

AGREEMENT FOR ENGINEERING SERVICES

THE STATE OF TEXAS §
§
COUNTY OF HARRIS §

THIS AGREEMENT is made, entered into, and executed by and between the **Harris County Flood Control District**, a body corporate and politic under the laws of the State of Texas, hereinafter called "District" or "HCFCD," and **LJA Engineering, Inc.**, a Texas corporation, hereinafter called "Engineer."

WITNESSETH, that

WHEREAS, the District desires a feasibility study to evaluate Hunting Bayou channel improvements downstream of IH-10 on HCFCD Unit H102-00-00, hereinafter called the "Project"; and

WHEREAS, the District desires that the Engineer provide Engineering Services for the Project; and

WHEREAS, the Engineer represents that it is capable and qualified to perform the various services that may be required.

NOW THEREFORE, the District and the Engineer, in consideration of the mutual covenants and agreements herein contained, do mutually agree as follows:

SECTION I**CHARACTER AND EXTENT OF SERVICES**

From time to time during the course of this Agreement, the Executive Director of the District or designee (the "Director") may deliver to the Engineer written authorization in accordance with this Section for the performance of certain engineering services with regard to the Project, which services the Engineer shall then perform in accordance with this Agreement. The Director may authorize the Engineer to provide all or any of the engineering services in connection with the study phase of the Project that are listed in Appendix A.

The District shall have no obligation to pay for any services hereunder that have been rendered without the prior written authorization for such services by the Director. The written authorization shall specify the services to be performed, a budget amount for such services, and a required completion date for such services. During the course of any services authorized hereunder, the Engineer shall provide the District with progress reports at such times and in such manner as may be requested by the Director. If it should become evident that the Engineer will not be able to complete any service hereunder by the previously set completion date or within the previously set budget for same, the Engineer shall notify the Director as soon as possible.

SECTION II

TIME OF PERFORMANCE

Upon receipt of a written authorization to perform certain services hereunder, the Engineer shall proceed diligently to complete each service within the limits of time therein specified. The District shall have no obligation to pay for a service performed after the required completion date for same as set forth in its authorization, except to the extent the date for required completion is extended and continuation of such service is approved by further written authorization from the Director.

SECTION III

THE ENGINEER'S COMPENSATION

For and in consideration of services rendered by employees of the Engineer pursuant to this Agreement, the District shall pay the Engineer in accordance with the following maximum hourly rates:

<u>Position</u>	<u>Maximum Hourly Rate</u>
Senior Consultant.....	\$245.00
Principal	\$320.00
Department Head (VP, Dept. Manager, Senior PM)	\$320.00
Project Manager	\$210.00
Senior Hydrologist	\$205.00
Senior Engineer	\$180.00
Engineer (Project Engineer)	\$160.00
Graduate Engineer (Graduate Engineer, EIT)	\$150.00
Natural Channel Design Engineer.....	\$230.00
Planner	\$130.00
Designer	\$135.00
Senior Designer	\$170.00
Senior GIS Developer	\$200.00
GIS Developer.....	\$200.00
GIS Analyst	\$120.00
Principal RPLS/President	\$250.00
Principal RPLS/Vice-President.....	\$225.00
Senior Project Manager/RPLS	\$200.00
Survey Manager.....	\$185.00
Project Manager/RPLS	\$160.00
Geospatial Services Manager	\$150.00
Assistant Project Manager/RPLS	\$140.00
Senior Project Surveyor	\$140.00
Project Surveyor.....	\$125.00
Senior Survey Technician	\$120.00
Survey Technician.....	\$110.00
Survey Draftsman	\$100.00
1-Person Field Survey Crew	\$125.00
2-Person Field Survey Crew	\$155.00
3-Person Field Survey Crew*	\$180.00

<u>Position</u>	<u>Maximum Hourly Rate</u>
4-Person Field Survey Crew*	\$210.00
Abstractor	\$ 80.00
CADD Operator (CADD Technician)	\$ 90.00
Clerical Support (Construction Administrative Assistant)	\$ 95.00
GPS*	\$ 50.00/day
Robotic Total Station*	\$ 25.00/day
All-Terrain Vehicle*	\$ 50.00/day

*Requires prior written approval by the Director.

Adjustments to fixed fee allocations may be made with prior review and written approval by the Director pursuant to Section I of this Agreement.

It is expressly understood that the Engineer shall neither seek reimbursement nor will the District be obligated to pay or reimburse the Engineer for normal business expenses such as overtime, postage, messenger services, delivery charges, mileage within Harris County, parking fees, facsimile (fax) transmissions, computer time on in-house computers and graphic systems, blue-line drawings or photocopies specifically required by Section I, or other costs or expenses, except those for which reimbursement is specifically provided in the following sentence. If approved in writing by the Director prior to their being incurred, the Engineer may be reimbursed the reasonable and necessary cost of the following, to the extent they are incurred in providing services hereunder: services performed by a subcontractor pursuant to authorization for such expense and as permitted by the County Purchasing Act, copies of reports or other documents to be delivered to the District or in accordance with instructions of the District in excess of the number specifically required by Section I, costs of travel outside of Harris County, rental costs of transportation equipment necessary to gain access to the Project site, costs of presentation materials (i.e., charts, slides, transparencies), costs of abstracting, and costs of photographic and video services.

