

September 3, 2021

Mr. Al Raymond, AIA, CBO
Director Development Services
City of Corpus Christi
PO Box 9277
Corpus Christi, TX 78469-9277

Re: City of Corpus Christi – Master Planning and Impact Fee Study – RFQ 3083
Additional Services Request No. 1

Dear Mr. Raymond:

On March 4, 2021 the City of Corpus Christi executed an agreement with Pape-Dawson Engineers, Inc. to prepare master plans for water, wastewater, stormwater, and thoroughfare infrastructure with the purpose of developing capital improvement projects (CIP) and conducting an Impact Fee Study for the respective infrastructure. As part of this overarching effort, the Stormwater Master Plan task (City Task 2) was scoped to build upon and update the City's existing stormwater master plan and associated hydrologic and hydraulic models for riverine and storm drainage systems.

Over the past 6 months, our exhaustive data collection efforts involving several of the City staff has either produced limited data and/or data that uses outdated modeling techniques that are not easily amenable to upgrades or reuse. Furthermore, for the significant portions of the City where there were no data or models provided, Pape-Dawson would need to create new models from scratch using current techniques.

Neither of these major developments were anticipated in our original scope of work and are a substantial undertaking for Pape-Dawson given the size of the City. In pursuit of the overall purpose and goal of the March 2021 contract, a brief summary of the major distinctions between the original scope and additional services requested is provided below:

1. This ASR is a grass roots approach to building a new hydrologic and hydraulic model for the blue, green, and brown areas to the south of Corpus Christi bay in Attachment 1 of the ASR – originally it was assumed that these detailed hydrologic and hydraulic models would be available to us.
2. The ASR is adding approximately 70 square miles of new InfoWorks ICM 1D/2D modeling (green areas in Attachment 1) in the urbanized areas of the City instead of the hot spots only approach in the original scope.
3. Approximately 7 square miles of new HEC-RAS 2D rain-on-grid modeling (brown areas in Attachment 1) will be performed for the developed Flour Bluff coastal area of the City.
4. In our data collection efforts, we received a fairly detailed XPSWMM 1D/2D model of the Central Business District that was recently completed; however, it will need an update to Atlas 14 rainfall that was not originally anticipated.

5. Developing a comprehensive Drainage Criteria Manual instead of the Atlas 14-only language update of the current manual in the current scope of work.

Pape-Dawson is requesting the attached additional services request of **\$1,192,000** to accomplish these additional tasks in development of the comprehensive Stormwater CIP Plan and Impact Fee Study. We believe this request is reasonable and comparable to other similar past efforts performed by various other municipal organizations in the coastal area of Texas of similar size, topographical features, urbanization, and rainfall patterns.

If you have questions or need additional information, please do not hesitate to contact me at your earliest convenience.

Sincerely,
Pape-Dawson Engineers, Inc.

Kim S. Keefer, P.E.
Managing Vice President Water/Wastewater Infrastructure



Cara C. Tackett, P.E.
Sr. Vice President

Attachments

- Additional Services Request No. 1
- Scope Attachment 1

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July 30, 2021
(Revised September 3, 2021)

Ms. Jennifer Rodriguez
Contracts/Funds Administrator
City of Corpus Christi
PO Box 9277
Corpus Christi, TX 78469-9277

Re: City of Corpus Christi - Master Planning and Impact Fee Study - RFQ 3083
Job No. 12383-00
Additional Services Request No. 1

Dear Ms. Rodriguez:

The City of Corpus Christi (the City) entered into an agreement with Pape-Dawson Engineers, Inc. (CONSULTANT) on March 4, 2021 for the completion of several citywide master plans, including one for stormwater. Completion of the stormwater master plan was predicated on the availability of certain data including existing conditions riverine and storm drainage hydraulic models. Much of the data could not be located or was not available as assumed. A few of the studies used outdated methods for determining discharges and flooding extents and the effort to use them for this study would be greater than creating a new model using current methods.

Execution of the following scope is intended to result in an updated assessment of the City's drainage infrastructure. Updated modeling is to be used to identify areas of flooding and capital projects which intend to mitigate flooding upon their construction. Projects identified are to be summarized, evaluated, and ranked in order of the City's priorities based on criteria developed by the City and stakeholders. A Capital Improvements Plan (CIP) will be developed for the next 10 years of the projects, estimates, and rankings.

