

30% Remedial Design

Volume II – Part I

Construction Quality Assurance Plan

Summary Table

Administrative Order on Consent 5 requires that a draft Construction Quality Assurance Plan (CQAP) be developed during Pre-Final (90%) remedial design (RD). Per the RD Work Plan for Preliminary (30%) RD, the Lower Duwamish Waterway Group has prepared a summary table with description of anticipated quality assurance (QA) activities that the Owner will implement during construction. The general content of the CQAP (draft to be submitted during Pre-Final [90%] RD) will include descriptions of the following main elements:

- Project organization and responsibilities
- Construction management activities
- Contract administration
- Contingency actions, corrective actions, and notification process (including decision frameworks)
- Appendices for construction QA monitoring plans, including water quality monitoring; sediment sampling QA project plan; air, noise, and light monitoring; and cultural, historic, and archaeological monitoring and inadvertent discovery

The Remedial Action Contractor's (contractor's) quality control (QC) requirements are defined in the Specifications. QA activities are defined in the CQAP and reflected in the Specifications for general information to the contractor. There are three main categories of CQAP activities that will be performed by the Owner during construction, as follows:

- Construction Inspection and Engineering Support (Compliance with Drawings and Specifications)
- Environmental Controls and Monitoring (Compliance with Environmental Protection Requirements)
- Remedy Performance (Compliance with Record of Decision remedial action requirements immediately following construction)

The following table summarizes anticipated key elements of construction QA that will be performed by the Owner. These QA elements will be described in the CQAP.

Construction Quality Assurance Plan Summary Table

Construction Element	QA Categories	Anticipated Contractor QC Requirements (to be developed in the Specifications)	Owner QA Activities
Pre-Construction Activities			
Pre-Construction Submittals and Mobilization	Construction Inspection and Engineering Support	<p>The contractor submits pre-construction submittals as required in the Specifications as follows:</p> <ul style="list-style-type: none"> • RAWP (e.g., construction means and methods, material supply source, transport and disposal plan, landfill facility location, sequencing and construction schedule). • Structures condition documentation (within or adjacent to SMAs) • Pre-construction bathymetric/topographic survey of SMAs and calculation of quantities • Contractor equipment inspection • Procure materials, including placement materials, and conduct and document results of QC testing. • Establish real-time kinematic positioning control and maintain. • Establish and maintain vertical control including tide gauges and survey monuments. • Establish and maintain environmental protection controls. • Establish and maintain contractor’s health and safety controls. 	<ul style="list-style-type: none"> • Owner reviews and approves contractor pre-construction submittals. • Equipment pre-construction inspection review • Structures condition documentation (within or adjacent to SMAs) review • Review and approve pre-construction bathymetric/topographic surveys and calculation of quantities. • Review and approve materials. • Owner may perform independent QA surveys.
During Construction Activities			
Construction Progress Tracking and Reporting	Construction Inspection and Engineering Support	<p>Contractor submits daily and weekly construction reports including the following:</p> <ul style="list-style-type: none"> • Quantity estimates (dredging and placement) • Progress summaries • Environmental monitoring summaries • Vessel movements • Health and safety incidences • Work hours, notes, visual observations, and change conditions • Look-ahead construction schedule and activities 	<p>Review daily and weekly construction reports and prepare the following:</p> <ul style="list-style-type: none"> • Progress summaries for all construction activities • Environmental monitoring summaries • Deviations from contractor’s RAWP or Drawings and Specifications
Structures Demolition, Installation and Utility Relocation	Construction Inspection and Engineering Support	<p>Contractor submits daily and weekly construction reports including the following:</p> <ul style="list-style-type: none"> • Material supply quality submittals • As-built surveys 	<ul style="list-style-type: none"> • Review daily and weekly progress tracking and reports.
Dredging and Excavation Activities	Construction Inspection and Engineering Support	<ul style="list-style-type: none"> • Conduct and submit bathymetric/topographic surveys (progress surveys and post-dredge acceptance surveys [as required by Specifications] and as-built surveys). • Submit barge measurements (empty and loaded) for transport and transload operations. • Submit disposal weight tickets from approved landfill facility(ies). • Submit bucket maps showing work progress. 	<ul style="list-style-type: none"> • Review contractor’s daily and weekly construction reports. • On-site inspections and observations • Review bathymetric and topographic surveys, bucket maps, barge measurements, and weight tickets for conformance with Drawings and Specifications. • Independent Licensed Surveyor performs acceptance surveys (may be contracted by Owner or contractor, TBD). • Review transload and disposal information to track progress of transport and disposal of dredged materials/debris at approved landfill(s). • Determine need for corrective action or contingency re-dredging in coordination with EPA.

