Form 10-300
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM

(Type all entries – complete applicable sections)

STATE: Nebraska
COUNTY: Thayer
FOR NPS USE ONLY
ENTRY NUMBER: JAN 29 1973 | DATE:

SEE INSTRUCTIONS

1. NAME

COMMON: Dill (Richard E.) House

AND/OR HISTORIC:

2. LOCATION

STREET AND NUMBER:

CITY OR TOWN: Alexandria

STATE	CODE	COUNTY:	CODE
Nebraska	31	Thayer	169

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP		STATUS	ACCESSIBLE TO THE PUBLIC
☐ District ☒ Building	☐ Public	Public Acquisition:	☒ Occupied	Yes:
☐ Site ☐ Structure	☒ Private	☐ In Process	☐ Unoccupied	☒ Restricted
☐ Object	☐ Both	☐ Being Considered	☐ Preservation work in progress	☐ Unrestricted
				☐ No

PRESENT USE *(Check One or More as Appropriate)*

☐ Agricultural	☐ Government	☐ Park	☐ Transportation	☐ Comments
☐ Commercial	☐ Industrial	☒ Private Residence	☐ Other *(Specify)*	
☐ Educational	☐ Military	☐ Religious		
☐ Entertainment	☐ Museum	☐ Scientific		

4. OWNER OF PROPERTY

OWNER'S NAME: Richard E. Dill

STREET AND NUMBER:

CITY OR TOWN:	STATE:	CODE
Alexandria	Nebraska	31

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC: County Clerk, Thayer County Courthouse

STREET AND NUMBER:

CITY OR TOWN:	STATE	CODE
Hebron	Nebraska	31

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6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY: Historic Preservation in Nebraska, Preliminary Report

DATE OF SURVEY: October, 1970 ☐ Federal ☒ State ☐ County ☐ Local

DEPOSITORY FOR SURVEY RECORDS: Nebraska State Historical Society

STREET AND NUMBER: 1500 "R" Street

CITY OR TOWN:	STATE:	CODE
Lincoln	Nebraska	31

First Nebraska Congressional District

STATE: Nebraska
COUNTY: Thayer
FOR NPS USE ONLY
ENTRY NUMBER: JAN 29 1973
DATE

7. DESCRIPTION

CONDITION	(Check One)					
	☒ Excellent	☐ Good	☐ Fair	☐ Deteriorated	☐ Ruins	☐ Unexposed
	(Check One)		(Check One)			
	☐ Altered	☒ Unaltered	☐ Moved	☒ Original Site		

DESCRIBE THE PRESENT AND ORIGINAL *(if known)* PHYSICAL APPEARANCE

Built in 1936, the house with exception of a conventionally poured concrete floor is entirely constructed of post-tensioned twelve and fourteen foot concrete channel planks. Planks, 12 feet long, 4 feet wide with a 2 3/4 inch flange and a 3/8 inch rod in each long flange, were used for inner and outer walls, partitions, and the ceiling. The planks for the roof and the ceiling of the largest room are 14 feet long by 2 feet wide with a 4 inch flange running entirely around each plank. The web for all the channel planks is 1 inch thick. The flanges give a definite boundary to each individual plank and in the finished house reflect the modular construction technique.

The house is one story and rectangular in plan; 38 feet by 32 feet of interior space. Three of the exterior walls are constructed entirely of these channel planks with a 18 inch to 24 inch gap between inner and outer surfaces to provide for a straw insulage infill.

Mr. Dill assumed this insulation system would work so efficiently that an entire wall of glass was incorporated into the south facade. In this manner the low rays of the winter sun would be admitted for purposes of solar heat. In application the insulation and solar heating systems worked so effectively that only a regular-sized fireplace, centrally located, was needed to heat the house to a comfortable level during cloudy winter periods.

This fireplace, however, is no ordinary fireplace. Mr. Dill constructed a system in which outside air is circulated thru a subterranean chamber whose temperature for all practical purposes is a constant 57 F. To provide this airconditioning system two shafts were sunk thirty feet and were connected by a tunnel 14 feet long. One shaft is located in the kitchen and is used as a refrigerant system. The other is in the living room and serves as a draft and warm air duct through the fireplace. Fresh air is induced through ducts under the floor slab into the subterranean chamber, then pushed up through the two shafts. In this manner the house is supplied with warm air in the winter and cool or unheated air in the summer.

