Final

ALASKAN WAY VIADUCT AND SEAWALL PROJECT

AGREEMENT NO. Y-7888

SUPPLEMENT 7

WORK ELEMENT 3

SCOPE OF WORK

Clarification and Refinements of Scope and Estimate for Work Element 3 From Supplement 3 budgeted but not previously authorized

Task 17

AUGUST 1, 2002

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ITEM 3.17 ENGINEERING SUPPORT FOR DEIS

The CONSULTANT shall continue development of the Conceptual Engineering to a level sufficient to support the eventual preparation of the Draft Environmental Impact Statement (DEIS). The Conceptual Engineering work will involve preparing documents of the First Operable Phase as well as modifications to the overall Design Plan Vision drawings under consideration for the AWV. These plans will be evaluated in sufficient detail in plan, section and in profile to determine their feasibility with respect to meeting engineering, environmental, and economic constraints. The level of detail that is sufficient to support the DEIS is assumed to be plan and profile definition; connection details, construction sequencing, and cost estimates, at a conceptual level. This effort will end with another "design snapshot".

Two (2) build, one (1) rebuild, and the No Action Plan will be developed to this level of detail, see Table 17.1.

Table 17.1

Design Plan	South	Central	North
Aerial	Aerial	Aerial	Aerial to Bored/Mined Tunnel to At-Grade
Tunnel	Aerial or At-Grade	Cut & Cover Tunnel	Cut & Cover Tunnel to Bored/Mined Tunnel to At-Grade
Rebuild	Aerial	Aerial	Aerial to Battery Street Tunnel

3.17.1 Civil / Roadway Conceptual Design Continuation

The CONSULTANT shall continue development of the Design Plans per Table 17.1 consistent with Work Element 3.3.1 of the Phase 2 Scope of Work dated January 11, 2002. The No-Action Plan will also be carried forward. Additionally, the CONSULTANT shall develop a conceptual design of the First Operable Phase for each Design Plan identified in Table 17.1.

The Design Parameters Form and Project Item Log Design File elements shall be continued consistent with Work Element 4 of the Phase 2 Scope of Work dated January 11, 2002.

3.17.2 Structural Conceptual Design Continuation

The CONSULTANT shall continue development of the Design Plans per Table 17.1 consistent with Work Element 3.3.2 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall develop a conceptual design of the First Operable Phase for each Design Plan identified in Table 17.1. The No-Action plan will also be carried forward.

The Rebuild Plan conceptual engineering will include analysis of a limited number of bridge frame units. These frame units will be utilized for the preferred rebuild or retrofit scheme as appropriate to determine the approximate quantities for the Rebuild Plan Conceptual Design Snapshot. The Rebuild Plan will also include an upgrade to the Battery Street Tunnel Fire/Life Safety systems.

A Special Study Technical Memorandum will be written to look at the effects of decreasing the depth of cover to the top of the Cut-and-Cover Tunnel. Input for the study will be provided by the following disciplines: structural, civil, utilities (including stormwater and electrical power), mechanical, tunnel systems, constructability and cost.

3.17.3 Tunnel Systems Conceptual Design Continuation

The CONSULTANT shall continue development of the Design Plans per Table 17.1 consistent with Work Element 3.3.3 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall develop a conceptual design of the First Operable Phase.

3.17.4 Surface Street Improvement Conceptual Design Continuation

The CONSULTANT shall continue development of the full build Design Plans per Table 17.1. The focus of this work effort will be on preparation of urban design concepts for surface improvements for both the full build and First Operable Phase.

The CONSULTANT shall participate in weekly team meetings either in person or by teleconference for brainstorming, coordination and review purposes. These meetings will include individual and group discussions on specific issues and topics. The CONSULTANT shall also participate in up to one (1) Port of Seattle and one (1) Washington State Ferry (WSF) meeting, one (1) meeting with the South Lake Union Development team, and two (2) Planning and Design Commission meetings related to the urban design concepts for the surface improvements. Prior to the Planning and Design Commission meetings, the CONSULTANT shall prepare wall displays and handouts and a PowerPoint presentation on the development of the urban design concepts for surface improvements along the Harborfront and the Seattle Center / South Lake Union area. For other meetings, "work-in-progress" drawings for discussion purposes will be used and copies of these drawings subsequently will be

provided for more detailed review and comment. The CONSULTANT shall attend and prepare materials for one (1) Leadership Group meeting during this scope of the project. Meeting materials will show the urban design concepts generated to date.

