US Army Corps of Engineers
Seattle District

NOTICE OF PREPARATION/CLEAN WATER ACT PUBLIC NOTICE

Planning, Environmental and Cultural Resources Branch
P.O. Box 3755
Seattle, WA 98124-3755
ATTN: Amanda Ogden (PMP-C)

Public Notice Date: April 1, 2021
Expiration Date: May 3, 2021
Reference: PMP-21-01
Name: Skagit River Diking Districts 3 and 12 Levee Rehabilitation

Interested parties are hereby notified that the U.S. Army Corps of Engineers, Seattle District (Corps) plans to prepare, pursuant to the National Environmental Policy Act (NEPA), an environmental assessment (EA) for proposed and previously completed levee repairs to the Skagit Diking District (DD) 3 and 12 Levees, Skagit County, Washington. Emergency work was completed to the DD 12 levee in February 2020, and further repair is expected to be conducted in 2021. Repairs are intended to rehabilitate existing flood control works that address damage caused during storm events and flooding occurring in February 2020 on the Skagit River. The purpose of this Notice is to solicit comments from interested persons, groups, and agencies on the Corps' proposed action under NEPA.

A further purpose of this Notice is to solicit comments on the proposed disposal of fill material into the waters of the U.S. under the Clean Water Act. This Public Notice is being issued in accordance with rules and regulations published as 33 CFR 335 "*Operation and Maintenance of Army Corps of Engineers Civil Works Projects Involving the Discharge of Dredged or Fill Material into Waters of the U.S. or Ocean Waters*"; 33 CFR 336 "*Factors to be Considered in Evaluation of Army Corps of Engineers Dredging Projects Involving the Discharge of Dredged Material into Waters of the U.S. and Ocean Waters*"; 33 CFR 337 "*Practice and Procedure*"; and 33 CFR 338 "*Other Corps Activities Involving the Discharge of Dredged Material or Fill into Waters of the U.S.*"

AUTHORITY

The proposed levee repair is authorized by Public Law 84-99 (33 U.S. Code Section 701n), Flood Control and Coastal Emergency Act. The Corps' rehabilitation and restoration work under this authority is limited to flood control works damaged or destroyed by floods. The statute authorizes rehabilitation to the condition and level of protection exhibited by the flood control work prior to the damaging event.

PROJECT LOCATION AND DESCRIPTION

The Skagit County DD 3 Main levee is located on the left bank of the Skagit River near Mt. Vernon, Washington. It is roughly 43,800 feet long and is the upstream portion of a 3-segment system. In its undamaged state, the levee provides a 50-year level of protection (LOP) to the City of Mt. Vernon and surrounding agricultural areas. The Skagit County DD 12 levee is located on the right bank of the Skagit River near the town of Burlington, in Skagit County, Washington. It is approximately 6.4 miles long and is the upstream segment of a 3-segment system that

protects urban, residential, commercial, agricultural, and public lands. In its undamaged state, it provides a 50-year level of protection to the town of Burlington and surrounding areas. Skagit County DD 3 and DD 12 are the local non-Federal sponsors for the proposed levee repair projects.

The first week of February 2020 brought an atmospheric river event into the Pacific Northwest. Not only did this event bring copious amounts of rain to Washington, but it brought with it warmer temperatures and higher snow levels. Combining the heavy rainfall with rapid snowmelt caused flooding issues across Washington, with some places exceeding record values. While the Skagit River was spared the more extreme flooding, a smaller discrete event occurred. The Skagit River exceeded flood stage in early February 2020. Significant precipitation resulted in a sustained river levels above Phase 1 flood stage for 1 day (February 1 into February 2). Based on flow analysis at the USGS gage on the Skagit River near Mt. Vernon (USGS 12200500), this was approximately a 40 percent annual chance exceedance (ACE) event (2.5-year return period).

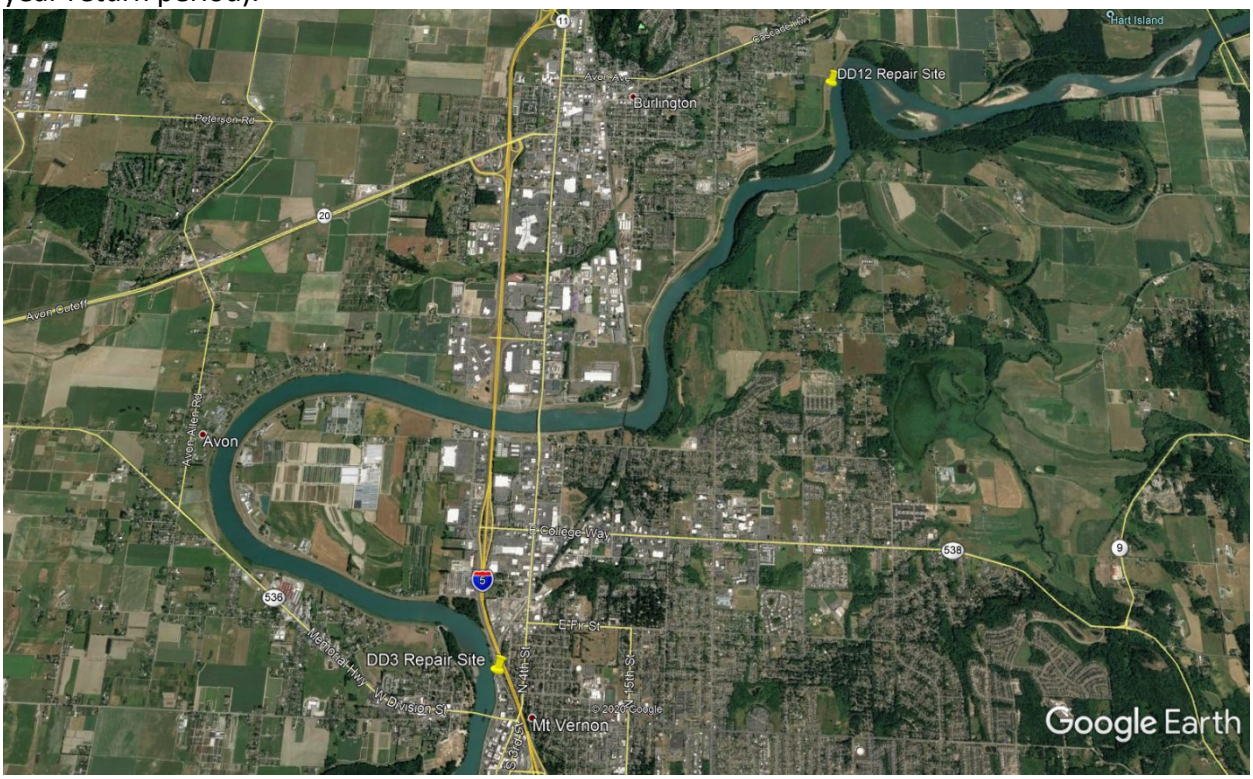


Figure 1. Project Locations.

PURPOSE AND NEED

The purpose of the project is to repair the levees and restore the 50-year level of flood protection exhibited prior to the damaging event in order to protect lives and property from subsequent flooding.