Construction Element	QA Categories	Anticipated Contractor QC Requirements (to be developed in the Specifications)	Owner QA Activities
Placement Activities (Enhanced Natural Recovery, Capping, Backfilling, Slope Armoring, Residuals Management Cover, and Area-Specific Technology)	Construction Inspection and Engineering Support	<ul style="list-style-type: none"> Conduct and submit bathymetric/topographic surveys (progress surveys, post-dredge acceptance surveys [as required by Specifications], and as-built surveys). Submit placement material supplier test results per Specifications. Submit placement material supplier quantity weight tickets and/or transport barge measurements. Submit bucket maps showing work progress. 	<ul style="list-style-type: none"> Review contractor's daily and weekly construction reports. On-site inspections and observations Review surveys and other submitted information for conformance with Drawings and Specifications. Independent Licensed Surveyor performs acceptance surveys (may be contracted by Owner or contractor, TBD). Review material supplier and barge measurement information to track quantities of placement materials. Review material supplier testing results for acceptance. Conduct verification sampling (e.g., coring, sediment profile imaging, probing, placement elevations and thickness, and mass balance calculations). Determine need for corrective action in coordination with EPA.
Site Cleanup and Restoration	Construction Inspection and Engineering Support	<ul style="list-style-type: none"> Submit Closeout Checklist to Resident Engineer for review. Submit draft as-built record drawings. Inspect all construction-impacted areas, including staging and transload to cleanup; restore vegetation (as required); and decontaminate equipment and the site for final acceptance per the Specifications. 	<ul style="list-style-type: none"> Review contractor's Closeout Checklist and identify final corrective actions. Review as-built surveys. Inspect the site to confirm cleanup, restoration and decontamination work has occurred per the contractor's RAWP.
All Construction Activities	Environmental Controls and Monitoring	<ul style="list-style-type: none"> Comply with Specifications requirements for all environmental protection criteria and comply with contractor's approved Environmental Protection Plan. Upgrade BMPs if environmental performance criteria are not being met. Contractor's QC officer will be responsible for ensuring compliance with environmental protection criteria. 	<ul style="list-style-type: none"> Conduct water quality monitoring during in-water construction activities per the approved Water Quality Monitoring Plan to ensure contractor is meeting performance criteria in the Specifications and the Water Quality Monitoring Plan and to modify BMPs if needed. On-site inspectors will observe contractor's operations to note compliance with environmental protection Specifications and the contractor's approved Environmental Protection Plan. Follow the procedures in the Community Outreach and Communications Plan, including notifications and communications. Determine need for corrective action in coordination with EPA.
Dredging, Excavation, and Demolition Activities	Environmental Controls and Monitoring	<ul style="list-style-type: none"> Visual observations for potential evidence of archaeological, cultural and historic artifacts; reporting to Owner's Archaeological Monitor 	<ul style="list-style-type: none"> Archaeological Monitor implements the approved Monitoring and Inadvertent Discovery Plan during dredging, excavation, and demolition activities. Coordinate response and communications to all relevant stakeholders if an inadvertent discovery occurs.
Required Contingency Actions	Remedy Performance	<ul style="list-style-type: none"> Perform contingency actions, as directed, in compliance with Drawings and Specifications. Conduct and submit bathymetric/topographic surveys (progress and as-built surveys). 	<ul style="list-style-type: none"> Conduct post-required dredging performance monitoring for identifying missed inventory and/or generated residuals. Determine need for contingency action in coordination with EPA. Implement (through directing the contractor) contingency actions per the EPA-approved contingency action decision framework as described in the CQAP (TBD).
Post-Construction Activities			
Post-Construction Documentation	Remedy Performance	<ul style="list-style-type: none"> Submit contractor's Annual Construction Report. Submit final as-built record drawings. Submit contractor's Closeout Report. 	<ul style="list-style-type: none"> Develop and submit Annual Summary Construction Technical Memorandum to EPA. Develop and submit Remedial Action Project Report to EPA.

Notes:
BMP: best management practice
CQAP: Construction Quality Assurance Plan
contractor: Remedial Action Contractor
EPA: U.S. Environmental Protection Agency
RAWP: Remedial Action Work Plan
QA: quality assurance
QC: quality control
SMA: sediment management area
TBD: to be determined