City of Tukwila

Allan Ekberg, Mayor

INFORMATIONAL MEMORANDUM

TO: **Utilities Committee**

FROM: **Bob Giberson, Public Works Director** BG

BY: **Ryan Larson, Senior Program Manager**

CC: **Mayor Ekberg**

DATE: **October 21, 2016**

SUBJECT: **Tukwila 205 Levee Certification**
Project No. 91341203, Contract No. 14-164
Supplemental Agreement No. 1 for Phase 2

ISSUE

Approve Supplemental Agreement No. 1 to Contract No. 14-164 with Northwest Hydraulic Consultants, Inc. (NHC) to provide levee certification services for the Tukwila 205 Levee Certification.

BACKGROUND

The Tukwila 205 Levee is located on the left bank of the Green River between S 196th St and I-405 and provides flood protection to the Tukwila Urban Center. The Corps of Engineers provided letters of levee certification as needed to certify that the levee met their minimum design standards. In July of 2012, the Corps notified the City that due to a change in their policy, they would no longer provide levee certification for this or any federal levee and that the current levee certification would expire in August of 2013.

Levee certification is critical because it provides documentation that the levee meets minimum federal standards and allows FEMA to map the protected area as outside of the 100-year floodplain. In late 2014, the City hired NHC to perform the first phase of a certification effort that included an engineering analysis in accordance with FEMA requirements. This analysis looked at the entire levee system to determine which segments did not meet FEMA requirements. The results of the Phase 1 study revealed that the levee does not meet minimum free board requirements in 14 segments and that embankment, foundation, and stability issues are present.

DISCUSSION

Phase 2 of this certification effort will look at each of the areas identified in Phase 1, collect additional site information, develop alternatives for correcting the deficiencies, and develop costs estimates. Phase 1's contract was for $447,711, yet the total spent was only $325,611.08. NHC's contract supplement for Phase 2 is $316,768.00, bringing the total contract amount to $642,379.08.

FISCAL IMPACT

Tukwila 205 Levee Certification Phase 2 funding is budgeted in 2016 with $100,000 and $217,000 proposed in the 2017 CIP. The $100,000 from 2016 will need to be transferred to 2017 as Phase 2 work will begin in 2017. A new Proposed 2017 CIP sheet for the Tukwila 205 Levee is attached.

RECOMMENDATION

Council is being asked to approve Supplemental Agreement No. 1 to Contract No. 14-164 with NHC, Inc. for Phase 2 of the Tukwila 205 Certification in the amount of $316,788.00 and consider this item at the November 14, 2016 Committee of the Whole meeting and subsequent November 21, 2016 Regular Meeting.

Attachments: CIP Page 100, Proposed 2017 CIP and new Proposed CIP sheet
NHC Supplement No. 1, Scope of Work and Fee Estimate

CITY OF TUKWILA CAPITAL PROJECT SUMMARY

2017 to 2022

PROJECT: **Tukwila 205 Levee Certification** Project No. 91341203

DESCRIPTION: Obtain levee certification for the Tukwila 205 Levee.

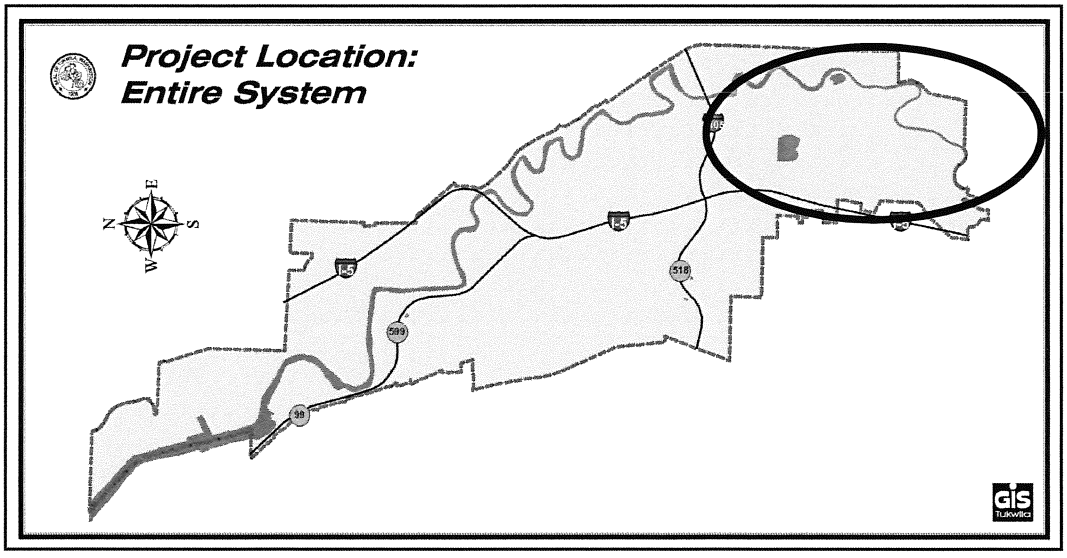
JUSTIFICATION: The US Army Corps of Engineers no longer provides levee certification services to federally authorized levees. The existing certification expired in August of 2013. Certification is required for the Federal Emergency Management Agency to accreditate the levee system as providing a 100-year level of flood protection.