The District shall have no obligation to pay compensation or reimbursement for any service or expense in excess of the amount budgeted for same in its written authorization, except to the extent the budget for such service is increased and continuation of such service is approved by further written authorization from the Director.

At the option of the Director, the Director may also issue work authorization(s) for performance of specified professional services to be compensated on a lump sum basis upon acceptance by Engineer. If a work authorization specifies payment on a lump sum basis for certain services, the hourly rates set out above shall not apply. In addition, where work performed pursuant to a work authorization is to be compensated on a lump sum basis, the budget for same shall not be increased pursuant to Section I or Section III of this Agreement, except to the extent that additional services are assigned to be performed by the Engineer by further written authorization from the Director.

SECTION IV

TIME OF PAYMENT

During the performance of the services provided herein, at intervals of not fewer than thirty (30) days each, the Engineer shall submit to the District a statement sworn to by the Engineer or an officer of the Engineer, in a form acceptable to the County Auditor of Harris County and in

compliance with Section III, setting forth the services completed and the compensation due for the same that have not been previously billed or paid. All hourly charges shall be itemized on the basis of the hourly rates and shall be certified in writing by the Engineer to be true and correct. The Director and the Harris County Auditor shall approve each statement after review, with such modifications as may be deemed appropriate. The District shall pay each statement approved within thirty (30) days after approval by the Director and the County Auditor, provided that the approval or payment of any such statement shall not be considered to be evidence of performance by the Engineer to the point indicated by such statement, or of the receipt of or acceptance by the District of the work covered by such statement. The Engineer shall in no case submit an invoice for less than \$500.00, except where the invoice is for the final payment.

Time sheets corroborating the information provided in the statement, signed by individuals performing services under this Agreement and their supervisor(s), showing the name of each individual performing services hereunder, the date or dates that he or she performed said services, his or her hourly rate, the total amount billed for each individual, and the total amount billed for all individuals, and including such other details as may be requested by the Harris County Auditor for verification purposes, shall be kept and maintained by the Engineer for a period of five (5) years after the completion of performance hereunder. The Director and/or the County Auditor shall have the right, after giving written notice, to review any and all documents or other data in the custody of the Engineer, in connection with any statement submitted by the Engineer to the District for approval and payment by the District.

SECTION V

TERMINATION

The District may terminate this Agreement at any time by notice in writing to the Engineer. Upon receipt of such notice, the Engineer shall discontinue all services in connection with the performance of this Agreement. As soon as practicable after receipt of notice of termination, the Engineer shall submit a statement, showing in detail the services performed under this Agreement to the date of termination. The District shall pay the Engineer the prescribed compensation for the services actually performed under this Agreement, less such payments on account of the charges as have been previously made. Copies of all complete or partially complete designs, plans, specifications, and other documents prepared or obtained under this Agreement shall be delivered to the District when and if the Agreement is terminated.

SECTION VI

ADDRESS OF NOTICES AND COMMUNICATIONS

All notices and communications under this Agreement shall be mailed by certified mail, return receipt requested, or delivered to the Engineer at the following address:

LJA Engineering, Inc.
3600 W. Sam Houston Parkway South, Suite 600
Houston, Texas 77042
Attn: John S. Grounds, III, PhD., P.E., CFM, D.WRE

All notices and communications under this Agreement shall be mailed by certified mail, return receipt requested, or delivered to the District at the following address:

Harris County Flood Control District
9900 Northwest Freeway
Houston, Texas 77092
Attn: Executive Director

SECTION VII

LIMIT OF APPROPRIATION

The Engineer clearly understands and agrees, such understanding and agreement being of the absolute essence to this Agreement, that the District shall have available the total maximum sum of \$600,000.00, specifically allocated to fully discharge any and all liabilities incurred by the District pursuant to the terms of this Agreement, and that the total maximum compensation the Engineer may become entitled to hereunder and the total maximum sum the District shall become liable to pay to the Engineer hereunder shall not under any conditions, circumstances, or interpretations hereof exceed the said total maximum sum provided for in this Section and certified as available therefor by the County Auditor as evidenced by the issuance of a purchase order from the Harris County Purchasing Agent.

SECTION VIII

SUCCESSORS AND ASSIGNS

The District and the Engineer bind themselves and their successors, executors, administrators, and assigns to the other party of this Agreement and to the successors, executors, administrators and assigns of such other party in respect to all covenants of this Agreement. Neither the District nor the Engineer shall assign, sublet, or transfer its or his interest in this Agreement without the written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public body that may be a party hereto.

SECTION IX

PUBLIC CONTACT

Engineer shall under no circumstances release any material or information developed in the performance of services hereunder, without the prior express written permission of the Director. Contact with the news media, private citizens, or community organizations shall be the sole responsibility of the District. Inquiries concerning this Agreement or any Requested Service shall be referred to the Director.

SECTION X

COMPLIANCE AND STANDARDS

The Engineer agrees to perform the work hereunder in accordance with generally accepted standards applicable thereto and shall use that degree of care and skill commensurate with the Engineer's profession to comply with all applicable state, federal, and local laws, ordinances, rules, and regulations relating to the work to be performed hereunder and the Engineer's performance. The Engineer represents that, prior to performing hereunder, it has or shall obtain all necessary licenses, ownership, or permission for use of any and all proprietary information, materials, or trade secrets employed in the performance of work hereunder for the District and agrees that he shall not copy, reproduce, recreate, distribute, or use any such proprietary information, materials, or trade secrets of any third party, except to the extent permitted by such third parties, or as otherwise authorized by law.

