the trail to its destination.

The ladder in Geldzuviel is positioned as an independent object between intermediate and upper levels. It is made of unseasoned white and red oak. Rough sawn lumber was dressed and shaped in the shop at R.D.F. and then assembled in the tower. Like the stair, as it ascends the platform surface grows. *(fig.28)* The ladder contrasts the stair, making a clear separation in the trail; defining a place.

A person using the stair ladder assembly will twist their way through the volume of the structure without a required association with the intermediate or upper level floors. The stair ladder assembly, although grafted onto the lower level walls, is in itself a type of room, different from those defined by the three floor levels. The volume that the stair ladder is found in, beginning at the ground and extending uninterrupted to the ceiling of the upper level, makes a kind of *room perpendicular* to the floor level rooms. The large open volume is used physically as well as emotionally.

# stair ladder assembly

*fig.29*

# skin

fig.30

The skin of Geldzuviel is a surface of rough sawn unseasoned 7/8" thick by 4" wide poplar boards of varying length nailed perpendicular to the vertical dimension of the frame. Between each board is a 1/2" to 5/8" void.
The technique was chosen after surveying a small farm building in the Catawba Valley. This building, which is about thirty to thirty-five years old has horizontal poplar boards that seem 'pasted' to the surface of it's frame. As the buildings frame began to settle and twist, the boards stayed true to their original position on the frame; the skin followed the integrity of the frame. I suspect that as Geldzuviel ages it too will bend and twist; the structure becoming animated.
The skin of Geldzuviel is perforated. Like the small farm building used as a model, Geldzuviel is not weather tight. The strategy was to make the enclosure loose enough that any water entering the structure can run back out or evaporate in the open air. The strategy of making the structure watertight presented levels of closure and permanence not desired. A strategy to keep water out would presume that the building is static. Geldzuviel moves. It had to be assumed that the structure could possibly, because of the volatility of the foundation piers, drastically and permanently change its form with age, creating spaces to hold water.

# skin

*fig.31*

In the search for material to make the skin of Geldzuviel, I found a sawyer willing to exchange two days labor and one-hundred and twenty dollars for 1200 in. ft. of unseasoned poplar. The two days labor were spent sawing poplar logs into 7/8" by 4" boards. Eight newly cut poplar trees made about 1200 ln.ft. of material of which I used 1000 in. ft. for the project.
The costs here are a significant issue. Financially and environmentally.
By using a *very* small business with low operating costs the price was less than half of that offered by a large commercial business. This worked to the advantage of the project and to the advantage of a local business.
Using unseasoned wood saves energy often used in commercial kilns; a step in the process is eliminated.
The Wood Miser portable band saw used by the sawyer *(fig.31)* wasted 1/16" of wood per pass. Most large commercial lumber yards use an enormous disc-like blade that saves time but eats 1/4" of wood per pass. To fulfill the order required for this project, two more trees would have been required had a commercial mill been used.