At DD 3 a slope failure occurred near Station 429+00 along approximately 60 linear feet (LF) of the levee due to a combination of riprap being scoured from the riverward toe and slope failure

due to saturated conditions of the embankment material (Appendix B, Figures 1 and 2). The failure created a near-vertical head scarp roughly 15 feet tall. This failure threatens the sheetpile cutoff and the approximately 3.5-foot tall floodwall constructed along the landward edge of the levee crest. In the damaged condition, the DD 3 levee is providing a 1-year flood (100% ACE) level of protection.

At DD 12, the Sponsor noted cracking in the bench between the levee and the river during the February flood event (Appendix B, Figures 3 and 4). This bench and the associated riprap armoring is critical to the levee performance and has been evaluated as an appurtenant levee component in previous levee inspections. The purpose of the emergency repair was to temporarily provide supplemental protection to prevent levee failure. During the flood event, the Sponsor began emergency construction of an access road to reach the damaged section, using quarry spalls and geofabric. The Corps took over the flood fight response and constructed emergency bank stabilization over approximately 300 LF of the bench, between roughly Stations 300+00 and 303+00 (Appendix B, Figure 3). After floodwaters receded, the sponsor observed additional cracking in the silt bench extending approximately 200 feet on either side of the repair. This cracking indicated that the riverward slope of the bench is unstable and continues to slide into the river. In all, the damaged area is approximately located between Stations 298+00 and 305+00. In the damaged condition, the DD 12 levee is providing a 1-year flood (100% ACE) level of protection.

ACTIONS ADDRESSED UNDER NEPA

The Corps conducted temporary emergency repairs to the DD 12 levee between February 1 and 2, 2020 to supplement local efforts during the 2020 flood. Shoreline and river impacted by construction activities was restricted to the areas of the damaged levee. The temporary measures executed in February 2020 involved work from the top of the bench, placing material by bucket load in a controlled manner to provide a blanket of armor to reduce the impacts from the high-velocity flows and high water levels. The emergency repairs involved placing riprap along approximately 300 LF of the riverward bench. The riprap that was placed reduced erosion from the high river velocities and reduced the risk of levee failure from cracking and slope instability. The flood fight emergency response efforts were necessary to prevent catastrophic levee failure.

For the proposed levee repairs, four alternatives are being considered as follows:

- **Alternative 1 – No Action Alternative**

Under this alternative, the levee would remain in its current damaged state. This alternative would not meet the project purpose because the levee would likely be further damaged in future flood events and could fail, which would endanger protected homes, businesses, and public infrastructure during future flood events. During any flood event threatening the integrity of the levee system, the Corps or other Federal and non-Federal agencies may act under emergency authorities to preserve the levee system and, to the extent possible, maintain protection of life and property behind the levee. Responding to damages during a flood event, however, would be temporary, less certain of success, potentially more expensive, and could be less protective of environmental and cultural resources. A response would also take time to

activate and execute, so there is risk that it would not prevent levee failure, such as overtopping or breaching.

The No Action Alternative is not recommended because it would risk failure of the levee systems and would present unacceptable risk to life and property. It does not meet the project purpose. While the No Action Alternative is not recommended, it is carried forward for further evaluation to serve as a base condition for evaluation of other alternatives.

- **Alternative 2 – Nonstructural Alternative**

This alternative consists of floodplain management strategies generally involving changes in land use offered by other Federal and state programs. Such strategies would include zoning, easements, flood warning, floodplain evacuation, and flood insurance. Nonstructural strategies involve acquisition, relocation, elevation, and flood proofing existing structures. The costs and timeframe for implementing this alternative makes it impractical. The participation of the non-Federal sponsors would be required to implement a nonstructural alternative, and DD 3 and DD 12 have not agreed to meet their various obligations as described above in executing a nonstructural alternative. Therefore, this alternative has been eliminated from detailed consideration.

- **Alternative 3 – Levee Setback Alternative**

This alternative would shift the alignment of the levee embankment landward by the necessary distance in order to avoid or minimize direct contact with the river current. Typically, the setback is a newly constructed earth embankment structure and abandons the existing levee located on the riverbank. In this instance, a setback levee may be more costly than other alternatives due to more extensive embankment material and real estate requirements. Such an approach could also encroach on existing structures, privately-owned land, and public infrastructure. The anticipated costs and time required for this alternative make implementation impracticable. This alternative would also require participation of the non-Federal sponsors to implement, and DD 3 and DD 12 have not agreed to meet their various obligations, including land acquisition and additional cost share funding in executing a setback alternative. Therefore, this alternative has been eliminated from detailed consideration.

- **Alternative 4 – Repair In-Place Alternative (Preferred Alternative)**

This alternative would repair the levee at each damaged site. At DD 3, repairing the levee in-place is recommended to restore the levee to its pre-damaged level of protection. Any sloughed material would be removed from the slope. The downstream extent of the repair would incorporate a buried toe with 4 feet of Class III riprap embedded into the foundation. The damaged riverward slope would be re-armored with a 2.5-foot thick blanket of Class III riprap placed over a quarry spalls. The upstream and downstream ends would be smoothly transitioned into the existing slopes. All repairs would occur within the pre-damage footprint as confirmed by historical records of the most recent prior repair to this site. Total rehabilitation construction length is 150 LF, which includes any necessary transitions. Topsoil and native hydroseed would be placed in all areas indicated on the plans to restore the project to the existing condition prior to construction.

Repairing the DD 12 levee in-place is recommended to restore the levee to its pre-damaged level of protection. However, extensive cracking along the riverward bench slope indicates that the toe erosion has destabilized the 2H:1V slope. The damaged slope would be laid back to 3H:1V resulting in both increased stabilization and high-water refuge habitat. Any sloughed material would be removed from the slope and suitable flood fight material would be salvaged for reuse into the final repair. The downstream extent of the repair would incorporate a launchable toe using 4 feet of Class V riprap. The damaged riverward slope would be re-armored with a 4-foot thick blanket of Class V riprap placed over a 12-inch layer of quarry spalls which is an increase in size from the existing Class IV riprap. The upstream and downstream ends would be smoothly transitioned into the existing slopes. All repairs would occur within the pre-damage footprint. Total rehabilitation construction length is 700 LF, which includes any necessary transitions. Topsoil and native hydroseed would be placed in all areas indicated on the plans to restore the project to the existing condition prior to construction.

The Corps proposes implementing the Repair In-Place Alternative. Design plans for repairs to the DD 3 and DD 12 levees under this alternative are in Appendix A.

Equipment to be utilized would be similar to those employed during previous rehabilitation projects and include: hydraulic excavator, dump truck, and bulldozer. Construction is expected to occur during the June 15 – August 31 work window established by the Washington Department of Fish and Wildlife (WDFW) when juvenile salmonids are least likely to be in the area. Construction vehicles would access the site by existing levee access ramps and the levee crown, which are accessible from public rights-of-way at several locations throughout the length of the project. Excavated materials would be staged within the levee footprint and at designated staging areas. Repairs to DD 3 and DD 12 would occur concurrently and are expected to take approximately six weeks. Best management practices would be employed to minimize project impacts.

ENVIRONMENTAL MITIGATION MEASURES

Because of the long history of modification of riverbanks within the lower Skagit valley, the edge habitat is quite degraded, yet the Skagit River remains critical for threatened salmonids. Due to the extent of necessary repairs to the Skagit River levees and the time lag for newly repaired sites to provide edge habitat functions, and also to avoid impacting salmon recovery, the Corps is proposing environmental measures to mitigate for lost habitat function of the riverine edge habitat.

