LOWER YELLOWSTONE PROJECT, CABLE SYSTEM
Intake vicinity
Dawson County
Montana

HAER MT-141-C
HAER MT-141-C

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
INTERMOUNTAIN REGIONAL OFFICE
National Park Service
U.S. Department of the Interior
12795 West Alameda Parkway
Denver, CO 80228

HISTORIC AMERICAN ENGINEERING RECORD

LOWER YELLOWSTONE PROJECT, CABLE SYSTEM

HAER No. MT-141-C

Location: The Cable System consists of a cable suspended over the dam between a head tower at the south end of the dam and a tail tower at the north end of the dam, adjacent to the Headworks (MT-141-B).
USGS Quadrangle: Intake, MT (1991)
Township 18 North, Range 56 East, Section 36
Dawson County, Montana

Date of Construction: 1912

Engineer: U.S. Reclamation Service

Present Owner: U.S. Department of the Interior, Bureau of Reclamation

Present Use: Maintenance of the Lower Yellowstone Diversion Dam

Significance: In 2000, the Cable System including head tower, tail tower, engineer's house, and power plant were determined to be part of a complex of sites directly related to the Lower Yellowstone Irrigation Project that constituted a National Register-eligible historic district significant for its association with the broad pattern of federal reclamation efforts in the early twentieth century and the agricultural development of the Lower Yellowstone Valley. The cable system, as a collection of elements contributing to this historic district, retains integrity; the head tower and tail tower have received minor alterations. The power plant building and engineer's house are historic-era replacements, and both retain sufficient integrity to convey their historic associations and all other aspects of integrity.

Historian: Jason Marmor, September 2010; Kathleen Corbett, February 2011

Project Information: This documentation was produced in order to mitigate adverse effects to important elements of the historic Lower Yellowstone Irrigation Project, as determined through consultations between Reclamation, the Corps of Engineers, and the State Historic Preservation Officer (SHPO) of Montana in compliance with Section 106 of the National Historic Preservation Act (as amended), and the associated implementing regulations codified in Title 36 of the Code of Federal Regulations, Part 800. A

Memorandum of Agreement (MOA) was developed between Reclamation, the Corps of Engineers, the Montana SHPO, and the Lower Yellowstone Irrigation Project Board of Control. This MOA specified that Historic American Engineering Record (HAER) documentation be made as a permanent record of the Lower Yellowstone Project complex as a whole (HAER No. MT-141), as well as for certain significant features subject to impacts from the federal undertaking:

HAER MT-141-A
Lower Yellowstone Project, Lower Yellowstone Diversion Dam

HAER MT-141-B
Lower Yellowstone Project, Headworks

HAER MT-141-C
Lower Yellowstone Project, Cable System

HAER MT-141-D
Lower Yellowstone Project, Gate Tender's Residence

HAER MT-141-E
Lower Yellowstone Project, Garage

HAER MT-141-F
Lower Yellowstone Project, Privy

The documentation was prepared in accordance with the National Parks Service's "Manual for Editing HABS/HAER Documentation" including the "Addendum" to that report which covers documentation requirements for HAER complexes. Large-format black-and-white photographs were processed and prepared in accordance with guidelines outlined in the National Park Service's "Photographic Specifications for HABS/HAER."

This documentation for the Lower Yellowstone Project Cable System (MT-141-C) includes the following: 1) a written narrative describing the character-defining attributes of the Cable System, 2) six archival-quality, large-format photographs and negatives of the system, including views of significant engineering and historic features, and 3) an index to photographs.

NARRATIVE

The Cable System at the Lower Yellowstone Diversion Dam is a component of the Lower Yellowstone Diversion Dam and Main Canal Headworks complex at Intake, Montana. The Cable System was designed and constructed to facilitate maintenance and repair activities on the dam. This system was installed at the Lower Yellowstone Diversion Dam complex in 1912, and has been in use since that time. It functions to carry rocks to selected points along the downstream side of the dam and place them, as needed, to reinforce and maintain the dam's structural integrity.

By 1912, Reclamation concluded that the best way to be able to consistently repair the dam in the face of periodic seasonal onslaughts from ice and persistent winter freeze-thaw was a permanent cable system. Severe damage to the dam in 1911 and the duress under which repairs had to be made over the winter of 1911–12 led to the decision that the expense of ongoing preventive maintenance would be offset by the time and effort saved. Although this was one of the early cable systems installed by Reclamation, such systems gained favor for use in mines and quarries across the country through the early twentieth century. The system installed by Reclamation at the Lower Yellowstone Diversion Dam was previously used in Cody, Wyoming, at the Shoshone Project. The cable system installation at the Lower Yellowstone Diversion Dam was completed in late February 1912.[1]

Function

The Cable System consists of a cable suspended over the dam between a head tower at the south end of the dam and a tail tower at the north end of the dam, adjacent to the Main Canal Headworks (MT-141-B). The system conveys rock by bucket or platform carriers along the suspended cable to specified points along the dam, where the rock is then placed. The cable is controlled by means of a pulley system, which is supported by the head tower (south) and tail tower (north). Two cables run between the towers: a heavier 3″ cable carries the bucket or platform in which the rock is conveyed, and a lighter steel cable line controls the movement of the bucket or platform when it has reached its destination.

