

Luis Partida

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Objective

To apply advanced modeling techniques that I have developed to improve current hydrologic and hydraulic modeling systems contributing to safety and the predictability of storm events.

Experience

Graduate Engineer- WALTER P. MOORE

February 2014-July 2014

Using developed communication and engineering design skills, was put in charge of managing three current developments. Each project consisted of weekly design team meetings, strategic planning, cost analysis, proposal write-ups, site investigation and impact studies involving design updates; see outlined scopes of each below.

DOW Facilities Lake Jackson Phase One, Lake Jackson, Texas- The proposed development will include a 240,000 sf, 4 story office building and surface parking lot providing 1080 parking spaces.

DOW Facilities Lake Jackson Phase Two, Lake Jackson, Texas- The proposed development will include a 629,000 sf of office and laboratory space in 3 buildings, a 25,000 sf central plant and a 40,000 sf hazardous occupancy warehouse with surface parking lots to support these facilities.

Block 98 Houston, Texas- The proposed development will include a 38 story apartment building with vehicular access on Crawford Street and Rusk Avenue. The building will contain a combination lobby/parking floor at ground level, 11 additional above-grade parking levels and 24 residential floors.

Water Resources Engineer- OMEGA Engineers Inc.

July 2014-August 2018

Responsibilities include deputy manager for multiple projects, technical analysis lead for hydraulic and hydrologic calculations. Was also responsible for writing and presenting project findings in the form of reports and or in person presentations to multiple agencies; various projects listed below:

Border Highway West El Paso, Texas

The proposed highway extension contained multiple bridge and culvert layouts stretching across the Rio Grande River. I was in charge of modeling the bridges and culvert systems to minimize impacts to the existing watershed.

EPWU Impact Analysis El Paso, Texas

Storm sewer networks responsible for collecting runoff from Elevated bridge crossings were out-falling to an EPWU designated outfall for which a "No Impact" analysis was required. The existing and proposed watersheds were delineated from which flows were developed and then modeled in Autodesk Storm and Sanitary.

Black Creek Cooling Pond Jackson, Mississippi

The current cooling facility stores 9400 acre-feet of water. The Reservoir spillway is 150 ft long with two independently operated bascule gates. I was in charge of performing a **PMF Dam breach/Sunny day Breach analysis** and inundation mapping for the entire watershed. This included a hydrologic study utilizing routing and calibration within the hydrologic software HEC-HMS and the Hydraulic software HEC-RAS

Doniphan Drive Corridor Study El Paso, Texas

This project included 11 miles of roadway serving as the final crossing before out-falling to the Rio Grande. The project included 55 sq.-miles of offsite watershed. A hydrologic analysis was completed and calibrated for known flooding locations. I created an offsite 2-Dimensional precipitation model consisting of a computational mesh of approximately 1-million cells. The hydraulic model verified existing dams within the watershed for the hydraulic capacity and causes for flooding along local roadways.

The corridor analysis also included the evaluation of a future proposed IBWC levee that would act as a barrier for overflow from the Rio Grande. Was in charge of modeling the proposed levee for impacts in multiple scenarios involving the manually operated gates. The model was a fully 2-Dimensional hydraulic model within HEC-RAS that incorporated the Rio Grande as well as the entire 55-sq mile offsite watershed. The project included multiple presentations to the IBWC, TxDOT and the public for which I created all presentations and led all meetings. A final report was submitted post analysis for which I wrote and compiled all data and exhibits.

RM 652 Corridor Analysis El Paso, Texas

This project consisted of 33 miles of roadway for which approximately 100 culverts and bridges were analyzed for their existing hydraulic capacity. The geotechnical makeup of the underlying terrain was unique containing multiple karst features causing failure in roadways and structures. Challenges included modeling a network of all structures in a 2-dimensional atmosphere for which over 30 hydraulic models were interconnected to increase efficiency. In 2 (two) specific areas the development of flows involved over 120 sq-miles of offsite watershed for which a peak flow was developed. In order to calibrate the offsite flows with current conditions verified in the field, a precipitation model was created routing the flow through various networks of alluvial channels allowing the true peak flow contributing to the final structure to be developed.

Guadalupe Bridge Hydrologic and Hydraulic Analysis El Paso, Texas

A bridge located 40 miles downstream of the Guadalupe Mountains was analyzed for the development of establishing existing conditions. The current bridge's upstream channel had large deposits of offsite sediment and erosion at the bridge abutments. A 2-dimensional hydraulic model was created in order to evaluate natural flow paths that were created over time to evaluate the origin of high velocity flows impacting the existing bridge.