STATUS: Consultant hired in 2014 for Phase I that includes an initial study and identification of levee deficiencies.

MAINT. IMPACT: Certification process is expected to lead to additional levee repair projects that are required to meet the certification criteria. Certification is valid for a 10-year period.

COMMENT: The initial phase of the certification process will determine needed repairs and cost estimates. Costs listed in 2017 through 2019 are estimates for potential repairs that would be grant dependent. King County Flood Control District's Opportunity Grant Program currently has $63k per year.

FINANCIAL (in $000's)	Through 2015	Estimated 2016	2017	2018	2019	2020	2021	2022	BEYOND	TOTAL
EXPENSES										
Certification Phase I	350									350
Certification Phase II		100	217	220						537
Design				275						275
Const. Mgmt.			30	115	600					745
Construction			200	750	4,000					4,950
TOTAL EXPENSES	**350**	**100**	**447**	**1,360**	**4,600**	**0**	**0**	**0**	**0**	**6,857**
FUND SOURCES										
KC Flood Control	113	63	63	63	63	63	63	63	63	617
Proposed Grants			150	780	4,500					5,430
Mitigation Actual										0
Mitigation Expected										0
Utility Revenue	237	37	234	517	37	(63)	(63)	(63)	(63)	810
TOTAL SOURCES	**350**	**100**	**447**	**1,360**	**4600**	**0**	**0**	**0**	**0**	**6,857**



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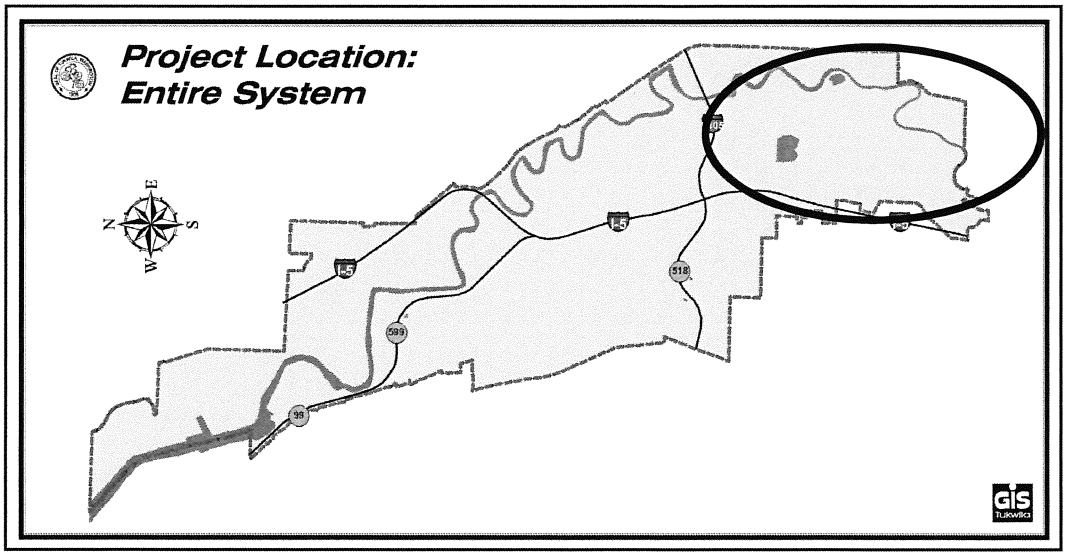
STATUS: Consultant hired in 2014 for Phase I that includes an initial study and identification of levee deficiencies.

