NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

SENT TO D.C.
12-22-05

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name **Fuller, R. Buckminster and Anne Hewlett Dome Home**

other names/site number

2. Location

street & number **407 S. Forest Avenue** _____Not for publication

city or town **Carbondale** _____vicinity

state **Illinois** code **IL** county **Jackson** code **077** zip code **62901-2505**

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this X nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant X nationally ___ statewide ___ locally. (___ See continuation sheet for additional comments.)

William L. Wheeler /SHPO — 12-21-05
Signature of certifying official — Date

Illinois Historic Preservation Agency
State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official — Date

Illinois Historic Preservation Agency
State or Federal agency and bureau — American Indian Tribe

4. National Park Service Certification

I, hereby certify that this property is:	Signature of the Keeper	Date of Action
____ entered in the National Register ___ See continuation sheet.	_____	_____
____ determined eligible for the National Register ___ See continuation sheet.	_____	_____
____ determined not eligible for the National Register	_____	_____
____ removed from the National Register	_____	_____
____ other (explain):	_____	_____

5. Classification

Ownership of Property
(Check as many boxes as apply)
- __x_ private
- ___public-local
- ___ public-State
- ___ public-Federal

Category of Property
(Check only one box)
- _x__ building(s)
- ___ district
- ___ site
- ___ structure
- ___ object

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
__1___	__0__	buildings
__0__	__0_	sites
__2___	__1_	structures
__1___	__0_	objects
__4___	__1_	Total

Number of contributing resources previously listed in the National Register **N/A**

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.)
N/A

6. Function or Use

Historic Functions (Enter categories from instructions) Domestic, single dwelling
Domestic: Single Dwelling

Current Functions (Enter categories from instructions) Work in Progress
Domestic: Single Dwelling

7. Description

Architectural Classification
(Enter categories from instructions)
Modern Movement

Materials (Enter categories from instructions)

Foundation **Concrete**

Roof Asphalt: **Shingles**

Walls: **Plywood**

other

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

See Section 7 continuation pages.

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

____ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

__x__ B Property is associated with the lives of persons significant in our past.

__x__ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

____ D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations (Mark "X" in all the boxes that apply.)

____ A owned by a religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

__x__ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
Invention
Architecture

Period of Significance **1960-1971**

Significant Dates

Significant Person (Complete if Criterion B is marked above) **Fuller, R. Buckminster**

Cultural Affiliation **N/A**

Architect/Builder **Fuller, R. Buckminster and Miller, Al/Parrish, Ira**

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.) See Section 8 continuation pages.

9. Major Bibliographical References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS)
___ preliminary determination of individual listing (36 CFR 67) has been requested.
___ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey # _____
___ recorded by Historic American Engineering Record # _____

Primary Location of Additional Data
__x_ State Historic Preservation Office
___ Other State agency
___ Federal agency
_x__ Local government
___ University
_x__ Other

Name of repository **RBF Dome NFP,407 S. Forest Avenue, Carbondale, IL 62901**
Carbondale Historic Preservation Commission

10. Geographical Data

Acreage of Property **Less than one acre**

UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	**16**	**303882**	**4177432**	3	__	_____	_____
2	__	_____	_____	4	__	_____	_____

___ See continuation sheet.

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

See Continuation Sheets

Fuller, R. Buckminster and Anne Hewlett Dome Home | **Jackson Co., IL**
Name of Property | County and State

11. Form Prepared By

name/title **William M. Gatlin**

organization | date **October 2005**

street & number **818 Themis Apt. 203** | telephone **573-651-8976**

city or town **Cape Girardeau** state **MO** | zip code **63701**

Additional Documentation

Submit the following items with the completed form:
Continuation Sheets

Maps
A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs
Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name **RBF Dome NFP**

street & number 407 S. Forest Avenue **telephone 618/549-3663**

city or town **Carbondale** state **IL** zip code **62901-2505**

Narrative Description

The R. Buckminster Fuller and Anne Hewlett Fuller Dome Home is located at 407 S. Forest Street, Carbondale, Illinois. Carbondale is in south central Illinois and is home to Southern Illinois University. The Fullers built the dome house in 1960 while Fuller was a faculty member at SIU. The dome is located in a residential neighborhood of conventional homes. The dome is located on a 51' x 121' lot, which is enclosed by a wood slat fence designed by Fuller. The fence was designed to allow the breeze to pass through while screening the house from sight and noise and provided an exterior living space. It is a contributing structure. A small circular fountain is located south of the house. The sound of the fountain contributed to the ambiance of the exterior living space and masked outside noise. The fountain is an original feature and is a contributing object. A concrete pad with room to park two cars is located north of the structure and is non-contributing. A 46'diameter steel frame covered with chicken wire and greenhouse plastic covers the dome and protects it from the elements until it can be rehabilitated. The protective dome is noncontributing.

R. Buckminster Fuller developed the geodesic dome framing system which he patented in 1954. A number of companies designed and built domes or manufactured prefabricated dome structures on license from Fuller. Among these companies was Pease Woodworking Co. of Hamilton, Ohio, owned and operated by Al Miller. Miller designed and manufactured prefabricated dome structures based on Fuller's conceptual design. Martin designed the dome which was constructed at 407 S. Forest Street. This was the

first residential application of a Pease dome. The dome was constructed by Ira Parrish, a Carbondale contractor.

The Fuller dome rests on a poured concrete pad. The pad is four inches thick with embedded copper pipes for radiant heating. It is ten-sided, with a diameter of thirty-nine and one-half feet.

The dome contains no interior frame. It was constructed by bolting together prefabricated triangular sections. The triangular sections abut to form hexagons or pentagons, which are seven feet and eleven inches on each edge. Each of the sixty triangular sections is made with 5-16ths-inch plywood on a 2 x 4 frame. The frames were bolted together and the seams were taped and chemically coated to provide waterproofing. The intersections of the sections create a "dimpled" appearance. The dome is thirty-nine feet six inches in diameter and sixteen feet six inches at its highest point. Ten Plexiglas skylights provided interior lighting. The exterior of the panels were painted blue and white.

Five trapezoidal dormers house doors and windows. One dormer cases a traditional wooden front door and a window. The bedroom dormer has a traditional double-hung window. Two dormers open off the living room and contain sliding glass doors. The fifth dormer houses a sliding glass door opening off the dining area. The dormers are evenly spaced around the circumference of the dome.

The interior walls are 1/8" wood paneling, painted white. There are 1100 square feet of floor space. A loft adds an additional 300 square feet. Entry to the dome is through a dormer roughly on the northeast side. A door opens northwest from the entry and leads to the bedroom, which contains two closets and two bathrooms. The entry is open to the south for access to the living room. About half of the ground floor level is devoted to the living room. The base wall for the loft study bisects the house on an almost direct east-west axis. The living room is open to the full height of the dome. Two dormers provide natural light. The northwest corner of the living room opens to the kitchen, which has room for a dining room table. All kitchen services are lined along an interior wall. The house is operated on electricity. A boiler in a utility room located off the living room provides hot water for the radiant heat and domestic use. A stairway from the living room provides access to the library and study. The library is above the kitchen, bedroom and entry, and it is open to the living room below.

The R. Buckminster Fuller and Anne Hewlett Fuller Dome Home has sufficient integrity for listing on the National Register of Historic Places. The exterior remains unchanged in configuration. The original roof material has been replaced over time. The roof is currently covered with asphalt shingles. There may be additional layers of shingles. Fuller applied the first layer of shingles in the early 1960s after the original roof coating proved inadequate. Either at that time, or sometime later, the skylights were either removed or covered on both the interior and the exterior. The interior is mostly intact. A cork surface which covered the floor has been removed in the living room and dining/room but remains in place in the bedroom and the loft study. The house and fence do exhibit some deterioration due to deferred maintenance.

Statement of Significance

The R. Buckminster and Anne Hewlett Fuller Dome Home is eligible for listing in the National Register of Historic Places under Criterion B for national significance based on its association with Buckminster Fuller and Criterion C for local significance as a good local example of a geodesic dome house. The dome home meets Criterion Consideration G for properties with exceptional importance that have achieved significance within the last fifty years. The home is the property most closely associated with Fuller, whose prolific career spanned over five decades, ending with his death in 1983. It is the only property he ever owned and the only geodesic dome in which he lived. Its period of significance is from 1960 until 1971, when Fuller resided there.

