INFORMATIONAL MEMORANDUM

TO: **Transportation and Infrastructure Services Committee**
FROM: **Hari Ponnekanti, Public Works Director/ City Engineer**
BY: **Joshua Hopkins, Surface Water Project Manager**
CC: **Mayor Allan Ekberg**
DATE: **August 12, 2022,**
SUBJECT: **S. 131st Place Drainage Improvement Project**
Project No. 91641204
Engineering and Design Consultant Selection and Agreement

ISSUE

Approve a contract with PACE Engineers to provide engineering and design services for the S 131st Place Drainage Improvement Project in the amount of $371,610.00.

BACKGROUND

The S. 131st Place Drainage Improvement Project was established as a City CIP project in 2019. The primary goals of this project are to address local flooding of roadway and adjacent private properties and address upstream issues that contribute to flooding, water quality concerns and present fish barriers and habitat degradation. This contract will consist of two parts: 1) Part A will be to develop a permitted design for a fish-passable culvert beneath S. 131st Place and associated stream and/or roadway improvements that will improve stream flow, alleviate flooding, and eliminate barriers to fish migration; 2) Part B will entail an assessment and analysis of the Southgate Creek basin for the purpose of identifying future surface water improvement projects that will reduce downstream flooding, eliminate the need for regulated dredging activities, improve water quality, reduce undesirable erosion, and improve stream flow alignments and/or conditions to benefit fish passage and habitat.

ANALYSIS

A Request for Proposals (RFP) for engineering and design services was advertised in the Daily Journal of Commerce and Seattle Times. PACE Engineer's proposal was reviewed and scored according to predefined criteria by a selection committee. PACE's proposal scored high among committee members. The City has contracted with PACE Engineers for engineering and design services for numerous projects in the past with good results. Staff have had positive experience and continue to be very satisfied with PACE's work.

FISCAL IMPACT

PACE has provided a cost estimate not to exceed $371,610.00 to perform engineering and design services for the S 131st Place Drainage Improvements Project. The project CIP design budget is $150,000.00 and the City has secured $120,083.00 in grant funding from the King County Flood Control District. If awarded, the remaining $101,527.00 could be funded by a pending grant of $300,000.00 or the Surface Water (412) utility fund.

	Cost Estimate	Fund Source	2021-2023 Design Budget
Design Contract	$ 371,610.00	Project CIP	$ 150,000.00
		Grant Funding	120,083.00
		412 Fund/Grant	101,527.00
Total	**$ 371,610.00**		**$ 371,610.00**

RECOMMENDATION

Council is being asked to approve a consultant agreement with PACE Engineers in the amount of $371,610.00 for engineering and design services for the S. 131st Place Drainage Improvement project and consider this item on the Consent Agenda at the August 22, 2022, Special Council Meeting.

Attachments: 2021 CIP, page 89
Consultant Agreement & Exhibits

CITY OF TUKWILA CAPITAL PROJECT SUMMARY

2021 to 2026

PROJECT: **S 131st Place Drainage Improvements** Project No. 91641204

DESCRIPTION: Design and replace an existing 36" culvert under S. 131st Pl. Raise the roadway approximately 18" and/or provide a concrete wall or other means to keep Southgate Creek within its banks during storm events.

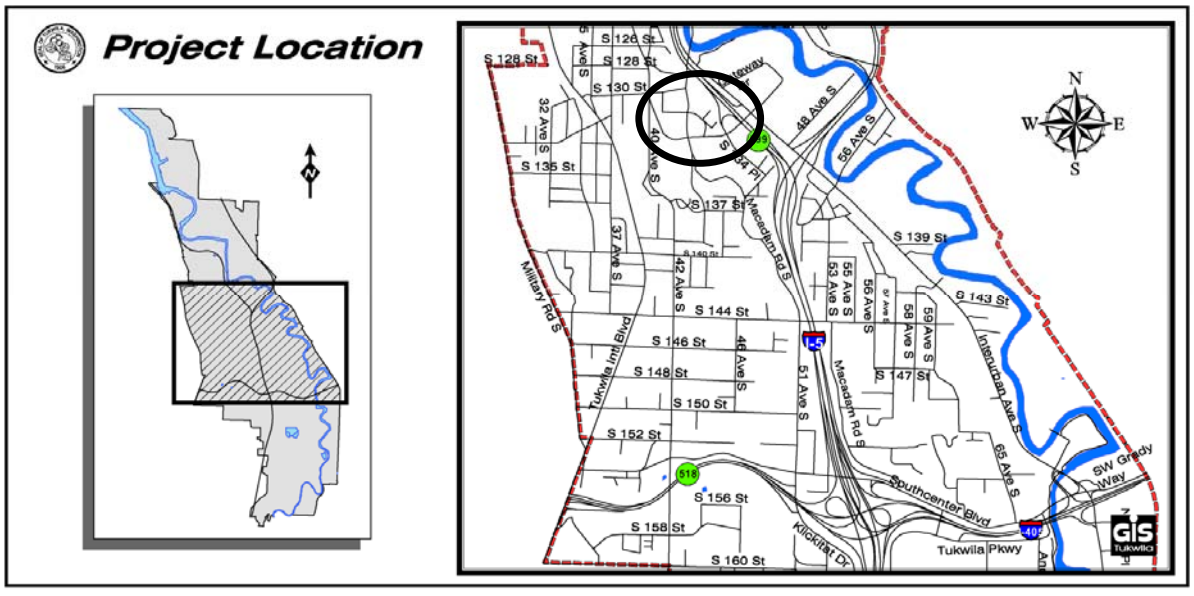
JUSTIFICATION: Southgate Creek overtops its bank several times per year during storm events and runs through private property. Debris is deposited within a private driveway and storm system.

STATUS: Maintenance is performed annually on the creek to remove excess sedimentation to reduce the likelihood of flooding.

MAINT. IMPACT: Reduce the frequency of stream sediment removal and storm cleanup.

COMMENT: Project will require an HPA. Will consider combining with a future overlay project to reduce overall costs. A grant request for $200K was submitted to the KCFCD in 2020.

FINANCIAL (in $000's)	Through 2019	Estimated 2020	2021	2022	2023	2024	2025	2026	BEYOND	TOTAL
EXPENSES										
Design		100	150							250
Land (R/W)										0
Const. Mgmt.				150						150
Construction				850						850
TOTAL EXPENSES	**0**	**100**	**150**	**1,000**	**0**	**0**	**0**	**0**	**0**	**1,250**
FUND SOURCES										
Awarded Grant										0
Proposed Grant			100	150						250
Mitigation Actual										0
Mitigation Expected										0
City Oper. Revenue	0	100	50	850	0	0	0	0	0	1,000
TOTAL SOURCES	**0**	**100**	**150**	**1,000**	**0**	**0**	**0**	**0**	**0**	**1,250**



City of Tukwila

6200 Southcenter Boulevard, Tukwila WA 98188

Contract Number:

PROFESSIONAL SERVICES AGREEMENT

(Includes consultants, architects, engineers, accountants, and other professional services)

THIS AGREEMENT is entered into between the City of Tukwila, Washington, hereinafter referred to as "the City", and _Pace Engineers, Inc._, hereinafter referred to as "the Consultant", in consideration of the mutual benefits, terms, and conditions hereinafter specified.