MAINT. IMPACT: Certification process is expected to lead to additional levee repair projects that are required to meet the certification criteria. Certification is valid for a 10-year period.

COMMENT: The initial phase of the certification process will determine levee deficiencies and corrective measures. Costs listed in 2017 through 2019 are estimates for potential repairs that would be grant dependent. King County Flood Control District's Opportunity Grant Program currently has $1M per year.

Revised 10/19/16

FINANCIAL (in $000's)	Through 2015	2016	2017	2018	2019	2020	2021	2022	BEYOND	TOTAL
EXPENSES										
Certification Phase I	350	3								353
Certification Phase II			317	220						537
Design				275						275
Const. Mgmt.			30	115	600					745
Construction			200	750	4,000					4,950
TOTAL EXPENSES	**350**	**3**	**547**	**1,360**	**4,600**	**0**	**0**	**0**	**0**	**6,860**
FUND SOURCES										
KC Flood Control	113	63	63	63	63	63	63	63	63	617
Proposed Grants			150	780	4,500					5,430
Mitigation Actual										0
Mitigation Expected										0
Utility Revenue	237	(60)	334	517	37	(63)	(63)	(63)	(63)	813
TOTAL SOURCES	**350**	**3**	**547**	**1,360**	**4600**	**0**	**0**	**0**	**0**	**6,860**



City of Tukwila

6200 Southcenter Boulevard, Tukwila WA 98188

Agreement Number:

CONTRACT FOR SERVICES

Amendment # 1

Between the City of Tukwila and Northwest Hydraulic Consultants, Inc.

That portion of Contract No. 14-164 between the City of Tukwila and Northwest Hydraulic, Inc. is amended as follows:

Section 2: Scope of Services

The consultant agrees to perform the additional services, identified on Exhibit "A1" attached hereto, including the provision of all labor, materials, equipment, and supplies.

Section 3: Duration of Agreement; Time for Performance

This Agreement as amended shall be in full force until December 30, 2018, unless sooner terminated under the provisions of the agreement. 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 30, 2017 unless an extension of such time is granted in writing by the City.

Section 4: Payment

A. Payment for the work provided by the Consultant shall be made as provided on Exhibit "B1" attached hereto, provided that the total amount of payment to the Consultant shall not exceed $642,399.00 without express modification of the Agreement signed by the City.

All other provisions of the contract shall remain in full force and effect.

Dated this _____ day of _____, 20_____.

CITY OF TUKWILA	CONTRACTOR
_____	_____
Allan Ekberg, Mayor	Todd Bennett, Branch Manager
ATTEST/AUTHENTICATED	APPROVED AS TO FORM
_____	_____
Christy O'Flaherty, MMC, City Clerk	City Attorney

EXHIBIT A1

16300 Christensen Rd., Ste. 350 | Seattle, WA 98188 | 206.241.6000 | www.nhcweb.com

nhc
northwest hydraulic consultants

TUKWILA 205 LEVEE CERTIFICATION
PHASE 2 – ALTERNATIVES ANALYSES FOR LARGE SCALE IMPROVEMENTS
SCOPE OF WORK

Prepared by Northwest Hydraulic Consultants Inc.
for the City of Tukwila Department of Public Works
October 19, 2016

OVERVIEW

The City of Tukwila (City) Department of Public Works has selected Northwest Hydraulic Consultants Inc. (NHC), with their subconsultants AMEC Environment and Infrastructure, Inc. (AMEC) and KPG, to provide professional engineering consulting services to evaluate and certify the Tukwila 205 Levee in accordance with Federal Emergency Management Agency (FEMA) requirements (44 CFR Section 65.10). The 4.6-mile-long levee is located on the left bank of the Green River between I-405 and South 196th Street and includes the cutoff levee to Southcenter Parkway. Engineering services generally consist of researching records, conducting inspections, performing structural, geotechnical, seismic, and hydraulic analyses, preparing detailed reports of the current levee system, providing an analysis and report of needed improvements, and working with the City to provide engineering plans, specifications, and cost estimates for the improvements. Work may include engineering services during construction for any required improvements, such as inspection and change management support under the direction of the City's project manager. Once the levee is deemed certifiable, work will include providing the necessary reports and documentation to certify that the levee provides protection from the base (1 percent annual chance) flood in accordance with FEMA guidelines.

