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NATIONAL REGISTER

NPS FORM 10-900 (Rev. 8-86) OMB No. 1024-0018 [SD-SHPO # ECA-OH-597-1/89]
[use paper with at least 25% cotton rag content, use NLQ or LQ printer]

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 of eligibility for individual properties or districts. See instructions in Guidelines for Completing National Register Forms (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering "NA" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name: Micheel, Herman F., Gothic Arched-Roof Barn
other name/ site number: BK-AR-25

2. Location

street & number: 5 miles north & 3 miles west of White /NA/ not for publication
city, town: White /XX/ vicinity
state: SOUTH DAKOTA code: SD county: Brookings code: SD 011 zip code: 57276

3. Classification

Ownership of Property:	Category of Property	Number of Resources within Property:		
		Contributing	Noncontributing	
/XX/ private	/XX/ building(s)	1		buildings
/ / public-local	/ / district			sites
/ / public-state	/ / site			structures
/ / public-federal	/ / structure			objects
	/ / object	1	0	Total

Name of related multiple property listing: NA

Number of contributing resources previously listed in the National Register: 0

11. Form Prepared by

name/title: Michael M. Olson, owner; w/technical assistance by John Rau, SHPO staff
organization: date: October 9, 1990
street & number: RR 1, Box 58 telephone: 605-794-4641
city or town: White state: SOUTH DAKOTA zip code: 57276

page 2: Herman F. Micheel Gothic Arched-Roofed Barn, Brookings
property name county

, SOUTH DAKOTA
state

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, 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. / / See continuation sheet.

On Fisher Signature of certifying official 12/24/71 Date

Small D. DeWitt SH70 State or Federal agency or bureau

In my opinion, the property / / meets / / does not meet the National Register Criteria. / / See continuation sheet.

Signature of commenting or other official Date

State or Federal agency or bureau

5. National Park Service Certification

I, hereby, certify that this 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) _____

Entered in the National Register

Mark J. Baker 25 June 1991

for Signature of the Keeper Date

page 3: Herman F. Micheel Gothic Arched-Roofed Barn, Brookings
property name county

, SOUTH DAKOTA
state

6. **Function or Use** (enter categories from instructions)

Historic functions:

AGRICULTURE/Animal Facility

Current Functions:

AGRICULTURE/Animal Facility

7. **Description**

Architectural Classification:

(enter categories from instructions)

OTHER: Gothic Arched-Roof Barn

Materials:

(enter categories from instructions)

foundation Concrete

walls Wood

roof Asphalt

other NA

Describe present and historic physical appearance: /XX/ see continuation sheet

8. **Significance**

Certifying official has considered the significance of this property in

relation to other properties: / / / / /XX/

nationally statewide locally

Applicable National Register Criteria / / A / /B /XX/C / /D

Criteria Considerations / /A / /B / /C / /D / /E / /F / /G

Areas of Significance (enter from instructions)

Architecture

Period of Significance

1920

Significant Dates

1920

Significant Person

NA

Cultural Affiliation

NA

Architect/Builder

Wulbers, Henry

State significance of property, and justify criteria, criteria considerations,
and periods of significance noted above /XX/ see continuation sheet

**United States Department of the Interior
National Park Service****National Register of Historic Places
Continuation Sheet**Section number 7 Page 1

Situated on a thriving hog farm in north-central Brookings County, South Dakota, the Herman F. Micheel Gothic Arched-Roof Barn is a large wood frame animal shelter built in 1920. Rising from massive concrete footings and a concrete work floor, the building measures 42 feet by 60 feet and is clad with clapboard siding. Called a Gothic roof in contemporary agricultural literature, the remarkable roof forms a tall lancet arch fabricated from short-sectioned laminated rafters cut to form the arch. The rafter ends are cut to give the eaves a slightly outward flair. Asphalt shingles cover the roof surface. Two galvanized metal exhaust ventilators project from the ridge line. Several original swing-out and sliding doors provide access to the barn. A huge vertical-sliding door, on the north (front) end wall, opens onto the immense hay mow. Fenestration includes 20 two-over-two fixed sash windows and 2 four-over-four double-hung windows, the latter of which are located near the roof peak on the north end wall.

The barn was designed to house dairy cows and work horses; however, it is now used as an enclosure for feeder hogs. Interior space on the first floor is divided into 2 large pens, 5 horse stalls, 2 small feed rooms, and a tack storage room. Although some original items remain extant, much of this floor plan has been modified over the years. The loft, on the other hand, is in good, nearly unaltered condition. Besides the exposed picturesque cut rafters, it features 2 small granaries and the spacious hay mow. Much of the original track and hardware for transporting loose hay to the back of the mow is still suspended from the ridge. Wooden air ducts rise along the inside wall/roof surface up to the 2 ventilators.