1. **Project Designation.** The Consultant is retained by the City to perform _engineering and design services in connection with the project titled _S. 131st St. Drainage Improvements_.

2. **Scope of Services.** The Consultant agrees to perform the services, identified on Exhibit "A" attached hereto, including the provision of all labor, materials, equipment and supplies.

3. **Duration of Agreement; Time for Performance.** This Agreement shall be in full force and effect for a period commencing upon execution and ending _December 31, 2023_, unless sooner terminated under the provisions hereinafter specified. Work under this Agreement shall commence upon written notice by the City to the Consultant to proceed. The Consultant shall perform all services and provide all work product required pursuant to this Agreement no later than _December 31, 2023_ unless an extension of such time is granted in writing by the City.

4. **Payment.** The Consultant shall be paid by the City for completed work and for services rendered under this Agreement as follows:

   A. Payment for the work provided by the Consultant shall be made as provided on Exhibit "B" attached hereto, provided that the total amount of payment to the Consultant shall not exceed _$371,610.00_ without express written modification of the Agreement signed by the City.

   B. The Consultant may submit vouchers to the City once per month during the progress of the work for partial payment for that portion of the project completed to date. Such vouchers will be checked by the City and, upon approval thereof, payment shall be made to the Consultant in the amount approved.

   C. Final payment of any balance due the Consultant of the total contract price earned will be made promptly upon its ascertainment and verification by the City after the completion of the work under this Agreement and its acceptance by the City.

   D. Payment as provided in this section shall be full compensation for work performed, services rendered, and for all materials, supplies, equipment and incidentals necessary to complete the work.

   E. The Consultant's records and accounts pertaining to this Agreement are to be kept available for inspection by representatives of the City and the state of Washington for a period of three (3) years after final payments. Copies shall be made available upon request.

5. **Ownership and Use of Documents.** All documents, drawings, specifications and other materials produced by the Consultant in connection with the services rendered under this Agreement shall be the property of the City whether the project for which they are made is executed or not. The Consultant shall be permitted to retain copies, including reproducible copies, of drawings and specifications for information, reference and use in connection with the Consultant's endeavors. The Consultant shall not be responsible for any use of the said documents, drawings, specifications or other materials by the City on any project other than the project specified in this Agreement.

6. **Compliance with Laws.** The Consultant shall, in performing the services contemplated by this Agreement, faithfully observe and comply with all federal, state, and local laws, ordinances and regulations, applicable to the services rendered under this Agreement.

7. **Indemnification.** The Consultant shall defend, indemnify and hold the City, its officers, officials, employees and volunteers harmless from any and all claims, injuries, damages, losses or suits including attorney fees, arising out of or resulting from the acts, errors or omissions of the Consultant in performance of this Agreement, except for injuries and damages caused by the sole negligence of the City.

   Should a court of competent jurisdiction determine that this Agreement is subject to RCW 4.24.115, then, in the event of liability for damages arising out of bodily injury to persons or damages to property caused by or resulting from the concurrent negligence of the Consultant and the City, its officers, officials, employees, and volunteers, the Consultant's liability hereunder shall be only to the extent of the Consultant's negligence. It is further specifically and expressly understood that the indemnification provided herein constitutes the Consultant's waiver of immunity under Industrial Insurance, Title 51 RCW, solely for the purposes of this indemnification. This waiver has been mutually negotiated by the parties. The provisions of this section shall survive the expiration or termination of this Agreement.

8. **Insurance.** The Consultant shall procure and maintain for the duration of the Agreement, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Consultant, its agents, representatives, or employees. Consultant's maintenance of insurance as required by the agreement shall not be construed to limit the liability of the Consultant to the coverage provided by such insurance, or otherwise limit the City's recourse to any remedy available at law or in equity.

   A. **Minimum Amounts and Scope of Insurance.** Consultant shall obtain insurance of the types and with the limits described below:

      1. Automobile Liability insurance with a minimum combined single limit for bodily injury and property damage of $1,000,000 per accident. Automobile Liability insurance shall cover all owned, non-owned, hired and leased vehicles. Coverage shall be written on Insurance Services Office (ISO) form CA 00 01 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage.

      2. Commercial General Liability insurance with limits no less than $2,000,000 each occurrence, $2,000,000 general aggregate. Commercial General Liability insurance shall be at least as broad as ISO occurrence form CG 00 01 and shall cover liability arising from premises, operations, stop-gap independent contractors and personal injury and advertising injury. The City shall be named as an additional insured under the Consultant's Commercial General Liability insurance policy with respect to the work performed for the City using an additional insured endorsement at least as broad as ISO endorsement form CG 20 26.

      3. Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington.

4. Professional Liability with limits no less than $2,000,000 per claim and $2,000,000 policy aggregate limit. Professional Liability insurance shall be appropriate to the Consultant's profession.

B. **Public Entity Full Availability of Contractor Limits.** If the Contractor maintains higher insurance limits than the minimums shown above, the Public Entity shall be insured for the full available limits of Commercial General and Excess or Umbrella liability maintained by the Contractor, irrespective of whether such limits maintained by the Contractor are greater than those required by this Contract or whether any certificate of insurance furnished to the Public Entity evidences limits of liability lower than those maintained by the Contractor.

C. **Other Insurance Provision.** The Consultant's Automobile Liability and Commercial General Liability insurance policies are to contain, or be endorsed to contain that they shall be primary insurance with respect to the City. Any Insurance, self-insurance, or insurance pool coverage maintained by the City shall be excess of the Consultant's insurance and shall not be contributed or combined with it.

D. **Acceptability of Insurers.** Insurance is to be placed with insurers with a current A.M. Best rating of not less than A:VII.

E. **Verification of Coverage.** Consultant shall furnish the City with original certificates and a copy of the amendatory endorsements, including but not necessarily limited to the additional insured endorsement, evidencing the insurance requirements of the Contractor before commencement of the work. Upon request by the City, the Consultant shall furnish certified copies of all required insurance policies, including endorsements, required in this Agreement and evidence of all subcontractors' coverage.

F. **Notice of Cancellation.** The Consultant shall provide the City with written notice of any policy cancellation, within two business days of their receipt of such notice.

G. **Failure to Maintain Insurance.** Failure on the part of the Consultant to maintain the insurance as required shall constitute a material breach of contract, upon which the City may, after giving five business days notice to the Consultant to correct the breach, immediately terminate the contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the City on demand, or at the sole discretion of the City, offset against funds due the Consultant from the City.

