

**ELLIOTT BAY SEAWALL, SEATTLE, WASHINGTON
STORM DAMAGE REDUCTION PROJECT
FEASIBILITY STUDY**

PROJECT MANAGEMENT PLAN

Revised December 5, 2005



Prepared By:
**U.S. Army Corps of Engineers
Seattle District**

In Coordination With:
City of Seattle



**US Army Corps
of Engineers** ®
Seattle District

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Table 1: Principle Acronyms Used In The Project Management Plan

AFB	Alternative Formulation Briefing
ASA (CW)	Assistant Secretary of the Army for Civil Works
AWVSRP	Alaskan Way Viaduct and Seawall Replacement Team
CEFMS	Corps of Engineers Financial Management System
CR	Cultural Resources
DTM	Digital Terrain Model
EIS	Environmental Impact Statement
EO	Executive Order
ER	Engineer Regulation
ESA	Endangered Species Act
FCSA	Feasibility Cost Sharing Agreement
FWHA	Federal Highway Administration
FR	Feasibility Report
FSM	Feasibility Scoping Meeting
FWCA	Fish and Wildlife Coordination Act
FY	Fiscal Year
GDR	Geotechnical Data Report
GER	Geotechnical Engineering Report
GI	General Investigation Program
GIS	Geospatial Information System
HQUSACE	Headquarters, U. S. Army Corp of Engineers
HTRW	Hazardous, Toxic and Radiological Waste
IPR	In-Progress Review Conference
ITR	Independent Technical Review
LPP	Locally Preferred Plan
M-CACES	Micro-Computer Aided Cost Engineering System
NED	National Economic Development
NEPA	National Environmental Policy Act 1969
NER	National Ecosystem Restoration
NMFS	National Marine Fisheries Service
NWD	Northwestern Division, Corps of Engineers
OMB	Office of Management and Budget
OMRR&R	Operation, Maintenance, Repair & Replacement
PCA	Project Cooperation Agreement
PDT	Project Delivery Team
PED	Pre-Construction Engineering and Design
PL	Public Law
PMP	Project Management Plan

QC	Quality Control
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
TRC	Technical Review Conference
USFWS	United States Fish and Wildlife Service
VE	Value Engineering
WBSVE	Work Breakdown Schedule
WRDA	Water Resources Development Act
WSDOT	Washington State Department of Transportation

SECTION 1 – INTRODUCTION

1.1 OVERVIEW AND AUTHORITY

This study is authorized by the Committee on Transportation and Infrastructure, U.S. House of Representatives, House Resolution 2704, September 25, 2002, which reads as follows:

*Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army is requested to review the Comprehensive Study of Water and Related Land Resources for Puget Sound and Adjacent Waters, State of Washington, dated 1971, and other pertinent reports to determine whether modification and recommendations contained therein are advisable at the present time in the interest of storm damage prevention, shoreline protection, environmental restoration and protection, and related purposes in **Elliott Bay, Washington**, including the rehabilitation of the Alaskan Way seawall.*

This Project Management Plan (PMP) is hereby attached to the Feasibility Cost Sharing Agreement (FCSA) entitled “Agreement Between the Department of the Army and the City of Seattle for the Elliott Bay Seawall, Seattle, Washington, Storm Damage Reduction Study,” in accordance with Article I E of the FCSA. The PMP is the blueprint for conducting the feasibility phase of project development. It documents the work requirements and the level of detail that will be necessary to describe the future without project and future with-project conditions, formulate a range of alternative measures, assess their effects, and present a clear rationale for the selection of a storm damage reduction plan for the City of Seattle (“City” or “Sponsor”). The PMP performs the function described in the FCSA. The PMP is a tool for implementing the FCSA, including estimating and monitoring study costs, in-kind services, and schedules for conducting the feasibility phase.

The PMP does not attempt to repeat all project-related information provided in the October 2003 reconnaissance report (Section 905(b) Analysis). The reconnaissance report should be referred to for a detailed description of the reconnaissance studies and related investigations conducted prior to initiating the feasibility phase of project development.

1.2 PROJECT AREA LOCATION

The study area is along the Elliott Bay shoreline, within the central business district of the City of Seattle, Washington (see Figure 1). Seattle is a major port city for trans-Pacific and European trade. The Port of Seattle is the fifth largest (in dollar value) container port in the United States handling \$32 billion worth of products each year. The seawall extends for a distance of approximately 7,900 feet. The southern terminus of the wall abuts the Port of Seattle bulkheads and falls in the vicinity of Pier 48. The northern terminus of the seawall ends at the southern end of Myrtle Edwards Park, where it abuts natural slopes that have been armored with heavy rip-rap. The wall is interrupted in

places by fill, so that the total length of wall structure is actually somewhat less than 7,900 feet.

Figure 1: Project Location



1.3 PROJECT SPONSORSHIP

The City of Seattle, Washington, is the non-Federal sponsor of the feasibility study. The City has been involved in the development of this PMP and will provide local match through in-kind services for the feasibility study, as prescribed in the FCSA and this PMP.

1.4 PROJECT BACKGROUND

Following the Nisqually earthquake of February 2001, the City of Seattle, Washington State Department of Transportation (WSDOT) and Federal Highway Administration (FHWA) inspected both the seawall and the Alaska Way Viaduct for earthquake damage. The inspection revealed that the earthquake had damaged the viaduct but not the seawall. However, marine borers had caused severe deterioration of the seawall. Both structures are now considered to be at or near the ends of their design lives.

In 2001, the City and their partner agencies formed a team that began planning the replacement of the viaduct and the seawall. The SR 99 Alaskan Way Viaduct and Seawall Replacement Project (AWVSRP) partners, are comprised of the U.S. Department of Transportation Federal Highway Administration (FHWA), Washington State Department of Transportation (WSDOT), and City of Seattle. The AWVSRP included the evaluation of the rebuilding or replacement of the Elliott Bay seawall because the seawall is essential to the transportation function of SR99. The AWVSRP team has put significant effort into developing alternatives and examining their costs, benefits, and impacts.

The Corps is now partnering with the City of Seattle to evaluate only the seawall structure, to determine the Corps' Federal interest in cost-sharing in the construction of a seawall replacement. The Corps will begin the planning process by evaluating the work already performed.

The Corps' reconnaissance report, approved by Corps headquarters on 17 October, 2003, demonstrated that there is a Federal interest in pursuing a feasibility phase study to examine the feasibility of a project that will protect the public facilities and economic activities along the Elliott Bay shoreline from storm damages. Information contained in the reconnaissance report, as well as that in the City's previous engineering analyses and the AWVSRP Team's draft EIS will be used as a base from which to continue the required detailed project development and implementation studies. The feasibility study report will thus reflect current problems and opportunities, and the desires of the sponsor and views of the public, establish final planning criteria and planning objectives used to formulate plans, identify additional measures necessary to meet the final planning objectives, and document the formulation and evaluation of alternative plans and basis for plan selection.

1.5 STUDY PURPOSE

The purpose of the feasibility phase of project development is to formulate a plan to address the storm damage risk associated with the seriously deteriorated seawall along Elliott Bay in Seattle. The sponsor's objective is a long-term solution to storm damage that will protect public infrastructure and economic activity in the project area. The recommended plan that will be set forth in the feasibility report must be both a technically viable and an implementable solution to the storm damage problem.

The feasibility study will investigate and identify solutions to identified water resources problems and recommend either for or against Corps of Engineers authorization of a storm damage reduction project. The final feasibility report will provide a complete presentation of the study analyses and results, including those developed in the reconnaissance report. The feasibility report will also document compliance with all applicable guidance, statutes, Executive Orders and Administration policy. The feasibility report will thus be the basis for decision on Corps of Engineers authorization.

1.6 RELATIONSHIP BETWEEN CORPS AND AWVSRP TEAMS

The Corps' Elliott Bay Seawall Feasibility Study is closely related to replacement of the State Route (SR) 99 Alaskan Way Viaduct, which runs parallel to a portion of the seawall. The AWVSRP included the evaluation of the rebuilding or replacement of the Elliott Bay seawall because it is essential to the transportation function of SR99. The geographic area covered related to the seawall replacement is virtually the same as the Corps seawall study area. However, the Corps' will evaluate the seawall from a storm damage reduction perspective. The seawall will be the primary focus of the Corps' analysis rather than the seawall as secondary to the transportation function, which is the primary focus in the AWVSR Project.

The Corps will conduct scoping for the storm damage reduction (SDR) project, informing an EIS, and will formulate alternatives that address storm damage. The Corps will emphasize that the Corps' conduct of a parallel NEPA process does not intimate any conclusions of inadequacy, but a recognition that the Corps is operating under constraints and procedural obligations of a completely distinct project authority. The SDR project will result in a different range of alternatives from the AWVSR project, yet coincide in location.

The Corps is currently reviewing the AWVSRP existing body of work and coordinating closely with the City of Seattle, FHWA, and WSDOT to incorporate all relevant material, share information, and reduce duplication of efforts to ensure the best use of public funding. The Corps will provide draft products to the AWVSRP team for review prior to release. The Corps will coordinate all communication to the AWVSRP team with the City, and will participate in AWVSRP regular Environmental Strategy Team (EST) meetings, or other meetings, as necessary.

1.7 PURPOSE AND SCOPE OF PROJECT MANAGEMENT PLAN

The purpose of a PMP is to be a roadmap for quality project delivery, guiding the project delivery team through the development of a Feasibility Report and Environmental Impact Statement (EIS) that describes the formulation and evaluation of a storm damage reduction project. The PMP defines the scope of the study, tasks, and schedule for completing the feasibility study. It also serves to allocate responsibilities and costs between the U.S. Army Corps of Engineers ("Corps' or "Government") and City of Seattle and can be used to justify any necessary future negotiated modifications. The PMP provides a common understanding between City of Seattle and the Corps' Seattle District as to needs and expectations for project delivery. Specifically, the PMP addresses the following:

- Study tasks as well as responsibility for their accomplishment.
- The estimated cost of individual study tasks and total study cost, including the negotiated cost of work items to be accomplished by City of Seattle as in-kind services.
- Corps and other professional criteria to assess the adequacy of the completed work effort, including references to regulations and other guidance that will be followed in performing and evaluating the tasks.

- The schedule of performance and milestones (i.e., key decision points, including in-progress reviews, issue resolution conferences, etc.).
- The specific coordination mechanism between the Corps and City of Seattle.
- Procedures for reviewing and accepting work as an in-kind credit performed by City of Seattle.

The PMP was developed consistent with the requirements of the Corps' Engineer Regulation (ER) 1105-2-100, ER 5-1-11, and related guidance. The Project Delivery Team and Executive Committee will use this PMP to facilitate effective communication and oversee the execution of study tasks within time and budget. Because the planning process is dynamic, the stated tasks, scope, budget, and schedule for completion may change. Any proposed changes in the PMP will be fully coordinated with the Executive Committee in accordance with the terms of the FSCA and the PMP will be updated and the FSCA amended as appropriate.

1.8 PLANNING PROCESS

The Corps' planning process is a structured approach to problem solving. It involves six steps that include (1) identifying problems and opportunities, (2) inventorying and forecasting conditions, (3) formulating alternative plans, (4) evaluating alternative plans, (5) comparing alternative plans, and (6) selecting a plan. This process was initiated with the Corps' reconnaissance report. The process will continue in the feasibility phase, with major study activities sequenced as follows:

- Review and incorporate Alaskan Way Viaduct and Seawall Replacement Project studies already completed by the AWVSRP Team. The AWVSRP Team has completed extensive studies into the current condition of the existing shore protection, the probable modes of shore protection failure, and alternatives for new shore protection. The AWVSRP Team has assembled a large team of engineering consultants, who have produced a large volume of work, which may closely approximate the Corps planning process, especially steps 1 through 5.
- Document the without project condition. Careful documentation of the without project condition is critical for establishing a Federal interest in the project as defined in the Water Resources Development Act. The Corps will utilize the AWVSRP Team's existing information to the greatest extent possible in the without project condition documentation. The cost of the proposed project is very high, and a careful and complete documentation of the without project condition will be needed to justify a Corps recommendation for authorization as a Federal project.
- Formulate and evaluate alternative plans and select a recommended plan. The Corps will review previous work on formulation of alternatives to verify that the work has satisfied Corps' planning requirements. If the Corps is able to adopt the AWVSRP Team's alternatives formulation, the Corps will proceed to identify the National Economic Development (NED) plan. If additional formulation is found to be necessary, a rescope of the additional effort may be necessary and will result in a revision to this PMP. There is a mutual understanding that the AWVSRP Team will select a Locally Preferred Plan (LPP) by the time the Corps identifies a NED plan. If the plans do not coincide, it is understood that Executive

Committee may recommend the Locally Preferred Plan and base the recommended project cost sharing on the NED plan.

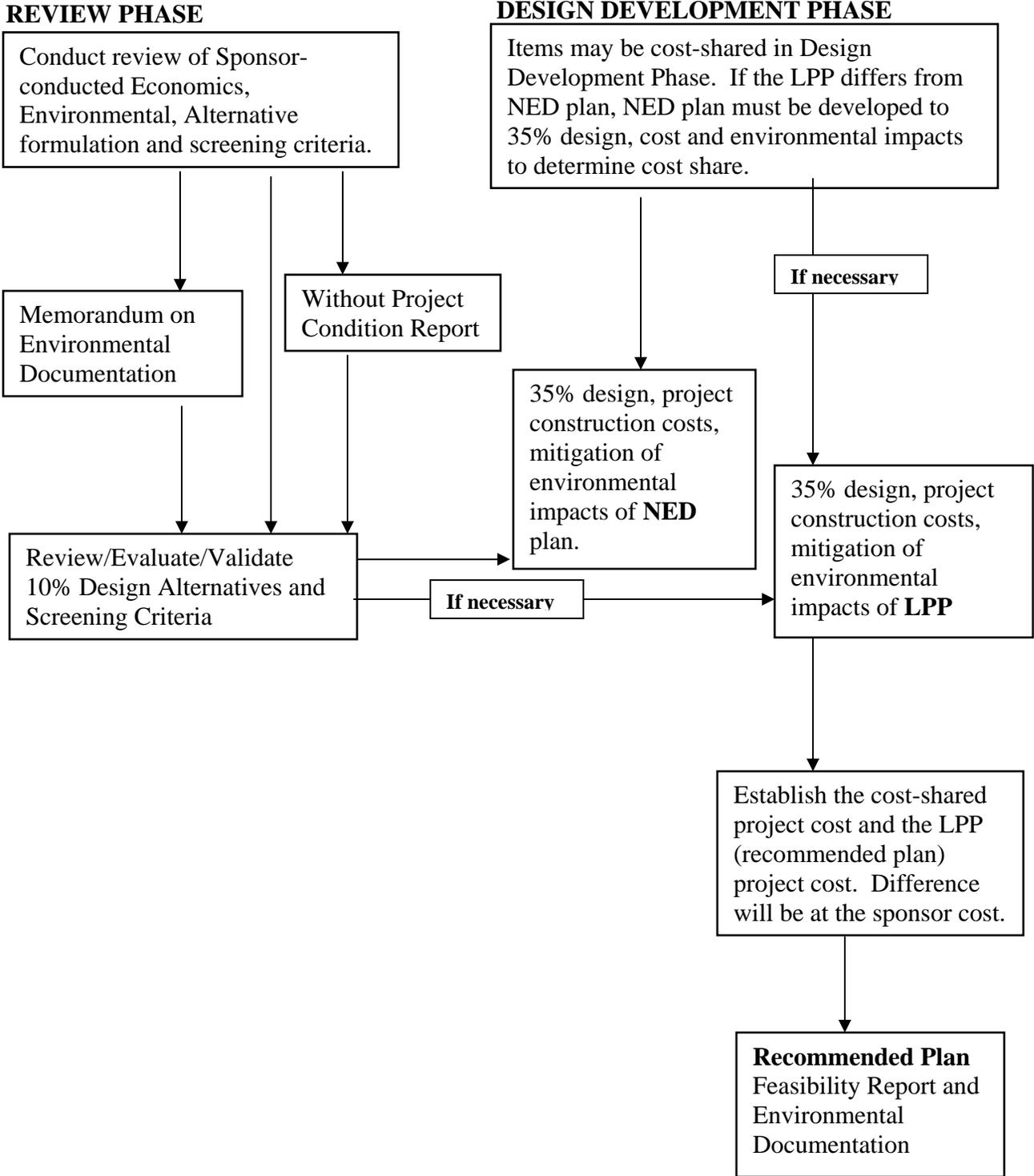
- Prepare draft feasibility report and EIS. A draft feasibility report and EIS will be prepared and issued for public review. The AWVSRP Team will have an EIS prepared prior to the draft feasibility report, and the Corps environmental compliance will be documented in material supplementary to that EIS. The draft feasibility report will include engineering, economics and real estate appendices. A formal public meeting will be held prior to the end of the draft report public review period.
- Prepare final feasibility report and Final EIS. Following public review, a final feasibility report and final EIS will be prepared and submitted for review and approval at the Washington, D.C., level.
- Washington Level Review and Approval Support. The Seattle District and City of Seattle will perform those tasks necessary to support the Washington, D.C. level review processing of the feasibility report.

