OMB No. 10024-0018

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1677

United States Department of the Interior
National Park Service

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 an 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: Ashton, Ned Residence

other names/site number: Edward L. Ashton House/Ashton House

2. Location

street & number: 820 Park Road N/A ☐ not for publication

city or town: Iowa City ☐ vicinity

state: Iowa code: 019 county: Johnson code: 103 zip code: 52246

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☒ 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 ☒ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☐ nationally ☐ statewide ☒ locally. (☐ See continuation sheet for additional comments.)

[signature] DSHPO Date 12-8-00

Signature of certifying official/Title

STATE HISTORICAL SOCIETY OF IOWA

State of 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 official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:

- ☒ 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:)

Signature of the Keeper: Edson H. Beall

Date of Action

Ashton Residence
Name of Property

Johnson Iowa
County and State

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		buildings
		sites
		structures
		objects
1		Total

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

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions)

DOMESTIC/single dwelling

Current Functions
(Enter categories from instructions)

DOMESTIC/single dwelling

7. Description

Architectural Classification
(Enter categories from instructions)

Modern Movement

Materials
(Enter categories from instructions)

foundation Concrete

walls Stone/limestone

Concrete

roof Asphalt

other

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

Ashton Residence
Name of Property

Johnson, Iowa
County and State

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.
- ☒ **B** Property is associated with the lives of persons significant in our past.
- ☒ **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.)

Property is:

- ☐ **A** owned by a religious institution or used for religious purposes.
- ☐ **B** removed from its original location.
- ☐ **C** a birthplace or grave.
- ☐ **D** a cemetery.
- ☐ **E** a reconstructed building, object, or structure.
- ☐ **F** a commemorative property.
- ☐ **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)
Engineering

Architecture

Period of Significance
1948-1950

Significant Dates
1948

Significant Person
(Complete if Criterion B is marked above)

Ashton, Edward L. "Ned"

Cultural Affiliation
N/A

Architect/Builder
Ashton, Edward L. "Ned"

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

9. Major Bibliographical References

Bibliography
(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:

- ☒ State Historic Preservation Office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☒ Other

Name of repository:
State Historical Society of Iowa, Iowa City

Ashton Residence
Name of Property

Johnson Iowa
County and State

10. Geographical Data

Acreage of Property 2.22

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

	Zone	Easting	Northing
1	15	620630	4614175
2			
3			
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.)

11. Form Prepared By

name/title David Arbogast, architectural conservator

organization ______ date May 30, 2000

street & number 701 Eastmoor Drive telephone (319) 351-4601

city or town Iowa City state Iowa zip code 52246

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 SHPO or FPO.)

name Marshall and Joye Ashton McKusick

street & number 820 Park Road telephone (319) 338-6746

city or town Iowa City state Iowa zip code 52246

DESCRIPTIVE SUMMARY:

The Edward L. Ashton House, on its flood plain site, is as much an engineering feat as it is a private residence. It structurally consists of massive concrete footings, columns, main floor column support beams, and floors. Its "curtain walls" consist of rock-faced limestone veneer faced over interior concrete block masonry on the ground floor and rock-faced limestone veneer over wood frame construction on the main floor.

STYLE:

Because the house was designed by an engineer for his own residence no high style was employed. The style of the house, as such, is characteristic of popular style trends following World War II and can be classified as a vernacular expression of the Modern Movement incorporating eclectic elements such as a mid-nineteenth century marble fireplace surround.

SITE AND LANDSCAPING:

The original house was sited on a three-acre lot with a driveway leading south to Park Road. The nomination boundary includes 2.22 acres (almost three-quarters of the original land) and includes a landscaped approach, the house and its immediate surroundings, and the river front west and north of the house.

The siting of the house takes advantage of the relative isolation and views of the woods and the river views which was enhanced by large expanses of windows.

ASHTON TRACT

The original Ashton property was about 3 acres with 330 feet of frontage on the Iowa River. During the 1950s the property was nearly doubled until it was subdivided in the late 1980s. Without going into details the core area has remained intact. It is 2.22 acres without other houses and a slightly enlarged river frontage of 352 feet. In 1999 over half of the riverfront has been set aside as a Designated Natural Area (defined by the Iowa City Code). This purpose allows reforestation following major tree loss in the major 1993 flood and 1995-96 windstorms

Ned and Gladys Ashtons bought their property in 1944 when it was a cornfield just outside the Iowa City boundary marked by Park Road. It was classified as rural Johnson County until 1958 when Park Road and Rocky Shore Drive were graded and paved. The original farm gates and barbed wire fencing around the Ashton property was maintained for privacy until removal in 1987.

FOUNDATION:

The house employs three distinct parts of the foundation - footing, foundation walls, and support columns for the main floor beams. All of these were calculated in terms of stresses and weights.

Some problems were encountered with the original plan. Ashton told the story that when the footing trench was laid out around the northwest corner he was very disappointed to find that the ground was soft and he doubted that the footing would be strong enough to hold the cantilevered turret. His solution was to drive rock by hand into the soft ground until it stabilized and no more rock could be driven into the ground with his maul. He also found soft ground where the footing supported the pillar for the massive lintel beam over the garage door - the only area in the foundation where the perimeter footing is not continuous. Steel reinforcement bars measured 3/4 and 7/8 inches in diameter.

Reinforcing bars were used wherever Ashton poured concrete - a carryover from his engineering practices. As one example, reinforcing bars were laid on the ground floor before the concrete was poured and the positions of these looped bars is partially depicted, appearing more clearly on the original drawing than on the copy. As another example, a photograph depicts reinforcing bars laid prior to the pouring of the connect driveway.

Lack of internal house supports put all of the weight on the perimeter footings. This design seemingly was conceived to eliminate a problem if central supports settled over time. In a traditional house central supports can be jacked without much damage, but in a concrete house central support weakness through subsidence would shift loads and crack the main floor, causing problems difficult to remedy. For this reason Ashton designed massive beams to carry the loads to perimeter columns and their footings.

The design required accurate calculations because all foundations settle to some extent and the problem was to ensure even settling throughout the perimeter. Ashton calculated such factors as roof load and truss reactions, earth pressure, as well as dead load weight of stone, concrete block masonry, main floor columns, and footings. These factors all entered into the final design. These and other calculations were needed to build when building small bridge footings which he commonly did in his professional practice. It is not necessary to say that this is not residential construction where lighter loads seldom require a structural engineer. The integral footing-wall-column-beam system that Ashton designed has remained solid and undamaged to the present time.

The footings, although continuous, varied in depth according to location. On the south bank side they did not need to be deep since they were already well below the frost line but where the outside ground level is even with the floor, particularly on the north around the garage, the footings are probably deeper. The footing design called for 12-inch footings, but the medial cross section suggest they were built somewhat thick - some 16 to 18 inches - because ground conditions were softer than originally estimated in the calculations. The base wall of reinforced concrete were built wide at 16 inches to carry the outer masonry and its facing inner concrete block wall. These base walls, made integral with the footings, provided horizontal stiffening. When one looks closely at the foundation the line of their support wall and the beginning of the masonry is seen where the outside dirt has settled. It is also seen by the east entry to the ground floor.

MAIN FLOOR CONCRETE BEAMS:

Large beams tied the columns together. One set paralleled the perimeter footings and supported the concrete floor and wooden framing above it on the main floor. Because the exterior limestone masonry continues from the ground floor without a break upwards to the eaves line its entire weight is separate from the beam structure as well as serving a non-bearing structural capacity for the floor system. The entire limestone masonry wall, two stories high on the west facade, is carried on the foundation wall-footings unit. The same foundation unit, on the interior, carries the column, beam, and poured concrete structure. The beam design seems to have tied the structure together sufficiently to keep the walls true and no sign of wall tilt is evident. The upright columns were made integral with the reinforced concrete beams which support the main floor and roof loads.

It may be said that Ashton did not just determine the load on one beam and use it for an estimate of loads for all of the others. The diagonal beam shown is presented as an example. The calculations were made individually for each beam in the notes, an the beams carried different loads because of the complexity of house design although he cast them to a uniform shape with some variations up to an inch or two thinner on beams calculated to carry lighter loads. The beam design represents a complex form, thickened on the outside where more load occurs. The columns, too, are thickened where they meet the beams. The aesthetic effect is striking when viewing the dark brown painted beams from the ground floor. Cast in wooden forms, the beams retain a wood texture and look like old Tudor woodwork. It requires a close inspection to determine that these beams are, in fact, poured concrete.

The main floor beams each had four reinforcement bars of thick 7/8 inch steel tied with 1/2 inch bars and stirrups. The concrete floor poured over the beams was reinforced with wire mesh. Where holes have been cut through the floor for utilities, the thickness can be seen and it is only two inches thick or less. While thin, it has been adequate and nowhere has cracked or broken away. While of good quality, the floor concrete is relatively simple to drill and lacks the extreme density of the beams and columns.

The foundation footings were enlarged during construction, but the upper concrete work needed no modification. The primary change made involved turning the internal stairwell 90 degrees. As originally designed, the stairway ran upstairs from the west side of the ground floor, which was an awkward arrangement. The blocked doorway with wooden lintel in place seen in the garage wall behind what is now the downstairs kitchen seems to be a remnant of this original plan which entered the ground floor from the back of the garage. An east entry adjacent to the garage provides direct outside access. The garage entry is now by this exterior door where it is more convenient.

The electrical system had to be installed before the concrete was poured to avoid major drilling later. The service access was brought in on the east side of the house by the garage down from the eaves on the inside to the ground floor entry service box. It was planned before the columns were poured. Two-wire BX flexible conduit was laid in the columns and their electrical box outlets and also in the ceiling. The conduit was laid out in rectangular patterns so most boxes opening from the ceiling side have four leads running into the box. The purpose was to provide a flexible system because the four leads can be wired together in various ways or bypassed to provide access to different circuit combinations. This proved useful in later years when the ground floor was turned into an engineering shop with more electrical needs and the fixed circuitry was altered by simple changes to outlet box splices to provide more outlets.

MAIN FLOOR ROOM DESIGN:

The main floor plan is one of the areas of design that was the most substantially altered during construction. The upper area of the house was of wood frame construction rather than the concrete block masonry construction of the ground floor. It consisted of wooden plates bolted to the concrete floor with wood studs sheathed diagonally for strength. The exterior was not changed, but inside the house the walls were modified from their planned location. Because the concrete floor and beam structure was so strong it made no difference where the interior walls were placed and they show no particular orientation to the concrete beams in either their initial planned placement or their actual constructed positions.

The kitchen was constructed narrower (a more useful arrangement) by removing a half wall between the kitchen and breakfast room and adding a broom closet in the different entry to the dining room area. With a narrower kitchen the north bedroom then had room for a sliding-door closet on the west wall. The closet on the south wall was expanded to a half bath although the toilet was never installed. The full north bathroom was rearranged into a narrower but more efficient design and the full south bathroom was rearranged to allow for a large square tub rather than a smaller shower stall. The closets were changed, as well. The living room, south bedroom, center bedroom, and master bedroom closets were altered, as well as the north bedroom closet previously described. Originally designed with full-length screening on the porch, it was decided to bring the masonry up to window height. Finally, a full flight of stairs, shut off by a door, now opened from the hallway and led to the attic storage area. These changes, individually minor, were well thought out and made the house more convenient and livable.