Due to faulty wiring the straw insulation caught fire in 1938 but quickly extinguished itself from lack of air. The fire produced minor heat damage to the paint. Also recently the joints between the channel planks of the roof have produced minor leaks. This could be readily repaired with modern flashing techniques as the problem increases. The house has had no alteration and today, except for the leaks the roof has developed, is for all practical purposes in as good a physical condition as when it was first built.

SEE INSTRUCTIONS

8. SIGNIFICANCE

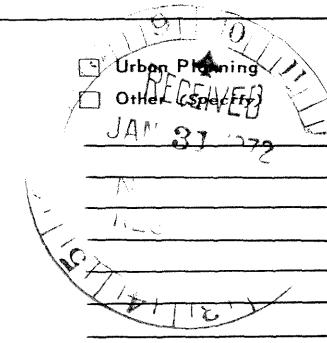
PERIOD *(Check One or More as Appropriate)*

- ☐ Pre-Columbian
- ☐ 15th Century
- ☐ 16th Century
- ☐ 17th Century
- ☐ 18th Century
- ☐ 19th Century
- ☒ 20th Century

SPECIFIC DATE(S) *(If Applicable and Known)*

AREAS OF SIGNIFICANCE *(Check One or More as Appropriate)*

- ☐ Aboriginal
- ☐ Prehistoric
- ☐ Historic
- ☐ Agriculture
- ☒ Architecture
- ☐ Art
- ☐ Commerce
- ☐ Communications
- ☐ Conservation
- ☐ Education
- ☒ Engineering
- ☐ Industry
- ☐ Invention
- ☐ Landscape Architecture
- ☐ Literature
- ☐ Military
- ☐ Music
- ☐ Political
- ☐ Religion/Philosophy
- ☐ Science
- ☐ Sculpture
- ☐ Social/Humanitarian
- ☐ Theater
- ☐ Transportation
- ☐ Urban Planning
- ☐ Other (Specify)



STATEMENT OF SIGNIFICANCE

Mr. Dill is a native of Alexandria, Nebraska and is a retired rural mail carrier. He attended the University of Nebraska for three years and studied Engineering but has no degree. He refers to himself as a "practical engineer."

Mr. Dill is accredited in national as well as international publications as being the "father" of prestressed concrete technology in the United States." Until Mr. Dills work all early attempts at post-tensioning had failed, because no one had taken into account the considerable losses which occur in the initial steel stress due to shrinkage and creep of the concrete. In 1928 he tried out this method in the production of fence posts which are still in use in many areas throughout the town. Although the constructional concept for the house was developed in the early 1920's, the house was not built until 1936. The Dill house is the first example of constructional use of "Prestressed channel-plank modules." He patented this method in 1928, U.S. patent No. 1684663, and published an article in ACI journal, Vol. 13 (1941), pp. 165-68.

This house is the first example of the use of a concrete modular construction technique in a successful application. This can be appreciated in the current search for solving the economic problems in housing through a mass produced modular system.

Mr. Dill was also farsighted in his use of solar heating and his contrived airconditioning system.

Townspeople relate that at the time the house was built few houses had bathrooms. Mr. Dill put two in his six room house and caused quite a stir in this small rural town of Alexandria. Dill used stainless steel sinks and crome furnishings which would be considered modern even by todays designers.

Dills contemporaries in the design of the house can only be found in Europe. At this time Germany's Bauhaus was stressing the use of modern technology and the use of construction members which could be mass produced by industry. The Dill House portrays many of the characteristics stressed by the Bauhaus. Such as the use of material in a manner that reflects its inherent construction qualities. Dill, using a new material and construction method arrived at a design which gave architectural expression to the material and the method. This in itself shows consider-

-CONTINUED-

SEE INSTRUCTIONS

9. MAJOR BIBLIOGRAPHICAL REFERENCES

See continuation sheet

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY						OR	LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES					
CORNER	LATITUDE			LONGITUDE				LATITUDE			LONGITUDE	
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
NW	°	'	"	°	'	"		97°	23'	18"	40°	14'	53"
NE	°	'	"	°	'	"							
SE	°	'	"	°	'	"							
SW	°	'	"	°	'	"							