In accordance with TEX. GOV'T CODE ANN. § 2270.002, the Engineer warrants and represents that it does not boycott Israel and agrees that it will not boycott Israel during the term of this contract.

The Engineer represents and certifies that, at the time of execution of this Agreement, the Engineer (including, in this provision, any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same) is not listed by the Texas Comptroller of Public Accounts

pursuant to Chapters 2252 or 2270 of the Texas Government Code, nor will the Engineer engage in scrutinized business operations or other business practices that could cause it to be listed during the term of this Agreement.

The Engineer warrants and represents, in accordance with Tex. Gov't Code Ann. § 2274.002, that unless the Engineer meets an exemption under subsection (c), then, as required by subsection (b), the Engineer's signature on this Agreement constitutes the Engineer's written verification that it does not boycott energy companies and will not boycott energy companies during the term of the contract.

The Engineer warrants and represents, in accordance with Tex. Gov't Code Ann. § 2274.002, that unless the Engineer meets an exemption under subsection (c) or section 2274.003, then, as required by subsection (b) of section 2274.002, the Engineer's signature on this Agreement constitutes the Engineer's written verification that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate against a firearm entity or firearm trade association during the term of the contract.

SECTION XI

LICENSE REQUIREMENTS

The Engineer shall have and maintain any licenses or certification required by the State of Texas or recognized professional organization governing the services performed under this Agreement.

SECTION XII

CERTIFICATE OF INTERESTED PARTIES

In compliance with Government Code § 2252.908, the Engineer must submit a completed Certificate of Interested Parties Form 1295, including an unsworn declaration and the Certification of Filing, printed after completing the electronic filing requirements on the Texas Ethics Commission website (see www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm), to the District along with this signed Agreement.

SECTION XIII

CONFLICT OF INTEREST CERTIFICATION

The Engineer certifies that the Engineer has complied with Chapter 176 of the Texas Local Government Code by completing and filing any required conflict of interest disclosures or questionnaires (see www.ethics.state.tx.us). If this certification is materially incomplete or inaccurate, the Engineer acknowledges that the District shall have the right to terminate this Agreement without prior notice.

SECTION XIV

INDEMNIFICATION

TO THE EXTENT ALLOWED BY LAW, THE ENGINEER AGREES TO INDEMNIFY AND HOLD HARMLESS THE DISTRICT, ITS OFFICERS, EMPLOYEES, AND AGENTS FROM LIABILITY, LOSSES, EXPENSES, DEMANDS, REASONABLE ATTORNEYS' FEES, AND CLAIMS FOR BODILY INJURY (INCLUDING DEATH) AND PROPERTY DAMAGE TO THE EXTENT CAUSED BY THE NEGLIGENCE, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT OF THE ENGINEER (INCLUDING THE ENGINEER'S AGENTS, EMPLOYEES, VOLUNTEERS, AND SUBCONTRACTORS/CONSULTANTS UNDER CONTRACT, OR ANY OTHER ENTITY OVER WHICH ENGINEER EXERCISES CONTROL) IN

THE PERFORMANCE OF THE SERVICES DEFINED IN THIS AGREEMENT. THE ENGINEER SHALL ALSO SAVE THE DISTRICT HARMLESS FROM AND AGAINST ANY AND ALL EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, IN PROPORTION TO THE ENGINEER'S LIABILITY, THAT MIGHT BE INCURRED BY THE DISTRICT, IN LITIGATION OR OTHERWISE RESISTING SUCH CLAIMS OR LIABILITIES.

SECTION XV

INSURANCE REQUIREMENTS

Coverage and Limits. During the Term of this Agreement and any extensions thereto, the Engineer at its sole cost and expense shall provide insurance of such type and with such terms and limits as may be reasonably associated with this Agreement. As a minimum, the Engineer shall provide and maintain the following coverage and limits:

- (a) Workers Compensation, as required by the laws of Texas, and Employers' Liability, as well as All States, United States Longshore & Harbor Workers Compensation Act and other endorsements, if applicable to the project, and in accordance with state law.

Employers' Liability

(i)	Each Accident	\$1,000,000
(ii)	Disease – Each Employee	\$1,000,000
(iii)	Policy Limit	\$1,000,000

- (b) Commercial General Liability, including but not limited to, the coverage indicated below. This policy will provide coverage for personal and bodily injury, including death, and for property damage, and include an endorsement for contractual liability. Coverage shall not exclude or limit the Products/Completed Operations, Contractual Liability, or Cross Liability. Where exposure exists, the District may require coverage for watercraft, blasting, collapse, explosions, blowout, cratering, underground damage, pollution, and other coverage. *The District shall be named Additional Insured on primary/non-contributory basis.*

(i)	Each Occurrence	\$1,000,000
(ii)	Personal and Advertising Injury	\$1,000,000
(iii)	Products/Completed Operations	\$1,000,000
(iv)	General Aggregate (per project)	\$2,000,000

- (c) Professional Liability/Errors and Omissions, in an amount not less than One Million Dollars (\$1,000,000) per claim and in the aggregate.

