Jeffrey W. Sickles, PE, CFM

Principal

Mr. Sickles has 16 years of experience in water resources engineering. He has served as a group manager, project director, project manager, project engineer and hydraulics task manager on numerous projects throughout Colorado and the Western United States and has worked with a variety of local, state and federal agencies. Jeff's expertise includes a broad knowledge of hydraulic and hydrologic engineering from conceptual studies, CLOMR/LOMR approval, through preparation of final construction plan packages. Specific areas of expertise include floodplain management, floodplain hydraulic modeling, design of open channels, channel rehabilitation, drop structure design, design of stream stability and scour countermeasures, stream restoration, storm drains, and culverts. His broad range of experience includes construction management for storm drainage projects. Jeff is well known for providing innovative, cost-effective drainage solutions.

Project Experience

Floodplain Management

Floodplain Map Modernization Project, Colorado Colorado Water Conservation Board (CWCB). Project Director responsible for coordinating between CWCB, local agencies and sub-consulting team. Coordinated with CWCB to develop project scoping and cost estimates. Provided QA/QC of map modernization elements including LOMR and existing study review and incorporation into DFIRM mapping; profile data conversions; and DFIRM production. This work effort produced some of the first, countywide, DFIRM projects in Colorado under the Federal Emergency Management Agency's (FEMA) map modernization efforts and established standards for future FEMA projects in Colorado. Fee: $3.5M.

Floodplain Map Modernization Project, North Dakota, North Dakota State Water Commision. Principal-in-Charge providing project oversight, QA/QC of map modernization work including hydrology and hydraulics, and coordination of DFIRM production. Directed staff on DFIRM projects, coordinated with FEMA on critical project issues, and ensured resources were available to meet project schedule and delivery dates.

Floodplain Map Modernization Project, South Dakota, South Dakota Office of Emergency Management. Quality Control and Quality Assurance Lead responsible for ensuring that all work was properly reviewed and met FEMA submittal requirements. Provided oversight and QC for new H&H study for the Town of Groton, SD. Reviewed report content to ensure that study met FEMA TSDN requirements and was properly incorporated into DFIRM mapping and database.

Stormwater Management & Planning

Dutch Creek, Coon Creek, and Lilley Gulch Drainageway Planning Study and Flood Hazard Area Delineation, Jefferson County, CO, Urban Drainage and Flood Control District. Project manager responsible for the development of revised hydrology for the Dutch Creek watershed (16 sq miles) using the Colorado Urban Hydrograph Procedure and EPA-SWMM; development of a new hydraulic model for over 23 miles of drainageways using HEC-GeoRAS; new floodplain mapping with 1.0 ft and 0.5 ft floodway for 23 miles of drainageways; and development of a comprehensive drainageway master plan for flood damage mitigation and channel stabilization totaling more than $50 million.

27th and Federal Stormwater Master Plan, Denver, CO, City and County of Denver. Project manager for the City and County of Denver's 27th and Federal stormwater master planning project. Responsible for overseeing the development of the hydrologic models for a 5.2 square mile basin that is fully developed in a dense urban area. The Colorado Urban Hydrograph Procedure (CUHP) and Urban Drainage Stormwater Management Model (UDSWM) were used for the hydrologic analysis. Developed alternative

stormwater concepts including conveyance and detention. Other tasks managed or performed include hydraulic analysis for storm drain systems, storm drain system sizing, inlet interception analysis, detention pond design, and water quality concept development. All master plan mapping was developed using GIS. Developed a comprehensive capital improvement plan for the project area that included project-by-project descriptions, design flows, cost analysis, and preliminary storm drain profiles.

Boxelder Creek Stormwater Master Plan, Larimer CO, Colorado, Larimer County Engineering. Responsible for quality assurance/quality control (QA/QC) for PBS&J's proposed improvements within the Boxelder, Cooper Slough, and Coal Creek drainages.

City-wide Stormwater Master Plan Update, Denver, CO, City and County of Denver. Hydraulics task manager responsible for providing stormwater master planning services as a subconsultant. Developed the existing and proposed conditions hydrologic models for basins 4400-02 (Quebec Basin) and 0060-02 (Brighton Basin) using the Colorado Unit Hydrograph Procedure (CUHP) and the Urban Drainage Stormwater Management Model (UDSWMM). In total, the basin is over 2,400 acres of fully-developed urban area. Directed GIS mapping for the Quebec and Brighton basins showing basin delineations and routing schematics. Developed a HEC-RAS model to provide a flood hazard area map at the downstream end of the basin to show areas of 100-year inundation. Analyzed alternatives for the master plan including both conveyance and detention.