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: 1/4 acre

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

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11. FORM PREPARED BY

NAME AND TITLE:
Persijs Kolberg, Curator of Historic Sites

ORGANIZATION
Nebraska State Historical Society

DATE
January 14, 1972

STREET AND NUMBER:
1500 "R" Street

CITY OR TOWN:
Lincoln

STATE
Nebraska

CODE
31

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National [X] State [ ] Local [ ]

Name Marvin D. Kivett

Title Director, Nebraska State Historical Society

Date Jan 24, 1972

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Robert M. Utley
Chief, Office of Archeology and Historic Preservation

Date 1/29/73

ATTEST:

Keeper of The National Register

Date 1-26-73

SEE INSTRUCTIONS

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
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NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE	
Nebraska	
COUNTY	
Thayer	
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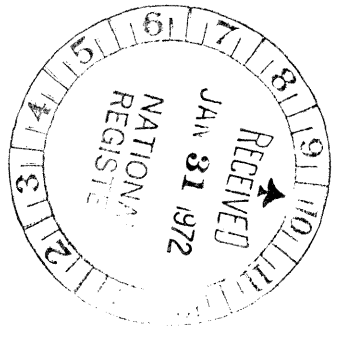
#8. Significance

(Number all entries)

able significance for modern architectural ideals are based upon these same principles.

The house was built at the time when modern architecture in the United States was trying to formulate itself. Viewed in a historical perspective the house portrays many of the answers arrived at by modern architectural theory but at a very early date.



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INVENTORY - NOMINATION FORM

STATE	
Nebraska	
COUNTY	
Thayer	
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	JAN 29 1973

#9 Major Bibliographical References *(Continuation Sheet)*

(Number all entries)

From: "REINFORCED CONCRETE IN ARCHITECTURE"
A. Raafat, 1958, Reinhold, N.Y.

"It was in 1923 that two patents were issued on prestressed concrete. One was issued to R. E. Dill of Alexandria, Nebraska for the construction of prestressed concrete units with unbonded steel. The other was given in France to Freyssinet, who demonstrated that high strength steel is essential to the success of prestressing." (P.H. Jackson of San Francisco was awarded a patent for prestressed concrete units using low strength steel. These units failed to hold the prestressing forces and further work was abandoned. E.B. vol 6)

From: "DESIGN OF PRESTRESSED CONCRETE
STRUCTURES:, T. Y. Lin, 1955-63
John Wiley, N.Y.

"In 1925, R. E. Dill of Nebraska tried high-strength steel bars coated to prevent bond with concrete. After the concrete had set, the steel rods were tensioned and anchored to the concrete by means of nuts." (T.Y. Lin is America's foremost authority on prestressed concrete)

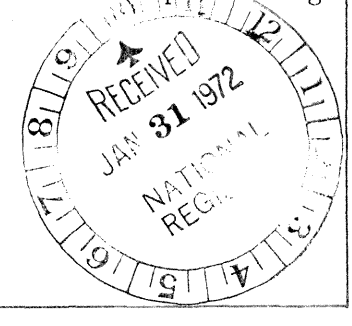
From: "THE THEORY OF PRESTRESSED CONCRETE
DESIGN:, Henry J. Cowan, 1956
Macmillan & Co. London