By submitting ASR#1 Pape-Dawson is requesting that Task 291 of the original contract be deleted and the remaining unbilled budget be applied to Tasks 901-904. The work detailed below was performed within the scope of work and ultimately led us to the recommendation for the proposed rescoping. The portions of the current scope which have been completed under this agreement are as-follows:

Scope Section V., Part A. "Data Collection"

- Prepared for and conduct a kick-off meeting.
- Obtained and cataloged the latest watershed data, to wit—this was demonstrably longer and more data than was than budgeted.
- Prepared for and attended additional meetings and phone calls in pursuit of existing modeling data.
- Requested plans of record, to wit—none were provided.
- Reviewed existing and future land-use data.

- Obtained GIS data.
- Conducted a 1-day field visit.

Scope Section V., Part C. “Update to Existing Modeling”

- Developed a hydrologic modeling memo to document the modeling methodology to be used in performance of the study.
- Reviewed existing models to see if they were complete and usable.

Scope Section V., Part D. “Stormwater Master Plan”

- Met with City staff to discuss intended revisions, one of which was to consolidate the DCM and DDM into one adoptable document.
- Completed review and began making recommendation for “potential drainage criteria revisions.”

Scope Section V., Part E. “Drainage Capital Improvement Plan”

- Worked with City staff to identify any current CIP projects.
- Created a fillable form to be used by City staff to populate the data on CIP projects which may be programmed, though of, expected, but not documented.

Shown in the attachment are the study limits and modeling types that are referenced throughout the following scope of work:

- | | | |
|-----------|--|------------------|
| I. | HYDROLOGY FOR ONE-DIMENSIONAL (1D) MODELING (TASK 901) | \$140,100 |
| | <ul style="list-style-type: none">• CONSULTANT to obtain, mosaic, re-sample at a 10-meter resolution, and re-project the 2018 Texas Water Development Board (TWDB) Strategic Mapping (StratMap) Light Detection and Ranging (LiDAR) hydro-flattened Digital Elevation Models (DEM).• CONSULTANT to utilize the Hydrologic Digital Elevation Model (HDEM) to automate delineation of watersheds. Watersheds are to be manually subdivided where necessary to coincide with hydraulic modeling.• CONSULTANT to obtain and merge soil surveys for Nueces, Jim Wells, San Patricio, Live Oak, and Kleberg counties. The soil texture classes to be extracted and utilized for the application of Green-Ampt soil losses.• CONSULTANT to obtain the 2016 National Land Cover Dataset (NLCD) as the basis of existing impervious cover. The impervious cover raster is to be visually screened and updated. The updates include areas of development which are beyond the extent of the original NLCD imaging. Polygons of areas of development and approximate impervious covers to be used based on comparison with other areas of similar development captured within the NLCD.• CONSULTANT to approximate Clark unit hydrograph parameters using the time of concentration and storage coefficients.• CONSULTANT to develop hydrologic routing using a combination of Modified-Puls and Muskingum eight-point cross sections. Modified-Puls to be used where one-dimensional (1D) HEC-RAS models are available. Muskingum eight-point cross | |

- sections are to be used for other open channel reaches. Results from the two-dimensional (2D) hydraulic modeling to be used to create source hydrographs for the hydrologic modeling. It is assumed that HEC-HMS v4.8 is to be used to prepare the hydrology for the 1D hydraulic modeling areas shown in the attachment.
- CONSULTANT to apply rainfall using the National Oceanographic and Atmospheric Administration (NOAA) Rainfall Atlas Number 14, Volume 11—Texas point precipitation data for the Corpus Christi station.
 - CONSULTANT to simulate runoff using HEC-HMS for four events: 10%- (10-year), 2%- (50-year), 1%- (100-year), 0.2%-annual chance (500-year).
 - CONSULTANT to utilize the United States Geological Survey (USGS) gauge at Oso Creek and CR 763 to perform a flood frequency analysis (FFA) for the Oso Creek only. The FFA is to be performed using USGS' PeakFQ and the requirements of Bulletin 17B. Results of the FFA to be used to analyze the statistical discharges for the modeled storm events. Time-of-concentration and storage coefficients to be adjusted to produce discharges within the confidence limits. CONSULTANT has not assumed modeling of historical events for calibration of model parameters.
 - CONSULTANT to summarize the results of the FFA in a technical memorandum to be incorporated by reference into the overall drainage master plan report. A draft pdf version of the technical memorandum is to be provided to the City for review. Following a formal review consisting of one (1) set of written comments by the City and its various departments under one cover, a revised technical memo in pdf format is to be prepared to incorporate as a reference in to the overall drainage master plan. It is assumed that only one (1) round of review comments are to be addressed as part of finalizing the technical memo.