ROOF DESIGN:

The relatively complex outline of the house made roof design difficult. The final form was reached after a number of drawing revisions. The original plan seen in the southeast elevation shows that an additional half story was planned with a fairly high pitched roof and a large dormer window on the east side and probably on the west side. as well. The roof became more complex in shape in the next design with windows added to the half story on both the north and south elevations. As the final planning was done the roof was lowered in pitch, had wider eaves, and the idea of a dormer was dropped because the roof line was too low for a full half story.

A 1948 roof plan was used to estimate rafter lengths. As finally constructed, the roof ridge is centered. The middle section of the house has the ridge weight carried by uprights to the dining room wall directly below. Uprights bearing on the hallway wall similarly carry the north section ridge. The wall and door lintels dividing the living room from the porch carry the southern section ridge. This line is 3 feet off center but provides enough support and no problems occur.

DESIGN CHANGES:

The cantilevered balcony, breakfast room, and the north entry deck are shown as they were built on the original 1946 concrete framing plan. The curving stairway was also a construction alteration. The original design had been a straight-run stair with a flare at its base. No sketch seems to have survived of the interior stairway, the curving stair, or the north exterior stairway designs. The porch entry stairs were also altered in their design during the construction.

LIMESTONE MASONRY VENEER:

The well-known Stone City Quarry near Anamosa was the source of the limestone used for the exterior facing of the walls. Ashton had selected the strata he wanted and it was delivered in large chunks which he then split on a steel railroad rail and hand faced with a large rock hammer. Stone City limestone is a dolomitic limestone bonded with magnesium. When fresh, it is easily worked and one of its characteristics is hardening upon exposure to the air.

The numerous window openings were finished by pouring a reinforced concrete sill for each., Window openings on the ground floor also required a reinforced concrete cap or lintel. The window openings on the main floor were all designed with the top of the frame at the eaves level regardless of window size. They require poured concrete sill, but no concrete lintels.

The stone veneer is nowhere set beneath ground level because mortared stone would not weather well as a foundation material. Structurally, the stone facade is a freestanding veneer with the immense weight carried by the poured concrete footings and by concrete block masonry interior walls. However, a completely freestanding wall unattached to the concrete beams and interior framing would tend to shift away from the house over time. For this reason the wall was tied to the concrete block masonry walls and poured concrete structure of the house, although this does not affect weight distribution. Where the stone wall is outside the ground floor the stone and interior concrete block wall were mortared together. The interior frame wall was constructed of studs nailed to a wood sill plate bolted to the concrete floor. As noted above the studs were then sheathed with diagonal boards for strength. Tar paper was then applied for weather proofing over the sheathing.

THE GROUND FLOOR:

Structurally, the ground floor is a clear-span enclosure with the garage area separated by a non-bearing wall of 4-inch thick concrete block masonry. The ground floor of some 1600 square feet was primarily intended as an occasional recreational area. Double French doors lead to the patio and there is a massive stone fireplace. Carrying out the recreational theme, the light fixtures were glass globes set against a ship wheel motif.

The furnace was never completely walled from the workroom area, but a wall partially obscured it and formed a storage room lined with shelves for canned goods. A somewhat primitive bathroom served the employees of the engineering shop and eventually the security room was constructed in the southeast corner for the safe files of classified naval radar plans. After Ashton's retirement, Joye and her daughter Deborah built an apartment in the basement by enclosing part of the workroom for drafting equipment and file storage, adding a bathtub to the washroom, putting in a kitchen, and walling off the last section of the open stairwell.

The ground floor workroom had a humidity problem. The massive walls and ceiling kept the area cool in summer, but on humid summer days outside ventilation brought in warm air which condensed its water vapor on walls and floor. Air conditioning alleviated the problem. Today, ceiling fans and a dehumidifier provide a better solution.

WINDOWS AND INTERIOR TRIM:

TABLE 1 ASHTON HOUSE WINDOWS AND DOORS

MAIN FLOOR WINDOWS AND DOORS

Window Style	No.
Vertical casement sash, side opening	24
Double-hung sash	11
Picture window sash	5
Porch window sash	7*
Total main floor window sash	47

Door Style	No.
Pairs of French doors	4
Exterior doors	2*
Interior flush, hollow core, hinged	18
Interior flush, hollow core, sliding	4*
Interior flush, 1-inch plywood, hinged	2*
Total main floor doors	30

GROUND FLOOR WINDOWS AND DOORS

Window Style	No.
Horizontal awning sash, bottom opening	7
Double-hung sash	2
Picture window sash	1
Glass block masonry	12*
Total ground floor window sash	22

*Non-Curtis origin

Door Style	No.
Pairs of French doors	2
Exterior doors	2*
Steel security door	1*
Interior flush, solid core	1
(Doors removed in 1986 remodeling)	(5)*
Total ground floor doors	11

*Non-Curtis origin

There are 47 windows on the main floor in addition to two fully-glazed sets of French doors and glazed panels in both entry doors. Every window and entry door has a removable storm sash and screen. The numerous windows provide river views and also reflect house design before residential air conditioning became common. The house plan provides cross ventilation through every room. The wide eaves have protected the original millwork intact. Maintenance today is minimal. All sash windows have the storms left on year round. Ample ventilation comes through the vertical casement windows that are double glazed and have inside screens easily removed and stored in a closet during the winter.

The ground floor has 11 block windows that are maintenance free. Other windows are left year round with storm sash. Because of the potential summer himidity condensation problem, outside ventilation is limited to circulation through the screened doors.

The Curtis millwork catalogue illustrates the birch trim around all the windows and doors on the main floor and also surrounding the large picture window on the ground floor. The trim had mitered corners which the Curtis Company named "mitertite", and there are adjustable door jambs made of fir stained to closely match the birch woodwork and door veneer. The catalogue identifies the grooved woodwork pattern as its "Regency" style.

THE 1986 RENOVATION OF ASHTON HOUSE

New owners in 1986 faced the consequences of deferred maintenance. Repairs included complete replacement of the plumbing, replacement of the septic system with a lift station to the city sewer, new air conditioning, water heater and furnace, a new kitchen, complete renovation of the ground floor; as well as interior renovation. The stonework protected by the wide eaves remained in a remarkable state of preservation with its original mortar and the well-designed house needed no structural repairs. Even with its original millwork the thick walls provide effective insulation against temperature variations and the yearly gas-electric bill averaged $100 per month through 1999.

On the main floor plaster repairs and paint transformed the interior. The white tint chosen sets off the birch woodwork that is in excellent condition. Sills required refinishing, but cleaning and wax restored the luster to the other birch trim. An unexpectedly difficult project was the restoration of the mid-nineteenth century marble fireplace that had come from the family home in Clinton, Iowa. Light fixtures were cleaned and left except in the north bedroom and the kitchen where replacements were needed. New carpeting throughout completed the renovation. On the porch, a new slate floor replaced the composition tile. The porch was restored to its original function as a summer sitting room off the living room.

After considerable discussion the kitchen was judged to be a hopeless case and it was removed to the bare walls. Replacement oak cabinets match the tone of birch trim around the 9 windows in the kitchen and adjoining breakfast room. The north kitchen entry was enlarged by moving the washer and dryer to a new utility area in the former half bath off the north bedroom. The main floor renovation has restored the house to its original design after years of deferred maintenance. It is not a new house, but a unique older one.

The ground floor was originally intended to be a great hall type of recreational and party room. Later modifications had been added over the years. The entry had been enclosed into a room for the washer and dryer and a sink with counter added for canning. A narrow room was added as a fruit cellar and later used for engineering journal storage. After Ned's retirement, his large workroom was subdivided with a wall to form a storage room and an efficiency apartment with full bath and kitchen.

The 1986-87 renovation removed all later additions to return the ground floor into a great hall with an open stairway leading down to it. Removing the partitions recreated a huge expanse some 60 feet long and 26 feet wide highlighting the limestone fireplace and showing off the massive dark brown structural beams against the white walls and ceiling. Once the ground floor was cleared, the old asbestos floor tiles were removed and replaced with water-resistant carpeting.

At this same time the water system was changed with new copper lines running in a more efficient pattern to avoid freezing which had always been a problem. The furnace, water heater, and air conditioner were also replaced with high efficiency units cutting utility bills in half. The only utility requiring eventual replacement is the 50-yeaar old electrical system. It is a daunting task because the original two-wire system runs through conduit buried in the concrete beams at the time of construction. It will require a new service entry and complete replacement through the house.

THE GREAT 1993 FLOOD

The previous massive flooding of the Iowa River crested on 16 June 1947. This occasion was just prior to completion of Coralville dam upstream. As house construction pictures show, it covered the footings and most of what would become the adjacent Park View Terrace subdivision and lower City Park.

By late 1992 heavy rains raised the Iowa River and the lower floodplain was covered most of the winter. In 1993 wet weather caused rivers to flood throughout the Midwest. Beginning in June, the Iowa River flood continued with fluctuations over ten weeks. There is some controversy because the final crest came at night when the dam was opened near full and unmanned. Its outflow then combined with unexpected downstream flooding to create a near disaster. Early morning the flood was a foot above the 1947 crest Ashton marked with an iron piper set in concrete. The 1993 crest measured 28 inches over the ground floor by the lower pair of French doors.

By design, no structural damage occurred and the McKusicks continued to live on the main floor during the entire flood with only minor interruptions in utility services. . The electrical system and air conditioner were undamaged. The furnace and water on a concrete pedestal were required minor repairs after the final crest. After the crest passed, the ground floor drained its water through the garage and outside without any impeding sill. It was a messy cleanup but even the carpet was cleaned and is still in use.

SIGNIFICANCE SUMMARY:

The Edward Lowell Ashton house in Iowa City is associated with the productive career of a noted bridge engineer, said to have been the most distinguished bridge engineer in the history of Iowa. Designed and constructed by Ashton and used as his office and drafting room, it directly embodies his career and his Iowa aesthetics.

The Ashton house is likely to survive as one of Ned Ashton's most unique engineering accomplishments. Already locally considered to be a landmark, the great stone house with its cantilevered turret and exterior stairway reflects the bridge designs of its builder. Overlooking the Iowa River, the house incorporates Ashton's engineering skills combined with his aesthetic sense of setting and use of native materials.

EMBODIMENT OF ENGINEERING PRINCIPLES:

Ashton's career as a bridge and structural engineer show through in the reinforced concrete beam construction of the frame which incorporates such sophisticated elements as curving concrete stairs and a cantilevered turret. The very siting of the house with a river view was a constant reminder of one of his chief professional concerns - the bridging of great rivers. The lower floor of the house was designed for, and served as, his work room.

Much of the distinctive architecture of the Ashton house has nothing to do with architectural styles. Ashton brought his knowledge as a bridge designer and structural engineer to the house plan, choosing reinforced concrete and masonry as major materials because he was expert in their use. Some distinctive engineering features of the house include the following:

- The professionally designed poured concrete footing to carry the immense weight of stone and concrete masonry on a soft flood plain.
- The poured concrete pillar and beam system of support of the house core.
- The reinforced concrete floor poured in place over the clear span of the ground floor.
- The offset exterior walls of the porch resting on a concrete sill designed to balance the weight of interior stone masonry.
- The interior ground-level stairway - a concrete monolith supported only by a ceiling beam and a floor footing. The lateral street against the bearing ceiling beam is, of course, distributed through secondary beams to the next adjacent main beam and to the entire ceiling support system.