Stream Rehabilitation & Restoration

SJCD 6100, Arapahoe County, CO, Urban Drainage and Flood Control District. Designed 900-lineal-foot boulder-lined channel per UDFCD drainage criteria (developed multiple layout options using EaglePoint design software). Developed the HEC-RAS hydraulic models for both existing and proposed site conditions and analyzed the effects of the proposed improvements to the floodplain. Authored the Alternative Selection Report from which the final alternative was selected. Provided construction services that included periodic field observation, submittal review and approval and preparation of pay estimates.

Shooks Run Drainage Improvements, Colorado Springs, CO, City of Colorado Springs. Hydraulic engineer responsible for developing multiple open channel alternatives and alignments for 2,000 lineal feet of Shooks Run with 100-year design flows of 6,000 cubic feet per second. Civil layout included retaining walls, bike path alignments, and storm drain design. Alternatives were presented to the public for comment and direction. Developed HEC-RAS hydraulic models for proposed conditions to develop culvert and bridge sizing. Designed channel, roadway, sanitary sewer, water line improvements, and prepared construction plans and specifications.

Fountain Creek and Sheridan Avenue Drainage Improvements, Woodland Park, CO, City of Woodland Park. Designed channel stabilization for approximately 2000 linear feet of Fountain Creek. Design included boulder and riprap lining, grouted boulder drop structures, storm drain systems, and two large box culverts. Designed channel, roadway, sanitary sewer and water line improvements, and prepared construction plans and specifications. Developed HEC-RAS hydraulic models to compare existing and proposed conditions floodplains and to evaluate the revised floodway due to project improvements. Prepared a Letter of Map Revision (LOMR) to be submitted to FEMA. ***Project won the 1999 American Public Works Association award for Best Municipal Project for a small city***.

East Plum Creek Channel Restoration, Douglas County, CO, Aggregate Industries. Evaluated a 5,000-lineal-foot segment of East Plum Creek to determine optimal stream

alignment and bank stabilization techniques, which would protect the stream from both aggradation and degradation. Developed existing and proposed conditions HEC-RAS model to evaluate potential for stream degradation and bank erosion during low flow events. Authored report documenting findings and discussing alternative stream alignments, channel stabilization, and bank stabilization techniques which included drop structures, wrapped soil lifts, willow wattle toe stabilization, a-jacks stabilization, and soil riprap banks.

Airport Creek, Westminster, CO, Urban Drainage and Flood Control District. Developed the HEC-2 hydraulic models for both existing and proposed site conditions and analyzed the effects of the proposed improvements to the floodplain. Performed a hydraulic grade line analysis for an existing storm drain and designed a replacement inlet and storm drain. Provided construction services that included periodic field observation, submittal review and approval, and preparation of pay estimates.

The Sanctuary at West Meadows, Jefferson County, CO, Skyland Meadows Development. Designed a pump station to be used for a pond recirculation system. Designed grouted boulder drop structures in conformance with the Urban Drainage and Flood Control Districts Drainage Criteria Manuals. Performed a HEC-2 analysis to compare existing and proposed channel conditions. Prepared construction drawings for the project including site grading, drop structure layout and detention pond details.

Upper and Lower Running Gulch Improvements, Black Hawk, CO, Western Diversified Builders. Provided preliminary layout for a detention/sedimentation pond and performed site grading for various drainageways and a maintenance access road. Prepared construction drawings for the project. Prepared the 404 Permit for submission to the Army Corps of Engineers. Provided construction services which included periodic field observation and submittal review.

Lena Gulch Maintenance Improvements (downstream of Consolidated Mutual), Lakewood, CO, Urban Drainage and Flood Control District. Performed construction observation for the project and oversaw the installation of a grouted boulder drop structure, riprap placement and footbridge abutments and caissons. Reviewed shop drawings and submittals assuring minimum conformance with project construction drawings and specifications. Examined pay items and change orders for appropriateness.