This is a multi-phase project. “Phase 1 – Engineering Analyses and Improvement Identification” collected data, performed analyses required under 44 CFR 65.10, and identified deficiencies. This work indicated that steep bank slopes throughout the reach significantly limit the ability to certify the levee as-is. As such, “Phase 2 - Alternatives Analyses for large Scale Improvements for Large Scale Improvements” will identify if there are alternative options to evaluate the existing case, and then, if still deemed that the levee can’t be certified as-is, evaluate options that will certify the levee by selecting a preferred alternative and developing conceptual level construction plans. These complex fixes will move the project into permitting, design, and construction in “Phase 3 - Large Scale Improvements”. “Phase 4 - Certification Submittal” will provide the documentation necessary to certify the Tukwila Levee and include an Operations and Maintenance Manual, of which the basis will be the existing U.S. Army Corps’ (Corps) approved manual, but also will adopt other recent policies and procedures, if appropriate, such as those from King County’s ongoing System-Wide Improvement Framework (SWIF) assessment for the Green River. After completion of Phase 2, the specific task work to be completed in Phases 3 through 4 will be refined and a cost estimate to complete this work will be prepared.

PHASE 1 - ENGINEERING ANALYSES AND IMPROVEMENT IDENTIFICATION

The Scope of Work (SOW) for Phase 1 defined Tasks 1 through 8 to complete the engineering analyses needed to certify the Tukwila 205 Levee in accordance with FEMA requirements (44 CFR Section 65.10), and identify any physical improvements necessary to certify the levee. Specific assignments and deliverables have been listed for each task, including who is responsible for certifying compliance with each section of 65.10.

PHASE 2 - ALTERNATIVES ANALYSES FOR LARGE SCALE IMPROVEMENTS

Phase 2 will conduct the alternatives analyses for the large, complex improvements necessary to certify the levee. Any small-scale fixes determined in Phase 1 – for instance where the solution is obvious and no permitting is required, such as raising the levee slightly to gain the necessary freeboard – will be incorporated into the large-scale improvements. Phase 3 will address design, permitting, and construction of large, complex improvements. The Phase 3 SOW will be refined after the completion of Phase 2. A Phase 3 cost estimate will then be prepared and submitted to the City.

TASK 9. SITE SPECIFIC ENGINEERING ANALYSES

This task will collect additional data, evaluate methods, and conduct additional (or refine existing) analyses to determine if the levees can be certified as-is. Phase 1 conducted a reach-wide assessment of the levees using generalized information. More site specific details and review of levee sections in finer detail, may indicate that portions can be certified as-is and not need a constructed fix. The project team will discretize the project reach based on common characteristics and determine how Phase 1 engineering analyses could be refined for these sections. The team will then collect additional data and refine the engineering analyses if it is deemed that they could provide the technical backing to certify discrete sections of the levee. The City will be engaged, and meetings will be held as necessary at regular intervals during the task work.

NHC will lead this effort, with both NHC and AMEC evaluating and refining the analyses as needed. It is anticipated that AMEC will lead the effort to collect more detailed site characterization through cone penetration test (CPT) probes. The CPT probes are a less costly exploration method than boring, but still provide a continuous log of the soil profile when correlated with Phase 1 information. KPG will conduct detailed channel bank information at up to eight cross-sections and, if requested, will collect additional survey data in key areas up to the allotted level of effort budgeted.

ASSIGNMENTS

NHC: Evaluate and refine hydraulic engineering analyses. Assemble summary document.

AMEC: Evaluate and refine hydraulic geotechnical analyses.

KPG: Topographic survey.

City: Provide assistance as needed.

DELIVERABLES

- Documentation of sections of the levee that can be certified as-is without a constructed fix.

TASK 10. ALTERNATIVES ANALYSIS – LARGE SCALE PROJECTS

Phase 1 identified that projects of a larger and more complex scale are likely necessary to certify the levee. For larger projects, an initial alternatives assessment will be conducted by the consultant team.

Alternatives will be assessed for each project using objectives and performance metrics developed in conjunction with the City. A recommended alternative will be selected and presented to the City for approval prior to beginning Phase 3 work.