# skin

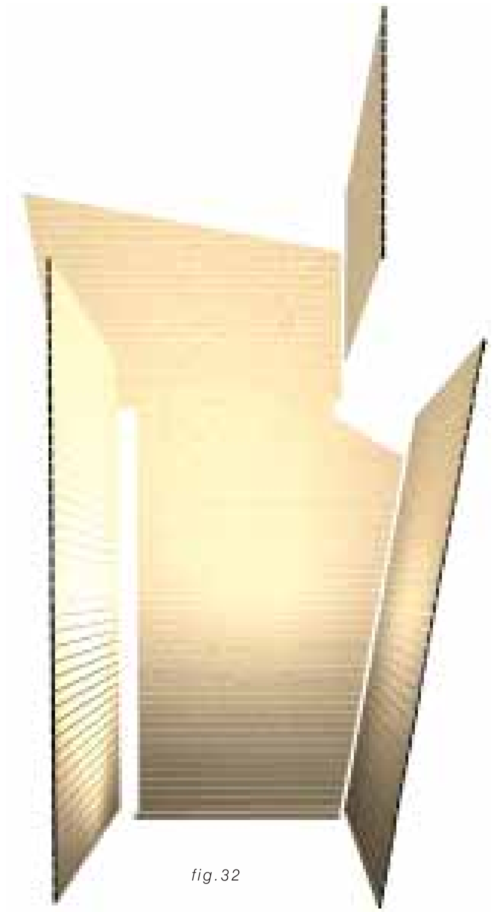


*fig.32*

Surfaces of poplar boards make a skin that was thought of much like the skin of an organism. Horizontal lines remain unbroken across each exterior wall surface joints between two boards occur only at corners and at doors.
8d galvanized finish nails were countersunk into the unseasoned poplar boards. As the poplar dries it will shrink around the head of the nail making it disappear. Like the building platform, the presence of fasteners is controlled.
Choosing Geldzuviels' skin was a matter of discrimination. Pine, left untreated and exposed, will weather to a black. Red or white oak with its immense weight, will turn a nice grey, but its immense weight made it unsuitable. Poplar was chosen for its light weight and blonde color, which will turn silver with age, and durability when left untreated and exposed to weather.

# skin

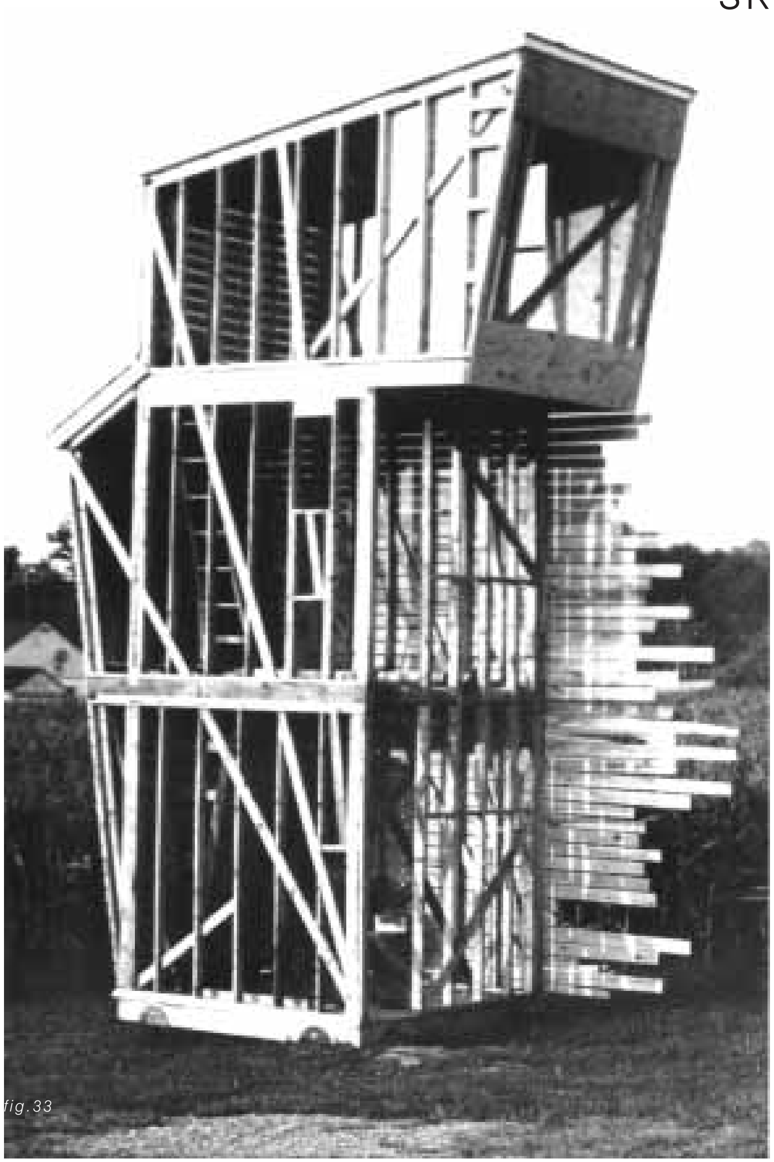


fig.33

A good tight fit was desired with the least amount of work. Starting at the north wall boards were pre-cut to the outside dimension of eight feet and nailed in place. Boards for the east and west walls were pre-cut on one end with the correct angle to make a tight butt joint. After all the boards on the east side were in place *(fig.33)*, a circular saw was used to cut off the excess. This procedure resulted in a uniform line and was repeated on the west side.