As the Corps feasibility study begins, the City and their partners have already progressed through the planning process by setting goals and objectives, outlining three without project conditions, formulating alternatives, developing the alternatives, and partially evaluating the alternatives. A draft EIS was released March 2004 by the City, the Washington State Department of Transportation and the Federal Highway Administration. As of December 2004, the AWVSRP Team selected the tunnel alternative as the preferred alternative for the transportation project. This alternative includes the replacement of the seawall from Washington St to Broad St.

Because of the vast amounts of information completed by the AWVSR Team, the Corps intends to utilize all pertinent information to reduce cost, create efficiencies and form partnerships with the AWVSR Team. Where appropriate, this would best be done through incorporation by reference of technical information, and partial adoption of analysis and conclusions drawn from the existing body of work, pertaining to the seawall and pertinent to the SDR analysis. If the Corps finds that additional work is needed to support the storm damage reduction project, that work will be incorporated into and performed in accordance with the feasibility study PMP. This review process will comprise one of two concurrent phases.

The design development phase will be concurrent to the review phase and will ensure that the Corps is able to participate and cost-share in necessary design development with the City, in order to maintain aggressive project schedule. Figure 2 demonstrates the concurrent two-phase approach to the Corps planning process.

Figure 2: Project Development Strategy



SECTION 2 - PROJECT MANAGEMENT

The specific management and coordination mechanisms between the Corps of Engineers and City of Seattle are described below. Study management and coordination are generally described in Article IV of the FCSA, which provides for an Executive Committee to oversee the feasibility study and a Project Delivery Team to manage and conduct the day-to-day study activities.

2.1 EXECUTIVE COMMITTEE

Members of the Elliott Bay Seawall Study Executive Committee are identified in Table 2. Meetings of the Executive Committee will be scheduled, as necessary on a quarterly basis. More frequent meetings will be scheduled, as required. The Corps Project Manager, acting on behalf of the PDT, will provide periodic status reports to the Executive Committee.

2.2 PROJECT STAKEHOLDERS

There are a number of stakeholders associated with this project, many with multiple interests. The following stakeholders have had direct involvement in the study:

- ❑ Federal Highways Administration
- ❑ Washington State Department of Transportation
- ❑ U.S. Environmental Protection Agency
- ❑ Burlington Northern-Santa Fe Railroad
- ❑ Union Pacific Railroad
- ❑ Port of Seattle
- ❑ People for Puget Sound
- ❑ Business Owners along the downtown Seattle waterfront
- ❑ Users of the downtown Seattle waterfront
- ❑ Community and business associations
- ❑ Others

2.3 PROJECT DELIVERY TEAM

The Project Delivery Team (PDT) is led by the Corps Project Manager, in coordination with the Corps Assistant Project Manager, Corps Environmental Coordinator, and the City of Seattle Project Manager. The Corps Project Manager will be responsible for overall day-to-day management of the feasibility phase study. He/she will maintain close coordination with the PDT, to ensure timely prosecution of the study and compliance with the FCSA and PMP. The Corps' Project Manager and Environmental Coordinator and will meet and confer with the City of Seattle Project Manager on a regular basis throughout the study to coordinate study prosecution and progress.

The PDT is composed of qualified staff from the Seattle District, the City of Seattle, and other members of the AWVSRP team. Various consultants and contractors may provide assistance. The PDT members are listed in Table 2. Team meetings will be scheduled periodically, as required by study activities or issues.

2.4 PARTNERSHIP TEAM

The Partnership team exists as a multi-agency, staff-level issue resolution body, co-managed by the four agencies involved: Corps, City, WSDOT, and FHWA. At a minimum, for a meeting, each agency must have representation by a project manager, or other decision-making participant. This body also may include subgroups from each agency, as necessary to resolve a particular issue. Any of the four agencies may initiate a Partnership team meeting and develop an agenda to facilitate the resolution of a current issue. The leader or facilitator for each meeting will be designated based upon the issue at hand. An independent facilitator may be requested by any of the four agencies.

2.5 STATUS REPORTS

The Corps Project Manager, in coordination with the City of Seattle Project Manager, will prepare and distribute study status reports, with appropriate input from the PDT. The reports will identify progress of work items during the period, projected and actual costs through the last reporting period, as well as document unresolved conflicts or policy issues requiring action by the Executive Committee. In addition, any revisions of the PMP will be coordinated with the Executive Committee. Project managers will exchange weekly progress status reports to provide up-to-date accounting of task progress, and quarterly financial reports to provide up-to-date accounting of study expenditures, including documentation and crediting of City of Seattle in-kind services.

2.6 REVIEW AND ACCEPTANCE OF WORK

The PDT, under the direction of the Corp Project Manager, will monitor and review all work. PDT review and acceptance of work items, including contracts, will be documented in the study status reports submitted to the Executive Committee. The Corps Project Manager, acting through the PDT, will immediately bring any disagreements about the acceptability of completed work to the attention of the Executive Committee.

Table 2: Project Team Members

<u>Position/Role</u>	<u>Name</u>	<u>Office or Agency</u>
Feasibility Study Executive Committee		
Director of Seattle Department of Transportation	Grace Crunican	City of Seattle
Lead Project Manager	Bob Chandler	City of Seattle
Division of Structures	Richard Miller	City of Seattle
Representative of WSDOT, ex-officio		WSDOT
Representative of FHWA, ex-officio		FHWA
Chief, Planning, Programs & Project Management Division, Seattle	Michael Bevens	Corps of Engineers
Chief, Planning Branch,	Mona Thomason	Corps of Engineers

Position/Role	Name	Office or Agency
Seattle		
Project Manager, Seattle	Tim Shaw	Corps of Engineers
Environmental Coordinator	Aimee Kinney	Corps of Engineers
Chief, Planning & Policy Division, Northwestern Division, Portland, Oregon	Dennis Wagner **	Corps of Engineers
Corps – Planning & Policy Division, Northwestern Division, Portland, Oregon	Ed Woodruff **	Corps of Engineers
Planning and Policy Division, Headquarters, Washington, D.C.	William Schmitz **	Corps of Engineers
Planning and Policy Division, Headquarters, Washington, D.C.	Zoltan Montvai **	Corps of Engineers
	(** denotes “Virtual Team” member)	
Project Delivery Team		
Project Manager	Tim Shaw	CENWS-PM-CP
Assistant Project Manager	Rebecca Jahns	CENWS-PM-PL
Program Analyst	Patricia Bauccio	CENWS-PM-CP
Budget Analyst	Li-Shine Lin	CENEW-PM-CP
Environmental Coordinator	Kathy Kunz	CENWS-PM-PL-ER
Environmental Resources	Nicolle Rutherford	CENWS-PM-PL-ER
Cultural Resources	Ron Kent	CENWS-PM-PL-ER
Environmental Engineering/HTRW	Kathryn Carpenter	CENWS-EC-TB-ET
Geotechnical/Civil Engineering	Paul Anderson	CENWS-EC-DB-CS
Economic Evaluation	Brian Shenk	CENWP-PM-FE
Economic Evaluation	Mike Green	CENWS-PM-PL
Cost Engineering	Tim Sullivan	CENWS-EC-CO-CA
Real Estate	Wanda Gentry Robert Zillmer	CENWS-RE-RS CENWS-RE-AP
Value Engineer	Rick Lambert	CESAC-VE
Sponsor-Project Manager	Bob Chandler	City of Seattle, WA
Sponsor – Assistant. Project Manager	John Arnesen	City of Seattle, WA
Sponsor-Project Coordinator	Joyce Kling	City of Seattle, WA
Senior Project Engineer	John Buswell	City of Seattle, WA
Representative of WSDOT, ex-officio		WSDOT
Representative of FHWA, ex-officio		FHWA
Independent Technical Review Team		

<u>Position/Role</u>	<u>Name</u>	<u>Office or Agency</u>
Review Team Leader	Steve Babcock	CENWS-PM-PL
Economics	Michael Hallisy	CESPL-PD-WE
Plan Formulation	Michael Hallisy	CESPL-PD-WE
Environmental Resources	Eric Laux	CENWO-PM-AE
Soils and Geotechnical Engineering	Rich Hannan	CENWP-EC-HG
Grout methods/design	Tim Flaherty	CELRL-ED-T-G
Real Estate	A. E. Hamilton	CENWS-RE-RS
Civil Engineer	TBD	
Cost Engineer	TBD	
Structural Engineer	TBD	
Stakeholders and Consultant Participants		
AWVSR Team Project Manager	Tom Madden	Washington Department of Transportation
AWVSR Team Consultant Senior Supervising Engineer		
AWVSR Team Consultant		
AWVSR Team Consultant		
Stakeholder Agency	TBD	Federal Highway Administration
Stakeholder Agency	TBD	Washington Department of Natural Resources
Stakeholder Agency	TBD	US Fish and Wildlife Service
Stakeholder Agency	TBD	Washington Department of Fish and Wildlife
Stakeholder Agency	TBD	NOAA Fisheries
Stakeholder Agency	TBD	Washington Department of Ecology
Stakeholder Agency	TBD	Muckleshoot Indian Tribe

SECTION 3 - STUDY REQUIREMENTS, WORK BREAKDOWN STRUCTURE AND COST-SHARING ORGANIZATION

3.1 STUDY REQUIREMENTS

The work to be performed shall consist of the formulation and evaluation of alternative plans to address the storm damage problem at Elliott Bay and selection of a recommended plan. This will include: (1) developing a detailed plan and design; (2) preparing construction and operation and maintenance cost estimates for the recommended plan; (3) computing average annual benefits and costs; (4) evaluating technical and economic feasibility of the plan; (5) assessing environmental and social impacts, including impacts on biological resources, socio-economic conditions, cultural resources, and recreation; (6) addressing the views of the public through workshops and public meetings; (7) formulating plan mitigation measures; and (8) preparing the draft and final feasibility report and SEIS with required documentation to present the investigations and evaluations which support the selected plan.

The end products will be a feasibility report and EIS.

The feasibility phase is expected to identify a plan for storm damage reduction that meets or exceeds project objectives, is both technically viable and implementable, has Corps and Sponsor support, and will provide economic benefits at a reasonable and affordable cost. Within this analysis, a non-structural alternative will be identified and evaluated. Specifically, a plan recommended for implementation must be:

- Technically feasible from an engineering standpoint (i.e., sound engineering design).
- Economically justified (with construction and maintenance costs such that national economic development benefits exceed costs over the 50-year period of economic evaluation). The NED plan will also be identified, if different from the recommended plan. The NED plan is the plan that meets planning objectives and maximizes net benefits.
- Functionally complete. The recommended plan must provide a complete stand-alone solution that generates benefits sufficient to justify the project.
- Supported by the project sponsor and stakeholders, and environmentally acceptable (able to meet permitting and regulatory requirements).

The PMP thus defines and limits the work to that necessary to meet these requirements for a complete feasibility report.

The preparation of the feasibility report will consist of writing the main body and associated appendixes, as well as an EIS. There will be a technical review conference (TRC), an alternative formulation briefing (AFB), and possibly a feasibility review conference (FRC). Senior staff from Seattle District, Northwestern Division, HQUSACE, and City of Seattle will participate in these briefings and conferences. The

draft feasibility report and EIS will be released for public review, and a public meeting is anticipated. The report will then be revised. When the final feasibility report and EIS are ready, they will be submitted to the Northwestern Division Engineer for further processing.

Once the Division Engineer issues a Public Notice on the feasibility report, the report will then begin the Washington level review process. This process consists of filing the final EIS in the Federal Register following State and Federal agency review, submittal of the Chief of Engineer’s report to the Assistant Secretary of the Army for Civil Works [ASA(CW)], and submittal of the ASA(CW) letter to the Office of Management and Budget (OMB) for review for consistency with the policies and programs of the President.

3.2 WORK BREAKDOWN STRUCTURE

A work breakdown structure (WBS) is applied to the study tasks and subtasks, creating a hierarchy of activities. The WBS provides a means for organizing the feasibility phase activities in a logical sequence and identifying products or deliverables through the various stages of the feasibility phase. The study tasks identified in the PMP are organized according to their associated WBS category.

NOTE: The anticipated deployment and implementation in fiscal year 2004 of P2, the Corps of Engineers’ new Automated Information System (AIS) that supports the doctrine of ER 5-1-11, will necessitate the transformation of the WBS presented in the PMP to that required by P2.

Table 3 provides the WBS for the feasibility study. This WBS is used for accounting and administrative purposes to track obligations and expenditures within the Corps of Engineers Financial Management System (CEFMS). The Work Category (WC) and Work Category Element (WCE) codes in CEFMS provide a representation of the study scope broken down into a hierarchy of activities. The codes are designated in CEFMS when in-house labor, and requests for goods and services (contracts and purchase orders) are obligated, as well as when sponsor in-kind services are credited.