In addition to these enumerated engineering characteristics, a group of others relate to cantilever construction, here defined as weight balanced upon the pillars by extending main interior beams outside the wall line. Please note the following examples:

- The front concrete balcony is cantilevered upon two integral beam extensions from the interior.
- The monolithic curving stairway of reinforced concrete is tied diagonally into the footing disguised as the two lowest steps.

- The most spectacular example of cantilever support is the round breakfast room where three-quarters of this small room rests upon the cantilever system of beams carried beyond the pillar in the house corner below it.
- The breakfast room support system continues along and outside the north wall of the house facade where the north upstairs entry deck floor is cantilevered on concrete beams structurally continuing the level of the kitchen and breakfast room floor.
- From this outside entry deck the north exterior stairway, a reinforced concrete monolith, leads to the ground. This stairway, only three inches from the masonry facade, is not supported by it, but bears entirely upon the cantilevered entry deck system above and upon a ground footing below.

As an engineer who had specialized in hydraulics, Ned Ashton was well aware of the potential for another great flood in the Iowa River valley which would be beyond the capacity of the Coralville Reservoir to control. The ground floor is designed to minimize the damage of a major flood. Opening the French doors equalizes the pressure and entering water will flow through into the garage unhindered by a threshold or sill, and from there runs out at ground level into the yard. The furnace and utilities are set up on a concrete platform out of harm's way. This system was put to its greatest test in the Flood of 1993. The result was that the house stands firm and unharmed to the present.

Ashton's embodiment of the Iowa aesthetic can be seen in the use of local limestone for wall facing and in the siting heretofore mentioned.

Ashton is credited with the design or restoration of more than 100 bridges throughout his active career. His bridges span the Mississippi River at Greenville, Natchez, Vicksburg, Burlington, Rock Island, and Dubuque. Others bridge the Ohio, Missouri, Neches, Columbia, and Colorado Rivers. His other structures include the Diamond Truss Towers for Pioneer Industries of Sioux City which were built in various locations for the U.S. Air Force. He also built antennae for Collins Radio. Ashton designed the 140 foot telescope in Green Bank, West Virginia for Associated Universities, Inc., a group organized by the National Science Foundation. He also worked for the Army on the Army Reserve Training Center in Iowa City and for the Crandic Railroad in eastern Iowa.

Among all of these engineering projects, his own house is among his more intriguing designs and the place where he carried out his work. The limestone veneer conceals a surprisingly elegant support system of concrete beams, each one individually calculated to spread the stress and mass to the foundation plates floating on the flood plain. It was sited in a private woodland by a river he bridged and is like others where he spent so much of his professional and personal life. Knowing the danger of these rivers he also designed the house to be strong and simple enough to withstand the worst floods that he, as a hydraulic engineer, could foresee. In several other ways the house reflects the values he followed in his professional life and taught his students - cost efficiency, innovative solutions, salvage of materials, and the meeting of challenge. Of all of his commercial and public projects, his own house expresses these values by which Ashton lived.

MAJOR PROJECTS, PRE-1946

Structure/Location	Date
Tieton Reservoir	1917-1924
Minidoka Dam	1921
Cape Girardeau Bridge - Mississippi River	1926-1927
Mobile Bay Bridge	1926
Arkansas River Bridge at Little Rock	1927
Vicksburg Bridge	1929
Trinity River Bridge at Dallas, Texas	1930
Alcova Dam	1933
Boulder Dam	1933
Hoover Dam	1933
Wheeler Dam	1934
Ogden River Project	1934
Baton Rouge Bridge	1934
Grand Coulee Dam	1935
Floyd River Bridge	1936
Greenville Bridge - Mississippi River	1938-1939
Neches River Bridge - Beaumont, Texas	1939
Natchez Bridge - Mississippi River	1940
Brownsville, Nebraska Bridge - Missouri River	1940
St. Croix Bridge - Prescott, Wisconsin	1940
Grand Avenue Viaduct - Sioux City	1940
Manchester Avenue Bridge - Kansas City	1940
Rock Island Centennial Bridge	1940
Current River Bridge at Highway 106	1941
Douglas Aircraft Assembly Plant - Oklahoma City	1942-1943
Dubuque Bridge - Mississippi River	1943

ENGINEERING CAREER, PRE-PERIOD OF SIGNIFICANCE:

Ned Ashton completed his professional training in 1927 and first served as an apprentice engineer working with Kansas City bridge construction for two years. He "cut his teeth" as a designer and detailer of the main spans for the Mississippi River bridge at Vicksburg, constructed in 1929. He worked for four years with the Saint Louis Electric Terminal Railroad project where he was associated with the construction of a six-track underground station. This project was terminated by the Great Depression in mid-1933. He next worked with the U.S. Reclamation Bureau at Denver where for three years, 1933-35, he was responsible for large dam design work, principally the design of intake towers, bridges, hoist houses (Alcova, Boulder, Hoover Dams in 1933, Wheeler Dam and the Ogden River Project in 1934, Grand Coulee Dam, 1935). His major project was the design of an arch bridge over the Arizona Spillway at the Boulder Dam.

He next worked for the Kansas City engineering firm of Howard, Needles, Tammen & Bergendorf, primarily with the construction of a series of major bridges. The Mississippi River Bridge at Greenville (1939-1940) was paralleled by the construction of the Neches River Bridge at Port Arthur, Texas. The latter bridge was planned with an underclearance of 176 feet, and the superstructure towered 176 feet above its supports, with a total length of 8,800 feet. The bridge featured "V" shaped support towers. The Mississippi River Bridge at Natchez (1940) features a 875 foot long main truss, approach trusses of 570 and 790 feet, and stood 375 feet high. The Missouri River Bridge at Brownsville, Nebraska, featured two continuous girder truss spans each 420 feet long and steel pile piers, both innovative. Notable area works on a smaller scale included the Grand Avenue Viaduct in Kansas City with 131 and 127 foot long spans, the Manchester Avenue Bridge over the Blue River in Kansas City, featuring variable depth continuous box girders and all welded continuous curbs. Several major bridges were completed. The Rock Island Centennial Bridge over the Mississippi River (1939-40) employed box girders, steel sheet pile piers, a main span of 540 feet, and outer 396 foot long spans. An open bracing system allowed for considerable economy of construction. The Current River Bridge, Powder Creek, Kentucky, followed in 1941. In 1943 the Mississippi River Bridge at Dubuque again employed a triple span (1,540 feet) continuous truss system and the approaches used a continuous variable depth girder system. The 800 foot clear span was a true tied arch. The Dubuque design had only two antecedents, the Merrimac Bridge at St. Louis and the Cooghnawaga Bridge at Montreal, both of which were smaller than that designed by Ashton et. al. The last bridge, a 550 foot clear span suspension design, was over the Osage River at Finey, Missouri. Ashton designed the Douglas Aircraft Plant at Oklahoma City (1942-43), his final design effort before the war shut down projects and he relocated to Iowa City in September 1943.

MAJOR PROJECTS, 1946-1974

Structure/Location	Date
Cambridge Antenna - Massachusetts	1945-53
Market Street Bridge - Ottumwa, Iowa	1945-72
Benton Street Bridge - Iowa City, Iowa*	1947-51
Lyons Fulton Bridge - Vinton, Iowa	1949-56
Vine Street Bridge - Ottumwa, Iowa	1950-71
Sandusky Bay Bridge	1951-62
MacArthur Bridge - Burlington, Iowa	1951-53
Burlington City Swimming Pool	1952-55
Iowa River Bridge (Crandic) - Iowa City, Iowa	1953-58
354' Radar Telescope (Collins) - Cedar Rapids, Iowa	1954-55
Self-supporting Microwave Radio Relay and VHF Towers, Pioneer Industries, Iowa City	1955-61
Curtis Bridge (Crandic) - Curtis, Iowa	1955-56
Wolf Avenue Bridge - Iowa City, Iowa	1956-58
Central Avenue Viaduct - Burlington, Iowa	1956-71
Prairie Creek Bridge (Crandic)	1957
Clive Road Bridge - Des Moines, Iowa*	1957-61
U.S. Army/Navy Reserve Training Center - Iowa City, Iowa	1957-60
F Avenue Bridge - Cedar Rapids, Iowa*	1961-74
Second Avenue Bridge - Cedar Rapids, Iowa*	1961-65
First Avenue Bridge - Cedar Rapids, Iowa*	1961-63

MAJOR PROJECTS, 1946-1974 (continued)

Structure/Location	Date
Third Avenue Bridge - Cedar Rapids, Iowa*	1963-69
Northwest Overpass - Iowa City, Iowa	1964
Rocky Shore Overpass (Crandic) - Iowa City, Iowa	1964-66
140' Telescope - National Observatory - Green Bank, West Virginia*	1964
College Street Bridge - Iowa City, Iowa	1965-72
Kent Park Dam - Johnson County, Iowa	1966-71
Iowa Avenue Bridge - Iowa City, Iowa	1967-72
Eighth Avenue Bridge - Cedar Rapids, Iowa*	1967-71
Hancher Foot Bridge - Iowa City, Iowa*	1967-74
Edgewood Road Bridge - Cedar Rapids, Iowa*	1967-71
Bear Creek Bridge - Iowa City, Iowa	1969-70
South Bleachers - Kinnick Stadium - Iowa City, Iowa	1970-71
Twelfth Avenue Bridge - Cedar Rapids, Iowa	1972-74
Ironton Bridge - Ironton, Ohio	ca. 1950
Wheeling Bridge - West Virginia	ca. 1951
Resnatron Antenna - Cedar Rapids, Iowa Airport	mid-1950's
Omaha Air Force Base Steel Cable Transmitting Antenna	mid-1950's
140' and 600' Telescopes	1950-60

Note: Dates refer to complete range of paper relating to the project in the Ashton papers
* significant works

THE CONSULTING PROFESSOR 1943-1955:

With that news (the rejection by the Navy) in hand Ashton contacted his former professor, B. J. Lambert, Head of Civil Engineering and former Acting Dean of the College of Engineering at the University of Iowa in Iowa City. He was offered a position as Assistant Professor, at the bottom of the academic hierarchy, teaching graduate and advanced engineers in the Army Specialized Training Program. He was by now forty years old. Working with his mentor, Ashton rose rapidly, becoming a tenured Associate Professor in 1947 and a Full Professor three years later. He fully enjoyed academic life and teaching but, as soon as the war was over he became submerged in incredible activity of various kinds - teaching, campus affairs, some research and publication, personally constructing his complex and large residence with hand-split limestone masonry and, at the same time, developing a large and successful consulting practice.

The Army training program effectively ended with the War and he developed courses in his specialties listed in his vita - steel structures, structural design, masonry structures, and mechanics. He was well regarded by his students and they found him full of entertaining anecdotes from his years as a practicing, professional engineer. He found his classroom activities to be stimulating and he enjoyed the company of students. He and his wife, Gladys, frequently entertained graduate students and they respected him as a man whose outside consulting enabled him to employ them on their first professional jobs. By 1958 he correctly noted that he had already employed 40 to 50 students at one time or another and in later years he employed others (Alumni Review, 1958, ibid, p. 15). He also organized the student program with the help of his wife at First Congregational Church in Iowa City.

From 1946 to 1949 Ashton's professional involvement with the Benton Street Bridge and personal commitment to building his house absorbed his time and energy. After finishing the exterior facade of his home he let interior finishing slide, sub-contracting some of it and putting off the rest to the sometime dismay of Gladys. The interior was incomplete until 1952.

