Interlocal Agreement
Between
The University of Washington
and
The City of Kirkland

This Agreement ("the Agreement") is made and entered into by the City of Kirkland, a municipal corporation ("the City"), and the University of Washington, hereinafter referred to as "the University," collectively referred to as the "Parties," in order for the University to provide the City with specific services to support Geologic and Hazard Mapping for the City.

I. Purpose

Through this Agreement the University will provide geologic, hazard and derivative digital mapping and database management under the scope and budget contained in Exhibit 1 attached to this Agreement. Each mapping product and methodology would be designed in partnership with the City and would be accompanied by a technical memorandum, metadata, and a fact sheet for providing information to the public. The map products, technical information and databases shall be compatible with the City's Enterprise GIS program.

II. Project Management

The activities performed under the Agreement shall be managed by a joint project team composed of Kathy Troost of the University and by Jenny Gaus, Jeremy McMahan and Paul Stewart of the City ("the Board") See 39.34.030(4)(a). All work to be completed by the University shall be under the direction of Washington Licensed Geologist Kathy Troost.

In the event of a dispute under the Agreement, the dispute shall be resolved by the appropriate University official and Deputy City Manager of the City. If resolution cannot be reached by the appropriate official and Manager, then the issue will be forwarded to the City Manager for Kirkland or designee for resolution with the appropriate University official.

III. Responsibilities

A. The University shall:

1. Perform the work identified in the Scope for Geologic and Hazard Mapping and Budget, attached to this Agreement as Exhibit 1, and hereby incorporated.

B. The City shall:

1. Review all deliverables and provide comments in a timely manner if the City deems that such comments would be useful to the project.
2. Provide appropriate access to City geotechnical documents and other sources determined during the course of the Agreement.

IV. Costs, Billing, and Payment

The Parties agree to the following regarding project costs and terms:

A. The City shall pay for the services, as outlined in the attached scope of work (Exhibit 1), provided that the amount for these services over the term of the Agreement shall not exceed $185,039.00 over the duration of the project scope.

B. Payment to University by the City in accordance with the payment amount specified above shall be the total compensation for all work performed under this Agreement and supporting documents hereto as well as all subcontractors' fees and expenses, supervision, labor, supplies, materials, equipment or the use thereof, reimbursable expenses, and other necessary incidentals.

C. The University shall be paid monthly on the basis of invoices submitted and provide progress reports for work performed. Invoicing will be on the basis of percentage complete or on the basis of time, whichever is applicable in accordance with the terms of this Agreement.

D. The City shall pay the University within 60 days of receipt of invoices for all expenses shown on itemized invoices. The City shall have the right to withhold payment to the University for any work not completed in a satisfactory manner until such time as the University modifies such work to the satisfaction of the City.

E. The Parties represent that funds for service provision under the Agreement have been appropriated and are available. To the extent that such service provision requires future appropriations beyond current appropriation authority, the Parties' obligations are contingent upon the appropriation of sufficient funds to complete the activities described herein. If no such appropriation is made, this Agreement will terminate.

F. Any mutually agreed upon revisions to the cost arrangement as described above will be accomplished by a written amendment per Agreement section V. (C).

G. All data, maps, information or equipment produced or acquired with funds provided by the City, shall be the property of the City. Property will be acquired only upon approval of the Board and will be held as further approved by the Board. (See RCW 39.34.030(4)(b).)

The University License. Providing that the University has otherwise performed its material obligations under this Agreement, the City hereby grants to the University a fully-paid, non-exclusive, royalty-free license for the University's use, to: (i) all data, maps, or information produced or acquired with funds provided by the City; (ii) the written reports delivered to the City as described in this Agreement; and (iii) the data produced by the University researchers during the course of performing the Project. The University understands and agrees that excepting only the foregoing license, the City retains ownership of such reports and data.

V. Duration, Termination, and Amendment

A. The starting date of the Agreement is April 11, 2016, and it will become effective upon signature by the Parties. It will remain in effect until April 30, 2017 unless extended by the City or until the scope is completed to the satisfaction of the City or terminated pursuant to Section V. B below.

B. Either Party upon 30 days written notice may terminate the Agreement. In the event of termination, the City will make payment for work satisfactorily performed by the University to the date of termination.

C. The Agreement may be amended, altered, clarified, or extended only by the written Agreement of the Parties hereto.

D. The Agreement is not assignable by either Party, either in whole or in part.

E. The Agreement is the complete expression of the terms hereto and any oral or written representations or understandings not incorporated herein are excluded. The Parties recognize that time is of the essence in the performance of the provisions of the Agreement. Waiver of any default shall not be deemed to be waiver of any subsequent default. Waiver of breach of any provision of this Agreement shall not be deemed to be a waiver of any other or subsequent breach

and shall not be construed to be a modification of the terms of the Agreement unless stated to be such through written approval by the Parties which shall be attached to the original Agreement.