Four (4) urban design concept plans for surface improvements that have been previously developed will be updated. This will include two (2) concept plans for the Tunnel Plan (open space and transit priority), one (1) for the Aerial Plan, and one (1) for the Rebuild plan. This effort will include the Harborfront (from Atlantic Avenue to Broad Street) and the Seattle Center/South Lake Union area. The focus of this effort, however, will be on the Harborfront since separate planning is currently being undertaken by the City for the Seattle Center/South Lake Union Area. The CONSULTANT shall develop Four (4) corresponding Urban Design schemes for the First Operable phase of each Design Plan. The CONSULTANT shall provide input into the estimates of probable construction costs for surface improvements for both the full build and the First Operable Phase.

There will be one (1) open house focused on urban design considerations for surface improvements. The meeting will include displays of current work efforts, a PowerPoint presentation of the development of the urban design concepts, break-out discussions at individual tables on specific topics, group discussion and review of the input from individual table discussions and further comments from the participants.

A written and graphic description of the updated plan layouts and cross-sections of urban design concepts for surface street improvements within the corridor, including the First Operable Phase of construction and the final build condition will be provided in draft and final form. This report will be in an 11 x 17 format with color graphics. Twelve (12) copies will be provided of the final report.

3.17.5 Utilities Conceptual Design Continuation

The CONSULTANT shall continue development of the utilities for the Design Plans per Table 17.1 consistent with Work Element 10 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall develop a conceptual utilities design of the First Operable Phase for each of the Design Plans in Table 17.1. Stormwater BMPs and Electrical Power are not covered in this section, see Work Element 17.6 and 17.7 respectively.

The CONSULTANT shall continue development of the stormwater conceptual design for the full build Design Plans per Table 17.1 consistent with Work Element 4.3 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall develop a conceptual stormwater design of the First Operable Phase for each Design Plan.

The CONSULTANT shall prepare a Draft and Final Drainage Concept technical memorandum to address two (2) alternative means of conveying

stormwater/combined sewage from Vine Street to S. Royal Brougham Way for each of the Design Plans. In conceptual terms one of the alternative drainage conveyance plans would involve conveyance of combined storm drainage, groundwater, and combined sewage overflow volumes to a new wet weather treatment plant in the vicinity of Royal Brougham Way. The other conceptual alternative involves storing combined sewage in a large detention pipe or vaults for conveyance to the Elliott Bay Interceptor and ultimately the West Point Wastewater Treatment Facility. Existing SPU-owned overflows will be maintained in service and the goal will be to limit CSOs to a frequency of one (1) untreated overflow per year. The CONSULTANT shall develop pump station flow rates, head, and wet well volumes to a conceptual level based on available information. Evaluation of the cost of pumping and treatment of the drainage and wastewater for a proposed KC CSO facility in the vicinity of Royal Brougham is not included. The scope of proposed options is limited to conveyance from Vine Street to Royal Brougham Way.

The CONSULTANT shall design detention systems for sub-basins within each Design Plan that connect to the City of Seattle combined sewer system to match existing points of connection. Pump systems may be required for new storm water conveyance systems, especially for tunnels.

The Technical Memorandum shall recommend the preferred conveyance strategy for conveying storm drainage, groundwater, and combined sewage along the waterfront based on conceptual level analysis of the proposed conveyance system.

The CONSULTANT will receive King County modeling results no later than 21 calendar days from the NTP. Use of the King County hydraulic or other models by the CONSULTANT shall not be required, unless a modification is made to this scope. Additional modeling by the CONSULTANT is not included in this scope of work.

3.17.6 Stormwater BMPs Conceptual Design Continuation

The CONSULTANT shall continue development of the stormwater BMPs conceptual design for the Design Plans per Table 17.1 consistent with Work Element 4.3 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall develop a conceptual design of the First Operable Phase for each Design Plan identified in Table 17.1.

Detention design shall be based on criteria in the City of Seattle Drainage and Grading Control Ordinance. For sub-basins that require new outfalls or connection to systems exclusively conveying storm water, storm water quality treatment facilities shall be designed based on the WSDOT Hydraulics Manual, Highway Runoff Manual, and Instructional Letter IL4020.01. Compliance with King County and Washington State Department of Ecology manuals shall not be required. Identification and conceptual design of permanent stormwater treatment BMPs shall be provided. The CONSULTANT shall develop the conceptual level stormwater

design for BMPs for the First Operable Phase and the final Design Plans based on the stormwater systems described in Item 17.5 Stormwater Conceptual Design Development. Wetvaults are the only stormwater treatment BMP that will be considered. A conceptual level footprint and unit price will be provided for the conceptual design for construction stormwater treatment BMPs. The CONSULTANT shall prepare a Technical Memo on potential need for an AFFF treatment facility and supporting costs and a Technical Memo on feasibility of stormwater treatment facility at Royal Brougham Way and supporting costs.