Table 3 : Civil Work Breakdown Structure for Feasibility Study

CEFMS Work Category	CEFMS Work Category Element	Work Item
22A0D	J1000	Public Involvement
22D0D	JG000	Cultural Resource and Historical Studies/Report
22E0D	JD000	Environmental Studies/Report (EIS)
22F0D	JE000	Fish and Wildlife Coordination Act Report
22G0D	JBA00	Economic Analysis/Report
22H0D	JC000	Real Estate Analyses/Documents
22J0D	JAB00	Hydrology and Hydraulics Studies/Report
22K0D	JAC00	Geotechnical Studies/Report

22L0D	JF000	HTRW Studies/Report
22N0D	JAA00	Surveys and Mapping (excluding real estate)
22P0D	-----	Engineering and Design Analysis Report/Cost Estimates:
22P0D	JAE00	• Feasibility Engineering and Design
22P0D	JAF00	• Model Studies
22P0D	JH000	• Cost Estimates
22M0D	JN000	All Other Studies/Investigations (to be specified in CEFMS)
22Q0D	JP000	Feasibility Management (Program and Project Management)
22R0D	JJ000	Plan Formulation and Evaluation
22S0D	-----	Feasibility Report Documentation:
22S0D	JK000	• Draft Report Documentation
22S0D	JL000	• Final Report Documentation
22V0D	K0000	Initial Project Cooperation Agreement (PCA)
22Y0D	JM000	Washington Level Report Approval

3.3 FEASIBILITY STUDY COST SHARING AND SCHEDULE

The feasibility study cost estimate is summarized by Federal fiscal year (FY) in Table 4. The funding breakdown is tied to a schedule which calls for submittal of the final feasibility report to the Northwestern Division Commander in Portland, Oregon 26 months after signing the FCSA and initiating the study. Note that the “study period,” as defined in the Agreement (Article I D), commences with the release to the U.S. Army Corps of Engineers, Seattle District, of initial feasibility funds following execution of the Agreement. The study period, and thus the feasibility phase itself, ends when the Assistant Secretary of the Army (Civil Works) submits the feasibility report to the Office of Management and Budget (OMB) for review for consistency with the policies and programs of the President.

Table 4: Fully Funded Total Project Cost Summary

<u>Task</u>	<u>Corps</u>	<u>City</u>	<u>Total</u>
J1000 - Public Involvement			
Public Involvement	\$ 168,070	\$ 271,328	\$ 439,398
JB000 - Social and Economic Studies			
Economic analysis/report	\$ 275,092	\$ -	\$ 275,092
ITR of economics products	\$ 12,731	\$ -	\$ 12,731
JG000 - Cultural Resources			
Cultural resources inventory	\$ 88,323	\$ -	\$ 88,323
	\$ -	\$ -	\$ -
JG000 - Environmental Studies	\$ -	\$ -	\$ -
Collect and review existing literature and/or surveys in project area	\$ 15,450	\$ -	\$ 15,450
Environmental surveys	\$ 220,935	\$ 53,045	\$ 273,980
Environmental Impact Assessment and mitigation plan development	\$ 130,295	\$ 104,545	\$ 234,840
Prepare draft and final NEPA/SEPA SEIS	\$ 199,408	\$ 52,273	\$ 251,681

Coordination/analysis (in addition to the NEPA process)	\$ 73,645	\$ -	\$ 73,645
Supervision and administration	\$ 15,697	\$ -	\$ 15,697
ITR of interim environmental products	\$ 46,000	\$ -	\$ 46,000
	\$ -	\$ -	\$ -
JD000 - US Fish & Wildlife Service Coordination	\$ -	\$ -	\$ -
Fish and Wildlife Coordination Act studies/reports	\$ 71,611	\$ -	\$ 71,611
	\$ -	\$ -	\$ -
JC000 - Real Estate Analyses/docs	\$ 708,815	\$ -	\$ 708,815
	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -
JAC00 - Geotechnical studies	\$ -	\$ -	\$ -
Geotechnical Explorations	\$ 518,500	\$ 868,500	\$ 1,387,000
Geotechnical Engineering Analyses	\$ -	\$ 507,481	\$ 507,481
	\$ -	\$ -	\$ -
JF000 - HTRW Studies	\$ -	\$ -	\$ -
HTRW Assessment	\$ 284,460	\$ -	\$ 284,460
	\$ -	\$ -	\$ -
JAA00 Surveys and mapping (excluding RE)	\$ -	\$ -	\$ -
GIS support	\$ 35,545	\$ -	\$ 35,545
Survey base mapping	\$ -	\$ 693,872	\$ 693,872
Utility and Drainage Mapping	\$ -	\$ -	\$ -
JAE00 Engineering analysis and Design			
Engineering Management	\$ -	\$ 515,135	\$ 515,135
Engineering	\$ 480,619	\$ 496,589	\$ 977,207
Construction phasing and maintenance of traffic	\$ -	\$ 38,110	\$ 38,110
Utility design and relocation plan	\$ -	\$ -	\$ -
Surface restoration for seawall stabilization	\$ -	\$ 150,741	\$ 150,741
Value Engineering Study	\$ 56,650	\$ -	\$ 56,650
Prepare engineering and Design Appendix	\$ 53,045	\$ 106,090	\$ 159,135
ITR of interim engineering products	\$ 98,159	\$ 68,959	\$ 167,118
JH000 - Cost Estimates			
Prepare and Review final cost estimates	\$ 10,609	\$ 58,350	\$ 68,959
JJ000 - Plan Formulation and evaluation			
Review of prior work	\$ 25,000	\$ -	\$ 25,000
Without project conditions analysis	\$ 60,000	\$ 40,000	\$ 100,000
Plan formulation	\$ 25,000	\$ 10,000	\$ 35,000
FSM	\$ 3,000	\$ 3,000	\$ 6,000
AFB	\$ 3,183	\$ 3,183	\$ 6,365
	\$ -	\$ -	\$ -
JK000 - Feasibility Report Preparation	\$ -	\$ -	\$ -
Draft report preparation	\$ 33,949	\$ 10,609	\$ 44,558
Draft report ITR	\$ 21,855	\$ 21,855	\$ 43,709
Final report preparation	\$ 10,927	\$ 5,464	\$ 16,391

	\$ -	\$ -	\$ -
L0000 - Project Management Plan	\$ -	\$ -	\$ -
PMP Development and Update	\$ 13,180	\$ 13,180	\$ 26,360
Review and maintenance	\$ 14,848	\$ 13,722	\$ 28,570
	\$ -	\$ -	\$ -
Z0000 - Program and Project Management	\$ -	\$ -	\$ -
Program Management, Corps	\$ 344,606	\$ -	\$ 344,606
Project Management	\$ 490,953	\$ 504,132	\$ 995,085
Executive Committee	\$ 15,918	\$ 15,918	\$ 31,836
Preconstruction Engineering and Design Cost Sharing Agreement	\$ 31,827	\$ 31,827	\$ 63,654
Lessons Learned	\$ 5,464	\$ 5,464	\$ 10,927
	\$ -	\$ -	\$ -
K0000 Draft Project Cooperation Agreement	\$ -	\$ -	\$ -
Negotiate Draft Project Cooperation Agreement	\$ 42,436	\$ 42,436	\$ 84,872
	\$ -	\$ -	\$ -
JM000 - Washington Level Review and Approval Support	\$ -	\$ -	\$ -
Coordination, Review and Response	\$ 53,045	\$ 53,045	\$ 106,090
	\$ -	\$ -	\$ -
Totals:	\$ 4,758,849	\$4,758,849	\$ 9,517,698

SECTION 4 - FEASIBILITY STUDY WORK ITEMS

4.1 PUBLIC INVOLVEMENT

This task includes a multi-pronged approach to achieve coordination with stakeholders and the general public to provide opportunity for public comment on measures associated with providing storm damage reduction at Elliott Bay project area. This work will be closely coordinated with the AWVSRP team. Education and increased awareness and exchange of viewpoints with the public are vital to the formulation of a technically viable and implementable storm damage reduction plan. Coordination with Native American tribes, state and Federal resource agencies, and interest groups and parties, is an also important component of the public involvement program. A number of methods of conveying information are identified, but not limited to, newsletters, advertisements, website, news releases and mailings. Through these methods, information conveyed may include summaries of technical information and informational displays. This work will lead to a summary of public comment within the EIS and appropriate written narrative for the feasibility report. Reference: ER 1105-2-100.

4.2 CULTURAL RESOURCES AND HISTORICAL STUDIES/REPORT

This task involves a literature review and query of state GIS and databases for historical and archaeological materials to determine impacts of alternative plans upon historic and cultural resources. This is required under the National Historic Preservation Act. The Corps, in consultation with the Washington State Historical Preservation Office and the City, will perform any work that may not have been completed by the AWVSRP Team. References: National Historic Preservation Act of 1966, Archeological and Historical Preservation Act of 1974, National Environmental Policy Act of 1969, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), Native American Religious Freedom Act.

4.3 ENVIRONMENTAL STUDIES AND EIS

This task includes reviewing the Draft EIS prepared by the AWVSRP Team, the 25 Appendices to that document and any supporting studies and documentation. In addition, if required, it will include literature review and field studies and investigations required to document the environmental baseline of the study area and to identify impacts that would be associated with providing storm damage reduction measures at Elliott Bay project area. A number of discrete tasks and related study activities would be undertaken, as described below. Work will lead to a determination of whether additional environmental review is required, preparation of an EIS, and appropriate written narrative for the feasibility report. The Corps, its contractors, and the Sponsor will perform the work. Reference: ER 1105-2-100; ER 200-2-2.

4.3.1. Collect and Review Existing Literature and/or Surveys in Project Area

Review will focus on habitat, Federal and state endangered/threatened species and species of concern, and commercially important species. The field studies listed below may be modified after a thorough review of work already completed by the AWVSRP Team, existing literature and surveys of the project area has been completed. Without the

knowledge of this review, the following list of studies is recommended in order to fulfill the purpose of this project.

4.3.2 Environmental Surveys

Wildlife, fisheries, and habitat surveys will provide baseline data on existing site conditions. This baseline data is necessary for subsequent impact assessments that will predict changes to existing site conditions that could result from the various alternatives under future with-project conditions. These studies will also provide valuable and vital information for Endangered Species Act (ESA) Section 7 Biological Evaluations, where determinations on how construction activities and habitat changes would affect endangered and threatened species are made. The exact composition and extent of environmental surveys is a function of the range of alternative plans that must be evaluated in detail as part of plan formulation. The estimated cost of environmental surveys presented in the PMP identifies the probable upper limit of costs. Individual studies include use survey of species of concern and subtidal/intertidal habitat survey.

4.3.3 Environmental Impact Assessment and Mitigation Plan Development

Environmental impact assessment will determine how the baseline environmental conditions identified above would be changed by implementation of feasible alternatives under future with-project conditions. Impact assessments will largely correspond to the studied identified above. This information will be used in the plan formulation process. A mitigation plan will be developed to address unavoidable adverse environmental impacts that will result from the recommended plan.

4.3.4 Prepare Draft and Final EIS

This task includes preparing a draft EIS, conducting the document review process and related environmental coordination, contract management, and production of the final EIS. The City of Seattle/Washington State Department of Transportation/Federal Highway Administration EIS (in process) for the Alaskan Way Viaduct/Seawall project will be utilized to the maximum extent. Reference: 33 CFR Parts 230 and 325, and ER 1105-2-100.

4.3.5 Coordination/Analysis (in Addition to the NEPA Process)

This task involves preparation of supporting documentation for the project that will not yet have been accomplished by the AWVSRP Team, possibly including the 404(b)(1) analysis to demonstrate compliance with the Clean Water Act, Coastal Zone Management Act consistency determination, preparation of a biological assessment as required under Section 7 of the Endangered Species Act and preparation of the Clean Water Act 401 Certification application. It may also include Clean Water Act 402 permits, depending how storm water will be managed both during and after construction. This work involves extensive coordination with Federal and State agencies and the preparation of technical support documents. Reference: 40 CFR 230 and 33 CFR 320-330; ER 200-2-2; ER 1105-2-100; Clean Water Act of 1972; Endangered Species Act of 1973; Coastal Zone Management Act of 1972.

4.4 FISH AND WILDLIFE COORDINATION ACT REPORT

This subtask includes coordination with, and studies conducted by, the U.S. Fish and Wildlife Service (USFWS), as required by the Fish and Wildlife Coordination Act (FWCA). USFWS activities will include interagency and tribal coordination, planning and evaluation of the impacts of alternative plans on fish and wildlife resources, and preparation of a draft and final Fish and Wildlife Coordination Act Report for the feasibility report. Related activities by the Corps will include preparation and coordination of statements of work and related fund transfer documents for planning activities by USFWS, plus review of the draft and final Fish and Wildlife Coordination Act Report by the Corps and Sponsor, and incorporation of the report, or necessary portions of it, into the NEPA documentation. USFWS staff, with guidance and oversight by Corps environmental staff, will perform the work.

Reference: Fish and Wildlife Coordination Act of 1958 (PL 85-624, as amended).

4.5 ECONOMIC ANALYSIS/REPORT

Social and Economic Studies/Appendix: This includes studies pertinent to an economic analysis of a major rehabilitation to the Elliott Bay Seawall under future without and with-project conditions. The economic analysis will quantify the future without-project damages and quantify damages reduced associated with a range of alternative plans including the optimum NED alternative plan. A financial analysis in support of the construction recommendation will also be prepared and will include a statement of Sponsor financial capability, a financial capability assessment, and a financing plan. The financing plan will provide detail as to the anticipated project implementation funding sources available to the Sponsor. Cost apportionment will delineate the Federal and Non-federal costs in design and construction phase. Federal cost share of design and construction of the recommended plan will be based upon the costs of the NED plan. Recreation features may be cost-shared in design phase and cost-shared at 50/50 in construction. No recreation features have yet been identified. An economic appendix to the feasibility report will be prepared. The appendix will include the results of all social and economic studies, plus benefit-to-cost analysis, maximization analysis, Federal versus non-Federal cost sharing computations, and determination of the NED plan. The Corps will perform the economic and financial analysis, with input provided by the Sponsor. The Sponsor will develop the financing plan, coordinated with the Corps.
Reference: ER 1105-2-100, Planning Guidance Notebook, Appendix D, Economic and Social Considerations (April, 2000).

4.6 REAL ESTATE ANALYSES/DOCUMENTS

This task includes all required real estate studies and analysis to support the project plan formulation and selected plan. Products include but are not limited to the following:

- obtaining rights-of-entries
- procuring title information
- Attorney's Opinion of Compensability for facility and utility relocations
- investigation and legal memorandum on the application of navigational servitude
- preparation of the real estate drawings
- performance of PL 91-646 Relocation Benefits Survey and plan, if necessary

- preparation of a land cost estimate (gross appraisal)
- preparation of the real estate plan
- preparation of a baseline estimate for real estate costs in M-CACES format.

Reference: ER 405-1-12 Real Estate Handbook; the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements and rights-of-way required for the implementation, operation, and maintenance of the project.