Buckminster Fuller was a man of international renown who made significant contributions in the fields of architecture, engineering, mathematics, education and social philosophy. Fuller developed the geodesic dome framing system which he patented in 1954. Thousands of geodesic dome structures were built in the following years. They were used as industrial spaces, commercial space, schools, auditoriums, and housing. The number of geodesic domes based on Fuller's conceptual design is uncountable and domes were found around the world, including Antarctica, where a geodesic dome protected scientists from the harsh climate. A number of companies designed or manufactured prefabricated dome structures on license from Fuller. Among these companies was Pease Woodworking Co. of Hamilton, Ohio, owned and operated by Al Miller. Miller designed and manufactured prefabricated dome structures and he designed and manufactured the Carbondale dome. This was the first residential application of a Pease dome. After 1960, thousands of dome houses were constructed all over the world. Some were prefabricated

units, while others were designed by architects. Fuller's Carbondale dome was a prototype and launched an entire industry. Dome houses continue to be popular because of the relative ease and the low cost of construction, their overall efficiency and their stability during natural disasters such as earthquakes and hurricanes.

Significance Under Criteria B

R. Buckminster Fuller: Architect, Engineer, Inventor

At the time of his death in 1983, the *St. Louis Post-Dispatch* eulogized Fuller as "one of the century's most fertile and wide-ranging intellects. Small concepts were not for him...He dreamed great dreams; and in sharing them he first shocked us and then sharpened our view of the world's possibilities."[1]

Richard Buckminster Fuller was born in Milton, Massachusetts, on July 12, 1895. Both sides of his family came from old Yankee stock. His mother was descended from a Royal Governor of Connecticut. The Fuller family traced its Massachusetts roots back seven generations.

As a child, Fuller was profoundly cross-eyed. Until he was fitted with glasses at the age of four his vision was severely limited. Fuller later stated, "Until I was four I could see only large patterns, houses, trees, outlines of people with blurred coloring. While I saw two dark areas on human faces, I did not see a human eye, or a teardrop or a human hair until I was four."[2] Early in his education, he showed a grasp of mathematics and geometry, as well as a deft hand at construction. In kindergarten he constructed a figure out of toothpicks and dried peas that he would later patent as a tetrahendronal octet truss.

---

[1] *St. Louis Post-Dispatch*, July 3, 1983.
[2] Hugh Kenner. *Bucky: A Guided Tour of Buckminster Fuller* (New York: William Morrow & Company, 1973), 53.

Fuller, commonly called Bucky, attended Milton Academy. He excelled in mathematics and athletics. He was an excellent football player, although he was later to discover that one leg was shorter than the other.

In 1913, Fuller entered Harvard University, following generations of Fullers. His Harvard experience was short. Fuller later tried to explain that he found the social stratifications too hard to accept. This was likely a grown man's rationalization when the truth was "that Bucky was too individualistic, too much an oddball in thought and appearance to meet the conformist standards of these young, so-sure-of-themselves aristocrats."[3] The event which resulted in his expulsion was an ill-timed trip to New York where he extravagantly entertained an actress on funds earmarked for his education.

After his expulsion, family friends arranged for him to work at a textile mill being constructed in Sherbrooke, Canada. He worked for the construction manager and showed a flair for engineering. His work required him to learn principles of metallurgy and mechanics which would serve him well over the years. Fuller regarded this experience as a basic part of his self-education.

His excellent record at Sherbrooke won him a reprieve from exile and a return to Harvard in 1914. Unfortunately, he still did not find the university a good fit and was again expelled in 1914, this time for "lack of sustained interest in the processes within the university."[4]

Fuller never returned to Harvard as a student. He was largely self-educated. One biographer suggested that by not attending college, Fuller missed being "initiated into a shared culture" and that as a result his learning path was to address every problem as if it

[3] Alden Hatch. *Buckminster Fuller: At Home in the Universe* (New York: Crown Publishers, 1974), 12.
[4] Hatch, 38.

had never been addressed before. Since he had not learned the "shared idiom" of the educated, he developed an idiosyncratic lexicon, later to be dubbed "Fullerese".[5]

After leaving Harvard, Fuller worked for Armour and Company, the meatpacking giant. He held a number of positions in their processing and sales divisions.

When the United States entered World War I, Fuller anxiously wanted to enter the armed forces. However, his vision was so poor it was unlikely he would pass the physical. Fuller volunteered the family boat for submarine patrol duty and was enlisted into the naval reserve. He commanded a flotilla of private boats that patrolled the Maine coastline for enemy submarines. He was later transferred to the Chesapeake Bay where he commanded a ship that rescued pilots who crashed into the bay during training flights. He designed a crane that was used to lift the planes out of the water, which dramatically reduced the number of pilots lost to drowning. His service there earned him a berth at the Naval Academy for a program designed to train civilians as officers. The ninety day course concentrated on engineering, ballistics, navigation and comprehensive thinking.. Fuller credited this experience as invaluable in his later career as architect, engineer and inventor.

While in the Navy, Fuller courted and married Anne Hewlett. Her father, James Monroe Hewlett, was a painter and architect in New York. Through this relationship, Fuller entered New York's artistic and literary circle. The Fullers had a daughter, Alexandra, born during Fuller's Navy service. The child contracted meningitis, and later polio. Due to her illness, Fuller gave up a possible assignment to the Navy's Asiatic Squadron, effectively ending his naval career.

---

[5] Kremer, 80-81.

After leaving the Navy, Fuller returned to Armour and Company. After a brief time with Kelly Springfield Company, he went into business with his father-in-law. Hewlett devised a building block made of cement-bonded excelsior. Fuller perfected the bonding process and designed the machinery necessary to mass produce the blocks. The blocks were lightweight and could be stacked. Concrete was poured into voids in the block to create a sturdy stockade wall, giving the company its mane: The Stockade Building System. Fuller moved to Chicago to oversee operations there. The building industry was not quick to adopt the Stockade Building System and Fuller and Hewlett lost control of the company. New owners fired Fuller, who was stranded in Chicago with no money, no employment and no immediate prospects.

Fuller had been suffering from a deep depression since his daughter's death in 1922. During the several years since, he drank heavily. The combination of these factors with the failure of the Stockade Building System drove Fuller to the point of suicide. By 1927, Fuller and his wife had a second child, Allegra. Fuller determined that family members could care for Anne and Allegra better than he could. Fuller considered drowning himself in Lake Michigan. However, as he contemplated his position Fuller came to an illumination. He apprehended that his unique combination of experiences was potentially valuable, and he had no right to destroy that experience. Speaking of the episode later in life, Fuller said, "The significance of you will forever remain obscure to you, but you may assume you are fulfilling your significance if you apply yourself to converting all your experience to the higher advantage of others. You and all men are here for the sake of other men."[6]

---

[6] Kremer, 159-160.

Fuller decided to address his combination of experiences to the problem of housing, since he had been involved in that industry, and saw much that needed improvement. Fuller spent the next two years rethinking everything he knew about housing, construction, engineering and technology. Fullerene legend holds that he did not speak during that time, resolved not to speak until he knew what he was saying. What he conceived was a philosophy that technology could solve all problems and that all people could achieve a healthful standard of living through the application of good design principles.

His first application of these principles to housing resulted in the 4D House. Fuller designed a multiple story apartment building in which the hexagonal shaped floors would be suspended from a post, relying on tension rather than compression for the structural strength of the building. This fanciful structure soon gave way to a single family dwelling. The shape remained hexagonal and the structure was still suspended from a center post, so the idea came to be known as the "House on a Pole." Fuller built a model and began hauling it around and speaking to any group who would listen. He continued this peripatetic mission for the rest of his life.

Fuller's design got a big boost from an unexpected source. Marshall Field's department store in Chicago purchased a large quantity of French designed modern furniture. The marketing department thought displaying Fuller's 4D House would draw crowds. They were not pleased with the name and assigned a wordsmith to come up with another name. After listening to Fuller speak, he coined the word "Dymaxion", based on words which peppered Fuller's speech: dynamic, maximum, and tension. Fuller adopted

the term immediately and it became shorthand for his idea of "getting the maximum performance from the technical knowledge we have."[7]

The Dymaxion House Fuller conceived could not be built with the technology available in the 1930s. He wanted the house to be independent of utility lines and able to be moved from place to place, suspended from dirigibles. The time for the Dymaxion House had not arrived.

