Water Quality Monitoring Plan

Hiram M. Chittenden Locks
Large Lock Center Gate Replacement
January 2022

Constituents Monitored:

The Hiram M. Chittenden Locks (Locks) large lock center gate (LLCG) Replacement project area is located in Shilshole Bay, which is designated as "Extraordinary Quality" (WAC 173-201A-612, Table 612). The project area contains extraordinary quality salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.

The proposed project requires the following water quality monitoring parameters pursuant to Public Notice of Application CENWS-PMP-21-06 Seattle, WA for WAC 173- 201A-210:

- Turbidity applicable criteria:
  - Point of Compliance (POC) is 150 feet down-current of any in-water activity (i.e., work behind temporary cofferdams).
  - Turbidity readings at the POC shall not exceed 5 NTU (nephelometric turbidity units) over background when the background is 50 NTU or less, or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
  - Visual turbidity anywhere at or past the POC from the activity shall be considered a possible exceedance of the standard and shall be verified through measured turbidity sampling.
- pH applicable criteria:
  - The State of Washington water quality standards do not specify a POC for pH so the U.S. Army Corps of Engineers (Corps) has determined that the pH will be monitored near the point of concrete work and curing that takes place behind the temporary cofferdam (i.e., any water within the cofferdam) and any discharge.
  - pH readings must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.2 units.
- Petroleum Sheen:
  - Visual monitoring throughout the project area for the duration of construction.

Background Conditions:

- The contractor will take background measurements of turbidity using a water quality meter (HydroLab or similar) as close as possible in time to the start of concrete work and potential turbidity generating activities such as installing a temporary cofferdam. Background measurements will coincide as close as possible in time with each measurement taken at the POC. Determination of background water quality conditions will be made according to the following:
  - The contractor will calibrate the water quality meter with standardized samples prior to the start of each day's monitoring, per the manufacturer's specifications.
  - The contractor will collect samples in the large lock at a location that will accurately represent background conditions. The contractor will determine the precise location that accurately represents background levels to acquire the samples.

- The contractor will collect samples at mid-depth at the background monitoring location.

Frequency of Monitoring:

- The contractor will monitor for turbidity daily, every four hours, during daylight hours only, for concrete work or other potential turbidity-generating work. No monitoring will occur before sunrise or after sunset unless authorized by the Corps.
- Turbidity monitoring will correspond with (1) slack tide and (2) strong ebb or flood tidal conditions to the extent that these times adequately reflect periods of concrete work or other potential turbidity-generating work, and occur during daylight hours.
- The contractor will operate construction equipment for at least one hour prior to the collection of water quality samples for turbidity monitoring to ensure samples are reflective of turbidity conditions during active operations.
- The contractor will monitor for pH during concrete work and curing. The contractor will provide a water quality meter (HydroLab or similar).
- The contractor will monitor for pH during concrete work and curing, and occur during daylight hours if the water quality meter is deployed from a boat. The Corps will approve night monitoring if work takes place at night.

Sampling Approach:

- The contractor shall establish water quality conditions according to the following:
  - The contractor shall measure turbidity and pH with a meter (HydroLab or similar), under the conditions described above to ensure readings and observations are reflective of active periods of concrete work and curing, and during other potential turbidity-generating work.
  - The contractor shall verify the calibration of the meter and calibrate as necessary with standardized samples prior to the start of each day's monitoring, per the manufacturer's specifications.
  - The contractor will take samples at mid-depth of the water column.
- The POC for turbidity for a temporary area of mixing shall be at a radius of one hundred fifty feet from the activity causing the turbidity.
- The State of Washington water quality standards do not specify a POC for pH so the Corps has determined that the contractor will monitor pH near the point of concrete work and curing that takes place behind the temporary cofferdam and any discharge of water, if applicable (e.g., from the cofferdam and/or a treatment container).
- Monitoring points shall be at the turbidity background monitoring point, at the turbidity POC, (a one hundred fifty foot radius from the activity), and as close to the concrete work as possible for pH monitoring.
- Samples taken by the contractor at the POC shall be adjusted within the depth range to target the turbidity plume which will be tracked visually. If no distinct turbidity plume can be identified within the depth range, the samples will be taken at the mid-depth.
- The contractor will compare turbidity samples taken at the POC to background levels at mid-depth to determine compliance with water quality standards.
- The contractor will take samples for pH as close to the concrete work as possible (i.e., behind the cofferdam) and at any discharge of water, if applicable (e.g., from the cofferdam and/or a treatment container), for the pH POC to determine if a change of 0.2 units or more occurs.

- Upon completion of the instrument measured monitoring days, the contractor shall send the monitoring data report daily to the Corps within 24 hours of completion of monitoring activity.
  - If there are exceedances in water quality, the contractor shall continue monitoring following the steps listed in “Exceedances and Exceedances Protocol.”
- The contractor shall continue to monitor and record (written) daily visual turbidity monitoring at the POC during construction. At any point, if visual monitoring indicates a turbidity plume, the contractor shall take a physical reading to confirm/verify if an exceedance has occurred. If an exceedance is confirmed/verified through physical monitoring, the exceedance protocol listed below shall be followed.

Monitoring Locations:

- The contractor will take samples at mid-depth of the water column.
- The POC for turbidity shall be at a radius of 150 feet from the activity causing the turbidity.
- The State of Washington water quality standards do not specify a POC for pH, so the Corps has determined that the contractor will monitor pH near the point of concrete work and curing that takes place behind the temporary cofferdam and at any discharge point of water, if applicable.
- The contractor will use monitoring points at the turbidity background monitoring point, at the turbidity monitoring POC (which is 150-foot radius from the activity), constant visual monitoring for sheen in the entire project area, and near the point of concrete work and curing that takes place behind the temporary cofferdam.
- The contractor will adjust samples taken at the turbidity POC and pH monitoring location to the depth range to target any turbidity plume, which will be tracked visually. If no distinct turbidity plume can be identified within the depth range, the contractor will take samples at the mid-depth.
- The contractor will compare turbidity samples taken at the POC to turbidity background levels at mid-depth to determine compliance with water quality standards.

Exceedances and Exceedance Protocol:

- If measurements taken at the POC location show recorded turbidity is greater than 5 NTU over background where the background is less than 50 NTU, or if more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU, occurring at the POC, the contractor will immediately notify the Corps and, assuming construction continues, will continue to monitor per the exceedance protocol below.
- The contractor shall be responsible for immediately notifying the Corps’ Project Engineer of any exceedance of the turbidity or pH standard, or of any visible petroleum sheen.
- If measurements taken at the pH monitoring location(s) show recorded pH has varied more than 0.2 units from the background, which will be within the range of 7.0 to 8.5, the contractor will immediately notify the Corps and, assuming construction continues, will continue to monitor per the exceedance protocol below. Water behind the cofferdam that varies more than 0.2 units from background shall not be discharged to surface waters; instead, this water will be collected and treated so that the pH standard is not exceeded before being discharged.
  - In response to a pH exceedance, work will stop so that water can be collected from behind the cofferdam and treated. The work stoppage will be coordinated so that it can be done safely for the contractor without releasing concrete into the water column, and without compromising previously poured concrete.

Step 1: Verification of the problem

- If monitoring indicates an exceedance in turbidity or pH levels, the contractor will immediately take another series of samples (top, mid-depth, and bottom of water column, if outside the cofferdam) in the same location.
- If the exceedance still exists ('strike one'), then the contractor must take another series of samples at the background station at the same time as the POC or as close in time as possible to samples taken at the POC to determine if the exceedance is caused by the construction activities or by a change in background conditions (for example due to a heavy rainfall event).
- If monitoring indicates a petroleum sheen in the project area, the contractor must locate the source of the sheen and deploy oil-absorbent materials.
- The contractor must notify Corps' Project Manager or Project Biologist by telephone as soon as possible after there has been a measured exceedance.
- The Corps will then verify with the contractor that a measured exceedance occurred and request that best management practices (BMPs; listed at the end of this document), as appropriate and applicable, be implemented by the construction contractor to reduce turbidity and return pH within acceptable limits. The BMP for a pH exceedance is to collect and treat the water so that the pH limit is not exceeded prior to discharge.

Step 2: Increased monitoring

- If a pH exceedance is recorded, the contractor will begin capturing and treating the cofferdam discharge water to return it to a pH within 0.2 units of background. The contractor will continue to monitor the water inside the cofferdam and water to be discharged after treatment.
- The contractor will take another sample no more than one (1) hour after the turbidity exceedance is recorded to verify the construction activities operation has been altered to reduce the exceedance to within acceptable limits.
- If the second sample, taken 1 hour later, still shows a turbidity exceedance ('strike two'), the contractor must immediately notify the Corps' Contracting Office, Project Manager, or Project Biologist by phone that there is still a measured exceedance.
- The Corps will review BMPs in place and request that all BMPs possible be implemented to reduce turbidity within acceptable limits. The BMP for a pH exceedance is to immediately begin to collect and treat the water so that the pH limit is not exceeded prior to discharge.
- Finally, the contractor will take a third sample no more than two (2) hours after the first turbidity exceedance is recorded.
- If the contractor deploys oil-absorbent materials for a petroleum sheen, the Corps' Project Manager or Project Biologist must be notified by telephone, by the contractor as soon as possible after there has been a visible sheen. The contractor will monitor the project area to confirm the source of the sheen was eliminated and that the oil control measures are working.

Step 3: Stop construction activities

- If the third sample, taken two (2) hours later, still shows a turbidity exceedance ('strike three'), the contractor will immediately notify the Corps' Contracting Office, Project Manager or Project Biologist and the Corps will order the contractor to stop work. The Corps will then notify Ecology of the situation.

- If a petroleum sheen source is not located or is not controlled by oil-absorbent materials, or if the sheen is coming from upstream, the contractor will immediately notify the Corps' Contracting Office, Project Manager, or Project Biologist and the Corps will order the contractor to stop work. The Corps will then notify Ecology of the situation.

Step 4: Continued sampling until compliance is achieved

- After the contractor has stopped work, the contractor will collect samples at hourly intervals until turbidity and pH levels in discharge water and/or in the large lock return within acceptable limits. The contractor should identify any source of petroleum creating a sheen and controlled with oil-absorbent materials.
- Once compliance has again been achieved, the contractor will resume work upon the direction of the appropriate Corps official.
- The Corps' Project Manager or Project Biologist will notify Ecology that work has resumed.
- The normal schedule of water quality sampling will resume as per specific requirements above.

Step 5: Reporting

- The Corps' Contracting Officer, Project Manager or Project Biologist will report any exceedances and/or shutdowns to Ecology to fednotification@ecy.wa.gov within 24 hours, referencing the project name, project location, project contact, and project phone number, activity, and monitoring results.
- The contractor will document any shutdowns with an incident report to the Corps, which will be transmitted to Ecology by email within two working days of the incident.
- The contractor will prepare the incident report, which will document any exceedances and will include the date, time, location, activity, water quality data collected, the nature of the event, name of person collecting the data, names of persons notified of the exceedance, summary of how the exceedance was resolved according to the above protocol such as what corrective action taken and/or planned, steps to be taken to prevent a recurrence, and any other pertinent information.
- Incident reports will be transmitted to the Corps' Contracting Officer, Project Manager or Project Biologist within 24 hours of the exceedance.
- The Corps will submit water quality monitoring data to Ecology on a weekly basis.
- Evaluate potential new BMPs in addition to those listed below.

Responsibility and Communication Plan:

- The Corps will notify Ecology at least 10 days prior to start of work and at least seven days within project completion.
- The Corps will oversee turbidity and pH monitoring conducted by the contractor.
- The Corps will be responsible for coordinating with Ecology and submitting the Turbidity Monitoring Reports and data provided by the contractor.
- The Corps will notify Ecology within 24 hours if an exceedance occurs.
- The Project Manager and Contracting Officer will coordinate with the contractor.
- The contractor will use the Corps-provided Sampling Form unless otherwise approved by the Corps.
- The contractor shall provide turbidity and pH monitoring data to the Corps daily.

- The contractor shall notify the Corps within 30 minutes of a confirmed exceedance and follow required notifications per exceedance protocols.
- The contractor will provide a contractor Point of Contact to the Corps.
- The Corps Points of Contact for turbidity and pH monitoring will be the Project Engineer (to be identified), Stephanie McKenna, Project Manager (206-764-6081), and Katie Whitlock, Project Biologist/Environmental Coordinator (206-764-3576).
- The Ecology Point of Contact is Rebekah Padgett, Federal Permit Coordinator, (425-365-6571; Rebekah.Padgett@ecy.wa.gov).
- The Corps will send official reporting of any incidents to the Ecology Point of Contact (Rebekah.Padgett@ecy.wa.gov) AND to the fednotification@ecy.wa.gov inbox.
- Work causing distressed or dying fish, discharges of oil, fuel, or chemicals into state waters or onto land with a potential for entry into state waters, is prohibited. The Locks Project Biologist/Environmental Compliance Coordinator is responsible for spill reporting and response. If such work, conditions, or discharges occur, the Corps shall notify Ecology and immediately take the following actions:
  - The Corps will notify the contractor to cease operations at the location of the non-compliance.
  - The contractor and Corps will assess the cause of the water quality problem and the contractor will take appropriate measures to correct the problem and/or prevent further environmental damage.
  - In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, the contractor will begin containment and cleanup efforts immediately to be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of any spilled material and used cleanup materials.
  - The Corps will immediately notify Ecology's Regional Spill Response Office at 425-649-7000 and the Washington State Department of Fish and Wildlife with the nature and details of the problem, any actions taken to correct the problem, and any proposed changes in operation to prevent further problems.
  - The Corps will immediately notify the National Response Center at 1-800-424-8802, for actual spills to water only.
  - The Corps will notify Ecology's Regional Spill Response Office at 425-649-7000 immediately if chemical containers (e.g., drums) are discovered on-site or any conditions present indicating disposal or burial of chemicals on-site that may impact surface water or ground water.

General Best Management Practices (BMPs) for Water Quality

- Vegetable oil will be used in machinery stationed on a boat or barge.
- The contractor will not refuel equipment such as generators and forklifts in the project area (i.e., the lock chamber) and spill containment trays will be used during refueling. The contractor will refuel vessels offsite in accordance with applicable regulations.
- The contractor will prevent any petroleum products, chemicals, or other toxic or deleterious materials from construction equipment and vehicles from entering the water.
- The contractor will regularly check fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. for leaks, and will maintain and store materials properly to prevent spills. The contractor will provide a schedule for these checks.
- The contractor will contain wash water resulting from wash down of equipment or work areas for

proper disposal and will not discharge wash water into state waters unless authorized through a state discharge permit.

- The contractor will maintain equipment that enters the surface water to prevent any visible sheen from petroleum products appearing on the water.
- There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.
- The contractor will not discharge cleaning solvents or chemicals used for tools or equipment cleaning to ground or surface waters.
- The contractor will be required to submit a spill prevention control and countermeasures (SPCC) plan prior to the commencement of any construction activities, including spills of concrete. The SPCC plan will identify and recognize potential spill sources at the site, outline best management practices and secondary containment, delineate responsive actions in the event of a spill or release, and identify notification and reporting procedures. Implementation of the SPCC plan will minimize the effect of construction activities on the quality of surrounding waters.
- The contractor will be required to submit a stormwater pollution prevention plan (SWPPP) prior to construction using best management practices pursuant to the most recent City of Seattle Stormwater Manual dated August 2017 (https://web6.seattle.gov/DPD/DirRulesViewer/Rule.aspx?id=17-2017) to control stormwater impacts during construction.
- A spill containment kit, including oil-absorbent materials will be kept on-site during construction in the event of a spill or if any oil product is observed in the water. If a spill was to occur, will be stopped immediately, steps will be taken to contain the material, and appropriate agency notifications will be made.

BMPs specific to the control of pH and turbidity

- Water to be discharged from the temporary cofferdam must meet water quality standards; otherwise, the contractor will collect and treat water before discharging to the waterway.
- The contractor will allow concrete to cure before rewatering the area.
- The contractor will regularly check all equipment from the source of concrete to placement locations, including hoses, hose clamps, drums, secondary containment berms, pans, and other containment, transfer valves, fittings, forms, grout bags, etc. for leaks, on land and in-water, and will maintain and store materials properly to prevent spills. The contractor will provide a schedule for these checks.
- The contractor will monitor for visual turbidity plumes and discharge during in-water work. If turbidity is identified, turbidity monitoring and pH monitoring locations will be adjusted to capture the plume (as described in “Sampling Approach” above).
- The contractor will use secondary containment for all equipment on land and on boats or barges with the potential to discharge a pollutant. This includes mechanical equipment, concrete pumping or mixing equipment, etc.
- The contractor will identify all concrete washout locations. Washout on-site will not be allowed to enter water or be dumped on land, and will not be within 50 feet of storm drains, open ditches, or waterbodies. The contractor will contain washout in leak-proof containers for proper recycling, treatment, and/or disposal. If washout is disposed of at a municipal wastewater treatment plant, the contractor will contact the plant so that any pretreatment requirements can be followed.
- The contractor will capture and contain concrete process water and waste. Discharge of concrete process water or waste materials to the ground or surface waters will not be allowed.

- All material that is removed from the water (concrete blocks, material lifted from scoured areas, etc.) will not be returned to the water. The contractor will properly contain material with a berm, pan, or other structure when on a boat and on land so that materials and water associated with materials cannot return to the water.
- The contractor will establish transfer locations to move materials removed from the large lock (e.g., concrete removed from the lock wall) to land for disposal to confine any accidental spillage and prevent the release of materials back into the water. The contractor will clean up any spilled materials immediately. The SWPPP submitted by the contractor will describe applicable BMPs at the transfer location.
- The contractor will clean equipment prior to construction so that it is free of external petroleum-based products while used around the waters of the state. The contractor will remove accumulation of soils or debris from the drive mechanisms (wheels, tires, tracks, etc.) and the undercarriage of equipment prior to its use.
- The contractor will retrieve any debris generated during construction with a skiff and net. Retrieval will occur at slack tide or when current velocity is low.

Sampling Form for In-Water Work

Cover Page

Please refer to the Water Quality Monitoring Plan (WQMP) for detailed instructions. Important WQMP details include the following:

- Use a new sampling form each day.
- Use this sampling form unless otherwise approved by the U.S. Army Corps of Engineers.
- Sheen presence should be constantly monitored for and reported immediately. Any source of petroleum creating a sheen must be identified, controlled with oil-absorbent materials, and reported as described in the WQMP.
- Turbidity is measured at mid-depth of the water column or within a visible plume (this depth will change with the tide)
    - Turbidity point of compliance is one hundred fifty feet from the turbidity-causing activity.
    - Turbidity readings 150 feet from the construction activity should be < 5 nephelometric turbidity units (NTU) over a background of ≤ 50 NTU or < 10% over a background of ≥ 50 NTU.
- pH is monitored outside of the cofferdam (if applicable) and as close to concrete work as possible.
    - pH should be 7.0 to 8.5 with a human-caused variation of less than 0.2 units.

Sampling Form for In-Water Work

Date:_____Project:_____

Name of Person Sampling: _____

Date of last calibration for Turbidity Meter: _____

Date of last calibration for pH meter: _____

Activity Start Time: _____ Activity Stop Time: _____

Turbidity Meter and/or pH Meter Location(s) **Identify if this is a background or compliance point.**	**Time**	**Turbidity (NTU)**	**pH**	**Sheen observed at any point today? (Y/N)**	**Notes (Compare to background turbidity as applicable, weather, construction activities at the time, if equipment is working properly, action taken to identify or stop sheen as applicable)**

Turbidity Meter and/or pH Meter Location(s) Identify if this is a background or compliance point.	Time	Turbidity (NTU)	pH	Sheen observed at any point today? (Y/N)	Notes (Compare to background turbidity as applicable, weather, construction activities at the time, if equipment is working properly, action taken to identify or stop sheen as applicable)

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

June 22, 2021

Laura Boerner, LG, LHG
Chief, Planning, Environmental and Cultural Resources Branch
US Army Corps of Engineers - Seattle District

In future correspondence please refer to:
Project Tracking Code: 2021-04-02392
Property: Hiram M. Chittenden Locks -Large Lock Center Gate Replacement
Re: ADVERSE Effect

Dear Laura Boerner:

Thank you for contacting the State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. We have reviewed the materials you provided for this project. As a result of our review, we concur with your determination that the project as proposed will have an Adverse Effect on Property ID: 724739, the Hiram M. Chittenden Large Lock, which is a contributing element of the Chittenden Locks and Lake Washington Ship Canal, which is listed in the National Register of Historic Places.

In view of our concurrence on the adverse effect determination, we look forward to further consultation and the development of a Memorandum of Agreement (MOA). The MOA shall identify specific measures that when implemented will serve to mitigate the adverse effect on the property.

Also, we appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is shared with any hired cultural resource consultants and is attached to any communications or submitted reports. Should you have any questions, please feel free to contact me.

Sincerely,

Holly Borth
Project Compliance Reviewer
(360) 890-0174
holly.borth@dahp.wa.gov

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

14 June 2021

Jennifer Meisner, Historic Preservation Officer
King County Historic Preservation Program
King Street Center
201 S. Jackson Street, Suite 700
Seattle, WA 98014

SUBJECT: Lake Washington Ship Canal Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Ms. Meisner:

The U.S. Army Corps of Engineers (Corps) is writing in regard to the proposed replacement of the large lock center gate (the Large Lock) (undertaking) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, WA (Enclosures 1 and 2). The LWSC is listed in the National Register of Historic Places as a discontinuous historic district, and the Corps has determined that replacement of the Large Lock center gate will result in an adverse effect to the LWSC Historic District.

The undertaking is located in Section 11, Township 25 North, Range 3 East in Seattle, Washington. The undertaking will consist of the complete demolition and removal of the original Large Lock center gate and a portion of the concrete walkway at the rear of the Administration Building (Enclosures 3 and 4). The original center gate will be replaced with a horizontally framed, welded steel fabrication with the same dimensions as the existing gate. The miter gate leaves would be a single sided skin plate design and mounted into the concrete canal walls. This will require removal and disposal of the old gate and fabrication/delivery of two (2) new gate leaves. Gate leaves are the gates doors that make up the gate. Each gate leaf has its own set of machinery to operate it. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchors placed into the concrete. The new gates will be metal and painted black to match the existing original gate, the design will change from double skin (Enclosure 4), to single skin (Enclosures 5 and 6). The demolished concrete will be replaced with color matched concrete to match the surrounding concrete. The concrete formula developed for this project will be save for future work. The existing gate operating machinery and electrical equipment will be reused and connected to the new gates.

The Corps initiated consultation with the Department of Archaeology and Historic Preservation (DAHP) on 12 May 2021. The Corps informed the Advisory Council on Historic Preservation (ACHP) of the adverse effect and invited them to participate in the development of a Memorandum of Agreement (MOA). The Corps has identified the King County as a Certified Local Government; we are notifying you of the undertaking and finding of effect and inviting

you to participate in the development of a MOA for this project. In consultation with DAHP, the Corps is beginning the effort to identify appropriate mitigation actions.