- (d) Umbrella/Excess Liability in an amount not less than One Million Dollars (\$1,000,000) per occurrence and in the aggregate. *The District shall be named Additional Insured on primary/non-contributory basis.*

- (e) Automobile Liability insurance to include the Engineer's liability for death, bodily injury, and property damage resulting from the Engineer's activities covering use of owned, hired, and non-owned vehicles, with combined single limit of not less than One Million Dollars (\$1,000,000) for each accident. *The District shall be named Additional Insured on primary/non-contributory basis.*

- (f) Any other coverage required of the Engineer pursuant to statute.

Delivery of Policies. Immediately upon execution of this Agreement and before any services are commenced by the Engineer, the Engineer shall provide the District evidence of all of the above coverage on forms and with insurers acceptable to the District. The Engineer must maintain a valid Certificate of Insurance as described herein on file with the District at all times during the

term of this Agreement. The Engineer must either (1) mail the Certificate of Insurance to the District at 9900 Northwest Freeway, Houston, TX 77092, Attn: Contract Management or (2) submit it by email to HCFCFCD_AdminServices@hcfcd.hctx.net.

Issuers of Policies. Coverage shall be issued by company(s) licensed by the Texas Department of Insurance to do business in Texas, unless said coverage is not available or economically feasible except through an excess or surplus lines company, in which case the company(s) should be registered to do business in Texas. Companies shall have an A.M. Best rating of at least A-VII.

Certificates of Insurance. The Engineer shall provide unaltered Certificates of Insurance which evidence the required coverage and endorsements and satisfy the following requirements:

- (a) Be less than 12 months old;
- (b) Include all pertinent identification information for the Insurer, including the company name and address, policy number, NAIC number or AMB number, and an authorized signature;
- (c) Include the project name and reference numbers and indicate the name and address of the Project Manager in the Certificate Holder Box; and
- (d) Be appropriately marked to accurately identify:
 - (i) All coverage and limits of the policy;
 - (ii) Effective and expiration dates;
 - (iii) Waivers of subrogation, endorsement of primary insurance and additional insured language, as described herein.

Certified Copies of Policies and Endorsements. Upon request, the Engineer shall furnish certified copies of insurance policies and endorsements to the District.

Renewal Certificates. Renewal certificates are due to the District at least thirty (30) days prior to the expiration of the current policies.

Subcontractors. If any part of the Agreement is sublet, insurance shall be provided by or on behalf of any subcontractor, and shall be sufficient to cover their portion of the Agreement. The Engineer shall furnish evidence of such insurance to the District as well.

Additional Insured. The Engineer shall include the District and its respective officers, directors, agents, and employees as an Additional Insured on the Commercial General Liability, Automobile Liability, and Umbrella/Excess Liability insurance certificates. The Engineer's coverage shall be primary insurance to any similar insurance maintained by the District and must contain an endorsement stating such. Coverage to the District as an Additional Insured on any of the Engineer's insurance coverage shall not be subject to any deductible.

Deductibles. The Engineer shall be responsible for and pay any claims or losses to the extent of any deductible amounts applicable under all such policies and waives any claim it may have for the same against the District, its officers, directors, agents, or employees.

Claims-made Policies. All insurance policies written on a claims-made basis, including Professional Liability/Errors and Omissions, shall be maintained for a minimum of two (2) years following completion of all services under this Agreement ("Extended Reporting Period"). The Engineer shall obtain or maintain full prior acts coverage at least to the effective date of this Agreement in the event of a carrier or policy change.

Waiver of Subrogation. The Engineer waives any claim or right of subrogation to recover against the District, its officers, directors, agents, and employees ("Waiver of Subrogation"). Each policy required under this Agreement must contain a Waiver of Subrogation endorsement.

Notice of Cancellation, Non-Renewal, or Material Change. The Engineer shall provide the District with thirty (30) days' minimum written notification in the event of cancellation, non-renewal, or material change to any or all of the required coverage.

Remedies for Noncompliance. Failure to comply with any part of this Article is a material breach of this Agreement. The Engineer could immediately, and without notice, have all compensation withheld or suspended, be suspended from providing further services, or be terminated from this Agreement for any lapse in coverage or material change in coverage which causes the Engineer to be in noncompliance with the requirements of this Article.

SECTION XVI

OWNERSHIP OF PLANS, COPYRIGHT

The District shall be the absolute and unqualified owner of any information, programs, Mylar reproductions, plans, preliminary layouts, sketches, reports, cost estimates, inventions, software, firmware, designs, computer applications, computations, computer input/output information, and other documents or materials prepared pursuant to this Agreement, including source codes therefor, with the same force and effect as if the District prepared the same. The District shall have an exclusive and perpetual copyright in and to any and all materials produced for the District pursuant to this Agreement and the Engineer shall convey and assign, and does hereby convey and assign, to District all right, title, and interest, including but not limited to copyright, the Engineer may have or may acquire in and to such materials. The Engineer agrees that work performed hereunder for the District will be deemed to have been done, to the extent authorized by law, on a "works made for hire" basis. In the event and to the extent such works are determined not to constitute "works made for hire" as that term is understood in copyright law, the Engineer hereby irrevocably assigns and transfers to the District all right, title, and interest in and to such works, including, but not limited to, copyrights. The Engineer agrees to promptly deliver to the District copies, in a form acceptable to the Director, of any and all such information, programs, Mylar reproductions, plans, preliminary layouts, sketches, reports, cost estimates, inventions, software, firmware, designs, computer applications, documents, materials and/or data, including the source codes therefor, upon request from the District. Copies of all complete or partially complete information, programs, Mylar reproductions, plans, preliminary layouts, sketches, reports, cost estimates, inventions, software, firmware, designs, computer applications, and other documents and materials, including source codes therefor, prepared pursuant to this Agreement, shall also be delivered to the District when and if the Agreement is terminated, or upon completion of performance hereunder, whichever occurs first. The Engineer may retain one (1) set of reproducible copies of such documents and materials, but such copies shall be for the Engineer's use in the preparation of studies or reports for the District only. The Engineer is expressly prohibited from selling, licensing, or otherwise marketing or donating such documents or materials, or using the same in the preparation of work for any other client without the express written permission of the Director. The Engineer does not intend or represent that construction documents or materials will be suitable for reuse. If the District reuses the same, such action shall be at the District's risk and without liability to the Engineer. If the Engineer furnishes partially complete plans, layouts, sketches, specifications, or other documents and materials by virtue of termination under Section VII above, the Engineer shall not be held accountable or responsible for the completeness of any document or material so produced.

