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 **Atkins North America, Inc.**, a Florida corporation, hereinafter called "Engineer."

WITNESSETH, that

WHEREAS, the District desires a feasibility study to evaluate drainage improvements and mitigation on HCFCD Unit W157-00-00 and its tributaries, 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:

Position	Maximum Hourly Rate
Principal	$275.00
Project Director	$265.00
Senior Project Manager	$245.00
Project Manager	$225.00
Associate Project Manager	$185.00
Senior Engineer IV	$250.00
Senior Engineer III	$215.00
Senior Engineer II	$170.00
Senior Engineer I	$145.00
Engineer III	$130.00
Engineer II	$115.00
Engineer I	$100.00
Technical Lead	$275.00
Senior Software Developer III	$220.00
Senior Software Developer II	$185.00
Senior Software Developer I	$150.00
Software Developer II	$130.00
Software Developer I	$110.00
Project Controls Manager	$245.00
Sr Estimator/Scheduler III	$210.00
Sr Estimator/Scheduler II	$170.00
Sr Estimator/Scheduler I	$160.00
Estimator/Scheduler II	$140.00
Estimator/Scheduler I	$120.00
CAD Manager	$160.00
CAD Designer II	$120.00
CAD Designer I	$ 90.00
CAD Technician III	$100.00
CAD Technician II	$ 85.00
GIS Manager	$190.00

Position	Maximum Hourly Rate
Senior GIS Analyst III	$160.00
Senior GIS Analyst II	$130.00
Senior GIS Analyst I	$100.00
GIS Analyst II	$ 90.00
GIS Analyst I	$ 75.00
Sr Drone Operator	$160.00
Drone Operator II	$100.00
Drone Operator I	$ 90.00
Sr Field Data Collector	$110.00
Field Data Collector II	$ 95.00
Field Data Collector I	$ 75.00
Sr Geomaticist	$155.00
Sr Survey Field Data Specialist II	$ 90.00
Sr Survey Field Data Specialist I	$ 75.00
Geomaticist II	$105.00
Geomaticist I	$ 65.00
Sciences Manager	$215.00
Senior Scientist III	$180.00
Senior Scientist II	$150.00
Senior Scientist I	$125.00
Scientist III	$110.00
Scientist II	$100.00
Scientist I	$ 80.00
Senior Administrative Support	$100.00
Administrative Support	$ 85.00
Clerical Support	$ 70.00
Word Processor	$ 90.00

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, blueline 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:

Atkins North America, Inc.
200 Westlake Park Boulevard, Suite 1100
Houston, Texas 77079
Attn: Brett Sachtleben, P.E., CFM

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 $400,000.00 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. § 2271.002, 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 HCFCD_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 reproducibles, 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 reproducibles, 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 reproducibles, 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. MENEFEE
Harris County Attorney

DocuSigned by:
Emily Kunst
ED17653073344AD...

By _____
EMILY KUNST
Assistant County Attorney

HARRIS COUNTY FLOOD CONTROL DISTRICT

By _____
LINA HIDALGO
County Judge

ATTEST:

DocuSigned by:
Jennifer K. Sorenson
2208F27FDB8E465...

Jennifer K. Sorenson

Name

Vice President, Sector Manager

Title

ATKINS NORTH AMERICA, INC.

DocuSigned by:
Brett Lee Sachtleben
EFCF79B816FE413...

Brett Lee Sachtleben

Name

Division Manager

Title

APPENDIX A

1 Project Management

Based on an estimated 12-month project duration, Atkins will perform project oversight and direction of daily internal administration and project management. The project manager will complete the HCFCD Project Certification Form and submit it to the District one week ahead of the estimated invoice date. Atkins will prepare monthly invoices that include the signed Project Certification Form and updated project schedule.

Atkins will develop and implement a Project Execution Plan and Quality Assurance and Quality Control (QA/QC) Plan for the project, including detailed independent engineering reviews for key elements. Reviews will be scheduled prior to each deliverable and following the completion of technical milestones. Proof of quality control will be submitted with each corresponding deliverable that is produced throughout the duration of the study. Atkin's three-step or five-step review process will be used for quality reviews.