For the 2011 Skagit River Levee Rehabilitation Project, the Corps formed a Technical Working Group to develop a strategy for assessing the impacts of the levee repairs and developing measures to offset those impacts. The Technical Working Group includes representatives from the DDs, National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (USFWS), the Skagit River System Cooperative, and the Corps. Through multiple meetings and discussions as well as site visits, Corps staff created a tool, the Habitat Capacity Mitigation Tool (HCMT), which was then further developed by the Technical Working Group.

The parameters for HCMT development were to accurately assess impacts of levee repairs, provide options that could be combined to provide the greatest on-site compensation for impacts, and evaluate off-site mitigation options while relying heavily on published scientific data of current fish populations and fish usage of different bank habitat types to define potential mitigation options such as slope laybacks, large woody debris, and plantings. The result is a new assessment tool that focuses on habitat capacity degradation due to levee repairs.

To provide compensatory mitigation for detrimental effects of levee repair on edge habitat, many mitigation offset options were considered that can be applied in various combinations to achieve the greatest on-site reduction of effects, and evaluate off-site mitigation options. For these proposed 2020 repairs, the mitigation offset options as determined by the HCMT include:

- Two rows of willows will be placed, the first starting at ordinary high water with willows spaced every 12-inches along the full repair at both levees and the second will start approximately 3 feet above the first lift.
- Placement of topsoil and native hydroseed along upper slope along the full repair at both levees.
- A slope layback to create a 3H:1V slope along 700 LF at the DD 12 repair site.
- Placement of 7 anchored rootwads at a location downstream of the DD 3 repair site at river mile (RM) 10. See Appendix A for location, configuration and design details.

IMPACTS OF THE PROJECT

The Corps' preliminary analyses of the principal effects of the (a) February 2020 DD 12 emergency repair activities and (b) the prospective DD 3 and DD 12 permanent repairs are summarized below.

Wetlands: No wetlands are located within or immediately adjacent to the project areas. (a) Access roads and staging areas were not located in jurisdictional wetlands during the February 2020 DD 12 temporary emergency repair. (b) Access roads and staging areas are not projected to be located in jurisdictional wetlands during the permanent repairs.

Water Quality: (a) The February 2020 DD 12 temporary emergency repair occurred when the river was already highly turbid. Although no turbidity monitoring was conducted, the work was unlikely to cause turbidity greater than the already high background conditions. The emergency repair only utilized clean rock free of contaminants. Best management practices, including restrictions on fueling and prevention of fluid leaks from construction equipment were in place to minimize discharge of pollutants into the river.

(b) There are no water quality exceedances at the DD 12 project site. However, downstream of the project site, water quality in the Skagit River is considered impaired for bacteria (category 4A). A Total Maximum Daily Load (TMDL) was established for the lower Skagit River and a Water Cleanup Plan was written by the Washington State Department of Ecology (Ecology) in 2000. The DD 3 repair site is within a category 2 listing for ammonia-N. The proposed repairs

would not contribute to these water quality impairments. Construction activities related to the repairs could cause short term impacts to local water quality. Placement of rip rap would cause a small temporary increase in turbidity. Dissolved oxygen levels should not be impacted because the material is relatively clean. Materials for construction would be obtained from an established borrow pit and rock quarry. No contaminants are known or suspected to be present in the construction materials. Turbidity during project construction would be monitored; if state water quality standards for maximum turbidity are exceeded, project work would be halted until the standards are met and construction methods changed to avoid future exceedances.

Biological Resources: (a) Impacts to aquatic resources from the completed flood fight included possible injury or displacement of aquatic species as a result of placing riprap into the water along the slope of the damaged levee. Since the construction work occurred during the peak of a flood, any impact from construction was minimized due to the flood conditions of rapidly moving, noisy and highly turbid waters. Most species of fish would not be expected to occur in waters immediately adjacent to the levee during the short duration of the emergency repair. This is due to the fact that this was a high energy and turbulent location that was actively eroding which are conditions that most species of fish avoid. If fish were present in the vicinity during the flood, they would more likely occur on the opposite bank which is the inside of bend in the river that has a lower velocity and less turbulent flows.

(b) Repair work on these levees would cause short-term impacts to fish and wildlife. The primary impacts would be a temporary increase in turbidity due to fill placement and an increase in noise and human activity during construction. Because the work would be accomplished during the established work window (June 15 – August 31), the potential disruption of salmonid movement in the area would be minimized. If present, adult and juvenile salmonids would be temporarily displaced from this area. Temporary impacts as a result of construction include vibration and noise associated with construction equipment, minor localized increases in turbidity from excavation of embankment material and placement of riprap, and a time lag for willows to become established. The construction of the levee rehabilitation will also take place during the in-water work window to ensure minimal disturbances only to the adults migrating in, and will not take place during spawning or out migration of juveniles.

The following listed and proposed threatened species and/or their critical habitat, as applicable, are expected to be found in the project area:

- Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*)
- Puget Sound steelhead (*Oncorhynchus mykiss*)
- Coastal/Puget Sound bull trout (*Salvelinus confluentus*)
- Southern Resident killer whale (*Orcinus orca*)

Bald eagles may be present at the project sites. These birds have been removed from the Endangered Species Act (ESA) but remain protected under the Bald and Golden Eagle Protection Act so caution would be taken to avoid significant harm to the birds or their habitat.

Air Quality: (a) Construction vehicles and heavy equipment used during the temporary repair resulted in a short term localized increase in gasoline and diesel exhaust fumes. The small area of construction and the short duration of the work would limit the impact to air quality. Emissions generated by the activity were minor and short-term and well below the *de minimis* threshold. Unquantifiable but insignificant exacerbation of effects of carbon dioxide (CO2) emissions on global climate change would be anticipated from the completed flood fight activities.

(b) Construction vehicles and heavy equipment used during the proposed construction would temporarily and locally generate increased gasoline and diesel exhaust fumes. The small area of construction and the short duration of the work would limit the impact to air quality. The activity would constitute routine repair of an existing facility, generating an increase in direct emissions of a criteria pollutant or its precursors that would be clearly *de minimis*, and would therefore be exempted by 40 CFR Section 93.153(c)(2)(iv) from the conformity determination requirements. Emissions generated by the construction activity are expected to be minor, short-term, and well below the *de minimis* threshold. Unquantifiable but insignificant exacerbation of effects of CO_2 emissions on global climate change would be anticipated.

Cultural Resources: Skagit Levee DD-3 and Skagit Levee DD-12 were constructed in the late 1800s, therefore are of historic age and would need to be evaluated by the Corps archaeologist for integrity and significance to the National Register of Historic Places. Prior to repairs, a Corps archaeologist would conduct a cultural resources survey of the project area to determine whether there is potential for the preliminarily recommended repair to cause effects to historic properties. The Corps would evaluate the project and prepare documentation necessary pursuant to compliance with Section 106 of the National Historic Preservation Act (NHPA). The report would include the findings of the investigations, recommendations for archaeological monitoring during construction, and a determination of effects to archaeological and historic properties. The Corps' determinations of effects to historic properties, the investigation report, and monitoring plan if necessary, would be coordinated with the Washington State Historic Preservation Office (SHPO), affected Indian Tribes, and other consulting parties prior to approval of the proposed action.