SECTION XVII

MODIFICATIONS

This instrument contains the entire Agreement between the parties relating to the rights herein granted and obligations herein assumed. Any oral or written representations or modifications

concerning this instrument shall be of no force or effect, excepting a subsequent modification in writing signed by both parties hereto.

EXECUTED on _____.

APPROVED AS TO FORM:

CHRISTIAN D. MENELEE
Harris County Attorney

HARRIS COUNTY FLOOD CONTROL
DISTRICT

DocuSigned by:

ED17653073344AD...
By _____
EMILY KUNST
Assistant County Attorney

By _____
LINA HIDALGO
County Judge

ATTEST:

LJA Engineering, Inc.

DocuSigned by:

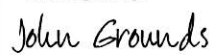
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Wallace Trochesset

Name

Senior Vice President

Title

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John S. Grounds, III, PhD, PE, CFM, D.WRE
Vice President, Director of Water Resources

APPENDIX A

The Harris County Flood Control District (HCFCD) has engaged LJA to perform a Feasibility Analysis for the Hunting Bayou Watershed. The intent of the Feasibility Study is to identify channel modifications to the H100-00-00 channel from its confluence with the Houston Ship Channel to the confluence with H102-00-00 for mitigation of existing flooding problems within the study limits as shown in Exhibit 1. The study is in Harris County Precinct 2 and is identified as bond project ID CI-59.

The basis of the analysis will be the MAAPnext HEC-HMS and HEC-RAS models utilizing the Atlas 14 rainfalls. In order to determine if there are any adverse impacts on the Ship Channel with the proposed alternatives, we will also analyze the Ship Channel MAAPnext model. Because the hydrograph used in the Ship Channel model at the confluence with Hunting Bayou does not match the outflow hydrograph from the Hunting Bayou MAAPnext model, the flow file will need to be revised to use the Hunting Bayou MAAPnext model output to be able to properly evaluate the impacts on the Houston Ship Channel. Inundation mapping of the 4%, and 1% frequency storms will be performed and the number of structures within each events floodplain will be determined. We will also estimate the effects of storm sewer improvements in the developed areas. This will be done by adjusting the BDF factors for the determination of TC&R to simulate improvements to the conveyance of subdivision drainage. Individual subdivision drainage components such as ditches, culverts, and storm sewers will not be modeled.

The alternative analysis will look at channel modifications, and bridge replacement/modification projects along the Hunting Bayou main channel and on H102-00-00. For evaluation of the alternatives, geometry cross sections will be modified to reflect the construction of each proposed alternative. This will require lengthening of the cross sections in the MAAPnext models as well as modification of the 2D areas, 2D mesh, Land Use layer and Terrain Layers. These changes will also be required in the Existing Condition models in order to ensure that changes in Water Surface Elevations are only due to the proposed modifications. The proposed models will be run, and the same frequency events will be analyzed. Inundation mapping of the events will be performed and the number of structures within each events floodplain will be determined based on the Structural Inventory Tool Database. These proposed improvements will be confined to the following areas:

- H102-02-00 from Fidelity Street to the confluence with Hunting Bayou (H100-00-00).
- Hunting Bayou (H100-00-00) from confluence with H126-00-00 to the confluence with the Houston Ship Channel.

Based on the results of the alternative analysis, the cost estimates, and review of constraints, we will develop a recommended plan for the study area utilizing the HCFCD Prioritization Scoring process. If the overall cost of the recommended plan has a construction cost in excess of \$10 million, we will create a preliminary implementation plan for potential project phasing, including initial estimates of approximate cost, benefits, and schedules for funding approval.