# door

*fig.34*

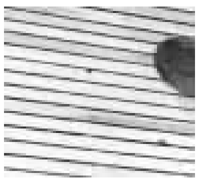
The door of Geldzuviel is made of salvaged two by four commercial grade lumber and attached to the ground level portion of the balloon wall. On the top of the door, a six inch diameter steel pipe filled with concrete placed twelve inches from the vertical center acts as a counterbalance against the doors weight. By sliding a pin in the wall, the door rotates about an axis on the top side of the door. The door tilts open about ten degrees, making space for a body to move inside. *(fig.34)* This tilt approximately matches the leaning wall on the north side of the building making its presence as part of the structure. The skin of the building *peels* up; one doesn't enter the tower, one invades it.

From the early conceptual stages of the tower design, all openings were thought of as part of the skin, meant to appear when open and disappear when closed. This strategy was chosen to maintain the rigid maxim that the tower is an object, that it is not a part of a larger thing. The 'objectness' of it provides a clue of its mobility and ephemeral qualities.

The design strategy stated above presented a nice condition. Initially, the door on the balloon wall was going to be lifted by hydraulic struts taken from a mid 1980's Chevrolet Camaro. Mark Champion suggested using a counterbalance method because of it's simple mechanics; arguing the technology of the hydraulic strut being an excess. This taught me the strength of collaborative design. That a designer acting alone risks becoming too inside the design, losing perspective of the project. I believe two designers, one acting as inventor (mother or father), the other acting as consultant (aunt or uncle) can provide a significant advantage to solitary design.

# window

*fig.35*



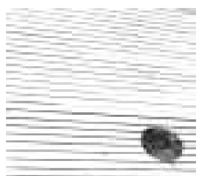


*fig.36*

The window of Geldzuviel is made of a 3/16" thick pickled alloy steel outer plate and a translucent blue acrylic inner plate. These plates are held to the surface of the building with duplex headed nails and a modified carriage bolt.

The two plates are fastened to a laminated wood panel made of commercial grade lumber. A cylindrical void is made in this laminate that allows the inner plate of blue acrylic to be seen from the interior. The shape of the outer steel plate was drawn digitally and sent via on-line services to a water-jet machine at the Radford Armory. Like the saddles for the foundation piers, the finish of the plate was perfect. Installing the plates required recessing a space in the poplar skin and laminated wood panel so the outer plate would lay flush with the exterior of the tower.

The design of the shape of the window came from a desire to make a strong contrast in the strict horizontal lines of the tower's skin, *(fig.36)* thus strengthening the reading of the skin as a single surface. The window continues the maxim that the tower is the result of a shifted geometry by its position off the center of the tower's geometry. The geometry of the inner window is then shifted from that of the outer window *(fig.35)* and the fasteners that hold the two plates to the structure then contrast this shift. The window assembly is a little mess contained in a field of strict order.

From the interior of the intermediate level of Geldzuviel, the window assembly projects a blue void. The blue activates the space by its singularity and welcomes a body to the intermediate level floor. A harbor along a trail.

# interior

fig. 37

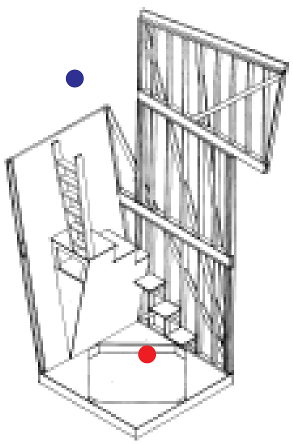
The interior of Geldzuviel is black. Black, black, black, with focused lines of intense color. *(fig.37)*

After the frame, stair, ladder, and skin were completed, six gallons of exterior grade flat black acrylic latex was laid over the interior surfaces of the structure. Only the intermediate level floor surface and interior window panel were spared.