4.7 GEOTECHNICAL STUDIES/REPORT

The geotechnical studies scope section is based on providing critical geotechnical data to support engineering, design and cost estimating for plan development, including the seawall rebuild option formulated by the City team prior to the feasibility study. At the time of this document, the seawall rebuild option is the most viable plan, and the City planning and engineering team is focusing on that plan.

4.7.1. Geotechnical Explorations

Field explorations and laboratory testing will be performed to obtain necessary subsurface data along the proposed alignment of the Elliott Bay seawall stabilization scheme. The following is provided for the geotechnical services that may be required for development of alternatives for the Elliott Bay seawall stabilization scheme.

(a) Subsurface Exploration Plan - A subsurface exploration program shall be planned and conducted using exploratory borings, test pits, and in-situ tests to provide information relative to soil, groundwater, and other geologic conditions along the project alignment. Laboratory testing on soil samples obtained from the exploratory borings shall be performed to obtain engineering and index properties for use in the design of the Elliott Bay seawall stabilization scheme.

(b) Soil Borings - Experienced contractors will be obtained to perform the field exploration and related activities. A licensed geologist will supervise field activities, log the borings, and classify and collect soil samples. Explorations will be accomplished for preliminary and final design of the proposed facilities.

(c) Test Pit Excavations - Four test pit excavations may be accomplished along the Alaskan Way seawall in the vicinity of Pier 66.

(d) Geotechnical Data Report - A geotechnical data report (GDR) will be prepared summarizing the field exploration and laboratory testing. The report will include all test results, logs of the borings and test pits, site maps showing exploration locations, and a discussion of the studies and results. The report will be submitted in draft format for review, and finalized after review comments are received and incorporated.

4.7.2. Geotechnical Engineering Analyses

Geotechnical engineering analyses may be performed to identify critical design elements and provide a basis for geotechnical recommendations. When necessary, geotechnical engineering design recommendations will be developed and provided for development of alternatives for the Elliott Bay seawall stabilization scheme. Results of studies will be summarized in interim submittals and provided to the PDT as they are developed. All of

the studies will then be summarized and presented in a Geotechnical Engineering Report (GER).

(a) Develop Subsurface Profiles -The results of the explorations will be incorporated into subsurface profiles. The profiles will be developed at selected locations both parallel and perpendicular to the alignment. Typical geologic cross sections will then be generalized for use in developing seawall design sections.

(b) Evaluate Geologic Hazards - The results of the explorations shall be used to evaluate the geologic hazards along the project alignment. These include erosion, landsliding, surface fault rupture, and liquefaction. Additional analyses will be performed to further quantify the potential for liquefaction and lateral spreading.

(c) Develop Seismic Design Criteria - Seismic design criteria will be developed for the project. It is anticipated that the results of site specific ground response analyses performed for another local project will be available for this task. Additional ground response analyses using the computer program ProShake may also be accomplished for selected portions of the seawall alignment based on the results of the subsurface exploration program.

(d) Limit Equilibrium Studies - Typical geologic cross sections will be developed and limit equilibrium analyses will be performed to establish preliminary seawall study sections. Both static and seismic (pseudostatic methods) limit equilibrium analyses will be accomplished to develop preliminary geometries of the ground improvement for seawall stabilization. The results of these analyses will be used in the numerical studies that will be performed to refine the seawall stabilization schemes.

(e) Three-Dimensional (3D) FLAC Analysis - To further evaluate the potential for reducing the volume of ground improvement used to stabilize the seawall, a 3D finite difference study shall be accomplished using the computer program FLAC. The FLAC analysis shall be focused on reducing the volume of ground improvement by considering various cell patterns rather than 100 percent coverage. The performance of the 3D structure under seismic loading conditions shall be evaluated using pseudo-static analysis methods. The FLAC analyses shall include the following subtasks: developing the model, calibrating the model, performing a series of parametric analyses, performing the pseudo-static analyses, and evaluating the results. Three typical subsurface profiles will be evaluated.

(f) Two-Dimensional (2D) FLAC Analysis - Based on the results of the 3D analyses, a 2D dynamic analysis shall be performed to model the performance of potential cellular ground improvement structures. This analysis shall use equivalent properties estimated from the 3D studies. These equivalent properties shall be used to evaluate the seismic performance under the 100-year, 500-year, and 2,500-year ground motions. Three typical subsurface profiles will be evaluated. The FLAC analyses shall include the following subtasks: developing the model, calibrating the model, performing a series of parametric analyses, performing the dynamic analyses, and evaluating the results.

(g) Temporary Construction Considerations - Geotechnical engineering recommendations may be developed for the design of temporary facilities and structures that may be required for construction of the permanent seawall structure. It is anticipated that recommendations may be developed for various cofferdam facilities, deep foundations required for bracing, and temporary excavation support schemes.

(h) Dewatering Considerations - It is anticipated that temporary dewatering may be required for construction of the seawall stabilization scheme. Recommendations may be developed for dewatering including: appropriate dewatering methods, estimated flow volumes, water quality issues, and disposal considerations.

(i) Soil and Groundwater Environmental Quality - The results of the environmental quality testing shall be summarized. Based on this effort, estimates of volumes, limits, and the nature of potential contaminated, and/or hazardous materials along the project corridor may be developed. Preliminary recommendations regarding treatment, disposal, and handling will be summarized in a technical memorandum.

(j) Recommendations and Report - The results of the geotechnical studies will be summarized in a technical report. The report will be submitted in draft format for review, and finalized after review comments are received and incorporated.

4.8 HAZARDOUS, TOXIC, AND RADIOLOGICAL WASTE (HTRW) STUDIES/REPORT

Limited hazardous, toxic, and radiological waste (HTRW) studies are required to establish the nature and extent, if any, of HTRW contamination and develop the impact and cost of needed remedial action. Because the project area is recently accreted tidelands, there is presently no reason to believe that investigations beyond a Preliminary Assessment will be required. A site visit and literature review (initial screening), as well as sampling and testing in conjunction with the geotechnical explorations, will reveal the need for any further site investigations to satisfy HTRW requirements. The objective of HTRW studies is to identify and assess potential areas of HTRW contamination, including the effects on project lands, worker health and safety, and material disposal; develop alternatives for addressing HTRW contaminated materials; and develop regulatory compliance strategies. The Corps will perform all HTRW studies. Reference: ER 1165-2-132.

4.9 SURVEYS AND MAPPING

This task includes all surveying, aerial photography, mapping and related tasks necessary to support real estate, engineering, environmental and design studies. Both the Corps and the City will perform this work.

4.9.1. Geographic Information System (GIS)

Geographic Information System (GIS) technology will be used to manage the diverse geospatial data and information to be used to visualize, evaluate and document alternatives. Tasks include identifying and compiling existing environmental, economic, real estate and infrastructure data; creating additional data layers and corresponding metadata; and preparing maps for public meetings, feasibility report and EIS.

4.9.2. Survey Base Mapping

A high precision topographic base map will be prepared for engineering design of the seawall stabilization. The base map will be developed based upon ground field survey techniques. The base mapping will adhere to national mapping standards, although the intent of the survey is to produce an “any given point positional tolerance” result within

0.12 feet horizontally and vertically. The west edge of the new base map is anticipated to be for the most part the outside face of the seawall along Alaskan Way from approximately King Street to Bay Street. The east edge of the new base map will include Alaskan Way but may extend east of the original shoreline of Elliot Bay. As the details of the project become better defined, the area of the survey may be extended in order to include areas that may be affected directly or indirectly by the construction of the project. The new base map will be added to the existing bathymetric survey data, which extends out into Elliott Bay. The base mapping shall consist of the following activities.

(a) Field Survey. Field survey topographic mapping will be conducted which will delineate all surface and above ground improvements and utilities situated within the project area, and spot elevations sufficient to establish 1 foot contour intervals for those areas situated within the Seattle Tidelands plat, 1 foot contour intervals on other relatively flat areas and 2 foot contour intervals on steep slope areas. Data will be gathered using a combination of traditional ground survey methods and 3D scanning.

(b) Initial Base Map Preparation. Once the data is collected and compiled by a "least squares" adjustment program, x, y and z coordinate values for each data point collected will be obtained. A digital terrain model (DTM) of said points will be generated which will generate the contours as referenced above. Line work connecting common data points will be performed manually within the DTM. For a horizontal features check, line work generated by the new DTM will be cross-checked against the existing aerial mapping for inconsistencies.

(c) Base Mapping Updates. It is possible that additional and/or supplemental survey points will be accumulated after the time of completion of the base mapping described above. It is possible that these new points would supersede areas within said base mapping. Accordingly, the base map will be continuously upgraded to reflect the supplemental survey data. Supplementary site specific data collection and mapping could include, but is not limited to, horizontal and vertical positioning of geotechnical potholing, column foundations, hazardous waste areas, subsurface seawall structure, viaduct bridge as built, face of adjoining buildings, mapping on adjoining private lands, building foundations, improvement changes within street right of way occurring after the initial mapping is completed, and detour areas beyond mapping limits described above.

4.9.3. Utility and Drainage Mapping

Utility Mapping for the non-gravity, gravity, and aerial utilities in the corridor, including but not limited to water, natural gas, petroleum and fuel oil, steam, telephone, fiber optics, cable television, electrical, traffic signals and parking meters, railroad communications, storm, sanitary, and combined sewers shall be prepared in accordance with applicable sections of CI/ASCE 38-02, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data" and the prevailing standard of care. This task does not include future utility relocation design or the analysis of the need for such design. The utility mapping shall cover the same defined project area as described in paragraph 4.2.2 for the initial base map and may be expanded as required to support the

continued development of the project's design. The City will provide this work task at no cost to the project. This task will not count toward the City's work-in-kind contribution.

4.10 ENGINEERING AND DESIGN ANALYSIS REPORT

The engineering objectives during the feasibility study are detailed in ER 1110-2-1150, Engineering and Design for Civil Works Projects. The primary engineering objective during the feasibility phase is to provide engineering data and analyses sufficient to develop the complete project schedule and cost estimate. The objectives also include plan formulation support and support for evaluation of alternatives. The local sponsor effort prior to the Corps feasibility study included plan formulation and evaluation of alternatives, with engineering support for that effort. The feasibility study team will review the prior work and evaluate whether reformulation will be required. Reformulation, and engineering support for that is not scoped, and will be scoped if needed. See ER 1110-2-1150 for additional details on engineering objectives.

4.10.1. Engineering Management/Administration

The management of the engineering effort includes, but is not limited to, scoping work, scheduling work, verifying that work meets scope requirement, managing design budget, contract management, scheduling and facilitating progress and coordination meetings, and coordination of effort between multiple engineering agencies.

4.10.2. Design Development of Preferred Seawall Stabilization Plan

Sufficient engineering and design will be performed in the feasibility phase to enable refinement of the features of the preferred plan, prepare the baseline cost estimates, develop a design and construction schedule, and allow detailed design on the selected plan to begin immediately following receipt of PED funds. The specific design subtasks required will depend, to a degree, on the preferred plan. Based upon the current understanding of the project, the subtasks listed below are likely to be required but may be modified to suit the needs of the preferred plan. Reference: ER 1110-2-1150, ER 1105-2-1407.

4.10.2.1. Engineering

Preliminary engineering will be provided to confirm the preferred method for stabilization of the seawall from approximately King Street to Bay Street. The following are the key work elements necessary to accomplish the following objective:

(a) Evaluate Ground Improvement Methods - Evaluate the preferred seawall stabilization concept by studying alternatives for accomplishing the ground improvement that is currently envisioned as the method of stabilizing the seawall. This will be a study of construction methods so that the scope of potential environmental impacts can be understood and mitigated in a cost-effective manner. It is anticipated that this evaluation may include a test section as part of the geotechnical exploration program.

4.10.2.2. Construction Phasing and Maintenance Of Traffic

The anticipated method of stabilizing the seawall will disrupt traffic and require demolition to major portions of the Alaskan Way Street. A preliminary maintenance of traffic plan is required to assess temporary impacts to traffic and businesses during

construction. Also, the preliminary traffic plan will have a significant impact on the construction cost estimate and schedule. This task will require close coordination with the structural engineering of the seawall stabilization as described above.

(a) Determine Objectives and Constraints - Phasing construction activities depend on the circumstances of the project and the objectives of the authorities carrying it out. Better decisions result when the underlying assumptions and objective priorities are explicitly identified in advance. This sub-task will result in identifying assumptions and establishing objectives that will drive the decisions for traffic maintenance, construction phasing and contract packaging. The following subtasks shall be performed:

- Clarify Assumptions: Through discussions with client agencies and EIS feedback and analysis, establish key factors such as funding flow, start date and third party concerns.
- Identify Constraints: Through discussions with client agencies and stakeholders identify constraints on construction contractor performance such as daily and annual work restrictions, noise limits and traffic throughput and access requirements.
- List Project Objectives: In coordination with stakeholders, compile list of project goals and objectives likely to be impacted by construction phasing and contract packaging.
- Prioritize Project Objectives: Rank the objectives to guide construction planning.

(b) Plan Construction Phasing and Traffic Management The project area is an urban street, a utility corridor, embarkation point for ferries and cruise ships, tourist attraction, access to waterfront businesses and littoral. Construction activities may overlap with replacement, removal, repair or stabilization of the adjacent Alaskan Way Viaduct, renovation of the Washington Ferry System Coleman Terminal or construction of the Olympic Sculpture Park. The construction phasing plan will describe in detail the sequence and interfaces of component activities, taking into account traffic maintenance requirements, utility relocation planning and the assumptions, constraints and prioritized objectives as described above. The following subtasks shall be performed:

- Determine Activity Sequence: Establish the optimum sequence of performing construction tasks.
- Estimate Activity Durations: Determine a range for the duration of each activity.
- Analyze Activity Interfaces: Examine how activities will intersect and interfere with each other. Establish precedence relationships.
- Develop Network Schedule for Construction: On Primavera or other approved medium, schedule the construction activities.

4.10.2.3. Utility Design and Relocation Plan

Preliminary design required for the relocation of electrical, water, combined and sanitary sewer, storm drain, natural gas, petroleum and fuel oil, steam, telephone, cable television, and fiber optic utility facilities for the Seawall Stabilization shall be prepared at approximately a 35% design level or as required to determine the cost of maintaining utilities during construction and/or relocating them. Design required for relocation of

electrical utility facilities shall be completed under subtask 4.3.3(F). Mainline and major service connection relocation requirements, both overhead and underground, will be identified to support design of the Seawall Stabilization project and development of an opinion of cost. The preliminary planning for relocation of utilities shall address (1) New services to meet the requirements of the Seawall Stabilization facilities and temporary construction facilities; (2) Permanent relocations of the existing utility systems within the project area, and (3) Temporary relocations as may be required to accommodate staged construction of the Seawall Stabilization project. If required storm water report may be prepared to assist in defining the final configuration of storm water treatment within the project area. The City will provide this work task at no cost to the project. This task will not count toward the City's work-in-kind contribution.