The rest of the farmstead is made up of a variety of outbuildings used in the hog-raising operation and a few domestic buildings. Several of these resources are more than fifty years old but are not considered significant examples of agricultural architecture. The house, built in 1900, underwent substantial alteration in 1958. This nomination includes only the Gothic arched-roof barn.

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetSection number 8 Page 1

Under Criterion C of the National Register Criteria, the Herman F. Micheel Gothic Arched-Roof Barn is significant in the area of architecture, because it is an excellent local example of the cut-rafter version of the laminated arched-roof barn and illustrates changes in agricultural building design after 1900. Despite extensive testing and promotion nationwide, this barn type enjoyed limited popularity in South Dakota. The Micheel Barn is a survivor of a vanishing building form. Under the South Dakota Historical Preservation Plan, the property relates to the historic context labeled V. Depression & Rebuilding, E/1. Changing Rural Patterns and Impact of New Farm Technologies/Pattern Book Structures.

For centuries barns in both the Old World and the New World were constructed using heavy Medieval timber frame technologies. However, by the dawn of the 20th Century, after timber resources had been severely reduced, American agricultural schools began experimenting with lighter framing systems for farm buildings. Of particular importance was a need to design a frame that would support tall, expansive roofs without inhibiting loft space with posts and beams. In 1904, John L. Shawver developed a roof truss of light dimensional lumber for barns that transferred the dead load of the roof to the walls so that there would be no need for heavy posts running from the loft floor to the ridge. Shawver truss barns, with their telltale gambrel roofs, were extremely popular across the country during the first half of the 20th Century. Such trusses still required a good deal of lumber, and the internal trusses took up some of the loft space. In addition, barn dimensions were, for practical reasons, restricted to those obtainable with standard lumber sizes. Therefore, engineers experimented with self-supporting roofs constructed of arched rafters that generally needed no internal trusses and could be built to larger proportions.

Two types evolved, both forming a Gothic arch configuration. The first type, which actually had its origin in the late 19th century (1), utilizes a rafter composed of short laminated sections pre-cut to form the arch. Like the Shawver truss, this system necessitates a considerable amount of materials and labor. Thus, a second type was developed with rafters fabricated from longer sections bent to form the arch. Soon, this later technique replaced the Shawver and other trussed-roof types as the system preferred by engineers and architects. Gothic roofs were praised in contemporary literature as more aesthetically pleasing than the multiple-angle gambrel roof. Nevertheless, bent rafter barn roofs were susceptible to sagging and experiments to make them stronger and more wind resistant continued.

1.

The cut rafter Gothic roof reportedly was first used as early as 1885 in Isabella County, Michigan.

**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Section number 8 Page 2

The region around Brookings, South Dakota, was a leader in promotion of new ideas in agriculture due to the presence of the state's only land grant college, now known as South Dakota State University. Numerous building experiments were conducted on that campus, but few, if any, pertained to the Gothic barn roof. In fact, most of the early 20th Century barns built in the state used the familiar Shawver-trussed gambrel roof. Yet, several Gothic roof barns are found about Brookings County. The Micheel Barn is a relatively late, premier example of the cut-rafter method. It also illustrates contemporary ventilation, feeding, and hay storage techniques that were an important part of early 20th century barn design.

Herman Friedrich Micheel was born in 1873 near Rollingstone, Minnesota. In 1898, he came to Brookings County, South Dakota, to work as a temporary harvester. The next year, he returned and purchased 120 acres of school land in Argo Township. In 1900, he married Bertha Buth, whose family moved to Brookings County in 1891. Also in 1900, Micheel erected a house and a barn on his farmstead. A number of other buildings were constructed over the years.

In 1920, the original barn was demolished, and much of the lumber was used for construction of the new Gothic arched-roof barn. Local carpenter Henry Wulbers was in charge of the project and was assisted by Dick Miller, John Krocke, and Henry Feldman. Wulbers is said to have spent approximately one month cutting the materials before raising the building. Labor charges totaled \$700, and the cost of new lumber and hardware was about \$2000. When it was time to shingle the roof, the Micheels entertained a "shingling bee" to complete the work in a single day. At that time, pre-bent cedar shingles covered the curved roof. It is now sheathed with aging asphalt shingles.

The Micheels were respected members of the community and were perennial participants in social, civic, and church affairs. They retired from the farm in 1941 and lived the rest of their lives in nearby towns of Aurora and Estelline. Bertha died in 1958, and Herman died in 1964. The farm is currently owned by their great-grandson Michael Olson and his wife Kristine. They are working on plans to renovate and restore the barn.