By the early 1950's he was sufficiently clear of house construction to undertake some campus involvement and here his primary contribution was as a member of the faculty committee on athletics. He was also active in the faculty Triangle Club. Meanwhile, his growing consulting practice was becoming remunerative financially and he began to obtain prestigious contracts with the Navy and the National Science Foundation. This work was carried out in his workshop area at his home where he employed other engineering students.

A review of the Ashton Papers shows that many of the projects were fairly routine in scope. However, he gained wide recognition for his farsighted emphasis upon welding structural steel members to avoid the structural weakness, heavy reinforcing plates, and expense of riveting. This subject was discussed at length by Ashton in sections he wrote in the Procedure Handbook of Arc Welding Design and Practice which was widely used by engineers, fabrication designers, and others in industry. Issued and published by the leading manufacturer of commercial welding equipment, Lincoln Electric, this Handbook had an enviable record of editions and reprintings. Aston made major contributions to the ninth edition of 1950, reprinted in 1951 and 1952, the tenth edition of 1955 reprinted in 1956, and the eleventh edition of 1957. As an example of his contributions, chapter 6, by Ashton, ran to 470 pages in the eleventh edition and the list of contributors and consultants, which was not in alphabetical order, placed him at its head. Ashton also published two articles in Civil Engineering , the premier academic journal in his field, during his early academic career. The articles covered his laboratory research on steel and reinforcement bar materials strength testing.

Some shipyards had experimented with welding rather than riveting prior to World War II, particularly to lighten and strengthen warships, but it was not until World War II itself that welding became commonplace on cargo ships because of its strength and efficiency in construction. Following the war one of the first all-welded truss bridges to be constructed in the United States was the Benton Street Bridge in Iowa City, designed in 1947 by Ashton and built in 1949. This bridge had clean lines for paint maintenance, provided a considerable cost savings in fabrication and steel weight over a comparable riveted structure, and was erected in far less time because sections were fabricated prior to erection. The

Benton Street Bridge, now replaced despite its historical interest, was an industrial landmark. It attracted a great deal of professional interest among engineers. Lincoln Electric loved the bridge because it sold commercial welding equipment and years later was still giving out reprints of Ashton's article published in the Welding Journal. Although welding was probably inevitable given the great success of shipyards, and Ashton's bridge may not have been the first of its kind worldwide, it was an extremely important example which, as much as any single structure made riveted girder bridges a largely obsolete technology within a very few years. In view of bridge construction techniques in use in the 1940's, the Benton Street Bridge represented a conceptual breakthrough in design, theory, practice, and of equal importance actually persuading the City fathers to finance its construction. Unfortunately, Ashton failed to convince the Iowa City Council to make the Benton Street Bridge four lanes in width, thereby dooming it for replacement by the present four-lane bridge.

Meanwhile, the concept of welded bridges spread throughout the United States and into Europe. A representative list of dated articles from the 1957 Procedural Handbook (Eleventh Edition, pp. 6-466) illustrates how the idea took hold. Articles were published in the prestigious journal Civil Engineering such as *California's All Welded Viaduct Points Way to Improved Design,* 1952; *Sequence and Continuity Mark Modern Welding Practice,* 1952; *Are We Ready for All-Welded Railroad Bridges,* 1952; or *Welded Railroad Bridges - Why Not?.* These appeared all three years after the Benton Street Bridge experiment and Ashton's publication of 1949 in the industrial Welding Journal. The Engineering News-Record (McGraw Hill) which kept readers up to date on contemporary advanced construction began publishing examples of the new breakthrough such as *Welded Bridges of the Future - Less Steel,* 1951; *New Plate Girder Span Record, 676 Feet, Is Set by Germans on Rhine Crossing,* 1952; *New Span Record Set for Welded Girders,* 1954; *New York State's First-All-Welded Railroad Bridge,* 1955. Meanwhile, other journals were reporting firsts in the 1950's such as the Pennsylvania Railroad in 1955, Switzerland in 1952, The French Seine Bridge in Paris in 1953, and elsewhere.

At this time Ashton turned his attention briefly to welded steel frameworks for forming the core of high-rise commercial buildings, publishing an article on the proper use of tab supports to avoid stressing the welds. He did not pursue this theme because he had contracts to design these structures (Ashton, *Arc-Welded Beam and Column Framing,* Progressive Architecture, September, 1949).

Meanwhile, the City of Burlington, Iowa employed him to study a number of their structures, including the MacArthur Bridge across the Mississippi. As described in his publications in The American City *The Bridge is Better Than New,* November, 1954 and in more detail in the Welding Journal *The Reconstruction of the MacArthur Bridge,* April 1954, the structure had been erected in 1916 by a private company until it paid for itself in 1923 when it reverted to the City of Burlington. Ashton wrote:

The construction of this bridge could well serve as a good exercise for the engineer. Its 2,460-foot span contains beam spans, six varieties of girder spans, and three lengths of deck-truss spans, in addition to 1,000 feet of main cantilever spans. (American City, 1954 ibid.)

Ashton estimated that the most cost-effective approach was reconstruction which finally cost $806,200 compared with the price of a new bridge in excess of $3,500,000. Because the details of the work were published it is enough to say here that the bridge, condemned for heavy traffic and shaking under lighter traffic was restored far in excess of its original specifications and was given another thirty years of useful life.

Ashton's work in radio and radar antenna towers apparently began in 1951 when he designed a 50-foot radar antenna on top of the Naval Research Laboratory in Washington, D.C. It needed to rotate so Ashton's solution used a surplus naval gun mount which he redesigned as the most cost-effective solution and it has worked very well ever since. The admirals were delighted with the nautical solution. The Director of the Naval Research Laboratory, Dr. John P. Hagen, next asked Ashton if he would be interested in working on a much larger project, and the result was that he began work on a 600-foot wide dish and mount for a radio telescope, receiving a two-year leave of absence from the University of Iowa beginning in 1955. This project, like all others during his employment at the University, was designed in Ashton's ground-floor workshop in his home in Iowa City. The fifth design was accepted and classified, but he was greatly disappointed when the completion of the project was taken out of his hands and given to a traditional defense contractor, Rockwell. According to later newspaper clippings, Ashton bitterly complained that Rockwell wasted $15,000,000 in half-completed construction at Sugar Grove, West Virginia, on an alternative design which could not be built because of flaws (later comment by Ashton in **The Cedar Rapids Gazette**, Sunday, November, 1964, Section B.)

At the same time Ashton was asked to design the 140-foot radio telescope for the National Observatory at Green Bank, West Virginia. Associated Universities, a non-profit consortium of universities contracted with the National Science Foundation to operate major facilities which included the National Radio Telescope Observatory at Green Bank. They also operate the Brookhaven National Laboratory at Upton, Long Island. Associated Universities represented major Northeastern Ivy League universities - Columbia, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Pennsylvania, Princeton, Rochester, and Yale. They contracted for Ashton's services on a consulting basis for conceptual plans and for every stage of construction through completion. This arrangement was made to avoid Rockwell's disaster with the 600-foot dish for the Air Force. Meanwhile, he designed a 300-foot radio telescope for the Navy. Unfortunately, it was never built.

INDEPENDENT CONSULTING PRACTICE 1955-1973:

Ashton emotionally left the Engineering College in the mid-1950's with his leave of absence from 1955-57 to work on the 600-foot telescope. His daughter, Joye, has said he also took the leave to confirm that, indeed, he could support himself solely by consulting.

The ground floor workroom was crowded with as many as twelve draftsmen working out details on the 140-foot telescope and numerous other projects. In his interview recorded in the Alumni Review (1958, ibid, pp. 13,14) the flurry of activity was described as follows:

The first glimpse I had of Ned Ashton, he was certainly in his element. He stood in the presence of several men in shirt sleeves, all of them standing around a table on which were spread many drawings of one of Ned's present projects. Handing over a stack of background materials he had promised me, he returned to conclude his conference in the next room after committing me temporarily to the care of Mrs. Ashton. At present, Ashton is consulting engineer on thirty-three projects from bridges and radio telescopes to radio towers and a swimming pool.

These projects are described in the Ashton Papers (Section 26) and this discussion is limited to four of the best examples of his structural engineering activity.

The first example is the Clive Road aluminum bridge in Des Moines which, unfortunately, has been demolished. The major journal Civil Engineering published his article (October, 1958, vol. p. 761, pp. 79,80). The title, *First Welded Aluminum Girder Bridge Spans Interstate Highway in Iowa,* is expanded in the opening sentence to correctly state that it is the world's first welded aluminum girder highway bridge. The pioneering structure was built as research and extra costs were paid for by the Alcoa, Kaiser Aluminum and Reynolds Metal Co., the three largest producers. Ashton was the conceptual engineer and supervised every stage of construction. The major advantage in using magnesium aluminum alloys is that they will last a lifetime without maintenance or painting and do not rust or corrode as ferrous metals do. Ashton also emphasized that these alloys are as strong as steel but much easier to handle and he predicted that aluminum would be cheaper than steel if mass produced. The Clive Road Bridge near Des Moines is described in other articles and for details see *Iowa Tries a Welded Aluminum Bridge,* Engineering News-Record, February 20, 1958 and locally The Central Constructor, October, 1958, vol. 36, no. 4, *Dedicate Welded Aluminum Girder Bridge* (p. 14) and *Experimental Structural Behavior of Iowa's Aluminum Bridge* (p. 15) by E. G. Prentzas, Project Engineer for the State Highway Commission.

The second major project was the giant 140-foot telescope at the National Observatory at Green Bank, West Virginia. During the late 1950's and early 1960's Ashton made repeated visits to iron out problems which came up during construction. He and Gladys always drove to West Virginia because he was uneasy in airplanes. In describing the problem of design Ashton was faced with complex stress calculations involving the mounting of the huge dish on a structure seven stories high. Ashton himself did not publish a discussion of this project, but a very complete article appeared with photographs illustrating the stages of construction and providing some technical detail. This article is *The New 140-Foot Radio Telescope* by Maxwell M. Small, National Radio Astronomy Observatory, Sky and Telescope, November, 1965, vol. 30, no. 5, pp. 267-274. This journal is published for the serious amateur and until recently was a public service of Harvard College Observatory Cambridge, Massachusetts. It is now independent. To provide one aspect of the engineering design problems, Maxwell Small wrote:

The mass moment of inertia of the instrument about the polar axis results in a (gear) tooth loading of 37,800 pounds in 35-mile-per-hour winds and 124,900 pounds in 80-mile-per-hour winds. (ibid, p. 274)

The design allows operation in winds up to 15 miles per hour. There are larger radio telescopes but these are fixed, transit types. Ashton's 140-foot design was the largest equatorially mounted, moveable radio telescope in the world at the time it was designed and has proven to be a very useful research instrument. It is accurate and considered to be unequaled for its type. Dedicated in February, 1965 it was operated by Associated Universities as previously discussed. In more recent astronomical research the Very Large Array system for directional antenna replaces single large instruments with a series of spaced smaller instruments with a combined greater theoretical amplification and thus the earlier emphasis in the 1950's on instruments such as Ashton designed has shifted. Nevertheless, it was a striking achievement in structural engineering. Aston said in the 1958 Alumni Review article that one of the major concerns was the effect of movements on the huge yoke and pole shafts as the instrument was shifted from one position to another. Every change in direction set up a new stress complex, tending to pull it apart. Ashton proved here that size makes no difference if the stresses are plotted correctly.