Atkins anticipates the following meetings for this project:

- 1 Project kickoff meeting
- 18 Coordination meetings
- 3 Stakeholder meetings
- 1 Precinct briefing
- 1 Executive briefing
- 1 Public Meeting:
  - 1 Preparation Meeting
  - 1 Rehearsal Meeting
  - 1 Public Meeting

Atkins will prepare for and attend project kickoff and monthly coordination meetings with the Project Team (up to 9 meetings) and will develop meeting agendas and provide meeting materials composed of project work maps and relevant draft information. Atkins will participate in one additional coordination conference call each month (9 months) with the District, if needed. Atkins will provide monthly meeting agendas in advance and post-meeting notes documenting discussion topics, important decisions, resulting action items, and responsibilities.

Scope details for technical workshops are discussed in tasks 300 and 400.

Atkins anticipated 3 meetings with stakeholders to share baseline condition results, benefits of proposed concepts, and to obtain stakeholder feedback. Atkins will provide data (GIS shapefiles, model results, etc.) to HCFCD and HCFCD will develop any required meeting materials.

Atkins will prepare for, attend, and present at one executive briefing. Draft and final presentations will be provided in Microsoft® PowerPoint® format for the executive briefing. Atkins will also prepare documentation of the meeting summarizing discussion topics, resulting action items and responsibilities.

Atkins will support the District with one (1) public meeting. This support includes providing analysis data to the District, attendance of one (1) preparation meeting, and attendance of one (1) rehearsal meeting. Atkins assumes that the District will be responsible for

development of exhibits for the public meeting. Atkins will provide the District with GIS data and other modeling results.

2. Baseline Condition

Atkins will develop baseline condition hydrologic and hydraulic models for the W157-00-00 watershed. The modeling for the watershed will be performed using XPSWMM 2D, as this modeling platform allows for a combined simulation of the W157-00-00 channel, lateral storm drain networks, and 2D overland flow patterns. Detailed modeling will be performed for the W157-00-00 channel and the City of Houston storm drain networks serving single-family residential subdivisions and roadways within the watershed. Although the model will account for inflows from the Westheimer Road storm drain network, as well as networks serving apartment and commercial developments, these networks will not be analyzed in detail.

The baseline models will be used to identify flooding problem areas within the watershed and will be updated under Task 300 (Improvement Concepts) and Task 400 (Alternative Analysis) to evaluate potential storm drain system and/or conveyance improvements.

A. Data Collection
Atkins will collect relevant data for the W157-00-00 to assist in the development of baseline condition modeling and improvement concepts. Atkins will collect the following from HCFCD:

- MAAPnext supporting data and models for the Buffalo Bayou watershed
- GIS database of District drainage channels and detention facilities
- Engineering and environmental reports
- LiDAR elevation data
- Pipeline and utility data
- District right-of-way (ROW)
- WEB-DST GIS data (District in-house watershed environmental baseline data)
- Aerial imagery
- Previous reports / observed flooded area locations and photos from stakeholders

It is anticipated that the configuration of underground storm drain systems will be determined from the City of Houston's Geolink HUB. Only limited collection of City of Houston construction plans will be performed.

Atkins will perform a one-day field reconnaissance to collect photos and capture information on the storm drain network and channel.

B. Initial Inventory
Atkins will develop a GIS inventory of underground storm drain components using downloaded information from the City of Houston Geolink HUB. Individual GIS shapefiles for storm drain conduits, manholes and inlets will be created. Atkins will correct the location of storm drain components based upon available aerial imagery and LiDAR. Attributes will be added to the GIS shapefiles to facilitate their import into XPSWMM.

It is assumed that the storm drain infrastructure elevations presented in the Geolink HUB have unknow datum adjustments. Atkins will make assumed adjustments to the Geolink HUB-based elevations so storm drain infrastructure elevations match reasonably with the 2018 LiDAR dataset (Geoid12B).

C. Hydrologic Modeling

A HEC-HMS hydrologic model will be created and used to develop hydrographs for input into the baseline XPSWMM model. Subbasin delineations for City of Houston storm drain networks serving single-family residential areas and roadways will have a high level of detail. For these areas, subbasins will be delineated for groups of inlets and, in some cases, for individual inlets. Private developments (commercial and multi-family residential) and the Westheimer Road storm drain network will be modeled with less detail. Atkins anticipates that the HEC-HMS model will have approximately 50 subbasins and will use MAAPnext rain-on-grid results to validate subbasin boundaries. The HEC-HMS model will use the increased rainfall depths from NOAA Atlas 14 and transformation parameters using the District's new Basin Development Factor (BDF) methodology, where applicable. Since the subbasin size used in this study will be much smaller than MAAPnext, BDF parameters will need to be validated. For 3 selected subbasins, BDF-developed time of concentration (Tc) values will be validated by manually delineating the longest flow path and calculating the Tc using estimated flow velocities. Rain on mesh simulations may also be used to validate BDF-based Tc values. Impervious values for each subbasin will be calculated using the District's impervious cover dataset that was used for MAAPnext.

