Contract No. 005-065
"Big Coulee Dam Repair"
Submitted by Joint Big Coulee Dam Operation and Maintenance Committee
Principal Investigator: Kelly Bursinger
Directives A, C & D

PARTICIPANTS

Sponsor	**Cost Share**	
Towner County WRD, City of Bisbee, Towner County Taxes	$197,350	
Unknown at this time (8/6/2015)	$240,899	
ND State Water Commission	$862,218	
Game and Fish Department	$ 25,000	
Subtotal Cost Share		$1,325,467
North Dakota Industrial Commission	$426,148	
Subtotal Outdoor Heritage Fund (OHF) dollars		$ 426,148
Total Project Cost		$1,751,615

Project Schedule – 2 years
Contract Date – 8/6/2015
Start Date – 4/1/2015
Completion Date – 1/31/2017

Project Deliverables:
Status Report: October 31, 2015 ✓
Status Report: April 30, 2016 ✓
Status Report: October 31, 2016 ✓
Final Report: January 31, 2017 ✓

OBJECTIVE/STATEMENT OF WORK:
The purpose of this project is to repair the principal spillway structure and do an upgrade to the emergency spillway on the Big Coulee Dam.

STATUS:
The original request from the applicant was for $667,048. At the time of the presentation to the OHF Advisory Board the applicant reduced their request to $586,639. The Industrial Commission awarded funding in the amount of $426,148 noting that no OHF dollars could be used for engineering costs. Contract has been executed.

10/31/2015 - Status Report received. It states:
Task Order 1 for the final design, development of plans and specifications, and services during bidding was signed and issued by the Joint Big Coulee Dam Operation and Maintenance Committee on October 19, 2015.

Work to be completed during the next reporting period of November 1, 2015 - April 1, 2016:

- Final design of repair
- Development of plans and specifications for construction
- Solicitation for construction bids.

4/29/2016 - Status Report received. It states:

- Final design documents were completed in early April
- Advertisement for construction Bids began in early April
- Pre-Bid Conference held on-site on April 20, 2016

Work to be completed during the next reporting period of May 1, 2016 - October 31, 2016:

- Opening of Construction Bids on May 6, 2016
- Award of Construction Contract
- Completion of Construction

8/09/2016 - Status report received. The report states the following:

- The dewatering system was installed at the project site
- Erosion control was installed for protection of the site
- The existing principal spillway and embankment were surveyed
- Approximately 15% of the riprap was demolished at the outlet.

Work to be completed during next month:

- Installation of the temporary coffer dam
- Coring of the principal spillway
- Demolition of the riprap (note: riprap will be salvaged when possible)
- Demolition of the principal spillway inlet structure

9/20/2016 - Status report received. The report states the following:

Work completed during 8/01/16 to 8/31/16.

- Installation of a coffer dam
- Coring of the downstream section of the principal spillway. The results do not indicate significant signs of a continuous void system under the spillway.
- Dewatering for construction

Work to be completed during next month:

- Demolition of intake structure
- Excavation along exterior walls downstream
- Removal and replacement of downstream drainage pipes
- Pouring of replacement intake structure slabs and walls

10/12/2016 - Status report received. The report states the following:

Work completed during 9/01/16 to 9/30/2016

- Demolition and replacement of drainage pipes
- Installation of filter and envelope material for new drainage pipes
- Demolition of existing concrete inlet structure
- Construction of new concrete inlet structure
- Excavation of sidewalls for inspection and drainage pipe removal

Work to be completed during next month:

- Final placement of fill
- Installation of new stoplog structure
- Camera inspection of drainage pipes
- Installation of bedding material and riprap at inlet and outlet
- Reclamation of disturbed areas
- Demobilization

11/28/2016 - Status report received. The report states the following:

Work Completed during 10/1/2016 - 10/31/2016:

- Reclamation of disturbed areas
- Removal of coffer dam
- Testing of concrete cores
- Construction of new concrete inlet structure
- Installation of bedding material and riprap at inlet

Work to be completed during next month:

- Final testing of cores, represented as 2% retainage.

Status and Final report received February 3, 2017. (Photos of the project are posted on the Outdoor Heritage Fund website under Final Report.) It states in part:

During the time period of November 01 , 2016 to 1/31/ 2017 Final testing of concrete cores was completed.

Project Purpose:
In December of 2013, the North Dakota State Water Commission (SWC) highlighted ongoing issues with the outlet works of Big Coulee Dam, near Bisbee, ND. The SWC urged the City of Bisbee to correct the deteriorating outlet as soon as possible. The purpose of the project was to not only repair the principal spillway structure, but to also preserve the original purposes and benefits the dam provides including water based recreation for the region, flood reduction, flood storage and emergency water supply.

Work Accomplished:
The Joint Bisbee Dam Operations Committee contracted HDR Engineering, Inc. to assess the dam and complete a feasibility study for options to fix the issue and allow the dam to meet current dam safety criteria. The feasibility study recommended a repair to the principal spillway structure. HDR was hired to design the replacement structure. The project was awarded to ECI Inc.

Work began at the dam in July of 2016. Construction activities included installation of a temporary coffer dam upstream of the principal spillway to allow for construction and demolition of the existing principal spillway walls. The spillway was cored to check for voids beneath the spillway structure. The results of the coring investigation did not indicate seepage beneath the spillway structure. The sidewalls along the downstream end of the spillway were exposed by excavation. They were examined for structural integrity and signs of deterioration. Both walls appeared to be in good condition. The drain pipes were also removed and replaced with a perforated pipe surrounded by filter and envelope material. New concrete walls with rebar reinforcement were poured to replace the demolished walls at the spillway inlet. New bedding material and riprap was also put in place upstream of the principal spillway structure. The existing gate valve was replaced and a stop log structure was installed for low level flow control.

After construction, the disturbed areas were seeded and mulched. Construction ended in October of 2016. Testing of concrete cores extended into December of 2016.

Project Results:
The new principal spillway structure was completed in October of 2016. When the protecting coffer dam was removed, and water returned to its place against the structure, the lack of leaking water was noticeable but not missed. The new structure provides better control of the reservoir level which is a greater benefit to the surrounding community and downstream landowners. Representatives from the

Joint Bisbee Dam Operations Committee attended the final inspection and were pleased with the final product.

Value of the Project:
By bringing the dam up to current dam safety standards, the life of the dam is extended. The dam, and reservoir, will continue to provide recreational opportunities for the region. Included in the recreation opportunities are fishing, boating, swimming, ice fishing and other water based recreation. The fishing at the reservoir has been recognized by the North Dakota Game and Fish Department as a valuable resource by providing funding to preserve the facility. The dam will continue to provide flood reduction benefits, flood storage benefits by reducing water entering Devils Lake and emergency water supply benefits.

This project is now complete and they came in under budget. The remaining amount of dollars set aside for this project of $178,462.07 is now released and available for the Commission to award for other projects.

This project is now closed.

Updated: 2/6/2017