The third major project which won wide recognition during his years in private practice was far removed from the two *tour de force* breakthroughs in structural engineering represented by his famous aluminum bridge and giant radio telescope. It was equally typical of his work, however, because it emphasized the concept of cost effectiveness. The project concerned the deteriorating concrete spandrel bridges in Cedar Rapids which had reached the state of being condemned for heavy traffic because of the crumbling concrete which had not been carefully supervised during the initial pours. The spans were hollow and filled with clay upon which the roadway was laid. it was a construction technique dating back to the time when brick roads were laid on sand over clay. His analysis showed that the spandrel bridges could be saved through reconstruction and the public expense would be far less than tearing down the old bridges and building completely new ones in their place. This entire project - rebuilding the downtown bridges - was accomplished rapidly and efficiently. At the end the old bridges were far stronger than the original designs. This was accomplished by removing the clay fill and building open supports tied to an integrated reinforced concrete deck. The load on the span was considerably lightened and the roadway directly contributed to the integral strength of the other braces and arches instead of merely resting upon them as was the original design. The project was featured on the cover of Civil Engineering, American Society of Civil Engineers, November, 1968, Vol. 38, No. 11, with Ashton's article *New Bridges Founded on Old* on pages 44-48. The technical details are discussed in the article and it is only noted here that Ashton estimated he had extended the life of the bridges another 40 or 50 years, provided 17 lanes of traffic where only 12 had existed before, and substantially improved the river channel as a floodway. Not only were these bridges interesting to view, but in saving them Ashton estimated that he saved the City $2,000,000 over the cost of new bridges.

The Civil Engineering article concluded with a boxed editorial noting *This project received an honorable mention in the U.S. Consulting Engineers Council's competition for the 1968 Award for Engineering Excellence.*

The Cedar Rapids bridge reconstruction led other cities to reconsider rebuilding rather than simply tearing down and replacing their period-piece concrete spandrel bridges. One example is the reconstruction of the spandrel bridges on Iowa Avenue and Burlington Street in Iowa City, carried out in the 1980's by an associate of Ashton affiliated with the original Cedar Rapids project, Robert Lenther.

The final project which represents Ashton's approach to structural engineering is the redesign of the College Street Bridge in Iowa City. This replaced a less-well-designed, narrower bridge of the late 1920's which was flawed by poor quality control of the concrete pours. By the late 1960s the bridge was closed to traffic. Ashton had previously inspected the bridge in 1965 and recommended reconstruction or rebuilding, and five years later, in 1970 he won the contract for design. This led to an acrimonious public debate in the Iowa City Press-Citizen (August 21, 1970) with the story, *Ethics Questioned in Bridge Study,* with complaints by the firm of Shive-Hattery because they had expected to be awarded the contract as a matter of course. The firm did not appreciate Ashton's published comment that it was *not worth fighting over such a little job* since he had both won the contract and made Shive-Hattery look small at the same time. Ashton's conceptual design published in the Iowa City Press-Citizen (December 8, 1970, p. 5A) used the old abutments at both ends spanned by a concrete flat arch resembling his late 1960s design of the Hancher footbridge. It removed the central supports of the old bridge, opening up the area below and reducing floodwater backup from the adjacent Ralston Creek. He estimated the cost at only $350,000 and his replacement had widened the traffic lanes four feet, provided parking on both sides to allow for more traffic in future, and eliminated the four-foot crown in the bridge center while having a higher clearance below. Seen today, the College Street Bridge revitalized the area below it in conjunction with Project Green's successful plan for a civic plaza.

There were Ashton designs in his later years, among them the Edgewood Bridge of 1968 in Cedar Rapids which won a national award. This interstate highway bridge crosses the Cedar River. The Hancher footbridge of 1969 on the University of Iowa campus should have won an award and did not. It is a visual delight.

During the 1960's Ashton received national recognition for his designs. In 1964 he was the medallist for his contributions to industrial welding from the James F. Lincoln Arc Welding Foundation. The next year he was honored at the dedication of the 140-foot telescope at the National Observatory in Green Bank, West Virginia, as the project's conceptual engineer (see the Dedication Program, 1965). In 1968 he received honorable mention in the Award for Excellence from the U.S. Consulting Engineers Council for his Cedar Rapids spandrel bridge reconstruction. In 1970 he won the American Institute of Steel award, category medium span high clearance, for his Edgewood Road Bridge in Cedar Rapids. In the Iowa City Press-Citizen (Thursday, July 30, 1970, p. 12A) he was quoted as saying that he had designed well over 100 bridges in addition to his other projects.

RETIREMENT 1973-1985:

Ned Ashton disregarded legal advice to incorporate his business. Running his own business without named partners or associates gave the consulting practice a sequence of employees over the years. Ashton would not have worked for such a business in his younger years. One consequence was that the sometimes fiercely competitive rival firms expanded with partnerships while his own consulting contracts dwindled as he neared his seventies. While in his late sixties he began to wind up his engineering business and reduced his staff. Gladys had always served as secretary and business manager and as her health began to fail a part-time secretary was employed. There was no sudden break, but rather a tapering off of activity for a period of several years.

The lack of incorporation did have one interesting long-term effect - the business reports and contract reports were kept intact instead of going with the firm or sold and this made it possible after Ashton's death for his heirs to donate them to the Iowa State Historical Society.

For most of his life Ned Ashton had been favored with remarkably robust health. In the 1960s, about 1963, he suffered his first major heart attack and the family thought it was brought on by the pressure of business and disappointment over the fate of his 600-foot telescope which was not being built. Some ten years later, as his business was winding down he suffered a second major heart attack in 1973. He was not visibly impaired by either one. Although overweight, he maintained a high level of physical activity for a man of his age, cutting timber on the Ashton Tract and at his cabin, digging, and doing yard work. In 1983, at the age of eighty, he spent the summer completely reroofing his house - a project neglected for some years as evidenced by the deterioration of interior plaster on the perimeter walls. This job was undertaken a section at a time, taking off shingles and tar paper down to the wood sheathing planks, replacing rotten boards as he found them. The same summer he also replaced the roof at his cabin. Late in the summer of 1983 he overstressed himself severely. While fishing in the Mississippi River he jumped into the river to try and untangle and salvage his lines. He was alone, in chest deep water and, as he later told the story himself, he was surprised to find that he could not muscle his way back over the gunwale of his boat. He was far out in the shallow, mud-bottomed flood pool and said he waded two miles, pulling his boat behind him, to get back to his mooring. The next day, deciding to lay up his boat for the fall, he trailered it from the Army Corps of Engineers landing to his garage at the cabin. It was there that he lifted the trailer tongue to wheel the boat inside when it was heavy with boat water not completely drained. The resultant strain brought on his third heart attack. He recovered sufficiently to get to the cabin where he spent the night and the next noon he drove to Iowa City to consult with his doctor and was immediately hospitalized. With his permission a crew finished the last roof section over the kitchen and he was no sooner out of the hospital than he climbed the two-story ladder to check progress on the roof. Following this heart attack he continued his physical activity, maintaining the yards at the house and cabin, walking to Kinnick Stadium, and doing chores, but carefully pacing himself. He also continued fishing from his boat on the Mississippi River.

The day he died, December 1, 1985, a heavy snow had fallen. He cleared his 300-foot driveway with his large snow blower and then set up a ladder and trimmed some snow-broken dead branches on the driveway with his chain saw. He then decided to drive out to fill his car with gasoline. At the intersection of Rocky Shore Drive and Highway 6, about one-half mile from his home he realized he was having a major heart attack. He stopped the car in the middle of the intersection, turned off the ignition, and, minutes later, was found in a coma by the police. He died quietly at the University of Iowa Hospital an hour later where efforts to revive him failed.

Ned Ashton maintained his interest in structural engineering through his last years of retirement. He often had uncomplimentary remarks about modern projects based upon what he felt were design flaws and lack of knowledge about structural details. The design of the new Carver Hawkeye Arena came in for particular criticism because he considered the exposed roof trusses to be far more expensive and heavy than were necessary. Moreover, the exposed trusses became a radiator, radiating heat from the arena during the winter and absorbing heat during the summer and greatly inflating utility costs. He also criticized the cantilever design of the roof, predicting that winter contraction and summer expansion would soon break down the seals at the outer walls, providing a number of examples of the expansion of exposed bridge beams on the Mississippi River which caused temporary flexing, most readily seen on swing bridges. The Rock Island swing bridge would not close properly if one side was in the sun and the other in shade and it had to be set for even expansion before closing upon occasion. He also studied the collapse of the Kansas City hotel skywalk from technical reports and was shocked to learn it had been supported by bolts and washers too light in design to carry the weight. His last consulting job, an informal one given to him by a former student in practice in Cedar Rapids concerned whether the new Kinnick Stadium scoreboard could take additional weight for advertising. His study of the plans convinced him that the scoreboard was improperly seated on the foundations and was a potential danger even without additional stress. This last plan review was in 1983. Among other stories he told in his latter years were several related to over-caution when it was not needed. In prior years he had studied the steel beam structure over the University of Iowa Fieldhouse and felt that closing it for replacement had been unnecessary as it was repairable. Similarly, the closing of the Mississippi River bridge north of McGregor, Iowa in the early 1980s because of a cracked plate had been an unneeded precaution, stating that such a flaw was repairable and the bridge was strong enough for one-way traffic during repairs. Other stories could be mentioned, but a few have been provided to provide the context for a final disappointment. About 1983 Ashton's professional certification as a professional registered engineer in Iowa was removed because he had not taken continuing education courses at the University of Iowa. He retained his Missouri certification, but protested the Iowa decision in vain.

ASHTON HOUSE CONSTRUCTION; A FAMILY SAGA

Ned Ashton finalized his house structural plans in the spring of 1945 and fully intended to do much of the work himself while he and his family lived in a rental house near downtown Iowa City. However, circumstances soon required a much more burdensome family involvement.

Immediately after the war new lumber was impossible to buy. One of Ned's engineering friends had successfully bid on hundreds of thousands of feet of salvageable lumber owned by the government, but it was in the form of built up crates designed for shipping Army tanks overseas. Using this source Ned bought four railway flatcar loads of flattened crates, had it delivered to an Iowa City siding, and then trucked to his house construction site. One crate was rebuilt as his temporary tool shed. His two older teenage daughters were then put to work pulling nails to make useable lumber. Reusable nails were tossed in one barrel, bent nails that could be straightened went into a second and junk nails ended in a third. This source of lumber was used for all the concrete forms and subsequently reused in the timber construction of the main floor walls and roof. Even the tool shed was recycled. In the attic today some of the boards still have traces of concrete from their previous use in forms. Other lumber was subsequently bought as needed.

The first concrete was ready mix delivered and poured into his footing forms. However, the drivers stopped delivery because Ashton was not hiring union labor. In response, he sank a shallow sand point well with a hand pump, bought a hand concrete mixer, and bulk ordered sand, gravel, and bags of concrete. His wife Gladys and oldest daughter Joye mixed concrete a small load at a time, which Ned moved to each pour in a wheelbarrow. He soon added a motor to the mixed using temporary electrical service. The small pours are still evident today.

When the house was completed, Ned tallied his receipts and estimated his total costs at $17,000 that included the original purchase of the cornfield. Paid for along the way, the house had no mortgage.

BIBLIOGRAPHY: THE ASHTON PAPERS

A convenient date for the house is the inscription, *ASHTONS 1947.* which was impressed with rope during the pouring of the massive reinforced concrete lintel beam above the garage on the east elevation.