1. **Project Management and Coordination**

- A. **Project Management**: The Engineer shall perform project management services necessary to complete the project including submitting monthly invoices with progress reports, developing and maintaining a detailed project schedule, and managing and monitoring sub-consultants.
- B. **Quality Control**: The Engineer shall Perform QA/QC throughout the study. This will be performed by designated reviewers with appropriate expertise for their review responsibility. All deliverables will be reviewed prior to submission.
- C. **Meetings**: The following meetings are anticipated for a 9-month project schedule.
 - 1) **Coordination meetings with HCFCD**: Attend project kickoff and bi-weekly status meetings (19 meetings) to present work activities and results of the study and discuss project issues. The Engineer will prepare agendas for each meeting and will distribute meeting minutes within 5 business days of each meeting.
 - 2) **HCFCD Technical Workshops**: The Engineer will prepare for two (2) workshops to review and discuss existing conditions findings and improvement alternatives.
 - 3) **Stakeholder Meetings**: It is anticipated that the Engineer will attend eight (8) meetings with varying stakeholders (Port of Houston, City of Galena Park, City of Jacinto City, City of Houston) throughout the course of the project to present study results and receive stakeholder input to be incorporated into the proposed improvements. This effort includes preparing for the stakeholder meetings with appropriate materials such as basic exhibits, or a small PowerPoint presentation slide deck, as well as attending and documenting the minutes of the meetings. At most four (4) exhibits larger than 11" x 17" will be the printed for each Stakeholder meeting.
 - 4) **Briefings**: Prepare and attend one briefing with the Precinct and one briefing with the HCFCD.
- D. **Community Engagement**: The Hunting Bayou Study is part of the HCFCD bond (Bond Project ID CI-59). The standard community engagement process for bond projects will be followed.
 - 1) **Public Meeting Preparation**: The Engineer shall prepare for one (1) community engagement meeting. The Engineer will develop written and illustrative materials (printed maps, slideshow, etc.) to inform the public about the projects. At most four (4) exhibits larger than 11" x 17" will be the printed for each Community Engagement meeting.
 - 2) **Public Meeting Preparation Meeting**: The Engineer will prepare for and attend two (2) preparation meetings for the community engagement meetings. This effort includes a "dry run" of the presentation with HCFCD.
 - 3) **Public Meeting Attendance**: The Engineer will provide two (2) staff members for the one (1) anticipated public meeting.

2. **Data Collection**

- A. **Data Collection**: The purpose of this task is to collect and evaluate key information to assist in refining the study scope of work. The Engineer shall collect available information and data including, but not limited to, HCFCD historical flooding data, HCFCD Structural Inventory database, flooding reports, LiDAR DEM data, aerial maps, HCFCD watershed maps, hydrologic and hydraulic models, City of Houston GIMS data, HCAD property valuations and other pertinent technical data.
- B. **Field Reconnaissance**: The Engineer shall conduct one (1) field reconnaissance visit to identify and document the existing drainage systems, outfalls, and drainage patterns for the project area.

3. Existing Conditions

The MAAPnext HEC-HMS and HEC-RAS products will be used as the basis of the project H&H modeling effort. The linked 1D-2D models will be utilized for the analysis. The Rain on Grid models will not be utilized for this analysis.

- A. Future Condition Hydrology: Determine the future conditions flows based on the assumption of storm sewer improvements in the already developed portion of the study area. This will be done by adjustment of BDF factors only. No adjustments outside the study area or additional development will be included.
- B. Update Ship Channel model: Update the MAAPnext G100-00-00 model to evaluate the changes in the outflow hydrograph from H100-00-00. This will involve changing the inflow hydrograph at the Hunting Bayou confluence to utilize an appropriate flow hydrograph from the H100-00-00 MAAPnext model. This hydrograph location will also be used for the analysis of the effects of the alternatives.
- C. Create Current Condition Geometry: As needed to properly evaluate alternatives, add or delete 1D cross-sections from the MAAPnext model used as the base existing condition model for the analysis. As needed extend cross sections, revise 2D area, 2D mesh, terrain layer and Land Use layer to allow modeling of and comparisons with the alternatives. Geometric data for cross sections will be extracted from the terrain data utilized in the MAAPnext model.
- D. Existing Condition Analysis: Perform analysis of the 4% and 1% frequency storm events utilizing the current condition flows from the MAAPnext HMS models and the future condition flow determined in Task 1.1. This will result in four HEC-RAS plans.
- E. Determine Flood Damages –Develop inundation maps for the 4-, and 1-% storms for the current and future conditions flows. Using the HCFCD Structural Inventory Tool database, determine the number of flooded structures in the study area. Utilizing GIS we will determine the acreage of inundation within the study area and the miles of roadway inundated. This will be done for the 4% and 1% frequency events for the Current and Future Conditions for a total of four damage assessments.
- F. Technical Memorandum – Prepare a Technical Memorandum providing details of the development and results of the Existing Condition Analysis.

4. Develop Alternative Improvement Projects

- A. Create Alternative Geometries: As necessary, update 1D Cross Section and/or bridge geometry information to reflect proposed construction of alternatives. The alternatives to be analyzed are;
 - Channel modification of H100-00-00 consisting of enlargement of the channel to contain the 1% flow from the confluence with H103-00-00 to the confluence with the Ship Channel,
 - Channel modification of H100-00-00 consisting of enlargement of the channel to contain the 4% event flow from the confluence with H103-00-00 to the confluence with the Ship Channel.
 - Channel modification of H102-00-00 consisting of enlargement of the channel to contain the 1% flow.
 - Construction of a by-pass channel for H100-00-00 from the confluence with H102 downstream to the PTRR Railroad.
- B. Alternative Analysis: The revised geometries for each alternative will be used in the HEC-RAS analysis for the 4% and 1% frequency storms using the current and future conditions runoff hydrographs utilized for the Existing Condition Analysis. This will result in 16 HEC-RAS Plans. If there are impacts, estimate detention volume required to mitigate the impacts based on hydrograph comparison, determine conceptual detention pond geometries and area, and develop cost estimates for mitigation facilities.