Atkins will update MAAPnext HEC-RAS rain-on-grid model using NOAA Atlas 14 rainfall data to identify areas of ponding within the watershed. The analysis will simulate the 10-,4-, 2-, 1- and 0.2-percent AEP rainfall events, as well as a 2-inch rainfall event. Using the results from the analysis, Atkins will update drainage area boundaries and create a map to identify neighborhoods impacted by ponding or overflow areas.

D. Hydraulic Modeling

Atkins will develop the XPSWMM model for the W157-00-00 watershed in two steps. First, a model that simulates the 1D storm drain networks with ground surface represented using 2D mesh will be created. Topography for this model will be based on the 2018 LiDAR dataset and storm drain component configurations will be based on the configurations shown in the City of Houston Geolink HUB. The primary tasks for the storm drainage models include:

- Develop Terrain (XPTin format)
- Setup 1D storm sewer network
- Create 2D Mesh and setup 2D connections
- Develop land use (Manning's n) layer
- Apply inflow and boundary conditions
- Review model setup
- Test model sensitivity to mesh size, timestep, and stability

Once the storm drain XPSWMM model is developed, an XPWSMM model for W157-00-00 will be created. The model development will include:

- Importing the MAAPnext HEC-RAS model for W157-00-00 into XPSWMM
- Developing channel crossing geometries (2 culverts and 1 bridge)
- Defining 1D/2D connections and interfaces
- Troubleshooting and reviewing the model set up

Once the individual storm drain and W157-00-00 channel XPSWMM models are complete, they will be combined into a single XPSWMM model. The watershed XPSWMM models will be simulated with the standard 24-hour storm for the 10-, 4-, 2-, 1-, and 0.2-percent annual exceedance probability (AEP) storm events. Tailwater conditions on Buffalo Bayou (W100-00-00) for the corresponding AEP storm event will be set based on MAAPnext results. In addition, a historic event and a shorter duration event (likely a 3-Hour storm event) will be simulated.

E. Results
Atkins will summarize the results of the watershed XPSWMM model and rain-on-grid analysis. This will include:
- Exhibit defining the W157-00-00 System Capacity
- W157-00-00 Peak Flow and Stage Summary Table
- Exhibits showing storm drain conduit capacity
- Ponding depth maps

3. Improvement Concepts
Under this task Atkins will work with the District to develop a list of potential improvement concepts that can advance to a more detailed alternative analysis under Task 400.

A. Identify and Characterize Problem Areas
The results from Task 200 will be used to define problem areas throughout the watershed. We will characterize the problem areas by defining the likely cause of flooding (riverine backwater, undersized channel, lack of inlet capacity, lack of conduit capacity, lack of extreme overflow capacity, etc.).

B. Identify Constraints
Atkins will identify major potential constraints to implementing flood mitigation projects, including right-of-way limitations, potential pipeline and utility conflicts, and required intergovernmental coordination and permitting. Environmental constraints will also be identified and may include: sites with known hazardous materials, landfills, pipelines, oil and gas wells, parks, archeological and cultural resources, cemeteries, potential wetlands, threatened and endangered species, and special biological resource areas. Atkins will use District-provided GIS files to complete an environmental desktop assessment.

C. Test Improvement Benefits
The intent of this task is to estimate the effectiveness of selected flood improvement concepts using simplified means. The results will inform the development of improvement concepts and the selection of improvement alternatives to be analyzed in more detail under Task 400. Our team will perform a simplistic simulation of three improvement concepts:

- W157-00-00 conveyance improvements only
- Storm drain improvements only
- W157-00-00 conveyance improvements and storm drain improvements

The benefits that each of these concepts has in terms of reduced ponding or reduced structural flooding will be summarized in a series of exhibits.

D. BDF Testing
Atkins will test the effect that underground storm drain system improvements may have upon BDF values. Atkins will first create a single subbasin in HEC-HMS that matches the overall drainage area and impervious percentage of the W157-00-00 XPSWMM model. The BDF values (Tc &R) will be modified until the resulting HEC-HMS 10- and 1-percent AEP outflow hydrographs reasonably match the shape of the baseline XPSWMM outflow hydrographs. The same process will be performed for an XPSWMM simulation that has improved storm drain components. The BDF values of both HMS models will be compared.