Please let us know if you would like to participate as a concurring party in the development of a MOA. If you have any questions or concerns please contact Ms. Lys Opp-Beckman, Architectural Historian, at lys.opp-beckman@usace.mail.mil or (206) 764-3422, or the Project Archaeologist Ms. Kara Kanaby at Kara.M.Kanaby@usace.army.mil or (206) 764-6857. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

Sincerely,

KANABY.KARA.M.1400065701

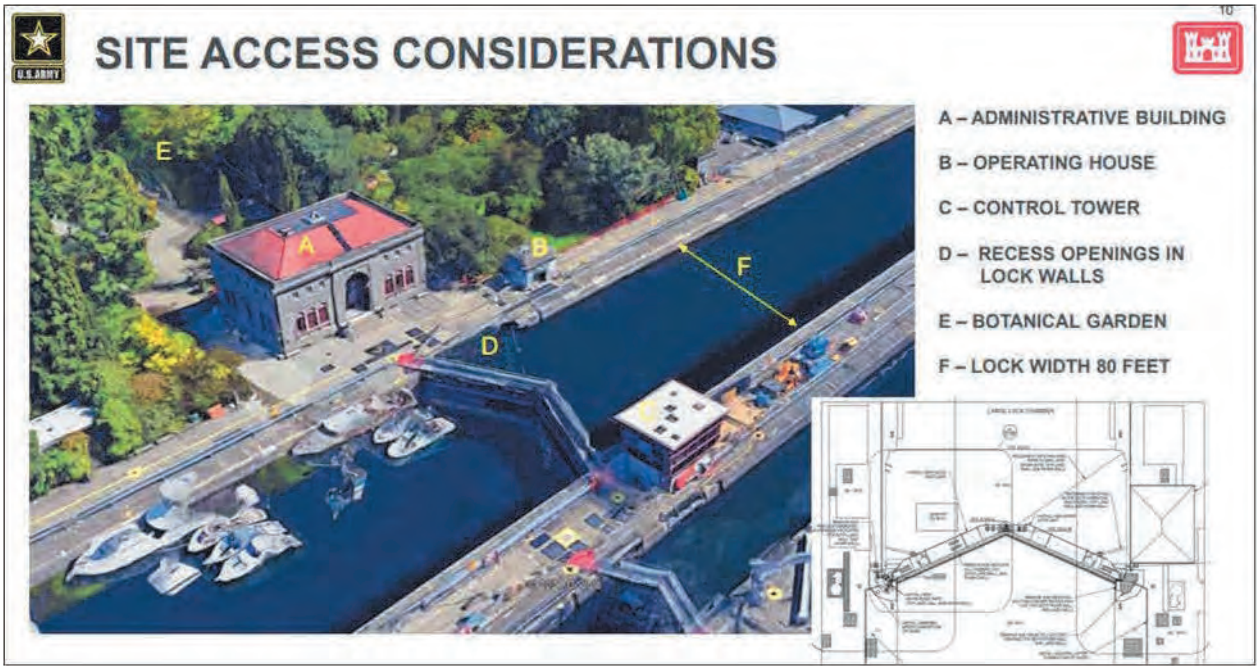
Digitally signed by KANABY.KARA.M.1400065701
Date: 2021.06.14 16:32:37 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental, and
Cultural Resources Branch

Enclosure/s

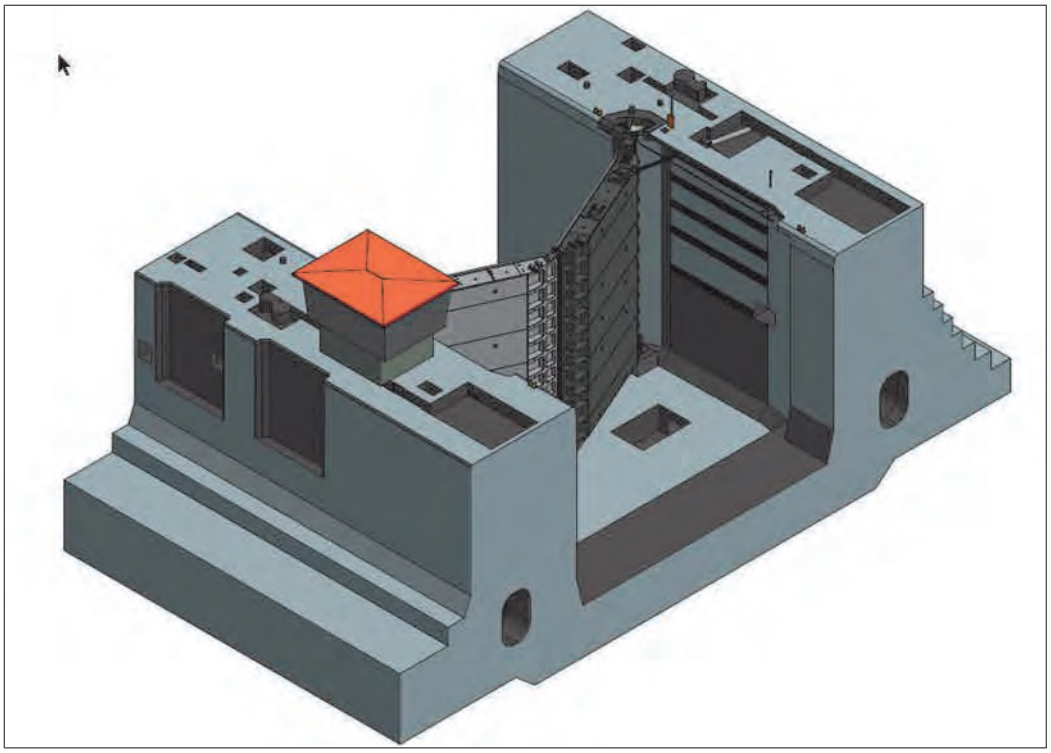
Enclosure 1: Area of Potential Effects

Enclosure 2. Yellow arrow points to the center gate

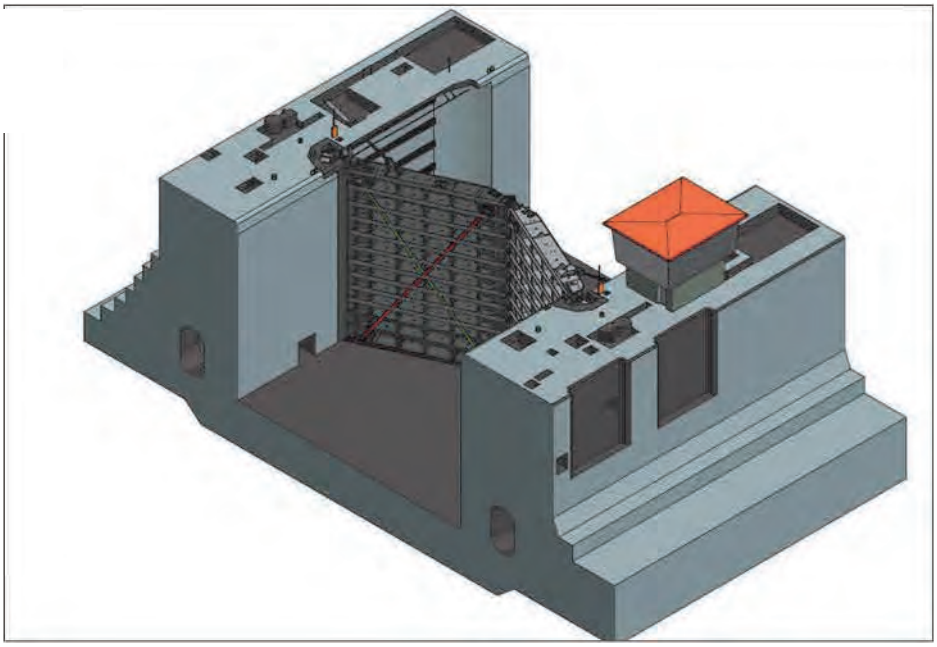


Enclosure 3. Close up of site, letter D shows the gate

Enclosure 4. De-watered, double skin, historic center gate, photo taken March 2021



Enclosure 5. Rendering of new single skin gate



Enclosure 6. Rendering of new single skin gate from another view

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

14 June 2021

Sarah Sodt, City Historic Preservation Officer
City of Seattle Historic Preservation Program
P.O. Box 94649
Seattle, WA 98124

SUBJECT: Lake Washington Ship Canal Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Ms. Sodt:

The U.S. Army Corps of Engineers (Corps) is writing in regard to the proposed replacement of the large lock center gate (undertaking) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, WA (Enclosures 1 and 2). The LWSC is listed in the National Register of Historic Places as a discontinuous historic district, and the Corps has determined that replacement of the large lock center gate will result in an adverse effect to the LWSC Historic District.

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The Corps initiated consultation with the Department of Archaeology and Historic Preservation (DAHP) on 12 May 2021. The Corps informed the Advisory Council on Historic Preservation (ACHP) of the adverse effect and invited them to participate in the development of a Memorandum of Agreement (MOA). The Corps has identified the City of Seattle as a Certified Local Government; we are notifying you of the undertaking and finding of effect and inviting

you to participate in the development of a MOA for this project. In consultation with DAHP, the Corps is beginning the effort to identify appropriate mitigation actions.

Please let us know if you would like to participate as a concurring party in the development of a MOA. If you have any questions or concerns please contact Ms. Lys Opp-Beckman, Architectural Historian, at lys.opp-beckman@usace.mail.mil or (206) 764-3422, or the Project Archaeologist Ms. Kara Kanaby at Kara.M.Kanaby@usace.army.mil or (206) 764-6857. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

Sincerely,

KANABY.KARA.M.1400065701

Digitally signed by KANABY.KARA.M.1400065701
Date: 2021.06.14 15:46:17 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental, and
Cultural Resources Branch

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

14 June 2021

Susan Connole
Friends of the Ballard Locks

SUBJECT: Lake Washington Ship Canal Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Ms. Connole:

The U.S. Army Corps of Engineers (Corps) is writing in regard to the proposed replacement of the large lock center gate (undertaking) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, Washington State (Enclosures 1 and 2). The LWSC is listed in the National Register of Historic Places as a discontinuous historic district, and the Corps has determined that replacement of the large lock center gate will result in an adverse effect to the LWSC Historic District.

The undertaking is located in Section 11, Township 25 North, Range 3 East in Seattle, Washington. The undertaking will consist of the complete demolition and removal of the original Large Lock center gate and a portion of the concrete walkway at the rear of the Administration Building (Enclosures 3 and 4). The original center gate will be replaced with a horizontally framed, welded steel fabrication with the same dimensions as the existing gate. The miter gate leaves would be a single sided skin plate design and mounted into the concrete canal walls. This will require removal and disposal of the old gate and fabrication/delivery of two (2) new gate leaves. Gate leaves are the gates doors that make up the gate. Each gate leaf has its own set of machinery to operate it. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchors placed into the concrete. The new gates will be metal and painted black to match the existing historic gate, the design will change from double skin (Enclosure 4), to single skin (Enclosures 5 and 6). The demolished concrete will be replaced with color matched concrete to match the surrounding concrete. The concrete formula developed for this project will be save for future work. The existing gate operating machinery and electrical equipment will be reused and connected to the new gates.

The Corps initiated consultation with the Department of Archaeology and Historic Preservation (DAHP) on 12 May 2021. The Corps informed the Advisory Council on Historic Preservation (ACHP) of the adverse effect and invited them to participate in the development of a Memorandum of Agreement (MOA). The Corps Friends of the Ballard Locks as a possible consulting party; we are notifying you of the undertaking and finding of effect and inviting you to participate in the development of a MOA for this project. In consultation with DAHP, the Corps is beginning the effort to identify appropriate mitigation actions.

Please let us know if you would like to participate as a concurring party in the development of a MOA. If you have any questions or concerns please contact Ms. Lys Opp-Beckman, Architectural Historian, at lys.opp-beckman@usace.mail.mil or (206) 764-3422, or the Project Archaeologist Ms. Kara Kanaby at Kara.M.Kanaby@usace.army.mil or (206) 764-6857. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

Sincerely,

KANABY.KARA.M.1400065701

Digitally signed by KANABY.KARA.M.1400065701
Date: 2021.06.14 16:02:40 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental, and
Cultural Resources Branch

Enclosure/s

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

14 June 2021

Kji Kelly, Executive Director
Historic Seattle
1117 Minor Avenue
Seattle, Washington 98101

SUBJECT: Lake Washington Ship Canal Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Mr. Kelly:

The U.S. Army Corps of Engineers (Corps) is writing in regard to the proposed replacement of the large lock center gate (undertaking) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, WA (Enclosures 1 and 2). The LWSC is listed in the National Register of Historic Places as a discontinuous historic district, and the Corps has determined that replacement of the large lock center gate will result in an adverse effect to the LWSC Historic District.

The undertaking is located in Section 11, Township 25 North, Range 3 East in Seattle, Washington. The undertaking will consist of the complete demolition and removal of the original Large Lock center gate and a portion of the concrete walkway at the rear of the Administration Building (Enclosures 3 and 4). The original center gate will be replaced with a horizontally framed, welded steel fabrication with the same dimensions as the existing gate. The miter gate leaves would be a single sided skin plate design and mounted into the concrete canal walls. This will require removal and disposal of the old gate and fabrication/delivery of two (2) new gate leaves. Gate leaves are the gates doors that make up the gate. Each gate leaf has its own set of machinery to operate it. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchors placed into the concrete. The new gates will be metal and painted black to match the existing original gate, the design will change from double skin (Enclosure 4), to single skin (Enclosures 5 and 6). The demolished concrete will be replaced with color matched concrete to match the surrounding concrete. The concrete formula developed for this project will be save for future work. The existing gate operating machinery and electrical equipment will be reused and connected to the new gates. .

The Corps initiated consultation with the Department of Archaeology and Historic Preservation (DAHP) on 12 May 2021. The Corps informed the Advisory Council on Historic Preservation of the adverse effect and invited them to participate in the development of a Memorandum of Agreement (MOA). The Corps has identified Historic Seattle as a possible consulting party; we are notifying you of the undertaking and finding of effect and inviting you

to participate in the development of a MOA for this project. In consultation with DAHP, the Corps is beginning the effort to identify appropriate mitigation actions.

Please let us know if you would like to participate as a concurring party in the development of a MOA. If you have any questions or concerns please contact Ms. Lys Opp-Beckman, Architectural Historian, at lys.opp-beckman@usace.mail.mil or (206) 764-3422, or the Project Archaeologist Ms. Kara Kanaby at Kara.M.Kanaby@usace.army.mil or (206) 764-6857. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

Sincerely,

KANABY.KARA.M.1400065701

Digitally signed by KANABY.KARA.M.1400065701
Date: 2021.06.14 16:24:03 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental, and
Cultural Resources Branch

Enclosure/s

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

June 15, 2021

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
Post Office Box 48343
Olympia, Washington 98504-8343

SUBJECT: Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Dr. Brooks:

The U.S. Army Corps of Engineers (Corps) is responding to your office's request for additional information and to revise the area of potential effects (APE) for the proposed replacement of the large lock center gate (the Large Lock) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, Washington (Enclosures 1 and 2). The Corps is also providing additional information including the location of the center gate in relation to the Large Lock, a definition of gate leaves and the demolition plan for the concrete.

The Corps has determined and documented the revised APE for the undertaking and is consulting with your office under Section 106 as provided at 36 C.F.R.§ 800.4(a). The letter requests agreement with the Corps' revised APE determination and with our determination that the proposed undertaking will have an adverse effect to the Large Lock which is a contributing element to the LWSC Historic District. Removal of the original center gate and the installation of a new gate will result in the 100% material loss of the original gate for the Large Lock (see letter dated 21 May 2021).

The undertaking is located in Section 11, Township 25 North, Range 3 East in Seattle, Washington. The revised APE for the undertaking encompasses the project area, include staging, and access areas. The Corps believes that the revised APE is sufficient to identify and consider both direct and indirect effects of the proposed project.

The Large Lock is an element of the National Register of Historic Places (NRHP) listed Chittenden (Hiram M.) Locks and Related Features of the Lake Washington Ship Canal Historic District (LWSC Historic District). The District was listed on the National Register in 1978 and is eligible under Criteria A, B, and C. The District is significant as a major engineering achievement that created a navigable waterway joining Puget Sound to Lake Union and Lake Washington.

The Large Lock is divided into two components: Large Lock, West and Large Lock, East and contains a total of five gates (Enclosure 3). A miter guard gate and service gate are located at both the east end on the freshwater side and the west end on the saltwater side of the Large Lock. The fifth gate is a service gate located in the center of the Large Lock and is to be replaced (Enclosures 4 and 5).

The undertaking will consist of the complete demolition and removal of the original Large Lock center gate and a portion of the concrete walkway at the rear of the Administration Building (Enclosure 4). The historic center gate will be replaced with a horizontally framed, welded steel fabrication with the same dimensions as the existing gate. The miter gate leaves would be a single sided skin plate design and mounted into the concrete canal walls. This will require removal and disposal of the old gate and fabrication/delivery of two (2) new gate leaves. Gate leaves are the doors that make up the gate. Each gate leaf has its own set of machinery to operate it. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchors placed into the concrete. The new gates will be metal and painted black to match the existing historic gate, the design will change from double skin (Enclosure 5), to single skin (Enclosures 6 and 7). The demolished concrete will be replaced with color matched material to match the historic concrete. Enclosures 8-10 show where historic concrete will be removed and replaced with color matched material. The concrete formula developed for this project will be saved for future work. The existing gate machinery and electrical equipment will be reused and connected to the new gates. One lock chamber dewatering is anticipated to adjust and commission the miter gate after installation.

The Corps requests your review and agreement with our determination of the revised APE and our determination that there will be an adverse effect to the NRHP listed LWSC Historic District by the undertaking given the loss of material from the Large Lock.

If you have any questions or desire additional information, please contact the project Architectural Historian, Ms. Lys Opp-Beckman, at lys.opp-beckman@usace.mail.mil or (206) 764-3422. The project Archaeologist, Ms. Kara Kanaby can be contacted at Kara.M.Kanaby@usace.army.mil or (206) 940-9715. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

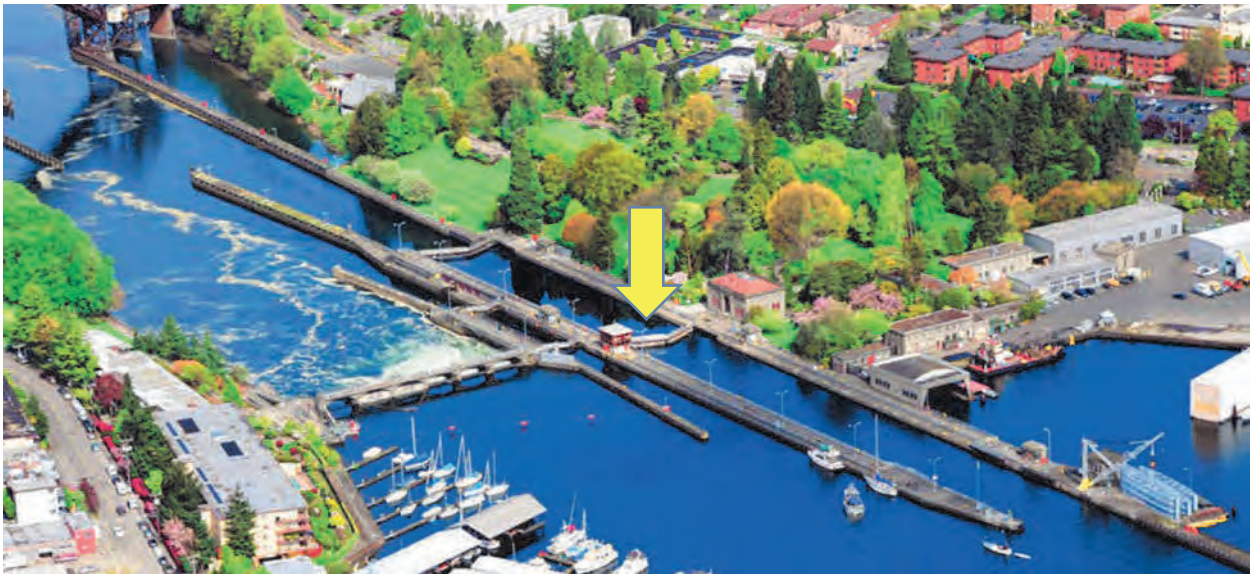
Sincerely,

KANABY.KARA.M.1400065701 Digitally signed by KANABY.KARA.M.1400065701 Date: 2021.06.15 11:43:51 -07'00'

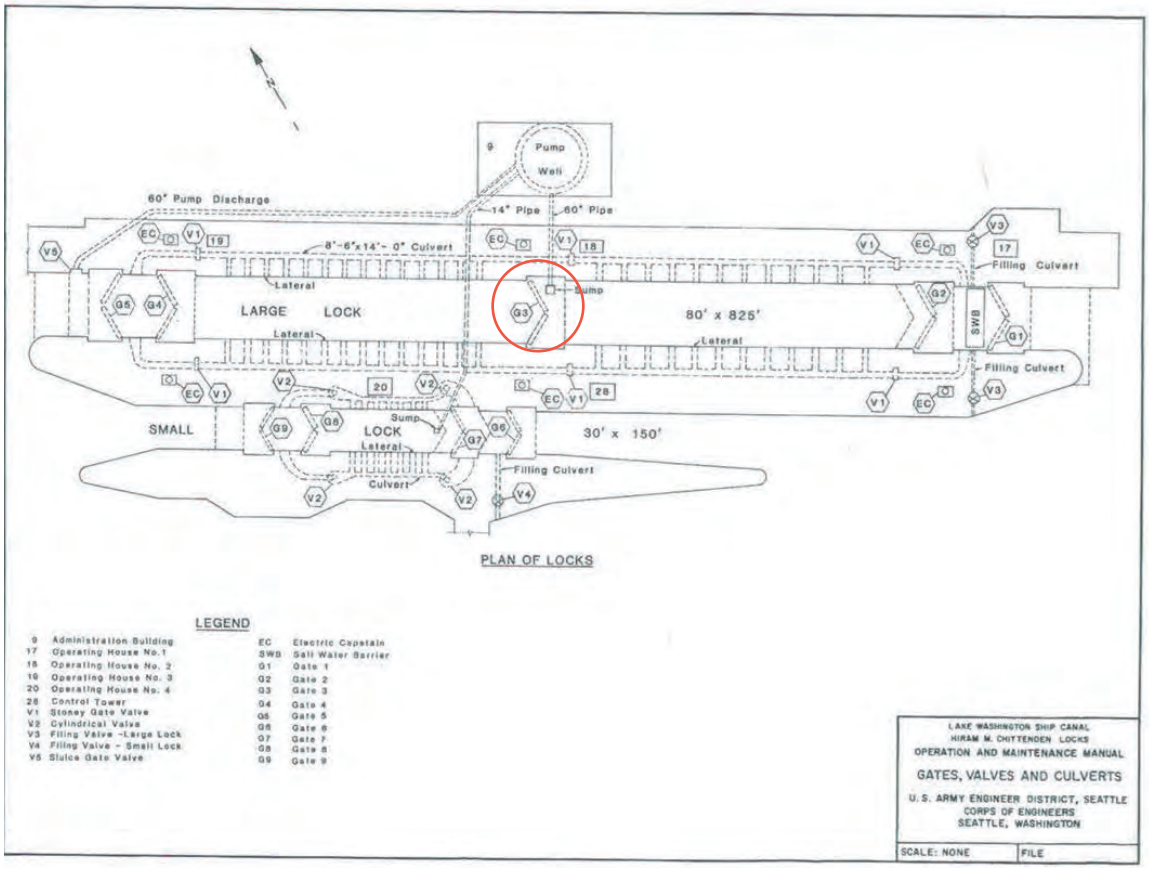
Laura Boerner, LG, LHG
Chief, Planning, Environmental and
Cultural Resources Branch

Enclosures

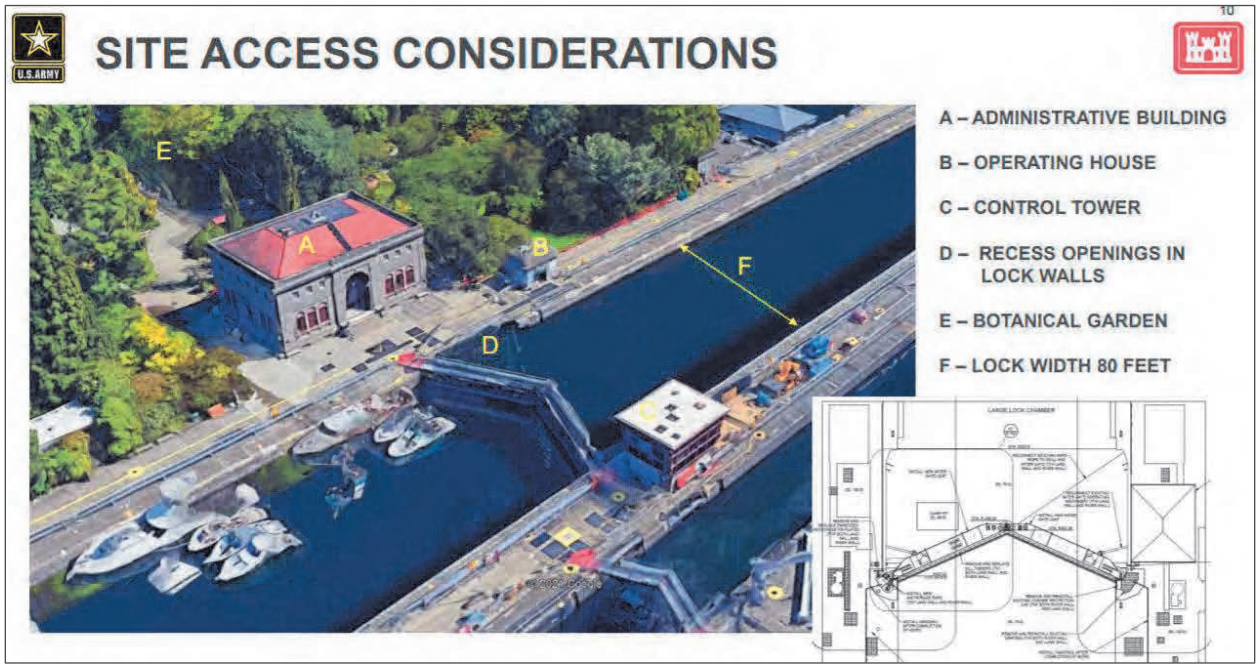
Enclosure 1: Revised APE



Enclosure 2. Yellow arrow points to the center gates

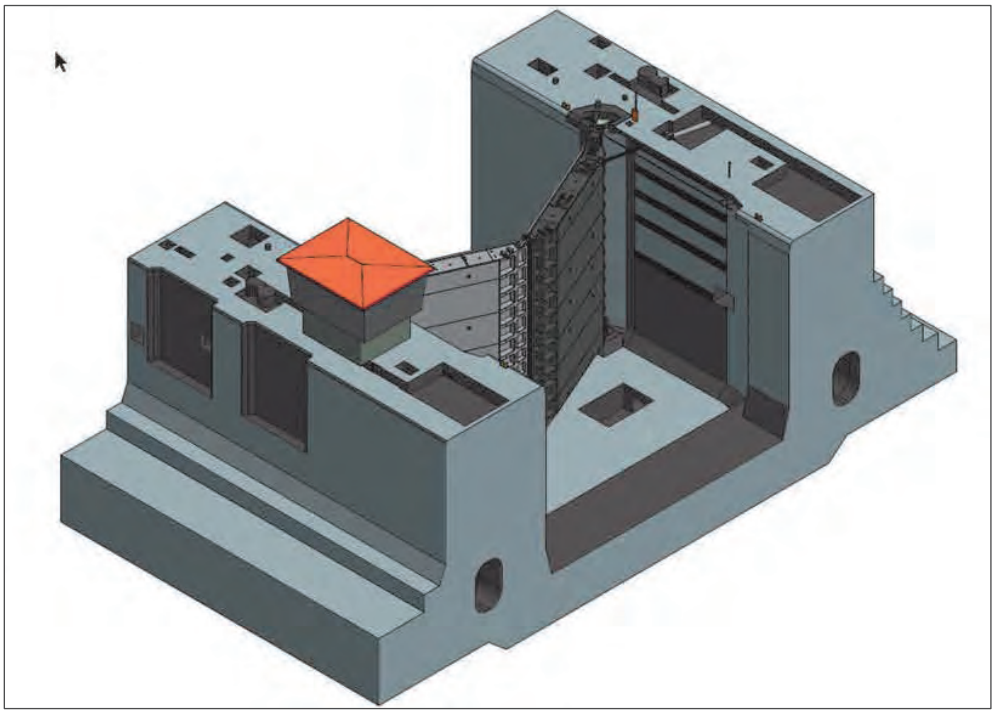


Enclosure 3: Map showing Large Lock Gate locations. Red circle show location of center gate.