VI. Compliance with Laws

The University shall comply with all applicable State, Federal, and City laws, ordinances, regulations, and codes.

VII. Indemnification and Hold Harmless

Each Party shall defend, indemnify, and save harmless the other Party, its officers, officials, employees, and agents, while acting within the scope of its employment as such, from any and all costs, claims, judgments, and/or awards of damages, arising out of or in any way resulting from either Party's own negligent acts or omissions. Each Party agrees that its obligations under this subparagraph extend to any claim, demand, and/or cause of action brought by, or on behalf of, any of its employees or agents. In the event that either Party incurs any judgment, award, and/or cost arising therefrom, including attorneys' fees, to enforce the provisions of this Article, all such fees, expenses, and costs shall be recoverable from the responsible Party to the extent of that Party's culpability.

Workers' Compensation. The University faculty, employees, fellows, trainees, and students participating in the Project will in no sense be considered employees of The City and to the extent they are employees of The University will remain as employees of The University. The City does not and will not assume any liability under any law relating to worker's compensation by reason of any The University representative participating in the Project, receiving training, or traveling pursuant to this Agreement. Nothing in this Agreement will be construed as a waiver by The University of any rights it may have under any applicable law governing injury to workers, including without limitation The University's rights under RCW Title 51, Industrial Insurance.

VIII. Additional Work

The City may desire to have the University perform additional work or render services in connection with the project other than provided for by the express intent of this Agreement. Any such work or services shall be considered as additional work, supplemental to this Agreement. Such work may include, but shall not be limited to, additional technical analysis or mapping, preparation of informational materials or additional meetings and presentations. Additional work shall not proceed unless so

authorized in writing by the City. Authorized additional work will be compensated for in accordance with a written supplemental authorization by the City.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the _____ day of July 1, 2016.

Approved as to Form:

By: Oskar Rey

Title: Kirkland City Attorney
Asst.

City of Kirkland:

By: Marilynne Beard

Title: City Manager

University of Washington

By: Roberta L. Mondares June 21, 2016

Title: Roberta L. Mondares
Grant & Contract Administrator
Authorized Signing Official
Office of Sponsored Programs

MEMORANDUM

DATE: May 23, 2016

TO: Paul Stewart, Jenny Gaus, and Jeremy McMahan, City of Kirkland

FROM: Kathy Troost, University of Washington (UW)

RE: **Revised Cost Estimate and Scope for Geologic and Hazard Mapping for the City of Kirkland**

This memo serves as a proposal for the scope of work to prepare certain geologic and hazard maps and databases for the City of Kirkland (City) and the University of Washington (UW).

Background

We understand that the City needs a new and updated geologic map and geologic hazard maps for updating their Growth Management Act (GMA) products following their annexation of 7.2 square miles to the north. Cities are obligated to map their "Critical areas" as defined under chapter 36.70A RCW which includes "Geologically hazardous areas". WAC 365-190-120 provides the definition of geologically hazardous areas which "include areas susceptible to erosion, sliding, earthquake, or other geological events. They pose a threat to the health and safety of citizens when incompatible commercial, residential, or industrial development is sited in areas of significant hazard." The WAC chapter further defines each of these hazards.

Proposed Maps

We propose to produce the following hazard maps: seismic, liquefaction, and landslide. In addition, infiltration potential and depth to groundwater maps would be generated. Each map requires field work, data collection, and database compilation; for example gathering information on known landslides to generate a landslide inventory-a required part of the landslide hazard map, and compiling subsurface exploration logs to help with geologic mapping and obtaining depth to groundwater. Each map product would be designed in collaboration with City staff and would be accompanied by a technical memo, metadata, and a one-page Fact Sheet for providing information to the public. The map products and databases proposed would be compatible with work previously completed for the City by GeoMapNW.

Cost

The attached table provides a cost estimate for digital geologic and derivative mapping for the City. Costs are presented as cost per map/database task. The work would be completed by faculty and graduate students at the UW in the Department of Earth and Space Sciences. The costs shown assume that the City would pay the UW for work completed by graduate students under the direction of WA Licensed Geologist, Kathy Troost, who would also complete some of the work. Costs per map/task include one meeting per month, map plots, supplies, equipment, limited radiocarbon dating, mileage,

and bridge tolls. Deliverables for each map/task would include a geodatabase, metadata, a technical memorandum, and a fact sheet.