4.10.2.4. Surface Restoration For Seawall Stabilization

After seawall stabilization work the project surface should be restored consistent with development objectives for the Elliott Bay waterfront area. The purpose of this task is to provide technical support to City and stakeholder planning efforts and then prepare plans in sufficient detail to allow costs to be more accurately established.

4.10.3. Value Engineering Study

Conduct value engineering study for Seattle seawall project using OVEST CX study team. OVEST will provide a 5 person team consisting of geotechnical, civil, structural, and interdisciplinary engineers and environmental specialist.

The study team will follow the 5 step VE job plan: information gathering, speculation, analysis, development, and presentation phases. The sponsoring District will provide representatives of the design team to assist in the information, speculation and analysis phases of the study.

4.10.4. Prepare Engineering and Design Appendix.

The engineering appendix will document the engineering and design effort during project formulation, and will include the design data analyses, a detailed description of the design features of the recommended plan, summary of alternative measures and plans evaluated, drawings, and construction cost estimates.

4.11 COST ESTIMATES

This task includes review of existing cost estimates necessary to evaluate alternative plans, and preparation of a detailed baseline cost estimate for the recommended plan to be used for project authorization, development and completion. Cost estimates for the recommended plan and National Economic Development (NED) plan, if different, will be prepared for the final feasibility report using the Corps' MCACES software. The estimates will include all Corps of Engineers and non-Federal costs for lands and damages, all construction features, relocation of facilities and utilities, mitigation, HTRW concerns, planning, engineering and design, and supervision and administration, along with the appropriate contingencies and escalation associated with each of these activities through project completion. The final product will be a reliable, accurate cost estimate that defines the non-Federal sponsor's obligations and supports project authorization within established statutory limits. The Corps will review the City's cost estimates for

alternative plans and the recommended plan, and will assist the City in preparing the cost estimate for the recommended plan in MCACES. Reference: ER 1110-2-1150 and ER 1110-2-1302.

4.12 PLAN FORMULATION AND EVALUATION

This task includes the iterative process of evaluation of alternative plans and selection of the recommended plan, and includes activities that are not directly associated with other study tasks. Plan formulation is the process whereby project alternatives, including the existing and future without and with-project condition, are evaluated. Alternative plans, beginning with those that have already been developed by the City, will be formulated in consideration of four criteria: completeness, effectiveness, efficiency, and acceptability. As formulation progresses, alternatives will be considered in increasing level of detail and the number of alternative plans will decrease in number, until a recommended plan is selected and a detailed evaluation is completed. The formulation process will analyze all available information and data assembled from many different components of the study. The Corps and the Sponsor will jointly conduct plan formulation. Reference: ER 1105-2-100.

4.12.1. Review of work completed prior to this study

This task includes engineering, environmental, and planning review of work completed by the AWVSRP Team prior to the City and Corps signing the FCSA. Significant prior work includes alternatives formulation and screening, plan formulation, and environmental coordination including a draft EIS. The review is to verify that prior work, including alternatives formulation and screening, conforms to Corps standards. This task will review and identify any constraints within the City's planning process that are inconsistent with the Corps planning process, which may result in the need for additional formulation and the LPP varying from the NED plan. Specifically, the Corps will review work associated with the non-structural alternative to evaluate the continued work necessary in the feasibility study. Any identified gaps will provide the basis for a verification/revision of the PMP in conjunction with the Feasibility Scoping Meeting.

4.12.2. Without Project Conditions Report and review

Selection of the NED plan is based on comparison of alternatives to the future without project condition. An accurate determination of the future without project condition is essential to successful completion of the planning process. This task includes the necessary PDT coordination to determine the without project condition, prepare a report describing that condition in detail and the Independent Technical Review of that product.. The economic analysis of the without project condition failure scenarios is included in the economics scope. This separate scope item for this is intended to demonstrate emphasis for the report and review.

4.12.3. Plan formulation and evaluation

Beginning with the City's work completed prior to this study, alternatives will be formulated, screened and evaluated to determine the recommended plan. This scope anticipates that the City's process considered an appropriate range of alternatives and correctly screened and evaluated them to result in the City's selection of the ground

improvement alternative. A non-structural alternative must be included in this alternatives analysis. If the team determines that there are additional alternatives to consider, or that the City's planning process screened out viable alternatives, then the work associated with evaluating additional alternatives will be scoped and performed. This may ultimately result in a LPP differing from the NED plan. This task included preparation of an alternatives formulation memorandum, which will serve as the basis of the Alternatives Formulation Briefing.

4.12.4. Feasibility Scoping Meeting (FSM)

To ensure that the study is focused on the specific objectives of the project, a FSM will be convened early in the study. The FSM will be held after the without project conditions memo has been reviewed. The FSM will bring the HQ, Division and District staffs, the City, and resource agencies together to focus the study, to further define the depth of analysis required, and to refine the study constraints. A possible outcome of the FSM is a need to update the PMP.

4.12.5. Alternatives formulation briefing (AFB)

The alternative review process was established to save time and costs in the preparation and review of feasibility reports, and to facilitate HQUSACE participation in plan formulation. The AFB will be scheduled when the District has identified a selected plan and is prepared to present the formulation and evaluation of alternatives. The Washington level participants will seek to confirm that the plan formulation and selection process, the identified preferred plan, and definition of Corps of Engineers and non-Federal responsibilities conform to current policy guidance. The goal is to identify and resolve any policy concerns that would otherwise delay or preclude approval of the draft report.

4.13 FEASIBILITY REPORT DOCUMENTATION

4.13.1. Draft Report Preparation

This task includes all activities specifically pertaining to producing the draft feasibility report for public review. Activities include writing the draft report, editing and revision following independent technical review, and distributing the draft feasibility report for public review. Reference: ER 1105-2-100.

4.13.2. Draft Feasibility Report Independent Technical Review

This task includes costs for technical review of the draft feasibility report by the Independent Technical Review Team. Qualified individuals who are independent of the technical production of the feasibility report will conduct technical review of the draft report. The review will verify that the recommended plan (1) satisfies engineering and functional criteria; (2) meets the customers needs consistent with law and existing public policy, (3) has correct design assumptions and calculations; and (4) has a sufficient level of engineering to substantiate both the screening level comparative cost estimates and the baseline cost estimate with contingencies to support selection of the recommended plan. Members of the review team may include Seattle District and sponsor's personnel. The study will also have extensive review during the plan formulation process, and the draft report and SEIS will undergo a rigorous public review following the independent

technical review. See also Section 7 below for additional discussion pertaining to quality control.

4.13.3. Final Report Preparation

This task includes all activities specifically pertaining to producing the final feasibility report. Specific activities include responding to review comments, preparing the final documents, and transmitting them for processing by the Northwestern Division Engineer. Reference: ER 1105-2-100.

4.14 PROJECT MANAGEMENT PLAN

This task includes all activities required to maintaining the accuracy and relevance of the Project Management Plan throughout the feasibility study.

4.14.1. PMP development and update

The initial PMP was prepared based on assumptions about the work already accomplished and, therefore, assumptions have been made about what work remains. Since the budget for preparing the PMP was not sufficient for a complete review of the work already accomplished, and that review may change some of the assumptions built into this plan, the team will review the PMP after reviewing the prior work and make changes as needed.

Additionally, the PMP validation task includes development of certain sections of the PMP that require additional coordination and analysis with the sponsor and coordinating AWVSRP Team. This task will specifically include further definition of the roles, responsibilities and organizational and financial structure of the Corps and AWVSRP team partnership, defining the conditions necessary for in-kind work to be creditable and fully addressing the technical review process for consultant work. Furthermore, defining the long-term maintenance of the study, through this PMP would include defining the conditions under which the PMP or the FCSA would be amended.

4.14.2. Maintenance of PMP

The initial PMP was prepared based on the team's capability to perform work, rather than on the anticipated funding availability. As the budget situation for each year becomes known, the PMP will be updated to reflect a more accurate budget and schedule.

4.15 FEASIBILITY STUDY MANAGEMENT

This task will include all activities related to the overall management of the feasibility phase.

4.15.1 Program management

Program management consists of feasibility phase Corps of Engineers budget development, management, defense and execution, as well as funds allocation and monitoring of both Corps of Engineers and non-Federal expenditures. It includes preparation of budgetary documents and upward reporting; programming of funding,

managing and tracking study obligations and expenditures, and accounting for Sponsor in-kind services.

4.15.2 Project management

Project management includes a wide variety of tasks and activities. These include overall coordination with local, state, tribal and Federal governmental agencies, interest groups, and the general public; oversight management of Corps, Sponsor, and contracted study tasks and related activities; coordination between the Corps and the Sponsor; attending and conducting meetings and briefings throughout the course of the study; responding to congressional and other inquiries; upward reporting and responses to data calls; maintenance of data in automated management systems such as P2; and oversight management of the review of the draft and final feasibility report/SEIS or other documents. Both the Corps and the Sponsor will perform project management activities. This task does not include plan formulation, report preparation, or Washington level review support that are separately accounted for. Reference: ER 5-1-11, ER 1105-2-100.

4.15.3 Executive Committee

This task includes costs incurred by the study Executive Committee members who will generally oversee study progress in accordance with the PMP, as prescribed in Article IV of the FCSA. The Executive Committee will meet periodically throughout the feasibility phase.

4.15.4 Preconstruction Engineering and Design Cost Sharing Agreement

A preconstruction engineering and design (PED) cost sharing agreement is prepared during the feasibility phase, following completion and submittal of the final feasibility report. The PED phase of project development encompasses all planning and engineering necessary for project construction. It also outlines the division of design responsibilities between the Corps and the Sponsor. This task includes scoping, scheduling and budgeting the PED phase, and preparing the PED phase PMP.

4.16 INITIAL PROJECT COOPERATION AGREEMENT

This task includes reviewing the model project cooperation agreement (PCA) with the Sponsor and agreeing on a final draft PCA to be included in the final feasibility report. The PCA describes all of the requirements and responsibilities relating to construction of the project, including items of local cooperation required from the local sponsor. Reference Section 221 of Flood Control Act of 1970 (PL 91-611), as amended by Sections 101(e) and 103(j) of the 1986 Water Resources Development Act (PL 99-662), as amended.

4.17 WASHINGTON LEVEL REPORT APPROVAL

This task includes those activities typically necessary for the Seattle District and the Sponsor to support the Washington level review process of the feasibility report. This includes the period from the signing of the final report by the Seattle District Engineer, and ending when the Assistant Secretary of the Army (Civil Works) submits the feasibility report to the Office of Management and Budget for review for consistency with the policies and programs of the President. These items could include answering

comments, attending Washington level meetings and other necessary travel, and making minor report revisions as a result of Washington level review. This item is required to be estimated at five (5) percent of the total study cost or \$50,000, whichever is less, and will be shared equally. Because the amount of work that will be required during this review period cannot be predetermined, this work item is considered a contingency, to be used only as necessary. Any costs relating to the feasibility report that are incurred following completion of the feasibility phase and subsequent termination of the FCSA will be 100 percent Corps of Engineers costs. Reference: ER 1105-2-100 (Chapter 8), EC 1105-2-208.

SECTION 5 - FUNDING

5.1 COST-SHARING

The feasibility study is cost shared by the Corps of Engineers and the City of Seattle according to the terms in the Feasibility Cost Sharing Agreement. The total study cost is shared 50/50. The City can provide up to their full requirement in Work-in-Kind. The City will provide cash for any cost-sharing requirement that the City does not fulfill with work-in-kind.

The fully-funded estimated total study cost is \$9,517,698. The local sponsor 50% share is \$4,758,849, of which the sponsor will contribute \$4,758,849, the full amount, as work-in-kind. The City will provide documentation of their work-in-kind contribution quarterly.

Work in-kind will be credited to match available Corps of Engineers funds. The sponsor understands that any work performed in excess of the Corps of Engineers funding may not be creditable to the sponsor's cost share, but will reduce the total project cost. All work-in-kind products will receive technical review consistent with the Federal Independent Technical Review requirements and must be acceptable to the Corps. Work-in-kind must be specifically detailed in the PMP, although the PMP may be modified to accommodate changes to the planned work.

The estimated dollar value of the work-in-kind effort will be established prior to the initiation of the work-in-kind effort. The value will be negotiated, based on a detailed Corps estimate and sponsor proposal, between the Federal Government and the non-Federal sponsor, applying applicable Federal regulations, including OMB Circular A-87. The non-Federal sponsor will comply with applicable Federal and state laws and regulations, including the requirement to secure competitive bids for all work to be performed by contract. Credit for work-in-kind will be subject to audit and if the actual costs are less than the Corps estimate amount, the value of the credit will be reduced accordingly.

5.2 DETAILED COST ESTIMATE

Table 5 summarizes the estimate of Corps cost share and Sponsor cost share (cash contribution and in-kind services) for the study. Detailed study cost estimates for individual study tasks have been assembled in an Attachment to the PMP. The detailed estimates will be used by the Project Manager in issuing Work Requests during the course of the feasibility phase.