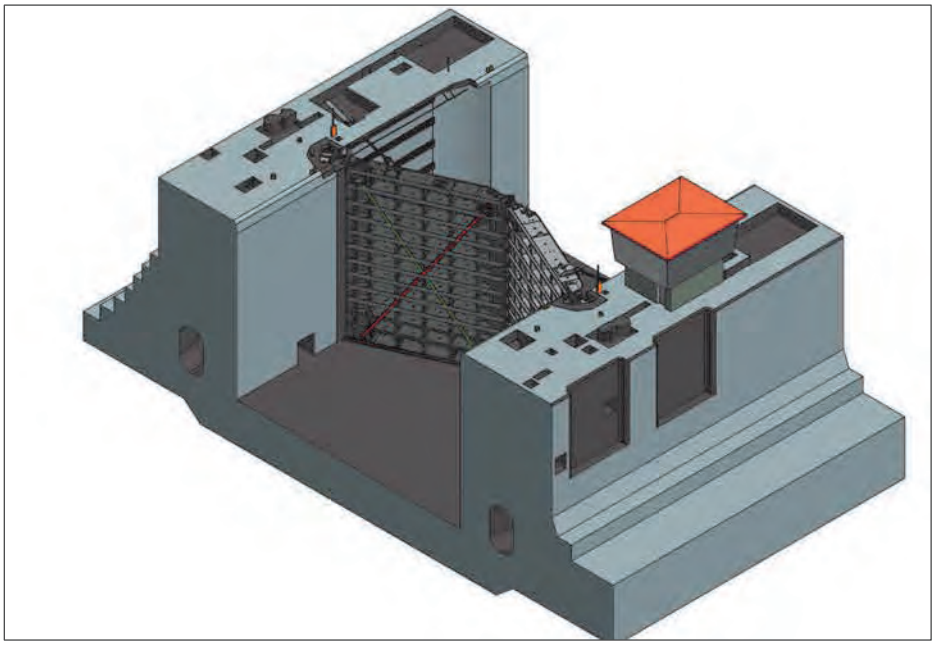


Enclosure 4. Close up of site, letter D shows the gate.

Enclosure 5. De-watered, double skin, historic center gate, photo taken March 2021.

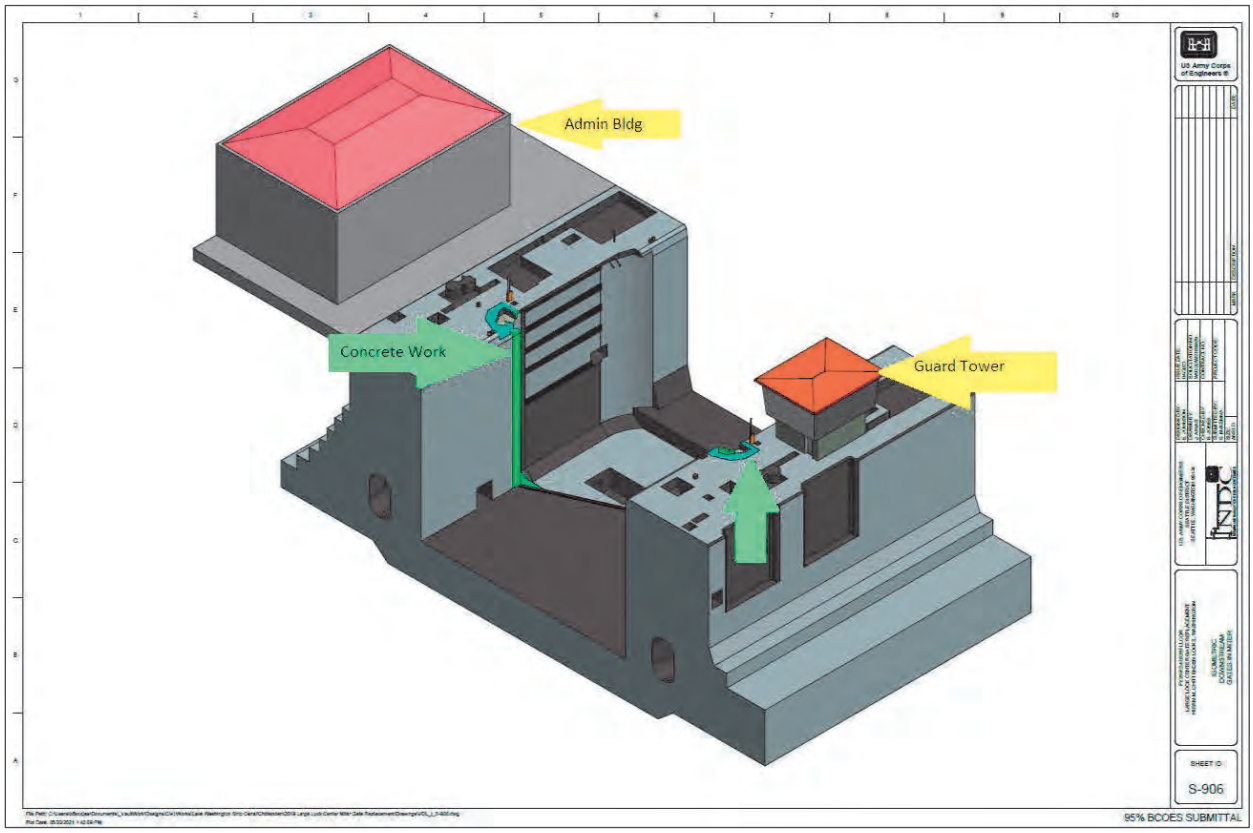


Enclosure 6. Rendering of new single skin gate

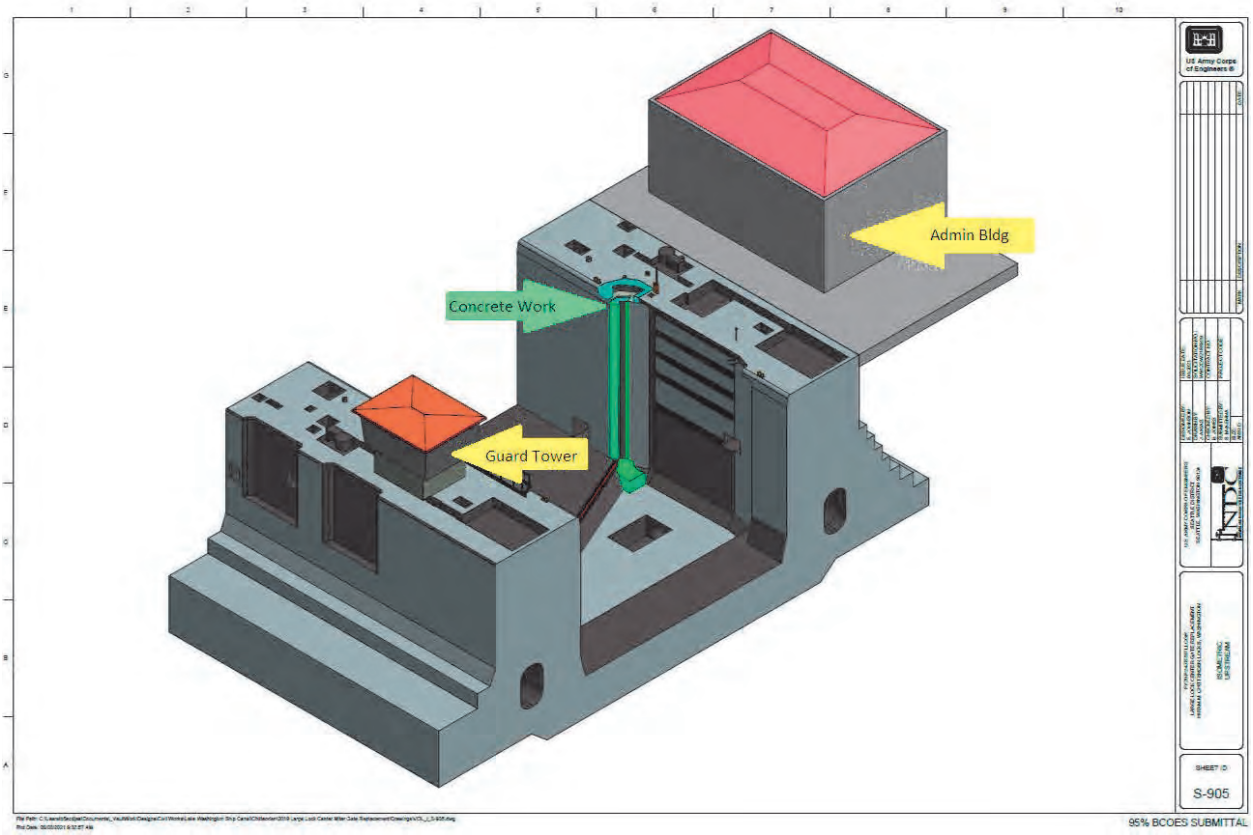


Enclosure 7. Rendering of new single skin gate from another view

Enclosure 8: Overhead view of location where concrete will be removed from Large Lock walls. The green dots mark the location but are not to scale and are for representation purposes only.



Enclosure 9: Overview showing where historic concrete will be removed. Historic concrete is green with green arrows pointing to it.



Enclosure 10: Overview showing where historic concrete will be removed. Historic concrete is green with green arrows pointing to it. -

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

Planning, Environmental and Cultural Resources Branch May 21, 2021

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
Post Office Box 48343
Olympia, Washington 98504-8343

SUBJECT: Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Dr. Brooks:

The U.S. Army Corps of Engineers (Corps) is continuing consultation on the proposed replacement of the large lock center gates (The Large Lock) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, Washington State (Enclosures 1,2, and 3). In our letter dated 13 May 2021, the Corps documented the area of potential effects (APE) with which your office agreed to on 14 May 2021. This letter provides a brief project description, summarizes the efforts to identify historic properties, and provides the agency determinations and findings as provided at 36 C.F.R.§ 800.4(d).

The undertaking is located in Section 11, Township 25 North, Range 3-0 East in Seattle, Washington. The Large Lock is a component of the Chittenden Locks which was listed on the National Register of Historic Places (NRHP) in 1978.

The undertaking will consist of the complete demolition and removal of the old Large Lock center gates and a portion of the concrete walkway at the rear of the Administration Building (Enclosure 4). The historic center gate will be replaced with two metal ones mounted into the concrete canal walls (Enclosure 5). This will require removal and disposal of the old gates and fabrication/delivery of two (2) new gate leaves. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchorages placed into the concrete. The new gates will be metal and painted black like the existing historic gates, the design will change from double skin (Enclosure 6), to single skin (Enclosure 7), there is historic precedent for this design modification at the locks. The demolished concrete will be replaced with color matched material with large aggregate to match the historic, the formula developed for this project will be save for future work. The existing gate operating machinery will be reused and connected to the new gates. Existing electrical equipment on the gates will be removed and reinstalled on the new gates. One lock chamber dewatering is anticipated to adjust and commission the miter gate after installation.

The Large Lock and the center gates was completed in 1916. It is a double skin, gate that is held together with circular rivets. The top of the gate is protected from ship impacts with boards that are attached with nuts and bolts, the assembly is painted black. The center gates are beyond their functional lifetime and must be replaced for safety issues. The gates have been largely un-altered during their lifetime. Creosote treated timbers at the top of the gates were replaced with a composite wood circa 2010, because the material change was very small and imitative it does not decrease the integrity of this central feature of the Chittenden Locks.

At this time the Corps is requesting Washington SHPO's review and agreement with our finding that there will be an adverse effect to the NRHP listed Chittenden Locks by the undertaking. The removal of the original center gates and the installation of a new gate will adversely affect the Chittenden Locks because this project will result in the 100% material loss of an original and contributing element (the center gate).

The Corps is making a good faith effort to gather information from affected Tribes identified pursuant to 36 C.F.R.§ 800.3(f). We have notified the Muckleshoot Indian Tribe and Suquamish Tribe to assist in identifying properties which may be of religious and cultural significance. We have not received a response from either Tribe. Furthermore, the Corps requests your concurrence with our finding that there will be an adverse effect by the proposed undertaking 36 C.F.R.§ 800.5 due to a 100% material loss of the 1917 center gates (A.1). Based on the finding of adverse effect we will begin the creation of an MOA drafted in compliance with § 800.6(c).

We appreciate your consideration of our request. If you have any questions or desire additional information, please contact the project Architectural Historian, Ms. Lys Opp-Beckman, at lys.opp-beckman@usace.mail.mil or (206) 764-3422. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

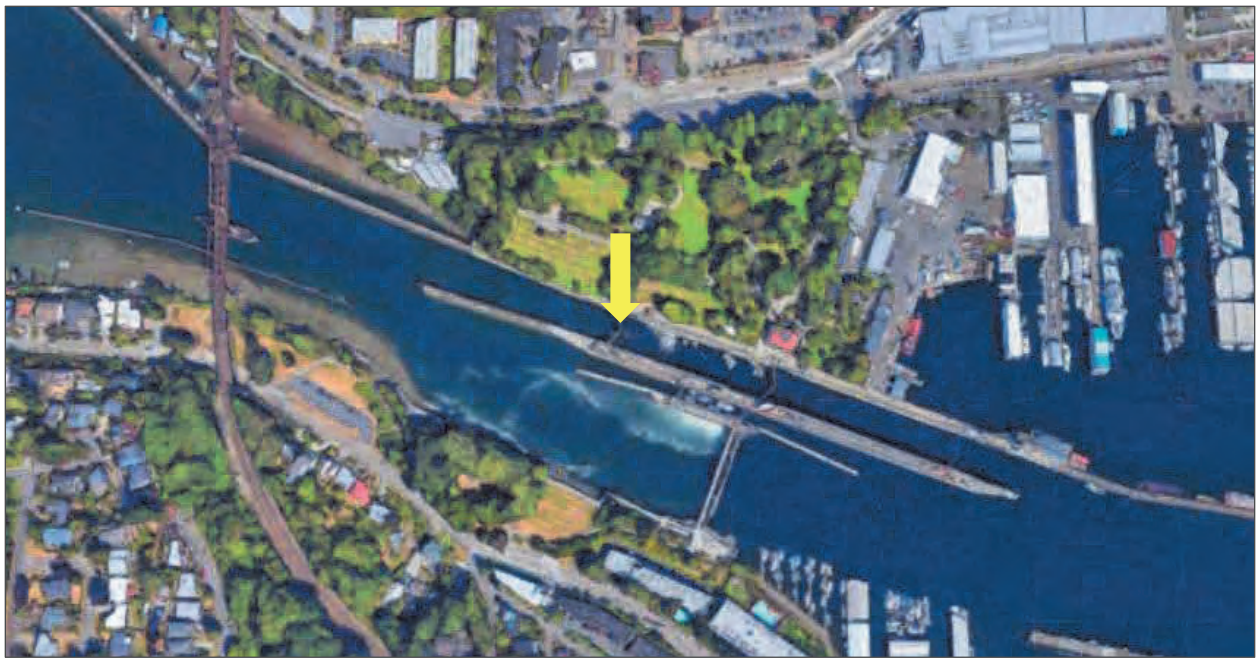
Sincerely,

PUNKE.MATTHEW.M.1151361001

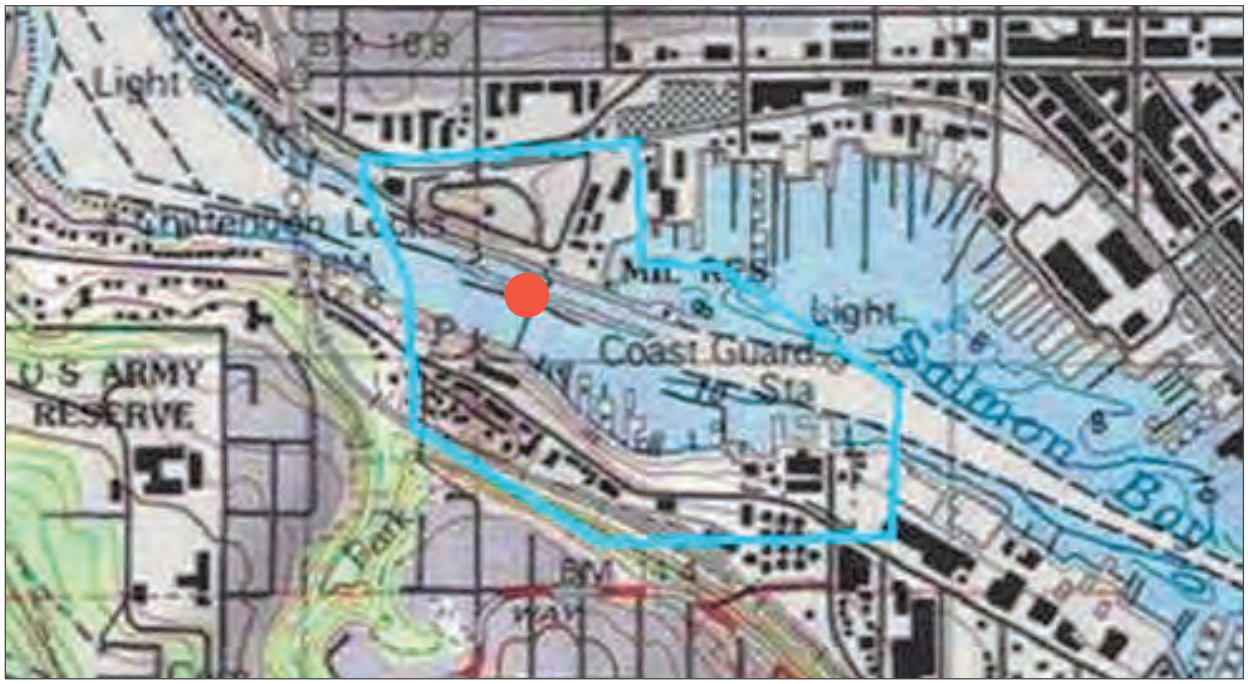
Digitally signed by PUNKE.MATTHEW.M.1151361001
Date: 2021.05.21 10:01:05 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental and
Cultural Resources Branch

Enclosure/s

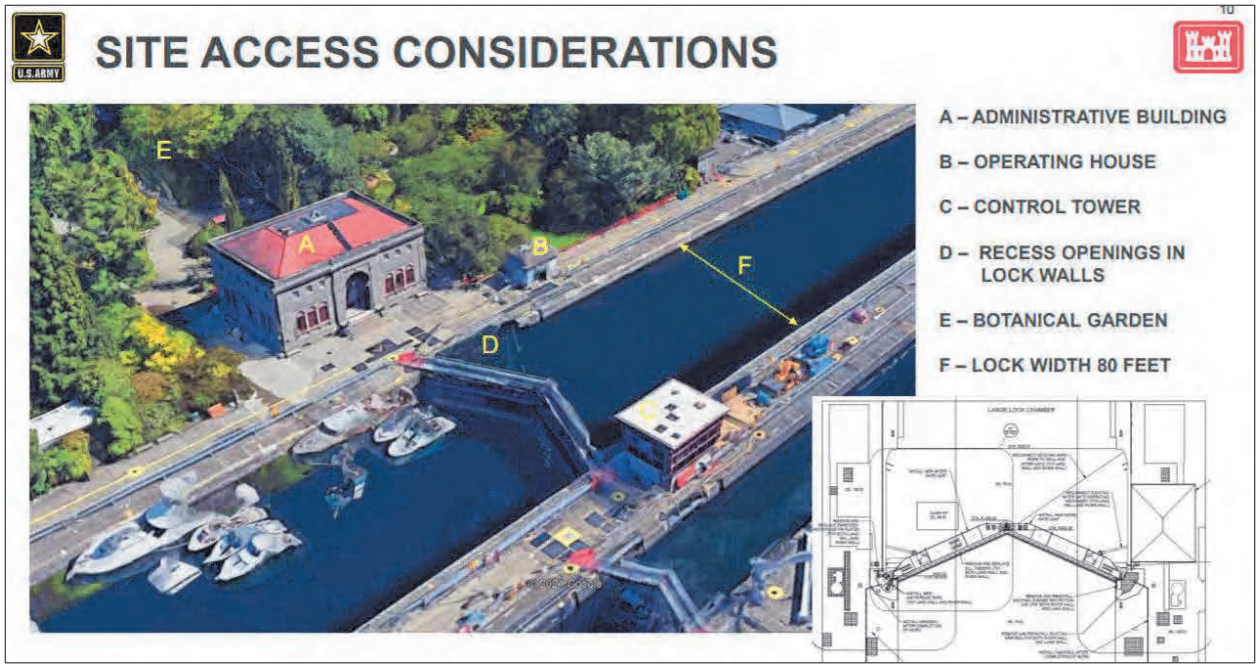


Enclosure 1. Location Map, 2021 Aerial, locks shown with yellow arrow.



Enclosure 2. APE Map, APE boundary shown with blue line, location.

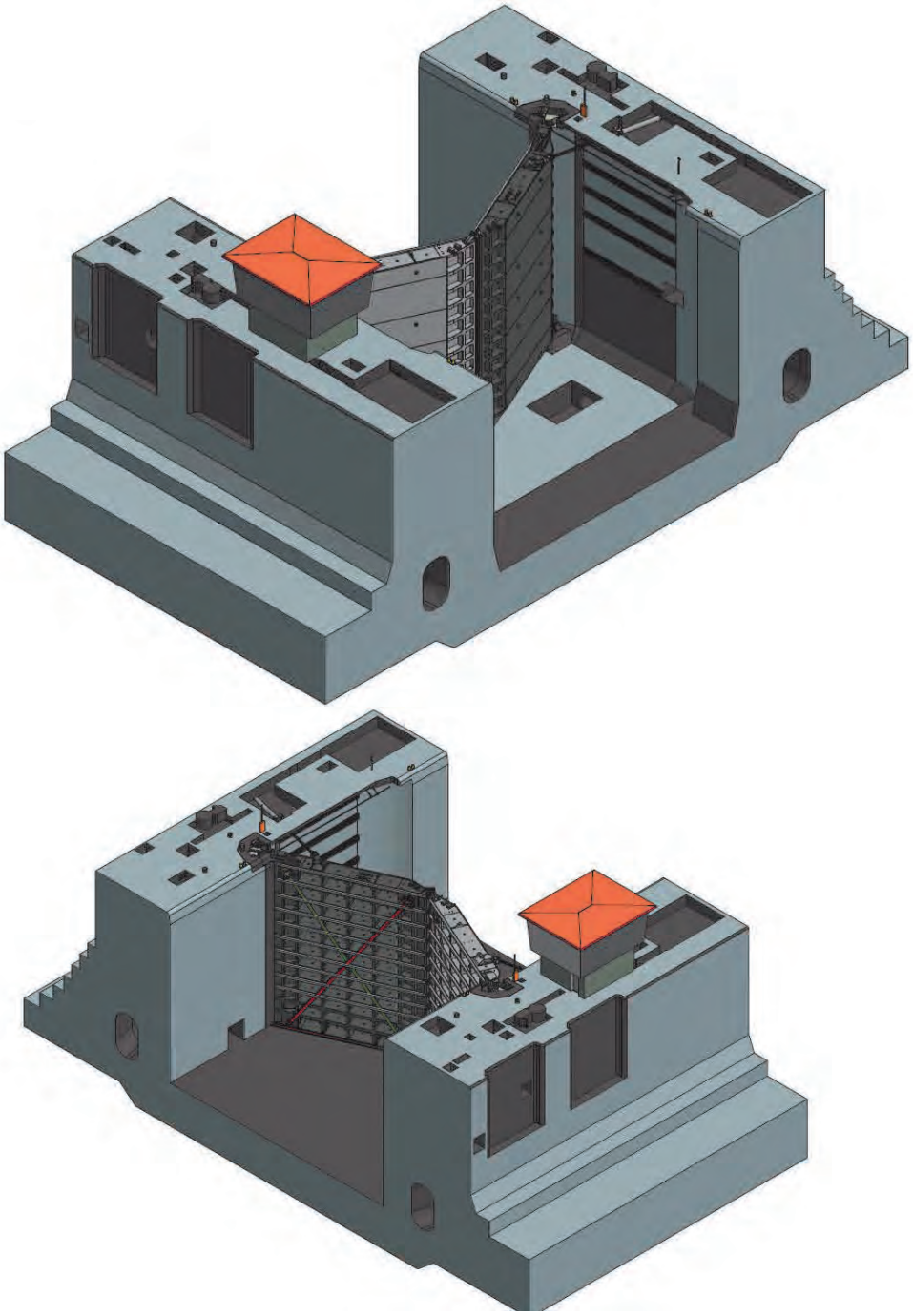
Enclosure 3. Blue line shows historic district boundaries.