- C. Determine Flood Damages: Develop inundation maps for the 4% and 1% storms for the current and future conditions flows for each alternative. Using HCFCD Structural Inventory Tool database, determine the number of flooded structures in the study area. Using GIS we will determine the acreage of inundation within the study area and the miles of roadway inundated. This will be done for the 4% and 1% frequency events for the Current and Future Conditions for each alternative analyzed for a total of 16 damage assessments.
 - D. Assess Impacts to Ship Channel: Determine impacts on the Houston Ship Channel (G100-00-00) based on water surface elevation changes relative to structures on the Ship Channel for each alternative and event analyzed. This will result in at most sixteen HEC-RAS plans. Inundation maps for each plan will be created and utilizing the Structural Inventory Database information, we will determine if any additional structures are impacted along the Ship Channel as compared to the Existing Condition Existing Flow Base model.
 - E. Develop Cost Estimates: Develop cost estimates for the proposed alternatives based on recent HCFCD bid tabulation unit costs for each alternative analyzed.
 - F. Determine Possible Constraints: Define the major uncertainties related to each of the four alternative projects and recommend additional actions necessary to reduce or eliminate those uncertainties which most impact the project. Anticipated uncertainties include environmental permitting requirements, geotechnical conditions in the areas of proposed excavation, potential cooperation of property owners, potential partnership opportunities, and availability of future funding.
 - G. Determine Recommended Plan - Based on the results of the HCFCD Prioritization Scoring methodology, the cost estimates, and review of constraints, we will develop a recommended plan for the lower watershed.
 - H. Implementation Plan: If the total project costs exceed \$10 M, create a preliminary implementation plan for potential project phasing, including initial estimates of approximate cost, benefits, and schedules (for funding approval).
5. **Document and Communicate Findings**
- A. Prepare an engineering report and exhibits that document existing levels of flooding and the recommended alternative improvements to reduce those flood damages, complete with cost, schedule, and benefit estimates for future feasible solutions to the identified problems. All exhibits, drawings, and figures will be 11" x 17" or smaller.
 - B. Prepare a summary report providing details of the methodologies and development of the plan with appropriate exhibits and tables to present the findings and recommendations.
6. **Analysis of Additional Frequency Events**: Additional analysis of other frequency events in addition to the proposed 4 and 1% events, including damage assessment. This will result in ten additional analysis runs per frequency with Existing Condition and Future Condition flows for the Existing Channel and each of the alternatives. Ten additional analysis runs, inundation maps, and damage assessments per frequency. Scope and budget will be agreed upon as necessary.
7. **Analysis of Additional Alternatives**: Analysis of additional alternatives other than the four alternatives provided in the scope. This may require terrain and land use modifications, modification of 2D mesh, etc. This would result in four additional runs on H100-00-00 and the Ship Channel models for a total of eight runs. This will require four damage assessments on H100-00-00 and four impact assessments on the Ship Channel. Scope and budget will be agreed upon as necessary.
8. **Survey Services**: Prepare proposals when appropriate to perform survey services to reduce the identified uncertainties. Scope and budget will be agreed upon as necessary.

9. **Environmental Services:** Prepare proposals when appropriate to perform Environmental Engineering services to reduce the identified uncertainties Services as needed. Scope and budget will be agreed upon as necessary.
10. **Investigation of Regional Detention and Mitigation:** Prepare proposals when appropriate to perform Investigation of regional detention and mitigation needs if deemed necessary. Scope and budget will be agreed upon as necessary.
11. **Stakeholder Engagement:** Prepare proposals when appropriate for Additional stakeholder engagement if deemed necessary. Scope and budget will be agreed upon as necessary.
12. **Revisions**
The Engineer shall make requested revisions to documents and materials prepared under this Agreement. The Engineer also shall provide such engineering services necessary for such revision, when they are not necessitated by any fault of the Engineer and such revisions are inconsistent with approvals or instructions previously given by the District, or are made necessary by the enactment or revision of codes, laws, or regulations issued subsequent to the preparation of such documents.

THE STATE OF TEXAS §
§
COUNTY OF HARRIS §

The Commissioners Court of Harris County, Texas, convened at a meeting of said Court at the Harris County Administration Building in the City of Houston, Texas, on _____, with the following members present, to-wit:

Lina Hidalgo	County Judge
Rodney Ellis	Commissioner, Precinct No. 1
Adrian Garcia	Commissioner, Precinct No. 2
Tom S. Ramsey, P.E.	Commissioner, Precinct No. 3
R. Jack Cagle	Commissioner, Precinct No. 4

and the following members absent, to-wit: _____, constituting a quorum, when among other business, the following was transacted:

**ORDER AUTHORIZING EXECUTION OF AN AGREEMENT FOR ENGINEERING SERVICES
 BETWEEN THE HARRIS COUNTY FLOOD CONTROL DISTRICT
 AND LJA ENGINEERING, INC.**

Commissioner _____ introduced an order and made a motion that the same be adopted. Commissioner _____ seconded the motion for adoption of the order. The motion, carrying with it the adoption of the order, prevailed by the following vote:

		Yes	No	Abstain
AYES:	Judge Lina Hidalgo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NAYS:	Comm. Rodney Ellis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ABSTENTIONS:	Comm. Adrian Garcia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Comm. Tom S. Ramsey, P.E.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Comm. R. Jack Cagle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The County Judge thereupon announced that the motion had duly and lawfully carried and that the order had been duly and lawfully adopted. The order thus adopted follows:

WHEREAS, the District desires a feasibility study to evaluate Hunting Bayou channel improvements downstream of IH-10 on HCFCU Unit H102-00-00, hereinafter called the "Project"; and

WHEREAS, the District desires that the Engineer provide Engineering Services for the Project; and

WHEREAS, the Engineer represents that it is capable and qualified to perform the various services that may be required.