Fuller spent the next several years working on other projects. He designed and built a three-wheeled vehicle, the Dymaxion car, which could turn around in a confined radius. He designed the Dymaxion bathroom, where the fixtures were stamped out of a single sheet of steel. He worked on a new system of geometry, not based on Euclidean theories that support traditional geometry, but rather is based on dynamic spherical properties and relationships that form Fuller's theory of 4-dimensional synergetic geometry.

Fuller continued to travel the country lecturing on his idea. In the summer of 1940, while driving near Hannibal, Missouri, Fuller noticed some corrugated steel grain bins. He determined the bins would make excellent housing. He told his companion, the novelist Christopher Morley, the bins "would be the most efficient unit for a small prefabricated house now available for mass production by present industrial measures."[8] Fuller followed up with the Butler Company, which made the grain bins and contracted them to manufacture the structure he dubbed the Dymaxion Deployment Unit (DDU). The perfectly round structures were twenty-three feet in diameter. Fiberglass insulation and wallboard covered the galvanized steel walls and roof. The unit sat on a brick pad covered with insulating board and Masonite. The interior could be divided into three

[7] Kremer, 163.

separate rooms by heavy fireproof curtains. Natural air conditioning was created by air pulled in through a roof ventilator. The unit, absent the bricks, weighed 3,200 pounds, about the weight of an automobile. The lightweight structure could easily be shipped and constructed onsite. The Dymaxion Deployment Unit saw wide use in the early days of World War II, sheltering soldiers on Pacific Islands, the Persian Gulf, and even troops in Russia. As the war continued, military officials found other uses for the available steel supply and the DDU went out of production.

Fuller spent the war working in Washington as the Director of the Mechanical Engineering Section of the Board of Economic Warfare. Beech Aircraft Company, in Wichita, Kansas, had developed from a small company to a major aircraft producer during the war. With the end of the war in sight, Beech's laborers were concerned about how Beech could continue to employ a large work force. They started to leave Wichita for other jobs. The Board of Economic Warfare wanted to stop this and they turned to Bucky Fuller.

He thought the time was right to return the Dymaxion House. The concept changed slightly. The idea was to develop inexpensive housing that could be mass produced. However, the newly designed Dymaxion house would be round but still suspended from a central mast.

A lightweight aluminum frame and skin developed in aircraft construction was the key to the cost and efficiency necessary to mass produce the Dymaxion Dwelling Machine. An aircraft company could do this with little retooling. Fuller worked with Beech engineer and laborers to build the prototype. The walls and domed roof were made of sheet aluminum stamped on dies designed by Fuller. The circumference was 118 feet.

---

[8] Hatch, 157.

The interior had a stainless steel fireplace, for ambiance. A living room occupied about one-third of the floor space. Two bedrooms, each with its own Dymaxion bathroom, and a small kitchen completed the house. Plexiglas windows circumnavigated the wall at eye height. The entire unit weighed three tons, and the components could be packaged in a packing case less than 300 cubic feet for movement.

When the prototype was shown to the public, it was favorably received. An article in *Fortune* magazine generated 37,000 unsolicited orders. Investors were interested in providing the capital necessary to get the new industry off to a start. Fuller balked, wanting to do further work on the prototype. He was concerned there was no system in place for the distribution, delivery and assembly of the house and delayed the project long enough that interest died down. William Graham, an investor, bought two prototypes. One was incorporated into Graham's house as a component. His family lived in the house until the 1970s. In 1991, the Henry Ford Museum purchased the house, restored it and it is now on display.

In the 1930s, Fuller went to work for Henry Luce as a contributing editor for *Fortune* magazine. One of his projects was to map the distribution of coal and oil reserves throughout the world. Fuller was dissatisfied with the distortion inherent in available maps. The problem came from trying to place a spherical world on a flat map. Fuller was determined to create a flat map which accurately projected the earth. The result was the Dymaxion Airocean Map, one of the few maps ever to receive a U. S. patent. In plotting the map he scribed thirty-one great circles on a sphere. A great circle is the shortest distance between two points on a sphere. The intersecting lines created triangles of varying sizes. Fuller realized that a completely triangulated spherical structure would equally diffuse force so that it would not weigh down on the structure.

After the Wichita experience, Fuller began to seriously work out the mathematics for his spherical structure. This required intensive hand calculations of complex trigonometric formulae, since computers were still in their infancy. Fuller sought to balance compressive force with tensional force. He "discovered that if tension and compression are not completely balanced in a structure, the building would collapse. He also found that builders were not using the tensional forces available."[9] Finding the balance and employing the tensional forces made the geodesic dome a reality. Fuller called the structure "geodesic" because the sections of arcs of great circles are called geodesics.

Even while working out the mathematics, Fuller began to build models of the dome. He used different material in different combinations. In 1949, at Black Mountain College in North Carolina, he built the first successful large scale model. To prove the strength, Fuller and some students hung from the frame.

Fuller applied for a patent on December 12, 1951. In the patent application he described a "framework enclosing space" derived from subdivided icosahedrons. To Fuller this was the fulfillment of a longtime dream to create

> a rational system for enclosing living space , mass-producible, readily erected from standardized parts, maximally economical of materials (hence of weight), and more over something you could take apart and move intact, slung from a helicopter.[10]

The geodesic dome soon had an opportunity to prove itself in the real world. The

[9] Lloyd Steven Seiden. "The Birth of the Geodesic Dome." *The Futurist* 23, 6(Nov-Dec 1989), 16.
[10] Kremer, 233.

Rotunda at the Ford Motor Company's River Rouge Ford Plant in Detroit, which had originally been Ford's pavilion at the 1933 World's Fair, was a round building with an open courtyard. Henry Ford had always wanted to cover the courtyard. His grandson, Henry Ford II determined to make this dream come true as a memorial to his grandfather for the company's 50th anniversary in 1953. However, the state-of-the-art steel roof frames of the day weighed 160 tons, which would crush the Rotunda building. Fuller was brought in and designed a dome to cover the 93-foot expanse. The geodesic dome weighed only eight and one-half tons. The octet-truss frame was covered with transparent polyester fiberglass. The completed dome weighed two and one- half pounds per square foot covered. By contrast, the dome of St. Peter's in Rome weighs 1350 pounds per square foot covered.

The geodesic dome passed the real world test and the dome business progressed rapidly. Fuller formed a corporation to design and erect domes for special purposes. He also licensed other companies, such as Kaiser Geodesics, to build domes. One estimate suggested that in the ten years following the Rotunda project, Fuller's geodesic domes covered more square feet than any other single kind of structure.[11] The domes found multiple uses. One significant use was a series of domes protecting radar installations in the Arctic which were part of the Distant Early Warning (DEW) line. These "radomes" had to be constructed of polyester fiberglass struts and skins so the microwave beams of the radar could penetrate. They also had to withstand Arctic blasts of wind. Fuller's company, Synergetics, Inc., built what was then the largest clear-span structure ever erected in 1958. The dome was built for the Union Tank Car Company of Baton Rouge and was used as a repair facility for railroad tank cars. The dome spanned 384 feet and

[11] "The Dymaxion American." *Time* January 10, 1964, 46.

covered a floor area of 115,558 square feet and weighed 1200 tons, about two ounces for every cubic foot enclosed. The volume is 15,000,000 cubic feet, about twenty-three times the volume of St. Peter's dome.

During the 1960s, Fuller worked with various government agencies on domes which were used as pavilions at trade fairs throughout the world. Geodesic domes turned up in such places as Kabul, Rangoon, Delhi and Moscow. Jack Massey, an Officer with the Unites States Information Agency (USIA) worked with Fuller on many of these projects. Massey knew the domes were easy to erect, easy to move and easy to fill with exhibits. He also found that the domes "almost invariably filled foreign spectators with awe at U.S. technical ability, and with delight at U.S. esthetic sensibility."[12] USIA asked Fuller to design the United States pavilion for the 1967 World's Fair in Montreal.