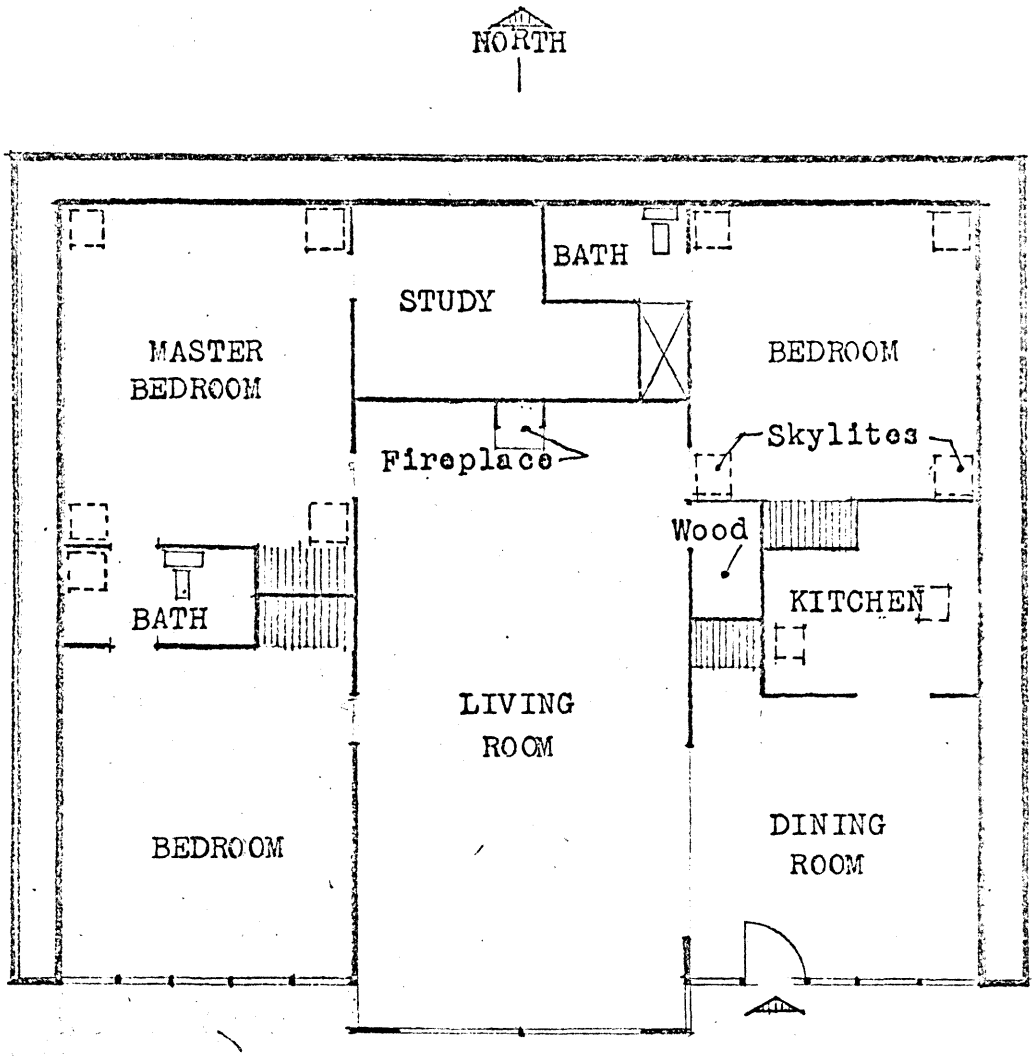
"Although his (Freyssinet's) early work was concerned with pretensioned concrete beams and pipes he later turned to post-tensioning. The idea of post-tensioning appears to have originated with Dill of the U.S.A. in 1928. (R. E. Dill: "Some Experiences with prestressed steel in small concrete units"; Jnl. of American Concrete Institute, vol. 13 (1941), pp. 165-168.)

From: THEORY OF PRESTRESSED CONCRETE DESIGN
Chin, Biberstein, 1963

"The utilization of fine music wire to make thin concrete planks was first made by Karl Wettstein. Most authorities attribute this invention to Ewold Hoger in 1939 but since the records strongly favor Wettstein priority goes to him. The utilization of high tensile steel of large size was suggested independently by Emperger and R. E. Dill. True prestressed channel planks and fence posts were produced for the first time by Dill in 1928 in Nebraska, U.S.A. (However), work lagged in the U.S. following the brilliant pioneering work of Dill, Jackson and others.

(Wettstein and Emperger were German engineers).