9. **Independent Contractor.** The Consultant and the City agree that the Consultant is an independent contractor with respect to the services provided pursuant to this Agreement. Nothing in this Agreement shall be considered to create the relationship of employer and employee between the parties hereto. Neither the Consultant nor any employee of the Consultant shall be entitled to any benefits accorded City employees by virtue of the services provided under this Agreement. The City shall not be responsible for withholding or otherwise deducting federal income tax or social security or for contributing to the state industrial insurance program, otherwise assuming the duties of an employer with respect to the Consultant, or any employee of the Consultant.

10. **Covenant Against Contingent Fees.** The Consultant warrants that he has not employed or retained any company or person, other than a bonafide employee working solely for the Consultant, to solicit or secure this contract, and that he has not paid or agreed to pay any company or person, other than a bonafide employee working solely for the Consultant, any fee, commission, percentage, brokerage fee, gifts, or any other consideration contingent upon or resulting from the award or making of this contract. For breach or violation of this warrant, the City shall have the right to annul this contract without liability, or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

11. **Discrimination Prohibited.** Contractor, with regard to the work performed by it under this Agreement, will not discriminate on the grounds of race, religion, creed, color, national origin, age, veteran status, sex, sexual orientation, gender identity, marital status, political affiliation, the presence of any disability, or any other protected class status under state or federal law, in the selection and retention of employees or procurement of materials or supplies.

12. **Assignment.** The Consultant shall not sublet or assign any of the services covered by this Agreement without the express written consent of the City.

13. **Non-Waiver.** Waiver by the City of any provision of this Agreement or any time limitation provided for in this Agreement shall not constitute a waiver of any other provision.

14. **Termination.**

    A. The City reserves the right to terminate this Agreement at any time by giving ten (10) days written notice to the Consultant.

    B. In the event of the death of a member, partner or officer of the Consultant, or any of its supervisory personnel assigned to the project, the surviving members of the Consultant hereby agree to complete the work under the terms of this Agreement, if requested to do so by the City. This section shall not be a bar to renegotiations of this Agreement between surviving members of the Consultant and the City, if the City so chooses.

15. **Applicable Law; Venue; Attorney's Fees.** This Agreement shall be subject to, and the Consultant shall at all times comply with, all applicable federal, state and local laws, regulations, and rules, including the provisions of the City of Tukwila Municipal Code and ordinances of the City of Tukwila. In the event any suit, arbitration, or other proceeding is instituted to enforce any term of this Agreement, the parties specifically understand and agree that venue shall be properly laid in King County, Washington. The prevailing party in any such action shall be entitled to its attorney's fees and costs of suit. Venue for any action arising from or related to this Agreement shall be exclusively in King County Superior Court.

16. **Severability and Survival.** If any term, condition or provision of this Agreement is declared void or unenforceable or limited in its application or effect, such event shall not affect any other provisions hereof and all other provisions shall remain fully enforceable. The provisions of this Agreement, which by their sense and context are reasonably intended to survive the completion, expiration or cancellation of this Agreement, shall survive termination of this Agreement.

17. **Notices.** Notices to the City of Tukwila shall be sent to the following address:

    City Clerk
    City of Tukwila
    6200 Southcenter Boulevard
    Tukwila, WA 98188

    Notices to Consultant shall be sent to the following address:

    Pace Engineers
    11255 Kirkland Way, Suite 300
    Kirkland, WA 98033

18. **Entire Agreement; Modification.** This Agreement, together with attachments or addenda, represents the entire and integrated Agreement between the City and the Consultant and supersedes all prior negotiations, representations, or agreements written or oral. No amendment or modification of this Agreement shall be of any force or effect unless it is in writing and signed by the parties.

DATED this _____ day of _____, 20_____.

CITY OF TUKWILA

_____

Allan Ekberg, Mayor

CONSULTANT

By: _____

Printed Name: Ken Nilsen, PE

Title: Executive Vice President

Attest/Authenticated:

_____

City Clerk, Christy O'Flaherty

Approved as to Form:

_____

Office of the City Attorney

August 10, 2022

City of Tukwila
6300 Southcenter Boulevard, Suite 200
Tukwila, WA 98188
Attn: Joshua Hopkins, Surface Water Project Manager

Scope of Services
Professional Civil Engineering Services
South 131st Place Drainage Improvement Project

Project Understanding

The City of Tukwila would like to improve the Southgate Creek crossing of South 131st Street, along with a portion of the stream that is currently subject to routine flooding. The stream currently runs parallel to South 131st Street in a dug channel which accumulates sediments and requires periodic dredging. The existing culvert runs northwest beneath the roadway. The creek overtops South 131st Street during storm events flooding the street and a private access road belonging to NorMed.

The project consists of two components to be worked on simultaneously. Part A is to develop a permitted bid-ready design for a fish-passable culvert beneath South 131st St and associated stream and/or roadway improvements that will improve stream flow, alleviate flooding, and eliminate barriers to fish migration. Part B is an assessment and analysis of the Southgate Creek basin for the purpose of determining hydrology and identifying future surface water improvement projects that will reduce downstream flooding and sedimentation. The hydrologic modeling and stormwater analysis portion of the Part B Basin Study will occur early in the project and will feed into the hydraulic modeling portion of Part A. Sequencing the basin stormwater modeling prior to the other portion of the basin study will allow for calibration of the model and develop a higher level of confidence in recreating the existing flow conditions in Southgate Creek.

Scope of Work

A detailed proposal consisting of fifteen (14) tasks follows. This proposal includes necessary civil, environmental, survey, structural, and geotechnical services through the design phase of this project. Construction administration and bid assistance is not included in this scope of work and can be reassessed at a later time based on the City's needs.

PACE will be the prime consultant for the entire Scope of Work and will oversee and administer all work on the project. PACE will complete all civil and survey in-house and will subcontract with GeoEngineers for geotechnical evaluations and permitting services.

Task 1 –Project Management

PACE will provide administration and coordination for both Part A and part B of this project. The following items are included in this task:

1. Regular biweekly coordination and update meetings will be held with the City via Teams. Major design review meetings can be held in-person or remotely as required. The following major review meetings are anticipated:
    a) Conceptual Alternatives Design Review
    b) 30% Design Development Review
    c) 60% Design Development Review
    d) 90% Design Development Review
2. Review existing information provided by the City – as-builts, maintenance records, etc.
3. Coordinate with subconsultants.
4. In-house project administration, scheduling, and direction of design team staff.

Task 2 – Part A: Topographic Survey

PACE will provide a topographic stream and boundary survey showing all locatable utilities and surface conditions, environmental constraints, right-of-way, and other relevant items along Southgate Creek and at the South 131st Street crossing. Full stream and wetland survey will extend 300 feet downstream of the existing South 131st Street crossing and upstream along both Southgate Creek tributary channels to South 133rd Street. A channel centerline survey will extend to down to Southgate Creek's confluence with the Duwamish River including the SR 599 crossing, a private access road crossing, and the outlet tide gate.