The "Skybreak Bubble" is the most famous geodesic dome Fuller designed. It is the cousin of the Carbondale dome house. The pavilion is a three-quarter sphere that appears to float on the surface of the ground. It was seen as a new and efficient means to enclose large spaces, and yet remain a "social structure."[13] The dome, which now houses a museum known as Biosphere, is 200 feet high and has a diameter of 250 feet. It encloses a volume 6.7 million square feet, about the same space contained in the Seagram Building in New York. The triangulated frame is covered by 2000 acrylic hexagonal tiles in about forty-five different shapes. The different panels reflect light in different patterns that "throb and change colors...here clear, here silvery, elsewhere like a rainbow..."[14] The "contents are silhouetted at night, when the sphere acquires a magical luminosity."[15]

---

[12] "Bucky's Biggest Bubble." *Architectural Forum* 124, 6 (June 1966), 75.
[13] "The Architect's Expo," *Progressive Architecture* 147 (June 1967), 127.
[14] David Jacobs, "An Expo Named Buckminster Fuller," *New York Times Magazine* (April 1967), 33.
[15] J. M. Richards, "Architecture at Expo: Design Commentary." *The Architectural Review* 142, 846 (August 1967), 161.

The individual panels pivot depending on the temperature. A network of motors controlled by computers moved the panels. The pavilion was meant to be a "controlled environment," Fuller explained

> From the inside there will be uninterrupted visual contact with the exterior world. The sun and moon will shine in, the landscape and sky will still be completely visible, but the unpleasant effects of climate, heat, dust, bugs, glare, etc. will be modulated by the skin to provide a "Garden of Eden" interior.[16]

After 1967, Fuller concentrated on more conceptual projects. He proposed building a large self-contained community. Old Man River City, to be built in East St. Louis, Illinois, contemplated a planned community of twenty-five thousand families living under a clear geodesic dome umbrella one mile in diameter, suspended 500 feet above the ground. Another futuristic plan called for a floating city of 300,000 in Tokyo Bay.

Fuller continued to lecture all over the world. He would speak for hours without notes in sessions he called "thinking-out-loud."[17] A common theme he repeated was the need to efficiently distribute the world's resources. He had developed a World Resources Inventory plotting the location and distribution of mineral and other resources. In the 1960's he created the World Game as a workshop where participants had to distribute the world's resources in a manner that benefited the most humans. He coined the phrase "Spaceship Earth" in 1953 as he discussed man's relationship with the natural environment. In the 1970s he began to speak more about ideas as the means to innovation rather than physical inventions. He continued a schedule of public speaking with over one

[16] *Architectural Forum*, 77.

hundred engagements per year all over the world. R. Buckminster Fuller died in Los Angeles, California, on July 1, 1983.

Honors and Accolades

Buckminster Fuller's contributions in diverse fields were recognized during his lifetime. Although he never graduated from college, he was awarded honorary degrees by forty-seven North American universities. He was not a licensed architect but he was awarded the Gold Medal for lifetime achievement by American Institute of Architects in 1970. The Royal Institute of British Architects bestowed on him the Royal Gold Medal of Architecture in 1968.

His accomplishments in other fields were also recognized. Harvard University awarded him the Charles Eliot Norton Chair of Poetry in 1962. He was nominated for a Nobel Peace Prize in 1969. Just months before his death, President Ronald Reagan awarded Buckminster Fuller the Presidential Medal of Freedom, the highest civilian award recognized by the United States. The citation for that award sums up the significance of Buckminster Fuller's life and work:

> A true renaissance man and one of the greatest minds of our times, Richard Buckminster Fuller's contribution as a geometrician, educator and architect-designer are benchmarks of accomplishment in their fields. Among his most notable inventions and discoveries are synergetic geometry, geodesic structures and tensegrity structures. Mr. Fuller reminds us all that America is a land of pioneers, haven for innovation and the free expression of ideas.[18]

[17] Seiden, Lloyd Steven. *Buckminster Fuller's Universe.* (Cambridge, MA: Perseus Publishing, 1989), 46.

Buckminster Fuller in Carbondale

Buckminster Fuller was named Research Professor at Southern Illinois University at Carbondale, Illinois, in 1959. He gave lectures and taught seminars at the school while maintaining a world-wide travel schedule. Fuller lived in Carbondale from 1959 to 1971. During most of that time he and Anne, his wife, lived in the dome at 407 S. Forest. It is the only home Fuller ever owned, it was the only geodesic dome he ever called home, and it is the structure in the United States most closely associated with him. Many of his major accomplishments occurred during the time he resided in the dome. During his lifetime, he was awarded twenty-five patents. Nine of those were awarded while he lived at 407 S. Forest.

Fuller authored twenty-eight books in his lifetime. Eleven were published while he lived in Carbondale. Twenty-three honorary degrees were bestowed on Fuller during his residence in Carbondale. He was awarded both the Gold Medals for architecture while residing in the dome house. It was while he lived in the Carbondale dome that Fuller completed the U.S. pavilion at the Montreal World's Fair, his most known work.

Significance Under Criteria C

The geodesic dome home at 407 S. Forest, Carbondale, Illinois, was designed by Al Miller, based on the conceptual designs of Buckminster Fuller. Fuller licensed Miller the use of the geodesic dome patent to design and build pre-fabricated domes. Carbondale contractor Ira Parrish built the dome house. The house was one of the earliest geodesic

[18] Seiden, *Universe*, 416.

domes used as a residence.[19] The house was a model that demonstrated the principles of geodesic dome construction and served as a prototype for geodesic dome houses built across the world after 1960.

Builders began to experiment with dome construction in the 1960s and 1970s. Geodesic domes were initially associated with the counterculture when "they began springing up on remote hillsides and in communes around the United States."[20] Instruction manuals for self-built domes, such as *The Domebook,* generated huge sales, selling out two printings. A follow-up edition, *Domebook 2,* rapidly fed the interests of dome-builders.[21] The ease of construction and the wide availability of the necessary construction materials made domes popular for self-builders. Prefabricated geodesic dome kits remain widely available today. Although the exact number of geodesic dome residences is not known, statistics in 1992 showed that the U.S. dome industry sold about 1500 dome kits annually.[22]

The geodesic dome has also appealed to a more mainstream market. The cost of construction per square foot remains low. Geodesic dome structures are also considered one of the most energy efficient structures for residential use,[23] and known for maintaining their structural integrity during natural disasters such as earthquakes and hurricanes.

Fuller's dome house in Carbondale served as a model for the dome homes built since 1960. He continued to experiment with the house. When the initial system for

[19] Seiden, *Universe,* 346.
[20] Seiden, *Universe,* 359.
[21] Kremer, 232.
[22] Gene Knauer. "The Return of the Geodesic Dome." *The Futurist* 26, 1 (Jan/Feb 1992), 29f.
[23] Susan Fornoff. "It's Hip to Round/ Fuller's Folly? Nope-Geodesic Domes Have Finally Come of Age." *San Francisco Chronicle,* May 20, 2001, 1.

sealing the joints between the panels failed, Fuller installed a new system which consisted of a brushed-on rubberized paint. When this proved unsatisfactory, Fuller employed a more traditional asphalt shingle. These experiments aided later dome designers in developing better systems for sealing the exterior surface of domes.

Domes continue to serve as residences in a variety of communities. In their *A Field Guide to American Houses,* McAlester and McAlester called the geodesic dome house "a modern folk type...popularized by the eloquent advocacy of Buckminster Fuller..."[24] The University of California-Davis has a student co-operative housing unit consisting of fourteen domes. A community of eighteen domes serves as temporary and flexible housing for the homeless in Los Angeles.

The Fuller dome house is the only geodesic dome residential dwelling in Carbondale directly associated with R. Buckminster Fuller. Newspaper accounts suggest a second house was owned by Rev. Malcolm E. Gillespie,[25] and it is believed the dome is still used for residential purposes. The Design Department at SIU used four domes as classrooms in between 1961 and 1984 but those domes were demolished in 1985. A dome structure is used by the city of Carbondale to store snow removal materials. However none of the remaining domes have the intimate relationship with Buckminster Fuller. The Carbondale Preservation Commission named the Fuller house a local historic landmark in 2003.

Criterion Consideration G

The period of significance for the Fuller dome home is from 1960 to 1971, the dates when the Fullers resided in the home. Although this is less than fifty years ago, it is

[24] Virginia McAlester and Lee McAlester. *A Field Guide to American Houses.* New York: Alfred A. Knopf, 1984.
[25] *Southern Illinoisan,* date unknown.

an exceptional property associated with an exceptional personality. Fuller was known and admired around the world for his contributions in multiple fields of endeavor. He continued to be active into the 1980s. The dome house in Carbondale was an early example of residential geodesic domes, which would proliferate in the decades following its construction in 1960.