NHC will lead this task. NHC and AMEC will first determine potential alternative construction fixes that will lead to the levee being certified and then determine approximate construction costs for each alternative with KPG assistance. For each levee section characterized, NHC and AMEC will determine the evaluation criteria with the City, evaluate the alternatives accordingly, and provide a recommended alternative to the City during an in-person meeting. Once a preferred alternative is selected, the project team will develop conceptual level designs for each levee section.

ASSIGNMENTS

NHC: Lead alternatives analysis and conceptual design. Develop alternatives. Provide hydraulic support. Document work.

AMEC: Assist with developing alternatives. Provide geotechnical support.

KPG: Assist with developing alternatives and preliminary cost estimates.

City: Provide input on alternatives assessment metrics and preferred alternative.

DELIVERABLES

- Alternatives assessment documentation for discrete levee sections including methodology, selection criteria, and preferred alternative with a conceptual design.

COST ESTIMATE

The total estimated cost to complete Phase 2 (Tasks 9 and 10) is $316,788 as detailed in Exhibit B, "Phase 2 Cost Estimate 10/14/2016".

PHASE 3 - LARGE SCALE IMPROVEMENTS

Phase 3 will provide civil design and construction support of the preferred design determined in Phase 2 for large-scale, complex physical deficiencies. Meetings will be held as needed. The SOW for Phase 3 will be refined at the completion of Phase 1, and a cost estimate prepared.

TASK 11. CIVIL DESIGN AND CONSTRUCTION SUPPORT – LARGE SCALE

KPG will take the lead on plans, specifications, and engineering to develop and resolve deficiencies. NHC and AMEC will provide specifications and direction on key hydraulic and geotechnical design features. KPG will provide construction management services for the projects.

ASSIGNMENTS

NHC: Provide hydraulic technical input based on work completed in prior tasks.

AMEC: Provide geotechnical input based on work completed in prior tasks.

KPG: Lead efforts for construction of physical deficiency corrections including creating PSE and providing construction support.

City: Provide assistance as needed.

DELIVERABLES

- Full PSE packages suitable for bid letting. Construction management documentation as required.

TASK 12. ENVIRONMENTAL/PERMITTING

Capital improvements required to address deficiencies will likely require obtaining permits. If work is required on the riverward side of the levee, federal permits triggering ESA consultations may be mandatory. AMEC will provide permitting support for any required capital projects if requested by the City.

ASSIGNMENTS

NHC: Hydraulics support for permitting.

AMEC: Provide permitting support as needed for the project.

KPG: Civil design support for permitting.

City: No assignments under this task.

DELIVERABLES

- Permit submittal packages as required to meet environmental/permitting needs.

PHASE 4 - CERTIFICATION SUBMITTAL

Once all deficiencies have been identified and corrected, the Tukwila Levee Certification report will be prepared for submittal. The SOW for Phase 4 will be refined at the completion of Phase 1, and a cost estimate prepared.

TASK 13. OPERATIONS PLANS AND CRITERIA DOCUMENTATION

An Operations and Maintenance (O&M) manual to meet FEMA requirements for the levee (CFR 65.10.c) will be created, primarily by combining existing manuals. The basis of the manual will be the existing Corps' approved manual, but will also adopt other recent policies and procedures, if appropriate, such as those from the ongoing King County SWIF process, (on which NHC is part of the consultant project team). Additions may be necessary where other infrastructure – particularly bridge embankments – serve as part of the levee system, but are not considered by the Corps as part of their project, and hence are not addressed in the existing manual. The O&M manual must also address the stormwater system that provides interior drainage for the City; therefore, all the City's pump stations will need to be addressed.

FEMA requires clear ownership of the levee system be demonstrated. As the Washington State Department of Transportation (WSDOT) owned I-405 bridge embankment is high ground and the downstream tie-in, an inter-jurisdictional agreement will need to be made between the City and WSDOT. Kent and WSDOT have recently determined a method to address the issue within the City, and we expect the same process to be followed. This task is required to be led by the City, but the consultant team will provide the technical materials needed.

ASSIGNMENTS

NHC: Prepare documentation (including references to existing manuals) to meet CFR 65.10.c requirements.

AMEC: Assist with document preparation.

KPG: No assignments under this task.

City: Assist with providing existing O&M manuals. Lead inter-jurisdictional agreement at downstream tie-in to high ground.

DELIVERABLES

- Draft and final versions of O&M report.
- Technical materials for inter-jurisdictional agreement at downstream tie-in.