Enclosure 4. Close up of site, letter D shows the gates.

Enclosure 5. De-watered, double skin, historic center gates, photo taken March 2021.

Enclosure 6. Example of historic single skin gate at Chittenden Locks.



Enclosure 7. Rendering of new single skin gate.

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

May 14, 2021

Laura Boerner, LG, LHG
Chief, Planning, Environmental and
Cultural Resources Branch
US Army Corps of Engineers - Seattle District

In future correspondence please refer to:
Project Tracking Code: 2021-04-02392
Property: Large Lock Center Gate Replacement
Re: APE Concur

Dear Laura Boerner:

Thank you for contacting the State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced project. In response, we have reviewed your description and map of the area of potential effect (APE).

We concur with your definition of the APE. Please provide us with your survey methodology before proceeding with any inventories. Along with the results of the inventory we will need to review your consultation with the concerned tribes, and other interested/affected parties. Please provide any correspondence or comments from concerned tribes and/or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the SHPO in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800. Should additional information about the project become available, our assessment may be revised.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is shared with any hired cultural resource consultants and is attached to any communications or submitted reports. If you have any questions, please feel free to contact me.

Sincerely,

Holly Borth
Project Compliance Reviewer
(360) 890-0174
holly.borth@dahp.wa.gov

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

Planning, Environmental and Cultural Resources Branch May 12, 2021

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
Post Office Box 48343
Olympia, Washington 98504-8343

SUBJECT: Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Dr. Brooks:

The U.S. Army Corps of Engineers (Corps) proposes the replacement of the large lock center gates (The Large Lock) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, Washington State. (Enclosures 1 and 2). The purpose of the undertaking is to replace the existing large lock gates with new gates to ensure safety. The Corps has determined and documented the area of potential effect (APE) for the undertaking and is consulting with your office under Section 106 as provided at 36 C.F.R.§ 800.4(a). The letter requests agreement with the Corps' APE determination.

The Large Lock is an element of the National Register of Historic Places (NRHP) listed Chittenden (Hiram M.) Locks and Related Features of the Lake Washington Ship Canal Historic District (Enclosure 3). The District was listed on the National Register in 1978 and is eligible under Criteria A, B, and C. The District is significant as a major engineering achievement that created a navigable waterway joining Puget Sound to Lake Union and Lake Washington.

The LWSC is the one of the busiest shipping canals in the nation. The purpose of the undertaking will ensure continued function and safety for LWSC users. The gates are over 100 years old; a 2012 Corps study concluded the gates are at high risk of failure and are in need of full replacement.

The proposed project includes the complete demolition and removal of the old gates and replacement with two metal ones mounted into the concrete canal walls (Enclosure 4). This will require removal and disposal of the old gates and fabrication/delivery of two (2) new gate leaves. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchorages placed into the concrete. New intermittent contact quoin blocks and sealing surfaces will be retrofitted vertically in the concrete gate monoliths. The new gate pintles will incorporate self-lubricating pintle balls as part of a fixed-pintle design into new embedded metals at the bottom of the lock chamber. The existing gate operating machinery will be reused

and connected to the new gates. Existing electrical equipment on the gates will be removed and reinstalled on the new gates. One lock chamber dewatering is anticipated to adjust and commission the miter gate after installation.

The undertaking is located in Section 11, Township 25 North, Range 3-0 East in Seattle, Washington. The APE for the undertaking encompasses the project area, include staging, and access areas. The Corps believes that the APE is sufficient to identify and consider both direct and indirect effects of the proposed project.

The Corps is making a good faith effort to gather information from affected Tribes identified pursuant to 36 C.F.R.§ 800.3(f). We have notified the Muckleshoot Indian Tribe and Suquamish Tribe to assist in identifying properties which may be of religious and cultural significance.

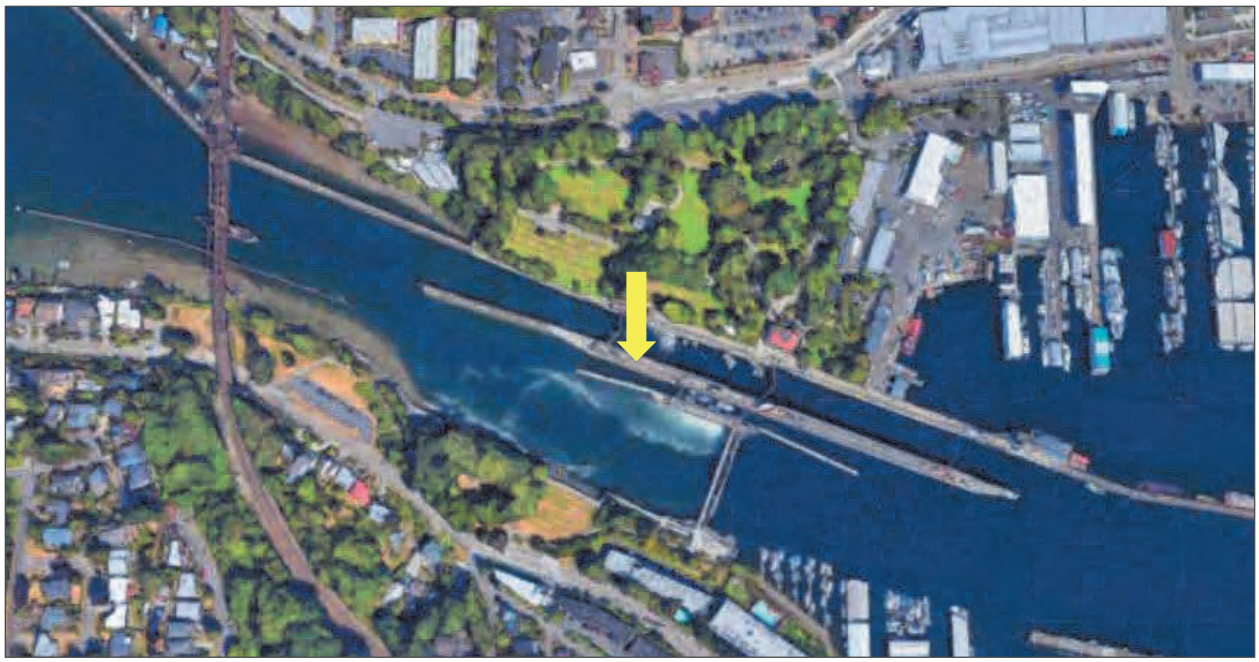
The Corps requests your review and agreement with our determination of the APE. If you have any questions or desire additional information, please contact the project Architectural Historian, Ms. Lys Opp-Beckman, at lys.opp-beckman@usace.mail.mil or (206) 764-3422. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

Sincerely,

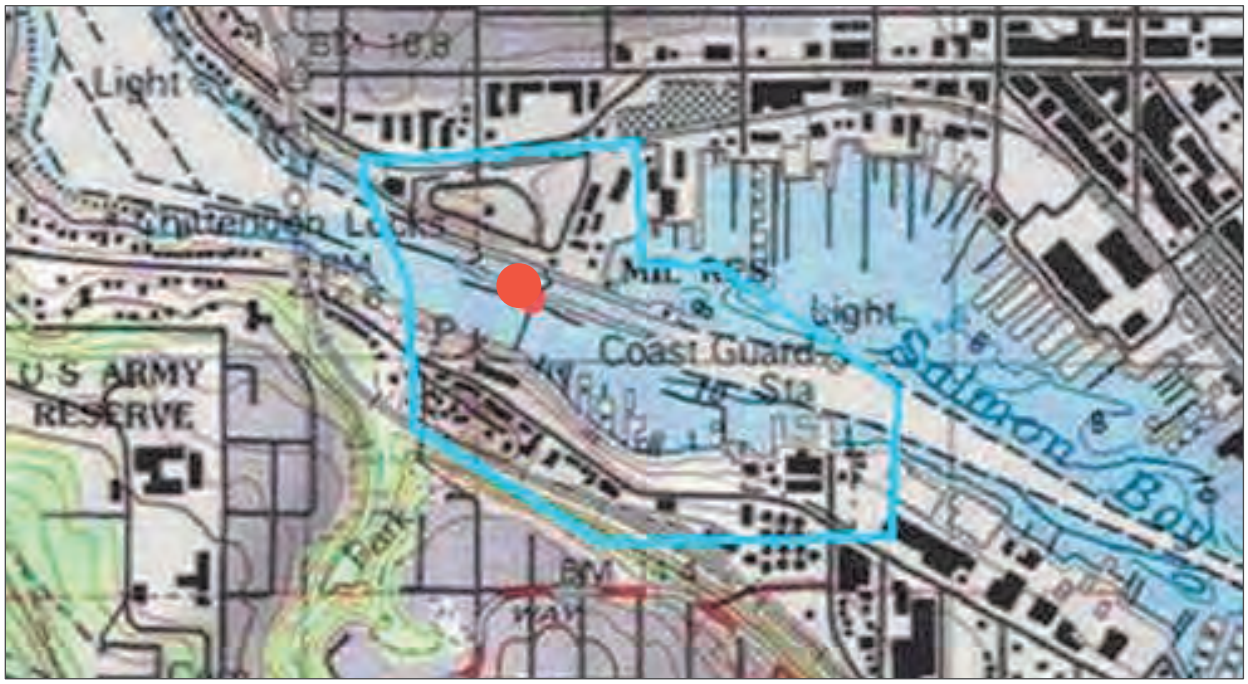
BOERNER.LAURA.A.1251907443
Digitally signed by BOERNER.LAURA.A.1251907443
Date: 2021.05.12 11:21:34 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental and
Cultural Resources Branch

Enclosure/s

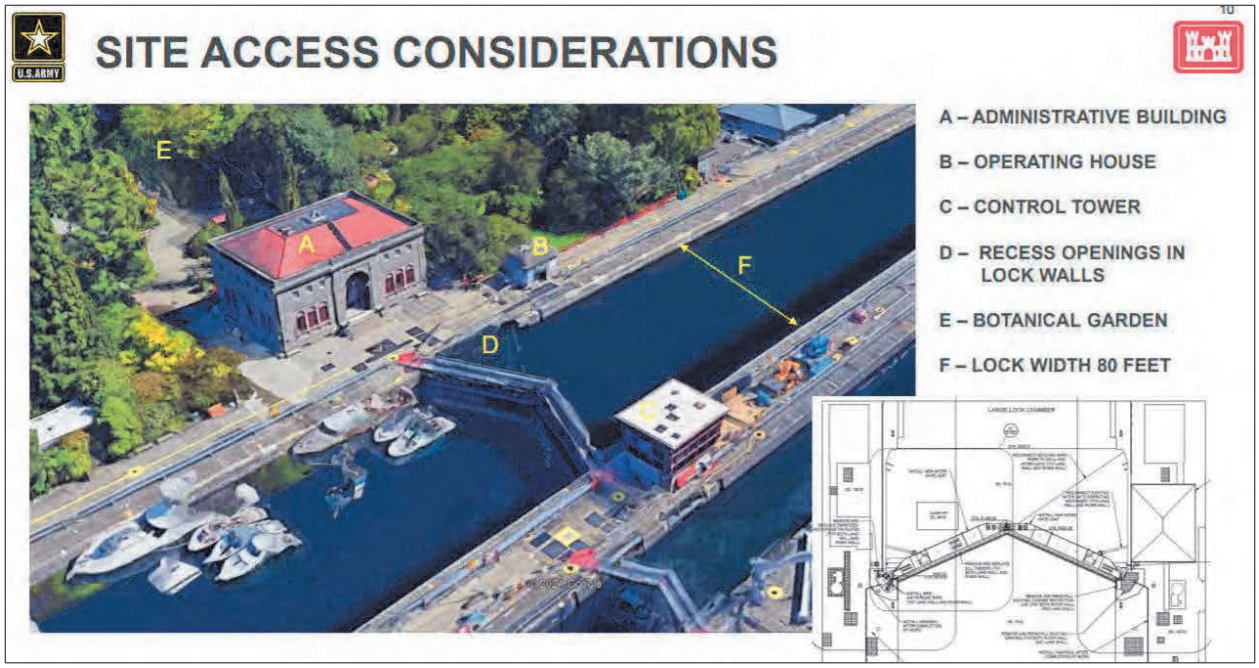


Enclosure 1. Location Map, 2021 Aerial, locks shown with yellow arrow.



Enclosure 2. APE Map, APE boundary shown with blue line, location.

Enclosure 3. Blue line shows historic district boundaries.



Enclosure 4. Close up of site, letter D shows the gates.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

May 12, 2021

The Honorable Jaison Elkins, Chairman
Muckleshoot Indian Tribe
39015 172nd Avenue SE
Auburn, WA 98092-9763

SUBJECT: Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Chairman Elkins:

The U.S. Army Corps of Engineers (Corps) proposes the replacement of the large lock center gates (The Large Lock) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, Washington State (Enclosure 1). The purpose of the undertaking will ensure continued function and safety for LWSC users. The gates are over 100 years old; a 2012 Corps study concluded the gates are at high risk of failure and are in need of full replacement. The proposed project includes the complete demolition and removal of the old gates and replacement with two metal ones mounted into the concrete canal walls (Enclosure 2). To assist in our review, we are notifying you about the project, and requesting your assistance in gathering information you might have to identify properties which may be of religious or cultural significance that may be affected by the project as specified by the implementing regulations for Section 106 as provided at 36 C.F.R.§ 800.4(a)(4). The letter also summarizes efforts made by the Corps to identify historic properties that may be affected by the undertaking.

The Large Lock is an element of the National Register of Historic Places (NRHP) listed Chittenden (Hiram M.) Locks and Related Features of the Lake Washington Ship Canal Historic District (Enclosure 2). The District was listed on the National Register in 1978 and is eligible under Criteria A, B, and C. The District is significant as a major engineering achievement that created a navigable waterway joining Puget Sound to Lake Union and Lake Washington.

The proposed project includes replacing the existing 100-year old miter gate leaves. This would require removal and disposal of the old gates and fabrication/delivery of two (2) new gate leaves. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchorages placed into the concrete. New intermittent contact quoin blocks and sealing surfaces will be retrofitted vertically in the concrete gate monoliths. The new gate pintles will incorporate self-lubricating pintle balls as part of a fixed-pintle design into new embedded metals at the bottom of the lock chamber. The existing gate operating machinery will be reused and connected to the new gates. Existing electrical equipment on the gates will be removed and reinstalled on the new gates. One lock chamber dewatering is anticipated to adjust

and commission the miter gate after installation. The duration of the dewatering is expected to be 45 days.

The undertaking is located in Section 11, Township 25 North, Range 3-0 East in Seattle, Washington (Enclosure 3). The area of potential effect (APE) for the undertaking encompasses the project area, include staging and access areas (Enclosure 4). The Corps believes that the APE is sufficient to identify and consider both direct and indirect effects of the proposed project.

We would like to summarize efforts taken to date to identify cultural resources within the APE. The Corps staff archaeologist has conducted a records search and literature review of the Washington Information System Architectural and Archaeological Records Database. The literature review and records search indicate no archeological sites, or traditional cultural places present within the APE.

If you have information or concerns regarding properties which may be of religious or cultural significance that you believe may be affected by this project, please contact us as soon as possible. A copy of this letter with enclosures will be furnished to: Ms. Laura Murphy, Archaeologist, Muckleshoot Indian Tribe, 39015 172nd Avenue SE, Auburn, WA 98092-9763.

If you have any questions or desire additional information, please contact the Project Architectural Historian, Ms. Lys Opp-Beckman, at lys.opp-beckman@usace.army.mil, or (206) 708-5899. You may also contact Ms. Lori Morris, Tribal Liaison at (206) 764-3625 or by email at frances.morris@usace.army.mil. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761. Thank you for your assistance with this undertaking.

Sincerely,

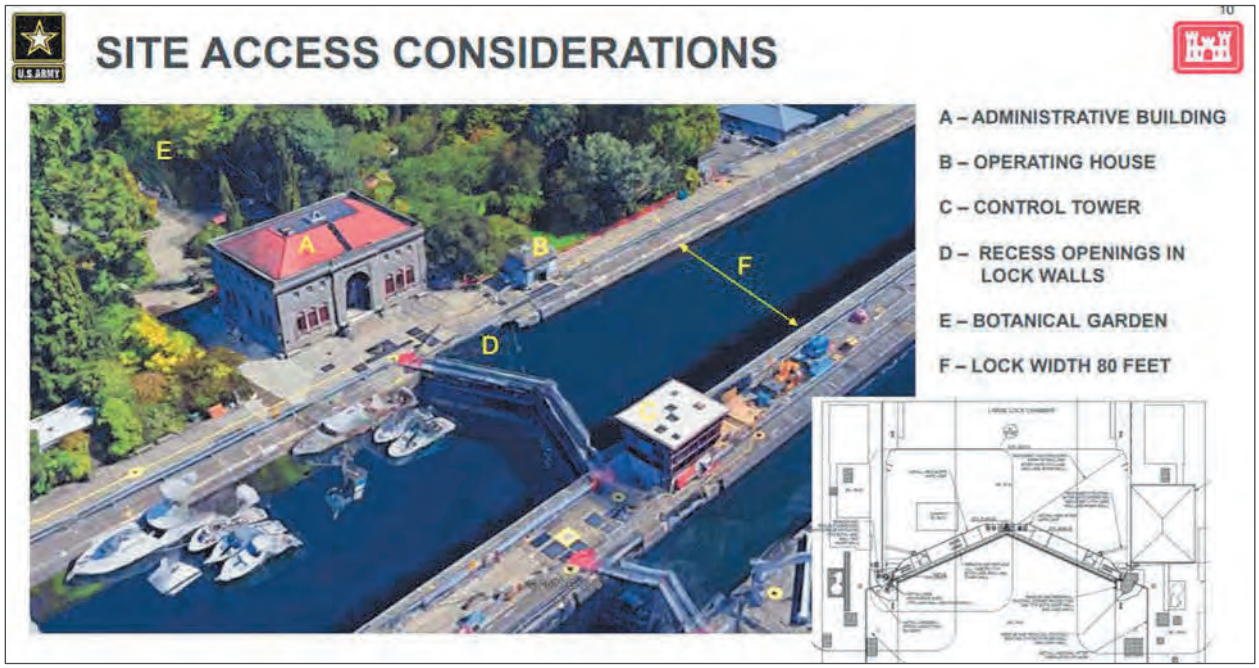
BOERNER.LAURA.A.1251907443

Digitally signed by BOERNER.LAURA.A.1251907443
Date: 2021.05.12 10:41:55 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental, and
Cultural Resources Branch

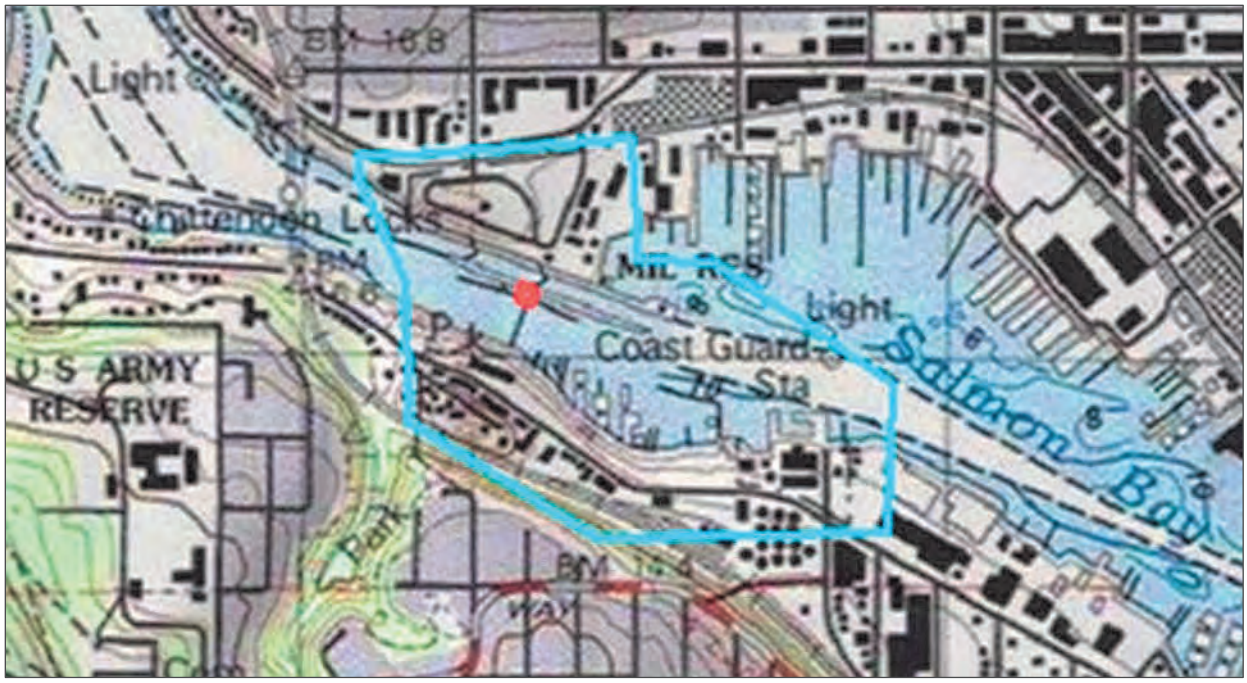
Enclosure/s

Enclosure 1. Location Map, 2021 Aerial, locks shown with yellow arrow.



Enclosure 2. Close up of site, letter D shows the gates.

Enclosure 3. Blue line shows historic district boundaries.



Enclosure 4. APE Map, APE boundary shown with blue line, red dot indicates lock location.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PO BOX 3755
SEATTLE, WA 98124-3755

May 12, 2021

The Honorable Leonard Forsman, Chairman
Suquamish Tribe
P.O. Box 498
Suquamish, WA 98392

SUBJECT: Large Lock Center Gate Replacement, King County, Washington State, DAHP Log: 2021-04-02392

Dear Chairman Forsman:

The U.S. Army Corps of Engineers (Corps) proposes the replacement of the large lock center gates (The Large Lock) located at the Lake Washington Ship Canal (LWSC), also known as the Chittenden Locks, in Seattle, King County, Washington State. (Enclosure 1). The purpose of the undertaking will ensure continued function and safety for LWSC users. The gates are over 100 years old; a 2012 Corps study concluded the gates are at high risk of failure and are in need of full replacement. The proposed project includes the complete demolition and removal of the old gates and replacement with two metal ones mounted into the concrete canal walls (Enclosure 2). To assist in our review, we are notifying you about the project, and requesting your assistance in gathering information you might have to identify properties which may be of religious or cultural significance that may be affected by the project as specified by the implementing regulations for Section 106 as provided at 36 C.F.R.§ 800.4(a)(4). The letter also summarizes efforts made by the Corps to identify historic properties that may be affected by the undertaking.

The Large Lock is an element of the National Register of Historic Places (NRHP) listed Chittenden (Hiram M.) Locks and Related Features of the Lake Washington Ship Canal Historic District (Enclosure 2). The District was listed on the National Register in 1978 and is eligible under Criteria A, B, and C. The District is significant as a major engineering achievement that created a navigable waterway joining Puget Sound to Lake Union and Lake Washington.

The proposed project includes replacing the existing 100-year old miter gate leaves, this will require removal and disposal of the old gates and fabrication/delivery of two (2) new gate leaves. The new contractor-fabricated miter gate leaves will be installed in the existing gate recesses with new gate anchorages placed into the concrete. New intermittent contact quoin blocks and sealing surfaces will be retrofitted vertically in the concrete gate monoliths. The new gate pintles will incorporate self-lubricating pintle balls as part of a fixed-pintle design into new embedded metals at the bottom of the lock chamber. The existing gate operating machinery will be reused and connected to the new gates. Existing electrical equipment on the gates will be removed and reinstalled on the new gates. One lock chamber dewatering is anticipated to adjust and

commission the miter gate after installation. The duration of the dewatering is expected to be 45 days.

The undertaking is located in Section 11, Township 25 North, Range 3-0 East in Seattle, Washington (Enclosure 3). The area of potential effect (APE) for the undertaking encompasses the project area, include staging, and access areas (Enclosure 4). The Corps believes that the APE is sufficient to identify and consider both direct and indirect effects of the proposed project.

We would like to summarize efforts taken to date to identify cultural resources within the APE. The Corps staff archaeologist has conducted a records search and literature review of the Washington Information System Architectural and Archaeological Records Database. The literature review and records search indicate no archeological sites, or traditional cultural places present within the APE.