II. HYDRAULICS (TASK 902)

\$1,224,500

As shown in the attachment, there are several different hydraulic modeling techniques required to address the differing types of flooding throughout the extent of the city's stormwater master plan area. InfoWorks ICM will be used for the urbanized areas of the study area, XPSWMM for the downtown area building upon recent modeling performed by others, 1D steady state HEC-RAS modeling for the riverine portions of the Oso Creek watershed, and 2D rain-on-grid HEC-RAS modeling for the Flour Bluff coastal area of the city.

The following tasks are to be performed as part of the overall Hydraulics effort:

InfoWorks ICM

- CONSULTANT assumes that InfoWorks ICM is to be used to study approximately 70 square miles of the most urbanized areas of the overall study area. The approximate area is shown in attachment.
- CONSULTANT to obtain the City shapefiles for storm drainage pipes, junctions, and inlets.
- CONSULTANT to create shapefiles which are capable of being imported into InfoWorks ICM. This model is to use a structure naming convention, 'from' and 'to'

node identification, inverts, conduit size and shape, and rim elevations where available. Where invert and rim elevations are not available an assumed cover of 4-feet above the top of pipe is to be used. Where pipe size and inverts are not available, the pipe segment and manholes may be omitted.

- CONSULTANT to generate a 2D mesh area using a minimum triangle area of 50 square feet and a maximum area of 80 square feet. Breaklines are to be added for open ditch centerlines using the city's asset management shapefiles.
- CONSULTANT to create a 2D land-use shapefile using a combination of public consumption building data, zoning classifications, and parcel boundaries. Roughness is to be specified as depth-varying due to the range of depths expected in the 2D domain. Infiltration is not to be simulated within the 2D domain.
- CONSULTANT to use the drainage areas and hydrologic parameters generated in Task 1 to import catchments into the InfoWorks ICM model.
- CONSULTANT to utilize the 1D cross section to create a boundary condition along the Oso Creek perimeter of the InfoWorks ICM model limits. A rating curve is to be applied one cross section downstream of the study limits.
- CONSULTANT to generate inlet rating curves for City of Corpus Christi inlets. Desktop observation using GIS data is to be used to identify the type of inlet and number of inlets. The rating curve is to be applied at the nearest junction and the rating curve scaled to represent the cumulative inlet capacity. This study is not an inlet-level analysis and prioritizes the assessment of the storm drain main capacities.
- CONSULTANT to utilize EagleView to approximate bridge and culvert crossings which may not be included in the City asset management databases. The data obtained from this review is to include the inlet/outlet configuration, approximate size and number of barrels, structure depth, rail heights, and length of crossing. CONSULTANT has assumed that 790 crossings are to be created using the approximate methods.
- CONSULTANT to place boundary conditions at the external limits of the models. Boundary conditions representing the Corpus Christi and Oso Bays is to be placed at the Highest High Water (HHW) as recorded by the NOAA tidal gauges recorded at the USS Lexington and Corpus Christi stations. No storm surge or coastal flooding are to be assumed in the hydraulic modeling.
- CONSULTANT to subdivide the model as needed for operational efficiency. The models are to be run for existing conditions and debugged for model stability. Adjustments are to be made to achieve a cumulative mass balance error less than 10%.
- CONSULTANT to create a 10-year ultimate development (UD) model using the existing conditions as the basis. The 10-year UD model is to be updated with impervious cover increases from the 10-year land-use assumptions. 2D land-uses are to be updated commensurately to incorporate the land-use changes. The 2D land-use for residential land-uses which have not yet developed are to be composited to increase the roughness which comes from the presence of buildings.