Summary

Buckminster Fuller was a figure of international renown. His achievements in architecture, design science, education, and literature have been widely recognized. Many of his achievements were made while he resided in the dome house in Carbondale. The dome at 407 S. Forest in Carbondale, Illinois, is an appropriate site for recognition on the National Register of Historic Places.

Bibliography

"The Architect's Expo." *Progressive Architecture* 147 (June 1967): 126-167.

"Bucky's Biggest Bubble." *Architectural Forum* 124, 6 (June 1966): 74-79.

Carbondale Preservation Commission. Preservation District Nomination for The R. Buckminster Fuller and Anne Hewlett Fuller Dome Home. File No: PD 03-02, August 27, 2003.

"The Dymaxion American." *Time*, January 10, 1964, 46-51.

Fornoff, Susan. "It's Hip to be Round, Fuller's Folly? Nope-Geodesic Domes Have Finally Come of Age." *San Francisco Chronicle*, May 20, 2001, 1.

Hatch, Alden. *Buckminster Fuller, At Home in the Universe.* New York: Crown Publishers, 1974.

Jacobs, David. "An Expo Named Buckminster Fuller." *The New York Times Magazine*, (April 1967): 132-137.

Kahn, Lloyd. *The Domebook.* Los Gatos, CA: Pacific Domes, 1970.

Kahn, Lloyd. *The Domebook 2.* Bolinas, CA: Pacific Domes, 1971.

Knauer, Gene. "The Return of the Geodesic Dome." *The Futurist.* 26, 1 (Jan/Fed 1992): 29-32.

Kenner, Hugh. *Bucky: A Guided Tour.* New York: William Morrow and Company, 1973.

Luke, Susan Skiles. "Protégé Tries to Save Buckminster Fuller Dome." *The Chicago Tribune*, May 5, 2002, 5L.

Marks, Robert W. *The Dymaxion World of Buckminster Fuller.* Carbondale and Edwardsville, IL: Southern Illinois University Press, 1960.

Mason, Joseph B. *History of Housing in the U.S. 1930-1980.* Houston, TX: Gulf Publishing Co., 1982.

McAlester, Virginia and Lee McAlester. *A Field Guide to American Houses.* New York: Alfred A. Knopf, 1984.

New York Times, July 3, 1983.

RBF Dome.Org Homepage, http://www.buckysdome.org.

Richards, J. M. "Architecture at Expo: Design Commentary." *The Architecture Review* 142, 846 (August 1967): 155-266.

Rosen, Sidney. *Wizard of the Dome: R. Buckminster Fuller, Designer for the Future.* Boston: Little, Brown and Co., 1969.

St. Louis Post-Dispatch, July 3, 1983.

Seiden, Lloyd Steven. "The Birth of the Geodesic Dome." *The Futurist* 23, 6 (Nov/Dec 1989): 14-19.

Seiden, Lloyd Steven. *Buckminster Fuller's Universe.* Cambridge, MA: Perseus Publishing, 1989.

The Southern Illinoisan, April 13, 1960; April 21, 1960.

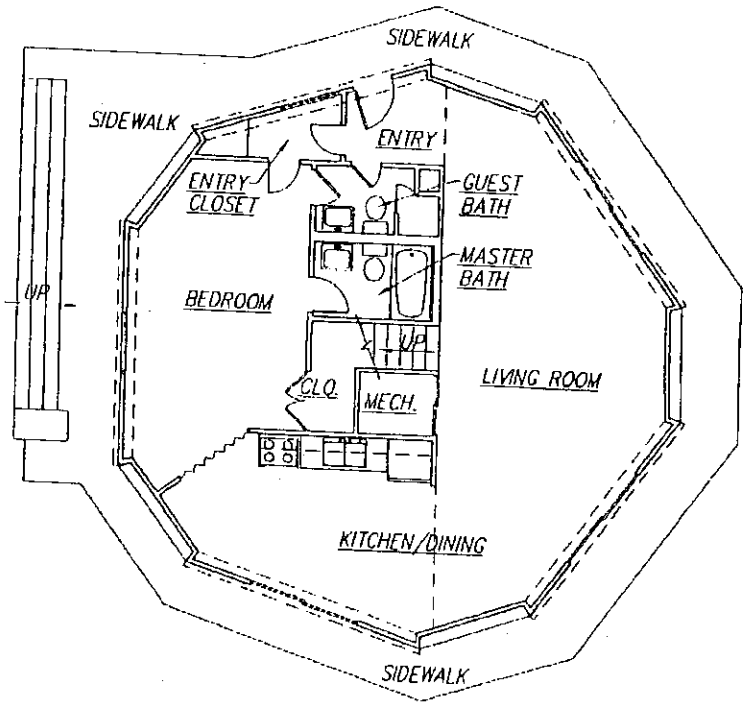
Geographic Data

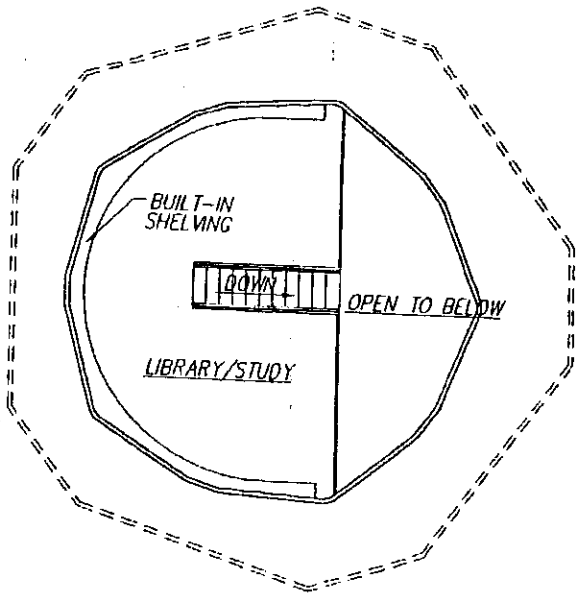
Verbal Boundary Description

Lot 78 in University Place addition to Carbondale, Illinois, being subdivision of Outlot 110 and Lots 539 and 540 Brewster's Second Addition to Carbondale, as shown by the recorded Plat thereof in Book 4 of Plats at Page 38, in the Recorder's Office of Jackson County, Illinois.

Boundary Justification

The nominated property includes the entire parcel historically associated with the R. Buckminster and Anne Hewlett Fuller Dome Home.





1 / A1.0 ORIGINAL FIRST FLOOR PLAN

5' 0 5' 10' 15' 20'

SCALE: 1/8"=1'-0"

2 / A1.0 ORIGINAL SECOND FLOOR PLAN

5' 0 5' 10' 15' 20'

SCALE: 1/8"=1'-0"

wba WHITE & BOARDMAN ARCHITECTS, P.C.
ARCHITECTURE · DESIGN · PRESERVATION
212 North Illinois Avenue
Carbondale, Illinois 62901-1452
Telephone (618) 529-3591
www.wb-architects.com