The black interior cloaks the poor quality of the salvaged framing material, accentuates exterior places from the interior by making their colors saturate the void between the poplar boards, and works to level the hierarchy of interior features like the stair, the leaning wall, etc.

The interior seems to think it is made of a single, void-like material. The blackness directs its attention to the voids in the wall surfaces. These surfaces, the solid surface and the void surface, blend with each other and at times become indistinguishable. *(fig.37)* When light passes through the voids and lands on the black surface it creates a momentary illusion of another void . This condition becomes pronounced when the sun comes close to the horizon.

# interior



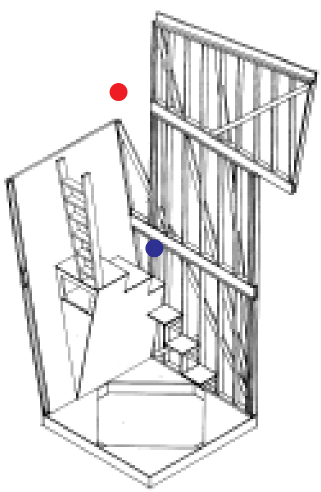
Blue = Camera
Red = Target

fig.38

The ground level floor surface is held to a minimum, leaving a large void which reveals the terrain below the tower. This void brings the exterior of the building inside; being enclosed isn't necessarily being inside. A person shouldn't feel fully accepted into the building until standing on the platform where the stair and ladder meet. At the junction of the stair and ladder the wall on the north side provides a welcoming place to lean and pause. From this position in the building several decisions can be made. To step across an open volume onto the intermediate level, to continue to the upper level, to retreat to the ground level, or to stay.

# interior

*fig.39*



Blue = Camera
Red = Target

# exterior


fig.40

From a fair distance away, the exterior of the building perforates and shows the diagonal bracing on east and west walls. The diagonal bracing helps unite the three floor levels and strengthens the structure's reading as an object. The building's design as an object was noted as being successful when a person commented that it reminded them of the Trojan Horse from Monty Python's film *The Holy Grail*.

# exterior

fig.41

Standing next to the tower, the surface of the structures skin starts to become solidified; the voids become a surface. The number of horizontal lines help the butt joined pieces of poplar read like a continuous piece that wraps around the structure.

# exterior

*fig.42*

The exterior of the south face of the upper level wall is made of salvaged 3/4" pressure treated plywood and is painted black like the interior. This surface disappears at night, blending with the sky.