The following items are included in this task:

a) Develop survey limits.
b) Research and confirm primary control points for use on the project.
c) Establish horizontal and vertical control work points along the route.
d) Survey the stream corridor locating surface improvements, types of material, and changes in elevation.
e) All identifiable underground utilities will be surveyed along South 131st Street that will be impacted by the culver replacement. Utility locations will be based on surface indications, radio frequency locating and readily available maps from the service provider.
f) The rights of way and adjoining properties will be calculated from record information and recovered monuments.
g) The survey/base map will be prepared in AutoCAD® at a scale of 1" = 20', showing the rights of way and lot lines, two-foot contours, and surveyed features. Other features from City GIS data (sensitive areas, setbacks, etc. will may be included to augment the survey).

PACE will provide the City with AutoCAD® files, DEM, and pdf of the basemap.

Task 3 – Part A: Conceptual Alternatives Design for Fish-Passable Crossing

Based on a site assessment and the topographic survey, PACE will prepare up to three conceptual alternatives for the South 131st Street crossing and associated stream improvements for City review and comment. The alternatives will present options and address the following items, as well as any specific items requested by the City:

- The need of property acquisition
- The project extents and grading limits

- Roadway impacts

The following items are included in this task:

a) Site visit to the South 131st Street crossing area to collect stream data
b) Preliminary layouts for the three conceptual designs
c) Pro/con list and high-level cost benefit for each alternative

Task 4 – Part B: Basin Analysis and Stormwater Modelling

This task consists of a desktop analysis of Southgate Creek basin to establish runoff volumes of individual sub-basin areas and existing flow paths leading to the South 131st St crossing. The task includes the following items:

a) Review of all exiting stormwater infrastructure data in Southgate Creek basin including GIS data, as-builts, past watershed reports.
b) Basin delineation using LiDAR and stormwater network data, the number and size of subbasins will depend on the density of the flow paths and pipe network. All significant flow paths will be captured in the stormwater model.
c) Landcover and impervious area will be delineated form publicly available datasets and aerial imaging and combined with USDA NRCS soil data to calculate rainfall runoff modeling parameters.
d) A continuous simulation MGSFlood stormwater model will use the SEATAC long-term rainfall record to calculate all statistical peak flow estimates (Q2 – Q500)
e) Calibration of the MGSFlood will be based on the date of known storm events where flooding occurred ie. roadway overtopping.

Task 5 – Part A: Hydraulic Design Report and Schematic Design (30 % design)

After the preferred alternative and project extents are established, PACE will build an existing model & proposed condition hydraulic model and write up a basis of design report to establish how the project will mitigate flooding, meet fish passage requirements, and maintain structure resiliency. The Hydraulic Design Report will cover coordination with WSDOT on SR 599 plans and how the proposed project will function with future downstream improvements. Hydraulic modeling will be performed using the United States Bureau of Reclamation's SRH-2D computer program, a FEMA approved two-dimensional (2D) hydraulic and sediment transport numerical model. Model results will inform multiple aspects of the crossing design including the structure size, streambed design, and scour.

In conjunction with the report and modeling PACE will develop the 30% schematic design of the proposed crossing. The task includes the following components.

a) Site assessment results
b) Existing geomorphology
c) Hydrology method and results
d) Existing and proposed modeling and analysis
e) WSDOT coordination
f) Channel and crossing designs
g) Streambed design
h) Restoration components

i) Scour analysis
j) 30% design sheets

Task 6 – Part A: Geotechnical Evaluation

GeoEngineers will provide a geotechnical evaluation of the site. This evaluation will include up to two soil borings to depths of 40 feet below existing ground surface in the vicinity of proposed crossing structure and prepare a geotechnical design memorandum (see the attached Scope of Work from Geoengineers for more details on the geotechnical evaluation).

Task 7 – Part A: Design Development Plans (60% Plans, Specifications and Estimates)

Based on City comments on the 30% design, PACE will prepare Design Development Plans (60%) of the South 131st Street crossing and included stream improvements. We will also prepare an outline of the specifications and prepare an estimate of probable construction costs for City review and comment. This work includes:

a) Design of the stream alignment
b) Design of the proposed channel geometry
c) Design of the roadway elevation and alignment
d) Design of any large wood or other restoration features
e) Outline of the proposed specifications using WSDOT format
f) Prepare budget-level construction cost estimate

Task 8 – Part A: Easement Preparation and Acquisition

It is assumed that the project will require 3 permanent or temporary construction easements. PACE will prepare, coordinate with impacted property owners for signature and record all successfully secured easements. It is assumed that an appraisal is not required for this work and the City will secure any required Title Reports. If more than 3-easements are required, PACE will utilize the Management Reserve Fund as directed by the City.

Task 9 – Part A: Permitting

GeoEngineers and PACE will coordinate with the required permitting agencies and prepare all necessary permit applications. This task will be initiated as early as possible in the design process, based on the 60% design plans. The City will initiate coordination with permitting agencies earlier in the project to establish a relationship. The project is assumed to qualify for a streamlined permit process utilizing the Fish Habitat Enhancement Hydraulic Project Approval (FHE-HPA) process. GeoEngineers will lead the baseline critical areas assessment, environmental documentation, agency/tribal outreach and permit submittal processes. GeoEngineers and PACE will collaborate on permit application materials, as outlined in the attached Scope of Work from Geoengineers.

Task 10 – Part A: Public Involvement

PACE will assist the City with a public outreach to solicit comments on the design if required. This includes preparing materials for soliciting feedback from nearby and affected property owners. The task assumes preparation and attending one community meeting if deemed necessary. The City will be responsible for providing contact information for the businesses in the project vicinity. If a community meeting is held

the City will be responsible for setting up the meeting time and location and notifying the businesses. PACE will organize any feedback received and prepare a written summary.

Task 11 – Part B: Basin Planning

Using data from the stormwater model and coordination with City staff PACE will identify problem areas or areas of opportunity for improvement within the Southgate Creek Basin. PACE will conduct a site visit to upstream areas to assess the potential and effectiveness of future surface water improvement projects outside of the restoration proposed in Part A. Improvements will aim to

- Improve water quality
- Reduce any flooding that may be identified
- Reduce undesirable erosion
- Improve fish passage and habitat

Tasks Include:

a) Developing a list of potential treatments or solutions
b) Conduct a site visit to identified potential improvement locations
c) Preparing a Tech Memo summarizing the basin stormwater modeling results as well as proposed improvements including a project description, sketch and preliminary cost estimate

Task 12 – Part A: Construction Document Development (90% Plans, specifications and estimates)

PACE will provide construction level documents based upon City comments from the 60% plan review. At this stage PACE will also develop complete project specifications utilizing contract documents and general provisions from past City projects. Any specific technical specifications will be created as needed. PACE anticipates the project will bid as one schedule and that the bid documents will be based on the most recent Washington State Department of Transportation "Standard Specifications for Road, Bridge and Municipal Construction". It is assumed that the City's review of these documents will be limited to two reviews and two set of revisions to get the documents "bid-ready".

