



EDWARD (TED) DRURY, MS, EIT

Associate Engineer

BACKGROUND:

- 8 years of professional experience in hydrologic and hydraulic modeling
- Developed numerous integrated hydrologic and hydraulic stormwater models using XPSTORM and EPA SWMM modeling software
- Performed dynamic hydraulic modeling of storm drain systems with more than 1,000 storm drain lines per model
- Integrated GIS hydrologic and hydraulic data with stormwater modeling programs such as XPSTORM
- Analyzed and designed detention basins and biofiltration systems for both flood control and hydromodification compliance, using EPA SWMM and HEC-HMS
- Prepared hydromodification, stormwater quality, and drainage reports
- Collected field data in urban creeks and evaluated stream channel conditions for Erosion Susceptibility Reports
- Floodplain analysis using HEC-RAS in support of preparation of Conditional Letter of Map Revisions (CLOMRs)
- Graduate-level course work in watershed modeling and stormwater management including Low Impact Development

Engineer In Training
(EIT) #137402

MS, Water Resources
and Environmental
Engineering

BS, Environmental
Engineering

RELEVANT EXPERIENCE:

PROFESSIONAL DEVELOPMENT REVIEW SERVICES - VISTA, CA

Mr. Drury has provided review services for the City of Vista on a variety of projects concerning hydrology and hydraulics. He has reviewed drainage studies, Stormwater Quality Management Plans, Hydromodification Management Plans (HMP), and Erosion Susceptibility Studies. He has evaluated detention basin analyses and has verified continuous simulation SWMM models used to comply with hydromodification criteria. He is experienced in ensuring that stormwater BMPs are shown adequately on project plans and meet criteria established in the BMP Design Manual.

HYDROMODIFICATION MANAGEMENT PLANS - SAN DIEGO COUNTY, CA

Mr. Drury has created continuous simulation hydrologic models for numerous projects in San Diego County using the EPA SWMM software, including 100+ acre projects with multiple biofiltration basins and points of compliance. He has prepared Hydromodification Management Plans, including design of multipurpose biofiltration systems that satisfy water quality, flood control, and hydromodification standards.

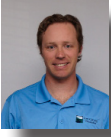
HYDROLOGIC AND HYDRAULIC MODELING, BUTTERFIELD TRAILS RANCH - VALLEY CENTER, CA

Mr. Drury prepared the hydrologic and onsite hydraulic models as part of the drainage report for Butterfield Trails Ranch, a 50+ acre residential development. Peak flows were determined using the Rational Method AES modeling software and the Water Surface Pressure Gradient (WSPG) software was employed for hydraulic design of storm drains. He also conducted a detention basin analysis to determine peak flow reductions from 3 onsite ponds using a HEC-HMS model.

WATERSHED AND STORM DRAIN SYSTEM MODELING, OCEANSIDE MASTER PLAN OF DRAINAGE – OCEANSIDE, CA

Mr. Drury built over 7 distinct hydrologic/hydraulic stormwater models in order to identify deficient stormwater facilities for the City of Oceanside Master Plan of Drainage. The models were developed using XPSTORM software which allowed integration of dynamic hydrologic and hydraulic elements into a single model for each watershed in the City. Mr. Drury facilitated the use of GIS databases in the stormwater models, and was responsible for analyzing large volumes of output data for each model, some of which contained over 1,000 storm drain lines. In addition, he used the models to perform a detention optimization analysis of existing and proposed detention basin facilities in Loma Alta Creek.





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RELEVANT EXPERIENCE (CONTINUED):

FLOODPLAIN ANALYSIS, CLOMR FOR BUTTERFIELD TRAILS RANCH - VALLEY CENTER, CA

Mr. Drury performed HEC-RAS analyses and created floodplain maps for Moosa Creek in support of the Conditional Letter of Map Revision (CLOMR) for Butterfield Trails Ranch. The HEC-RAS analysis involved a natural creek channel and flow through a box culvert. He gained experience in creating HEC-RAS models as well as floodplain mapping utilizing AutoCAD.

WATERSHED MODEL SENSITIVITY AND CALIBRATION ANALYSIS - VILLANOVA UNIVERSITY

Mr. Drury completed several hydrologic model sensitivity studies as part of his coursework at Villanova University. Using the NRCS Curve Number and Unit Hydrograph method in a HEC-HMS model of a real watershed, he varied key parameters and analyzed the response of the watershed model. Finally, he utilized USGS rainfall and stream gage data and the calibration tools of HEC-HMS to create a calibrated hydrologic model of the watershed.

STORMWATER PROTECTION PROGRAM, ENVIRONMENTAL PROGRAMS - CARLSBAD, CA

Mr. Drury served as a Stormwater Intern for the City of Carlsbad. He performed a total of more than 100 on-site stormwater compliance inspections of commercial businesses and recorded and analyzed data from the stormwater inspections. He explained stormwater codes to business managers and advised on BMP improvement as necessary. In addition, he collected standard water samples at stormwater outfalls to assist in water quality monitoring.

HMP AND STORMWATER CONSULTATION, RANCHO COSTERA – CARLSBAD, CA

Mr. Drury prepared a Hydromodification Management Plan (HMP) and provided design consultation support for the 100+ acre Rancho Costera project site. He performed continuous simulation hydrologic modeling using SWMM in order to size underground detention facilities. Through optimization of the outlet structures and SWMM models, he reduced the size of BMPs and eliminated two underground storage areas. He sized biofiltration units, coordinated their design with the HMP, and consulted with the project team to ensure that the updated designs were successfully transferred to the final design plans. Mr. Drury worked with the project team to create an integrated system of biofiltration units and underground detention that satisfied water quality and hydromodification criteria.

LOMA ALTA CREEK DETENTION OPTIMIZATION STUDY – OCEANSIDE, CA

As part of the Oceanside Master Plan of Drainage, Mr. Drury built an XPSTORM model for the Loma Alta Creek watershed and used the model to perform a detention optimization study. He used output from the model to analyze the performance of detention basins and the timing of hydrographs in the watershed. Mr. Drury evaluated multiple scenarios including retrofitting existing detention basins, and alternatives for the location, size, and outlet structure of proposed detention facilities.

PROFESSIONAL SWQMP REVIEW SERVICES – OCEANSIDE, CA

Mr. Drury has provided review services for the City of Oceanside regarding stormwater and hydrology. He has reviewed Stormwater Quality Management Plans, Hydromodification Management Plans, and drainage studies, ensuring consistency between each document. He has applied his experience from the Oceanside Master Plan of Drainage to augment the review process by providing reviews based on his detailed knowledge of the local storm drain system and watershed characteristics.

LA JOLLA VIEW RESERVOIR - SAN DIEGO, CA

TRWE prepared a drainage study and provided stormwater consulting services for the La Jolla View Reservoir project. The City of San Diego project proposes to construct an underground reservoir tank and access road, as well as regrading and landscape restoration next to La Jolla Natural Park on Mt. Soledad. The mix of steep, natural terrain and residential streets created complex drainage networks that required TRWE to perform a site visit to establish watershed boundaries and flow paths. TRWE produced hydrology maps and calculations for the existing and proposed conditions, and worked with the project team to determine the appropriate level of stormwater quality requirements for the project.