The primary and most important source on the Ashton House consists of unpublished plans and drawings by Ned Ashton. These were assembled and photocopied at original scale by Technigraphics of Iowa City in the fall of 1986. The folio, Ashton House Survey and Plans 1945-1986, is an integral part of it.

Other unpublished documentary material is the very incomplete photographic file taken during construction (Ashton House photographs and negatives 1946-1955). His late professional engineering projects documented each set of reinforcing bars and individual concrete pours to demonstrate that contractual specifications were followed. This procedure was followed because in his professional life he had frequently encountered inferior construction because of inadequate project supervision. His detailed project photographs accompany his engineering records (Ashton Papers, Iowa State Historical Society). Building Ashton House himself, he saw no need for a continuous photographic record, although his set of annotated plans notes all construction deviations from the working drawings. The result was that the house construction photographs are merely snapshots and often of poor quality. It is hoped that additional photographs will be found when the Ashton Papers are organized by the Historical Society.

In summary of sources, published descriptions and photographs by themselves are inadequate, but there is a very complete and unique unpublished record including calculations, receipts, house plans, annotated design changes, and construction notes, all providing a wealth of detail. Not considered here are the family anecdotes of this epic house construction.

Primary sources on Ashton's engineering consulting practice associated with the house as a workshop are the Ashton Papers which are his professional engineering files on major and minor projects. As mentioned previously, these papers are at the Iowa State Historical Society. The Index to the Ashton Papers dates from the 1960s and was a working guide used in the office for information retrieval, but it does not include the last projects in the files. The Index is a useful document although now obsolete because the papers themselves have been reorganized but not yet catalogued. Sources on individual projects vary. Some were published in professional engineering journals, others as pamphlets, and a few newspaper clippings provide some insights. Much of what Ashton designed during his early years as a professional (1926-1943) has not survived in any retrievable form. A few bridge study plans are in the Ashton papers from his years with the Harrington et. al. Engineering Company, but no complete list of projects which he designed or supervised is known to survive, nor is it known if the company is still in existence, much less that they would retain these files. Most engineering companies do not keep extensive files for lengthy periods of time because of storage costs. Similarly, nothing is known of the Austin Company which employed Ashton as design engineer to build the huge Douglas aircraft factory in Oklahoma City. A short, published note is the only record reported for the project. His work with Hooks and Associates in St. Louis was to supervise the project and, with the death of Hooks, Ashton kept all of the plans which are available. They were, in fact, stored for many years in the Ashton House attic. These plans show that Ashton was not the designer of the subway. His work with the U.S. Department of the Interior, Bureau of Reclamation is probably on file somewhere in the labyrinth of the federal archives.

As Ashton established himself as a consulting engineer he produced a number of publications. Into the 1950s the two best general sources on Ashton's career are his own 1955 professional vita and the subsequent article *Bridges Are His Business* in the 1958 Alumni Review which clearly draws upon the vita for some source material, even to a few phrases.

There is a wealth of unpublished and unwritten family anecdotal information, together with genealogical records. His University of Iowa athletic prowess and that of Gladys, who was equally proficient, is documented by Hawkeyes of the mid-1920s. Taken together, there is enough background information and specific project documentation to provide a fuller sketch than is summarized here.

Ashton's record as a professor of civil engineering (1943-55) is part of the University of Iowa archives. it is likely to be of little value in understanding his conceptual work as a designer. The Ashton Papers start with his consulting on projects during the immediate post-war period where there was money for both civilian and military projects. One may suppose that as a contractor and consultant, Ashton appears in project archives of the U.S. Navy, Office of Naval Research, the U.S. Air Force, and, perhaps, the U.S. Army. There is also Associated Universities, Inc. and the National Science Foundation. However, these projects are fully covered in the Ashton Papers themselves.

The Ashton House was locally considered to be a seven-day wonder during initial construction because of the unusual concrete framework. For this reason it is surprising that little was published about the house. The first article to appear was in the Iowa City Press-Citizen, 1949, where the society editor wrote a quaint fable telling of the Ashton womenfolk building the house while the engineer performed the necessary slide rule calculations and installed the Clinton marble fireplace mantelpiece. A more complete and accurate story was published in the 1955 University of Iowa Staff Magazine. Some information also appears in the Alumni Review, 1958, which is not the most significant source on Ashton's career. Because the house was not a professional project, nothing about it is known to have appeared in any engineering journal. Finally, the Curtis Woodwork Style Book, 1946 provides descriptions of all of the catalogue birch millwork, framing, windows, and interior doors used in the house.

The Ashton Papers are in the custody of the State Historical Society of Iowa in Iowa City and the original organization by file drawers has been disrupted in the process of filing them permanently. With restricted state funding it is unclear as to when the Papers will be organized for reference and research. The original file index is available and it lists the projects, but it was originally planned merely for retrieval reference during the consulting practice. Rather than simply repeat the index here, or reorganize them serially by year, they have been grouped by client, which may be of assistance in depicting the scope of the projects. Additional entries may be found among the papers once they are researched as, in Ashton's later years, they became slightly disorganized and there was also duplication of materials as he tended to save everything. It comes as a surprise to discover that plans of public engineering works have often had an uncertain and short shelf life in years past because of the absence of a public archival program. It is hoped that the Ashton Papers will provide a further impetus toward this necessary public program organized at the State Archives in Des Moines.

ASHTON ENGINEERING CLIENTS

ASSOCIATED UNIVERSITIES: National Science Foundation. Design and construction supervision of 140-foot radio telescope, National Observatory, Green Bank, West Virginia (1955-65).

BURLINGTON, IOWA, CITY OF: New Maintenance building (1955), Burlington Garage (1955), Burlington Swimming Pool (1955), Cascade Bridge Reconstruction (1955), MacArthur Bridge Redesign and Reconstruction (1953-54), Main Street Subway Preliminary Design (1967), Sixth and Seventh Avenue Viaduct, Preliminary Design (1967), Central Viaduct (1967-1969).

CEDAR RAPIDS, IOWA, CITY OF: A Avenue Viaduct (1954), F Avenue Bridge Inspection (1962), Mays Island Parkade Parking Ramp and Memorial Coliseum (1963), First Avenue Bridge Reconstruction (1961-1966), Second Avenue Bridge Reconstruction (1961-1966), Third Avenue Bridge Reconstruction (1963-1965), Fifth Avenue Bridge Specifications (n.d.), Mays Island Retaining Walls (1965), Access Northwestern Bell Manhole, Third Avenue and Second Street (1965), F Avenue Dam and Freeway, Flood Control (1967), Eighth Avenue Dam Estimate (1967).

CHICAGO BRIDGE AND IRON: Information on wave tank design, offshore structures ((1968).

CLINTON (IOWA) COUNTY: Lyons-Fulton High Bridge, Studied and Dismantled (1955).

COLLINS RADIO, CEDAR RAPIDS, IOWA: Proposed Foundation, Collins Radio Antenna (n.d.), Steerable Beam Antenna (n.d.), 50-foot Radar Telescope (1955?), 20-foot bi-conical horn (1955).

CRANDIC RAILROAD (acronym: CEDAR RAPIDS AND IOWA CITY): Consulting engineer on Bridge Repair and Design. Bridge at Iowa River Coralville Reservoir (1955-1966), Prairie Creek Bridge (1957), Iowa River at Iowa City Bridge and Overpasses: Report Specifications (1957 -1958), Chicago and Northwestern Overpass (1964), Rocky Shore Drive Overpass (1964-1965), Ralston Creek Bridge (1966), Interstate 518 (1968), North Riverside Drive, Iowa City (1968).

CULLEN AND SEHLITZ, IOWA: Trickling Filter Cover, Dyersville, Iowa (1966).

F.S. FEED SERVICES MILL, IOWA CITY, IOWA: Report on Bin Failure (1964).

HIGHWAY COMMISSION, STATE OF IOWA, AMES: Reconstruction of Blue Earth Creek Bridge, Winnebago County (1954), Continuous Girder Bridge, Scott County (1956), Aluminum Bridge, Clive Road Overpass on Interstate 80, Des Moines (1957), Delmar Junction, C.M. St. Paul and Pacific R.R. over U.S. 61 (1958), Loveland Bridge, 111, Cent. over Interstate 80 (1959), Edgewood Road Interstate over Cedar River, Cedar Rapids (1968).

IOWA CITY, IOWA, CITY OF: Municipal Swimming Pool, City Park (1944-48), Benton Street Welded Bridge, Specifications (1948) and Plans (1949), Wolf Avenue Bridge Specifications (1958), Ralston Creek Bridges including South Dodge, Glendale Road, Sheridan Road, Third Avenue, and Center Street (1953-1959), New Park Road Bridge (1959) (contract not awarded to Ashton), College Street Viaduct Inspection (1965) and Rebuilding (1970).

IRONTON, OHIO (OHIO STATE HIGHWAY COMIISSION?): Reconstruction of Ironton Bridge, Highway 52 (n.d.).

JOHNSON COUNTY, IOWA: Kent Park Dam (1968).

JOHNSON, ROBERT: Repair Weld on Tainter Gate (1965).

KAHILL ENGINEERING: Hubinger Conveyer Structure, Keokuk, Iowa (n.d.)

KOPPERS COMPANY: Report and Recommendation, Urea Bulk Storage Building, Port Neal, Iowa (1967).

OTTUMWA, IOWA, CITY OF: Vine Street Bridge Inspection (1968), Market Street Bridge Inspection (1968-1969).

PIONEER INDUSTRIES, SIOUX CITY, IOWA: Designs for Diamond Truss Towers, Aluminum Garbage Trucks, Load King Trailers (n.d.).

U.S. AIR FORCE: 300-foot Radio Telescope (1954), Air Force Towers (n.d.).

U.S. ARMY: 50-foot antenna, Naval Research Laboratory, Washington, D.C. (1949), Erected (1951), Remounting Calculations (1959-60), 600-foot Radio Telescope (1956-1957).

UNIVERSITY OF IOWA, IOWA CITY, IOWA: 60-foot Kennedy Disk, Physics Department, MacBride Field Campus (n.d.), Hancher Fine Arts Center Iowa River Footbridge (1968), Kinnick Stadium Report (1970).

The foregoing list of clients is reorganized from the Index to the Files because the Reports themselves are temporarily unavailable for reference. (n.d.) means that the entry is not dated in the source index. These files date from 1944 to 1970 and later and represent Ashton's period as a consulting engineer. Work from his earlier professional career is more sparsely represented. The St. Louis Railroad Subway (1929-1933) is explained in the text (pages 52-54). Indexed plans from the late 1930s through the early 1940s are major bridges: Greenville, Mississippi,; Natchez, Mississippi; and Centennial Bridge, Rock Island, Illinois. Bill Ashton believes there are other bridge plans, as well, from his commercial designing period. There is another group of plans of railroad bridges: Milwaukee Lift Bridge, and two Milwaukee Bascule bridges, one at South First Street and the other at Jureau. These are presumed to be Burlington Railroad bridges where Ned Ashton's older brother, George, was chief engineer, but it is unlikely that Ned Ashton designed them, although he may have been consulted informally about them. A more complete list of the Ashton Papers from the State Historical Society is yet awaited.

ANNOTATED BIBLOGRPAHY

Part A. Publications and Printed Materials

Ashton, Ned L.

1944 *The Design of a 1,540-foot, Three Span Continuous Tied Arch Truss.* The Transit, University of Iowa College of Engineering, vol. 48, No. 7, cover and pp. 5-11, 14-17. and 22. Various calculation tables, 8 photographs, 3 drawings. Also available as University of Iowa College of Engineering Reprint paginated continuously. Technical review of conceptual design of Julien Dubuque Bridge with comparisons to other Ashton bridges and the designs of others.