Task 13 - QA (Quality Assurance)

In order to assure that the final plans and specifications are complete, accurate and appropriate, PACE will conduct a quality assurance review of the documents prior to each submittal to the City. The review will consist of a complete sheet-by-sheet and contract document review to assure the City that the documents meet the standard level of care of our industry.

Task 14 – Management Reserve Fund

If directed by the City, PACE will provide services needed to assist the City with tasks related to this project that were not specifically addressed in this scope of work. When requested by the City, PACE will provide a scope and budget for the task identified by the City. PACE will not proceed with the task until written authorization has been provided by the City.

PROJECT COSTS

The costs associated with the above-described work is shown on the attached spreadsheet.

PACE Engineers

Project Budget Worksheet - 2022 Washington Standard Rates

Project Name	S 131st Place Drainage Improvement Project		Location:	Tukwila, WA	Prepared By:	SAS, KHN
Project #:	P22-103	Billing Group #:		Task #:	Date:	8/9/2022

		Labor Hours by Classification														
Staff Type # (See Labor Rates Table)	Code	1	11	15	17	34	74	19	26	40	41	58	45	118		
Staff Type Hourly Rate		$255	$222	$170	$132	$158	$145	$195	$145	$222	$210	$222	$158	$132		
Drawing/Task Title	Job Title	Sr. Principal Engineer	Sr. Project Manager	Sr. Engineer	Engineer I	Planner III	CAD Tech III	Sr. Structural Engineer	Designer III	Sr. Principal Surveyor	Principal Surveyor	Two-Person Crew	Sr. Survey Tech	Sr. Project Administrator	Hour Total	Dollar Total
Task 1 - Project Management																
Coordination and Review Meetings		4	16	8											28.0	$5,932
Team Coord incl subs/invoicing		4	16												20.0	$4,572
Task 2- Topographic Survey			1	2						1	13	94	46		157.0	$31,650
Task 3 - Alternatives Design		1	2												3.0	$699
Site Visit			8	8	8	8									32.0	$5,456
Coneptual designs/prelim cost est		2	8	16	16		24								66.0	$10,598
Task 4 - Basin Analysis and Stormwater Modelling																
Basin Deliniation			2	6	8										16.0	$2,520
Model inputs			2	6	16										24.0	$3,576
MGSFlood Model			2	10	12										24.0	$3,728
Task 5 - Hydraulic Design Report and 30% Design		6	8	8										4	26.0	$5,194
Hydraulic Design Report			8	24	30	30									92.0	$14,556
Design Sheets			2	24	8	4	40								78.0	$12,012
Task 6 - Geotechnical Evaluation			2	2											4.0	$784
Task 7 - 60% Plans		2	6	24	16		40	4	10						102.0	$16,064
Specifications		2	8		8									16	34.0	$5,454
Cost Estimates		1	2	6	6										15.0	$2,511
Task 8 - Easement Preparation and Acquisition		2	4	12			10				24				52.0	$9,928
Task 9 - PACE Permitting Support		1	4	8		8	12								33.0	$5,507
Task 10 - Public Involvement		1	8	8		24									41.0	$7,183
Task 11 - Basin Planning		1	10	30	30	40	16								127.0	$20,175
Task 12 - Construction Documents		4	8	24	48		64	24	35					16	223.0	$34,359
Task 13 - QA		8	16					4							28.0	$6,372
Task 14 - Management Reserve Fund																$25,000
Hours Total		39.0	143.0	226.0	206.0	114.0	206.0	32.0	45.0	1.0	37.0	94.0	46.0	36.0	1225.0	
Labor Total		$9,945	$31,746	$38,420	$27,192	$18,012	$29,870	$6,240	$6,525	$222	$7,770	$20,868	$7,268	$4,752		$233,830.00

Please note this project is budgeted as a whole and not by task.

Expenses	rate/unit	Reimbursable Quantity	Reimbursable Cost
Postage/Courier			
Printing Costs			
Mileage/Travel/Per Diem			
Miscellaneous			$500.00
		Total	$500.00

Subconsultants	
Utility Locate	$3,500
Geotechnical Engineer	$24,800
Cultural / Environmental / Permitting	$42,500
Wetland Contengency	$54,000
Subconsultant Subtotal	$124,800
Markup	10%
Total	$137,280.00

PACE Billed Labor Total	$233,830.00
Reimbursable Expenses	$500.00
Subconsultants	$137,280.00
Total Project Budget	**$371,610.00**

GeoEngineers
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

August 5, 2022

PACE Engineers, Inc.
11255 Kirkland Way, Suite 300
Kirkland, Washington 98033

Attention: Shane Sheldon, PE

Subject: Proposal
Geotechnical Engineering and Environmental Permitting Services
South 131st Place Drainage Improvements Project
Tukwila, Washington
File No. 0259-061-00

INTRODUCTION

Thank you for the opportunity to provide this proposal for geotechnical engineering and environmental permitting services in support of the South 131st Place Drainage Improvements Project in Tukwila, Washington. Our understanding of the requested services is based on email correspondence with you on July 18, 2022. We understand that our services are requested in support of Part A of the project, which includes replacement of the existing culvert conveying Southgate Creek under South 131st Place with a fish-passable crossing. At this time, our proposal does not address Part B of the project, which is a drainage study of the Southgate Creek basin. This proposal also does not address construction-phase support, which can be included in a future scope of work and/or contract amendment.

SCOPE OF SERVICES

Our proposed scope of services is split into two (2) tasks, one (1) addressing geotechnical engineering and the other environmental permitting. Task numbering follows the prime scope provided to GeoEngineers.

Task 6. Geotechnical Engineering

The purpose of our geotechnical services to review available information and explore subsurface conditions as a basis for developing geotechnical recommendations for the proposed Southgate Creek culvert crossing.

Subtask 6.1 – Field Explorations and Laboratory Testing

- Review readily available published geologic data and our relevant in-house files for existing information on subsurface conditions in the project vicinity.
- Apply for and secure a Right-of-Way (ROW) Use Permit from the City of Tukwila (City) for the work to be completed along South 131st Place. Coordinate driller and traffic control subcontractors.
- Visit the project site to mark out the preliminary exploration locations and contact the Washington State Utility Notification Center, as required by Washington State law. GeoEngineers, Inc. (GeoEngineers) will not be liable for damage to underground utilities that are not marked during the utility locating process.
- Explore subsurface conditions by advancing up to two soil borings to depths of 40 feet below existing ground surface (for a total drill footage of 80 feet) using subcontracted equipment and operators. Our field representative will continuously monitor the drilling activities, maintain a log of subsurface conditions and collect representative soil samples at 2.5- to 5-foot intervals.
- Conduct geotechnical laboratory testing on selected soil samples. We anticipate laboratory testing will include particle-size gradation analyses and moisture content determinations.