- CONSULTANT has assumed thirty (30) CIP projects within the InfoWorks ICM modeling area with one (1) proposed model run for each project of the projects for one (1) design storm event;
- CONSULTANT to utilize the maximum water depth results from the 10-year UD model to identify areas where structure flooding is occurring. These areas are to be clustered into “damage areas.” CONSULTANT to create a single model run for a proposed solution to address the structure flooding in the identified damage areas. 30 damage areas have been assumed for the purposes of estimating the level of effort. Optimization, utility conflict identification, or value engineering of the proposed solutions is not included.
- CONSULTANT to utilize depth grid comparisons between existing conditions and the 10-year UD 100-year results to identify areas which are impacted by proposed development or redevelopment. Areas where increased flooding from development/redevelopment is identified a structure depth-damage assessment of existing conditions and 10-year UD conditions are to be used to proportion the amount of cost of the projects which may be eligible for impact fee.
- CONSULTANT to create maps of existing conditions 100-year and proposed 10-year UD conditions 100-year floodplains for the identified damage centers. The proposed improvements are to be noted schematically to allow for approximating lengths and sizes of improvements.
- CONSULTANT to summarize the methodology and results of the study in a memorandum which is to be incorporated into the revised report. A draft pdf version of the technical memorandum is to be provided to the City for review. Following a formal review consisting of one (1) set of written comments by the City and its various departments under one cover, a revised technical memo in pdf format are to be prepared to incorporate as a reference in to the overall drainage master plan. It is assumed that only one (1) round of review comments are to be addressed as part of finalizing the technical memo.

HEC-RAS 1D Modeling

- CONSULTANT assumes that HEC-RAS 1D unsteady state modeling is to be used for the study of approximately 107 stream miles.
- CONSULTANT to utilize the Effective 1D steady-state HEC-RAS models for the Oso Creek as the basis for review and update of cross section configuration, reach lengths, and manning’s n-values. CONSULTANT to import the Major Ditches models completed for City project E12191 as the ‘best available.’ Adjustments to reach connectivity are to be made to accommodate the imported model.
- CONSULTANT to re-cut the cross sections using the 2018 StratMap LiDAR.
- CONSULTANT to create manning’s n-value shapefiles using the NLCD 2016 as the basis. The manning’s n-value shapefile is to be used to update existing models as well as determine values for newly created models.
- CONSULTANT to create or update the flow file with the discharges calculated in the hydrology task.

- CONSULTANT to utilize stream centerlines generated in the Task 1 to delineate cross sections for the unstudied stream segments within the study area. CONSULTANT has assumed that there are approximately 35 stream miles of unstudied stream.
- CONSULTANT to utilize normal depth for all stream segments which do not daylight to the Corpus Christi or Oso Bays. CONSULTANT to utilize the HHW elevation at the nearest NOAA tidal gauge for the starting water surface for streams which outfall into the Corpus Christi or Oso Bays.
- CONSULTANT to utilize EagleView to approximate bridge and culvert crossings which may not be included in the City asset management databases. The data obtained from this review is to include the inlet/outlet configuration, approximate size and number of barrels, structure depth, rail heights, and length of crossing. CONSULTANT to not update the existing bridges and culverts or review them for accuracy. CONSULTANT has assumed that 790 crossings are to be created using the approximate methods.
- CONSULTANT is to complete preliminary model runs and adjust the cross-section lengths as needed to contain the maximum water surface of the profiles analyzed.
- CONSULTANT to generate 100-year water surface mapping for existing conditions and UD conditions.
- CONSULTANT to utilize the water surface results to identify areas where structure flooding is occurring. These areas are to be clustered into “damage areas.” CONSULTANT to create a single model run for a proposed solution to address the structure flooding in the identified damage areas. Five (5) damage areas have been assumed for the purposes of estimating the level of effort. Optimization, utility conflict identification, or value engineering of the proposed solutions is not included.
 - CONSULTANT has assumed five (5) CIP projects within the HEC-RAS 1D modeling area with one (1) proposed model run for each project of the projects for one (1) design storm event;
- CONSULTANT to create maps of existing conditions 100-year and proposed 10-year UD conditions 100-year floodplains for the identified damage centers. The proposed improvements are to be noted schematically to allow for approximating lengths and sizes of improvements.
- CONSULTANT to summarize the methodology and results of the study in a memorandum which is to be incorporated into the revised report. A draft pdf version of the technical memorandum is to be provided to the City for review. Following a formal review consisting of one (1) set of written comments by the City and its various departments under one cover, a revised technical memo in pdf format is to be prepared to incorporate as a reference in to the overall drainage master plan. It is assumed that only one (1) round of review comments is to be addressed as part of finalizing the technical memo.