1949 *Prestretching Increases Strength of Steel T-beams in University of Iowa Tests,* Civil Engineering, American Society of Civil Engineers, Vol., 182, pp. 42,43. March Reprint.

1949 *Welded Deck Girder Highway Bridge,* Welding Journal, September. Reprint, University of Iowa Reprints in Engineering, No. 80, pp. 1-9. Three tables, 23 construction photographs. Subject is Benton Street Bridge, Iowa City, Iowa

1949 *Arc-welded Beam and Column Framing,* Progressive Architecture, September, pp. 86-89, 11 drawings, 2 tables, 1 photograph. Reprint with no vol. or no. given.

1950 *A Modern Steel Deck Girder Highway Bridge,* Studies in Structural Arc Welding, File No. 13c2, Plate 119, pp. 1-6, 7 photographs, 7 drawings, 1 table. Subject is Benton Street Bridge, Iowa City, Iowa.
Note: These studies were punched for addition to a ring binder. They were sent to commercial customers of Lincoln Electric. Each of these reprints was termed a plate in confusing terminology. Ned Ashton, Vita 1955, states that he wrote 45 of these studies and names 14 by title. These were subsequently incorporated in Chapter Six, Procedure Handbook of Arc Welding Design and Practice (see Ashton, Editor) and only one specimen copy is with his reprints.

1954 *The Reconstruction of the MacArthur Bridge.* The Welding Journal, April, 1954, pp. 1-12, 9 photos, 2 drawings, 2 tables. Reprint with no vol. or no. and probably paginated differently.

1954 *This Bridge is Better than New,* American City, November, 1954, 1 page, 1 photograph. Reprint, no author, no vol., or page. Subject: MacArthur Bridge and attributed to Ashton.

1954 *Reinforced Concrete Bridge Economy.* Journal, American Concrete Institution Proceedings, vol. 25, no. 7, May, p. 804, 1 table. Subject: Ralston Creek Bridge, Iowa City, comparing costs with more expensive pre-stressed concrete. Published in Letters from Readers. Reprint.

1958 *First Welded Aluminum Girder Bridge Spans Interstate Highway in Iowa.* Civil Engineering, American Society of Civil Engineers, vol. p. 762 pp. 78-80, 5 photographs, 1 table, 1 drawing. Reprint. Subject: Clive Road Bridge.

1958 *Iowa Tries a Welded Aluminum Bridge: Design of First Structure of This Type Required Special Considerations: State Considers the Project as Research,* Engineering News-Record, February 20, 2 pages, McGraw-Hill Publishing. Reprint with no vol. or pp. given.

1958 *Cars Will Soon Cross New Aluminum Bridge,* Welding Engineer, August, 1 page, 3 photographs. Reprint with no vol. or pp. given. Attributed to Ashton.

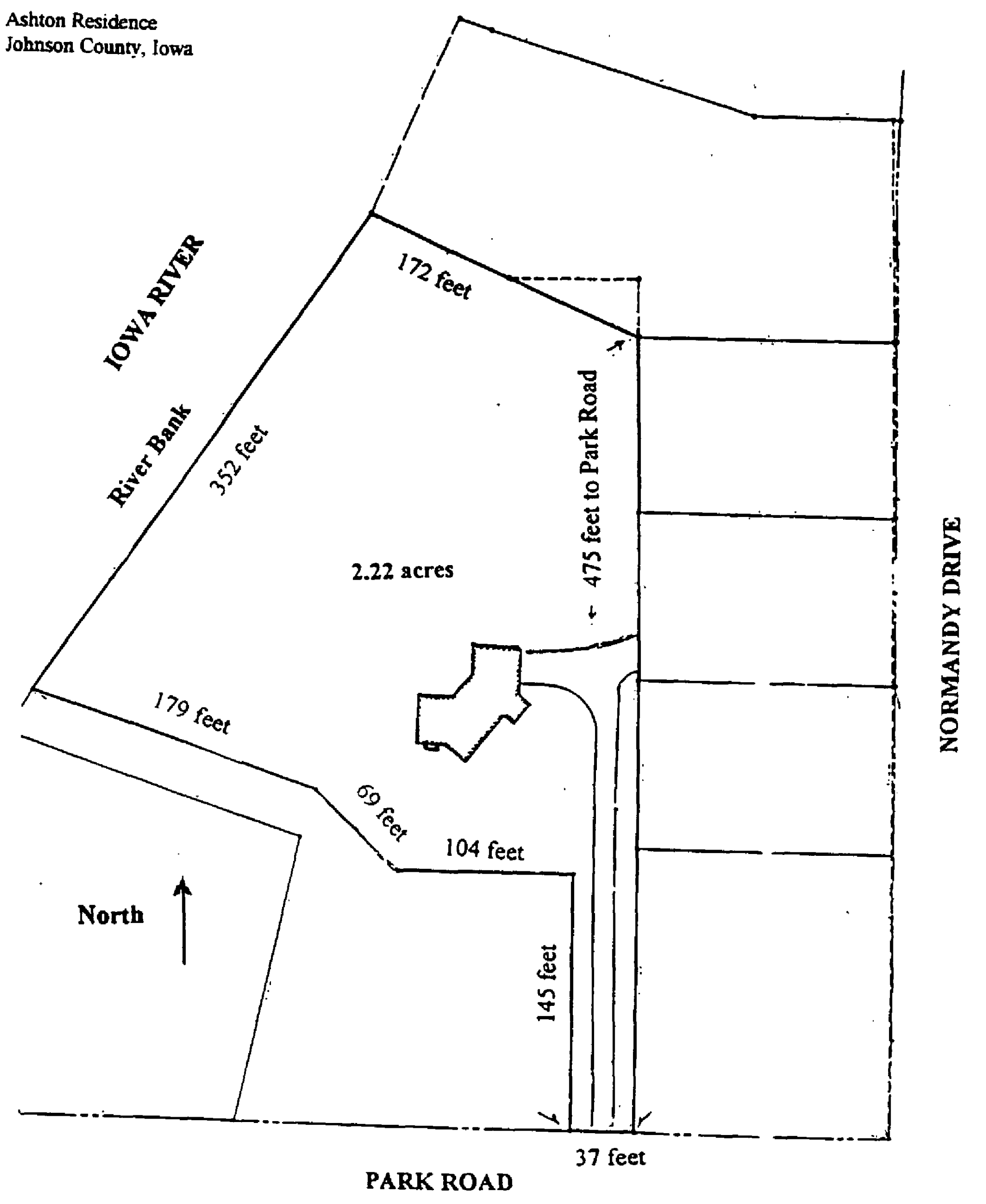
1968 *New Bridges Founded on Old,* Civil Engineering, American Society of Civil Engineers, vol. 38, no. 11, pp. 44-48, 6 photographs, 2 diagrams, cover photo feature. Subject: Cedar Rapids bridge reconstructions.

VERBAL BOUNDARY DESCRIPTION:

Part of T-79N, R-6W, Sec. 4 (S.E. 1/4 of S.W. 1/4): Beginning 230' west of S.E. corner of S.W. quarter of Section 4, thence N.12'26'E.171.6', thence N72'8'W.223' to the east bank of the Iowa River, generally northeast along the same to the point where the bank intersects with east-west line which run 500' north of and parallel to the stated south boundary line of Section 4, thence 160' due east, thence 155' due south, thence 151.5' due east, thence 345' due south to a point 180' east of the point of beginning, thence 180' west to the same point.

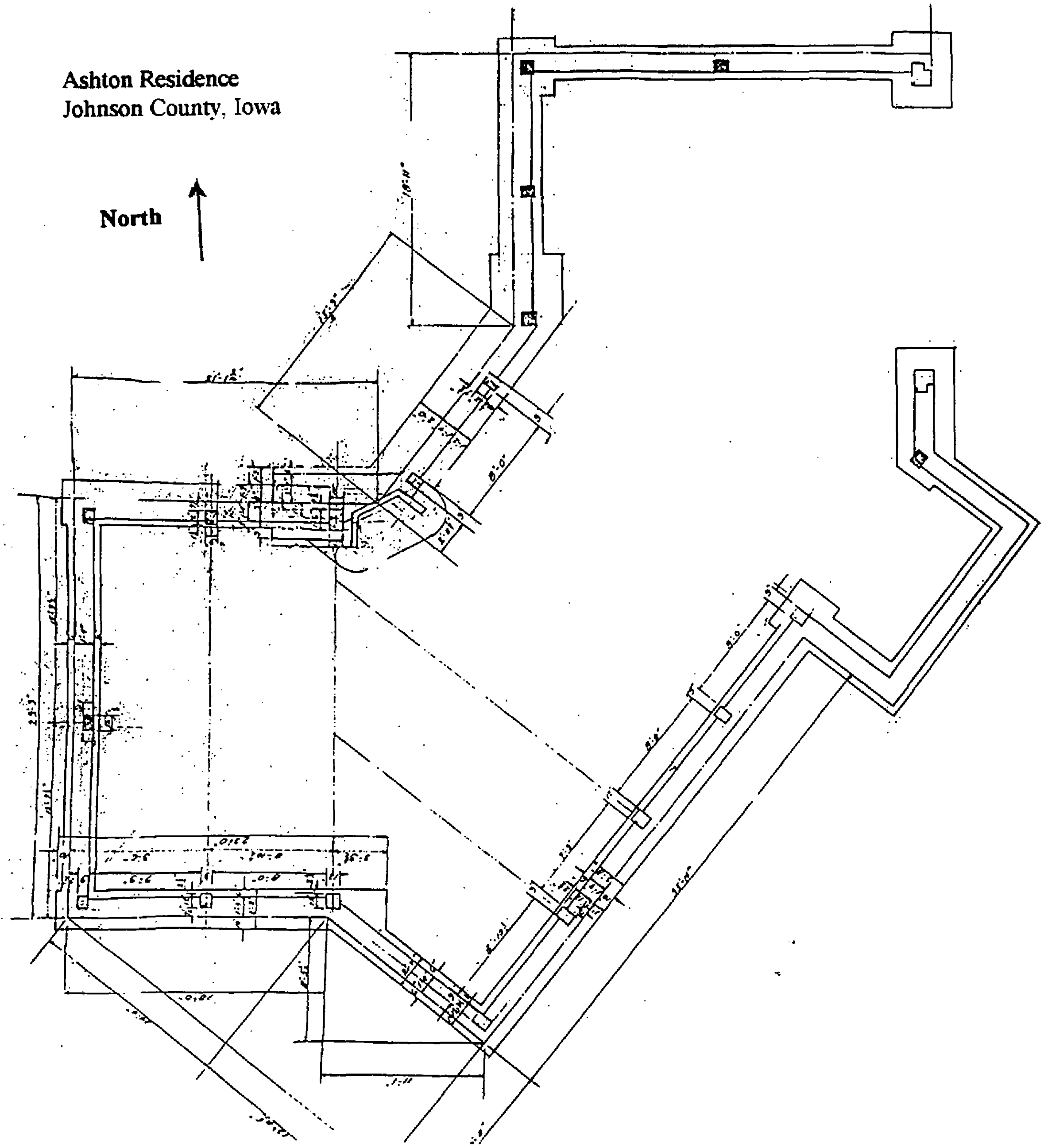
BOUNDARY JUSTIFICATION:

The original Ashton property was about 3 acres with 330 feet of frontage on the Iowa River. During the 1950s the property was nearly doubled until it was subdivided in the late 1980s. Without going into detail the core area has remained intact. It is 2.22 acres without other houses and a slightly enlarged river frontage of 352 feet. Over half of the river front has been set aside as a Designated Natural Area defined by the Iowa City Code. This purpose for this is to permit reforestation following major tree loss in the 1993 flood and the 1995-96 wind storms.