Subtask 6.2 – Provide Geotechnical Design Recommendations

- Provide a discussion of soil and groundwater conditions encountered in our explorations.
- Provide the Seismic Site Class in accordance with the *2020 American Association of State Highway and Transportation Officials Load and Resistance Factor Design Bridge Design Specifications* (AASHTO LRFD) criteria and discuss our opinion on the potential for surface rupture, liquefaction and lateral spreading at the site. Based on our experience with similar projects, we have limited the scope of our liquefaction analysis to simplified empirical methods addressing only the depths explored; advanced liquefaction analysis methods (such as effective stress analysis or numerical modeling) are not included in our scope at this time. If simplified analysis methods indicate a liquefaction risk that may cause significant damage to the structure, it may be appropriate to perform a more detailed evaluation at a later date.
- Provide recommendations for site preparation and earthwork. We will discuss temporary erosion and sedimentation controls, temporary and permanent slopes, estimated stripping and clearing depths, fill placement and compaction requirements, suitability of on-site material for use as structural fill, import fill requirements, wet weather considerations, groundwater handling and dewatering, and site drainage.
- Provide design recommendations for shallow foundations for culvert support in accordance with AASHTO LRFD guidelines. We will provide bearing surface preparation recommendations, including over excavation and replacement, if necessary, minimum recommended size, bearing resistances, and passive soil pressures and friction for resisting lateral loads.
- Provide recommended active, passive and at-rest lateral earth pressures for the culvert and associated wingwalls in accordance with AASHTO LRFD guidelines. We will also provide recommendations for seismic surcharge pressures, if needed, and drainage criteria.

Subtask 6.3 – Geotechnical Design Report and Consultation

- Prepare a written geotechnical report presenting our findings, conclusions and recommendations. Our report will include a project site plan showing approximate locations of explorations, summary exploration logs, laboratory test results and appropriate engineering figures.
- Provide limited consultation after our report has been finalized. We envision this will include answering geotechnical-related design questions in the form of phone calls, emails and or online virtual meetings. We have budgeted up to three (3) hours for Associate and three (3) hours for Project Engineer for this task.

Task 6 Deliverables

- Draft and final geotechnical report

Task 6 Assumptions and Exclusions

Our budget estimate is based on the following assumptions and exclusions:

- GeoEngineers will obtain a ROW use permit to complete borings in street. We have assumed the City will waive all ROW use fees.
- Our budget estimate assumes that the exploration can be completed in one (1) day during typical work hours.
- Our budget assumes that South 131st Place can be fully closed between Macadam Road South to the west and local business access to the east on the day of drilling. We have assumed a traffic control plan will be required.
- Borings through asphalt will be patched with cement concrete, and an asphalt repair will not be required.
- We have not included the installation of wells nor monitoring of groundwater levels through the wet season at this time.
- Our scope and fee assumes that soil cuttings generated by the drilling will be removed by the drilling subcontractor, and that signs of soil or groundwater contamination are not observed.

Task 9. Environmental Permitting

Permitting will be a joint effort between PACE Engineers, Inc. (PACE) and GeoEngineers. GeoEngineers will lead the baseline critical areas assessment, environmental documentation, agency/tribal outreach and permit submittal processes. GeoEngineers and PACE will collaborate on permit application materials, as outlined below.

As a fish passage improvement project that removes a manmade barrier, the project is anticipated to qualify for a streamlined permit process utilizing the Fish Habitat Enhancement Hydraulic Project Approval (FHE-HPA) process for state approval and a programmatic consultation for Restoration Actions in Washington State for Endangered Species Act (ESA) compliance necessitated by the federal permit nexus. The FHE-HPA approval process obviates the need to complete State Environmental Policy Act (SEPA) and local permitting separately, streamlining the timeline and documentation requirements. The programmatic

ESA consultation process streamlines the documentation and approval timeline for ESA compliance. The scope of services outlined below is premised on the project qualifying for these streamlined processes.

Subtask 9.1 – Critical Areas Assessment and Report

The purpose of this task is to identify and document regulated aquatic areas, critical areas and other permitting considerations.

- Complete a background review of available project-specific data and publicly available wetland, stream, wildlife and soil databases.
- Complete a site reconnaissance to identify and delineate wetlands, stream ordinary high water mark (OHWM) and other species or habitats present at the site that are protected by federal, state or local regulations.
- Mark wetlands (if any) and streams in the field with survey flagging for subsequent professional land survey and incorporation onto the project base map.
- Submit draft and final critical areas report for use during environmental permitting of the project.

Subtask 9.2 – Environmental Documentation and Permit Application Materials

- Complete a Joint Aquatic Resources Permit Application (JARPA) form for submission to regulatory agencies. Drawings that accompany the permit application will be provided by PACE.
- Prepare ESA consultation documentation in the form of a Biological Evaluation (BE) and/or Specific Project Information Form (SPIF), depending on agency requirements (U.S. Fish and Wildlife Service [USFWS] and National Marine Fisheries Service [NMFS]).
- Develop a Cultural Resources Survey (CRS) Report for compliance with Section 106 of the National Historic Preservation Act. This survey and report will be subcontracted to a specialty provider.

Subtask 9.3 – Permit Submittal and Coordination

- JARPA Form and Drawings and Critical Areas Report will be submitted to Washington Department of Fish and Wildlife (WDFW) for FHE-HPA review.
- JARPA Form and Drawings, Critical Areas Report, BE and/or SPIF, and CRS Report will be submitted to the US Army Corps of Engineers (USACE) to obtain a Nationwide Permit under their authority to administer Section 404 of the Clean Water Act; most Nationwide Permits also include approvals for Section 401 of the Clean Water Act and Coastal Zone Management Act (CZMA) Consistency.
- Track permit submittal, review and approval schedule and progress during the permit review periods.
- Coordinate with the USACE, Washington Department of Ecology, WDFW and federal ESA agencies during permit review periods and respond to questions and requests for more information from these agencies.
- Participate in a meeting with the City planning department to review compliance with the substantive requirements of the Critical Areas Ordinance in lieu of permit submittal, which is not needed due to the FHE-HPA.

Subtask 9.4 – Design Coordination, Management and Support

- Provide consultation to other members of the design team during design development addressing permit restrictions and requirements that may influence alternative designs or design details during advancement.
- Support landscape design including identifying appropriate native planting palette for restoration of construction impacts within the riparian buffer.
- Participate in team meetings over the course of the project duration.