Towers

The head tower and the tail tower are constructed of bolted 12″ x 12″ timbers, and are reinforced with X-braces made of wood planking. Both were constructed to be moveable, and could be located at points up to 30′-0″ downstream for the placement of rock on the toe of the dam.

---

[1] Cynthia Kordecki et al, *Lower Yellowstone Project, 1996 and 1997 Cultural Resources Inventory, Dawson and Richland Counties, Montana, and McKenzie County, North Dakota* (University of North Dakota Department of Anthropology, Grand Forks, ND, and Renewable Technologies Inc., Butte, MT for the U.S. Bureau of Reclamation, Montana Area Office, Billings, 2000), p. 5.11.

The head tower (24DW443, F3a) is approximately 60′ in height and is square in plan, measuring approximately 25′ x 25′ at its base, tapering to about 6′ x 6′ where it meets the platform at the top. The top platform is U-shaped, allowing for cable movement and the raising and lowering of the hoist bucket, and extends several feet toward the river. It is enclosed by a steel post and rail surround and is braced in its north (river) ends by steel diagonal braces. The platform was originally accessed by a wooden ladder that is attached at the second cross brace on the north side,[2] but this appears to have been removed. The tower is currently accessed by a steel ladder on the southeast corner of the tower, adjacent to the vertical member. A smaller cable-and-pulley system is also in place on the north side of the tower, to carry the rock to the platform above. The tower is set on wooden rollers, which move on steel rails embedded in concrete at the base. These rails are approximately 30′ in length and run parallel to the river embankment. An engineer's house (described below) is nested into the base of the tower scaffolding, and contains the hoist for the cable system. The tower is anchored by cable to a wheel anchor that is set in concrete, to the south of the tower.

The tail tower (24DW443, F3b) is located on the north end of the dam, on the north side of the Main Canal Headworks. This tower is rectangular in plan, measuring 75′-0″ in length (east to west) and 20′-0″ in width (north to south). It stands approximately 15′ tall at the east side, with its west side extending part way down the east bank of the Main Canal. The platform at the top of the tail tower contains a head frame, which secures the north pulley and cable. This frame is mounted on a saddle block that is able to traverse the length of the platform by means of a guy wire system. The platform is accessed by means of a steel ladder, which has been mounted on the east side of the platform. A second ladder has been mounted on the east side of the head frame, to provide access to the pulleys.

Buildings

An unused power plant building (24DW443, F4) stands approximately 20 feet from the south side of the head tower, on the south side of the river. This building houses the original coal-fired steam boiler that was used to power the hoist mechanism for the cable system. This building was constructed in the 1930s as part of a Civilian Conservation Corps (CCC) camp that operated on the Lower Yellowstone Project. It was moved to this site and remodeled to house the steam boiler in 1949. The steam power that was generated in the power plant building was conducted to the hoist in the engineer's house by means of an underground piping system, and was in operation until the mid-1980s.[3]

The power plant is a rectangular plan building measuring 20′-6″ x 66′-0″. It is a wood frame building and sits on a concrete slab foundation. The building is sided in horizontal shiplap siding, which has been painted white, although the paint is peeling and deteriorating. Access to the building is through human-scale doors, which are located on

[2] Ibid., p. 5.4.
[3] Ibid.

the south and north ends of the building. Windows on the building have been boarded from the inside. The roof is gabled, and of medium pitch. It is covered in asphalt shingles, and eaves are shallow with exposed rafter ends. A large pipe chimney rises from the west slope of the roof, and was put in place to vent the steam boiler.

The engineer's house (24DW443, F5) is a square-plan, shed-roofed building that has been partially inserted into the base of the head tower on its south side. It rests above grade on a platform. A 1997 recording noted that the building does not appear to be original to the cable system, and its materials and design indicate it was put in place in the late 1940s.[4] The building houses the hoist engine for the bucket that carries rock to the upper platform. This engine also controls the movement of the cable over the dam. The engineer's house measures approximately 15′ x 15′ in plan. It is clad in plywood, and the upper half of the north wall is hinged at the bottom, allowing the wall to be dropped which allows the person at the hoist controls to observe the cable system when it is in operation. It has a south-sloping shed roof, which is clad in asphalt shingles and has exposed rafter ends beneath the south eave overhang. The building is accessed by a human-scale plywood door on the east wall.

BIBLIOGRAPHY

Kordecki, Cynthia, Mary McCormick, Carrie F. Jackson, and Jennifer Bales
2000 *Lower Yellowstone Project, 1996 and 1997 Cultural Resources Inventory, Dawson and Richland Counties, Montana, and McKenzie County, North Dakota*. Prepared by the University of North Dakota Department of Anthropology, Grand Forks, ND, and Renewable Technologies Inc., Butte, MT. Report submitted to the U.S. Bureau of Reclamation, Montana Area Office, Billings, April 2000.

Water and Power Resources Service
1981 *Project Data*. Washington, D.C.: U.S. Department of the Interior, Water and Power Resources Service.

[4] Ibid.