The period of significance of the nominated property does not extend beyond its date of construction in 1920.

page 4: Herman F. Micheel Gothic Arched-Roofed Barn, Brookings
property name county

, SOUTH DAKOTA
state

9. Major Bibliographical References /XX/ see continuation sheet

Previous documentation by 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:

- /XX/ State historic preservation office
- / / Other State agency
- / / Federal agency
- / / Local government
- / / University
- / / Other

Specify repository:

State Historical Preservation Center

10. Geographical Data

Acreage of property: Less than one acre

UTM References:

A = /14/	/682-220/	/4930-830/	B = / /	/ /	/ /
C = / /	/ /	/ /	D = / /	/ /	/ /
ZONE	EASTING	NORTHING	ZONE	EASTING	NORTHING

Quad: Toronto

Scale: 1:24000

/ / see continuation sheet

Verbal Boundary Description:

/XX/ see continuation sheet

Boundary Justification:

/XX/ see continuation sheet

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 9 Page 1

Brookings County History Book. Brookings, SD: Brookings County History Book Committee, 1989. pp. 8, 528-529, 564-565.

Clyde, A. W. "Tests of Self-Supporting Barn Roofs." American Society of Agricultural Engineers Transactions. XVI (1922): pp. 176-182.

"Dairy Barn Construction." U.S.D.A. Farmers' Bulletin No. 1342. Washington: [U.S. Government Printing Office], 1923.

Fogle, F. E. "The Gothic Barn Roof With Sprung Rafters." Agricultural Engineering. VIII, n.1 (1927): pp. 13-14.

Giese, Henry and E. O. Anderson. "Tests of Laminated Bent Rafters." Agricultural Engineering. XIII, n.1 (1932): pp. 11-13.

_____ and Elmer F. Clark. "Tests of Laminated Bent Rafters (Part II)." Agricultural Engineering. XIV (1933): pp. 248-251.

Hopkins, Alfred. Modern Farm Buildings. Rev.: New York: Robert M. McBride, 1920.

Kirkpatrick, W. "Gothic Roofs for Barns." American Society of Agricultural Engineers Transactions. XIV (1920): pp. 87-91.

Micheel, Herman, Jr. Personal Interview with Michael Olson, Brookings County, SD. 1990.

Oates, William J. "The Use of Glued Laminated Rafters in Farm Barns." Iowa State College. Unpublished M.S. Thesis. 1941.

Shawver, John L. Plank Frame Barn Construction. New York: David Williams Co., 1904.

Strahan, J. L. "Barn Roof Design." American Society of Agricultural Engineers Transactions. XII (1918): pp. 57-75.

Test, William D. "Design of the Glued, Laminated, Bent Rafter." Iowa State College. Unpublished M.S. Thesis. 1937.

White, South Dakota, 1884-1984. [White, SD]: White History Book Committee, 1984. pp. 334-336, 347-348.

**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Section number 10 Page 1

VERBAL BOUNDARY DESCRIPTION

The nominated property is bounded by a set of imaginary lines that intersect to form a rectangle around the rectangular barn. The eastern boundary line lies 15 feet east of the east wall of the barn and runs parallel to that wall. The southern boundary line lies 15 feet south the south wall of the barn and runs parallel to that wall. The western boundary line lies 15 feet west of the west wall of the barn and runs parallel to that wall. The northern boundary line lies 15 feet north of the north wall of the barn and runs parallel to that wall. The property is located in the Northeast Quarter of the Southeast Quarter of the Northeast Quarter of Section 16, Township 112 North, Range 49 West (5th Principal Meridian), in Brookings County, South Dakota.

BOUNDARY JUSTIFICATION

The boundaries of the nominated property are set to include only the Gothic arched-roof barn and to exclude all other resources on the farmstead.

**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Section number Photos Page 1

1.

Herman F. Micheel Gothic Arched-Roof Barn
White Vicinity, Brookings County, South Dakota
by John Rau
June 1990
Neg.: South Dakota Historical Preservation Center
East (front) and north facades, camera facing southwest
Photo No. 1

2.

Herman F. Micheel Gothic Arched-Roof Barn
White Vicinity, Brookings County, South Dakota
by John Rau
June 1990
Neg.: South Dakota Historical Preservation Center
West facade, camera facing east
Photo No. 2

3.

Herman F. Micheel Gothic Arched-Roof Barn
White Vicinity, Brookings County, South Dakota
by John Rau
August 1990
Neg.: South Dakota Historical Preservation Center
Interior of loft, note granary along axial wall,
camera facing northeast
Photo No. 3

4.

Herman F. Micheel Gothic Arched-Roof Barn
White Vicinity, Brookings County, South Dakota
by John Rau
August 1990
Neg.: South Dakota Historical Preservation Center
Interior of loft, camera facing west
Photo No. 4

**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Section number Photos Page 2

5.

Herman F. Micheel Gothic Arched-Roof Barn
White Vicinity, Brookings County, South Dakota
by John Rau
August 1990
Neg.: South Dakota Historical Preservation Center
Interior of loft, detail of cut rafter
Photo No. 5

6.

Herman F. Micheel Gothic Arched-Roof Barn
White Vicinity, Brookings County, South Dakota
by John Rau
June 1990
Neg.: South Dakota Historical Preservation Center
Interior lower floor, camera facing south
Photo No. 6