PROJECT: R. Buckminster Fuller Dome Home

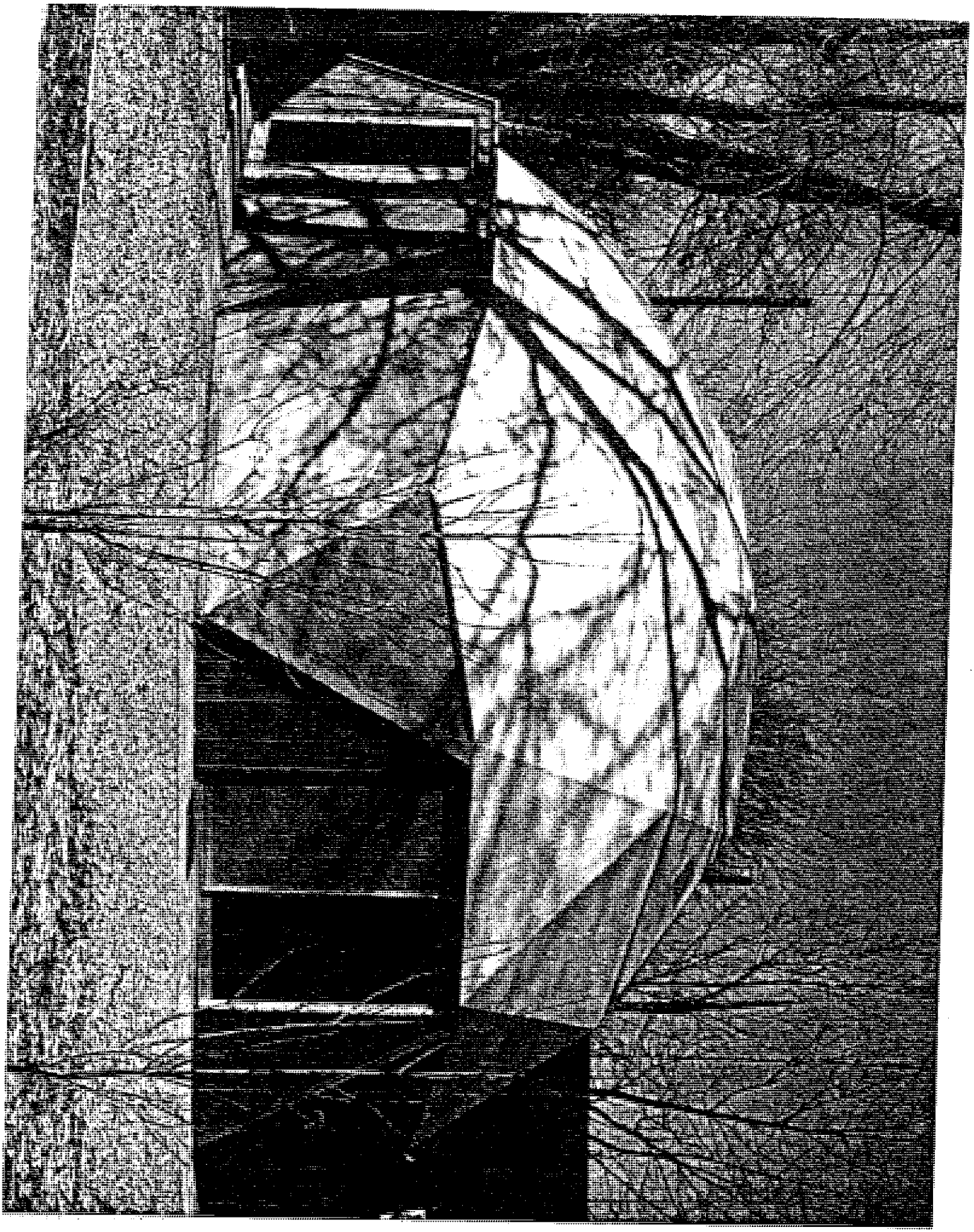
LOCATION: Carbondale, Illinois

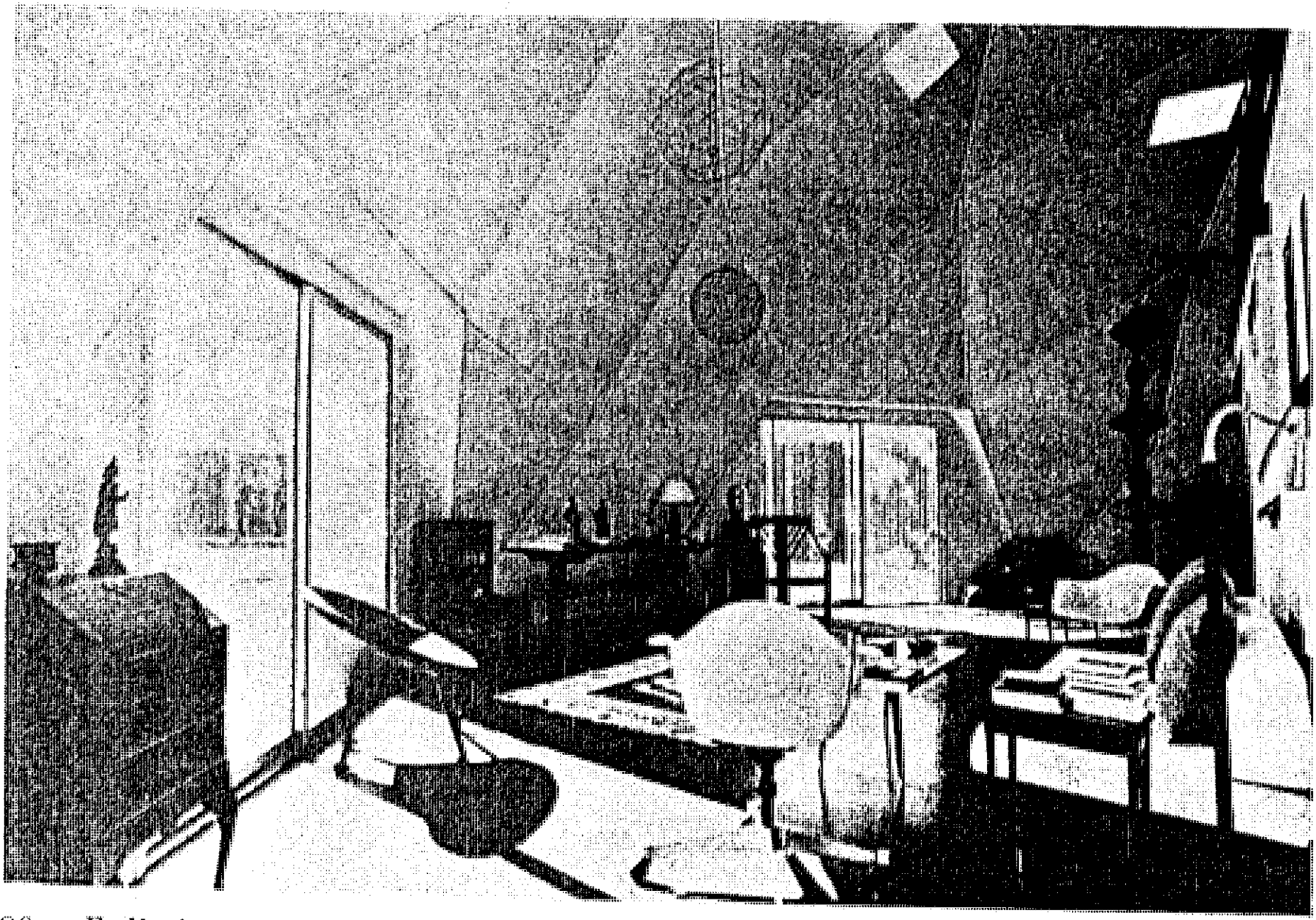
Illinois Licensed Professional Service Corporation #060-003965