# the show

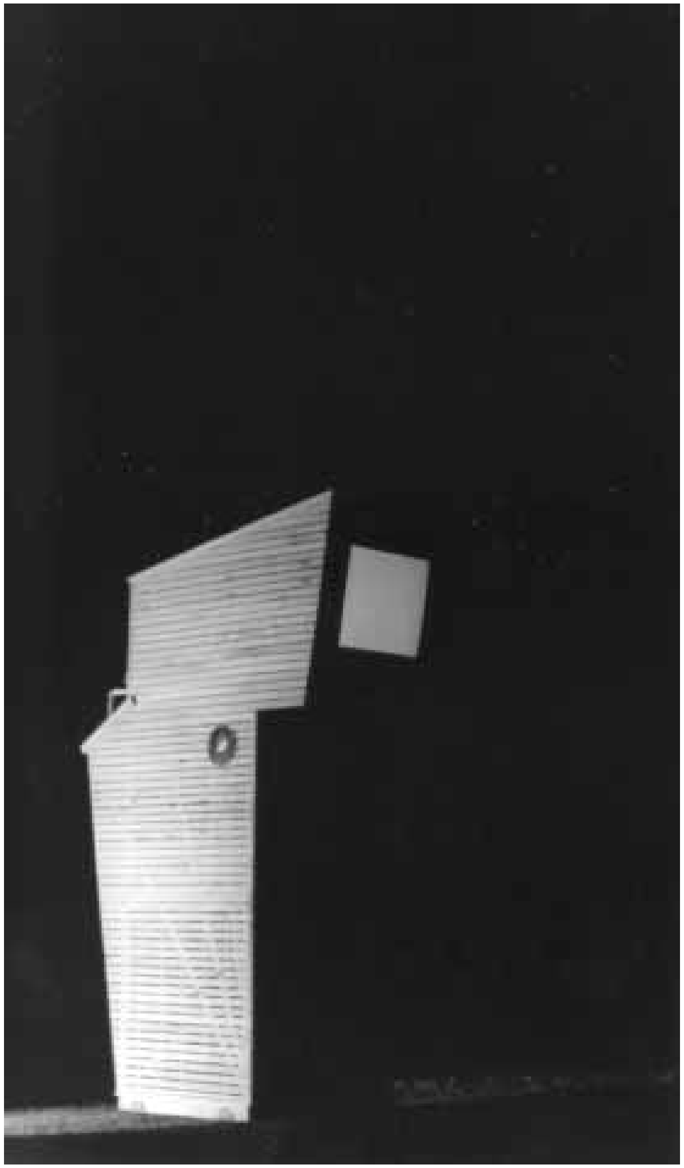


*fig..43*

# the show

fig.44

The show happens at night when the tower becomes a 'walk-in' movie theater. While at the Starlight Drive-In Theater in Christiansburg, Virginia one evening I noticed that most people watching the film were on blankets on the ground, or in lawn chairs. I thought Geldzuviel could be a type of urban theater, like the drive-in, but without the automobile.

A door in the upper level north wall swings inward an is latched against the wall. A temporary shelf made of salvaged lumber is placed over the sill of the door opening and rests on the lower roof of the north wall. A digital projector, capable of reversing the image is placed on the temporary shelf. Cables are fed from the projector to a video tape player and speakers. Next a white Ripstop nylon screen is stretched across the interior of the five foot square opening of the upper level south wall. When the image from the projector fills the opening, the tower, from earth to sky, is an active unit.

Although the landscape surrounding the tower becomes charged with activity when the show starts, the real energy is found inside the tower. The cables and wires needed to show the films run through the tower like veins and arteries. Installing the equipment is like being the mechanic backstage of a little mobile theatre; like being within the guts of a machine. Ones imagination is unavoidable.

# the show

*fig.45*

# hopes

It is my hope that this building will serve as a catalyst for other work of its nature. That the field behind the Research and Demonstration Facility will become filled with follies; little pockets of research.
I hope Geldzuviel is used as it was intended to be used and also as it was not intended to be used.
It could be a nice tea house.
Perhaps it serves as a shelter for a visiting alumni.
Maybe it becomes a retreat for the students of the R.D.F. studio; a place to read.
It may serve as a host upon which future projects, speculative or otherwise, could be grafted.
Perhaps before it collapses we could alert the airport, and have a beautiful fire.

# thanks

I would like to thank my Mother and Father for their support of my decisions. My Father, who was a great architect, inventor, and friend, would have greatly enjoyed this project. To him this is dedicated.

Mona, for her honesty and integrity from which I try to model myself, and for her spirit with which I am hopelessly addicted.

Mark Champion and Dave Connerley without whose hard work, curiosity, friendship, and ideas this project could simply not have happened.

Mario Cortes, Bill Green, and Robert Schubert for their time, energy, and patience. You are each a fine example of the architect I wish to be.

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# credits

1. **The Cult of the Vespa**, Editori di Comunicazione S.r.l. Qoute taken from the essay **The form of the Vespa** written by Francois Burkhardt and Francesca Picchi
2. **Follies: Architecture for the Late-Twentieth-Century Landscape**, Rizzoli International Publications, Inc. Quote taken from the essay **History of the Folly** written by ANthony Vidler.

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