TASK 14. REFINE ENGINEERING ANALYSES

Engineering analyses conducted in Phase 1 may need to be refined to reflect any constructed levee improvements, and demonstrate that the levee meets certification requirements. The project team will revise the Phase 1 analyses, as needed, and update the documentation for the levee certification.

ASSIGNMENTS

NHC, AMEC, and KPG: Revise Phase 1 engineering analyses, as needed.

DELIVERABLES

- Final documentation of engineering analyses.

TASK 15. PROJECT DOCUMENTATION SUBMITTAL AND REVIEW

Once all technical analyses are complete and any deficiencies addressed, a certification report package will be prepared. NHC will take the lead to prepare this document and combine reports, as-built plans, and other required files. The certification document will be combined with others from the City (that are related to the O&M manual) into a final report and submitted to FEMA. The project team will address review comments provided by FEMA.

Whether the project report is submitted as a Conditional Letter of Map Revision (CLOMR) through FEMA's consultant, STARR, or directly through local FEMA Region X for review, will be determined during the project. NHC will engage FEMA Region X early in the project to determine which of these paths is most likely.

ASSIGNMENTS

NHC: Prepare submittal package to meet CFR 65.10.c requirements.

AMEC: Assist with document preparation.

KPG: Assist with document preparation.

City: Assist with document preparation, including providing required City signatures and formal authorizations.

DELIVERABLES

- Draft project documentation.
- Final project documentation.

SCHEDULE

A tentative schedule for Phase 2 is shown below, assuming notice to proceed occurs near November 1, 2016. Timing for work beyond Phase 2 will depend heavily on the number and complexity of any fixes needed to obtain levee certification. Based on Phase 1 work, these could be significant. The schedule for completing final design, and construction of the larger, more complex projects in Phase 3, will be better known once Phase 2 is complete.

	2016												2017											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
PHASE 2																								
Task 9. Site Specific Engineering Analyses																								
Task 10. Alternatives Analysis - Large Scale																								

EXHIBIT B1
PHASE 2 COST ESTIMATE 10/19/2016

Cost Estimate

Northwest Hydraulic Consultants Inc.
16300 Christensen Road, Suite 350
Seattle, WA 98188
Tel. (206) 241-6000
Fax (206) 439-2420

Prepared for: Ryan Larson, City of Tukwila
Project: Tukwila Levee Certifcation
Project No.: P2000098
Prepared By: Todd Bennett, NHC
Date: 10/19/16

Labor Detail

Task Description	Principal	Sr. Engr.	Engineer	Jr. Engineer	GIS/CAD Analyst	Finance Manager	Document Prod.	Labor Total	Direct Expenses	Subs	Total Task Cost
9 Site Specific Engineereing Analyses	40	60	110		70	2	4	$ 42,564.77	$ -	$ 109,644.95	$ 152,210
10 Alternatives Analysis - Large Scale Projects	40	80	190	40	100	2	4	$ 63,757.44	$ -	$ 100,821.02	$ 164,578
Total Hours	80.0	140.0	300.0	40.0	170.0	4.0	8.0				
Cost Based Rates (2017, 199.04% OH, 12% fee)	$ 237.62	$ 191.17	$ 136.31	$ 97.16	$ 85.94	$ 129.44	$ 80.28				
Total								**$ 106,322.21**	**$ 0.00**	**$ 210,465.97**	**$ 316,788**

Direct Expenses

Description	Task	Units	Rate	Cost
Mileage		0	$ 0.54	$ 0.00
Color Photo Copies (8.5" x 11")		0	$ 1.00	$ 0.00
Color Photo Copies (11" x 17")		0	$ 2.00	$ 0.00
			Total Direct Expenses:	**$ 0.00**

Subconsultants

Firm	Task	Sub Expense	Markup	Cost
AmecFW	9	$ 84,489.00	10%	$ 92,937.90
AmecFW	10	$ 63,778.00	10%	$ 70,155.80
KPG	9	$ 15,188.23	10%	$ 16,707.05
KPG	10	$ 27,877.48	10%	$ 30,665.22
			Total Subconsultants:	**$ 210,465.97**

Cost Summary

Description	Cost
Total Labor	$ 106,322
Total Direct Expenses	$ 0
Total Subconsultants	$ 210,466
Total Project Cost:	**$ 316,788**