PROJECT #: 04-29-047/060

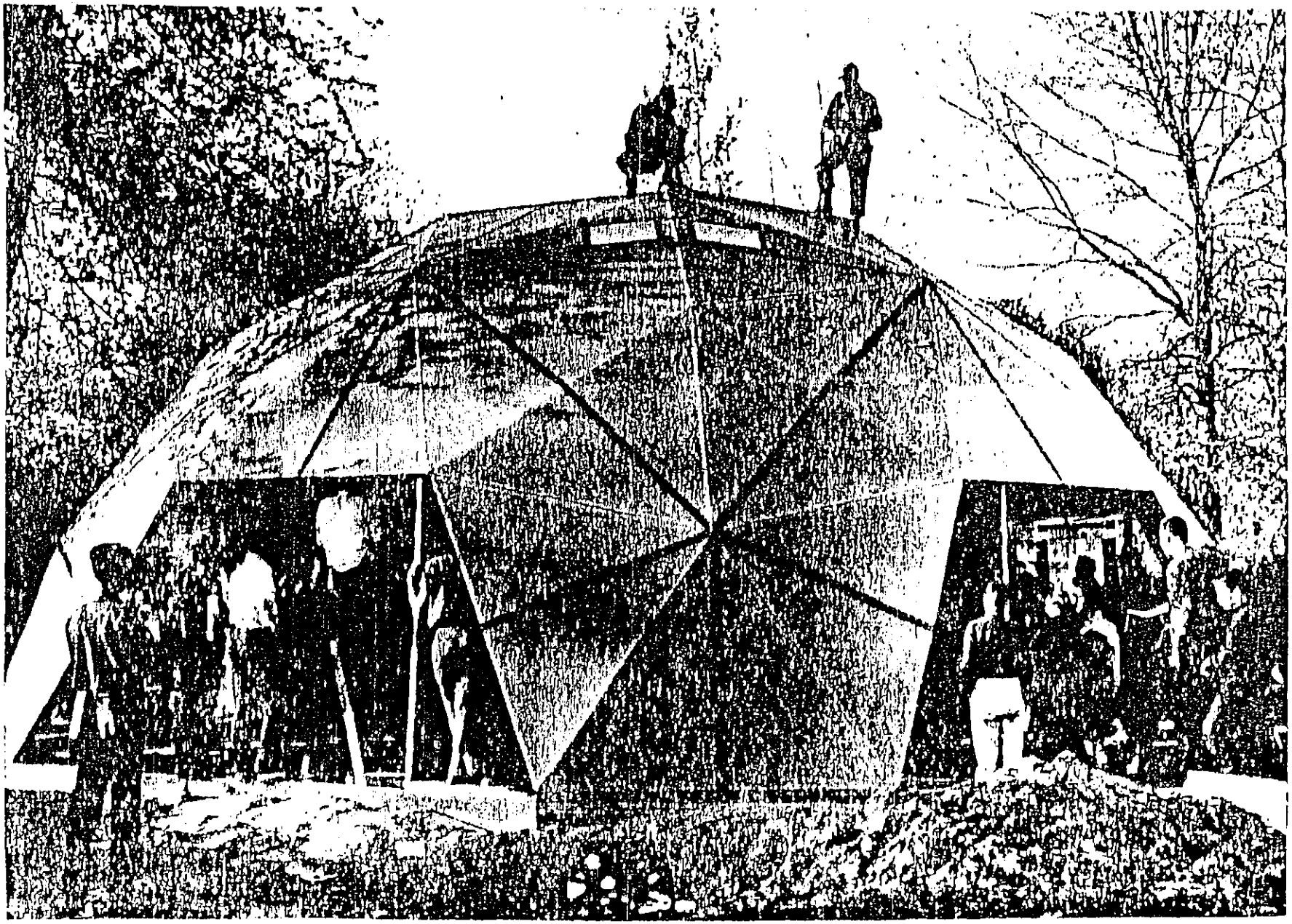
DATE: November 23, 2005

SHEET NO. A1.0 OF 2 SHEETS

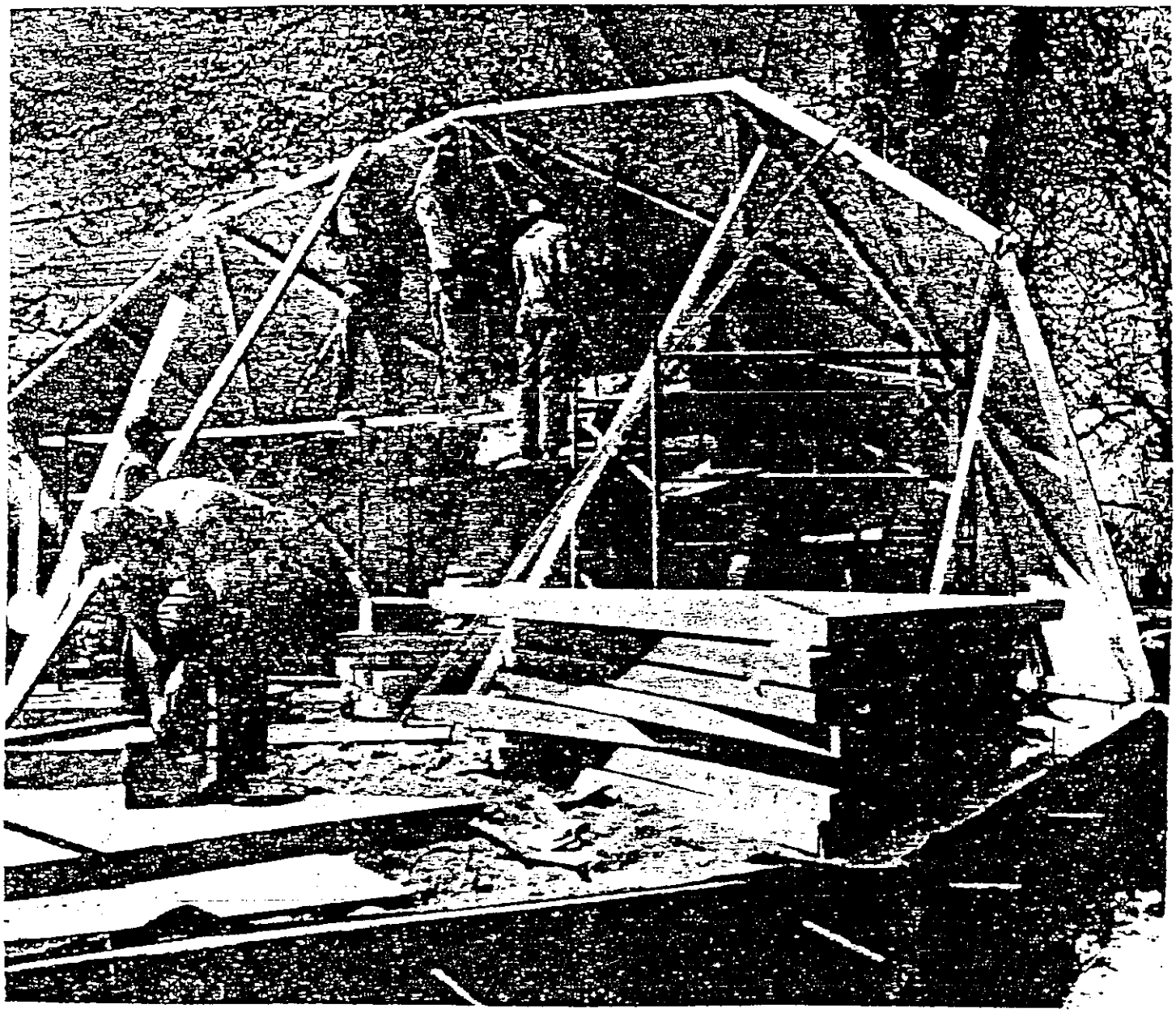




90. *Fuller's home. Interior showing living area. Stairway to library deck above on right.*