Task 9 Deliverables

- Critical Areas Report
- BE and/or SPIF
- CRS Report
- JARPA Application
- Copies of each electronic permit application submittal
- Permits received will be scanned and copies provided to the City

Task 9 Assumptions and Exclusions

Our budget estimate is based on the following assumptions and exclusions:

- Professional Land Survey of the OHWM and/or wetland boundaries will be provided by PACE and is not included.
- The project will qualify for a FHE-HPA; therefore, SEPA compliance and other local permits, including site development and/or clearing and grading, will be waived.
- Project can be characterized as restoration and habitat enhancement and is, therefore, not anticipated to have adverse effects on regulated critical areas or other protected species or habitats; habitat mitigation planning and design is not anticipated to be needed. There are wetlands immediately adjacent to the site; as long as impacts to wetlands are temporary in nature and restored following construction (i.e., no permanent loss) and/or are minor in nature and limited to impacts from the replacement structure itself, we anticipate wetland mitigation will not be required. If sediment removal is required within the wetland or other permanent impacts cannot be avoided or minimized, including alteration of flow/hydroperiod, a hydrology study and/or wetland mitigation may be required. The final decision will be made by regulatory agencies, potentially in consultation with tribal stakeholders.
- We have included a contingency fee estimate to provide a wetland hydrology monitoring study and wetland mitigation planning/design in case wetland impacts require mitigation. The hydrology monitoring study includes planning and preparation, procurement of well materials, installation of up to four (4) shallow groundwater monitoring wells and pressure transducers, data download and management for one (1) year, data analysis and a study report. Wetland mitigation planning and design assumes that compensatory wetland mitigation can be achieved either on-site, through purchase of wetland mitigation bank credits or an in-lieu fee program, or on another City-owned property, but does not include identifying an off-site mitigation site. The wetland mitigation

conceptual design would be submitted with permit applications and would need to be incorporated into design drawings by PACE.

- Drawings that accompany the permit application will be provided by PACE.
- Design calculations (e.g., volumes, areas) needed for permit application materials will be provided by PACE.
- The project will qualify for a Section 404 Nationwide Permit and neither an individual 401 Water Quality Certification nor a Construction Stormwater General will be needed from Ecology.
- GeoEngineers will act as authorized agent for federal and state permit authorizations, such as those required from the USACE, WDFW and Washington State Department of Ecology (Ecology).
- There is no state-owned aquatic land within the project footprint; an Aquatic Lands Lease will not be required from the Washington State Department of Natural Resources.
- All deliverables will be provided as electronic files.

SCHEDULE, TERMS, AND FEE ESTIMATE

Schedule

We are available to schedule environmental fieldwork within approximately one (1) month of contract approval. The Critical Areas Report can be submitted within approximately one (1) month of fieldwork. Permit documentation is anticipated to be prepared during the Fall 2022 through Spring 2023 timeframe for submittal in the spring. Permits are anticipated to take up to six (6) months for approval.

We will schedule a geotechnical driller upon authorization. Geotechnical drilling subcontractors are currently booked out six (6) to eight (8) weeks. Laboratory test results are typically available within one (1) to two (2) weeks of the completion of our explorations, and we can discuss preliminary findings with the project team soon thereafter. We can typically complete our draft report within about three (3) weeks of completing our explorations. Please contact us if you wish to modify this schedule.

Our services will be completed in accordance with the terms described in the Subconsultant Professional Services Agreement, to which is this proposal is attached.

Fee Estimate

The estimated fee for our services will be determined on a time-and-materials basis using the rates contained in our 2022 Standard Schedule of Charges, which is attached as part of this proposal. We will endeavor to keep you apprised of project status and conditions that may significantly affect our scope and estimate. The total estimated fees for the work described above is presented in the table below.

Task	Estimated Budget
6. Geotechnical Engineering Services	
6.1 Field Explorations and Laboratory Testing (GeoEngineers Time and Expense)	$7,800
Subcontractor Fees for Task 6.1	$8,000
6.2 Provide Geotechnical Design Recommendations	$3,500
6.3 Geotechnical Design Report and Consultation	$5,500
Subtotal Task 6	**$24,800**
9. Environmental Permitting	
9.1 – Critical Areas Assessment and Report	$10,200
9.2 – Environmental Documentation and Permit Application Materials	$14,700
9.3 – Permit Submittal and Coordination	$ 9,400
9.4 – Design Coordination, Management and Support	$8,200
Subtotal Task 9	**$42,500**
Contingency Tasks	
Wetland Hydrology Monitoring Study	$29,000
Wetland Mitigation Planning/Design	$25,000
Subtotal Contingency Tasks	**$54,000**
Grand Total Including Contingency	**$121,300**

There are no intended third-party beneficiaries arising from the services described in this proposal and no party other than the party executing this proposal shall have the right to legally rely on the product of our services without prior written permission of GeoEngineers.

This proposal is valid for a period of 60 days commencing from the first date listed above and subject to renegotiation by GeoEngineers, Inc., after the expiration date.

Sincerely,
GeoEngineers, Inc.

David B. Conlin, MA, PWS
Senior Biologist

Morgan McArthur, PE
Associate Geological Engineer

DBC:MM:sfw

Attachments:
Schedule of Charges – Redmond-Seattle-Tacoma 2022
Schedule of Charges – Redmond-Seattle-Tacoma Lab Inside Charges 2022

Schedule of Charges – 2022

COMPENSATION

Our compensation will be determined on the basis of time and expenses in accordance with the following schedule unless a lump sum amount is so indicated in the proposal or services agreement. Current rates are:

Professional Staff		
Staff 1 Scientist	$	126/hour
Staff 1 Engineer	$	134/hour
Staff 2 Scientist	$	145/hour
Staff 2 Engineer	$	152/hour
Staff 3 Scientist	$	166/hour
Staff 3 Engineer	$	173/hour
Scientist 1	$	192/hour
Engineer 1	$	199/hour
Scientist 2	$	199/hour
Engineer 2	$	203/hour
Senior Engineer/Scientist 1	$	221/hour
Senior Engineer/Scientist 2	$	243/hour
Associate	$	260/hour
Principal	$	280/hour
Senior Principal	$	299/hour
Technical Support Staff		
Administrator 1	$	92/hour
Administrator 2	$	105/hour
Administrator 3	$	120/hour
CAD Technician	$	115/hour
CAD Designer	$	135/hour
Senior CAD Designer	$	155/hour
GIS Analyst	$	145/hour
Senior GIS Analyst	$	160/hour
GIS Coordinator	$	180/hour
*Technician	$	99/hour
*Senior Technician	$	119/hour
*Lead Technician	$	127/hour

*Hours in excess of 8 hours in a day or 40 hours in a week will be charged at one and one-half times the hourly rates listed above.

Contracted professional and technical services will be charged at the applicable hourly rates listed above. Staff time spent in depositions, trial preparation and court or hearing testimony will be billed at one and one-half times the above rates. Time spent in either local or inter-city travel, when travel is in the interest of this contract, will be charged in accordance with the foregoing schedule. A surcharge may be applied to night and weekend work. See proposal for details.