3.17.7 Electrical Utility Conceptual Design Continuation

The CONSULTANT shall continue development of the electrical utility conceptual design for the Design Plans per Table 17.1 consistent with Work Element 10.4 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall develop a conceptual design of the First Operable Phase for each Design Plan identified in Table 17.1.

3.17.8 Geotechnical Conceptual Design Continuation

The CONSULTANT shall continue development of the geotechnical engineering for the full build Design Plans per Table 17.1 consistent with Work Element 8 of the Phase 2 Scope of Work dated January 11, 2002. The following Scope of Work is provided for the geotechnical engineering services required for the new Tunnel Plan alignment of the bored/mined segment.

The CONSULTANT shall plan and conduct a subsurface investigation for the new Tunnel alignment. Two (2) borings averaging two hundred fifty (250) feet depth each will be completed. Explorations will be required to identify soil and groundwater conditions. This information will be used to quantify construction techniques, as well as waste disposal, and groundwater pumping requirements.

The CONSULTANT shall prepare geologic Profile Logs for the two (2) completed borings. Based on the results of these two (2) borings, one (1) geologic profile along the tunnel alignment, and a memo describing the soil and groundwater conditions that may be encountered along the alignment will be prepared. Field and laboratory tests will not be done at this time.

Consistent with Work Element 9.4.1, two (2) groundwater pumping tests will be accomplished to evaluate the groundwater conditions and dewatering requirements for the project. The pumping tests will be designed, performed, and analyzed by the CONSULTANT. A subcontractor will be utilized to drill and install the pumping well and associated pumps for the test.

Conceptual geotechnical engineering design recommendations will be developed and provided for use in conceptual design of the new Tunnel Plan bored/mined segment

alignment to support preparation of the DEIS. The conceptual engineering performed shall identify suitable structure types and likely means and methods of construction for this Design Plan. The potential environmental impacts for each method or alternative shall be assessed. The CONSULTANT shall identify critical design elements and shall provide the basis for all geotechnical recommendations.

The results of these studies will be summarized in a technical memorandum that will be included in a Draft Geotechnical Data Report Technical Memorandum and a Final Geotechnical Data Report Technical Memorandum. The Data Report Technical Memorandum will include all the factual information developed for the project including the logs of the explorations and will summarize all the geotechnical engineering recommendations developed for the project during this phase including conceptual recommendations for tunnel construction and potential ground surface settlement estimates for the new tunnel alignment. In addition to the formal reports, it is anticipated that additional preliminary recommendations shall be provided to the Design Team as they are developed.

3.17.9 Survey and Base Mapping

The CONSULTANT shall continue to provide "Additional Surveying Services", "Hydraulic Locations", and "Traffic Control" on an as-needed basis in support of the full build Design Plans per Table 17.1 consistent with Work Element 11 of the Phase 2 Scope of Work dated January 11, 2002.

3.17.10 Construction Phasing/Constructability

The CONSULTANT shall continue development of the Construction Sequencing and Staging Analysis and the Mobility Analysis for the Design Plans per Table 17.1 consistent with Work Elements 12.1 and 12.2 respectively of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall support the development of the First Operable Phase for each Design Plan.

3.17.11 Risk Registries for Conceptual Level Design

The CONSULTANT shall continue development of the Risk Registries in support of the Design Plans per Table 17.1 and the No-Action Plan, consistent with Work Element 12.5 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall support the development of the First Operable Phase for each Design Plan.

The CONSULTANT shall maintain the Risk Registries previously developed during the evolution of the conceptual design for the No-Action, Rebuild, and Aerial Design Plans. A Tunnel Plan Risk Registry will be developed from previous risk work.

The Risk Registries shall also capture data to be used in the Cost Estimate Validation Process (CEVP).

3.17.12 Opinions of Cost

The CONSULTANT shall continue development of the Conceptual Opinions of Costs in support of the Design Plans per Table 17.1, consistent with Work Element 3.6 of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall support the development of the First Operable Phase for each Design Plan. A Technical Memorandum will be prepared to include estimated capital and Operations and Maintenance (O&M) costs. Conceptual cost estimate preparation, support, and attendance by six (6) staff will be provided for a one (1) week long CEVP workshop at a date to be determined by the STATE in downtown Seattle.