Ashton-McKusick property June 2000 after subdivision of adjacent lots. Sketch reduced and simplified survey plat of March 1989 by MMS Consultants Inc., Iowa City. Position of Ashton House and driveway taken from earlier Lambert-Ashton plan..

Ashton Residence
Johnson County, Iowa



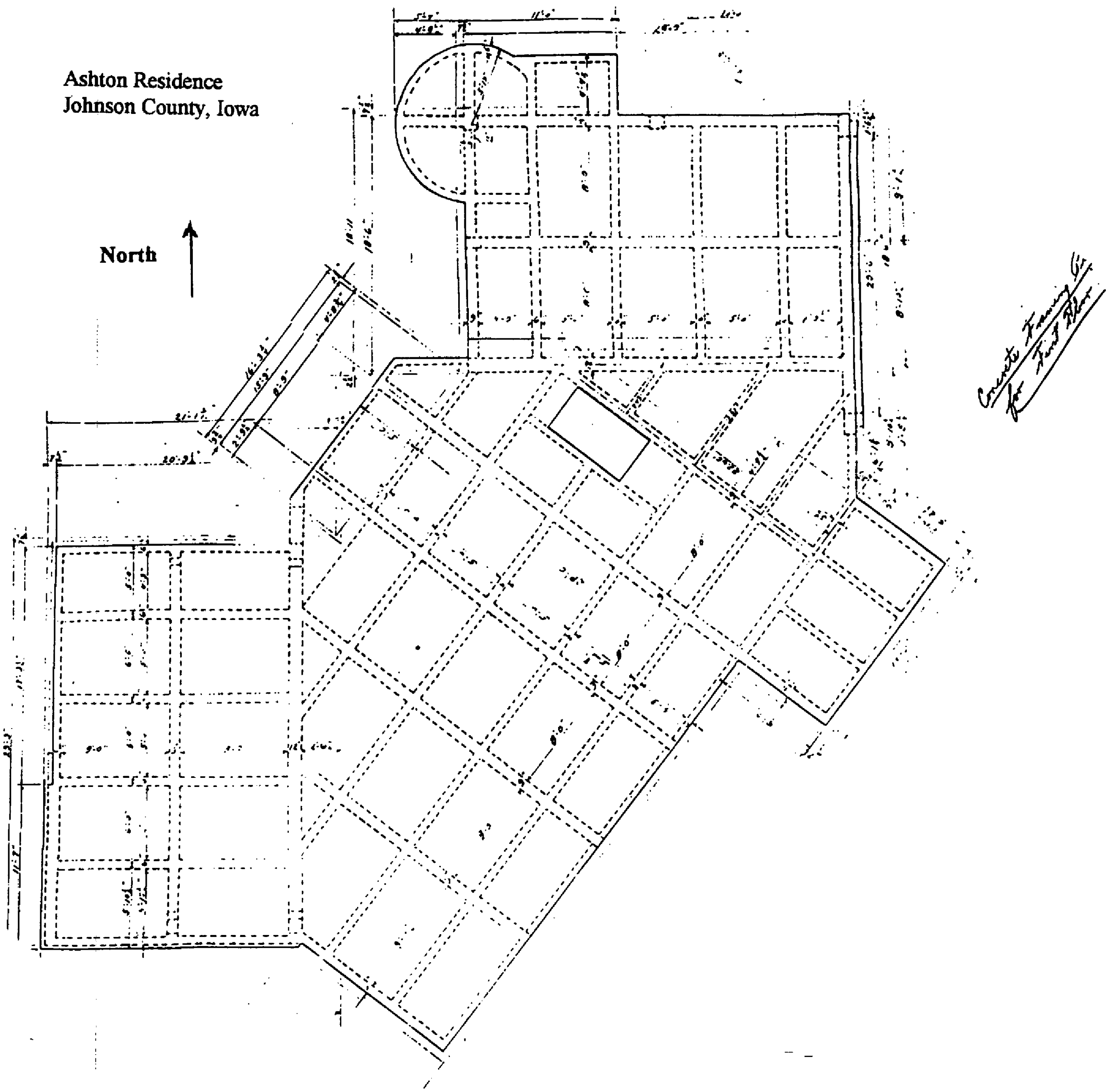
Ashton House Foundation Plan. Reduced from original of June 1946. In cross section the reinforced concrete foundation has an inverted T-shape. The bottom is a plate 6-inches thick and of variable width, 2 feet 8 inches to 5 feet. The plate is strengthened with the masonry platform 16 inches wide. Most of this platform is exposed on the lower interior walls of the ground floor. Because of the surface slope, the northern foundation is deeper to extend below the frost line.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

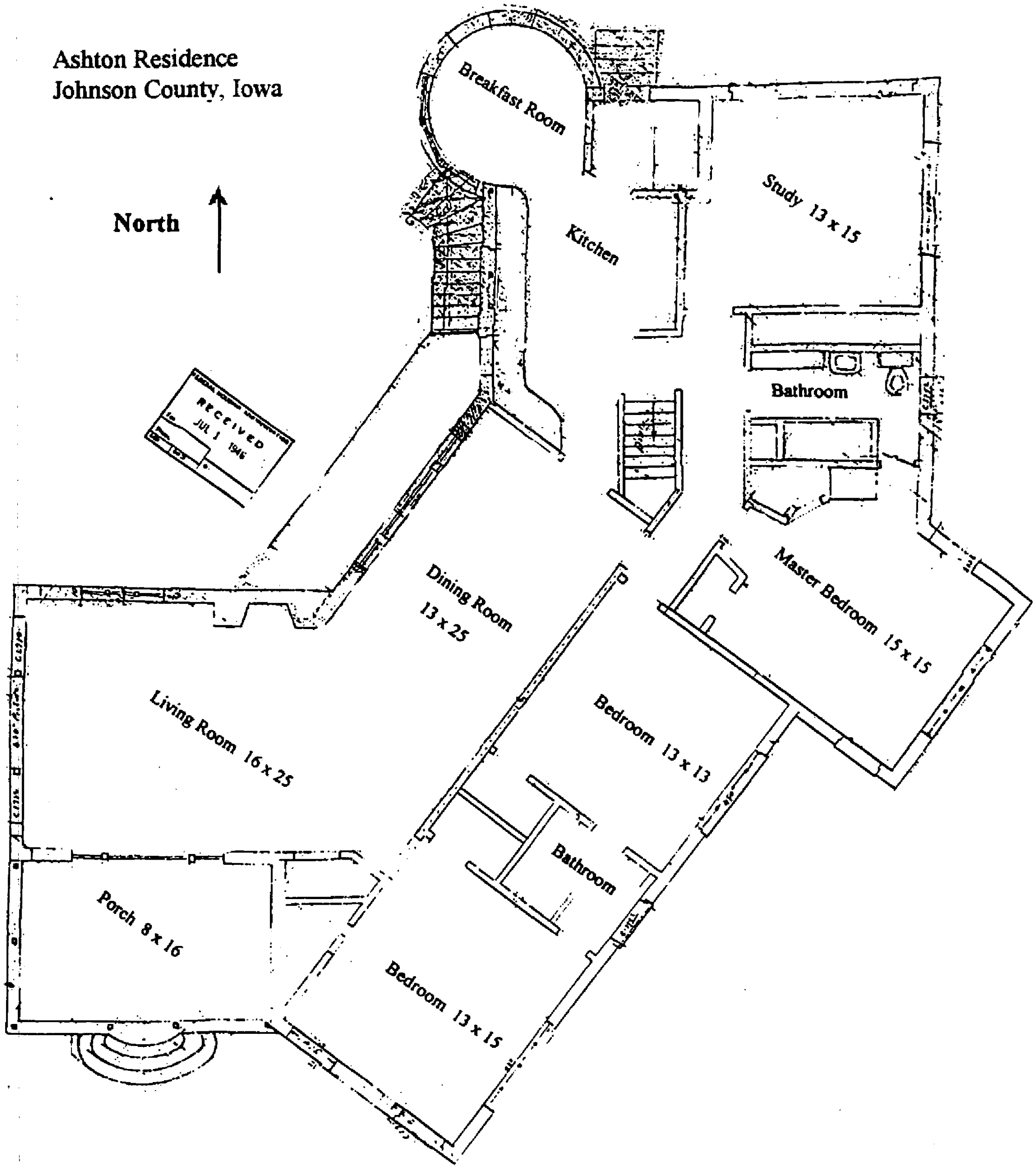
Section number ADDL DOC Page 31

CFN-259-1116



Ashton House Concrete Framing Plan for First Floor. Reduced from original of June 1946.

Ashton Residence
Johnson County, Iowa



Ashton House Main Floor. Reduced and simplified from the plan of June 1946. The main rooms were unchanged, but closets, both baths and the kitchen were redesigned during construction. Also modified were both decks and the stairways.

PHOTOGRAPHS, ASHTON RESIDENCE, JOHNSON COUNTY, IOWA

1. Ashton house, west facade that overlooks Iowa River. May 25, 2000, M. McKusick prints 1-6.

2. Ashton house, northwest corner. May 25, 2000.

3. Ashton house, northeast corner. May 25, 2000

4. Ashton house, east facade inscribed *Ashtons 1947.* May 25, 2000.

5. Ashton house, southeast facade. May 25, 2000.

6. Ashton house, southwest corner. May 25, 2000.

7. Ned L. Ashton removing foundation forms, east wall, the section that later became ground floor bathroom. Copy of print attributed to Fred Kent, August 1946.

8. Crest of the great flood, 16 June 1947, river stage 18.3 feet at the University footbridge. View from construction looking northeast across Mosquito Flats floodplain to City Park timber. Twenty years later this floodplain was renamed Park View Terrace, subdivided, and totally built up with houses. Foreground above garage shows main floor in progress reinforced with steel bars and mesh. In the immediate background, the fence is the east boundary of the Ashton tract with an Army tank crate serving as tool shed. Four flatcar loads of flattened crates provided most of the lumber used for forms and house construction. Copy of print attributed to Fred Kent 16 June 1947.

9. The crest receded but high water remained three days later when this photo was taken. View of northwest house corner from a ladder leaned against a tree. The wading girl is Ruth Ashton, age 12. Copy of print attributed to Fred Kent, about 21 June 1947.

10. Ned Ashton standing beside the south-reinforced column designed to support the huge concrete lintel that now spans the garage door. Ned used the high water to float his forms into position and then jacked them up. Copy of print attributed to Fred Kent about 21 June 1947.

11. In late summer of 1948 the Ashtons lost their lease to their rental house and moved into their new home before it was ready. While camped out on the main floor, the rush was on to weatherproof the living area for the coming winter? The roof shingling is finished but much remains to be done. Copy of print attributed to Ned Ashton about early September 1948. .

12. Ned L. Ashton at work at his desk by the picture window in his ground floor engineering office. Copy of print attributed to Fred Kent, fall 1957. It was published in a cropped form in *Bridges are His Business, Iowa Alumni Review, 1958, page 12.*