Bridge Scour & Hydraulic Analysis

Mary's Lake Road Bridge Replacement Design, Estes Park, CO, Larimer County. Hydraulics task manager responsible for overseeing the development of the hydraulic model and hydraulic opening analysis for the Mary's Lake Bridge. Additional work included bridge scour analysis and countermeasure design, culvert analysis and design, water quality design and development of a comprehensive report to document all changes to the effective FEMA SFHA.

Castle Oaks Bridge Replacement over Cherry Creek, Douglas County, CO, Town of Castle Rock. Hydraulics task manager responsible for the development of the hydraulic model for replacement of the Castle Oaks Bridge over Cherry Creek. Work included the development of the HEC-RAS model meeting FEMA requirements. Analysis included the evaluation of bridge scour and countermeasure design.

Hagerman NWR Bridge Replacement, Grayson County, TX, FHWA-CFLHD. Hydraulic engineer responsible for developing hydrologic and hydraulic analysis for replacement of a bridge on the Central Service Road within the Hagerman National Wildlife Refuge (NWR). Analysis included preparation of HEC-RAS hydraulic model and evaluation of scour using methods outlined by HEC-18.

Don Edwards NWR Bridge Replacement, Alameda County, CA, FHWA Central Federal Lands. Hydraulic engineer acting in support of hydrologic and hydraulic analysis for replacement of a bridge within the Don Edwards National Wildlife Refuge. Developed spreadsheet for the analysis of tidal hydraulics and scour using methods outlined in HEC-18 to support hydrologic and hydraulic analysis.

Bridge Scour Countermeasure Design Denver, CO, City and County of Denver. Provided design of bridge scour countermeasures at 12 bridges in the City and County of Denver. Countermeasure design included riprap revetment, fence spurs and grouted boulder drop structures. Prepared project construction drawings and specifications for each bridge site. Project involved intensive coordination with various departments within the City and County of Denver as well as utilities and environmental permitting.

SH 67 Bridge Replacement over Trout Creek, Teller County, CO, CDOT Region 2. Performed the HEC-2 models for existing and proposed site conditions for the replacement of a bridge on SH 67. Developed low chord elevations and bridge opening sizes and provided recommendations to CDOT Staff Bridge for structure size and type. Analysis included the evaluation of sediment movement through the bridge over a 60-year period and evaluation of future degradation/aggradation. Estimated peak flows through the bridge using TM-1 and developed hydrology for basins tributary to roadway culverts using SCS methodology. Sized cross culverts and developed structure sections for the project.

Hydrology & Hydraulics for Transportation

Cascade Dam Removal, Yosemite National Park, CA; FHWA Central Federal Lands. Hydraulics Task Manager responsible for providing hydraulic and floodplain analysis for the removal of the Cascade Dam on the Merced River. Developed HEC-RAS model for both existing and proposed conditions, revising n-values based washing out of sediment following removal of the dam. Estimated the final stream configuration, profile and annual high water for permitting.

US 85 Sedalia and Highlands Ranch to Titan Road; Douglas County, CO; CDOT Region 1. Hydraulics engineer responsible for hydrologic and hydraulic analysis for roadway widening improvements. Analysis included cross culvert and storm drain systems design. Developed construction plans and structure cross sections for incorporation in overall construction plan set. Prepared hydraulics reports for submittal to CDOT.

I-25/RidgeGate Parkway Interchange Design, Lone Tree, CO, City of Lone Tree. Hydraulics task manager responsible for overseeing hydrologic and hydraulic analysis including cross culvert design, storm drain systems layout and design, detention analysis, and water quality facilities design for a proposed interchange. Developed HEC-RAS model to analyze effects of fill placed within the floodplain.

South I-25 Corridor, Douglas County, CO; CDOT. Hydraulics task manager responsible for overseeing hydrologic and hydraulic analysis including bridge waterway opening and scour countermeasure design for a proposed frontage road bridge over Happy Canyon Creek. Developed HEC-RAS model to analyze the effects of fill placed in the floodplain and to analyze the proposed bridge opening for the new frontage road. Other tasks included cross culvert design, storm drain systems layout and design, detention analysis, and water quality facilities design for a proposed interchange.