Senior Water Resources Engineer- AIA Engineers Inc./CONSOR

August 2019-

October 2020

Responsibilities include managing multiple projects and serving as the technical analysis lead for hydraulic and hydrologic calculations. Was also responsible for writing and presenting multiple drainage reports for submittal.

FM 2100 Drainage Analysis Houston, Texas

FM 2100 is a roadway located within the Luce Bayou Watershed. The proposed roadway was to be widened requiring cut within the 500-yr floodplain. I analyzed the existing and proposed drainage network utilizing XPSWMM. The existing ditch network was to be changed to a closed conduit storm sewer network with 7 detention ponds requiring a no-impact result. The proposed network contain over a hundred nodes and links. Once completed, I wrote the drainage report and created exhibits for the final submittal that was submitted to TxDOT.

Aberdeen Green Drainage Analysis Houston, Texas

Aberdeen Green is a subdivision located in north Houston that sustained damages during Hurricane Harvey. Utilizing a 1D/2D XPSWMM hydraulic model and Atlas-14 rainfall data, I modeled existing conditions in order to determine the cause of flooding. The dynamic model allowed myself to determine the source of flooding, the time at which it occurred and to calibrate the model to a real time event. Proposed alternatives were modeled and presented to HCED. After the proposed solution was agreed upon based on its feasibility, the final product was presented to the Public including a power point presentation followed by an open forum question and answer session.

Meadow Hill Drainage Analysis Houston, Texas

Meadow Hill is a subdivision located in north Houston that sustained damages during Hurricane Harvey. Nearly 100 properties sustained damage. Utilizing a 1D/2D XPSWMM hydraulic model and Atlas-14 rainfall data, I modeled existing conditions in order to determine the cause of flooding. The dynamic model allowed myself to determine the source of flooding, the time at which it occurred and to calibrate the model to a real time event. Proposed alternatives were modeled and presented to HCED. After the proposed solution was agreed upon based on its feasibility, the final product was presented to the Public including a power point presentation followed by an open forum question and answer session.

Parkway Mobile Homes Drainage Analysis Houston, Texas

Parkway Mobile Homes is a subdivision located in north Houston that sustained damages during Hurricane Harvey. Over 300 properties sustained damage. This project was unique in that it was adjacent to the Greens Bayou. The proposed solution to flooding was to utilize Atlas-14 rainfall data with the assumption that if the Greens Bayou was not allowing runoff to outfall. Utilizing a 1D/2D XPSWMM hydraulic model, I modeled existing conditions in order to determine the cause of flooding. The dynamic model allowed myself to determine the source of flooding, the time at which it occurred and to calibrate the model to a real time event. Proposed alternatives

were modeled and presented to HCED. After the proposed solution was agreed upon based on its feasibility, the final product was presented to the Public including a power point presentation followed by an open forum question and answer session

FM 434 Primrose Creek Bridge Replacement San Antonio, Texas

Primrose Creek is a tributary of the Brazos River. The proposed bridge replacement occurred in a FEMA Zone AE floodplain. I created a 1D unsteady state model within HEC-RAS in order to achieve a no-rise final analysis. This analysis was unique in the the full hydrologic flow calculated was not entering the bridge opening and was escaping via the adjacent terrain. To model this a lateral weir was utilized in order to determine the quantity of runoff escaping the main channel. The final submittal included a drainage report consisting of hydrology, hydraulics, scour and erosion control results.

Senior Water Resources Engineer- RPS

October 2020-Present

I am currently serving as the Technical Hydraulics lead for all North America RPS branches. Any project relating to hydraulic modeling was either completed or reviewed by myself.

Galveston County Master Drainage Plan Galveston, Texas

An update to the Galveston County Master Drainage Plan was scoped which included the development of a 1D/2D HEC-RAS model that follows the HCFCD MAAPnext modeling guidelines. I served as the technical lead for the entire project and built the entire hydrologic and hydraulic model.

Chambers County Model Reviews

As the counties reviewing engineering agency, I served as the technical reviewer of all models related to H&H. This included advanced 1D/2D open channel models, 1D unsteady state closed conduit models and or a combined form of modeling open channel, detention and closed conduit systems for any development that was being proposed within the county.

Bunker Hill Village (BHV) Master Drainage Plan

RPS serves as the BHV engineering agency for which I served as the technical lead on the development of an updated Atlas-14 1D/2D PCSWMM model. This required utilizing a team of engineers to efficiently develop an updated model with 100's of elements within the model.