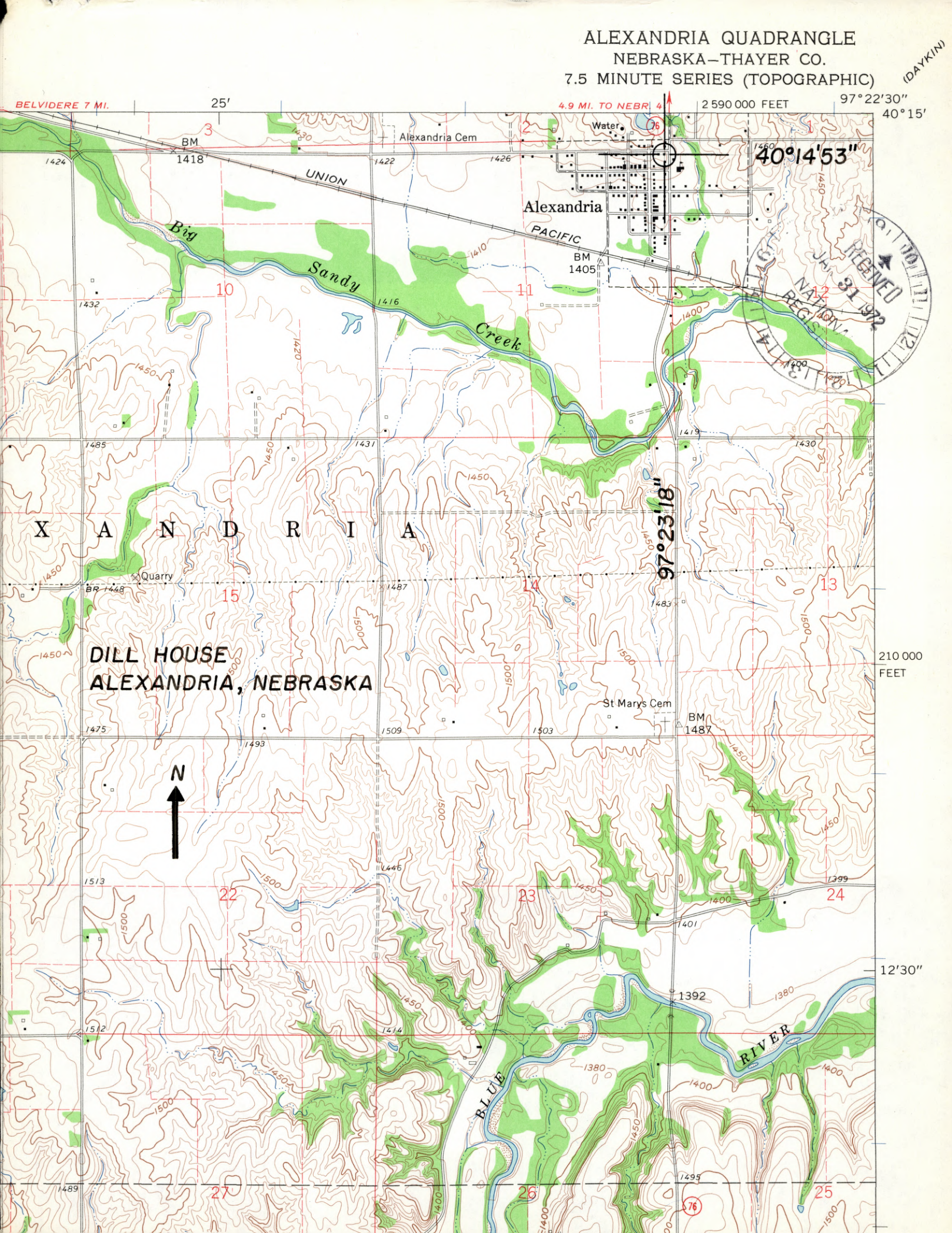




MAIN FLOOR PLAN

1/8" = 1' - 0"

Dill (Richard E.) House


ALEXANDRIA QUADRANGLE
NEBRASKA—THAYER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
(DAYKIN)
BELVIDERE 7 MI.
25'
4.9 MI. TO NEBR 4
2 590 000 FEET
97°22'30"
40°15'
40°14'53"
97°23'18"
210 000 FEET
12'30"
Alexandria Cem
Water
BM 1418
UNION PACIFIC
Alexandria
BM 1405
Big Sandy Creek
Quarry
BR 1448
St Marys Cem
BM 1487
1392
BLUE RIVER
N
DILL HOUSE
ALEXANDRIA, NEBRASKA
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NATIONAL REGISTER

Form 10-301
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES

PROPERTY MAP FORM

(Type all entries - attach to or enclose with map)

STATE	
Nebraska	
COUNTY	
Thayer	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE
JAN 29 1973	

SEE INSTRUCTIONS

1. NAME

COMMON: Dill (Richard E.) House

AND/OR HISTORIC:

2. LOCATION

STREET AND NUMBER:

CITY OR TOWN: Alexandria

STATE:	CODE	COUNTY:	CODE
Nebraska	31	Thayer	169

3. MAP REFERENCE

SOURCE: U.S.G.S., 7½', Alexandria Quadrangle

SCALE: 1:24,000

DATE: 1960

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4. REQUIREMENTS

TO BE INCLUDED ON ALL MAPS

1. Property broundaries where required.
2. North arrow.
3. Latitude and longitude reference.