I-25/Castle Pines Parkway Interchange Reconstruction Design, Douglas County, CO, CDOT Region 1. Hydraulics engineer responsible for evaluating hydrology of

basins draining to I-25 and designed cross culverts, storm drain systems, stream stabilization and detention, and water quality facilities for interchange improvements. The Castle Pines Parkway interchange is being upgraded from a diamond interchange to a partial cloverleaf interchange as part of the South I-25 Corridor and US 85 Corridor EIS Record of Decision.

Oroville-Quincy Highway Reconstruction and Widening, Plumas National Forest, Butte County, CA, FHWA-CFLHD. Hydraulics task manager responsible for evaluating hydrology, design of cross culverts, storm drain systems, and water quality facilities for roadway realignment and widening project. Prepared comprehensive drainage and erosion control report.

Baptist Road Improvements Design, El Paso County, CO, El Paso County Department of Transportation. Drainage engineer for preliminary and final design for the widening of three miles of Baptist Road. Involved in QA/QC for the drainage analysis in the preparation of a CLOMR.

US 85 at Sedalia Intersection Improvements Design, Douglas County, CO, CDOT Region 1. Hydraulics engineer responsible for hydrologic and hydraulic analysis for roadway widening improvements. Analysis included cross culvert and storm drain systems design. Developed construction plans and structure cross sections for incorporation in overall construction plan set. Prepared hydraulics reports for submittal to CDOT.

South I-25 Frontage Road, Douglas County, CO; Douglas County. Hydraulics task manager responsible for overseeing hydrologic and hydraulic analysis including design of cross culverts, detention facilities and water quality facilities for relocation of the I-25 frontage road between Tomah Road and Douglas Lane.

Hydraulic Analysis & Design

Sand Creek Greenway Trail, Commerce County, CO, City of Commerce City. Developed the HEC-RAS hydraulic models for both existing and proposed site conditions and analyzed the effects of the proposed improvements to the floodplain. Improvements included installation of a trail system and low water crossing across Sand Creek. Evaluated HEC-RAS model and designed scour countermeasures for proposed pedestrian bridge. Coordinated design effort with the CDOT and the Urban Drainage and Flood Control District (UDFCD).

Hidden River Home Development (Tallman Gulch), Parker, CO, Pulte Home Corporation. Developed the HEC-2 hydraulic models for two different waterways (Tallman Gulch and Tallman Gulch Tributary) to analyze both existing and proposed conditions. Delineated the existing 100-year and 500-year floodplains. Prepared final floodplain mapping and profiles to be sent to FEMA for the Conditional Letter of Map Revision (CLOMR). Analyzed the design of two onsite detention ponds using UD-SWMM and optimized the configurations of the outlet structures. Developed the bank stabilization grading plan and appropriate cross section details. Provided construction services which included periodic field observation and submittal review.

Riverbend Planned Unit Development (PUD), Johnstown, CO; Lajco Johnstown, LLC. Prepared and authored preliminary/final drainage report for the Riverbend PUD in Johnstown, CO. Design included hydrologic modeling using TR-55, roadway stormwater capacity analysis, storm sewer hydraulic gradeline analysis and water quality pond sizing. Developed the HEC-RAS hydraulic models for the Little Thompson River for both existing and proposed site conditions and analyzed the effects of the proposed improvements to the floodplain. Delineated floodplain boundaries for both existing and proposed conditions. Performed statistical analysis of stream gage data using the USGS PeakFQ program to determine peak flows in the Little Thompson River. Managed development of HEC-1 model to determine stream flows.

Professional Development

Education

University of Colorado, Boulder
Bachelor of Science in Civil Engineering, May 1994.

Registrations

Registered Professional Engineer, Colorado #34318
Registered Professional Engineer, Wyoming #10631
Registered Professional Engineer, Montana #17265

Affiliations

Region VIII Board Director, Association of State Floodplain Managers (ASFPM)
Colorado Association of Stormwater and Floodplain Managers

Computer Proficiency

Hydrology:	CUHP, HEC-HMS, TR-55, HEC-1, XP-SWMM
Hydraulics:	HEC-RAS, HEC-2, EPA-SWMM, XP-SWMM, UDSWM, UD-Sewer, UD-Inlet, FlowMaster, CulvertMaster, HY-8, FishXing, StormCAD, FLO-2D
CADD/GIS:	AutoCAD, Microstation, LDD, Eagle Point, ArcGIS