Noise: (a) During construction of the 2018 emergency repair, localized ambient noise levels within the levee Right of Way were slightly increased. However, given the urban location of the repair, any potential disturbance resulting from slightly elevated short-term ambient noise levels from construction activities were negligible. No long-term change in noise levels occurred as a result of the project. (b) Effects to noise of the proposed repairs would be the same as those described above from the emergency repair.

Traffic: (a) Construction-related traffic may have caused temporary increases to, and disruption of, local traffic. Flaggers and signs were used, as needed, to direct traffic safely around the construction site. (b) Effects to traffic from the proposed repairs would be the same as those described above. No long-term change in traffic would occur as a result of the project.

Recreation: (a) The DD 12 temporary emergency repair had short-term impacts to informal recreation use. The project site is not used extensively for recreation, but walkers from nearby communities use the gravel access road located on the top of the levee for recreation and recreational anglers are likely to access the river via the levee trail or by boat.

(b) Recreational use at DD 12 would be disrupted temporarily during construction similarly to the effects of the emergency repair. The DD 3 project site is adjacent to a heavily used pedestrian walkway. Cyclists, and pedestrians use the walkway to traverse between Lions Park and downtown Mount Vernon. A picnic area on the north side of the project site includes a restroom and parking lot.

EVALUATION

The Corps has made a preliminary determination that the environmental impacts of the proposal and the completed flood fight activities can be adequately evaluated under the NEPA through preparation of an EA. Preparation of an EA addressing potential environmental impacts associated with the levee rehabilitation project is currently underway.

The purpose of the Federal Water Pollution Control Act (33 U.S.C § 1252 et seq.), commonly referred to as Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. The Corps has determined that the proposed DD 3 repair is not subject to regulation under Sections 401 and 404 of the CWA. The exemption from the requirement to evaluate the effects of discharges of fill material into waters of the United States under 33 USC 1344(f)(1)(B) applies because all riverward work at the repair sites will be conducted within the pre-damaged levee footprint and the character, scope, and size of the resulting structure will not change as compared to the original fill design. Therefore, the proposed repairs do not require a 404 (b)(1) evaluation.

The DD 12 repair and offsite mitigation for DD 3 (placement of anchored rootwads at RM 10) would involve a discharge of fill material into waters of the United States that will be evaluated for substantive compliance with guidelines promulgated by the Environmental Protection Agency (EPA) under authority of Section 404(b)(1) of the CWA.

The Corps does not issue permits for its own Civil Works activities. Nevertheless, the Corps accepts responsibility for the compliance of its Civil Works project with Sections 401 and 404 of the Federal Water Pollution Control Act. The proposed DD 12 repair is analogous to a Nationwide Permit (NWP) 3, which authorizes the repair, rehabilitation, or replacement of any currently serviceable structure, provided that the structure or fill is not to be put to a different use. The proposed repairs will be within the existing footprint of a currently serviceable structure with minor deviations due to construction techniques as required by regulatory agencies. Though NWP 3 does not directly apply to Corps Civil Works activities, the effects of the repairs to the DD 12 Levee on Waters of the U.S. and water quality are functionally analogous to the Waters of the U.S. and water quality effects caused by repairs authorized

under NWP 3. Therefore, the Corps has concluded that repairs to the DD 12 Levee would generate effects that are functionally analogous to the effects of an authorized (NWP 3 permitted) repair.

The proposed anchored rootwad placement at RM 10 is analogous to a NWP 27, which authorizes restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, and the rehabilitation or enhancement of tidal streams, tidal wetlands, and tidal open waters, provided those activities result in net increases in aquatic resource functions and services. NWP 27 can be used to authorize compensatory mitigation projects. Though NWP 27 does not directly apply to Corps Civil Works activities, the effects of the offsite mitigation for DD 3 on Waters of the U.S. and water quality are functionally analogous to the Waters of the U.S. and water quality effects caused by compensatory mitigation authorized under NWP 27. Therefore, the Corps has concluded that offsite mitigation for the DD 3 Levee would generate effects that are functionally analogous to the effects of an authorized (NWP 27 permitted) repair. A memorandum detailing the Corps' analysis will be provided to the Washington State Department of Ecology (Ecology) for their review.

The Corps has determined that the proposed work is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Management Program. State concurrence with this determination has been requested.

The Corps will coordinate the proposed action with the USFWS and the NMFS concerning effects of the emergency repair and proposed repair activities on threatened and endangered species and their critical habitat, and submit a Biological Assessment pursuant to Section 7(a)(2) of the ESA.

The Corps is consulting with the Washington SHPO, Indian tribes, and other consulting parties about the project in accordance with Section 106 of the NHPA as implemented in the regulations at 36 CFR Part 800.

In preparation of the environmental documentation for this project, coordination has been conducted or is ongoing with the following public agencies:

(1) USFWS;
(2) NMFS;
(3) EPA;
(4) Ecology; and
(5) SHPO.

No significant unmitigated impact to Tribal Treaty Rights is expected as a result of the proposed activities. The emergency repair and proposed repairs will be analyzed with respect to its effects on the Tribal Treaty Rights or rights reserved to tribes through Executive Order or other legal instrument. The proposed action area is within the area of interest for the following Tribes and they will be coordinated and consulted with prior to making a final decision:

(1) Sauk-Suiattle Indian Tribe;
(2) Swinomish Indian Tribal Community;
(3) Skagit River System Cooperative;
(4) Upper Skagit Indian Tribe;
(5) Samish Indian Nation; and
(6) Tulalip Tribes

PUBLIC INTEREST EVALUATION

The decision to proceed with this action involving the discharge of dredged or fill material would be preceded by a determination of whether the proposed activity would be in the public interest. All factors which may be relevant to the proposal's public interest will be considered; among those are navigation and the Federal standard for dredged material disposal; water quality; coastal zone consistency; wetlands; endangered species; historic resources; scenic and recreation values; fish and wildlife; marine sanctuaries; applicable state/regional/local land use classifications, determinations, and/or policies; conservation; economics; shoreline erosion and accretion; safety; and considerations of property ownership.

As a foundation for its public interest determination the Corps would consider, on an equal basis, all alternatives that are both reasonable and practicable, i.e., available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. The Corps typically selects the alternative that represents the least costly alternative, constituting the discharge of dredged or fill material into waters of the United States in the least costly manner and at the least costly and most practicable location, that is consistent with sound engineering practices, and that meets the environmental standards established by the CWA Section 404(b)(1) evaluation process.

COMMENT AND REVIEW PERIOD

The Corps invites submission of comments on the environmental impact of the proposed action. Comments would be considered in determining whether it would be in the best public interest to proceed with the proposed project. The Corps would consider all submissions received before the expiration date of this notice. Comments not received within the comment period are deemed unexhausted and therefore forfeited. The nature or scope of the proposal may be changed upon consideration of the comments received. The Corps would initiate an Environmental Impact Statement (EIS) and would afford all the appropriate public participation opportunities attendant to an EIS, if significant effects on the quality of the human environment are identified and cannot be mitigated.

PUBLIC HEARING

Any person may request within the comment period specified in this Notice, that a public hearing be held to consider this proposal. Requests for a public hearing must clearly set forth the following: the interest that may be affected, the manner in which the interest may be affected by this activity, and the particular reason for holding a public hearing regarding this activity.