If you have information or concerns regarding properties which may be of religious or cultural significance that you believe may be affected by this project, please contact us as soon as possible. A copy of this letter with enclosures will be furnished to: Dennis Lewarch, Tribal Historic Preservation Officer, Suquamish Tribe , PO Box 498, Suquamish, WA 98392-0498.

If you have any questions or desire additional information, please contact the Project Architectural Historian, Ms. Lys Opp-Beckman, at lys.opp-beckman@usace.army.mil, or (206) 708-5899. You may also contact Ms. Lori Morris, Tribal Liaison at (206) 764-3625 or by email at frances.morris@usace.army.mil. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761. Thank you for your assistance with this undertaking.

Sincerely,

BOERNER.LAURA.A.1251907443

Digitally signed by BOERNER.LAURA.A.1251907443
Date: 2021.05.12 10:35:58 -07'00'

Laura Boerner, LG, LHG
Chief, Planning, Environmental, and
Cultural Resources Branch

Enclosure/s

MEMORANDUM OF AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT
AND
AND THE WASHINGTON STATE HISTORIC PRESERVATION OFFICER
FOR
THE LAKE WASHINGTON SHIP CANAL LARGE LOCK CENTER GATE PROJECT, SEATTLE, KING COUNTY, WASHINGTON

WHEREAS, the U.S. Army Corps of Engineers, Seattle District (USACE), will demolish and replace the original center gate of the Large Lock at the Chittenden (Hiram M.) Locks, Lake Washington Ship Canal (LWSC) operating project in the city of Seattle, King County, Washington, hereafter referred to as the undertaking; *and*

WHEREAS*,* the Chittenden Locks and Related Features of the LWSC Historic District is listed on the National Register of Historic Places (NRHP), under Criteria A as a significant major engineering achievement completed under government auspices that created a navigable waterway joining Puget Sound to Lake Union and Lake Washington; under Criteria B as it is associated with significant individuals: Major Hiram M. Chittenden, the Seattle District Engineer who developed and promoted the plan for the canal, Colonel James B. Cavanaugh, who supervised the construction of the project, and Bebb and Gould, the architectural firm who designed the layout and complex of concrete buildings around the Locks; and, Criteria C as the original eleven concrete accessory buildings are distinctive examples of classical ornamented early 20th century architecture; *and*

WHEREAS, the Large Lock is a contributing element to the LWSC Historic District and is divided into two components: Large Lock, West and Large Lock, East and contains a total of five sets of gates. A miter guard gate and service gate are located at both the east end on the freshwater side and the west end on the saltwater side of the Large Lock. The fifth gate pair is a service gate located in the center of the Large Lock and is the gate to be replaced. The Large Lock is situated at the foot of Salmon Bay and is 825 feet long and 80 feet wide. The Large Lock is separated by a concrete wall from the Small Locks *and*

WHEREAS, the undertaking is subject to review under Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 3000101-307108, and its implementing regulations (36 C.F.R. 800); *and*

WHEREAS, the USACE has notified the Advisory Council on Historic Preservation (ACHP) of the adverse effect and they have declined to participate in the memorandum of agreement (MOA); *and*

WHEREAS, the USACE has invited the City of Seattle Historic Preservation Program, Friends of the Ballard Locks, Historic Seattle, King County Historic Preservation Program, Muckleshoot Indian Tribe, and Suquamish Indian Tribe to be consulting

parties, participate in the development of the MOA and sign the MOA as consulting parties; *and*

WHEREAS, the City of Seattle Historic Preservation Program, Friends of the Ballard Locks, Historic Seattle, King County Historic Preservation Program, the Muckleshoot Indian Tribe and the Suquamish Indian Tribe, declined to participate in the development of the MOA and sign the MOA as consulting parties; *and*

WHEREAS; The removal of the original center gates will be 100% material loss of original material; *and*

WHEREAS, the USACE has consulted with the State Historic Preservation Officer (SHPO) under Section 106 of the NHPA and has determined that the project will have an adverse effect on the Historic District by the loss of the original center gate in the Large Lock; *and*

WHEREAS, the USACE has consulted with SHPO in accordance with Section 106 to resolve adverse effects to the LWSC Historic District from the undertaking; *and*

WHEREAS, the area of potential effect (APE) is defined as the Large Lock and staging and access areas (Appendix A); *and*

NOW, THEREFORE, the parties agree that the following stipulations will be met in order to mitigate the loss of the original center gate of the Large Lock as proposed below:

I. STIPULATIONS

To mitigate the loss of the original center gate of the Large Lock, the USACE will ensure the following are completed within 5 years from the date of execution of the MOA.

1. USACE will completely revise and update the 1978 National Register of Historic Places Inventory Nomination Form. The information in the existing nomination form is out of date and significant changes have occurred within the Historic District since 1978. The new nomination will be a wholesale replacement document. The new nomination form will follow the guidance set forth in the *Washington State National Register Guide, 5th Edition* 2013 (or most recent version), the *National Register Bulletins: Bulletin 15, How to Apply National Register Criteria for Evaluation*, and *Bulletin 16A How to Complete the National Register Registration Form.* As part of the nomination form revision and update, the USACE will document changes that have occurred within the LWSC historic district, review all existing buildings and structures to determine if they are still contributing elements to the Historic District, and ensure all buildings and structures that were not fifty years of age in 1978 are evaluated. The nomination will be presented for formal review and listing process with DAHP and the State Review Board. USACE will forward the revised and updated nomination to the Keeper of the National Register of Historic Places for re-listing.

2. A historic property inventory form (HPIF) will be completed in the DAHP WISAARD system for each building or structure located in the LWSC Historic District that does not already have a HPIF completed. Each HPIF will be prepared at the intensive level by a cultural resource professional meeting the Secretary of the Interior's Professional Qualification Standards in Architectural History.

3. The LWSC historic property management plan (HPMP) will be updated with any new information obtained from the nomination form update and revision that is not already included in the HPMP. DAHP will be offered at least one opportunity to review and comment on any revisions to the HPMP.

II. DISPUTE RESOLUTION

1) Should any Signatory object at any time to any actions proposed or to the manner in which the terms of this MOA are implemented, they shall immediately submit the objection in writing to the USACE. The USACE shall immediately notify the Signatory and any concurring party to this MOA of the objection and shall request their comments on the objection be provided within fifteen (15) calendar days following receipt of the USACE's notification, and proceed to consult with the objecting party for no more than thirty (30) days to resolve the objection.

2) If the objection is resolved during the thirty (30) calendar-day consultation period, the USACE may proceed with the disputed action in accordance with the terms of that resolution.

3) If the USACE determines that the objection cannot be resolved through consultation, the USACE shall forward all documentation relevant to the dispute, including the USACE's proposed resolution, to the ACHP. The ACHP shall provide the USACE with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories, and any concurring party, and provide them with a copy of this written response. The USACE will then proceed according to its final decision.

4) If the ACHP does not provide its advice regarding the dispute within the thirty (30) daytime period, the USACE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the USACE shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatory and any concurring Party to the MOA and provide them and the ACHP with a copy of such written response.

5) The USACE may authorize any action subject to objection under this Stipulation to proceed after the objection has been resolved in accordance with the terms of this Stipulation.

6) The USACE's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

III. AMENDMENTS

This MOA may be amended when such an agreement is agreed to in writing by all signatories and in accordance with 36 C.F.R. §800.6(c)(7).

IV. TERMINATION

1) The refusal of any concurring party invited to concur in this Agreement does not invalidate the Agreement per 36 C.F.R. 800.6(c) (3).

2) If any Signatory determines that the terms of this Agreement cannot be or are not being carried out, the parties shall immediately consult with the other signatories to develop an amendment per Section III, above. If the Agreement is not amended, any signatory may terminate it per 36 C.F.R. 800.6(c) (8).

3) Once the MOA is terminated, and prior to work continuing on the undertaking, USACE must either (a) execute a MOA pursuant to 36 C.F.R.§ 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 C.F.R. § 800.7. USACE will notify the other signatories as to the course of action it will pursue.

4) Execution of the MOA by the USACE and SHPO, and implementation of its terms, is evidence that the USACE has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment, thereby fulfilling its obligations under 36 C.F.R. 800.6 of Section 106 of the National Historic Preservation Act.

V. DURATION

This agreement will be null and void if its terms are not implemented within five (5) years from the date if its execution, unless the signatories agree in writing pursuant to Article III to an extension for carrying out its terms. If this agreement is considered null and void and the USACE chooses to continue with the undertaking, USACE shall re-initiate review of the undertaking. This MOA will expire within five years of signature date, unless extended per Stipulation IV. If this MOA expires prior to the stipulations being fulfilled, the Corps will follow Termination procedures at Stipulation IV.

VI. ANTI-DEFICIENCY ACT

USACE's obligations under this Agreement are subject to the availability of appropriated funds, and the stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act. USACE shall make reasonable and good faith efforts to secure the necessary funds to implement this Agreement in its entirety. If compliance with the Anti-

Deficiency Act alters or impairs USACE's ability to implement the stipulations of this Agreement, USACE shall consult in accordance with the amendment procedures found at Stipulation III and termination procedures found at Stipulation IV.

SIGNATORIES:

BULLOCK.ALEXANDER.LAWRENCE.1161324236 Digitally signed by BULLOCK.ALEXANDER.LAWRENCE.1161324236 Date: 2021.11.10 12:25:06 -08'00'

Date_____

Alexander "Xander" L. Bullock
Colonel, Corps of Engineers
District Commander

DocuSigned by:
Allyson Brooks
FF699DFCFDE1425...

Date 10/20/2021

Allyson Brooks, Ph.D.
State Historic Preservation Officer

APPENDIX A: Area of Potential Effects

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)
Hiram M. Chittenden Locks Large Lock Center Gate Project
King County, Washington

The U.S. Army Corps of Engineers, Seattle District (USACE) has conducted an environmental analysis in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The draft Environmental Assessment (EA) dated January 2022 for the Hiram M. Chittenden Locks (Locks) Large Lock Center Gate Project addresses efficient navigation through the large lock and routine visual maintenance inspections of the large lock center gate (LLCG) at the Locks in Seattle, King County, Washington.

The draft EA, incorporated herein by reference, evaluated various alternatives to maintain efficient navigation through the large lock and facilitate safe routine visual maintenance inspections of the LLCG. There is one Federal action analyzed in the EA summarized below.

Proposed Action: The preferred alternative is Alternative 3, Replace LLCG, which replaces the LLCG with a single-skin miter gate that meets current safety design standards and allows visual inspections without requiring entry into confined spaces.

Alternatives: In addition to a "no action" plan, two alternatives were evaluated. The alternatives included rehabilitate the LLCG (Section 2.2) and replace the LLCG (Section 2.3). The rehabilitate the LLCG alternative did not meet the purpose and need because it does not meet current safety standards and was not carried forward for detailed analysis. For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Proposed Action

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Aquatic resources/wetlands	☒	☐	☐
Invasive species	☐	☐	☒
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☐	☒	☐
Historic properties	☐	☒	☐
Other cultural resources	☒	☐	☐
Floodplains	☐	☐	☒
Hazardous, toxic and radioactive waste	☐	☐	☒

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Hydrology and geomorphology	☐	☐	☒
Land use	☐	☐	☒
Navigation	☐	☒	☐
Noise levels	☒	☐	☐
Public infrastructure	☒	☐	☐
Recreation	☐	☒	☐
Socioeconomics	☒	☐	☐
Environmental justice	☐	☐	☒
Soils	☐	☐	☒
Tribal trust resources	☒	☐	☐
Water quality	☐	☒	☐
Climate change	☐	☐	☒

Impact Minimization: All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the EA will be implemented, if appropriate, to minimize impacts. Sections 2.3.3 and 2.3.4 of the draft EA lists BMPs and conservation measures related to Endangered Species Act (ESA)-listed species and water quality. This includes scheduling the in-water work window between 15 October and 15 February to avoid migrating ESA-listed salmon and monitoring for turbidity and pH changes during construction. The USACE will require the contractor to submit a spill prevention and countermeasures plan to prevent deleterious materials from entering the water. Further, the scheduling of the large lock closure (Section 2.3.2) considers the importance of minimizing disruption to navigation such that each lock closure within the in-water work window will be limited to 30 days with a navigation period of at least 15 consecutive days. Impact to recreation is mitigated by keeping the small lock open and maintaining public access across the Locks.

Mitigation: The recommended plan will result in unavoidable adverse impacts to the Lake Washington Ship Canal (LWSC) Historic District as there would be 100 percent loss of the original LLCG. To mitigate for these unavoidable adverse impacts, the USACE is developing a memorandum of agreement that documents the adverse effect (Sections 3.7 and 7.7 of the draft EA).

Public Review: Public review of the draft EA and FONSI will be completed February 2022. All comments submitted during the public review period will be responded to in the Final EA and FONSI.

Treaty Tribes: The Muckleshoot Indian Tribe and the Suquamish Indian Tribe were contacted regarding the LLCG project and the USACE will continue to coordinate throughout the project to meet Tribal trust obligations. The Suquamish Indian Tribe expressed concerns with the in-water work window overlapping with the Tribal coho salmon fishery that takes place annually as early as mid-September and could extend to early November. It is expected that up to 10,000 adult coho salmon will pass the Locks on their annual migration. The USACE will supply additional project information and discuss construction logistics with the Suquamish Indian Tribe to avoid and minimize effects to the coho salmon fishery. Further coordination and consultation with both Tribes will occur throughout the construction effort.

Compliance:

a. Endangered Species Act:

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) are responsible for implementing the ESA of 1973. The USACE evaluated potential effects to endangered species in a Biological Assessment (BA) and determined that the proposed action would have minor and discountable effects from in-water noise and disturbance, lock dewatering, and potentially degraded water quality, in a limited area. Coordination with the USFWS and NMFS was initiated through the submission of the BA on 15 December 2021.

b. Manguson-Stevens Fishery Conservation and Management Act:

The BA also contained the USACEs' determination that the proposed action will not adversely affect Essential Fish Habitat for federally managed fish species in Washington waters.

c. Coastal Zone Management Act:

The USACE has determined that the proposed project is consistent to the maximum extent practicable with the enforceable policies of the Washington State Coastal Zone Management Program. The USACE prepared a Coastal Zone Management Act (CZMA) Consistency Determination outlining this determination for concurrence of the Washington Department of Ecology.

d. Clean Water Act:

Pursuant to both Section 404 of the CWA (33 USC 1344(f)(1)(b)) and Federal Regulations 33 CFR 323.4(a)(2), the USACE has determined that the proposed project falls within an exemption since the activity falls within the parameters of maintenance. Therefore, the repair does not require a Section 404(b)(1) evaluation or Section 401 certification.

e. National Historic Preservation Act:

On 12 May 2021, the USACE initiated consultation with the State Historic Preservation Officer (SHPO) and affected tribes with an area of potential effect (APE) letter. On 14 May 2021, the State Historic Preservation Office (SHPO) concurred with the APE. On 21 May 2021, the USACE sent the determination and findings letter to

the SHPO, documenting the USACE finding of adverse effect to the LWSC Historic District by the demolition and replacement of the original center gate of the large lock. On 27 May 2021, USACE and SHPO staff had a teleconference to discuss the project. SHPO staff requested additional information regarding the APE, location of center gate in relation to the large lock and the demolition plan for the concrete surrounding the center gate on either side of the large lock. On 15 June 2021, the USACE sent a letter with the revised APE, and provided the additional information as requested. On 22 June 2021, the SHPO concurred with the revised APE and the USACE determination that the demolition and replacement of the original LLCG is an adverse effect. On 14 June 2021, letters were sent to the following identified consulting parties: City of Seattle Historic Preservation Program, Friends of the Ballard Locks, King County Historic Preservation Program, Historic Seattle, Muckleshoot Indian Tribe, and the Suquamish Indian Tribe. All consulting parties have declined to participate in the development of the Memorandum of Agreement (MOA). An MOA was signed 11 November 2021 for the mitigation of the adverse effect this project will have on the LWSC Historic District.

f. Other Significant Environmental Compliance:

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

Finding: All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on the analysis presented in the EA, which has incorporated or referenced the best information available; the reviews by other Federal, State and local agencies, Tribes; input of the public; and the review by my staff, it is my determination that the recommended plan will not cause significant effects on the quality of the human environment. Therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

Date ALEXANDER “XANDER” L. BULLOCK
COL, Corps of Engineers
Commanding

Appendix E – ESA Section 7 Consultation Documentation

ESA consultation is ongoing. Consultation documents from National Marine Fisheries Service and U.S. Fish and Wildlife Service will be added here for the final EA.

DEPARTMENT OF THE ARMY
U.S ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH BLDG 1202
SEATTLE, WA 98134-2388

January 10, 2022

Planning, Environmental and Cultural Resources Branch

401/CZM Federal Permit Coordinator
Shorelands & Environmental Assistance Program
Washington Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Dear 401/CZM Federal Permit Coordinator:

The U.S. Army Corps of Engineers, Seattle District (USACE) proposes to replace the large lock center gate (LLCG) at the Hiram M. Chittenden Locks. The purpose of the LLCG replacement project is to maintain efficient navigation through the large lock at the Lake Washington Ship Canal and facilitate routine visual maintenance inspections of the LLCG.

The center gate is referred to as a miter gate because it has two leaves that swing out from the walls and meet in the center of the lock at an angle (miter). The center gate is used by pedestrians and staff to cross the large lock and allows for half lockages during operation. Dividing the large lock chamber in half during vessel passage reduces the time it takes to empty and fill the chamber, which uses less water and is faster than using the whole chamber. Most importantly, the center gate provides redundancy for the large lock by allowing vessel transit in half the lock if either the upstream or downstream gates were to malfunction.

The center gate, commissioned in 1917, is over 100 years old. The gate's design does not meet current design standards and has exceeded its functional lifespan (i.e., the time the gate operates before extensive maintenance is required or design standards change). Recent inspection shows the gate has excessive corrosion and wear. In addition, the two leaves of the center gate are a double-skin design with internal buoyancy chambers. The double skin design presents a major challenge for inspections because the interior components of the gate cannot be visually inspected without staff entering the chambers, which are considered a confined space and a high hazard workspace. Activities such as welding to repair portions of the gate can't be done in a confined space due to the potential for a fire in the buoyancy chamber that could jeopardize lives of workers. The inability of maintenance staff to safely and thoroughly inspect the condition of the gates and the difficulty of performing maintenance within the inner chambers create a potential for gate failure without advance warning. Depending on the type of failure, loss of LLCG function could have

negative consequences for navigation and the upstream communities that rely on the large lock for transportation through unexpected and potentially indefinite large lock closures or delays.

The Corps is requesting Coastal Zone Management (CZM) consistency concurrence from the Washington State Department of Ecology for the LLCG replacement (enclosed). Pursuant to the Shoreline Management Act of 1972 (RCW 90.58), the Corps finds this proposal consistent to the maximum extent practicable with the State of Washington Shoreline Management Program, as well as with the other CZM enforceable policies.

Thank you for your attention to this matter. If you have any questions or need additional information, please contact Ms. Katie Whitlock at Kaitlin.E.Whitlock@usace.army.mil or at 206-764-3576.

Sincerely,

Laura A. Boerner, LG, LHG
Chief, Planning, Environmental & Cultural Resources Branch

Enclosure

CENWS-PMP **January 2022**

COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

Lake Washington Ship Canal Large Lock Center Gate (LLCG) Project

Seattle, Washington

US Army Corps of Engineers®
Seattle District

Introduction. The Coastal Zone Management Act (CZMA) of 1972, as amended, requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved state Coastal Zone Management (CZM) Programs. The Shoreline Management Act of 1972 (SMA; RCW 90.58) is the core of Washington's CZM Program. Primary responsibility for the implementation of the SMA is assigned to the local government.

According to 15 CFR Ch. IX § 930.30, the Federal Government is directed to ensure "that all Federal agency activities including development projects affecting any coastal use or resource will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of approved management programs." The Large Lock Center Gate (LLCG) replacement project will occur on Federal Government property which is outside the coastal zone per section 304(1) of the CZMA. However, effects of the project will extend beyond Federal Government property to the coastal zone which necessitates a determination of consistency with the Washington CZM Program. The coastal zone affected is governed by the city of Seattle Shoreline Master Program (SMP), which was updated in 2021. This determination of consistency with the Washington CZM Program is based on review of applicable sections of the State of Washington Shoreline Management Act and policies and standards of the city of Seattle Shoreline Master Program. The repairs are activities undertaken by a Federal agency; the following constitutes a Federal consistency determination with the enforceable policies of the Washington CZM Program.

The U.S. Army Corps of Engineers, Seattle District (USACE) proposes to replace the LLCG. The purpose of the LLCG replacement project is to maintain efficient navigation through the large lock at the Lake Washington Ship Canal (LWSC) and facilitate routine visual maintenance inspections of the LLCG. The center gate is referred to as a miter gate because it has two leaves that swing out from the walls and meet in the center of the lock at an angle (miter). The center gate is used by pedestrians and staff to cross the large lock and allows for half lockages during operation. Dividing the large lock chamber in half during vessel passage reduces the time it takes to empty and fill the chamber, which uses less water and is faster than using the whole chamber. Most importantly, the center gate provides redundancy for the large lock by allowing vessel transit in half the lock if either the upstream or downstream gates were to malfunction.

The center gate, commissioned in 1917, is over 100 years old. The gate's design does not meet current design standards and has exceeded its functional lifespan (i.e., the time the gate operates before extensive maintenance is required or design standards change). Recent inspection shows the gate has excessive corrosion and wear. In addition, the two leaves of the center gate are a double-skin design with internal buoyancy chambers. The double skin design presents a major challenge for inspections because the interior components of the gate cannot be visually inspected without staff entering the chambers, which are considered a confined space and a high hazard workspace. Activities such as welding to repair portions of the gate can't be done in a confined space due to the potential for a fire in the buoyancy chamber that could jeopardize lives of workers. The inability of maintenance staff to safely and thoroughly

inspect the condition of the gates and the difficulty of performing maintenance within the inner chambers create a potential for gate failure without advance warning. Depending on the type of failure, loss of LLCG function could have negative consequences for navigation and the upstream communities that rely on the large lock for transportation through unexpected and potentially indefinite large lock closures or delays.

Proposed Repair Activities. This project replaces the center gate and associated components with modern equipment. Gate replacement will necessitate redesign of the associated components like the pintle bearing, quoin blocks, and gate anchorages (Figure 1). The new LLCG will have the same dimensions as the existing gate. The single sided skin plate design will allow access to all members for inspection and potential maintenance.

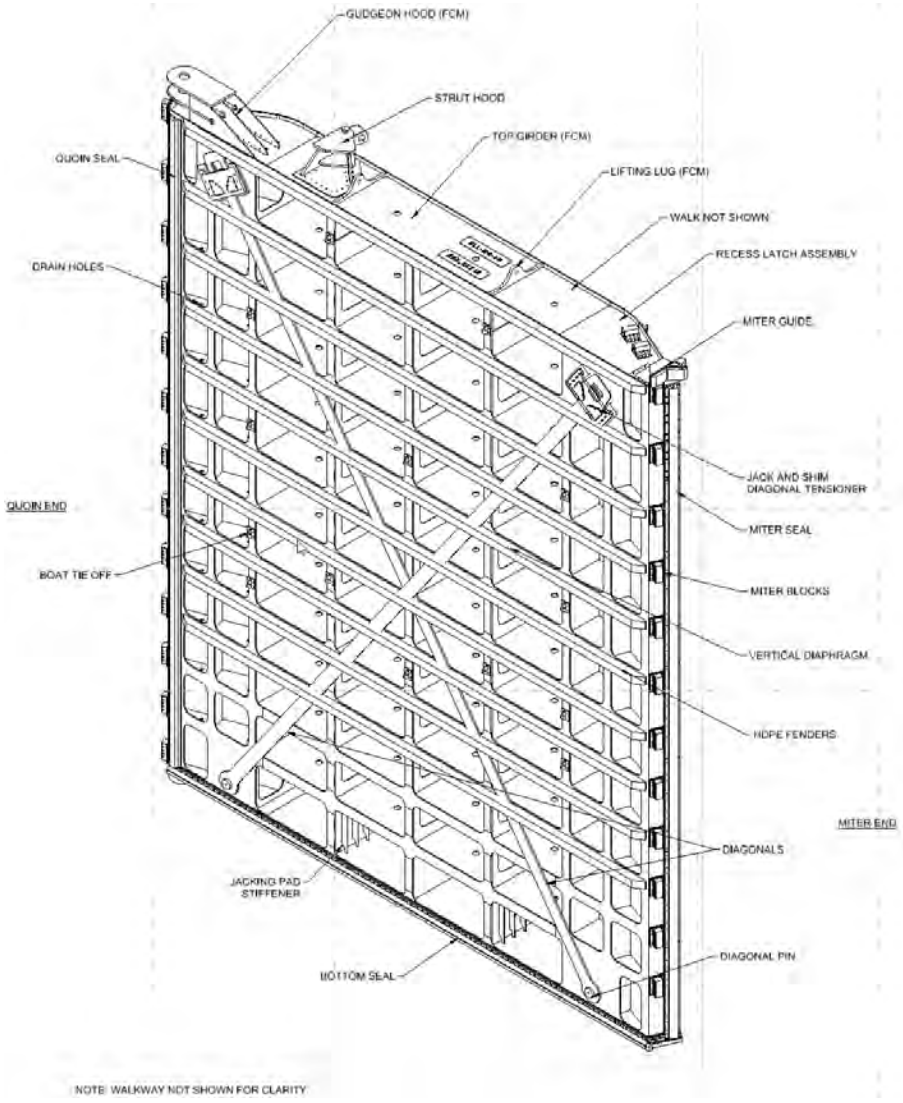


Figure 1. Replacement LLCG.

