

MEMORANDUM

JRS ENGINEERING CONSULTANT, LLC

TO: Chuck Reid, Manager - CCBWQA
CC: Rick Goncalves, PE, TAC Chairman
FROM: James R. "Jim" Swanson, PE
DATE: May 9, 2014
SUBJECT: West Boat Ramp Parking Lot PRF - Project Summary

Cherry Creek State Park - West Boat Ramp Parking Lot PRF Cherry Creek Basin Water Quality Authority

BACKGROUND AND PURPOSE:

In the fall of 2010, the Colorado Marina Association (CMA) requested the Authority investigate the impacts of surface runoff, from the West Boat Ramp parking lot, being discharged directly into Cherry Creek Reservoir. The West Boat Ramp Parking Lot and Marina Facility site layout is shown on Photo 1.

EXISTING CONDITIONS:

The Authority's investigation found that the majority of stormwater runoff from the parking lot was being directed to a single 5-foot wide curb inlet located adjacent to the marina and then discharged directly into the Reservoir through a deteriorated 18-inch corrugated metal pipe. Runoff from the West Boat Ramp parking lot is a point discharge that has direct adverse impacts on water quality within the Reservoir.



Photo 1 West Boat Ramp Parking Lot @ Cherry Creek Reservoir



Photo 2 Inlet w/ Direct Reservoir Connection

During significant rainfall events the parking lot stormwater surface runoff exceeds the capacity of the single 5-foot inlet and overtops the sidewalk and flows overland into the Reservoir. The inlet is shown in Photo 2.

In early 2011, the Authority and Cherry Creek State Park (Park) reviewed the project in light of the fact that the Park holds the MS4 Permit. Capital funding and the on-going maintenance for the project were two important factors to the success of implementing a capital project to eliminate this direct pollutant discharge into the Reservoir. The outcome of this review concluded that the Authority would fund/manage the design and capital construction of the project and the Park would perform annual maintenance in compliance with their MS4 Permit. The terms and detail of this arrangement were formulated in an intergovernmental agreement between the Park and the Authority. This is one of several projects where the Authority and the Park have collaborated to complete needed projects in a timely manner benefiting the water quality in the Reservoir.

DESIGN APPROACH:

The design approach included removing the single 5-foot inlet and replacing it with three inlets (one 15 foot inlet, one 10- foot inlet and one 5-foot inlet). The inlets are each connected to a single reinforced concrete pipe (RCP) and the RCP is then routed to an existing water quality basin located north of the marina's boat storage area. An outfall structure located in the water quality basin discharges stormwater at a controlled release rate to the reservoir through another RCP. The site improvement plan is shown on Figure 1.

A portion of the RCP was routed through an existing boat storage overflow parking area that was sparsely vegetated and often muddy. A crusher fine surface was installed, as a part of the project, to minimize sediment transport off this overflow parking area. Pre-construction and post-construction photos of the project are shown below in Photos 3 - 9.

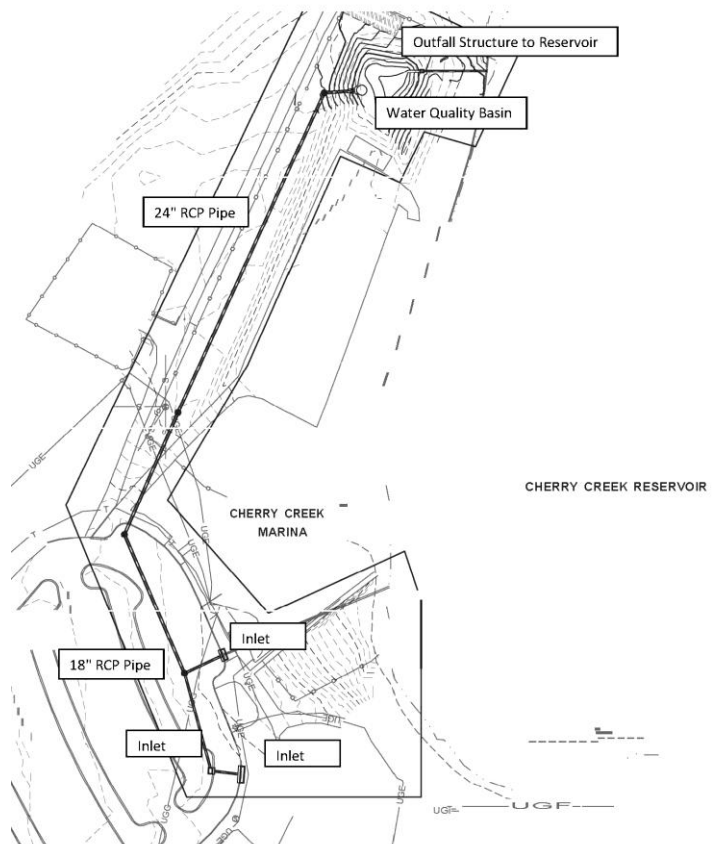


Figure 1 Site Improvement Plan



Photo 3 Existing 5-Foot Inlet



Photo 4 Constructed 15-Foot Inlet



Photo 5 Existing Overflow Storage Parking Area



Photo 6 Constructed Overflow Storage Parking Area



Photo 7 Existing Water Quality Basin



Photo 8 Reconstructed Water Quality Basin

CONSTRUCTED PROJECT:

Bids for the project were opened on September 24, 2013. The successful bidder, 53 Corporation, was awarded the contract in the amount of \$217,346.00 including the base bid and two bid alternates. The notice to proceed was issued for December 23, 2013. The work was substantially complete on April 15, 2014. The final project cost totaled \$221,155.35.

The Project included three Type "R" inlets, one outlet structure, 877 linear feet of 18-inch and 24-inch reinforced concrete pipe (RCP) , four standard manholes (5' diameter), 441 square yards of erosion control blanket, 172 tons of asphalt patch and 0.54 acres of seed/mulch. The project was constructed during the winter months to minimize disruption to the Marina and Yacht Club seasonal summer business.



Photo 9 Reconstructed Water Quality Basin

WATER QUALITY BENEFITS:

An assessment of the water quality benefits for the entire project was analyzed by the Authority¹ as part of the ongoing water quality analysis of all projects listed on the 5-year capital improvement program. Based on the outcome of this assessment it is calculated that 2 lbs of phosphorus and over 1,300 lbs of sediment per year will be eliminated from being directly discharged into Cherry Creek Reservoir.



¹ West Boat Ramp Parking Lot Improvements - Water Quality Analysis Memorandum, dated December 2, 2011; William P. Ruzzo, P.E., LLC