ITEM SW SEAWALL CONCEPTUAL DESIGN CONSIDERATIONS

The CONSULTANT shall continue development of the Conceptual Seawall Design in support of the overall Aerial and Rebuild Plans per Table 17.1, consistent with Work Element SW of the Phase 2 Scope of Work dated January 11, 2002. Additionally, the CONSULTANT shall support the development of the First Operable Phase. The basic objectives for these continued efforts are:

- Revise and expand construction cost estimates and schedules as required for phasing the Aerial Design Plan.
- Provide further study of construction methods and impacts for the purpose of identifying impacts.
- Coordinate the seawall options with the design of the stormwater system.
- Participate in a design snapshot interdisciplinary review and incorporate comments and suggestions generated by the review.
- Assist with public involvement activities as required.

Additional effort may be required to refine one or more of the seawall options previously developed and to coordinate phasing of the seawall construction with the definition of the "First Operable Phase" of the Aerial Plan and the Rebuild Plan for replacing the viaduct. In addition, some additional effort may be required to further develop and present anticipated construction methods, sequences and schedules. Stormwater design information will be reflected on the seawall design drawings. Subsequently, the CONSULTANT shall modify plans and cost estimates as required and shall finalize the plans for "design snapshot" to be eventually used in the DEIS.

The CONSULTANT shall perform a structural analysis of one (1) Type B seawall section and one (1) Type A seawall section. These analyses shall utilize existing computer models and shall approximate the effects of marine borer damage by eliminating the cap beam connection to the pre-cast concrete panel of the seawall. It will be assumed that the weight of the roadway fill is carried by the relieving platform because all test pits indicated that damage to the relieving platform is limited to a relatively small strip of the platform immediately behind the pre-cast seawall panel.

The results of the additional analyses shall be included in the Analysis of the Existing Seawall report.

Additional Relieving Platform Condition Survey:

The CONSULTANT shall perform an inspection of approximately 5,000 linear feet of relieving platform. It is anticipated that the methods to be utilized will consist of a geoprobe survey at approximately 100 feet intervals including utility identification, permitting, probing and coring, traffic control, supervision, and preparation of logs and reports. This effort will be consistent with work element 8. The results of the additional relieving platform condition survey shall be included in the Appendices to the Analysis of the Existing Seawall report.

TABLE OF DELIVERABLES

Item 17.2 Special Study Technical Memorandum on depth of cover for Tunnel Plan

Item 17.4 Urban Design Report

Item 17.5 Draft Drainage Concept Technical Memorandum

Final Drainage Concept Technical Memorandum

Item 17.6 Technical Memo on potential need for an AFFF treatment facility and supporting costs.

Technical Memo on feasibility of stormwater treatment facility at Royal Brougham Way and supporting costs.

Item 17.8 One (1) geologic profile along the tunnel alignment

Technical Memorandum describing the soil and groundwater conditions

Draft Geotechnical Data Report Technical Memorandum

Final Geotechnical Data Report Technical Memorandum

Item 17.12 Technical Memorandum on Costs

Item SW Analysis of the Existing Seawall Report

Appendices to the Analysis of the Existing Seawall report.

APPENDIX: DOCUMENTATION OF OUT-OF-SCOPE SERVICES PROVIDED FOR THE COST ESTIMATE VALIDATION PROCESS

WORK ELEMENT 3.6.2: CEVP PARTICIPATION

In addition to the work effort required in the Opinions of Cost Task 3.6, the CONSULTANT has been requested to develop additional materials and participate in WSDOT's new Cost Estimation Validation Process (CEVP) for the Alaskan Way Viaduct project. Special spreadsheets, development of quantities and unit prices, schedules, flowcharts, phasing plans, phasing estimates, risk registers, and presentation materials for a hybrid alternative C/D, a Tunnel alternative and the Retrofit Alternative are required for the CEVP panel review. Three (3) workshops have been held. The first workshop requires participation by eight (8) staff for five days each at an off-site location. The second workshop requires participation by six (6) staff for two (2) days each at PB's Seattle office. The third workshop requires participation by four (4) staff for one day each in PB's Seattle office.

Deliverables:

- *Cost Packages for a hybrid alternative C/D, Tunnel, Plans A, B, C & D, and the Retrofit Alternative*

- *Presentation Boards for hybrid alternative C/D, Tunnel, Plans A, B, C & D, and the Retrofit Alternative*

- *Risk Registers for hybrid alternative C/D, Tunnel, Plans A, B, C & D, and the Retrofit Alternative*

- *Flow charts with schedules for hybrid alternative C/D, Tunnel, Plans A, B, C & D, and the Retrofit Alternative*