

Master Planning Program Notes

By Ben Urbonas, P.E., Manager, Master Planning Program

Planning Projects

Five planning projects were completed in 2004; 10 projects were under way; and we hope to begin 6 new planning projects in 2005.

We now have a total of over 125 completed watershed-level major drainageway and outfall system plans in our inventory. Some of these studies are updates of master plans completed many years ago.

Urban Storm Drainage Criteria Manual

We no longer print updates to the Urban Storm Drainage Criteria Manual (USDCM), and remind all owners and holders of this manual that all revisions and updates are posted on our web page. Updates for Volumes 1 and 2 are under www.udfcd.org/usdcm/vol1&2.htm for free downloads of the revised pages in Adobe PDF format. Although there were no new updates to the manual in 2004, everyone should keep checking our web page www.udfcd.org for revisions and corrections. In addition, we hope to get away from printed Volumes 1 and 2 of the USDCM in 2005 and make all volumes available to download from our web site in 2005. So, keep checking our web site for this development.

Volume 3 of the USDCM continues to be available for free download from www.udfcd.org/usdcm/vol3.htm. You can choose to download the entire document or download the latest revision of any single chapter.

We have been working to develop a significantly revised section on porous pavement of the Structural BMPs Chapter of Volume 3. Instead of one type of porous pavement, we hope to have at least interim criteria for five types of porous pavement. Before the revised recommendations are incorporated into Volume 3, a draft of these criteria will be posted for public comment. The technical issues supporting porous pavement design and maintenance are quite complex and will determine if these installations will

STATUS OF PLANNING PROJECTS

Project	Sponsor(s)	Consultant	Status
Applewood OSP	Jefferson Co., Golden	Kiowa	Completed in 2004
Cherry Creek MDP u/s of Cherry Cr. Reservoir	Parker, Douglas Co., Arapahoe Co., Centennial	URS	Completed in 2004
Denver High Line Canal Marcy G. to Mississippi Av	Denver Water & WMD, Greenwood Village, SSPRD, Littleton, Cherry Hills Village, Arapahoe Co.	WRC	Completed in 2004
Fairmount Area OSP	Jefferson Co., Golden	Moser Assoc.	Completed in 2004
Second Creek (Lower) MP Update	Adams Co., Brighton & Commerce City	Kiowa	Completed in 2004
Broomfield & Vicinity	Broomfield & Westminster	Kiowa	95% Complete
Lower Brantner Gulch	Adams County, Thornton	Love & Assoc.	90% Complete
Third Creek (Lower) MP Updates	Adams Co., Commerce City, Brighton	Kiowa	90% Complete
Kinney Creek & Fonder Draw	Douglas Co.	WRC	85% Complete
Four Mile Canyon & Wonderland Cr. Updates	Boulder.	Love & Associates	65% Complete
Upper Goldsmith OSP	Arapahoe Co. Greenwood Village, Centennial	Moser Assoc.	60% Complete
Massey Draw & SJCD (S)	Jefferson Co., Arapahoe Co.	n/a	60% Complete
Rock Creek in Superior	Superior	n/a	25% Complete
Yankee Doodle OSP	Arvada	n/a	15% Complete
Lemon and Scott Gulch OSP	Douglas Co.	n/a	Start in Dec 04
Big Dry Cr. (AdCo) North Tributaries Update	Thornton, Adams Co., Broomfield	n/a	Start in 05
Clear Creek Update	Wheat Ridge, Jefferson Co., Adams Co., Golden, Denver	n/a	Start in 05
Cottonwood Cr. W.Q Update	Arapahoe Co., Centennial, CCBWQA, Lone Tree, Douglas Co.	n/a	Start in 05
Dutch Cr./Lilley G. Update	Jefferson Co., Denver, Lakewood	n/a	Start in 05
Murphy Creek Update	Aurora	n/a	Start in 05
Toll Gate Creek Hydrology	Aurora	n/a	Start in 05

succeed and survive over time. As a result, we need many eyes and brains to help us to develop recommendations that will best fit the climate and the conditions found in areas of the country similar to where we are located.

Ken MacKenzie of the Design and Construction Program has authored a major revision of the spreadsheet for the design of stormwater inlets. If you have not yet had a chance to download it, I strongly urge you to do so. Ken also approached the cities and counties within the District to help fund a scale modeling effort for three or more types of inlets. We suspect that some of the design guidance that is in practice today could be improved for some of the inlets used within the District. The District's

Board authorized this effort and appropriated funds that will substantially match the contributions we receive from cities and counties and will permit us to undertake this effort. We hope to have this testing program under way in 2005.

District's Software

Since posting a beta test version of new *UDSWM* software (FSA GUI with SWMM 2000) we launched an initiative to integrate the District's *CUHP* software into a new, Windows-based EPA *SWMM 5.0*.

For the last two years EPA has been working on rewriting the SWMM software and to provide a graphical user interface (GUI). Go to the web page

<http://www.epa.gov/ednrmrl/swmm> to download this software free of charge. I served on its development advisory committee and see it as becoming the national math engine for much of urban stormwater modeling in the future. While this software can be obtained free of charge, we expect private industry to incorporate enhancements and features that will make it even easier to use and will expand its capabilities. Watch for new products that will emerge over the next year that are anchored around this new *SWMM* 5.0 math engine.