The estimated costs are based on assuming that the City will provide: 1) assistance with finding and gathering geotechnical reports received since 2008, 2) space for a UW intern(s)/graduate student(s) to work on data collection and to scan relevant documents, 3) relevant GIS files, and 4) a letter of introduction to facilitate our accessing private property.

Landslide Mapping Methods

The methodology for mapping landslide hazards shall consist of field and office steps designed to meet the requirements of Chapter 365-190-120 of the WAC. To meet the guidelines, a landslide inventory will be completed, a map showing shallow landslide potential will be created, and a map of known deep-seated landslides will be created.

The first step is to prepare a map of documented landslides and landslide inventory (Task 2a on the attached table) using geotechnical reports, media articles, and City staff knowledge. The database attributes for the individual landslides will include, as available: source of information; date of landslide; extent of slide; x, y, and z coordinates; address; type of landslide; failure description; water; cause; and confidence. If outlines of the landslides are not available, then landslides will be mapped by creating a point in GIS, rather than a polygon.

The next step is to prepare a map of known landslides using existing lidar imagery. We propose to follow the method of Burns and Madin (2009). This allows the mapping of slumps (deep-seated, rotational, and translational landslides) since collectively they tend to have distinct geomorphic signatures. It may not be possible to distinguish the type of landslide using lidar, but attributes can still be assigned to each landslide. We will map/delineate scarps (headscarps and internal scarps), closed depressions, and outline landslide deposits. These features will have attributes including: x, y, and z coordinates; distinguishing characteristics; type of landslide; relative age; confidence; vintage of lidar; and source of information. Upon completion of the map, we will field verify the low confidence slides and field verify a representative sampling of the medium and high confidence slides. Modifications will be made to the map as appropriate based on the field findings.

We will utilize an integrated map and model approach to create a map of shallow landslide hazard. Using the model developed by Burns and others (2012) or similar shallow landslide susceptibility model such as the one developed by S. Slaughter at the WA DNR, we will create a map of shallow landslide hazard. These models evaluate slope, convergence, and material properties. We will merge the model findings with a geologic map to show susceptible stratigraphy and with the groundwater data to show potential springs. The merged product will serve as the hazard map.

Schedule

A schedule is also included herein and assumes that we start work on or about the first of June 2016. Under normal circumstances and with efficient data gathering at the City, the work can be completed in

8 months. We will attend one meeting per month at the City to evaluate scope, schedule, and budget. In addition, these meetings will be used to determine product format, obtain comments on deliverables, and to gather staff knowledge of the City.

Previous Work

The cost of the geologic mapping and database work completed between 2006 and 2010 for the City was borne by the City and the USGS. Kirkland's contribution was $125,000 for an area of about 11 square miles. The USGS provided another $75,000 to support the mapping and database efforts. Combined, the cost was about $25k/square mile. Having already worked in the City and the expected paucity of data allows for a significantly reduced rate for mapping the annexation area.

Schedule

Work could begin as soon as an agreement is completed. The geologic mapping tasks would take about 8 months to complete; field work should be undertaken during the months of February and March, if possible, to take advantage of lower vegetation cover. Many of the other tasks could begin while the mapping is underway and completed at about the same time. Please let me know if I can provide additional information at this stage of your planning process and if the schedule will meet your needs.

References

Burns, W.J. and Madin, I.P., 2009, Protocol for Inventory Mapping of Landslide Deposits from Light Detection and Ranging (Lidar) Imagery, DOGAMI Special Paper 42.

Burns, W.J., Madin, I.P., and Mickelson, K.A., 2012, Protocol for Shallow-Landslide Susceptibility Mapping, DOGAMI Special Paper 45.