COMMENTS TO THE U.S. ARMY CORPS OF ENGINEERS

Submit comments to this office, Attn: Planning, Environmental, and Cultural Resources Branch, PO Box 3755, Seattle, WA, 98124-3755, no later than 30 days after the posting of this notice to ensure consideration. Comments not received within the comment period are deemed unexhausted and therefore forfeited. In addition to sending comments via mail to the above address, comments may be e-mailed to Amanda.Ogden@usace.army.mil.

This Notice of Preparation can be found online at the link below.
Project Name: Skagit River Diking Districts 3 and 12 Levee Rehabilitation Project
http://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/
Posting Date: April 1, 2021 End of Comment Period: May 3, 2021

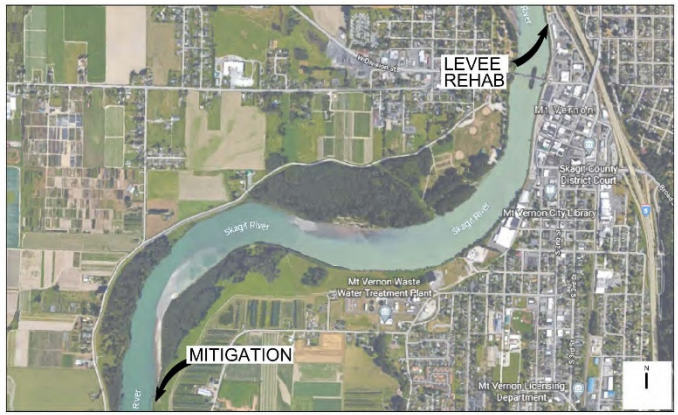
Appendix A – Project Designs

US Army Corps
of Engineers ®
Seattle District

FY20 P2-489170 DD3
SKAGIT DD3 MAIN LEVEE
2020 LEVEE REHAB
SKAGIT COUNTY, WA

SHEET ID	TITLE
	GENERAL
G-001	TITLE, VICINITY MAP, PROJECT MAP, AND INDEX
	CIVIL
CS-100	ACCESS AND HAUL ROUTE
CS-101	PROPOSED SITE PLAN
C-301	CROSS SECTIONS
	LANDSCAPE
L-100	MITIGATION AREA ACCESS ROUTE
L-101	MITIGATION SITE PLAN / DETAILS

PROJECT VICINITY MAP
NTS



PROJECT LOCATION MAP
NTS

SAFETY PAYS

IF SHEET MEASURES LESS THAN 22" X 34" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

DATE AND TIME PLOTTED: 11/12/2020

DESIGN FILE: I:\AEC\Designs\FY20_P2-489170_DD3\Con_Docs\CAD_Sheets\General\FY20_P2-489170_DD3-G-001CVR.dgn

US Army Corps of Engineers - Seattle District

Date: 02 OCT 2020
Solicitation No.: -
File No.: E-6-7-52

Recommended by: GUY L. GREEN, P.E. Chief, Design Branch — Date
Approved by: JOANN T. WALLS, P.E. Chief, Engineering Div. — Date

Submitted by: PROJECT MANAGER Project Manager — Date
Reviewed by: ANIL L. NISARGAND, P.E. Chief, Specs. and Tech Review — Date

U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT SEATTLE, WASHINGTON
Prepared by: Chief, Preparing Section — Date

FY20 P2-489170 DD3 SKAGIT DD3 MAIN LEVEE 2020 LEVEE REHAB
COVER SHEET

SHEET IDENTIFICATION
G-001

A1 ACCESS AND HAUL ROUTE
1" = 200'

GENERAL NOTES:

1. UPON PROJECT COMPLETION, STAGING AREA WILL BE COVERED IN TOPSOIL, HYDOSEEDED TO MATCH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: J. SKRINDE	ISSUE DATE: 02 OCT 2020
DRAWN BY: G. SIMON	SOLICITATION NO.:
CHECKED BY: G. KATO	CONTRACT NO.:
SUBMITTED BY: PROJECT MANAGER	FILE NUMBER: E-6-7-57
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

FY20 P2 488170 DD3
SKAGIT DD3 LEVEE RE-HAB 2020
MT VERNON, WA

ACCESS AND HAUL ROUTE

SHEET ID
DD3
CS-100

FINAL DESIGN SUBMITTAL

Plot Date: $DATE$ $TIME$ File Path: ...P2-488170-DD3-CS-100 - ACCESS AND HAUL ROUTE.dgn

A1 SITE PLAN
1" = 20'

GENERAL NOTES:

1. STATIONING DERIVED FROM THE NATIONAL LEVEE DATABASE (NLD). LEVEE REHAB FROM ST. 438+75 TO 438+25.
2. EDGES OF NEW LEVEE MUST TRANSITION SMOOTHLY TO EXISTING SURROUNDINGS.
3. ALL IN WATER WORK SHALL OCCUR BETWEEN JUNE 15 - AUGUST 31 TO MINIMIZE ECOLOGICAL IMPACT TO WILDLIFE HABITAT.
4. ASSOCIATED ENVIRONMENTAL MITIGATION SHALL OCCUR AT APPROXIMATELY ST. 335+00. SEE SHEETS L-100 AND L-101.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

DESIGNED BY: J. SKRINDE	ISSUE DATE: 02 OCT 2020
DRAWN BY: G. SIMON	SOLICITATION NO.:
CHECKED BY: G. KATO	CONTRACT NO.:
SUBMITTED BY: PROJECT MANAGER	FILE NUMBER: E-6-7-52
SIZE: ANSI D	

FY20 P2 489170 DD3
SKAGIT DD3 LEVEE REHAB 2020
MT VERNON, WA

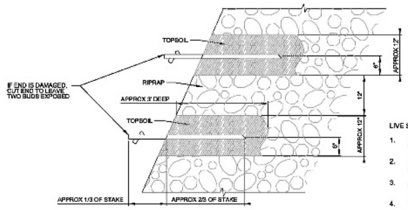
SITE PLAN

SHEET ID
DD3
CS-101

FINAL DESIGN SUBMITTAL

File Path: I:\AECDesigns\FY20_P2-489170_DD3\Con_Docs\CAD_Sheets\Civil\FY20_P2-489170-DD3-CS-101 - SITE PLAN.dgn