HEC-RAS 2D Rain-on-Grid (ROG) Modeling

- CONSULTANT to create a 2D grid using a 100-foot grid cell size. Breaklines are to be added for identifiable low points using the stream lines developed in the hydrology task.
- CONSULTANT to create a 2D land-use using the 2016 NLCD as the basis and augmented with land-use assumptions for the urbanized areas within the study limits.
- CONSULTANT to use the hydrology above to approximate the excess rainfall for the study area. The excess rainfall is to be applied to the study area as a rain-on-grid.
- CONSULTANT to utilize a constant elevation boundary condition at the limit of the Laguna Madre, the elevation chosen is to be a HHW elevation which is to be determined in consultation with the City based upon review of NOAA data and high-water marks obtained through anecdotal or actual evidence. Boundaries with landward streams are to be set to normal depth.
- CONSULTANT to run the existing conditions and debug the model for stability. Adjustments are to be made to achieve a cumulative mass balance error less than 10%.
- CONSULTANT to create a 10-year ultimate development (UD) model using the existing conditions as the basis. The 10-year UD model is to be updated with impervious cover increases from the 10-year land-use assumptions. 2D land-uses are to be updated commensurately to incorporate the land-use changes. The 2D land-use for residential land-uses which have not yet developed are to be composited to increase the roughness which comes from the presence of the buildings.
- CONSULTANT to utilize the maximum water depth results from the 10-year UD model to identify areas where structure flooding is occurring. These areas are to be clustered into “damage areas.” CONSULTANT to create a single model run for a proposed solution to address the structure flooding in the identified damage areas. Two (2) damage areas have been assumed for the purposes of estimating the level of effort. Optimization, utility conflict identification, or value engineering of the proposed solutions is not included.
 - CONSULTANT has assumed two (2) CIP projects within the HEC-RAS 2D modeling area with one (1) proposed model run for each project of the projects for one (1) design storm event;
- CONSULTANT to create floodplain maps of existing conditions 100-year and proposed 10-year UD conditions 100-year for the identified damage centers. The proposed improvements are to be noted schematically to allow for approximating lengths and sizes of improvements.
- CONSULTANT to summarize the methodology and results of the study in a memorandum which is to be incorporated into the revised report. A draft pdf version of the technical memorandum is to be provided to the City for review. Following a formal review consisting of one (1) set of written comments by the City and its various departments under one cover, a revised technical memo in pdf format is to be prepared to incorporate as a reference in to the overall drainage

master plan. It is assumed that only one (1) round of review comments is to be addressed as part of finalizing the technical memo.

XPSWMM 1D/2D Modeling

- CONSULTANT to utilize the XPSWMM 2019 existing conditions models created by AECOM as the basis for the modeling of the central business district. CONSULTANT assumes that the models include all necessary support files and are accurate having been accepted previously by the City and will not review the completeness or accuracy of the models. If modeling issues which cause erroneous results or are impactful to this study's results are found, the CONSULTANT will notify the City of such occurrences and recommendations for further modification of the models which is not included in this scope of services.
- CONSULTANT to update the applied hydrology using Atlas 14 rainfall depths.
- CONSULTANT to run the existing conditions model for four events 10-, 50-, 100-, and 500-year and debug the models for stability. Adjustments are to be made to achieve a cumulative mass balance error less than 10%.
- CONSULTANT to create a 10-year UD model run using the existing conditions model as the basis for four events 10-, 50-, 100-, and 500-year and debug the models for stability. Adjustments are to be made to achieve a cumulative mass balance error less than 10%.
- CONSULTANT to create a difference grid using the existing conditions and UD models for the storm events modeled. The difference grids are to be used to identify areas where there are increases in flooding due to redevelopment.
- CONSULTANT to import improvements from the proposed conditions AECOM models which are to improve the increased flooding identified by the difference grids. The portions of the proposed conditions model imported will be used to create maps of the proposed improvements. Those imported improvements are to be noted schematically to allow for approximating lengths and sizes of improvements.
 - CONSULTANT has assumed one (1) CIP projects within the XPSWMM 1D/2D modeling area with one (1) proposed model run for each project of the projects for one (1) design storm event;
- CONSULTANT to summarize the methodology and results of the study in a memorandum which is to be incorporated into the revised report. A draft pdf version of the technical memorandum is to be provided to the City for review. Following a formal review consisting of one (1) set of written comments by the City and its various departments under one cover, a revised technical memo in pdf format is to be prepared to incorporate as a reference in to the overall drainage master plan. It is assumed that only one (1) round of review comments are to be addressed as part of finalizing the technical memo.