E. Alternative Scoring Criteria
Atkins will work with the District to establish alternative scoring criteria. The scoring criteria will use the Harris County Bond Project Prioritization Framework as a starting point but may be updated to include additional evaluation criteria appropriate for this study. Potential additional criteria are listed below. The listed criteria, including storm frequency to evaluate against the criteria, will be expanded and refined in consultation with the District.

- Reduction in roadway length with greater than 1 foot of flooding/ponding depth
- Reduction in number of structures flooded (Structural flooding will be assumed if a floodplain touches a building footprint)
- Reduction in floodplain area

Each scoring criterion will be normalized to produce a score between 0 and 5 and given a weight so that a numerical score can be calculated for improvement alternatives. This scoring process will be documented under this task.

F. Graphical Layouts for 3 Improvement Concepts
Our team will develop graphical layouts (plan view) for up to three (3) improvement concepts. The size and configuration of improvement components will not be based upon modeling results but will be based on engineering judgement and informed by results from Task 303. The graphical layouts will be used during the Improvement Concepts Workshop and will provide a starting point for identifying improvement alternatives to be evaluated under Task 400.

G. Improvement Concepts Workshop
Atkins will hold a workshop with District staff to review baseline results, problem areas, constraints, and improvement concepts. Atkins will prepare tables and exhibits for the in-person Workshop that is anticipated to last 2 hours. From this workshop Atkins and District staff will develop up to three (3) improvement alternatives that will be evaluated in more detail under Task 400.

4. Alternative Analysis

A. Modeling
Atkins will create XPSWMM simulations of up to three (3) improvement alternatives. The alternatives will include a combination of channel improvements and storm drain system improvements, as well as detention to mitigate potential downstream impacts. The improvements will be appropriate for a feasibility study, meaning that the size, configuration and materials of various components may not be fully optimized to maximize performance and cost effectiveness.

Each alternative will be simulated for the standard 24-hour storm for the 10-, 4-, 2-, 1-, and 0.2-percent annual exceedance probability (AEP) storm events. Tailwater conditions on Buffalo Bayou (W100-00-00) for the corresponding AEP storm event will be used. Atkins will also simulate a historic event and a shorter duration event (likely a 3-hour storm event).

Tables and exhibits will be produced for each alternative to summarize its benefits in terms of channel system capacity, peak flows, peak flood stages, conduit capacity and ponding depths. Each alternative will be scored based upon the alternative scoring criteria defined under Task 305.

B. Planning-Level Construction Cost Estimates
Atkins will use District databases and cost methodology to develop planning-level construction costs estimates for each alternative. The cost estimates will include contingency (40%) and engineering and construction management costs (assumed to be 25% of construction costs).

C. Alternative Evaluation Workshop
Atkins will hold a workshop with District staff to review the alternative evaluation modeling results, cost estimates, and scoring. Atkins will prepare tables and exhibits for the in-person Workshop that is anticipated to last 2 hours. From this workshop Atkins and District staff will develop suggest modifications to alternatives and provide input on the Recommended Alternative.

D. Recommended Alternative
Atkins anticipates that minor updates to alternatives will result from the Alternative Evaluation Workshop. Atkins will update the modeling, layouts and construction cost estimates based upon District comments. Once complete, Atkins will put forward one alternative as the Recommended Alternative.

5. Report

A final report will be prepared that documents through text, tables and exhibits, the assumptions, methodology and results of the Baseline Conditions, Improvement Concepts and Alternative Analysis tasks.

6. 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 ATKINS NORTH AMERICA, 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	☐	☐	☐
NAYS:	Comm. Rodney Ellis	☐	☐	☐
ABSTENTIONS:	Comm. Adrian Garcia	☐	☐	☐
	Comm. Tom S. Ramsey, P.E.	☐	☐	☐
	Comm. R. Jack Cagle	☐	☐	☐

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 drainage improvements and mitigation on HCFCD Unit W157-00-00 and its tributaries, hereinafter called the "Project"; and