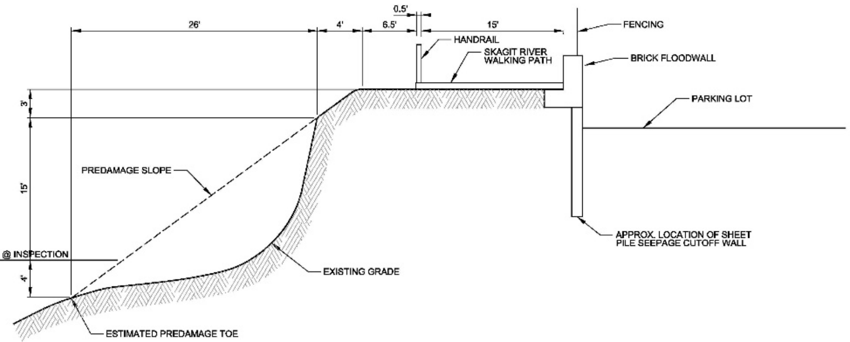
Plot Date: $DATE$ $TIME$



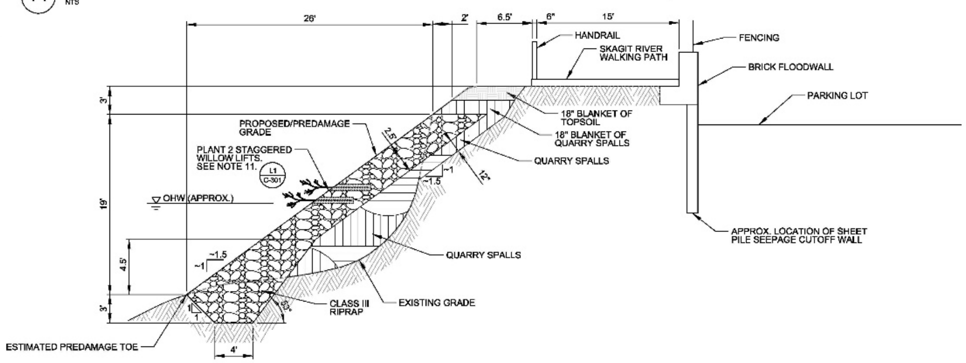
LIVE STAKE NOTES

1. PLANT STAKES BY HAND. DO NOT USE AXE OR SLEDGE FOR DRIVING STAKES.
2. IN HARD GROUND USE AN IRON BAR OR STAR DRILL TO PREPARE HOLES FOR THE STAKES.
3. AVOID STRIPPING BARK OR BRUISING STAKES DURING INSTALLATION.
4. BACKFILL VOIDS AROUND STAKE WITH NATIVE SOIL.

L1 WILLOW LIFT CROSS SECTION
NTS



F1 CROSS SECTION EXISTING CONDITIONS
NTS



A1 CROSS SECTION PROPOSED
NTS

GENERAL NOTES:

1. PROJECT SITE EXTENDS FOR 150 LINEAL FEET INCLUDING TRANSITIONS FROM NATIONAL LEVEE DATABASE (NLD) FROM STATION 436+75 TO STATION 438+25. ACTUAL STATION OF CROSS SECTIONS WILL VARY DEPENDING ON FIELD CONDITIONS.
2. USACE SHALL BE RESPONSIBLE FOR LOCATING UNDERGROUND AND OVERHEAD UTILITIES AS APPLICABLE PRIOR TO COMMENCING WORK.
3. QUARRY SPALLS SHALL CONFORM TO GRADATIONS IN TABLE 1 ON C-301 AND SHALL CONSIST OF CLEAN, ANGULAR, SCREENED AND CRUSHED ROCK.
4. CLASS III RIPRAP SHALL CONFORM TO THE GRADATIONS IN TABLE 2 ON C-301. STONE SHALL BE HARD, SOUND, AND DURABLE MATERIAL, FREE FROM SEAMS, CRACKS AND OTHER DEFECTS TENDING TO LEAD TO PREMATURE WEATHERING.
5. SOIL FROM EXISTING LEVEE EMBANKMENT TO BE REUSED ALONG THE EMBANKMENT. ADDITIONAL EMBANKMENT SOIL SHALL CONFORM TO THE GRADATIONS IN TABLE 3 ON C-301.
6. TOPSOIL PLANTING MATRIX SHALL CONSIST OF A 75/25 MIXTURE O SOIL AND ORGANIC COMPOST. ENGINEERED TOPSOIL SHALL CONFORM TO GRADATION IN TABLE 3 ON C-301 AND SHALL BE FREE OF ROOTS, CHEMICALS GARBAGE AND DEBRIS.
7. WHERE HISTORICAL RIVERWARD TOE EXCEEDS THE EXTENT OF THE LEVEE REPAIR, EFFORT SHOULD BE MADE FOR EXISTING MATERIAL TO REMAIN INTACT SUCH THAT SAFE CONSTRUCTION PRACTICES AND STABLE SLOPES ARE STILL MAINTAINED.
8. LIMIT CONSTRUCTION ACTIVITIES TO WORK AREAS SHOWN.
9. TREES AND OTHER WOODY SHRUBS REMOVED AS A RESULT OF THE REPAIR SHALL BE PLACED AT ABOUT 1' ABOVE OHW LINE FOR ALL SITES. DO NOT PLACE VEGETATION ON WILLOW BUNDLES.
10. CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF THE EXISTING HANDRAILING ADJACENT TO THE LEVEE REPAIR SITE.
11. 150LF OF 2 STAGGERED WILLOW LIFTS APPROXIMATELY AT OHW AND 18INCHES ABOVE OHW. WILLOWS SHALL BE SITKA WILLOW AND/OR HOOKER'S WILLOW 3' TO 4' LONG. LIVE STAKES WILL BE PLACED EVERY 12INCHES INTO A 6INCH LAYER OF SOIL PLANTED 2/3 THE LENGTH OF THE STAKE. SEE DETAIL L1 ON SHEET C-301 FOR MORE DETAIL.
12. HYDROSEED MIXTURE SHALL CONSIST OF THE FOLLOWING MINIMUM STANDARDS: 40-80 LBS TACKIFIER PER AC, 2000 LBS MULCH PER AC, 400 LBS FERTILIZER PER AC, 200 LB SEED PER AC WITH 48.24% MAXIMA CREEPING RED FESCUE, 24.51% ELF PERENNIAL RYEGRASS, 14.82% HIGHLAND BENTGRASS, AND 9.93% WHITE DUTCH CLOVER. SUITABLE SUBSTITUTES MAY BE USED AFTER REVIEW AND APPROVAL BY PROJECT BIOLOGIST.

REPAIR STEPS

1. EXCAVATE SLOUGHED MATERIAL FROM TOE OF SLOPE. REMOVE EXISTING RIPRAP AND RETAIN AS PRACTICABLE.
2. RECONSTRUCT LAUNCHABLE TOE TO PRE-DAMAGE CONDITION USING CLASS III RIPRAP.
3. INSTALL TWO STAGGERED WILLOW LIFTS.
4. RECONSTRUCT THE 2.5' BLANKET AND ASSOCIATED SPALL LAYER TO THE TOP OF SLOPE.
5. TRANSITION UPSTREAM AND DOWNSTREAM ENDS OF REPAIR TO SMOOTHLY TIE INTO EXISTING SLOPE AND EXISTING ELEVATION.
6. RESTORE CROWN AND MATCH ADJACENT EXISTING.
7. HYDROSEED EXPOSED GROUND WITH SPECIFIED LOCAL NATIVE SPECIES SEED MIX.

TABLE 1: QUARRY SPALL GRADATION

SIEVE SIZE	PRECENT PASSING
8"	100
4"	0

TABLE 2: RIPRAP GRADATIONS (ASSUMED SPECIFIC GRAVITY = 2.60)

DISTRIBUTION	CLASS III	
	WEIGHT (LB)	DIAMETER (IN)
100% SMALLER THAN	1600	27
50%	300	16
10%	68	10
Cu		2.2

TABLE 3: ENGINEERED TOPSOIL GRADATION

SIEVE SIZE	PRECENT PASSING BY WEIGHT
1/2"	100
NO. 4	75-100
NO. 10	40-75
NO. 16	25-65
NO. 40	25-50
NO. 200	10-20

TABLE 4: MATERIAL QUANTITIES

SITE	LENGTH (FEET)	CLASS III RIPRAP (CY)	FILTER SPALLS (CY)	EMBANKMENT SOIL (CY)	TOPSOIL* (CY)	HYDROSEED* (SY)
TOTAL	150	566	428	0	45	146

* DOES NOT INCLUDE QUANTITIES FOR RESTORATION TO MATCH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: J. SKRINDE
DRAWN BY: G. SIMON
CHECKED BY: G. KATO
SUBMITTED BY: PROJECT MANAGER
SIZE: ANSI D
ISSUE DATE: 02 OCT 2020
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER: E-6-7-52

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

FY20 P2 489170 DD3
SKAGIT DD3 LEVEE REHAB 2020
MT VERNON, WA

CROSS SECTIONS

SHEET ID
DD3
C-301

FINAL DESIGN SUBMITTAL

Plot Date: $DATE$ $TIME$ File Path: I:\AECDesigns\...