Mapping

- CONSULTANT to prepare draft workmaps at 1" = 1,000' on 36"x48" borders. The depth grids from the 100-year model results from the different model types are to

be used to create a water surface delineation which is to be merged to create one composite floodplain. The maps are to include streets, flooding sources, ditch names, existing storm drain mains, proposed CIP project limits, building outlines, and parcel boundaries.

- CONSULTANT to address City comments on the draft workmaps and submit copies with the revised report.

Reporting

- CONSULTANT assumes that modeling is an on-going task with informal reporting of progress and results. The reporting of those results is to be done through technical memorandums which are to be summarized into one cohesive formal report. Development of Capital Improvements Plan (CIP) is to be documented in the report along with the development of the scoring criteria and project scoring and rankings.

III. CAPITAL IMPROVEMENT PROJECT PLANNING (TASK 903) \$92,300

Cost Estimating

- CONSULTANT to prepare an opinion of probable construction (OPCC) cost which complies with Class 5 of the American Association of Cost Estimating (AACE) publication. OPCCs are to be prepared using TxDOT moving average bid prices for the quarter in which the estimates are completed. An OPCC is to be generated for each of the 37 damage centers assumed in the hydraulics tasks.
- CONSULTANT to maintain cost estimating back-up to include as an appendix to the project report.

Prioritization

- CONSULTANT to prepare a project sheet for the CIP projects identified. The project sheets are to include a brief project description, justification for the project, an image showing the location and expected limits, construction and other project costs, and potential sources of funding. These project sheets are to be completed in conjunction with City staff with input from CONSULTANT.
- CONSULTANT to hold one (1) in-person workshop with staff and community members. Those having input at the workshop are to be selected by the City in advance of the meeting. Prior to the workshop CONSULTANT to prepare a draft scoring matrix based on input from the City. The goal of the workshop is to gain consensus on the criteria used, weighting assigned, and the scoring criteria.
- CONSULTANT to separately score each project from the City and community members. A composite score will be developed based on input from City staff. The scoring will be summarized and provided to City staff for review.
- CONSULTANT to hold one (1) in-person workshop to review the project scoring and make adjustments prior to finalizing for inclusion into the report.
- CONSULTANT to update the project sheets to include the project ranking for inclusion in the project report.

IV. DEVELOPMENT OF DESIGN CRITERIA MANUAL (TASK 904) \$153,300

- CONSULTANT to review the draft of the Drainage Design Manual (DDM) and the Drainage Criteria Manual (DCM) and consolidate the two documents into one cohesive document, the DCM;
- CONSULTANT to prepare a table of contents (TOC) indicating sections removed from either document and sections newly inserted to the DCM and submit to City for review. The table of contents is to serve as the outline by which the rest of the document is to be completed;
- CONSULTANT to post the chapters of the document on a SharePoint site for collaboration on content with the City of Corpus Christi. CONSULTANT to make recommendations on the structure of the document and the content:
 - CONSULTANT assumes that effort is limited to text and no details or sketches are to be modified;
 - CONSULTANT assumes re-writing of sections is not be required and that the level of effort is commensurate with editing;
 - CONSULTANT assumes effort is limited to thirteen (13) chapters and re-formatting of three (3) appendices;
 - CONSULTANT assumes three (2) new sections are to be added: coastal flooding and stormwater pump stations;
- CONSULTANT to attend four (4) in-person workshops organized by City with developers and developer-engineers to obtain comments on the draft DCM;
- CONSULTANT to revise the draft DCM based on community comments, staff, and City legal review;
 - CONSULTANT assumes that coordinating legal reviews is to be completed by City without direction from CONSULTANT;
- CONSULTANT to attend in-person two (2) planning and zoning meetings for the discussion and recommendation to adopt the draft DCM;
- CONSULTANT to attend in-person the first reading of the ordinance to adopt the draft DCM and the final reading before adoption to answer questions that may arise from staff, citizens, or Council.