Our goal is to have the *CUHP* model be able to work with the new EPA software just like the current version works with the UDSWM program. One challenge is to write software that will convert the existing *CUHP* and *UDSWM* inputs to run under the new software package. Once done, the model will permit us to continue to use our hydrology methods and to expand our modeling capabilities to water quality, continuous simulations and many other features inherent in the EPA's model. We hope to have these tasks completed in 2005.

District's April 2004 Seminar

On April 28, 2004, the District held its annual seminar on urban stormwater and floodplain management topics. It was attended by over 200 participants from municipalities, federal and state governments, consultants and other organizations. The proceedings are available for download from: <http://udfcd.org/conferences/conferences.htm>

Douglas and Arapahoe Counties Criteria Manual Update Project

The District continues to work with the preparation of updated stormwater criteria manuals for Douglas and Arapahoe Counties. The consultant for this project is Muller Engineering Company. Since the project began in 2003, the Cities of Centennial, Lone Tree and Castle Rock have joined this effort. It is expected that the manuals for all the counties and cities now participating in this effort will be released in 2005.

Denver is preparing a BMP Implementation Manual

Denver's Wastewater Management Division is continuing with its effort to

develop a BMP implementation guidance document. The consultant for this project is Wright Water Engineers, Inc. This effort will result in a document that will suggest options of how to make BMPs work in an ultra-urban infill and redevelopment areas. Look for this document to also be released in 2005.

Denver is updating its Stormwater Design and Technical Criteria

Denver's Wastewater Management Division has launched an effort to update its Stormwater Design and Technical Criteria. The District has been asked to manage this project and is working with Denver and Wright Water Engineers, Inc., the project's consultant, to come up with an updated criteria document. Much of the focus is on streamlining the old document, utilizing the technical criteria of the District through cross-references and integrating the BMP implementation issues and guidance developed under the effort described above. Look for this effort to be completed late in 2005.

New Spillway Gates at Maple Grove Reservoir

By Mark R. Hunter, P.E., Manager, Maintenance Program

By mid-December, 2004 the two new steel crest gates located in the spillway of Maple Grove Dam were ready to hold back the water that was re-filling the reservoir. The new gates replaced two inflatable dams (fabridams) that were installed in 1977 and were near the end of their service life. The fabridams were installed to improve the operational control of the reservoir and to reduce spillway outflow to be in line with the flood-carrying capacity of the downstream channel.

Maple Grove Reservoir is situated on Lena Gulch at 27th Avenue near Youngfield Street in Lakewood, Colorado. Consolidated Mutual Water Company owns the reservoir and uses it to store raw water. The water is eventually treated and distributed to Consolidated's customers.

When Maple Grove Reservoir was constructed in 1955 it inadvertently provided substantial downstream flood protection. This benefit to the communities downstream of the reservoir was recognized in the 1975 Lena Gulch Drainage Study.

In 1974, Consolidated was directed by the Colorado State Engineer's office to enlarge the Maple Grove Dam spillway to pass the calculated Standard Project Flood. This is the flood that would result from a storm

with a recurrence interval of 250 years in the Lena Gulch drainage basin upstream of the reservoir.

Portions of Wheat Ridge, Jefferson County, and Lakewood benefited from



Looking upstream at the old fabridams

the flood protection provided by the reservoir. Along with the District, these communities cooperated with Consolidated in 1976 to design a unique spillway enlargement that met the needs of both Consolidated and the flood-prone communities downstream of the reservoir.

The coordinated plan called for Consolidated to own the 30-foot long by 6-foot tall dam and the District to own the 40-foot long by 10-foot tall dam, both of which were located in the newly-enlarged spillway. The dams in the spillway allowed discharges through the spillway to be controlled by the mechanically operated gates. The result was that the District and downstream local governments could anticipate acceptable spillway outflows during 100-year storm events while Consolidated could be confident in being able to withstand the Standard Project Flood without overtopping the reservoir.

The fabridams were inflated by a combination of air and water and were difficult to operate and maintain. They showed their vulnerability in March of 1979 when vandals using knives sliced

open the 30-foot long dam allowing a relatively small but certainly unexpected flood to occur. The peak flow immediately below the reservoir was about 750 cubic feet per second and caused some residential basement flooding and first floor damage to some commercial buildings.

The replacement system uses hydraulic cylinders to raise and lower the two

independent crest gates. They will operate under the same discharge parameters as did the fabridams. The new steel crest gates are more resistant to vandalism and are far simpler to operate and maintain than the fabridams. The new system affords renewed confidence in the integrity of Maple Grove Dam to the District, Consolidated, and the communities downstream of the reservoir.