There could be up to three dewaterings during the in-water work window (between October 15 and February 15, which is about 124 days total); each dewatering event will not exceed 30

consecutive days. The importance of minimizing disruption to navigation will be considered as the project progresses. Between each dewatering, there will be a navigation passage period of at least 15 consecutive days. For example, about 90 days is the maximum number of days the large lock will be closed during the in-water work window if there are three dewatering events of 30 days each followed by a navigation passage period of 15 days. Dewatering will not begin before October 15 or continue after February 15, and will follow protocols for stranded fish (i.e., prompt removal by biologists using aerated buckets to minimize stress and handling time).

Construction may use temporary cofferdams combined with work in the dry when the large lock is dewatered. While a temporary cofferdam is installed, the large lock will be open to navigation each day when workers are not within the cofferdam. Only one cofferdam will be used at a time. The contractor may be able to complete construction without temporary cofferdams by just working during the large lock annual dewatering events. Most likely, a combination of work behind temporary cofferdams and dewatering events of the large lock will be used.

Removal of the center gate is anticipated to occur prior to work on the adjacent lock walls. The exact construction method and associated schedule are not known until a contractor is chosen and a construction methodology is proposed and approved. Once finalized, a Notice to Mariners will be published alerting vessel operators to large lock closures and restrictions, in addition to other public communications on the USACE website, Locks Facebook page, and at stakeholder meetings. A summary of proposed actions (Table 1) appears below.

Table 1. Summary of Proposed Actions for the LLCG Replacement.

Action	**Summary**
Staging	Existing developed areas at USACE LWSC to stage equipment and materials.
Construction Access	Personnel, equipment, and materials will be transferred from the staging area and loaded on to a barge or directly transferred to the project area by walking over the lock gates. Any barge used will be tethered to USACE structures.
Construction Methods	Work will take place behind a temporary cofferdam or in the dewatered large lock. Divers may assist with cofferdam installation. A barge may deliver materials and a land-based or barge-mounted crane will facilitate construction. LLCG fabrication will occur at an off-site location. Construction activities to replace the concrete and gate appurtenances may involve drilling, sawing, grinding, hammering, compressed air or water, and power tool use, but are not limited to these methods. Any of the available methods might generate loud noise, percussive noise, concrete dust, sparks, and a small amount of contained water laden with concrete particles. Discharge of water that may contain materials such as concrete will be managed to comply with water quality requirements. To replace the center gate anchorage connection castings at the top of the wall, concrete

Action	Summary
	will be removed and replaced using similar techniques but can be performed from the top of the wall. Areas needing new concrete may have a form placed to contain and shape the concrete as it cures. The concrete will be fully cured before contacting water. During concrete work, uncured concrete will not be allowed to enter the water and monitoring will take place to avoid impacts to water quality.
Construction Duration	Initial site preparation and staging of materials may begin prior to in-water work. Two to four years of intermittent construction. In-water activities will not occur outside of October 15-February 15. Annual large lock maintenance will coincide with dewatering for construction so additional dewatering will not be needed for maintenance.

Construction activities are divided into several work periods. This allows the large lock to remain open to navigation during certain construction events when it is safe to do so and to minimize impacts to navigation. These work periods are classified as restriction, closure, and passage:

- Navigation **Restriction** Periods: Navigation use of the lock chamber will be prohibited while workers are inside a cofferdam to allow safe work inside the temporary structure. At a minimum, vessels will be allowed to transit the lock chamber from 5:00 pm to 6:00 am, with a width restriction in place for vessels smaller than 65 feet to avoid potential collision with the temporary cofferdam.
- Navigation **Closure** Periods: No vessels would use the large lock chamber. At this time, the total duration of any given closure will not exceed 30 days, with at least 15 days between outages. Generally, navigation closure periods would be longer, up to 30 days, if cofferdams and navigation restriction periods are not used. The final duration of closure periods will be determined by USACE based on contractor proposals and feedback from the maritime community and the public.
- Navigation **Passage** Periods: Normal navigation would be allowed.

If used, a temporary cofferdam will be placed in the large lock, secured to the lock wall, and dewatered with pumps; then construction activities will be performed in the dry. A typical localized cofferdam will be a three-sided, open-bottom cofferdam that will bolt to the lock wall, similar to the example in Figure 2. Highly compressible neoprene seals will slow flow between the cofferdam and the wall, allowing maintenance pumping to maintain the area in the dry. Sandbags can also be placed inside the cofferdam at the base to manage water. Divers may assist with installation if it occurs while the lock is fully watered. If temporary cofferdams are not used, Navigation Restriction Periods will not be needed. There will be Navigation Closure Periods for removal and installation of the LLCG or other construction activities.

Figure 2. Localized cofferdam example.

Fender systems would be provided, installed, maintained, and removed by the contractor. The contractor would install fenders in the LLCG recesses on either lock wall at the end of the in-water work period to reduce the risk of damage to new or existing features during navigation passage until the following in-water work period. The fender system can be installed in the wet or the dry and may require dive operations if installed in the wet. The fender system would be removed from the miter gate recesses, likely by crane, when construction is needed. After completion of the work within localized cofferdams, but prior to the installation of the new gate leaves, fender systems would be installed in both gate recesses.

Depending on when a contract is awarded, the earliest construction could begin is fall 2022. To complete the work within required in-water work period (October 15-February 15), minimize impacts to navigation, and ensure the large lock will be ready for customary use, multiple work shifts may be required, including 24 hours a day, as well as seven days per week.

Consistency Review. The CZMA requires states to identify "Enforceable Policies." Washington's authorities and their implementing regulations contain the state CZM Program's enforceable policies:

- The State Water Pollution Control Act
- The Washington State Clean Air Act
- The State Shoreline Management Act (SMA)

The Marine Spatial Plan for Washington Waters and the Ocean Resources Management Act are not applicable to this project because the proposed action does not occur in a county that is adjacent to the Pacific Ocean. There would be no significant long-term impacts to coastal or marine resources or uses of the Pacific Ocean as a result of this project. The Energy Facility Site Evaluation Council law is not applicable because the project is not an energy facility that requires a permit.

State of Washington Water Pollution Control Act (WPCA). The WPCA outlines the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington. It works in concert with the Federal Clean Water Act (CWA) to ensure that waters of the U.S. and Washington State are protected.

Even though the USACE does not issue Section 404 permits to itself for its Civil Works activities, the USACE must comply with the substantive requirements of Section 404 and 401 under the CWA. Pursuant to both Section 404 of the CWA (33 USC 1344(f)(1)(b)) and Federal Regulations 33 CFR 323.4(a)(2), the proposed activity falls within an exemption since the activity falls within the parameters of maintenance. Therefore, the repair does not require a Section 404(b)(1) evaluation or Section 401 certification.

The LLCG replacement is limited to maintenance of an existing serviceable dam and does not propose to change the scope, character, or size of the original fill design, so the discharge of fill material into Waters of the United States (U.S.) is exempt. This is because 33 USC 1344(f)(1)(B) provides that discharge of material "for the purpose of maintenance, including urgent reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, and bridge abutments or approaches, and transportation structures" is exempt from regulation as fill. In addition, use of materials such as concrete that do not contain toxic pollutants as listed under Section 307 of the CWA is consistent with the maintenance described in the exemption.

The LLCG replacement will be conducted within the existing footprint of the large lock as constructed in 1916. The components of the work include replacing infill concrete from 1916 in the lock wall and replacing the LLCG and associated components connected to the lock wall. To facilitate the work that is wholly inside the lock chamber, the repair may use a cofferdam with sandbags or other material inside to prevent leaks. This work will not change the character, scope, or size of the structure from the original fill design. New fill will conform to the original configuration and size of the original fill of the lock wall. Only as much concrete as is necessary for an adequate repair will be applied, and overfilling will be avoided to maintain a similar profile to the surrounding structure. USACE considers modern concrete formulations as analogous to the 1916 concrete used in the initial construction of the large lock chamber.

Best Management Practices (BMPs; Attachment A) will be employed to prevent pollutants from entering into Waters of the U.S. The proposed action will employ appropriate BMPs to conform with the WPCA to protect Waters of Washington State. Regular monitoring of turbidity and pH according to the water quality monitoring plan (Attachment A) in waters adjacent to the cofferdam will be conducted during concrete work behind a temporary cofferdam, particularly if a turbidity plume is spotted, and during activities that could generate turbidity such as cutting concrete.

Washington Clean Air Act. Washington Administrative Codes WAC 173.400 through 173.495 were reviewed to ensure the project will comply with the Washington State Clean Air Act. Additionally, the project will comply with the adopted Federal rules. Section 176 of the Clean Air Act, 42 USC 7506(c), prohibits Federal agencies from approving any action that does not conform to an approved state or Federal implementation plan. Activities during the project will have short-term localized effects to air quality. There will be a temporary increase in emissions during equipment operation. Construction will occur in a maintenance area. The area was previously a non-attainment area for carbon monoxide (CO). The 20-year maintenance period for CO ended in 2016. The impact to air quality is anticipated to be minor due to the small area of construction (< 1 acre) and the type of equipment used (e.g., generators, power tools, intermittent crane and barge use). The small area of construction and the nature of the work will limit the impact to air quality, which is expected to be well below the *de minimis* threshold of 100 tons per year of CO or PM10. Under 40 CFR 93.153(c)(2)(iv), conformity determinations are not required for Federal maintenance and repair activities where the increase in emissions associated with the activity falls below the *de minimis* level.

State of Washington Shoreline Management Program. The Washington State Department of Ecology enforces the following policies under the State Shoreline Management Act.

- WAC 173-15: Oil and Natural Gas Exploration Permits: This project does not include the exploration of oil or natural gas; and therefore, the regulation does not apply to the proposed action.
- WAC 173-18: Rivers within Shoreline jurisdiction: The project is not located at the mouth of a river; therefore, the regulation does not apply to the proposed action.
- WAC 173-20: Lakes within Shoreline jurisdiction: This project does not include shoreline adjacent to a lake; therefore, the regulation does not apply to the proposed action.
- WAC 173-22: Shorelines of the State: The project does occur within a Shoreline of the State. The project is consistent to the maximum extent practicable with the local Shoreline Master Plan (SMP) requirements for the local shoreline designation. Please refer to Local Shoreline Master Program below.

This project falls within the description of an activity exempted from the permit process as outlined in WAC 173-27-040(2)(b), “Normal maintenance or repair of existing structures.” Replacement of existing structures is a common method of repair for lock gates, the new

components are comparable to the original structure, and the replacement does not cause substantial adverse effects to shoreline resources or environment. Furthermore, the CZMA does not require Federal agencies to obtain local permits. However, the USACE has demonstrated consistency to the maximum extent practicable with the Seattle SMP and all applicable policies and regulations for shorelines of the state.

The Washington SMA, Revised Code of Washington (RCW) Chapter 90.58 is the core authority of Washington's Coastal Zone Management Program. This chapter enunciates the following state policy:

- To provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses.
- To ensure the development of shorelines in manner that promotes and enhances the public interest while allowing only limited reduction of rights of the public in the navigable waters.
- To protect against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights.

The proposed activities are consistent with this broad statement of policy. The proposed action will support the continued use of the large lock. The project is in the public interest due to the structure's role in maintaining LWSC water levels and providing migratory fish passage, and will not change the rights of navigation.

Local Shoreline Master Program. The Seattle Shoreline Master Program (SMP; 2021) constitutes the policies and regulations governing development and uses in and adjacent to marine and freshwater shorelines as defined in Seattle Municipal Code Chapter 23.60A [https://www.municode.com/library/wa/seattle/codes/municipal_code?nodeId=TIT23LAUSCO_SUBTITLE_IIILAUSRE_CH23.60ASESHMAPRRE].

Following the procedures as detailed at Seattle Municipal Code 23.60A.062, this document provides information for a determination of consistency. The following outlines pertinent sections of the city of Seattle SMP that apply to and implement the SMA. The USACE consistency determinations are located below the relevant code in ***bold italics***.

<u>23.60A.002 - Title and purpose</u>

A. This Chapter 23.60A shall be known as the "Seattle Shoreline Master Program Regulations."

B. It is the purpose of this Chapter 23.60A to implement the policy and provisions of the Shoreline Management Act and the Shoreline Goals and Policies of the Seattle Comprehensive Plan, as well as the City's interest in the public health, safety and welfare, by regulating development, uses and shoreline modifications of the shorelines of the City in order to:

1. Protect the ecological functions of the shoreline areas;

2. Encourage water-dependent uses;

3. Provide for maximum public access to, and enjoyment of the shorelines of the City; and

4. Preserve, enhance, and increase views of the water.

Consistent. The LLCG project will not alter the ecological function at the large lock and will maintain the use of the large lock. The LLCG project will maintain the Locks facilities so that public access for enjoyment of the shoreline and views of the water may continue.

23.60A.020 C– Permits and Exceptions

The following substantial developments are exempt from obtaining a shoreline substantial development permit from the Director:

1. "Normal maintenance" or repair of existing structures or developments, including damage by accident, fire or elements.

a. "Normal maintenance" means those usual acts to prevent a decline, lapse or cessation from a lawfully established state comparable to its original condition, including but not limited to its size, shape, configuration, location, and external appearance, within a reasonable period after decay or partial destruction, except where repair causes substantial adverse effects to shoreline resources or environment.

Consistent. The LLCG project will maintain the Federal structures at the Locks at their present location. The LLCG project will be designed and constructed to be a similar size, shape, configuration, location, and external appearance of the existing structure. LLCG project method is normal maintenance or repair. The LLCG project will prevent a decline in the functionality or operation of the large lock. With the use of BMPs listed in the draft EA, no adverse effects to shoreline resources or the environment are anticipated.

23.60A.152 - General development

All developments, shoreline modifications, including land disturbing activity, and uses are subject to the following general development standards, whether they are located on dry land, overwater or in setbacks:

A. All shoreline developments, shoreline modifications, and uses shall be located, designed, constructed and managed to achieve no net loss of ecological functions. No net loss of ecological functions shall be achieved by applying the standards set out in this Chapter 23.60A, including applying mitigation sequencing pursuant to Section 23.60A.158.

Consistent. The LLCG project will maintain the Locks structures in their present location. Repairs will be designed, constructed and managed to achieve no net loss of ecological functions. Mitigation sequencing to avoid and minimize impacts using best management practices (BMPs) will be implemented according to Section 23.60A.158 B.1.a-b.

B. All shoreline development, shoreline modifications, and uses shall be located, designed, constructed, and managed to avoid, or if that is infeasible, to minimize to the maximum extent feasible, adverse impacts or interference with beneficial natural shoreline processes such as water circulation, littoral drift, sand movement, or erosion.

Consistent. The LLCG project will maintain the functionality and operation of the large lock. Therefore, no changes in shoreline processes will occur over the status quo.

C. All shoreline developments, shoreline modifications, and uses shall be located, designed, constructed, and managed to prevent the need for shoreline defense and stabilization measures and flood protection works such as bulkheads, other bank stabilization, fills, levees, dikes, groins, jetties, dredging, or substantial site regrades to the extent feasible except as allowed in Section 23.60A.188.

Consistent. The proposed project does not require shoreline stabilization, only repairs to the existing structures.

D. All new shoreline development and uses shall be sited and designed to avoid or, if that is infeasible, to minimize to the maximum extent feasible the need for new and maintenance dredging.

Not Applicable. No new development will occur. This is a repair of an existing structure according to WAC 173-27-040(2)(b). The current usage of the large lock will not change. The proposed repairs do not require new or maintenance dredging.

E. All shoreline developments, shoreline modifications, and uses shall be located, designed, constructed, and managed in a manner that minimizes adverse impacts to surrounding land and water uses in the Shoreline District and is compatible with the affected area in the Shoreline District.

Consistent. The proposed project will have no adverse impacts to the surrounding land and water uses. The purpose of the project is to maintain the large lock within the existing footprint. Closure of the large lock will be coordinated with a Notice to Mariners and to the public.

F. All shoreline developments, shoreline modifications, and uses shall be located, constructed, operated, and managed to protect public health and safety.

Consistent. The proposed repairs are designed to address structural concerns of the LLCG. The project has been designed to minimize any effects to public health and safety to the maximum extent practicable.

G. Disturbance areas and land clearing shall be limited to the minimum necessary for development. Any surface disturbed or cleared of vegetation and not to be used for development shall be planted with native vegetation, except that pre-disturbance landscaped areas containing non-native vegetation located outside the shoreline setback may be re-landscaped using non-native, noninvasive vegetation pursuant to Section 23.60A.190.

Not Applicable. No land clearing is proposed.

H. All shoreline developments, shoreline modifications, and uses shall use best management practices pursuant to DR 16-2009, Construction Stormwater Control Technical Requirements, to control impacts during construction.

Consistent. The contractor will provide a stormwater pollution prevention plan (SWPPP) using best management practices pursuant to the most recent City of Seattle Stormwater Manual dated August 2017 (https://web6.seattle.gov/DPD/DirRulesViewer/Rule.aspx?id=17-2017) to control impacts during construction to the USACE for approval.

I. All shoreline developments, shoreline modifications, and uses shall be located, designed, constructed, operated and managed to: protect the quality and quantity of surface and ground water on and adjacent to the development lot by using best management practices as follows:

1. Keep all material on the property appropriately stored, and maintain all structures, machinery, and materials on the property to prevent the entry of debris and waste materials into any water body.

2. Pave and/or berm drum storage areas, and control fugitive dust to prevent contamination of land or water.

3. Minimize the impervious surface on the site, and use permeable surfacing where practicable, except where other required state or federal permits prohibit such actions.

4. Use other control measures as appropriate, including but not limited to bioretention, rainwater harvesting, downspout dispersion, filters, catch basins, and planted buffers.

Consistent. Construction materials will be properly stored and secured to prevent the entry of debris and waste materials into any water body, and secondary containment will be used as needed around materials and machinery. There will be no impervious surfaces created. Please see Attachment A for a complete list of BMPs.

J. All in-water and over-water structures shall be designed, located, constructed, and managed to avoid adverse impacts to aquatic habitat, such as increased salmonid predator habitat and adverse impacts due to shading, to the maximum extent feasible and to limit construction to the times of the year when construction will have the least impact on migrating salmonids as set by WDFW and the USACE.

Consistent. The project involves replacement of an existing in-water structure with no design changes. There are no over-water structures. In-water work will take place October 15-February 15 as coordinated with the National Marine Fisheries Service and U.S. Fish and Wildlife Service to avoid impacts to migrating salmonids.

K. Durable, non-toxic components are the first priority for in-water and over-water structures and shall be used unless it is unreasonable. Treated wood and other material shall be the least toxic according to industry standards. Treated wood used shall be applied and used in accordance with the American Wood Preserver Association (AWPA) standards for aquatic use.

Wood treated with pentachlorophenol, creosote, chromate copper arsenate (CCA), or comparably toxic compounds is prohibited for decking or piling.

Consistent. Concrete will be placed in the dewatered lock chamber or behind a cofferdam to prevent contact between uncured concrete and surface waters. Concrete will be allowed to cure prior to removing the cofferdam or rewatering the lock chamber.

L. Creosote piles

1. Creosote treated piles may be repaired if:

a. the piling is under a structure that is not being replaced; or

b. fewer than 50 percent of the existing piles are in need of repair under a structure that is being replaced.

2. "Sleeving" shall be the repair method used unless another method provides better protection of ecological functions.

3. Creosote treated piles in need of repair must be replaced if under a structure that is being replaced and 50 percent or more of the number of piles are proposed to be repaired, if reasonable.

Not Applicable. The project involves the LLCG only and will have no piles.

M. Replaced covered moorage and new and replaced boat sheds shall be designed to provide the maximum ambient light to reach the water. Designs shall:

1. Minimize sides of the structures; and

2. Provide light transmitting roofing and side material to the maximum extent feasible.

Not Applicable. The project does not involve covered moorage or boat sheds.

N. Light transmitting features are required to be installed for all new and replaced piers and floats, over-water boat repair facilities and similar structures to the maximum extent feasible. When determining feasibility of light transmitting features for nonresidential piers and floats see subsection 23.60A.187.E.6.

Not applicable. The project involves replacement of the LLCG with a similar structure that does not increase the footprint. The LLCG project will not install any piers, floats, over-water boat repair facilities, or similar structures.

O. Tires are prohibited as part of above or below water structures or where tires could potentially come in contact with the water (e.g., floatation, fenders, hinges). During maintenance of structures using tires, existing tires shall be removed or replaced with nontoxic material.

Not Applicable. The project will not use or replace any tires.

P. All foam material, whether used for floatation or for any other purpose, shall be encapsulated within a shell that prevents breakup or loss of the foam material into the water and that is not readily subject to damage by ultraviolet radiation or abrasion. During maintenance of structures using foam, existing un-encapsulated foam material shall be removed or replaced with material meeting the standards of this subsection 23.60A.152.P.

Not Applicable. The project will not use or replace any foam material.

Q. Artificial night lighting shall first be avoided. If that is infeasible, lighting should minimize night light impacts on the aquatic environment by focusing the light on the pier surface, using shades that minimize illumination of the surrounding environment and using lights that minimize penetration into the water, to the maximum extent feasible, considering the activities that occur at the site at night.

Consistent. LLCG work is expected to occur during daylight hours. If work occurs at night, then lighting for safety of workers will be required and will be minimized to the extent feasible to conduct the work safely. Directional lighting will be used to focus light on the work area and minimize illuminating surrounding areas and penetration into adjacent water bodies.

R. The release of oil, chemicals, solid waste, untreated effluents, or other hazardous materials onto or into the water is prohibited. Best management practices shall be employed for the safe handling of these materials to prevent them from entering the water. Equipment for the transportation, storage, handling or application of such materials shall be maintained in a safe and leak-proof condition. If there is evidence of leakage, the further use of such equipment shall be suspended until the cause has been completely corrected. Best management practices shall be employed for prompt and effective clean-up of any spills that occur. A spill prevention and response plan to meet the above requirements may be required by the Director prior to issuance of a permit unless the Director has determined that it is reasonable to provide the plan prior to commencement of construction.

Consistent. The proposed project conforms to the above provisions. BMPs will be implemented during the proposed project. The USACE will require the contractor to provide a Spill Prevention and Response Plan.

S. Facilities, equipment and established procedures for the containment, recovery and mitigation of spilled petroleum products shall be provided at recreational marinas, commercial marinas, vessel repair facilities, marine service stations and any use regularly servicing vessels that have petroleum product capacities of 10,500 gallons or more. A third party may provide the containment and clean-up of spills if a containment boom, capable of containing a spill from the largest vessel, is available on site and personnel are trained to deploy containment booms around vessels moored at the site.

Consistent. BMPs to prevent and contain petroleum product spills from vessels used in the repair (e.g., barges and work boats) will be implemented (Attachment A).

T. Construction and repair work shall use best management practices to prevent the entry of debris and other waste materials into any water body. No over-water or in-water application of paint, preservative treatment, or other chemical compounds is permitted, except in accordance with best management practices. Any cleaning, sanding, cutting of treated wood, or resurfacing operation occurring over-water or in-water shall employ tarpaulins securely affixed above the water line to prevent material from entering the water. Prior to removing the tarpaulins, the accumulated contents shall be removed by vacuuming or an equivalent method that prevents material from entering the water.

Consistent. The proposed action does not involve over-water or in-water application of paint, preservative treatment, or other chemical compounds, or cleaning, sanding, cutting of treated wood, or resurfacing operations on site. Concrete removed from the lock wall during the course of the project will be disposed of properly offsite. BMPs will prevent turbidity or pH exceedances of State water quality standards during work behind temporary cofferdams.

U. Construction staging areas shall be as far from the OHW mark as reasonable. For projects involving concrete, a concrete truck chute cleanout area shall be established to contain wet concrete. All inlets and catch basins shall be protected from fresh concrete, paving, paint stripping and other high-risk pollution generating activities during construction.

Consistent. Appropriate staging areas will be provided by the USACE on previously developed property. The staging areas will be as far from the OHW mark as reasonable, but the configuration and location of the Locks limits the total potential staging area distance from the OHW mark. BMPs (Attachment A) will prevent introduction of concrete or other materials generated during the project into inlets and catch basins.

V. If at any time project-related activities cause a fish kill, the permittee shall stop all work relating to the fish kill and immediately notify the Department of Planning and Development, WDFW, and Ecology.

Consistent. In the event of any fish kill, all work will stop, and the contractor will notify all parties named above as well as the project manager for USACE. This is a notification process only.

W. Navigation channels shall be kept free of hazardous or obstructing development or uses.

Consistent. Navigation channels will be kept free of hazardous or obstructing development. Temporary navigation restrictions and closures will be necessary for the LLCG project, but the durations will be as short as possible to minimize disruption to boaters. The small lock will be available during large lock navigation restrictions and closures. A Notice to Mariners will be used to alert the public when exact restriction and closure dates are known.