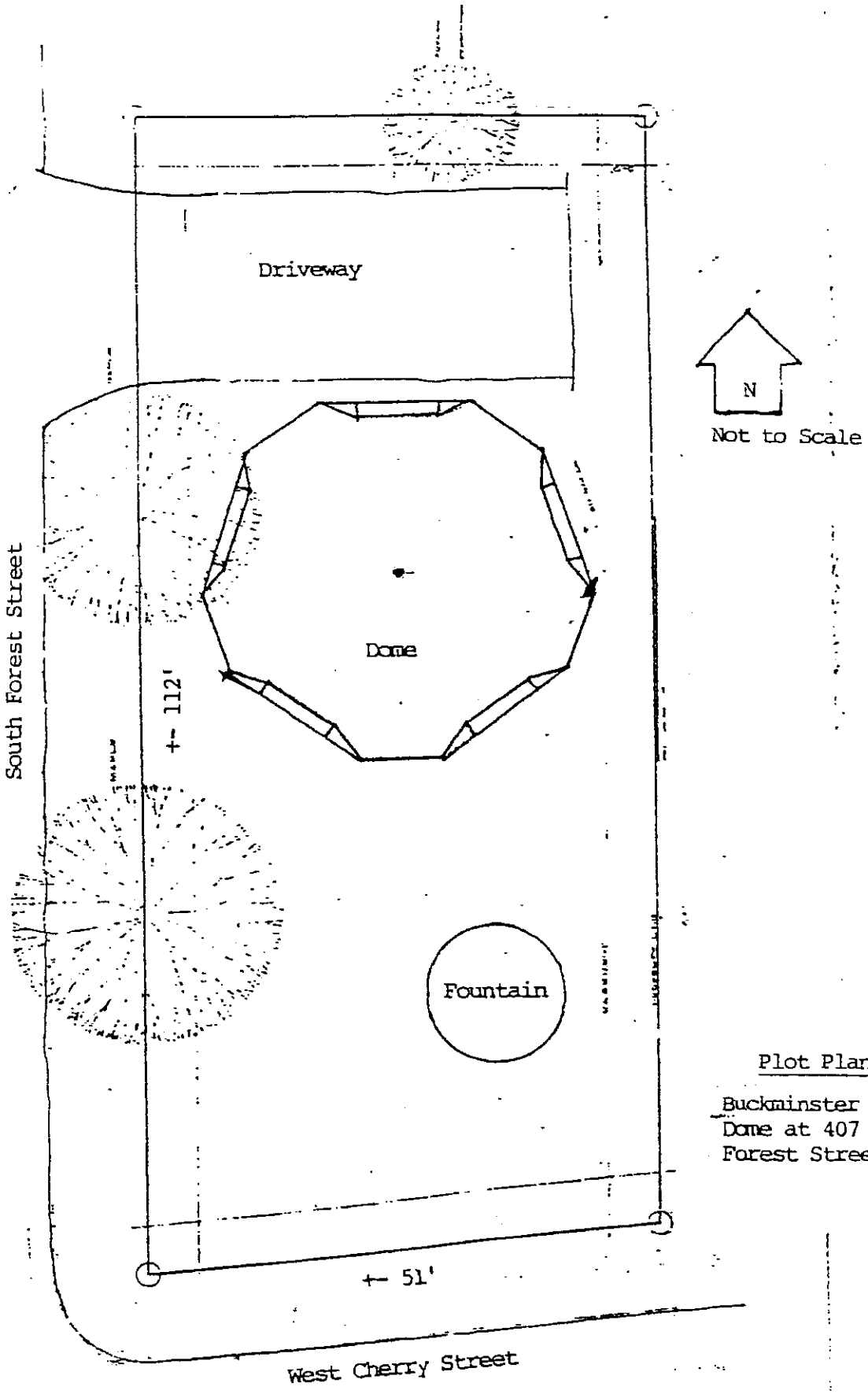


Dome home of R. Buckminster Fuller in Carbondale is completed at 5:30 p.m. after seven hours of work by five men as spectators watch



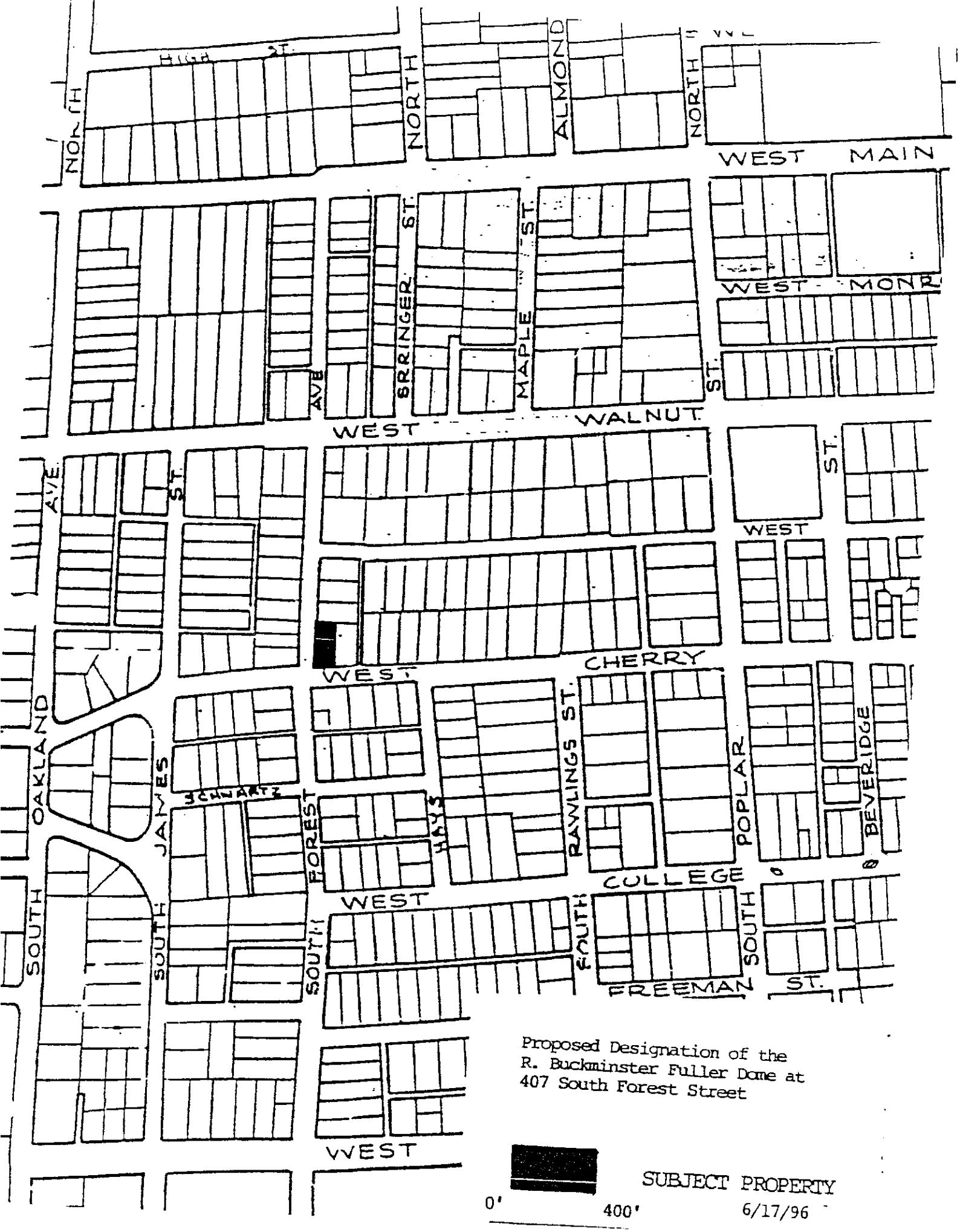
Dome starts to take shape as workmen complete framing one of five door and window openings.

SOUTHERN
ILLINOISAN
4/21/60



Plot Plan

Buckminster Fuller Dome at 407 South Forest Street


NORTH
HIGH ST.
NORTH
ALMOND
NORTH
WEST MAIN
BRRINGER ST.
MAPLE ST.
WEST MONR
ST.
AVE
WEST WALNUT
AVE
ST.
ST.
WEST
CHERRY
WEST
OAKLAND
JAMES
SCHWARTZ
FOREST
HAYS
RAWLINGS ST.
POPLAR
BEVERIDGE
COLLEGE
WEST
SOUTH
SOUTH
SOUTH
SOUTH
FREEMAN
SOUTH
ST.
WEST
Proposed Designation of the
R. Buckminster Fuller Dome at
407 South Forest Street
SUBJECT PROPERTY
0'
400'
6/17/96

Number, NHL, Action, Date, Multiple Name

ALASKA, WRANGELL-PETERBURG BOROUGH-CENSUS AREA,
F/V CHARLES W (Schooner),
Middle Harbor, W Float, Slip 299,
Petersburg, 05000285,
LISTED, 2/06/06

CALIFORNIA, LOS ANGELES COUNTY,
U.S. Court House and Post Office,
312 N. Spring St.,
Los Angeles, 06000001,
LISTED, 2/09/06

COLORADO, BOULDER COUNTY,
Colorado Chautauqua,
900 Baseline Rd.,
Boulder, 06000179,
NATIONAL HISTORIC LANDMARK DESIGNATED/LISTED, 2/10/06

COLORADO, MOFFAT COUNTY,
Castle Park Archeological District,
Address Restricted,
Dinosaur vicinity, 06000055,
LISTED, 1/03/06

COLORADO, PROWERS COUNTY,
Granada Relocation Center,
23900 County Rd. FF,
Granada vicinity, 06000180,
NATIONAL HISTORIC LANDMARK DESIGNATED/LISTED, 2/10/06

IDAHO, TETON COUNTY,
Hollingshead Homestead,
107 West 1200 N. Teton Cty Rd.,
Tetonia vicinity, 06000002,
LISTED, 2/09/06

ILLINOIS, COOK COUNTY,
Hanson, Anton, E., House,
7610 S. Ridgeland Ave.,
Chicago, 06000008,
LISTED, 2/09/06

ILLINOIS, COOK COUNTY,
Marywood Academy,
2100 Ridge Ave.,
Evanston, 06000007,
LISTED, 2/09/06

ILLINOIS, JACKSON COUNTY,
Fuller, R. Buckminster, and Anne Hewlett Dome Home,
407 S. Forest Ave.,
Carbondale, 06000012,
LISTED, 2/09/06

ILLINOIS, SHELBY COUNTY,
Westervelt Christian Church,
103 W. Main St.,
Westervelt, 06000009,
LISTED, 2/09/06