<u>Task</u>	<u>Corps Expenses</u>	<u>WIK submitted</u>	<u>Remaining Corps Budget</u>	<u>Remaining City WIK</u>	<u>Total</u>
J1000 - Public Involvement	\$ -		\$ 168,070	\$ 271,328	\$ 439,398

<u>Task</u>	<u>Corps Expenses</u>	<u>WIK submitted</u>	<u>Remaining Corps Budget</u>	<u>Remaining City WIK</u>	<u>Total</u>
JB000 - Social and Economic Studies	\$ 32,822		\$ 255,001		\$ 287,823
JG000 - Cultural Resources	\$ 2,337		\$ 85,986		\$ 88,323
JG000 - Environmental Studies	\$ 103,445		\$ 597,985	\$ 209,863	\$ 911,293
JD000 - US Fish & Wildlife Service Coordination			\$ 71,611		\$ 71,611
JC000 - Real Estate Analyses/docs	\$ 5,541	\$ 783	\$ 703,274	\$ (783)	\$ 708,815
JAC00 - Geotechnical studies			\$ 518,500	\$ 1,375,981	\$ 1,894,481
JF000 - HTRW Studies	\$ 1,232		\$ 283,228		\$ 284,460
JAA00 Surveys and mapping (excluding RE)		\$ 341,351	\$ 35,545	\$ 352,521	\$ 729,417
JAE00 Engineering analysis and Design	\$ 33,022	\$ 12,434	\$ 655,451	\$ 1,363,190	\$ 2,064,097
JH000 - Cost Estimates			\$ 10,609	\$ 58,350	\$ 68,959
JJ000 - Plan Formulation and evaluation	\$ 3,126		\$ 113,057	\$ 56,183	\$ 172,366
JK000 - Feasibility Report Preparation			\$ 66,731	\$ 37,928	\$ 104,659
L0000 - Project Management Plan	\$ 6,142		\$ 21,886	\$ 26,902	\$ 54,930
Z0000 - Program and Project Management	\$ 182,101	\$ 44,154	\$ 706,667	\$ 513,187	\$ 1,446,109
K0000 Draft Project Cooperation Agreement			\$ 42,436	\$ 42,436	\$ 84,872
JM000 - Washington Level Review and Approval Support			\$ 53,045	\$ 53,045	\$ 106,090
Totals:	\$ 369,768	\$ 398,723	\$ 4,389,082	\$ 4,360,130	\$ 9,517,703

SECTION 6 - SCHEDULE

Table 6: Feasibility Phase Schedule and Milestones

<u>Milestone</u>	<u>Description</u>	<u>Original Scheduled Date</u>	<u>Current Scheduled Date</u>
060	Sign FCSA	3 Aug, 2004	3 Aug, 2004
100	Initiate Feasibility Phase	August, 2004	August, 2004

	Without Project Conditions Report	May, 2005	June, 2006
130	Feasibility Review Conference (FRC) – only if needed	July, 2005	
120	Technical Review Conference (TRC)	November, 2005	
124	Alternative Formulation Briefing (AFB)	January, 2006	May 2007
145	Draft Feasibility Report/Draft EIS for Public Review	February, 2006	February 2009
----	District Engineer Signs Final Feasibility Report	September, 2006	November 2009
----	Submit Final Feasibility Report/EIS to NW Division	December, 2006	November 2009
----	Begin Pre-construction Engineering & Design Phase		
170	Complete Feasibility Report (Northwestern Division Commander issues Public Notice)	February, 2007	November 2009
290	PED Agreement signed with City of Seattle		
310	Final Feasibility Phase EIS Filed in Federal Register		
----	End 30-Day NEPA and State and Agency Review		October 2009
330	Chief of Engineers Report to Assistant Secretary of the Army for Civil Works [ASA(CW)]		December 2009
340	ASA(CW) Letter to Office of Management and Budget		March 2010
----	Termination of the FCSA/ Final Study Cost Accounting		
----	Project Authorization, Project Approved for Construction, Sign Project Cooperation Agreement, Award First Construction Contract		

6.1 WORK PLAN FOR FISCAL YEAR 2006

Our budget for this year is \$756,000. PM is still working as of this revision with project delivery team to finalize commitments for this year. Here is our tentative work plan for the year:

- **Real Estate.** Lead: Wanda G.. There is \$19,000 already on a contract for titles. At this point, we are only scheduling that work for this year, and continuing general coordination, up to \$5,000.
- **Planning and economics.** Lead: Steve B.. Finalize planning objectives, initial alternatives list, and preliminary screening, by Thanksgiving, \$8,000. Complete without project conditions report, including economics analysis of benefits, budget \$35k for Steve, \$114k for Mike G, and \$10k for engineering.
- **Engineering.** Lead: Paul A. We will have some coordination with the ongoing engineering effort. Budget: \$10k.
- **NEPA/Environmental Resources.** Lead: Aimee K. Public scoping, new studies based on recent gap analysis, start the EIS sections on the no-action alternative, and some FWS coordination. Budget: \$190k. A lot of this will be contracted.
- **Cultural Resources.** Lead: Ron K. Begin cultural resources inventory. Budget: \$5,000.
- **HTRW.** Lead: Marlowe D. Site assessment sampling. The City will be performing geotechnical exploration this year, We will piggyback this work onto their drilling. Budget: \$50,000 labor, \$150,000 contract.
- **Program management.** Lead: Patty B. Funds management, upward reporting. Budget: \$30,000.
- **Project Management.** Lead: Tim S. Coordination with sponsor, upward reporting, team lead, project oversight. Budget: \$125,000.
- **PMP update.** Lead: Tim S. Annual effort to keep the PMP up to date. Budget: \$5,000.

On the local side, the team will be developing the soil improvement alternative, with geotech exploration and further analysis. The City also plans to prepare for construction of a test section in 2007. This team will not be participating in that action, although what is learned will clearly be of use in a final design effort. The AWVSRP team is proceeding with real estate acquisition, which the Corps is not yet ready to participate in. This team has scheduled real estate acquisition for starting in 2010, but the City and State are starting now, and they might go ahead and acquire some of the land for our project if it suits them to do so. In that case, the Corps will coordinate with them, but won't be ready to make definite commitments.

SECTION 7 - QUALITY CONTROL PLAN

7.1 PURPOSE

This Quality Control (QC) Plan presents the process that assures quality products. This QC Plan defines the responsibilities and roles of each member on the Project Delivery Team (PDT) and Independent Technical Review (ITR) Team. The products to be reviewed by the ITR Team are the feasibility report, EIS, and associated technical appendixes. Corps policy is to develop, integrate and implement quality control and quality assurance as a part of the Corps' Project Management Business Process (PMBP). The PDT will ensure that services and products meet the agreed upon requirements and are performed in accordance with appropriate laws, policies and technical criteria. The QC Plan defines the responsibilities and roles of each member of the PDT and ITR team. ITR will be performed independent of the technical production of the product to be reviewed. It will include all relevant technical disciplines, along with necessary legal sufficiency and policy compliance review. Refer to NWSOM 5-1-3, dated February 25, 2002, as amended, for a complete description of quality management policy and responsibilities established by Seattle District.

Reference: ER 5-1-11, U.S. Army Corps of Engineers Business Process; ER 1110-1-12, Engineering and Design Quality Management; ER 1110-1-8159, Design and Review Checking System, DrChecks; NWSOM 5-1-3, Quality Management Plan, Seattle District; Northwestern Division Quality Management Plan.

7.2 METHODOLOGY

7.2.1 Technical Coordination

Generally, product development shall be performed in accordance with established criteria and guidance and with established policy. Meetings with the appropriate review team members during the planning process will be held at key decision points. Meetings will also be held to discuss and resolve technical and/or policy issues that may arise during the course of product development. Technical issues and concerns raised during the technical review process will be documented, as will the resolution of these issues and concerns.

7.2.2 Product Quality Control

Product Quality Control is the independent technical review (ITR) of a completed product. The Corps Project Manager will provide completed documents to the review team leader who will distribute them to the review team members for review. During the review, review team meetings will be scheduled as required to ensure that all components have been coordinated, there is consistency throughout the document, and there is a consensus on proposed revisions. Any issues on which a review team position cannot be reached will be referred through the project manager to the Seattle District Functional Chief for resolution. The review team will record comments in Dr Checks for appropriate action by the Project Delivery Team. The review team leader and project manager will take comments that cannot be resolved between reviewers and study team

to the appropriate Functional Chief for final disposition; the assistance of North Pacific Division and HQUSACE will be requested as needed.

7.2.1. Consultant Products

Consultants are an extension of the Corps or Sponsor staff. Accordingly, any designs, reports, etc. prepared by consultants will have an independent review by the review team just as if they had been prepared by the PDT.

7.2.2. Policy Review

Questions or problems regarding policy concerns will be elevated by Seattle District to HQUSACE (CECW-A) for resolution, as the issues develop. Legal and real estate policy issues will be elevated to the Chief Counsel and Director of Real Estate, respectively.

7.3 QUALITY CONTROL RESPONSIBILITIES

7.3.1. General

Technical review team continuity will be maintained through the life of the project, to the maximum extent possible. The size and composition of the review team shall be based on the complexity of the project; this composition may change as the project progresses and specific project features are better defined. The review team leader will normally be a Corps of Engineers project manager.

7.3.2. Project Manager

The feasibility study project manager shall be responsible for coordinating the review effort with the review team leader and shall:

- ensure that the schedule contains sufficient time to perform reviews of completed products;
- ensure that the team leader is notified of significant study team meetings and review conferences so that he/she can assemble the review team for in-progress reviews; and
- manage responses to review memorandums and resolve technical issues with the review team leader, consult with North Western Division as appropriate, and forward all unresolved technical issues to the appropriate Functional Chief for resolution.

7.3.3. Resource Managers

Each Corps of Engineers Resource Manager is responsible for ensuring that all work prepared by or for his/her Section or Branch has received any necessary internal quality control checks prior to the feasibility report being furnished to the review team for review.

7.3.4. Independent Technical Review Team Leader

The review team leader is responsible for coordinating all activities associated with the independent technical review of the draft feasibility report and EIS, and will:

- Attend all major plan formulation meetings.

- Coordinate the technical review and assemble all technical review comments and other review related correspondence for the use by the review team and Project Delivery Team.

7.3.5. Independent Technical Review Team Members

Each review team member is responsible for performing an independent technical review of the draft feasibility report and EIS or portion thereof. The ITR Team members are listed in Table 2.

7.4 TECHNICAL REVIEW DOCUMENTATION

All significant review comments will be provided to the Project Delivery Team in Dr Checks. The Project Manager will assure that all significant comments are resolved and their final disposition is identified within Dr Checks and back-checks are completed by each reviewer.

The feasibility report submitted to higher authority shall be accompanied by technical review documentation. This documentation shall be a separate item not to be included as part of the feasibility report. A page indicating the names of the Project Delivery Team members and technical review team members shall be included.

7.5 PRODUCTS TO REVIEW

The ITR team will review, at a minimum, these products of the Feasibility Study:

- Without Project Conditions Report
- Alternatives formulation
- EIS
- Feasibility Report

7.6 TECHNICAL REVIEW PROCESS FOR ACCEPTANCE OF CONSULTANT WORK

(This language has raised a few concerns from PB. I am not sure the exact issue and what revision may or may not result. I will get any comments to you soon)

The Corps will accept only work products from the City's A-E consultants that meet the following quality control requirements. The professional quality, technical accuracy, and the coordination of all reports, designs, drawings, specifications, and other services are the A-E's responsibility. The A-E's Quality Control Plan must include Independent Technical Review (ITR). The performance of the ITR shall be by senior designers not involved in day-to-day production or review of the package. It is in the A-E's best interest and a requirement for the A-E to have a logical and functional quality control program and project-specific Quality Control Plan (QCP) to assure that errors or deficiencies in all submittals are avoided. To meet this requirement, the A-E shall perform reviews during the design process and at completion of all work. Work shall be reviewed for technical accuracy, coordination, and conformance to customer requirements. All errors and deficiencies in the design documents or any other submitted product shall be corrected

prior to submitting the design documents or products for customer review. The City shall submit to the Corps PM two copies of the A-E's Quality Control Plan for approval fourteen (14) calendar days after award of the project design contract. The City shall direct the A-E to revise the QCP as indicated by these two or others assigned by them for review of QCP. An approved version of the QCP shall be completed prior to the first submittal of products developed specifically for the feasibility study. QCP requirements are described in Volume 1, Chapter 2, and Section 2.1.4 Design Quality Assurance Plan of the Design Guide for A-E's.

<http://www.nws.usace.army.mil/publicmenu/DOCUMENTS/v1ch1-3.pdf>

Certification stating that an ITR has taken place shall be provided with each final submittal for the products developed specifically for the feasibility study. Documentation of ITR of products not specifically developed to support the feasibility study shall be provided to the City. In addition, the A-E is strongly encouraged to have a formal quality assurance program that periodically audits projects for compliance with quality control procedures. The Corps reserves the right to conduct an audit of quality control process and related project specific activities.

SECTION 8 - ACQUISITION PLAN

8.1 OVERVIEW

The project team will prepare detailed acquisition plans during the course of the project, as specific acquisition needs are identified. In general, the Corps will accomplish its work tasks other than engineering with Corps personnel. The Corps will accomplish engineering work, other than review, through private sector consulting services. If the workload of the non-engineering tasks exceeds the capability of the Seattle District, the project manager will attempt to obtain resources at other Corps districts. If other districts are unable to accept the work, the project team will use private sector consulting services to complete the work.

SECTION 9 - RISK MANAGEMENT

9.1 OVERVIEW

Risk management is a systematic process of identifying, analyzing, and responding to risk for the entire project life cycle. A risk analysis is performed for five categories of project risk: scope, quality, schedule, cost, and safety and health risks. The level of detail of the risk analysis and plan is based on the complexity of the project. When a project is determined to be other than low-risk, the risk must be identified, and associated control procedures defined to address the risk.

Within the scope of this PMP, a review of study progress and any needed scope changes will be completed prior to initiating the next phase. Specific risks and associated control features will be identified with respect to scope, quality, schedule and cost at the initiation of each phase. A risk analysis will be completed at the initiation of feasibility phase.

SECTION 10 - SAFETY and OCCUPATIONAL HEALTH HAZARD ANALYSIS AND MONITORING

This section will be developed with further design development and construction management planning. This section will be of great import in subsequent site analysis, design development and construction management planning, so it will be developed early in feasibility phase. Also, the potential project site will undergo HTRW screening.

SECTION 11 - CHANGE MANAGEMENT

11.1 OVERVIEW

Study progress will be monitored and reviewed as the study progresses. This PMP incorporates assumptions and predictions concerning the possible outcome of these studies in order to provide a reasonable scope of work, estimate of cost, and duration of the individual study activities. As this study progress, these assumptions and predictions will be reevaluated to determine if the actual outcome of a study segment matches the assumed outcome. This reevaluation will be done continuously as the study progresses. Formal evaluation of changed conditions and assumptions will occur at the conclusion of the work described in the PMP, prior to proceeding to the next stage of project development. The Corps and City of Seattle will confer and revisit the scope or work, cost and shared funding commitments as study tasks are completed, and prior to initiating the next stage of the study. These reviews will provide an opportunity to revise the set of assumed outcomes, the scope of work, cost, and shared funding commitments, to accommodate these changes and ensure a favorable outcome.

Once an original PMP has been developed and accepted by the PDT (an acknowledgement by email of acceptance or formal signing), changes to the scope, schedule, or budget shall be communicated and agreed upon among all PDT members. Should conflicts occur, the PM shall facilitate resolution in a timely manner. Changes to scope, schedule, or budget shall be communicated to Executive Committee immediately.

11.2 CONFLICT RESOLUTION MANAGEMENT:

If and when the project delivery team (PDT) cannot resolve an issue on a timely basis (within one meeting cycle or no longer than one month), it is the responsibility of the project manager to refer the issue or conflict to the Executive Committee as identified within Table 2 of the PMP. The following are the basic guidelines for conflict resolution management within the PDT:

- a. Clarify each team member's role and responsibility with the team as defined in Table 2 of the PMP.
- b. Not all team members are decision makers, one spokesperson per discipline/organization will be on the Executive Committee .
- c. Each team member is encouraged to bring his/her idea to the table; however, when a team member raises an issue, he or she must explain how this issue will impact:
 - Scope
 - Budget
 - Schedule
 - His/her organization's mission or the quality of the product
- d. The PM will facilitate conflict resolution within the PDT. Each team member will have at least 5 minutes to state his or her opinion based on his/her interest and area of

expertise on the issue or conflict at hand. The PDT member raising an issue or that has conflict with a decision will start the discussions and must explain how the issue can be resolved with them. When each member has had the opportunity to comment, the team will discuss and vote on the issue. Unanimous agreement is desired but not required to reach a consensus. Every attempt should be made to satisfy all team members' concern with the issue in this process. The team members will vote on the decision/resolution based on the following:

1. I can say an unqualified "yes" to the proposed decision or resolution. I am satisfied that the resolution is an expression of wisdom of the group.
2. I find the proposed decision/resolution perfectly acceptable.
3. I can live with the proposed decision/resolution, although I am not especially enthusiastic about it.
4. I do not fully agree with the proposed decision/resolution and need to register my view about it. However, I do not choose to block the decision/resolution. I am willing to trust the wisdom of the group.
5. I do not agree with the decision/resolution and feel the need to stand in the way of acceptance.
6. I feel we have no clear sense of unity in the Team. We need to do more work before consensus can be reached

e. A consensus is reached when no team member voted 5 or 6. Once the team reaches a consensus, all team members are expected to abide by the resolution (i.e., same issue cannot be raised twice without any new information).

f. In the event that the PDT is not successful resolving the conflict, the project manager must raise the issue to Executive Committee based on the following dissenting vote(s):

- 1 or more team member(s) voted 6.

g. The Executive Committee will examine the issue or conflict, and evaluate the overall impact on scope, budget, and schedule, and making a determination of solution of the issue.

h. It is understood that once the Executive Committee reaches a consensus, the PDT will abide by the resolution recommended by the Core Management Team.

i. If the Executive Committee is not successful in resolving the issue or reaching a recommendation, they will elevate the issue to the next level of management until the issue is resolved or a decision can be made.