X. On waterfront lots uses that are not water-dependent shall be designed and located on the shoreline to encourage efficient use of the shoreline and to allow for water-dependent uses. Design considerations may include additional setbacks from all or a portion of the water's edge, joint use of piers and wharves with water-related or water-dependent uses, development of

the lot with a mixture of water-related and water-dependent uses, or other means of ensuring continued efficient use of the shoreline by water-dependent uses.

Not applicable.

Y. All open areas used for boat storage are required to be screened with natural existing vegetated buffers or planted landscaped areas except for lots with a dry land lot depth of less than 35 feet and areas within the UG, UI and UM Environments. Screening shall include a 5 foot wide landscaping strip with native evergreen plantings at least 3 feet tall. The screening shall be located outside any required sight triangle. The requirement for screening may be waived or modified by the Director to address traffic safety.

Not applicable. The project does not involve areas used for boat storage.

<u>23.60A.172 - Applicable standards for shoreline modifications</u>

A. All shoreline modifications are subject to the standards set out in Subchapter III of this Chapter 23.60A.

B. Any proposed shoreline modification located on state-owned aquatic lands must provide evidence of notification to DNR prior to obtaining authorization from the Director.

C. All shoreline modifications are prohibited except as allowed, allowed as a special use, or allowed as a shoreline conditional use in this Section 23.60A.172 and Table A for 23.60A.172. If Table A for 23.60A.172 lists a shoreline modification in association with a specific use or other shoreline modification, that use or shoreline modification must be allowed, allowed as a special use, or allowed as a shoreline conditional use in the shoreline environment for which the shoreline modification is proposed.

Excerpt from Table A for 23.60A.172 Applicable standards for shoreline modifications

	Shoreline Modification	Shoreline Environments									
		CM	CN	CP	CR	CW	UC	UG	UH	UI	UM	UR
7.	Fill 7.a through 7.j are required to demonstrate that alternatives to fill are infeasible.											
7.d.	Necessary to support a water dependent use.	CU	CU	X	CU	CU	CU	CU	CU	CU	CU	CU

Shoreline Environment Abbreviations: Conservancy Management (CM); Conservancy Navigation (CN); Conservancy Preservation (CP); Conservancy Recreation (CR); Conservancy Waterway (CW); Urban Commercial (UC); Urban General (UG); Urban Harborfront (UH); Urban Industrial (UI); Urban Maritime (UM); Urban Residential (UR).

Key: Shoreline Conditional Use (CU) and Prohibited (X).

Consistent. Subchapter III (General Provisions) includes 23.60A.090 to 23.60A.220, and the applicable sections are included in this consistency determination. The project will take place on federally owned property. This project falls under 7.d., fill necessary to support a water dependent use that meets the additional criteria in Section 23.60A.184 (see next section), and is a conditional use (CU) in Conservancy Management (CM) shoreline environment. An alternative to the proposed action is infeasible because the purpose of the project is to maintain the structure and function of the large lock, which is a water-dependent use.

23.60A.184 - Standards for fill

A. In shoreline environments where fill is allowed or allowed as a special use or a shoreline conditional use it shall comply with the standards in Section 23.60A.172 [above] and in this Section 23.60A.184.

B. Fill materials shall be of a quality that will not cause degradation of water or sediment quality.

C. Solid waste, refuse, and debris shall not be placed in the water or on shorelands.

Consistent. Fill materials (concrete) will be non-toxic and appropriate for marine uses. Concrete will have contact with water only after curing. Water quality monitoring for turbidity and pH will be performed. Only fill needed for the proposed action will be placed in the water; solid waste, refuse, and debris will be disposed of properly.

D. Fills shall be designed, located, constructed, and managed to ensure stability of slopes created including the provision of vegetation, retaining walls, or other mechanisms for erosion prevention.

Not applicable.

E. Dredged material not meeting the federal Environmental Protection Agency and Ecology criteria for open-water disposal may be used for fill in the water or shorelands if the applicant demonstrates that:

1. The fill meets the criteria for fill in Section 23.60A.172 and this Section 23.60A.184;

2. Either the area in which the fill material is placed has the same level of the same contaminant or the material is placed in a manner that it will not be a source of contaminants in an area cleaner than the proposed fill material;

3. The fill can be placed in the water or on the land without long-term adverse impacts to water quality, sediment quality, aquatic life, or human health, provided that if the fill is dredged material, placement of the material also complies with Section 23.60A.182; and

4. If classified by the state or federal government as problem or hazardous waste, any required federal Environmental Protection Agency and Ecology approval is obtained.

Not Applicable. Dredged material will not be used for fill.

F. Fill shall not result in the creation of dry land except where necessary for transportation projects of statewide significance, as part of ecological restoration and enhancement, beach nourishment, mitigation, or where necessary to repair pocket erosion as allowed in subsection 23.60A.184.G.

G. Fill that creates dry land that is necessary to repair pocket erosion between adjacent revetments is required to meet the standards of this Section 23.60A.184 and the following standards:

1. The repair of the erosion pocket is necessary to protect water-dependent or water-related uses;

2. The erosion pocket does not exceed 20 feet in length or 100 feet of shoreline, as measured between adjacent revetments;

3. The erosion pocket is in an area characterized by continuous revetments abutting and extending in both directions along the shoreline away from the erosion pocket;

4. The fill will not appreciably increase interference with a system of beach accretion and erosion; and 5. The fill does not extend beyond a line subtended between the adjacent revetments.

Not Applicable. The proposed LLCG project will not create dry land.

H. Fill incidental to the repair or replacement of existing shoreline stabilization measures pursuant to Section 23.60A.020 and subsection 23.60A.188.F including, but not limited to, the replacement of riprap, or the replacement of a bulkhead directly in front of an existing bulkhead, as allowed in Section 23.60A.020, does not require approval as fill under this Section 23.60A.184, provided that the fill is the minimum necessary to accommodate the repair or replacement, the repair or replacement has been approved and pursuant to Section 23.60A.158.

Not Applicable. The proposed action is not incidental to the repair or replacement of existing shoreline stabilization measures pursuant to Section 23.60A.020 and subsection 23.60A.188.F.

I. In applying mitigation sequencing pursuant to Section 23.60A.158, potential adverse impacts to be addressed include, but are not limited to: total water surface reduction; navigation restriction; impediment to water flow and circulation; reduction of water quality; disturbance of fish runs and other biological communities; and loss or modification of upland or shallow water vegetation functions and habitat and the adverse impacts of riprap migrating off-site and the impacts of the riprap at the off-site locations that are not retrieved as allowed pursuant to subsection 23.60A.184.H.

Consistent. BMPs (Attachment A) will be implemented to avoid and minimize reduction of water quality, disturbance of fish runs and other biological communities, and other potential

adverse effects. Reduction of total water surface, navigation restriction, and loss or modification of vegetation functions and habitat are not expected because the proposed action will only maintain the LLCG. No riprap will be used.

23.60A.220 - Environments established

A. Shoreline environment locations

1. The shoreline environments set out in subsection 23.60A.220.C and the boundaries of these environments are established on the Official Land Use Map as authorized in Chapter 23.32.

2. Any undesignated shorelines are designated Conservancy Preservation.

3. Submerged lands seaward of the Outer Harbor Line, Construction Limit Line or other navigational boundary that are not specifically designated or shown on the Official Land Use Map shall be designated Conservancy Navigation.

B. Submerged Lands

1. On Puget Sound, Lake Washington and Green Lake, submerged lands shall be designated as shoreline environments that preserve them for ecological functions and public or recreational purposes.

2. On Elliott Bay, Lake Union, the Ship Canal, and the Duwamish River, submerged lands shall be designated as shoreline environments that balance preservation of ecological functions and a mix of public, recreational, industrial, and commercial purposes. In these areas; the environmental designation given to submerged lands is generally the same as the abutting waterfront dry land and extends to the outer Harbor Line, Construction Limit Line, or other navigational boundary.

3. Where the shoreline environment designation on submerged land is different from the shoreline environment designation of the adjacent dry land, the environment boundary is the OHW mark in freshwater environments and mean higher high water in saltwater environments.

C. For the purpose of this Chapter 23.60A, the Shoreline District is divided into 11 environments.

D. The purpose and locational criteria for each shoreline environment are as follows:

1. Conservancy Management (CM) Environment

a. Purpose. The purpose of the CM Environment is to provide for water-dependent infrastructure, such as navigational locks, that provide a substantial public benefit, and recreational facilities, such as marinas and parks. Development allowed in the CM Environment can be managed to preserve ecological functions and typically provide public access.

b. Locational Criteria

1) Dry or submerged land that is generally owned by a public agency and developed with a major infrastructure or a recreational facility, including navigation locks and marinas;

2) Public and private parks; or

3) Areas of medium to high intensity development that are surrounded by areas of less intense development such that they may require active management to protect ecological functions.

Consistent. The USACE acknowledges the city of Seattle's designated shoreline environments and that work is proposed adjacent to land designated as a Conservancy Management (CM) environment. The proposed project is to repair the LLCG and maintain the use of the large lock, and is consistent with maintenance of water-dependent infrastructure (navigational locks) that provides a substantial public benefit for navigation and recreational use. The action would not change the existing land use at or any development adjacent to the project area. Applicable BMPs and conservation measures (Attachment A and draft environmental assessment) such as the in-water work window to avoid impacts to salmonids will be employed to avoid and minimize negative effects to ecological functions.

Subchapter V: - The Conservancy Management (CM) Environment

23.60A.222 - Applicable standards in the CM Environment

All uses and development in the CM Environment, including shoreline modifications, are subject to the standards set out in Subchapter III of this Chapter 23.60A and to the following standards for the CM Environment.

Consistent. Subchapter III (General Provisions) consists of Sections 23.60A.090 to 23.60A.220, and the applicable sections are included in this consistency determination.

Part 1 - Uses
23.60A.224 - Uses in the CM Environment

A. Use regulations

1. All uses are allowed, allowed as a special use, allowed as a shoreline conditional use, or prohibited pursuant to Section 23.60A.090, this Section 23.60A.224, and Table A for 23.60A.224. Use categories and subcategories cover all uses in that category and subcategory except when a subcategory of that use is specifically shown in Table A for 23.60A.224.

2. If Table A for 23.60A.224 or the text of Section 23.60A.224 states that a use is required to be water-dependent or water-related, a use that does not have the required attribute is prohibited.

3. Regulations for specific shoreline modifications are set out in Sections 23.60A.172 through 23.60A.190.

Consistent. The proposed LLCG project is for the maintenance of water-dependent structures in accordance with A.3, regulations for specific shoreline modifications (Standards for fill; 23.60A.184, as covered above).

Part 2 - Development Standards
23.60A.228 - Height in the CM Environment
23.60A.230 - Lot coverage in the CM Environment
23.60A.232 - Shoreline setbacks in the CM Environment
23.60A.234 - View corridors in the CM Environment
23.60A.236 - Regulated public access in the CM Environment

Consistent. The proposed LLCG project does not change the height, lot coverage, shoreline setback, or view corridor of the project area or USACE structures. For the safety of the public, access will be limited during construction, but the project will maintain long-term public access by replacing the LLCG and maintaining the functionality of the large lock.

Conclusion. Based on the above evaluation, the USACE has determined that the proposed LLCG project is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington State, including the enforceable policies as specified in the local planning documents for the city of Seattle that are incorporated in the approved programs. The action is, therefore, consistent with the State of Washington's CZM Program to the maximum extent practicable.

Water Quality Monitoring Plan

Hiram M. Chittenden Locks
Large Lock Center Gate Replacement
January 2022

Constituents Monitored:

The Hiram M. Chittenden Locks (Locks) large lock center gate (LLCG) Replacement project area is located in Shilshole Bay, which is designated as "Extraordinary Quality" (WAC 173-201A-612, Table 612). The project area contains extraordinary quality salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.

The proposed project requires the following water quality monitoring parameters pursuant to Public Notice of Application CENWS-PMP-21-06 Seattle, WA for WAC 173- 201A-210:

- Turbidity applicable criteria:
  - Point of Compliance (POC) is 150 feet down-current of any in-water activity (i.e., work behind temporary cofferdams).
  - Turbidity readings at the POC shall not exceed 5 NTU (nephelometric turbidity units) over background when the background is 50 NTU or less, or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
  - Visual turbidity anywhere at or past the POC from the activity shall be considered a possible exceedance of the standard and shall be verified through measured turbidity sampling.
- pH applicable criteria:
  - The State of Washington water quality standards do not specify a POC for pH so the U.S. Army Corps of Engineers (Corps) has determined that the pH will be monitored near the point of concrete work and curing that takes place behind the temporary cofferdam (i.e., any water within the cofferdam) and any discharge.
  - pH readings must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.2 units.
- Petroleum Sheen:
  - Visual monitoring throughout the project area for the duration of construction.

Background Conditions:

- The contractor will take background measurements of turbidity using a water quality meter (HydroLab or similar) as close as possible in time to the start of concrete work and potential turbidity generating activities such as installing a temporary cofferdam. Background measurements will coincide as close as possible in time with each measurement taken at the POC. Determination of background water quality conditions will be made according to the following:
  - The contractor will calibrate the water quality meter with standardized samples prior to the start of each day's monitoring, per the manufacturer's specifications.
  - The contractor will collect samples in the large lock at a location that will accurately represent background conditions. The contractor will determine the precise location that accurately represents background levels to acquire the samples.

- The contractor will collect samples at mid-depth at the background monitoring location.

Frequency of Monitoring:

- The contractor will monitor for turbidity daily, every four hours, during daylight hours only, for concrete work or other potential turbidity-generating work. No monitoring will occur before sunrise or after sunset unless authorized by the Corps.
- Turbidity monitoring will correspond with (1) slack tide and (2) strong ebb or flood tidal conditions to the extent that these times adequately reflect periods of concrete work or other potential turbidity-generating work, and occur during daylight hours.
- The contractor will operate construction equipment for at least one hour prior to the collection of water quality samples for turbidity monitoring to ensure samples are reflective of turbidity conditions during active operations.
- The contractor will monitor for pH during concrete work and curing. The contractor will provide a water quality meter (HydroLab or similar).
- The contractor will monitor for pH during concrete work and curing, and occur during daylight hours if the water quality meter is deployed from a boat. The Corps will approve night monitoring if work takes place at night.

Sampling Approach:

- The contractor shall establish water quality conditions according to the following:
  - The contractor shall measure turbidity and pH with a meter (HydroLab or similar), under the conditions described above to ensure readings and observations are reflective of active periods of concrete work and curing, and during other potential turbidity-generating work.
  - The contractor shall verify the calibration of the meter and calibrate as necessary with standardized samples prior to the start of each day's monitoring, per the manufacturer's specifications.
  - The contractor will take samples at mid-depth of the water column.
- The POC for turbidity for a temporary area of mixing shall be at a radius of one hundred fifty feet from the activity causing the turbidity.
- The State of Washington water quality standards do not specify a POC for pH so the Corps has determined that the contractor will monitor pH near the point of concrete work and curing that takes place behind the temporary cofferdam and any discharge of water, if applicable (e.g., from the cofferdam and/or a treatment container).
- Monitoring points shall be at the turbidity background monitoring point, at the turbidity POC, (a one hundred fifty foot radius from the activity), and as close to the concrete work as possible for pH monitoring.
- Samples taken by the contractor at the POC shall be adjusted within the depth range to target the turbidity plume which will be tracked visually. If no distinct turbidity plume can be identified within the depth range, the samples will be taken at the mid-depth.
- The contractor will compare turbidity samples taken at the POC to background levels at mid-depth to determine compliance with water quality standards.
- The contractor will take samples for pH as close to the concrete work as possible (i.e., behind the cofferdam) and at any discharge of water, if applicable (e.g., from the cofferdam and/or a treatment container), for the pH POC to determine if a change of 0.2 units or more occurs.

- Upon completion of the instrument measured monitoring days, the contractor shall send the monitoring data report daily to the Corps within 24 hours of completion of monitoring activity.
  - If there are exceedances in water quality, the contractor shall continue monitoring following the steps listed in “Exceedances and Exceedances Protocol.”
- The contractor shall continue to monitor and record (written) daily visual turbidity monitoring at the POC during construction. At any point, if visual monitoring indicates a turbidity plume, the contractor shall take a physical reading to confirm/verify if an exceedance has occurred. If an exceedance is confirmed/verified through physical monitoring, the exceedance protocol listed below shall be followed.

Monitoring Locations:

- The contractor will take samples at mid-depth of the water column.
- The POC for turbidity shall be at a radius of 150 feet from the activity causing the turbidity.
- The State of Washington water quality standards do not specify a POC for pH, so the Corps has determined that the contractor will monitor pH near the point of concrete work and curing that takes place behind the temporary cofferdam and at any discharge point of water, if applicable.
- The contractor will use monitoring points at the turbidity background monitoring point, at the turbidity monitoring POC (which is 150-foot radius from the activity), constant visual monitoring for sheen in the entire project area, and near the point of concrete work and curing that takes place behind the temporary cofferdam.
- The contractor will adjust samples taken at the turbidity POC and pH monitoring location to the depth range to target any turbidity plume, which will be tracked visually. If no distinct turbidity plume can be identified within the depth range, the contractor will take samples at the mid-depth.
- The contractor will compare turbidity samples taken at the POC to turbidity background levels at mid-depth to determine compliance with water quality standards.

Exceedances and Exceedance Protocol:

- If measurements taken at the POC location show recorded turbidity is greater than 5 NTU over background where the background is less than 50 NTU, or if more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU, occurring at the POC, the contractor will immediately notify the Corps and, assuming construction continues, will continue to monitor per the exceedance protocol below.
- The contractor shall be responsible for immediately notifying the Corps’ Project Engineer of any exceedance of the turbidity or pH standard, or of any visible petroleum sheen.
- If measurements taken at the pH monitoring location(s) show recorded pH has varied more than 0.2 units from the background, which will be within the range of 7.0 to 8.5, the contractor will immediately notify the Corps and, assuming construction continues, will continue to monitor per the exceedance protocol below. Water behind the cofferdam that varies more than 0.2 units from background shall not be discharged to surface waters; instead, this water will be collected and treated so that the pH standard is not exceeded before being discharged.
  - In response to a pH exceedance, work will stop so that water can be collected from behind the cofferdam and treated. The work stoppage will be coordinated so that it can be done safely for the contractor without releasing concrete into the water column, and without compromising previously poured concrete.

Step 1: Verification of the problem

- If monitoring indicates an exceedance in turbidity or pH levels, the contractor will immediately take another series of samples (top, mid-depth, and bottom of water column, if outside the cofferdam) in the same location.
- If the exceedance still exists ('strike one'), then the contractor must take another series of samples at the background station at the same time as the POC or as close in time as possible to samples taken at the POC to determine if the exceedance is caused by the construction activities or by a change in background conditions (for example due to a heavy rainfall event).
- If monitoring indicates a petroleum sheen in the project area, the contractor must locate the source of the sheen and deploy oil-absorbent materials.
- The contractor must notify Corps' Project Manager or Project Biologist by telephone as soon as possible after there has been a measured exceedance.
- The Corps will then verify with the contractor that a measured exceedance occurred and request that best management practices (BMPs; listed at the end of this document), as appropriate and applicable, be implemented by the construction contractor to reduce turbidity and return pH within acceptable limits. The BMP for a pH exceedance is to collect and treat the water so that the pH limit is not exceeded prior to discharge.

Step 2: Increased monitoring

- If a pH exceedance is recorded, the contractor will begin capturing and treating the cofferdam discharge water to return it to a pH within 0.2 units of background. The contractor will continue to monitor the water inside the cofferdam and water to be discharged after treatment.
- The contractor will take another sample no more than one (1) hour after the turbidity exceedance is recorded to verify the construction activities operation has been altered to reduce the exceedance to within acceptable limits.
- If the second sample, taken 1 hour later, still shows a turbidity exceedance ('strike two'), the contractor must immediately notify the Corps' Contracting Office, Project Manager, or Project Biologist by phone that there is still a measured exceedance.
- The Corps will review BMPs in place and request that all BMPs possible be implemented to reduce turbidity within acceptable limits. The BMP for a pH exceedance is to immediately begin to collect and treat the water so that the pH limit is not exceeded prior to discharge.
- Finally, the contractor will take a third sample no more than two (2) hours after the first turbidity exceedance is recorded.
- If the contractor deploys oil-absorbent materials for a petroleum sheen, the Corps' Project Manager or Project Biologist must be notified by telephone, by the contractor as soon as possible after there has been a visible sheen. The contractor will monitor the project area to confirm the source of the sheen was eliminated and that the oil control measures are working.

Step 3: Stop construction activities

- If the third sample, taken two (2) hours later, still shows a turbidity exceedance ('strike three'), the contractor will immediately notify the Corps' Contracting Office, Project Manager or Project Biologist and the Corps will order the contractor to stop work. The Corps will then notify Ecology of the situation.

- If a petroleum sheen source is not located or is not controlled by oil-absorbent materials, or if the sheen is coming from upstream, the contractor will immediately notify the Corps' Contracting Office, Project Manager, or Project Biologist and the Corps will order the contractor to stop work. The Corps will then notify Ecology of the situation.

Step 4: Continued sampling until compliance is achieved

- After the contractor has stopped work, the contractor will collect samples at hourly intervals until turbidity and pH levels in discharge water and/or in the large lock return within acceptable limits. The contractor should identify any source of petroleum creating a sheen and controlled with oil-absorbent materials.
- Once compliance has again been achieved, the contractor will resume work upon the direction of the appropriate Corps official.
- The Corps' Project Manager or Project Biologist will notify Ecology that work has resumed.
- The normal schedule of water quality sampling will resume as per specific requirements above.

Step 5: Reporting

- The Corps' Contracting Officer, Project Manager or Project Biologist will report any exceedances and/or shutdowns to Ecology to fednotification@ecy.wa.gov within 24 hours, referencing the project name, project location, project contact, and project phone number, activity, and monitoring results.
- The contractor will document any shutdowns with an incident report to the Corps, which will be transmitted to Ecology by email within two working days of the incident.
- The contractor will prepare the incident report, which will document any exceedances and will include the date, time, location, activity, water quality data collected, the nature of the event, name of person collecting the data, names of persons notified of the exceedance, summary of how the exceedance was resolved according to the above protocol such as what corrective action taken and/or planned, steps to be taken to prevent a recurrence, and any other pertinent information.
- Incident reports will be transmitted to the Corps' Contracting Officer, Project Manager or Project Biologist within 24 hours of the exceedance.
- The Corps will submit water quality monitoring data to Ecology on a weekly basis.
- Evaluate potential new BMPs in addition to those listed below.

Responsibility and Communication Plan:

- The Corps will notify Ecology at least 10 days prior to start of work and at least seven days within project completion.
- The Corps will oversee turbidity and pH monitoring conducted by the contractor.
- The Corps will be responsible for coordinating with Ecology and submitting the Turbidity Monitoring Reports and data provided by the contractor.
- The Corps will notify Ecology within 24 hours if an exceedance occurs.
- The Project Manager and Contracting Officer will coordinate with the contractor.
- The contractor will use the Corps-provided Sampling Form unless otherwise approved by the Corps.
- The contractor shall provide turbidity and pH monitoring data to the Corps daily.

- The contractor shall notify the Corps within 30 minutes of a confirmed exceedance and follow required notifications per exceedance protocols.
- The contractor will provide a contractor Point of Contact to the Corps.
- The Corps Points of Contact for turbidity and pH monitoring will be the Project Engineer (to be identified), Stephanie McKenna, Project Manager (206-764-6081), and Katie Whitlock, Project Biologist/Environmental Coordinator (206-764-3576).
- The Ecology Point of Contact is Rebekah Padgett, Federal Permit Coordinator, (425-365-6571; Rebekah.Padgett@ecy.wa.gov).
- The Corps will send official reporting of any incidents to the Ecology Point of Contact (Rebekah.Padgett@ecy.wa.gov) AND to the fednotification@ecy.wa.gov inbox.
- Work causing distressed or dying fish, discharges of oil, fuel, or chemicals into state waters or onto land with a potential for entry into state waters, is prohibited. The Locks Project Biologist/Environmental Compliance Coordinator is responsible for spill reporting and response. If such work, conditions, or discharges occur, the Corps shall notify Ecology and immediately take the following actions:
  - The Corps will notify the contractor to cease operations at the location of the non-compliance.
  - The contractor and Corps will assess the cause of the water quality problem and the contractor will take appropriate measures to correct the problem and/or prevent further environmental damage.
  - In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, the contractor will begin containment and cleanup efforts immediately to be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of any spilled material and used cleanup materials.
  - The Corps will immediately notify Ecology's Regional Spill Response Office at 425-649-7000 and the Washington State Department of Fish and Wildlife with the nature and details of the problem, any actions taken to correct the problem, and any proposed changes in operation to prevent further problems.
  - The Corps will immediately notify the National Response Center at 1-800-424-8802, for actual spills to water only.
  - The Corps will notify Ecology's Regional Spill Response Office at 425-649-7000 immediately if chemical containers (e.g., drums) are discovered on-site or any conditions present indicating disposal or burial of chemicals on-site that may impact surface water or ground water.

