Canal Importation Basin Master Drainage Plan
Fort Collins, Colorado

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Anderson Consulting Engineers, Inc.
Civil • Water Resources • Environmental

Anderson Consulting Engineers, Inc. (ACE) was contracted by the City to update the Master Drainage Plan for the Canal Importation Basin. The primary purposes of the project were: (1) identify flooding problems within the basin, or in the Old Town Basin as a result of runoff generated within the Canal Importation Basin, including delineation of 100-year floodplains along major drainage corridors; (2) identify existing habitat areas within the basin and possible areas where habitat could be enhanced; and (3) utilizing an integrated watershed plan, prepare a cost effective plan of drainage improvements for the basin which will eliminate, to the extent practicable, flooding for all events up to and including the 100-year event, while protecting and enhancing habitat where possible. In order to accomplish these goals, the following general tasks were completed by ACE:

(a) a new hydrologic model for the five square mile basin was prepared and utilized to estimate runoff response to a range of rainfall events for both existing development and fully developed conditions;
(b) the three major irrigation canals which transect the basin were modeled initially using HEC-2 to estimate canal conveyance capacities assuming steady state conditions, they were subsequently modeled using UNET (now incorporated into HEC-RAS as the unsteady flow module) to determine the actual, dynamic operation of the canals under flooding conditions;
(c) baseline hydraulic analyses were conducted along seven major drainage corridors using both HEC-2 and HEC-RAS, floodplain mapping for the 100-year event was prepared along these drainage corridors;
(d) flood damages within the basin were estimated for a range of flood events;
(e) conceptual alternatives for reducing flood damages and preserving/enhancing habitat within the basin were developed;

(e) a selected plan of drainage improvements was prepared, comprised of thirteen identified projects, which included a combination of detention ponds, conveyance channels, storm sewers, culverts, and irrigation channel improvements consisting of controlled spill structures, radial gates, berms, channel reconstruction, and pipes/culverts;
(f) engineering and construction cost estimates for the selected plan of improvements totaled over $51 million; and
(g) hydrologic and hydraulic models were refined to reflect master plan conditions, residual 100-year floodplains were mapped, and residual flood damage estimates completed.

The drainage improvements identified in the Master Plan will be constructed over a period of years and will result in the removal of approximately 640 structures from the 100-year floodplain and a reduction in flood damages over a 50-year period from an estimated $125 million to $15 million.


New Mercer Ditch North of Crestmore Place


Plum Street Channel Headwaters