11.3 CHANGES TO PMP OTHER THAN SCOPE/SCHEDULE/BUDGET.

PMP changes may be accomplished at any time of year, as needed, by memo. Examples of such PMP changes are included this document. The annual PMP update will then include any interim changes that occurred since the previous update.

11.4 REGULAR PMP UPDATES FOR SCOPE/SCHEDULE/BUDGET.

PMP updates will be needed annually to reflect actual funding available and work accomplished. The PMP update process will begin in April when the Corps has some idea of the funding range likely for the following FY. The Corps will identify a plan for work to be accomplished in the following FY, and also identify any in-kind work needed to support the Corps' work. Also, the City and its consultants will plan for on-going engineering work. In September, the plan for the following FY will be complete, and combined with revisions to reflect actual work accomplished in the current FY. The final product of this effort each year will be a PMP revision agreed to by the Corps and City at staff level.

The description below refers to FY1, being the current fiscal year, FY2, the up-coming, and FY3, the following fiscal year.

Month	Corps Activities	City Activities	Consultant Activities
Oct FY1	When FY1 budget is distributed (or IWA in case of CR), provide memo on actual work expected for FY1. Memo to include strategic funding plan for remainder of FY1, as possible.	Award previously negotiated work, included in PMP.	
Jan	Quarterly update on FY1 (memo) and request in-kind report. Leverage reprogramming thru strategic plan.	Submit statement from accounting on Seawall expenditures, matching PMP task descriptions (contract and PM).	
Feb	Execute FY1 plan.		
Mar			
Apr	Quarterly update on FY1 (memo) and request in-kind report. Include in memo likely funding scenarios for FY2 (based on Pres budget and Cong requests) Begin to scope work for FY2, based on capability. Begin to develop FY2 strategic funding plan.	Based on funding range provided by Corps, begin planning engineering effort for following FY.	
May	Negotiate scope and associated or concurrent engineering scope with City, for work in FY2.		
Jun	Prepare detailed engineering estimate for consultant work, for work in FY2.	Request detailed scope from consultants	Provide detailed scope of work for following FY. Scope included support for Corps work as well as continuing

Month	Corps Activities	City Activities	Consultant Activities
			engineering.
Jul	Prepare scopes for FY2 Corps contracts. Quarterly update on FY1 (memo), request in-kind report.	Submit in-kind report.	Provide fee proposal
Aug		Negotiate with consultants.	
Sep	Final updated PMP, including schedule and budget based on capability funding in FY2. Scope allowable credit for in-kind work (50%). Draft strategic funding plan.	Negotiate draft strategic funding plan.	
Oct FY2	Initiate FY2 work.	Award work to consultants.	

- Quarterly update memos may include shifting scoped tasks from federal to sponsor in-kind, as the federal budget is known. Memo will document that in-kind is being completed ahead of schedule and is done at sponsor's risk of not being credited that in-kind.
- PMP must reflect capability figures for all out-years, including the current FY, until the official PMP update in later half of current FY.
- Strategic funding plan will be developed with the sponsor to ensure execution of funding up to capability funding levels.

11.5 THRESHOLD OF CHANGE TO PMP, REQUIRING SIGNATURES.

The project is managed at the staff level, and annual PMP updates that are generally within the approved scope, and strictly within the total approved budget, may be approved at the staff level. Significant scope changes either change the project, for example changing the study area, or will add tasks and increase the cost. Changes other than increasing the cost or significant scope changes will generally be approved at staff level, but staff may determine on a case-by-case basis that management support is beneficial to the project. That determination may initiate a signed PMP revision.

SECTION 12 - COMMUNICATIONS STRATEGY

12.1 OVERVIEW

PDT meetings will be held as needed to discuss study schedule, work requirements, and findings. In addition, the PM will update the PDT with email and frequent phone contacts. All significant meetings/emails/phone calls will be documented with memos and/or shared by email with the PDT. The PDT will be encouraged to hold open, frank discussions with the PM, sponsor, and other members. Communication will be courteous, informal, and frequent. The Technical Review Team will be involved throughout the study process as key decisions are made, not only at the end of the study.

The primary contact with resource agencies and groups will be through the Environmental Coordinator as part of the environmental scoping process for the study. In addition, resource agencies will be notified of key study findings/changes, and their input will be requested on both a formal and informal level.

The sponsor will be invited to all pertinent meetings and will share in emails and memos. Communication will be frequent and informal, supported by letters and formal communication as needed. The sponsor will provide the key avenue to contacting stakeholders throughout the study. The sponsor will also have high visibility in all general public involvement.

12.2 CONCEPTS

- Internal communication among Alaskan Way Viaduct and Seawall Replacement Project and Elliott Bay Seawall study teams is critical to a consistent message.
- Any external communication by seawall team should neither duplicate nor contradict viaduct team's communication efforts.
- Any existing viaduct team communication tools (leadership and agency groups, web pages, mailing lists) should be used by the seawall team if at all possible – to save everyone money.
- Any public outreach by seawall team should be scheduled in regard to viaduct outreach schedule.
- Any public outreach by viaduct team should be communicated to seawall team and any seawall tools or messages confirmed with seawall team.
- Any public outreach by seawall team should be communicated to viaduct team and any viaduct tools or messages confirmed with viaduct team.
- Agencies should continue to speak on what they know and refer inquiries on other agencies' business to those other agencies.
- The City of Seattle is the sponsor of the seawall project, and communication done by the Corps will be done in coordination with the City.

12.3 KEY MESSAGES

- The seawall study moves the city another step closer to a solution for a safe waterfront.

- With an in-depth look at seawall construction designs, the City and Corps can make the best choice for the city and our environment.
- Public involvement in evaluating seawall project alternatives will help the City and the Corps to find the best solution.
- Seattle and the Corps are working to protect waterfront businesses and transportation.

12.4 AUDIENCES

- Business—chamber, businesses along waterfront and below viaduct, S. Seattle businesses, tourism industry, Seahawks, Mariners
- Transportation—Burlington Northern Santa Fe Railroad, Union Pacific Railroad, Metro, Port, Bicyclists, pedestrians
- Environment—Non-Governmental Organizations, agencies
- Downtown residents, homeless advocates,
- Commuters—Ballard, Fremont, Greenwood, Shoreline, West Seattle
- Elected officials—city and federal primarily
- Viaduct team—Department Of Transportation, Federal Highways Administration, SDOT
- General public—Interested residents, casual observers

SECTION 13 - VALUE MANAGEMENT

13.1 OVERVIEW

Value Engineering (VE) studies will be conducted early in the feasibility study during the design development phase, concurrent to the review of existing alternatives formulation. The goal of these VE studies will be to identify opportunities to increase the overall value of the project, by identifying opportunities for cost savings or for enhancements. Also, in the process of technical review, the review team members may identify additional opportunities to increase the overall value.

SECTION 14 - CLOSE OUT PLAN

14.1 OVERVIEW

Throughout the project, expenditures will be monitored by the Corps in CEFMS to ensure Corps of Engineers/non-federal contributions and expenditures are in balance. Also, in-kind contributions from the local sponsor will be monitored and in-kind approvals by the project manager will be submitted to the Chief of F&A on a quarterly basis. In addition, accounts in CEFMS will be de-obligated as needed as the project progresses. This will ensure a timely and smooth closeout procedure for the project. As a part of the process of closing out a phase of a project, a lessons-learned report will be completed in Dr. Checks to provide a resource for future project planning.

SECTION 15 - APPROVALS

15.1 OVERVIEW

The approval activity is performed whenever the PMP is expanded or revised, and has been endorsed by the PDT. The PMP will be approved by the Program Manager. PMP revisions which require approval include changes in project scope (which may require different skills), changes in execution schedule (when people are required), and changes in the level of effort required. This activity formalizes commitment from District Resource Providers to support the resource requirements contained in the approved plan.

Team members from Real Estate, Environmental Resources Section, Civil Design, Cost Engineering, HTRW, Geotechnical Engineering, Value Engineering and Economics were all involved in the development of the PMP. Other offices were coordinated with on review of deliverables. With the approval of the PMP by the GI program manager, this PMP will be posted on District e-news, and can be used as a basis for entering the study into P2.

ATTACHMENT
TO

PROJECT MANAGEMENT PLAN
Elliott Bay Seawall, Seattle, Washington
Storm Damage Reduction Study

APPENDIX A

Detailed Study Schedule

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ATTACHMENT
TO

PROJECT MANAGEMENT PLAN
Elliott Bay Seawall, Seattle, Washington
Storm Damage Reduction Study

APPENDIX B

Detailed Study Cost Estimates

1. Economic Studies Cost Estimate

May 2004

MEMORANDUM FOR THE RECORD
NWS-PM-PL

FROM: Michael Green
Regional Economist

RE: Elliott Bay Seawall, Project Management Plan / Economics

Economics and Social Analysis

The economic data prepared during the reconnaissance 905(b) study will be used to its full extent when such data is consistent with feasibility phase requirements. Studies will be conducted pursuant to Appendix D "Economic and Social Considerations", of ER 1105-2-100. The base conditions in the study area must be well documented and readily understood. This area includes all of the Elliott Bay Seawall and the surrounding area which is affected by the Seawall. The feasibility phase analyses require the development of project area specific baseline information, including transportation and recreation values in the study area.

1. Without Project Conditions –

a. Literature Search – A literature search of research into the changes, updates, and currently accepted methodologies for quantifying seawall damage categories. No attempt will be made to produce benefit-cost ratios based on any alternative methodologies. The literature search will explore the applicability of methodologies that is consistent and relevant to the study scope.

Estimated time: 120 hours at \$88/hour = \$10,560

b. Define study area - Collect maps and real estate data. Working with the study team members will define the study area, locate area maps and assemble current and up-to-date assessor real estate parcel maps.

Estimated time: 40 hours at \$88/hour = \$3,520

c. Structure Inventory - Collect, assemble and refine real estate data. Establish an inventory of all structures in the study area and conduct a field survey. Retrieve study area parcel specific data to include in a structure inventory. During a field survey additional data will be collected on individual structures such as - first floor elevation, type and quality of structure.

Estimated time: 240 hours at \$88/hour = \$21,120

d. Major Rehabilitation Without Project Evaluation – The without project condition establishes the basis from which all other plans will be measured against. The without project condition assumes that the seawall will continue to function in the most efficient manner possible without the purposed rehabilitation. Extensive coordination between project study team members will be required to develop an event tree of probable failure scenarios expected to occur throughout the duration of the study period. Based upon the current physical condition of the Seawall, probabilities will be assigned to single or a combination of events reasonably expected to compromise the Seawall. Costs of repairs will be estimated to restore the seawall to the condition prior to being compromised, but not bettered. The economic costs of each of the failure events will be calculated and combined with the frequency of the event, this will be used as the basis for input into a Monte Carlo simulation (or comparable analysis tool) to generate a random stream of events. The report will clearly explain each of the failure events and the system for determining probabilities of failure.

Estimated time: 640 hours at \$88/hour = \$56,320

e. Travel Delays –Benefits are expected to be derived from travel delays from traffic re-routing and congestion under the Seawall failure and Viaduct closure scenario. Without project time and travel delays for public and private transportation routes, including passenger, freight, ferry and railroad. Transportation statistics will be collected from the appropriate agencies and displayed in a spreadsheet model that will estimate the associated economic costs. Costs will be reported separately for each type of transportation on surface streets, highway and freeway systems as average annual costs.

Estimated time: 480 hours at \$88/hour = \$42,240

f. Other Damages – This category includes identifying, investigating and collecting damage and cost information on utilities, clean-up costs, structure demolition and removal costs among other categories.

Estimated time: 160 hours at \$88/hour = \$14,080

g. Recreation Analysis – A recreation analysis will be completed for the waterfront area along the Seawall. Recreation benefits will be calculated using Unit Day Value method as described in the ER 1105-2-100. Should the Seawall fail and is no longer safe to be in the vicinity of the Seawall the recreation experience would be lost. Results will be reported incrementally and annualized. Unit Day Values will be determined for the present baseline condition and translated into a dollar value for recreation.

Estimated time: 240 hours at \$88/hour = \$21,120

h. Risk and Uncertainty Analysis (R&U): Guidance requires that risk and uncertainty be completed on all feasibility level studies. R&U analysis will be performed on each of the without project condition damage categories. The model developed will incorporate generally accepted risk based analysis tool, such as “@ Risk” or a comparable product, and may include a monte carlo simulation.

Estimated time: 160 hours at \$88/hour = \$14,080

i. Report Preparation – Assemble the narrative with-out project conditions
Economic appendix.

Estimated time: 60 hours at \$88/hour = \$5,280

j. Address review comments – Following submission of the without project condition report, technical review comments will be address and changes or modification will be made to the without project condition report.

Estimated time: 120 hours at \$88/hour = \$10,560

2. With-Project Conditions

a. Update the without project condition. As necessary, update all costs, interest rate, real estate values etc.

Estimated time: 80 hours at \$88/hour = \$7,040

b. Evaluate alternative impacts on each of the damage categories, travel and time delays and, recreation. The future without and with-project conditions will be measured against the baseline condition.

Estimated time: 480 hours at \$88/hour = \$42,240

c. Risk and Uncertainty. As required by guidance, R&U will be preformed on the with project condition.

Estimated time: 80 hours at \$88/hour = \$7,040

d. Independent technical review. Following the technical review conference, questions and comments will be addressed and necessary changes or modifications will be made to the Economics appendix.