Rates for data storage and web-based access will be provided on a project-specific basis.

Equipment

Air Sparging Field Test, per day	$	100.00
Air/Vapor Monitoring Equipment (PID, 5-Gas Meter), per day	$	100.00
Asbestos Sample Kit	$	25.00
Blastmate, per day	$	100.00
D&M Sampler, per day	$	80.00
DO (Dissolved Oxygen) Kit	$	20.00
Dynamic Cone Penetrometer, per day	$	40.00
E-Tape (Electric Tape), per day	$	25.00
Field Data Acquisition Equipment	$	50.00
Field Gear / Reconnaissance, per day	$	50.00
Gas Detection Meters, per day	$	100.00
Generator, per day	$	100.00
Groundwater Pressure Transducer w/ Datalogger, per day	$	50.00
Groundwater Pressure Transducer w/ Datalogger, per week	$	200.00
Hand Auger, per day	$	20.00
Inclinometer Probe, per day, 1/2 day minimum	$	200.00
Interface Probe, per day	$	50.00
Iron Test Kit	$	20.00
Laser Level, per day	$	50.00
Low Flow Groundwater Sampling Equipment, per day	$	225.00
Multiparameter Water Quality Meter, per day	$	80.00
Nuclear Density Gage, per hour, 1/2 day minimum	$	10.00
Peristaltic Pump, per day	$	50.00
pH Probe, per day	$	15.00
PID, FID or OVA, per day	$	100.00
Saximeter, per day	$	50.00
Scuba Diving Gear, per day/per diver	$	250.00
Shallow Soil Exploration Equipment, per day	$	50.00
Soil Field Screening Equipment, per day	$	15.00
Soil Sample Kit	$	15.00
Steam Flow Meter, per day	$	15.00
Strain Gauge Readout Equipment, per day	$	50.00
Surface Water Flow Meter, per day, 1/2 day minimum	$	50.00
Surface Water Quality Monitoring Equipment, per day	$	50.00
Turbidity Meter, per day	$	30.00
Vehicle usage, per mile, or $30/half-day, whichever is greater	$	0.65

Specialized and miscellaneous field equipment, at current rates, list available upon request.

OTHER SERVICES, SUPPLIES AND SPECIAL TAXES

Charges for services, equipment, supplies and facilities not furnished in accordance with the above schedule, and any unusual items of expense not customarily incurred in our normal operations, are charged at cost plus 15 percent. This includes shipping charges, subsistence, transportation, printing and reproduction, miscellaneous supplies and rentals, surveying services, drilling equipment, construction equipment, watercraft, aircraft, and special insurance which may be required. Taxes required by local jurisdictions for projects in specific geographic areas will be charged to projects at direct cost.

Per diem may be charged in lieu of subsistence and lodging.

Routinely used field supplies stocked in-house by GeoEngineers, at current rates, list available upon request.

In-house testing for geotechnical soil characteristics at current rates, list available upon request.

Associated Project Costs (APC)

Computer hardware and software, telephone and fax communications, printing and photocopying and routine postage via USPS will be charged at a flat rate of 6 percent of labor charges. These charges are labeled as Associated Project Costs (APC).

All rates are subject to change upon notification.

Laboratory Schedule of Charges – 2022

Type of Test		Unit Price
Soil Index and Classification Tests		
Soil Description (ASTM D 2488)	$	16
Moisture Content		
Oven (ASTM D 2216)	$	22
Moisture/Density (ASTM D 7263, D 2937)		
Rings	$	40
Shelby Tubes, waxed chunk	$	50
Tubes (liners), chunk	$	50
Particle Size Analysis		
Percent Passing No. 200 (ASTM D 1140)	$	100
Sieve (ASTM D 422, D 6913, C 136 includes minus 200 Wash, Dry Sieve)	$	140
Gravel Sieve (ASTM D 422, D 6913, C 136 includes minus 200 Wash, Dry Sieve)	$	210
Hydrometer Only (ASTM D 422, minus #10 fraction)	$	170
Combined Sieve and Hydrometer (ASTM D 422-63)	$	270
Combined Gravel Sieve and Hydrometer (ASTM D 422-63)	$	340
Organic Content (ASTM D 2974)	$	80
Specific Gravity (ASTM D 854)	$	90
Atterberg Limits (ASTM D 4318)	$	200
Organic	$	105
Porosity (includes Moisture Content, Dry Density, and Specific Gravity) (ASTM D 7263)	$	130
Compaction (ASTM D 698/D 1557, AASHTO T 99/T 180, Methods A, B and C)		
Granular/Cohesive (1 Point)	$	120
Granular (4 Point)	$	290
Cohesive (4 Point)	$	310
Shrinkage Factors of Soils by Wax Method (ASTM D 4943)	$	70
Strength and Consolidation Tests		
Triaxial Compression		
Unconfined Comp. Strength – UCS (ASTM D 2166)	$	130
Unconsolidated Undrained – UU (ASTM D 2850)	$	250
Unconsolidated Undrained (back pressure saturation)	$	480
Consolidated Undrained – CU (ASTM D 4767) with pore pressure measurement	$	600
Consolidated Drained – CD (Army Corps of Engineers EM 1110-2-1906 Appendix X)	$	650
Consolidated Undrained or Consolidated Drained (3 points, staged)	$	1,500
Consolidation (ASTM D 2435)	$	650
With Reload	$	725
With Reload and Unload	$	800
Additional timed load increments, each	$	75
Constant Rate of Strain Consolidation (ASTM D 4186)	$	675
One-Dimensional Swell (ASTM D 4546)		
Method A	$	1,200
Method B	$	450
Method C	$	650
CBR, 1 point with Proctor (ASTM D 1883)	$	500
Additional points, each	$	150
Corrosion Tests		
Soil Resistivity (ASTM G 187)	$	70
pH of Soil (ASTM D 4972 / G 51)	$	45
Soluble Sulfates (US EPA 375.4)	$	55
Sulfides	$	50
Ductile Iron Pipe Research Association 10 Point Soil Evaluation Procedure (ANSI/ANSW C105/A21.5). Includes evaluation of resistivity, pH, Redox potential, sulfides and moisture)	$	180

Type of Test		Unit Price
Permeability Tests		
In triaxial cell with back pressure saturation (ASTM D 5084)	$	700
Soil Sample Preparation		
Extrusion – Extrude and log (visual classification) Shelby tube sample	$	65
Remolding – Remolding a soil sample to desired moisture and density	$	Hourly
Soil – Cement/Lime Treatment	$	Hourly - negotiated
Aggregate and Rock Tests		
Specific Gravity, Fine/Coarse Aggregate (ASTM C 127, C 128)	$	75/120
Point Load Test or Rock Core (ASTM D5731)	$	75

*Please contact us regarding test procedures which are not listed or for tests on contaminated soils. Negotiated unit rates or hourly rates will be charged for these procedures.

**Not WABO-certified.