Author of RPS Hydraulic and Hydrologic Training Modules

In order to keep my team up to date on the latest modeling techniques and guidelines, I developed 6 training modules for which I taught multiple engineers some of the H&H knowledge that I have. This included the following Modules:

- 1D vs. 2D Expectations: This course' purpose was to train project managers and technical engineers the what, when and where of 1D and 2D modeling.
- HEC-HMS: This was a base introduction to showing the engineers how to construct a base model for use in Hydraulic Modeling with DSS functionality.
- HEC-HMS Optimization Manager: This course' purpose was to teach the engineers how to utilize the widely unknown Optimization trial manager to quickly obtain calibrated results.
- HEC-RAS Steady State Modeling: This course taught the basics of steady state modeling including the technical background as well as a complete model build.
- HEC-RAS Unsteady State Modeling: This course was much more in depth and was a 2-part course on the details of unsteady state modeling. This course tied in the DSS lessons from the previous HEC-HMS Module.
- HEC-RAS 2D Modeling: This course showed the engineer how to construct rain-on-mesh models as well as full 2D models. The course was broken up into 2 Modules to then tie in a 1D/2D model build by utilizing the previous modules geometry. This is the most complex form of modeling and was a hands on instructional course.

- Technical Writing: At the end of each project the product is always a summary of written events. This course detailed the specifics of grammar and what to and what not to include in a report write-up.

Modeling Techniques/Developments & Accomplishments

ASCE Guest Speaker on 2-Dimensional Hydraulic Modeling of Junctions Biloxi, Mississippi

I was invited to speak at the ASCE Conference regarding my findings in 2-Dimensional Hydraulics and its associations with junctions. This presentation was developed by comparing traditional 1-Dimensional Steady State and Unsteady State modeling within the Hydraulic Software HEC-RAS.

Creator of a HEC-RAS 2-Dimensional Unsteady State Workshop

From my experience and vast amount of time analyzing different variables within HEC-RAS, it occurred to me that multiple techniques on modeling have not yet been written or discussed. If methodologies had been previously developed, there were large inconsistencies in the overall understanding of the hydraulic modeling software and processes. I am the sole author of a 2 (two) day workshop which includes a written manual which also incorporates a hands on workshop for students/professionals.

I have successfully been hired to teach this workshop multiple times outside of my current company. The workshop has received praise and is a continual learning experience for what current industry standards and engineers have misunderstood from available documentation.

TxDOT El Paso Hydrologic and Hydraulic Methodologies

I was asked to give a presentation to the TxDOT El Paso District's Head of H&H on the development of offsite peak flows and how they directly correlate to future modeling. The current Hydrologic Methods as defined by TxDOT have been underestimating peak flows. El Paso consists of unique terrains containing high sloping watersheds with short duration high intensity storms. I developed a presentation that presented my findings and recommendations for which TxDOT El Paso will implement in future studies.

Contract, Proposal and Interview Preparation

Over the last 5 years my advanced knowledge in hydrologic methodologies and hydraulics has led to the contribution in answering topic questions. Many of which we were either shortlisted or won a contract. Interview preparation is something that I have also contributed to not in only the answering of questions but preparing the presenter of H&H to be fully versed during the presentation.

Education

University of Arizona-College of Civil Engineering and Engineering Mechanics

January 2011- 2013

Bachelors Of Science in Civil Engineering (December 2013) – Major GPA 3.38

Mohave Community College

January 2008-December 2010

Associates Degree in Liberal Arts- GPA 3.6

Professional Memberships, Honors, Awards & Certifications

E.I.T. registered in California July 11th, 2013 CERTIFICATE NO. 150200

E.I.T. registered in Texas October 25th, 2017 CERTIFICATE NO. 60709

American Society of Civil Engineers- Student Chapter, Member # 9145115

Awardee of the Arizona Builders Alliance Scholarship 2012

Certificate for Electrical Craftsmanship Helper; LA Trade Tech 2008

Skills

Proficient in:

- AutoCAD Civil 3D
- HEC-RAS Steady State, Unsteady State and 2-Dimensional Modeling, ROM Modeling (ADVANCED KNOWLEDGE)
- XPSWMM 1 and 2D Unsteady State Modeling
- PCSWMM 1D Unsteady State Modeling
- HEC-HMS and optimization functions
- HEC-MetVue transformations of gridded data
- ArcMap (GIS)
- GeoRAS (Though the process is now outdated)