Estimated time: 120 hours at \$88/hour = \$10,560

3. Summary

Total estimated time: 3,020 hours at \$88/hour = \$265,760

JB000 - SOCIO-ECONOMIC STUDIES

a. Social and Economic Studies/Appendix: This includes studies pertinent to an economic analysis of a major rehabilitation to the Elliott Bay Seawall under future without and with-project conditions. The economic analysis will quantify the future without-project damages and quantify a range of alternative plans including the optimum NED alternative plan. A financial analysis in support of the construction recommendation will also be prepared and will include a statement of Sponsor financial capability, a financial capability assessment, and a financing plan. The financing plan will provide detail as to the anticipated project implementation funding sources

available to the Sponsor. An economic appendix to the feasibility report will be prepared. The appendix will include the results of all social and economic studies, plus benefit-to-cost analysis, maximization analysis, Federal verses non-Federal cost sharing computations, and determination of the National Economic Development (NED) plan. The Corps will perform the economic and financial analysis, with input provided by the Sponsor. The Sponsor will develop the financing plan, coordinated with the Corps. Reference: ER 1105-2-100, Planning Guidance Notebook, Appendix D, Economic and Social Considerations (April, 2000).

2. Real Estate Study Tasks and Cost Estimates

SUMMARY OF REAL ESTATE FEASIBILITY COSTS FOR FCSA SCOPE OF STUDIES FOR ELLIOTT BAY SEAWALL

	Project
1. Attend Feasibility Study Meetings	\$29,927
2. Conferences	\$1,713
3. Rights-of-Entry (ROE)	\$11,919
4. Coordination	\$13,533
5. Procure Title Information for Proposed Project Lands	\$82,665
6. Facility and Utility Relocations and Attorney's Opinion of Compensability	\$11,870
7. Real Estate Discussions on Application of Navigational Servitude	\$13,614
8. Real Estate Requirements	\$13,614
9. Prepare Preliminary Real Estate Drawings for Real Estate Plan	\$21,239
10. Perform P. L. 91-646 Relocation Survey	\$15,433
11. Prepare Land Cost Estimate	\$256,500
12. Prepare a Baseline Cost Estimate for Real Estate in M-CACES Format	\$8,129
13. Prepare a Real Estate Plan (REP) for the Feasibility Report	\$14,675
14. Review and Comment on Draft and Final PMP	\$6,438
15. Review, Comment and Coordinate on Final Feasibility Report	\$2,468
16. Ascertain Non-Federal Sponsors' Legal Authority	\$2,295
17. Project Cooperation Agreement and Deviation Report	\$8,740
18. Technical Review of Decision Document	\$11,800
19. Revise Comment and Coordinate Response to Technical Review and Higher Authority Review Comments	\$13,831
20. P&C Administrative Support	\$1,332
TOTAL REAL ESTATE DIVISION COST	
Subtotal (Items 1-20)	\$542,000
Contingency of 25% (Rounded)	\$136,000
GRAND TOTAL (Rounded)	\$678,000

3. Environmental Study Tasks and Cost Estimates

Environmental Study Tasks and Cost Estimates Elliott Bay Seawall Project Management Plan

Prepared by:

*Kathleen Kunz and Nicolle Rutherford
CENWS-PM-PL-ER*

PURPOSE

The purpose of the studies described below is to document the environmental baseline of the study area, and to identify impacts that would be associated with providing storm damage reduction. This Project Management Plan is based on the alternatives presented in the June 2003 Reconnaissance Report (Section 905(b) Analysis).

This PMP also assumes that at least some of the work completed by the City of Seattle, and Washington State Department of Transportation (with Federal Highways Administration) for their EIS (on which we are a cooperating agency) will provide sufficient background and/or analysis for NEPA documentation for this study. The major issues identified through the City/WSDOT (Fall 2003) scoping process included traffic impacts, economic impacts, transit impacts, noise, air and water quality impacts, and marine environment impacts. Also mentioned were aesthetic impacts, open space concerns, public safety, and all impacts associated with construction, including the duration of construction. We will need to conduct formal scoping with interested parties and the resource agencies. Additional issues of concern may be identified during our scoping.

Regardless of studies conducted by the City and WSDOT, the Corps anticipates additional studies will be necessary to augment and/or provide further impact analysis once more project information becomes available. This budget recognizes the abundance of extant data regarding this project while allowing for the Corps to generate additional data where appropriate.

TASKING/LABOR

1. EIS SCOPING:

- Review DEIS/Scoping documents from City/WSDOT.
- Prepare a scoping notice for the Federal Register.
- Coordinate and hold scoping meeting with agencies and interested public.
- Prepare summary of scoping document for project record.
- LABOR – ERS Staff
- **COSTS** **\$6000.00**

2. COLLECT AND REVIEW EXISTING LITERATURE AND/OR SURVEYS IN STUDY AREA

- Review extant studies by City/WSDOT and others.
- Identify information gaps
- Develop study plans for information gaps.
- Include coordination with resource agencies and interested public..
- LABOR – all ERS Staff
- **COSTS** **\$15,000.00**

3. DEVELOP SCOPE AND INTENT FOR ADDITIONAL ENVIRONMENTAL STUDIES (INCLUDING NOISE, AESTHETICS, MARINE ENVIRONMENT, WATER AND AIR QUALITY, ETC).

- Develop various SOW for additional studies
- Manage studies
- LABOR – ERS Staff \$ 40,000.00
- LABOR - Contract \$220,000.00
- **COSTS** **\$260,000.00**

4. CULTURAL RESOURCES INVENTORY

- Review extant literature/studies
- Prepare SOW for historic archeology expert
- Manage contract
- LABOR – ERS Staff \$10,000.00
- LABOR – Contract \$50,000.00
- **COSTS** **\$60,000.00**

5. FWCA SCOPE OF WORK/PLANNING AID LETTER

- Prepare planning aid letter based upon a review of the data generated by the studies described above.
- LABOR – USFWS Staff \$10,000.00
- LABOR – ERS staff coordination \$ 2,500.00
- **COSTS** **\$12,500.00**

6. ENVIRONMENTAL IMPACT ASSESSMENT

- This assessment will determine how the baseline environmental conditions identified above would be changed by implementation of feasible alternatives. Impact assessments would largely correspond to the studied identified in paragraphs 3 above. The estimate presented below represents the cost for alternatives identified in the 905(b) Analysis.
- Analysis of impacts by Contractor \$50,000.00
- Oversight by ERS (include contract management) \$25,000.00
- **COSTS** **\$75,000.00**

7. MITIGATION PLANNING

- This planning effort would include the identification, design, and analysis of suitable mitigation to offset adverse impacts identified in 6 above.
- Mitigation planning for alternatives by Contractor \$35,000.00
- Oversight by ERS
10,000.00
- Coordination with resource agencies/interested public. 5,000.00
- **COSTS**
\$50,000.00

8. CULTURAL RESOURCES IMPACT ASSESSMENT

- This assessment will determine how the baseline environmental conditions identified in 4 would be changed by implementation of feasible alternatives. The scope of this assessment will depend on availability of geotechnical data and the extent of excavation (i.e., will underground utilities infrastructure and/or roads be removed). Cost is highly dependent on undetermined variables.
- Impact Assessment
- Coordination with SHPO/Tribes (All ERS LABOR)
- **COSTS** **\$25,000.00**

9. FWCA REPORT PREPARATION

- The Fish and Wildlife Coordination Act (16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This U.S. Fish and Wildlife Service FWCA report will evaluate the likely impacts of proposed actions, which would provide the basis for recommendations for avoiding or minimizing potential adverse impacts.
- Written by USFWS staff \$50,000.00
- Guidance/oversight by ERS staff \$ 5,000.00
- **COSTS** **\$55,000.00**

10. PREPARATION OF DRAFT AND FINAL EIS

- Document preparation by contractor \$150,000.00
- Contract oversight (ERS Staff) \$ 40,000.00
- **COSTS** **\$190,000.00**

11. PUBLIC INVOLVEMENT/COORDINATION

- Public meetings/workshops (3) \$ 10,000.00
- Coordination (ERS staff) \$ 5,000.00
- **COSTS** **\$ 15,000.00**

12. ADDITIONAL COORDINATION/ANALYSIS (in addition to the NEPA process).

- Preparation of CWA 404 compliance documents \$ 5,000.00
- Preparation of ESA Section 7 Consultation documents \$25,000.00
- Preparation of 401/402 application documents \$35,000.00
- Interagency coordination/consultation meetings (on above) \$ 5,000.00
- **COSTS**
\$70,000.00

13. Miscellaneous Fire Management/Coordination with HQ/Div

- ERS support to Planning/PM/Meetings **\$ 15,000.00**

14. For total costs, see Table 1

TABLE 1 – ESTIMATED COSTS FOR ENVIRONMENTAL RESOURCES SECTION

	Tasks	\$
1	EIS Scoping	6,000
2	Review	15,000
3	Env. Studies	260,000
4	Cultural Studies	60,000
5	FWS PAL	12,500
6	Env. Impact Assessment	75,000
7	Mitigation Planning	50,000
8	Cul. Impact Assessment	25,000
9	FWCA Report	55,000
10	DEIS/FEIS	190,000
11	Public Coordination	15,000
12	Permits/Consultation	70,000
13	Misc	15,000
	TOTAL	848,500

Assumptions:

1. This budget was developed inclusive of administrative and supervisory support funding.
2. This budget assumes that the current EIS and Study process by the City does not contain a high level of detailed site-specific (or ‘wall-site-specific’) information. We will be able to give a better assessment once we get to review the existing DEIS by the City.

HTRW investigations

Chemical Testing Summary			
Management and Technical Analysis/Reporting by USACE			
Assume 30% of Analytical Cost		SUBTOTAL =	\$53,031.0
Laboratory Analysis	# Samples	Unit Cost	Subtotal
Metals (RCRA 8)	55	\$180	\$9,900
Semivolatiles (GC/MS)	55	\$375	\$20,625
Volatiles (GC/MS)	55	\$225	\$12,375
Pesticides and PCBs (as Aroclors)	55	\$155	\$8,525
NWTPH-Gx (w/BETX)	55	\$80	\$4,400
NWTPH-Dx	55	\$95	\$5,225
TCLP Metals (RCRA 8)	110	\$205	\$22,550
TCLP Semivolatiles	110	\$435	\$47,850
TCLP Volatiles	110	\$265	\$29,150
pH	110	\$12	\$1,320
Ignitability	110	\$45	\$4,950
Reactivity (Total CN and Sulfide)	110	\$90	\$9,900
		SUBTOTAL =	\$176,770
Data Management Subcontract			
Assume 20% of Analytical Cost		SUBTOTAL =	\$35,354
Data Quality Review			
Assume 10% of Analytical Cost		SUBTOTAL =	\$17,677
		TOTAL EXPENSES =	\$282,832

VE study

The VE study is based on an email exchange with Rick Lambert:

Tim:

Here is a first draft for the paragraph description of the VE study that we propose to conduct on the Seattle seawall.

"Conduct value engineering study for Seattle seawall project using OVEST CX study team.

OVEST will provide a 5 person team consisting of geotechnical, civil, structural, and interdisciplinary engineers and environmental specialist.

The study team will follow the 5 step VE job plan: information gathering, speculation, analysis, development, and presentation phases. The sponsoring District will provide representatives of the design team to assist in the information, speculation and analysis phases of the study. Cost to utilize OVEST to conduct the VE study including labor, travel, and per diem will be approximately \$55,000".

Rick Lambert, PE
Civil / Structural Engineer
OVEST

Plan formulation, Feasibility report preparation, Project Management Plan, Program and Project Management, Draft Project Cooperation Agreement

Plan formulation and evaluation:

- Review of prior work: Prior work includes alternatives formulation, engineering support, cost estimates, and alternatives evaluation. The Corps team members will review the documentation of the prior work. \$25,000.
- Without project conditions analysis: The without project conditions analysis for all projects has recently been called out for more attention by Corps HQ. The without project conditions analysis will generate a memorandum for independent technical review. This analysis itself is part of the economics task, but this separate task is included to emphasize the without project conditions memo and review. I estimate \$10,000 to prepare the memo and fund the review.
- Plan formulation and evaluation: Alternatives formulation and screening based on prior City effort, as well as formulation and screening of alternatives other than those the City considered. Engineering development of alternatives is not included in this task. Preparation for the AFB is included. \$25,000 Corps, \$10,000 City.
- Alternative Formulation Briefing: Required review of the selection of the recommended plan, to include HQ. See ER 1105-2-100. Washington level participation funded by “Washington level review and approval” task. District and City preparation and participation estimated at \$6,000

Feasibility Report Preparation: This task includes taking the technical work already done and compiling it into a report. The report “tells the story” of how the recommended plan is arrived at. The task breaks down into writing the draft report, review, and writing the final report. Most of the information included in the report comes from other tasks, so this task does not include all of the effort to prepare the report; rather it is a compilation of the products of other tasks, with narrative to tie it together.

- Draft report preparation: Write report. Team will include PM and assistant, City PM, engineer, economist, and environmental coordinator. At about 10 days each, \$42,000. most team members will need less than 10 days, the PM will probably need much more.
- Draft report ITR: The ITR team will review the draft report, submit comments, and then review the final report to close comments. About 7 reviewers, about 5 days each, plus DrChecks management. \$35,000
- Final report preparation: Address comments from the ITR. 20 days, \$15,000

Project Management Plan: The PMP will be finalized and approved prior to commencing the study.

- Review and Maintenance: The PMP will be updated as needed. At least annually, the PMP will be revised to reflect the expected budget for the following year. This task will be lead by the Corps PM, and will involve the City PM and various team

members. The task is estimated at roughly \$5000 per year, divided between City and Corps.

Program and Project Management:

- Program Management: The budget analyst is funded at approximately 7% of Corps of Engineers funding level of the project, which is a standard funding level for Seattle District projects. Because calculating this creates a circular calculation in the spreadsheet, it is set at approximately 7%, rather than trying to get it exact.
- Project Management: The overall PM effort is estimated at 1.25 persons, based on size and complexity of the project. Based on the average rate of Tim Shaw and Becky Jahns, the monthly cost of 1.25 persons is approximately is \$16,000, or \$192,000 per year, for the Corps. Estimate a similar level for the City.
- Executive committee: The executive committee is expected to meet a several of times each year. There are currently eight members shown at the executive level. The PMs' labor is covered by the PM budget. Eight executives, at about \$100/hour, would cost about \$1600, depending on meeting length. Estimate about \$10,000 per year for the executive committee task to get a meeting about every two months.
- PED Cost Sharing Agreement: The PED agreement will probably use the model agreement. As part of this task, a PMP for the PED phase will be required. I expect that effort to be much simpler than preparing the PMP for the study since the scope will be better known at that time. The PMP for the study has cost about \$50,000 to prepare. I estimate \$25,000 for preparation of the PED agreement and PMP for the PED phase, mostly Federal.
- Lessons Learned: Lessons learned will consist of a single partial-day meeting, with appropriate staff representing the spectrum of activities. Estimate \$5000 for this task.

Draft Project Cooperation Agreement:

The PCA for this project will probably contain deviations from the model. Negotiations of this sort are difficult to scope accurately in advance. The Corps will have the lead, and will probably have higher costs. I estimate \$20,000 for the Corps effort, and \$15,000 for the City effort.