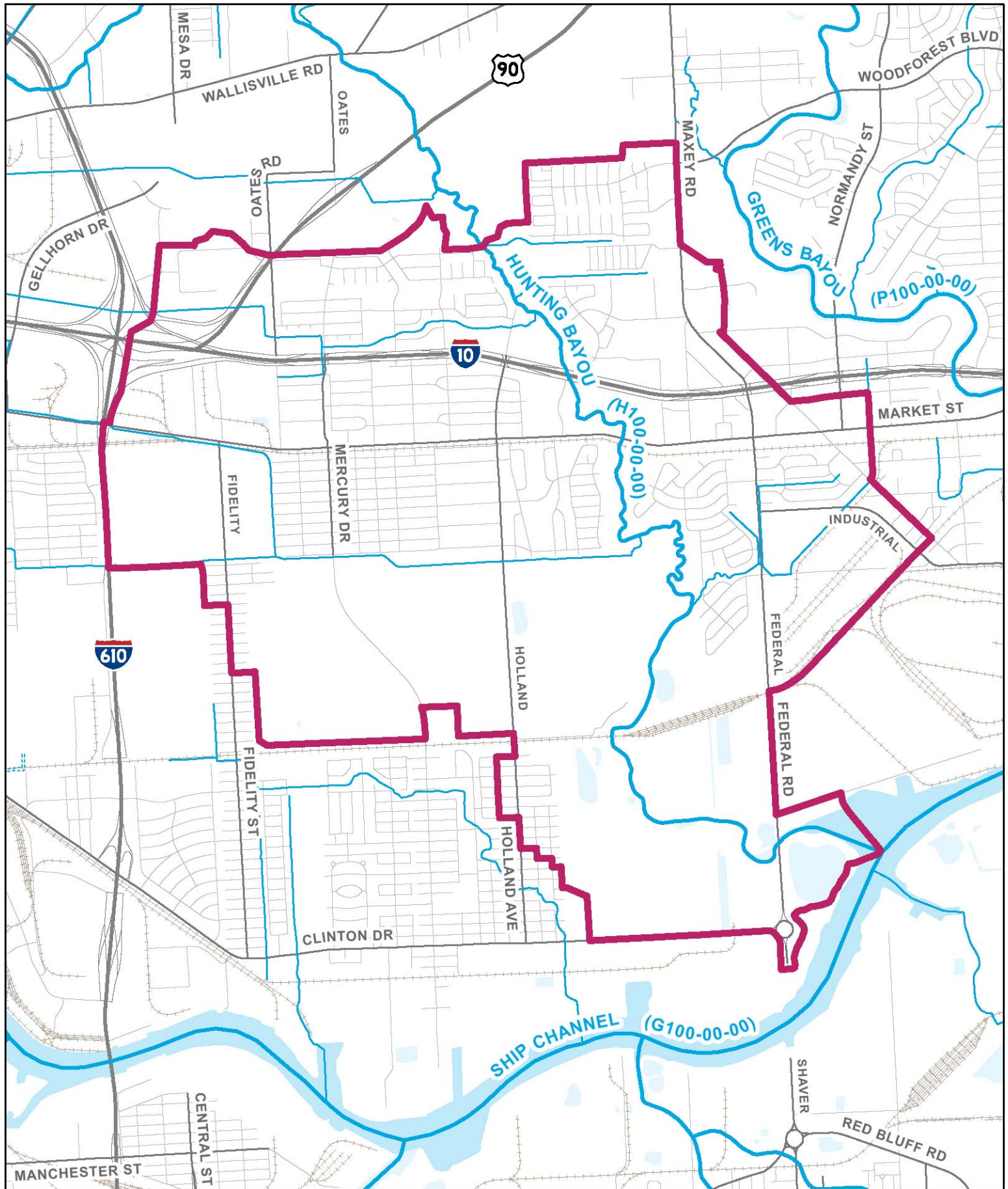
NOW, THEREFORE, BE IT ORDERED BY THE COMMISSIONERS COURT OF HARRIS COUNTY, TEXAS THAT:

Section 1: The recitals set forth in this order are true and correct.

Section 2: Exemption from the County Purchasing Act under Texas Local Government Code § 262.024(a)(4) is hereby granted.

Section 3: County Judge Lina Hidalgo is hereby authorized to execute for and on behalf of the Harris County Flood Control District, an Agreement by and between the Harris County Flood Control District and LJA Engineering, Inc. for a fee to be paid by the District of \$600,000.00, said Agreement being incorporated herein by reference for all purposes as though fully set forth verbatim herein.

PLN LJA H102-P001 2022-124.DOCX



Project ID: H102-00-00-P001

Watershed: Hunting Bayou

Precinct: 1, 2

- Project Boundary
- Harris County Precincts**
Judge Lina Hidalgo
- 1 - Rodney Ellis
 - 2 - Adrian Garcia
 - 3 - Tom S. Ramsey, P.E.
 - 4 - R. Jack Cagle