A1 MITIGATION AREA ACCESS ROUTE
1" = 100'

GENERAL NOTES:

1. ACCESS SITE FROM DIKE ROAD.
2. UPON PROJECT COMPLETION, STAGING AREA WILL BE COVERED IN TOPSOIL, HYDOSEEDED TO MATCH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. ASSOCIATED LEVEE REHAB LOCATED AT ST. 436+75 TO 438+25. SEE SHEETS CS-100, CS-101, AND C-301.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

DESIGNED BY: J. SKRINDE	ISSUE DATE: 02 OCT 2020
DRAWN BY: G. SIMON	SOLICITATION NO.:
CHECKED BY: G. KATO	CONTRACT NO.:
SUBMITTED BY: PROJECT MANAGER	FILE NUMBER: E-6-7-52
SIZE: ANSI D	

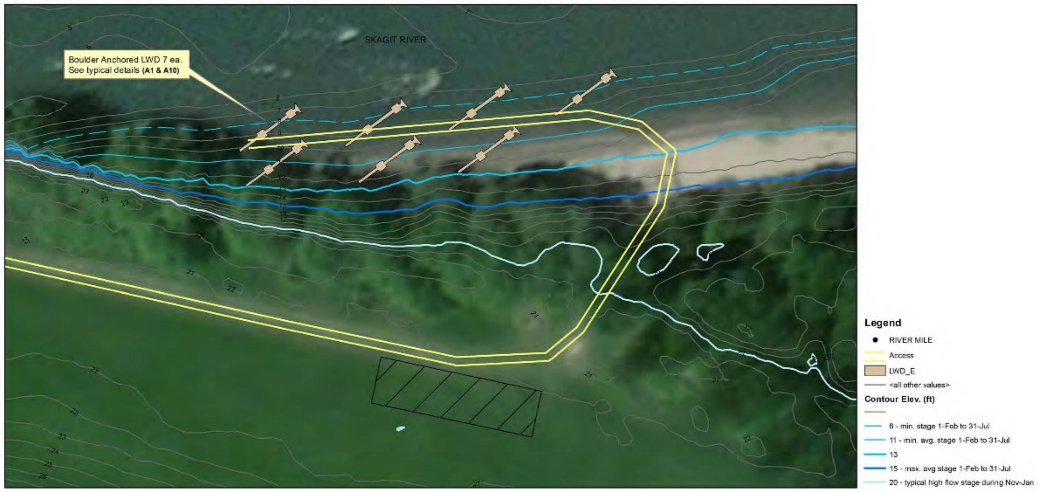
FY20 P2 488170 DD3
SKAGIT DD3 LEVEE REHAB 2020
MT VERNON, WA

MITIGATION ACCESS ROUTE

SHEET ID
DD3
L-100

FINAL DESIGN SUBMITTAL

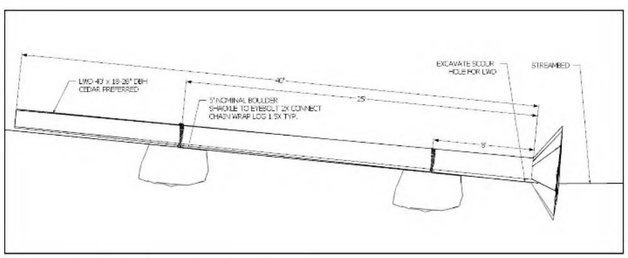
Plot Date: $DATE$ $TIME$



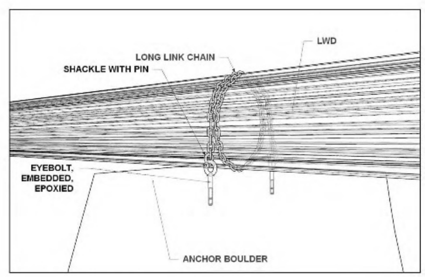
NOTES:
1. PLACE LWD IN LOCATION/ELEVATION AND ORIENTATION AS INDICATED.
2. DESIGN ENGINEER WILL STAKE FIELD LOCATIONS OF ROOTWADS AND TIPS TO AID INSTALLATION.
3. EXCAVATE SHALLOW TRENCH FOR BOULDERS. USE EXAVATOR BUCKET TO WORK BOULDER DOWN INTO SAND BAR. POSITION BOULDER SO LOG LAYS FLAT AND DOESNT ROLL OFF.
4. EXCAVATE TRENCH FOR ROOTWAD IN BANK/BED SO THAT LWD STEM LAYS FLUSH ON TOP OF BOULDERS. PLACE LWD.
5. DRILL HOLES BEFORE OR AFTER BOULDER PLACEMENT.
6. INJECT EPOXY PER SPECS AND INSTALL AND SECURE EYE BOLTS.
7. TIGHTLY WRAP CHAIN AROUND BOULDER FULLY ONE TIME AND ATTACH EACH END TO ONE EYE BOLT WITH A SHACKLE.
8. CONDUCT CHECK THAT BOLTS ARE SECURE AND CHAIN IS TIGHT BEFORE ACCEPTING WORK.

Service Layer Credits: Source: Esri, Maxar,NOAA

F1 MITIGATION SITE PLAN



A1 ANCHORED LWD PLACEMENT DETAIL (TYP.)



A10 CHAIN WRAP DETAIL (TYP.)

GENERAL NOTES:

1. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE TECHNICAL SPECIFICATIONS OF THE CONSTRUCTION MANAGEMENT PLAN (CMP), SEE APPENDIX D: MITIGATION LWD & ANCHORING SPECIFICATIONS
2. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE NOTES OF SHEET L-101, DETAIL F1.
3. CONSTRUCTION SHALL OCCUR DURING THE ESTABLISHED WORK WINDOW OF JUNE 15 - AUGUST 31 TO MINIMIZE DETRIMENTAL IMPACTS TO FISH HABITAT.
3. PRIOR TO INSTALLATION, A SITE VISIT BY THE ENGINEER OF RECORD IS REQUIRED TO VERIFY EXISTING FIELD CONDITIONS AND DETERMINE IF DESIGN MODIFICATIONS ARE NEEDED.
4. THE SEVEN (7) ANCHORED LARGE WOODY DEBRIS (LWD) WITH ROOT WADS SHALL CONSIST OF WESTERN RED CEDAR AND/OR DOUGLAS FIR SPECIES WITH BOLE LENGTHS OF 30-40 FEET, DIAMETERS AT BREAST HEIGHT OF 18-24 INCHES.
5. LWD SHALL BE INSTALLED ON A SLOPING BANK DOWN TO THE TOE ELEVATION (ABOUT ELEV. 6). LWD SHALL BE PLACED CLOSE TO THE TOE TO MAXIMIZE LONGEVITY AND HABITAT VALUE.
6. ANCHOR BOULDERS SHALL HAVE AN AVERAGE AXIS LENGTH OF 5 FEET, AND BE CONNECTED TO THE LWD WITH HEAVY CHAIN (3/8-INCH DIAM. LONG LINK, SELF-COLORED) VIA SHACKLE AND EPOXIED EYE BOLTS.
7. UPON PROJECT COMPLETION, STAGING AREA SHALL BE COVERED IN TOPSOIL, HYDOSEEDED TO MATCH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