General Best Management Practices (BMPs) for Water Quality

- Vegetable oil will be used in machinery stationed on a boat or barge.
- The contractor will not refuel equipment such as generators and forklifts in the project area (i.e., the lock chamber) and spill containment trays will be used during refueling. The contractor will refuel vessels offsite in accordance with applicable regulations.
- The contractor will prevent any petroleum products, chemicals, or other toxic or deleterious materials from construction equipment and vehicles from entering the water.
- The contractor will regularly check fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. for leaks, and will maintain and store materials properly to prevent spills. The contractor will provide a schedule for these checks.
- The contractor will contain wash water resulting from wash down of equipment or work areas for

proper disposal and will not discharge wash water into state waters unless authorized through a state discharge permit.

- The contractor will maintain equipment that enters the surface water to prevent any visible sheen from petroleum products appearing on the water.
- There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.
- The contractor will not discharge cleaning solvents or chemicals used for tools or equipment cleaning to ground or surface waters.
- The contractor will be required to submit a spill prevention control and countermeasures (SPCC) plan prior to the commencement of any construction activities, including spills of concrete. The SPCC plan will identify and recognize potential spill sources at the site, outline best management practices and secondary containment, delineate responsive actions in the event of a spill or release, and identify notification and reporting procedures. Implementation of the SPCC plan will minimize the effect of construction activities on the quality of surrounding waters.
- The contractor will be required to submit a stormwater pollution prevention plan (SWPPP) prior to construction using best management practices pursuant to the most recent City of Seattle Stormwater Manual dated August 2017 (https://web6.seattle.gov/DPD/DirRulesViewer/Rule.aspx?id=17-2017) to control stormwater impacts during construction.
- A spill containment kit, including oil-absorbent materials will be kept on-site during construction in the event of a spill or if any oil product is observed in the water. If a spill was to occur, will be stopped immediately, steps will be taken to contain the material, and appropriate agency notifications will be made.

BMPs specific to the control of pH and turbidity

- Water to be discharged from the temporary cofferdam must meet water quality standards; otherwise, the contractor will collect and treat water before discharging to the waterway.
- The contractor will allow concrete to cure before rewatering the area.
- The contractor will regularly check all equipment from the source of concrete to placement locations, including hoses, hose clamps, drums, secondary containment berms, pans, and other containment, transfer valves, fittings, forms, grout bags, etc. for leaks, on land and in-water, and will maintain and store materials properly to prevent spills. The contractor will provide a schedule for these checks.
- The contractor will monitor for visual turbidity plumes and discharge during in-water work. If turbidity is identified, turbidity monitoring and pH monitoring locations will be adjusted to capture the plume (as described in “Sampling Approach” above).
- The contractor will use secondary containment for all equipment on land and on boats or barges with the potential to discharge a pollutant. This includes mechanical equipment, concrete pumping or mixing equipment, etc.
- The contractor will identify all concrete washout locations. Washout on-site will not be allowed to enter water or be dumped on land, and will not be within 50 feet of storm drains, open ditches, or waterbodies. The contractor will contain washout in leak-proof containers for proper recycling, treatment, and/or disposal. If washout is disposed of at a municipal wastewater treatment plant, the contractor will contact the plant so that any pretreatment requirements can be followed.
- The contractor will capture and contain concrete process water and waste. Discharge of concrete process water or waste materials to the ground or surface waters will not be allowed.

- All material that is removed from the water (concrete blocks, material lifted from scoured areas, etc.) will not be returned to the water. The contractor will properly contain material with a berm, pan, or other structure when on a boat and on land so that materials and water associated with materials cannot return to the water.
- The contractor will establish transfer locations to move materials removed from the large lock (e.g., concrete removed from the lock wall) to land for disposal to confine any accidental spillage and prevent the release of materials back into the water. The contractor will clean up any spilled materials immediately. The SWPPP submitted by the contractor will describe applicable BMPs at the transfer location.
- The contractor will clean equipment prior to construction so that it is free of external petroleum-based products while used around the waters of the state. The contractor will remove accumulation of soils or debris from the drive mechanisms (wheels, tires, tracks, etc.) and the undercarriage of equipment prior to its use.
- The contractor will retrieve any debris generated during construction with a skiff and net. Retrieval will occur at slack tide or when current velocity is low.

Sampling Form for In-Water Work

Cover Page

Please refer to the Water Quality Monitoring Plan (WQMP) for detailed instructions. Important WQMP details include the following:

- Use a new sampling form each day.
- Use this sampling form unless otherwise approved by the U.S. Army Corps of Engineers.
- Sheen presence should be constantly monitored for and reported immediately. Any source of petroleum creating a sheen must be identified, controlled with oil-absorbent materials, and reported as described in the WQMP.
- Turbidity is measured at mid-depth of the water column or within a visible plume (this depth will change with the tide)
    - Turbidity point of compliance is one hundred fifty feet from the turbidity-causing activity.
    - Turbidity readings 150 feet from the construction activity should be < 5 nephelometric turbidity units (NTU) over a background of ≤ 50 NTU or < 10% over a background of ≥ 50 NTU.
- pH is monitored outside of the cofferdam (if applicable) and as close to concrete work as possible.
    - pH should be 7.0 to 8.5 with a human-caused variation of less than 0.2 units.

Sampling Form for In-Water Work

Date:_____Project:_____

Name of Person Sampling: _____

Date of last calibration for Turbidity Meter: _____

Date of last calibration for pH meter: _____

Activity Start Time: _____ Activity Stop Time: _____

Turbidity Meter and/or pH Meter Location(s) **Identify if this is a background or compliance point.**	**Time**	**Turbidity (NTU)**	**pH**	**Sheen observed at any point today? (Y/N)**	**Notes (Compare to background turbidity as applicable, weather, construction activities at the time, if equipment is working properly, action taken to identify or stop sheen as applicable)**

Turbidity Meter and/or pH Meter Location(s) Identify if this is a background or compliance point.	Time	Turbidity (NTU)	pH	Sheen observed at any point today? (Y/N)	Notes (Compare to background turbidity as applicable, weather, construction activities at the time, if equipment is working properly, action taken to identify or stop sheen as applicable)

DEPARTMENT OF THE ARMY
U.S ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH BLDG 1202
SEATTLE, WA 98134-2388

October 13, 2021

Planning, Environmental, and Cultural Resources Branch

[redacted]

Subject: Tribal Notification and Review for Hiram M. Chittenden Locks Large Lock Center Gate (LLCG) Project in King County, Washington

Dear [redacted]

The U.S. Army Corps of Engineers, Seattle District (USACE) proposes to rehabilitate or replace the large lock center gates (LLCG) at the Hiram M. Chittenden Locks (Locks) to address wear and design issues. This letter is intended to provide notification ahead of the National Environmental Policy Act (NEPA) public notice and to request review and comments from the [redacted] as USACE moves forward with planning and designing this action.

The LLCG, commissioned in 1917, is over 100 years old. The center gate is used to divide the large lock chamber into two smaller chambers. This configuration allows for quicker and more water efficient lockings, and it provides redundancy for the large lock by allowing vessel transit in half the lock if either the upstream or downstream gates were to malfunction. The center gate is also used by pedestrians and staff to cross the large lock chamber, as it is the quickest route across the facility.

The LLCG does not meet current design standards and has exceeded its functional lifespan. Recent inspection shows the gate has excessive corrosion and wear. In addition, the two leaves (i.e., two halves of the gate that swing towards the middle of the lock to close) of the LLCG are a double skin design with internal buoyancy chambers. The double skin design presents a major challenge for inspections because the interior components of the gate cannot be visually inspected without staff entering the chambers, which are confined spaces and high hazard workspaces. The inability of maintenance staff to thoroughly inspect the condition of the gates, and the difficulty of performing maintenance within the inner chambers, creates a potential for gate failure without advance warning. Depending on the type of failure, loss of LLCG function would have negative impacts on navigation and to upstream communities from unexpected and potentially indefinite large lock closures or delays. The purpose of this project is to

maintain efficient navigation through the large lock and facilitate routine visual maintenance inspections of the LLCG.

In accordance with NEPA, the USACE is preparing an Environmental Assessment (EA) in 2021 to evaluate the environmental effects of the proposed LLCG project beginning as early as Fall 2022. The EA describing the alternatives and anticipated effects will be circulated to solicit comments from interested persons, groups, tribes, and agencies on the proposed action under NEPA. We would like to offer the [redacted] the opportunity to review the proposed alternatives and solicit your input regarding tribal resources considerations prior to release of the EA.

The EA will contain an analysis of two action alternatives compared to taking an alternative of no action. Several action alternatives related to gate design were also considered but removed from further evaluation. In-water work would occur October 15 -February 15 for the project duration, which is up to four years of intermittent work while the LLCG is being rehabilitated or assembled. The in-water work window minimizes overlap with adult salmon migration and avoids the typical juvenile smolt outmigration period. Following is a summary of the alternatives that will be evaluated in the EA.

In Alternative 1 (No Action), there would be no repair to the gate or associated components; wear, corrosion, and deterioration of the system would continue unchecked on the LLCG, which is beyond its functional lifespan. Should the gate or its components fail, and the gate leaves could not be moved to the side of the lock chamber into recesses on each wall, the large lock would be closed indefinitely until repairs can be made or the center gate removed from the lock. There is no known duration for a lock outage for emergency repairs or gate removal. It is anticipated that the required mobilization and repair time would severely disrupt navigation and the maritime industry in Seattle. In addition, as discussed above the current gate design does not allow inspection and maintenance within the confined spaces of the buoyancy chambers and increases the risk of losing the redundancy of the large lock gates. This alternative does not meet the purpose and need because it does not reliably or efficiently maintain navigation and the LLCG would remain difficult to visually inspect; therefore, this is not an acceptable alternative but is carried forward for comparison purposes.

Under Alternative 2 (Rehabilitate Center Gate), rehabilitation of the gates and associated components would be performed to fix components that are experiencing deterioration. The two gate leaves would be removed, likely by crane or floated out of the lock chamber and taken to an offsite facility for rehabilitation. Upon completion, the leaves would be returned to the lock and reinstalled. Alternative 2 takes less

construction time than Alternative 3 because the gate connections to the lock wall would not require modification (Table 1, enclosed). Alternative 2 does not meet the purpose or need because it does not meet current safety standards and the LLCG would remain hazardous to visually inspect; therefore, this is not an acceptable alternative.

Alternative 3 (Replace Center Gate) would maintain the functional integrity of the LLCG by replacing and modernizing the center gate and associated components connecting the gate to the lock walls. This alternative replaces the center gate and associated components with modern equipment designed to have a lifespan of 100 years or more. Other gate types from the double-skinned gate design were considered and, following existing project research and modelling during design, a single-skinned, horizontally framed miter gate was selected due to several factors: gate weight, complexity of constructing a new gate, long-term maintenance, and cost (Figure 1). Gate replacement would necessitate redesign and installation of the associated gate connections to the lock wall. Alternative 3 meets the purpose and need by maintaining reliable and efficient navigation through the large lock, meeting current design standards, and allowing visual inspections without requiring entry into confined spaces.

Construction would be completed with lock outages while dewatering and/or with temporary cofferdam use. Large lock outages would be timed approximately when the large lock is dewatered annually in the fall for maintenance and within the in-water work window. Each dewatering event would not exceed 30 consecutive days. Timing of outages will consider the importance of minimizing disruption to navigation. Between each dewatering there would be a navigation period of at least 15 consecutive days. Based on those parameters it is estimated there could be one to three outages per year between October 15 and February 15. Due to construction scheduling, there could be up to 90 consecutive days of temporary cofferdam use on either side of the large lock chamber with only one cofferdam used at one time.

Given in-water work window constraints and gate fabrication time frames, the total project duration is estimated to take about four years to complete. Construction would occur intermittently over this duration to accommodate in-water work windows and navigation needs. Construction activities for the use of cofferdams and dewatering events are divided into several work periods to allow the large lock to remain open to navigation during certain construction events when it is safe, and to minimize impacts to navigation (Table 2, enclosed). These work periods are classified as:

- Navigation **Restriction** Periods: Navigation use of the lock chamber would be prohibited while workers are inside the cofferdam to allow safe work inside the temporary structure. At a minimum, vessels would be allowed to transit the lock

chamber from 5:00 pm to 6:00 am, with a width restriction to vessels smaller than 65 feet in place to avoid potential collision with the temporary cofferdam.

- Navigation **Closure** Periods: No vessels may use the large lock chamber. At this time, the total duration of any given closure is not anticipated to exceed 30 days, with at least 15 days between outages. The final duration would be determined by USACE based on feedback from the Maritime community and the public, and contractor proposals.
- Navigation **Passage** Periods: Normal navigation is allowed.

If used, a temporary cofferdam would be placed on one large lock wall, secured to the lock wall, dewatered with pumps, and then construction activities performed in the dry (Figure 2 through Figure 4). Divers may assist with installation if it occurs while the lock is fully watered. If temporary cofferdams are not used, Navigation Restriction Periods would not be needed. If temporary cofferdams are used, in addition to the Navigation Restriction Periods, there would be a need for Navigation Closure Periods for removal and installation of the LLCG. Water quality will be monitored for turbidity and pH during construction behind a temporary cofferdam.

Construction duration would depend on construction methods selected by the contractor; however, constraints for lock outages and cofferdams would be required as articulated in contracting documents. The exact construction method and associated schedule are not known until a contractor is chosen. Once finalized, a Notice to Mariners would be published alerting vessel operators to large lock closures and restrictions, in addition to other public communications on the USACE website, Locks Facebook page, and stakeholder meetings. The USACE would notify the Tribe of construction schedule developments as part of ongoing project coordination.

To complete the work within required in-water work period (October 15-February 15), minimize impacts to navigation, and assure the large lock ready for customary use, multiple work shifts may be required, including 24 hours a day, as well as seven days per week. All construction activities would comply with local noise and light ordinances and noise variances would be obtained as needed. An example construction schedule appears below incorporating either a combination of closures/cofferdams or just closures (Table 2, enclosed).

USACE is requesting comments on the proposed Locks LLCG project. We are interested in your comments and will fully consider any comments we receive. A copy of this letter has been sent to [redacted], Natural Resources Director and [redacted], Assistant Director of Harvest Management Division. To reply with comments or to request any additional information about this project, please contact Ms. Katie Whitlock at (206) 764-3576 or kaitlin.e.whitlock@usace.army.mil. For assistance with general information regarding tribal coordination, or to schedule a Government-to-Government meeting, please contact Ms. Lori Morris at (206) 764-3625 or frances.morris@usace.army.mil.

Sincerely,

Enclosure

Laura A. Boerner, LG, LHG
Chief, Planning, Environmental & Cultural Resources Branch

References

McDowell Group. 2017. Economic impacts of the Chittenden Locks. Prepared for Lake Washington Ship Canal Users Group. June 2017. Online at: https://www.mcdowellgroup.net/wp-content/uploads/2017/06/ballard-locks economic-impacts.pdf. Accessed May 24, 2021.

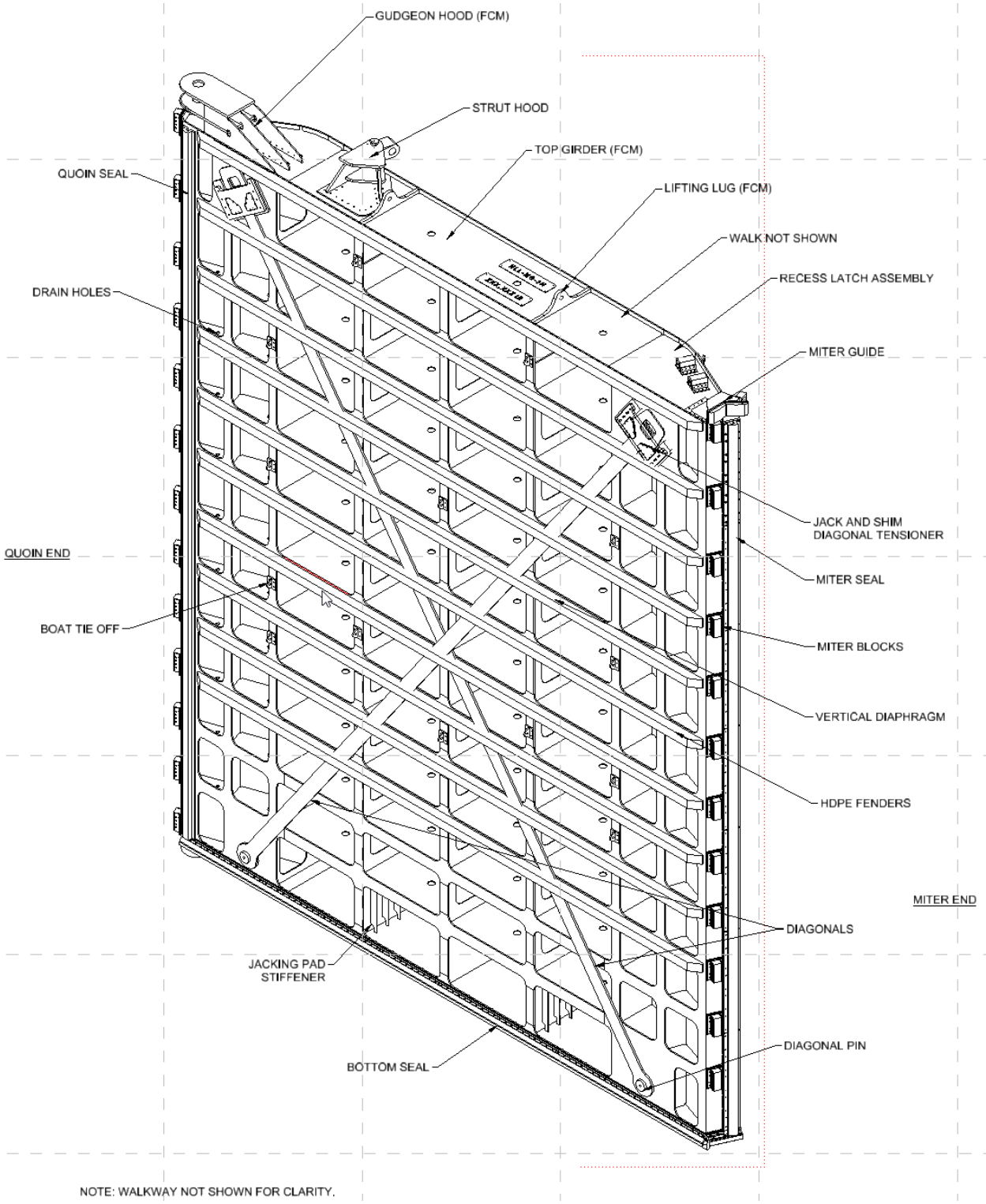


Figure 1. Replacement gate designed for Alternative 3.

Figure 2. Localized cofferdam example.

Figure 3. Example of an installed localized cofferdam.

Figure 4. Example of the inside of a localized cofferdam.

Table 1. Example schedule of proposed Alternative 2 (Repair Center Gate) work periods. All durations are approximate.

Construction Activities	Construction Activities and Potential Work Period(s)
Modify the existing center miter gates by installing hardware connections to allow removal of the gates, as necessary. The following work would be performed: a. Remove gate leaves b. Install fender system in both gate recesses	Navigation **Closure** Period 2023 Approximate Duration: 15 days (October 15-February 15) Work in lock is unrestricted. The large lock would be closed to vessels.
The following work would be performed at an off-site location: Rehabilitation of the center miter gates	Navigation **Passage** Period 2023 Approximate Duration: 2 years Unrestricted navigation.
The following work would be performed: a. Remove fender system from miter gate recesses b. Install rehabilitated gate leaves	Navigation **Closure** Period 2025 Approximate Duration: 15 days (October 15-February 15) Work is unrestricted. The large lock would be closed to vessels.

Table 2. Example schedule of proposed Alternative 3 (Replace Center Gate) construction with temporary cofferdams and large lock dewaterings. All durations are approximate.

Construction Activities	Construction Activities and Potential Work Period(s)
Modify the existing center miter gates by installing hardware connections to allow removal of the gates via crane, if necessary. Erect a heavy lift crane over the large lock, if necessary, and remove the existing gate leaves. Once the gate leaves are removed, the work would happen in a fully dewatered lock chamber, within a localized cofferdam, or a combination of both. A cofferdam can be installed while the large lock is dewatered or in water, which requires diver assistance. If	Navigation **Closure** and/or **Restriction** Periods 2023 (In-water work window 2023-2024) A combination of the following closures and/or restrictions may be needed for multiple combinations of dewatering and/or temporary cofferdam use. **Closure** Period Duration: Multiple 30-day dewaterings with at least 15 days of navigation in between each outage

Construction Activities	Construction Activities and Potential Work Period(s)
used, a cofferdam would be installed on the wall where gate appurtenance work (quoin, pintle, etc.) is scheduled to be performed during this in-water work period. A cofferdam could remain in place for up to 90 consecutive days, and then be removed. Fender systems would be installed in the miter gate recesses at the end of the in-water work period to reduce the risk of damage to new or existing features during navigation passage until the following in-water work period. The crane would be disassembled. All equipment and materials, except the localized cofferdam, would be removed from the large lock chamber to allow navigation with a width restriction 5:00 pm to 6:00 am. Navigation with a width restriction would be allowed if workers are not inside the cofferdam.	Unrestricted work daily. The large lock routine annual maintenance dewatering event would be part of this closure period. Dewatering includes time for USACE to perform the dewatering (approximately 3 days) and rewatering (approximately 2 days) of the large lock. **Restriction** Period Duration: Up to 90 days of work behind a temporary cofferdam Unrestricted work from 7:00 am to 5:00 pm daily Navigation is allowed in the Large Lock from 5:00 pm to 6:00 am, with a width restriction (65 feet), when workers are inside the cofferdam.
All equipment and materials would be removed from the Large Lock to allow unrestricted navigation traffic without a width restriction through the Large Lock.	Navigation **Passage** Period 2024 Duration: Falls between 2023 and 2024 in-water work windows, which are October 15-February 15 of each year. Unrestricted Navigation.
The fender system would be removed, likely by crane, so construction can occur. Construction would take place while the large lock is dewatered, within a localized cofferdam, or a combination of both. If a cofferdam is used, it would separate the work area from the water. then A cofferdam can be installed while the large lock is dewatered or in water, which requires diver assistance. A temporary cofferdam could remain in place for up to 90 consecutive days. Fender systems would be re-installed	Navigation **Closure** and/or **Restriction** Period 2024 (In-water work window 2024-2025) A combination of the following closures and/or restrictions may be needed. **Closure** Period Duration: Multiple 30-day dewaterings with at least 15 days of navigation in between each outage. The large lock would be closed to vessels during the

Construction Activities	Construction Activities and Potential Work Period(s)
at the end of the in-water work period to reduce the risk of damage to new or existing features during navigation passage until the following in-water work period. All equipment and materials, except the localized cofferdam, would be removed from the Large Lock to allow navigation with a width restriction 5:00 pm to 6:00 am.	Navigation Closure Period. Unrestricted work daily. The large lock routine annual maintenance dewatering event would be part of this closure period. This period includes time for USACE to perform the dewatering (approximately 3 days) and rewatering (approximately 2 days) of the large lock. **Restriction** Period Duration: Up to 90 days of work behind a temporary cofferdam (if used). Unrestricted work from 7:00 am to 5:00 pm daily. Navigation would be allowed in the Large Lock from 5:00 pm to 6:00 am, with a width restriction (65 feet).
All equipment and materials would be removed from the Large Lock to allow unrestricted navigation traffic without a width restriction through the Large Lock.	Navigation **Passage** Period 2025 Duration: Falls between 2024 and 2025 in-water work windows, which is October 15-February 15 of each year. Unrestricted Navigation.
Complete any work from the previous closure and/or restriction periods that may not have been completed. Re-install the fender system on both sides of the lock wall. The fender system can be installed in the wet or the dry and would require dive operations if installed in the wet. Fender system would remain in place until the gates are delivered and ready for installation during the next in-water work period.	Navigation **Closure** Period 2025 (In-water work window 2025-2026) Duration: Multiple 30-day dewaterings with at least 15 days of navigation in between each outage Unrestricted work would occur during the Navigation Closure Period. This includes time for USACE to perform the dewatering (approximately 3 days) and rewatering (approximately 2 days) of the large lock.
All equipment and materials would be removed from the Large Lock to allow	Navigation **Passage** Period 2026

Construction Activities	Construction Activities and Potential Work Period(s)
unrestricted navigation traffic without a width restriction through the Large Lock.	Duration: Falls between 2025 and 2026 in-water work windows, which is October 15-February 15 of each year. Unrestricted Navigation.
LLCG delivery would occur and be ready for installation. All testing (e.g., fit and function of the LLCG and controls) associated with LLCG would be completed during this period. Erect a heavy lift crane. Remove the fenders from both sides of the large lock miter gate recesses in the wet. Install the gates with the large lock fully watered and connect the gate anchorages and machinery to the new miter gate leaves. The lock chamber would be dewatered to perform miter gate sill work and adjust/commission the LLCG. The crane would be removed from service to prepare the lock chamber for rewatering and normal customary use of the lock. All equipment would be removed from the large lock and the chamber would be rewatered.	Navigation **Closure** Period 2026 (In-water work window 2026-2027) Duration: Multiple 30-day dewaterings with at least 15 days of navigation in between each outage Unrestricted work daily. This closure period includes the annual large lock dewatering maintenance. This includes time for USACE to perform the dewatering (approx. 3 days) and rewatering (approx. 2 days) of the large lock. After this closure period, the gates would be fully functional, and no further construction would be needed.