Looking upstream at one of the new gates

Maintenance Eligibility Program

By David Mallory, P.E., Senior Project Engineer, Floodplain Management Program

Construction Plan Reviews

The Wednesday, November 24th headline in the *Rocky Mountain News* proclaimed "Home Boom, \$13.1 billion in 2004 home sales". This year's continued robust housing market was fueled by low interest rates, a belief the Colorado economy is strengthening and a post election bounce. Total home sales for 2004 will likely outpace last year's record by 10%. The result was a continued boom in land development activities. The eastern E-470 and northern I-25 corridors have attracted the largest development interest. District staff reviewed over 300 construction plan referrals. Providing timely reviews is always challenging and this year was no exception. Terri Fead, PE has supplemented District staff

throughout the year. Terri's involvement has been a tremendous benefit to the maintenance eligibility program and I'm happy to announce she will be part of the program next year.

The District's maintenance eligibility database, updated bi-monthly, and the *Guidelines for Maintenance Eligibility Of Flood Control Facilities Constructed By Others* (Maintenance Eligibility Guidelines) have been available online throughout the year. This has proved helpful to local governments and consulting engineers alike. Another effective tool has been the practice of holding project meetings involving District staff, design consultants and local government representatives as a way to reach consensus and move

construction plans quickly through the final review process. We are also available by e-mail, fax or telephone to answer questions on design criteria and the maintenance eligibility program.

In April, the District hosted a workshop addressing current issues and guidelines in stormwater planning and design (see Ben Urbonas's article). One presentation subject was "Maintenance Eligibility and Master Plan Implementation". Bill DeGroot touched on this issue in his article. Bill continues to provide excellent leadership in this important effort. Private land development projects are responsible for constructing perhaps one-half to two-thirds of the Denver metropolitan area's major drainageway

infrastructure. In working with local governments, developers and their consultants, we have also been mindful that major drainageways must be attractive, provide a community asset and represent a "sense of place" in addition to functioning hydraulically. The aesthetic and urban design components are difficult to capture in criteria manuals, but oh so important in the final product.

RTD's West Corridor Project

Voters approved the \$4.6 billion Fast Tracks project in November. One of the six alignments, known as the West Corridor, will precede the other alignments into design and construction phase. The West Corridor, which will connect downtown Denver to the Federal Center and Jefferson County Government Center, follows the old Associated Railroad alignment, which RTD purchased a number of years ago. The West Corridor project is budgeted at \$500 million with major impacts to

the South Platte River, Lakewood Gulch, Dry Gulch and North Dry Gulch. We have been working with City and County of Denver, City of Lakewood and RTD representatives since mid-summer in an effort to advance the preliminary design, enhance drainageway and open space functions and define budget risks for RTD. Significant progress has been made and significant work still needs to be done. The largest remaining issue is the South Platte River crossing. The crossing alignment is approximately 14th Avenue, just north of the Zuni Power Plant and south of Denver's Solid Waste Management facility. Stay tuned...

In the field

An integral part of the maintenance eligibility process is construction oversight. Construction activity has increased this year over past years. At any given time, we typically have 120 to 150 active construction projects spread out over 1600 square miles in many

different local jurisdictions. We depend heavily on networking and partnerships developed with local governments and various engineering consultants over the years to adequately cover construction oversight. In some cases, local government inspection staffs have conducted construction observations on the District's behalf. Field reports and/or digital photos are typically provided to us through e-mail. We also rely upon local inspection staff, engineering consultants and in some instances, contractors to keep us apprised of construction progress and the need for District construction site visits. During 2004, District staff completed over 100 construction site visits. Over 60 projects were completed and recommended for construction acceptance during the preceding 12 months. Another 30 previously approved projects were re-inspected for adequate vegetative cover and received final approval.

District Projects in the News

Two projects tie for CASFM 2004 Grand Award

Two projects with District involvement tied for the 2004 Grand Award for Engineering Excellence presented by the Colorado Association of Stormwater and Floodplain Managers at their annual conference in August.

The Goose Creek project was a flood mitigation project sponsored by the City of Boulder and the District, and designed by ASCG, Inc. The \$8 million



Goose Creek channel, decorative walls and trail

project 3200 feet of walls, a continuous trail along the 3300 foot length of channel, and creation of wetlands and wildlife habitat.

The Comprehensive Stormwater Management at Stapleton project involved the District in ways other than funding. This project included the restoration of Westerly Creek on the former airport site. In order to meet tight time lines the District met with Denver, developer and designer representatives on a monthly basis to

assure that the completed design would be eligible for District maintenance assistance, and would also experience minimal difficulty in receiving a Conditional Letter of Map Revision from FEMA. Both objectives were accomplished.

The developer is Forest City Stapleton, Inc. and the designers were Matrix Design Group, Inc. and EDAW, Inc.

Marcy Gulch featured in magazine

The Marcy Gulch restoration project which has won several awards and is described in detail in the 2003 edition of *Flood Hazard News* was the cover story in the September/October issue of *Land and Water*. The project was sponsored by the District and the Highlands Ranch Metro Districts.

District wins accounting award

For the fifteenth year in a row the District has received a "Certificate of Achievement for Excellence in Financial Reporting" from the Government Finance Officers Association of the United States and Canada.

The certificate is presented to government units whose comprehensive annual financial reports achieve the highest standards in government accounting and financial reporting. Congratulations to Frank Dobbins, Manager of Finance and Accounting, for continuing this string of awards.