Estimated Cost for Geologic and Hazard Mapping for the City of Kirkland

Exibit 1

MEMO
Jan 29, 2016

Task		Product/ Task	Area	Coverage	Cost Basis	Cost for Student	Cost for LG	Estimated Cost	Duration	Comments
	1a	Geologic Mapping of Annexation Area	Annexed since 2011	7.2 sq mi	2.5 months	$21,515	$10,284	$31,799 28	6 months	Includes new field mapping, geomorphic analyses, meeting with City staff, limited radiocarbon dating, and preparing a geologic map of the annexation area. Digital mapping at 1:12,000 scale
	1b	Borehole Database	Annexed area plus data post 2008 for older map	18 25 sq mi	4 months	$34,425	$16,454	$50,879	6 months	Includes collecting geotechnical reports from multiple sources, compiling borehole data from reports, evaluating the borehole data, IT work at UW, equipment, meeting with City staff
	1c	Final Geologic Map	Kirkland	18.25 sq mi	0.5 month	$4,303	$4,114	$8,417	2 month	Combines the Annexation area with the 2008 map area Includes an update of the 2008 map area. Includes meeting with City staff Provides metadata, fact sheet, description of map units, technical memo, and supporting documents. Digital mapping at 1:12,000 scale.
Total for Task 1		Geologic Map	City of Kirkland	18.25	7 months	$60,243	$30,852	$91,095	8 months	
	2a	Landslide Inventory	Kirkland	18.25 sq mi	1 month	$8,606	$4,114	$12,720	4 months	Includes compiling City data, querying the GeoMapNW database, meeting with City staff, creating a technical memo, and reviewing geotechnical reports
	2b	Landslide Hazard Map	Kirkland	18.25 sq mi	1 month	$8,606	$4,114	$12,720	3 months	Includes mapping of landslides from the LIDAR data, meeting with City staff, preparing a technical memo, and producing the map.
Total for Task 2		Landslide Map	City of Kirkland	18.25	2 months	$17,212	$8,227	$25,439	7 months	
	3a	Other Seismic Hazard Map	Kirkland	18.25 sq mi	1 month	$8,606	$4,114	$12,720	4 months	Includes mapping of known damage from earthquakes, evaluation of ground strength, evaluation of active faults, meeting with City staff, preparing a technical memo, and producing the map
	3b	Liquefaction Hazard Map	Kirkland	18.25 sq mi	1 month	$8,606	$4,114	$12,720	3 months	Includes mapping of areas prone to liquefaction based on depth to water, grain size, and degree of compaction; meeting with City staff, preparing a technical memo, and producing the map
Total for Task 3		Seismic Hazard Map	City of Kirkland	18.25	2 months	$17,212	$8,227	$25,439	7 months	
	4a	Depth to Groundwater Data	Kirkland	18.25 sq mi	2 months	$17,212	$8,227	$25,439	5 months	Includes reviewing borehole data compiled from 2008 and new geologic mapping of the annexation area, obtaining depth to water data, preparing a database, preparing a technical memo, meeting with City staff, and producing a map of point-location data
	4b	Infiltration Potential Map	Kirkland	18.25 sq mi	1 month	$8,606	$4,114	$12,720	3 months	Includes evaluating water depth and geologic materials, assessment of infiltration values, meeting with City staff, preparing a technical memo, and producing a map. Requires groundwater depth data.
Total for Task 4		Groundwater and Infiltration Maps	City of Kirkland	18.25 sq mi	3 months	$25,818	$12,341	$38,159	8 months	
Total for Task 5		Presentations			4 formal presenta-tions	Included	$4,906	$4,906	tbd	Up to 4 presentations will be made to the City and affiliates, describing each of the products.
Totals		Geologic and Hazard Maps	City of Kirkland	18.25 sq mi	14 months	$120,428	$64,551	$185,079	8 months	

K Troost

1/28/2016

Project Schedule for Geologic and Hazard Mapping for the City of Kirkland

Exhibit 1

Task	Product/ Task	Time required	Duration	Start	End	May	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb-April
1a	Geologic Mapping of Annexation Area	2 months	6 months	1-Jun-16	30-Nov-16										
1b	Borehole Database	4 months	6 months	1-Jun-16	31-Dec-16										
1c	Final Geologic Map	1 months	2 month	1-Nov-16	31-Jan-17										
Total for Task 1	**Geologic Map**	**7 months**	**8 months**	1-Jun-16	31-Jan-17										
2a	Landslide Inventory	1 month	4 months	1-Jun-16	30-Sep-16										
2b	Landslide Hazard Map	1 month	3 months	1-Oct-16	31-Dec-16										
Total for Task 2	**Landslide Map**	**2 months**	**7 months**	1-Jun-16	31-Dec-16										
3a	Other Seismic Hazard Map	1 month	4 months	1-Jun-16	30-Sep-16										
3b	Liquefaction Hazard Map	1 month	3 months	1-Oct-16	31-Dec-16										
Total for Task 3	**Seismic Hazard Map**	**2 months**	**7 months**	1-Jun-16	31-Dec-16										
4a	Depth to Groundwater Data	2 months	5 months	1-Jun-16	31-Oct-16										
4b	Infiltration Potential Map	1 month	3 months	1-Nov-16	31-Jan-17										
Total for Task 4	**Groundwater and Infiltration Maps**	**3 months**	**8 months**	1-Jun-16	31-Jan-17										
5	Presentations			Feb 1 2017	April 31 2017										
Totals	**Geologic and Hazard Maps**	**14 months**	**8 months**	1-Jun-16	31-Jan-17										
Kickoff Meeting						26-May									
Monthly Project Meetings							M	M	M	M	M	M	M		

5/23/2016