V. DIRECT EXPENSES (TASK 503) \$5,200

OPTIONAL SERVICES

VI. MODELING EAST OF CORPUS CHRISTI BAY (TASK 905) \$138,700

- CONSULTANT to utilize the scope of work for Task 902, HEC-RAS 1D unsteady state modeling for 88 additional stream miles of limited detail study;

THIS PROPOSAL ASSUMES AND/OR EXCLUDES THE FOLLOWING:

- ◆ *Results of this study are to be used for planning purposes, models produced for this purpose may be used as “best available” for other studies. Additional effort not included in this scope is required to verify accuracy of the models before using them for other purposes including insurance studies or design purposes;*

- ◆ *1D unsteady state modeling and 2D rain-on-grid modeling is expected to be performed in HEC-RAS v6.0. Upgrading to subsequent software versions released during the performance of this scope of work is not included in this scope. Upgrades to later software versions can be provided as an additional service;*
- ◆ *Field survey and/or field measurements are not included in this scope. Field surveying or measurements can be provided as an additional service;*
- ◆ *Spatial files (e.g. impervious cover delineations) not noted specifically in the above scope are not to be digitized or created as part of these services. Generating spatial data can be performed as an additional service;*
- ◆ *Minimal updates are to be performed to spatial linework data received from City based on desktop review. CONSULTANT is to make reasonable assumptions on missing data (e.g. elevation data) using engineering judgment where necessary to achieve the overall objective of the task;*
- ◆ *Models provided by the City are assumed to be complete and running without additional debugging;*
- ◆ *Development of an ArcGIS Online hosted website to display results of the study is not included. This service can be performed as an additional service;*
- ◆ *Meetings to be performed virtually unless specifically noted in this Scope. Additional meetings not noted in this Scope is to be performed virtually and limited to 30 minutes per meeting;*
- ◆ *Deliverables are to be provided in Portable Document Format (PDF) digitally for review unless otherwise noted above. Deliverables are to be provided in PDF digitally with an option for CONSULTANT to provide no more than 6 printed copies. Digital data is to be provided via the project SharePoint site established under other tasks being performed under this contract;*
- ◆ *One (1) round of responses to reviews of deliverables has been assumed, additional rounds of responses may be provided as an additional service;*
- ◆ *Review comments to be consolidated and reconciled by City before releasing to CONSULTANT for review and response;*
- ◆ *Work to be performed under one notice-to-proceed (NTP).*

SUMMARY

I.	Hydrology for One-Dimensional (1D) Modeling	Task 901	\$140,100
II.	Hydraulics	Task 902	\$1,224,500
III.	Capital Improvement Project Planning	Task 903	\$92,300
IV.	Development of Design Criteria Manual	Task 904	\$153,300
V.	Direct Expenses	Task 503	\$5,200
Total w/o Optional Services:			\$1,615,400
Less value of remaining work on Task 291			\$(423,400)
Increase in Total Contract Value			\$1,192,000

OPTIONAL SERVICES

VI.	Modeling East of Corpus Christi Bay	Task 905	\$138,700
Total of Optional Services:			\$138,700
Grand Total:			\$1,330,700

A budget increase of **\$1,192,000** is the estimated cost of Pape-Dawson's current understanding of the additional services identified above. Upon signing of this ASR by the client, this ASR to be governed by the existing proposal for this project signed by the client and engineer on the **4th** day of **March 2021**.

We appreciate the opportunity to work with you on this project. If you concur with this request, please acknowledge your approval by signing in the space provided below and returning this letter to our office via email, fax, or US Mail for our records.

If you have questions or need additional information, please do not hesitate to contact me at your earliest convenience.

Sincerely,
Pape-Dawson Engineers, Inc.

ACKNOWLEDGED & ACCEPTED



Zubin Sukheswalla, P.E., CFM
Managing Vice President, Hydrology & Hydraulics

Signature: _____

Print Name: _____

Title: _____

Date: _____



Cara C. Tackett, P.E.
Sr. Vice President

Attachment

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LIMITS OF OPTIONAL
MODELING

Text

Legend

STUDY_STREAMS

STUDY TYPE

ICM 1D/2D

NO MODELING (CCNAS); NO MODELING (PORT-CC); NO MODELING (TAMU-CC)

RAS 1D

RAS 1D HYDROLOGY

RAS 2D ROG

XPSWMM 1D/2D

Citylimits

ETJ

SCOPE ATTACHMENT 1