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

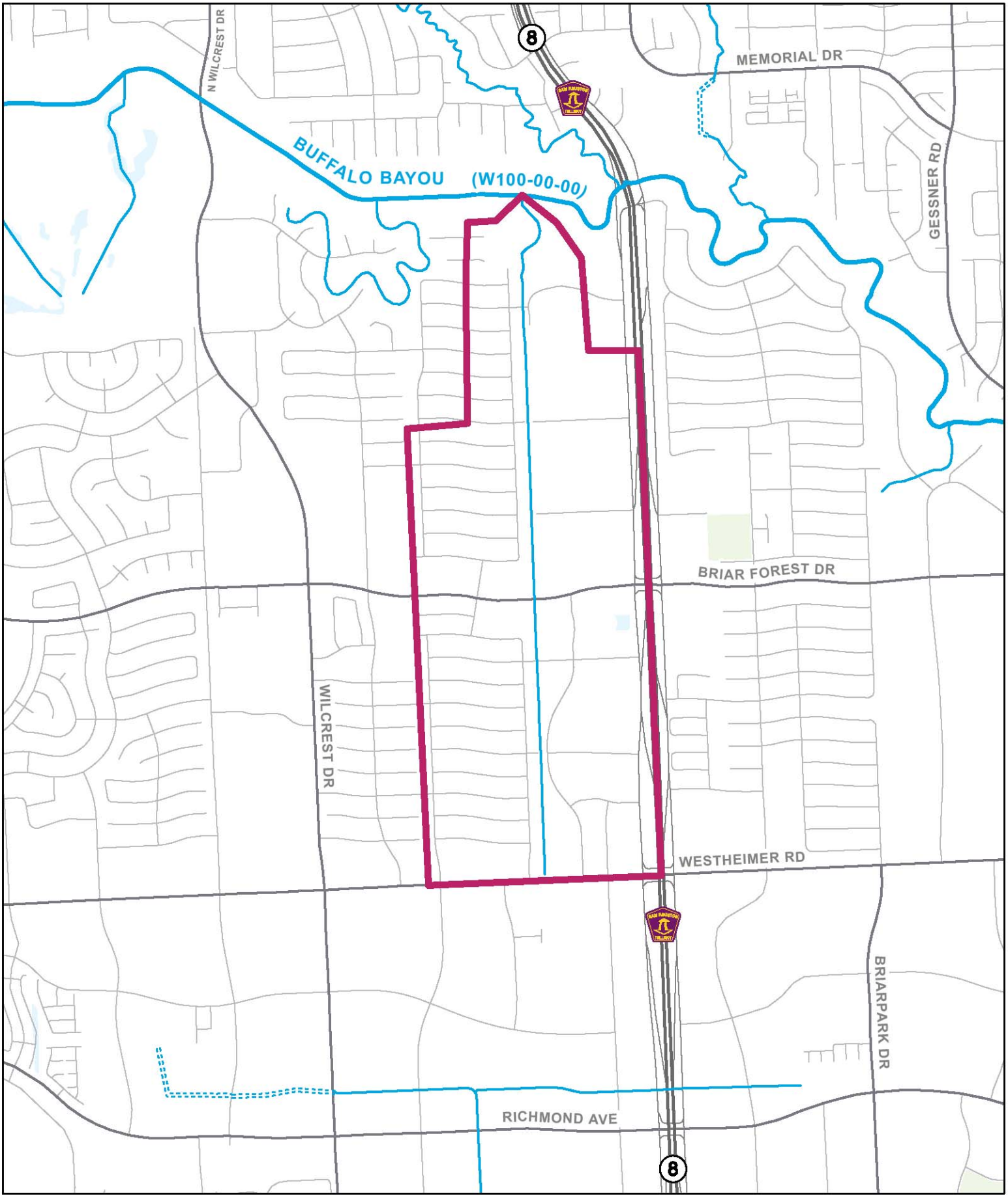
WHEREAS, the Engineer represents that it is capable and qualified to perform the various services that may be required.

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 Atkins North America, Inc., for a fee to be paid by the District of $400,000.00, said Agreement being incorporated herein by reference for all purposes as though fully set forth verbatim herein.



HARRIS COUNTY FLOOD CONTROL DISTRICT

Project ID: W157-00-00-P001

Watershed: Buffalo Bayou

Precinct: 4

Project Boundary

Harris County Precincts

Judge Lina Hidalgo

1 - Rodney Ellis

2 - Adrian Garcia

3 - Tom S. Ramsey,P.E.

4 - R. Jack Cagle

Map Extent

5/13/2022