

ENVIRONMENTAL ASSESSMENT

**TANTER GATE CABLE REPLACEMENT
LAKE RED ROCK
MARION COUNTY, IOWA**

APPENDIX C

**CONSTRUCTION PROCEDURES FOR
TANTER GATE CABLE REPLACEMENT**

APPENDIX C

Red Rock Dam – Lake Red Rock Des Moines River, Iowa Tainter Gate Hoist Cable Replacement

The Lake Red Rock outlet control structure was designed and constructed with the lake water level at 725 feet. The outlet structure consists of five cable operated tainter gates with a sill elevation of 735 feet. There are four 1” diameter-lifting cables located at each side of the tainter gates to be used to raise (open) or lower (close) the tainter gates, as shown in Figures C1 and C2. The cable connection bracket, shown in Figure C3, is at an elevation of 735 feet. When the conservation pool was raised in the spring of 1992 to an elevation of 742 feet several feet of the tainter gate lifting cables and brackets were permanently submerged. In order to maintain the conservation pool at 742 feet NGVD, the tainter gates must be kept in a closed position making inspection, maintenance, and repair of the tainter gates and the tainter gate lifting cables virtually impossible without a drawdown of the conservation pool.

The tainter gate cables (a total of 40) were replaced in 1993. The cables have an estimated service life of 15 years, requiring that they be replaced again in 2007-2008. A drawdown of the conservation pool below the elevation of the cable connection brackets at 735 feet is necessary to replace the cables.

Cable replacement will be accomplished by a construction contractor. Depending on how much time is given to the contractor, he may work on more than one tainter gate at a time. It is estimated that it will take 11 hours to remove and 19.5 hours to install the cables on one gate. Depending on the number of onsite crews, the entire project could be completed in a little over half a month (with a 93-hour work week) or take as much as a month (45-hour work week).

Work will begin with site mobilization. The contractor will need to bring in a variety of equipment including lights, air compressors, welding equipment, a 60-ton crane, tow truck and trailer, and other equipment and personnel vehicles. The total number of personnel working at one time will vary between 3-7, plus a site supervisor.

The first step in the project will be to remove the existing cables made of wire rope. Preparation for this task includes removal of the drum hoist cover hood, disassembly of the wire rope drum assembly, and removal of wire rope drum ferrules. The next step is the removal of the existing cables. This work will begin with the removal of the hitch pin assemblies. Then the wire rope cables will be lowered to the gate sill and then lifted up to the road above and onto a truck trailer by crane. The contractor will transport the wire rope to the park maintenance yard or other designated staging area for later disposal. The process of installing the new cables begins with installation of new wire rope drum ferrules and drum hoist cover hoods, and the reassembly of the wire rope drum assembly. The new wire rope cables will be delivered to the site by truck and lowered down to the gate sill by the crane. New hitch pin assemblies will be installed and then the new wire ropes. Testing of the new gate will be done to ensure the cables are installed properly and operate smoothly. The final step in the process is the field lubrication of the cables. Each cable must be lubricated with an approved lubricant suitable for both underwater and

atmospheric conditions. The contractor may also be required to provide, at the end of the contract, spare cable assemblies including wire rope, ferrules, gate hitch rope sockets, hitch pins, retaining rings, cotter pins, and steel shims.

The contractor will maintain a minimum amount of disruption to any traffic that may be crossing the bridge above the outlet structure. There may be some periods in which traffic will have to be stopped along the bridge or regulated to only one lane while the replacement work is underway.



**Figure C1: Looking down at the tainter gate cables.
There are four cables on each side of the 42-foot wide and 41-foot high tainter gates.**

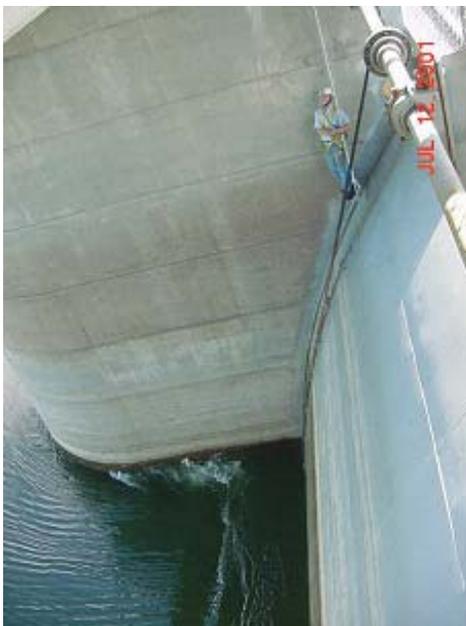


Figure C2: View of tainter gate cables on one side of a tainter gate.



Figure C3: View of cable connection bracket.