US Army Corps of Engineers ®

MARK | DESCRIPTION | DATE

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

DESIGNED BY: J. SKRINDE	ISSUE DATE: 02 OCT 2020
DRAWN BY: G. SIMON	SOLICITATION NO.:
CHECKED BY: G. KATO	CONTRACT NO.:
SUBMITTED BY: PROJECT MANAGER	FILE NUMBER: E-6-7-52
SIZE: ANSI D	

FY20 P2 489170 DD3
SKAGIT DD3 LEVEE REHAB 2020
MT VERNON, WA

MITIGATION SITE PLAN / DETAILS

SHEET ID
DD3
L-101

FINAL DESIGN SUBMITTAL

Plot Date: $DATE$ $TIME$

US Army Corps
of Engineers ®
Seattle District

FY20 P2-489172 DD12
DIKING DISTRICT 12 (DD12)
LEVEE REHAB 2020
BURLINGTON, WASHINGTON

PROJECT VICINITY MAP
NTS

PROJECT LOCATION MAP
NTS

INDEX OF DRAWINGS

SHEET ID	TITLE
	GENERAL
G-001	TITLE, VICINITY MAP, PROJECT MAP, AND INDEX
	CIVIL
CS100	ACCESS AND HAUL ROUTE
CS101	SITE PLAN
C-301	CROSS SECTIONS

IF SHEET MEASURES LESS THAN 22" X 34" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

US Army Corps of Engineers - Seattle District

Date: 08 OCTOBER 2020
Solicitation No.: -
File No.: E-6-7-53

Recommended by: GUY L. GREEN, P.E. 08/10/2020 Chief, Design Branch Date
Approved by: JOANN T. WALLS, P.E. 08/10/2020 Chief, Engineering Div. Date

Submitted by: AARON MEADOWS-HILLS 08/10/2020 Project Manager Date
Reviewed by: 08/10/2020 Chief, Specs. and Tech Review Date

U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT SEATTLE, WASHINGTON
Prepared by: 08/10/2020 ALICIA N. ROTHERY Chief, Preparing Section Date

YY20 P2-489172 DD12 DIKING DISTRICT 12 (DD12) LEVEE REHAB 2020
TITLE: VICINITY MAP, PROJECT MAP, AND INDEX

SHEET IDENTIFICATION
G-001

DATE AND TIME PLOTTED: 11/13/2020
DESIGN FILE: I:\AEC\Designs\FY20_P2-489172_DD12\Con_Docs\CAD_Sheets\General\FY20_P2-489172_DD12-G-001CVR.dgn

A1 ACCESS AND HAUL ROUTE
1" = 200'

GENERAL NOTES:

1. PROJECT ACCESS WILL BE FROM HIGHWAY 20 ONTO PETER ANDERSON ROAD.
2. STAGING AREA WILL BE COVERED IN TOPSOIL, HYDROSEEDED AND MATCH THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

DESIGNED BY: J. SKRINDE	ISSUE DATE: 08 OCTOBER 2020
DRAWN BY: A. ROTHERY	SOLICITATION NO.:
CHECKED BY: G. KATO	CONTRACT NO.:
SUBMITTED BY: PROJECT MANAGER	FILE NUMBER: E-6-7-53
SIZE: ANSI D	

FY20 P2 489172 DD12
SKA DD12 LEVEE REHAB 2020
BURLINGTON, WA

ACCESS AND HAUL ROUTE

SHEET ID
DD12
CS100

95% DESIGN SUBMITTAL

Plot Date: $DATE$ $TIME$

A1 SITE PLAN
1" = 50'

GENERAL NOTES:

1. PROJECT ACCESS WILL BE FROM HIGHWAY 20 ONTO PETER ANDERSON ROAD.
2. STAGING AREA WILL BE COVERED IN TOPSOIL, HYDROSEEDED AND MATCH THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

DESIGNED BY: J. SKRINDE	ISSUE DATE: 08 OCTOBER 2020
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SUBMITTED BY: PROJECT MANAGER	FILE NUMBER: E-6-7-53
SIZE: ANSI D	

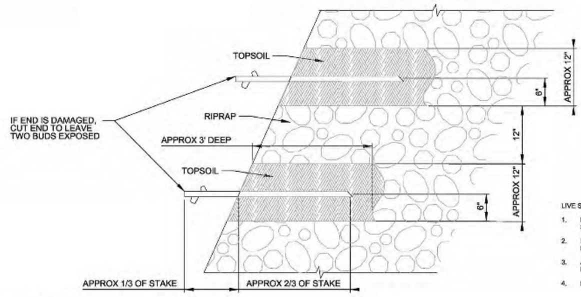
FY20 P2 489172 DD12
SKA DD12 LEVEE REHAB 2020
BURLINGTON, WA

SITE PLAN

SHEET ID
DD12
CS101

95% DESIGN SUBMITTAL

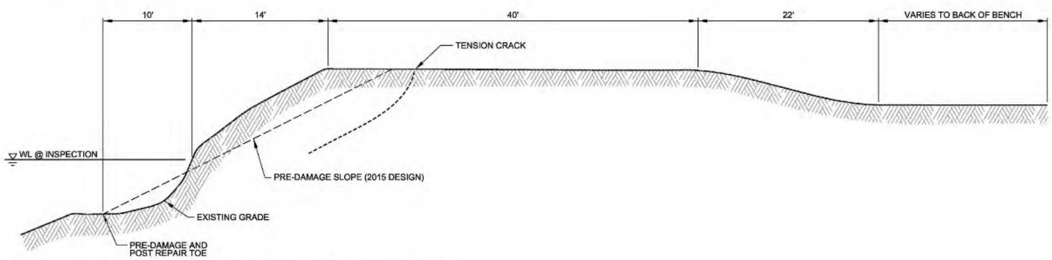
Plot Date: $DATES $TIMES



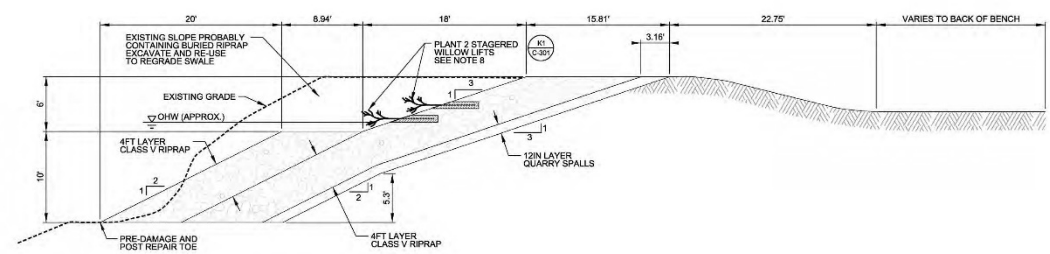
LIVE STAKE NOTES

1. PLANT STAKES BY HAND. DO NOT USE AXE OR SLEDGE FOR DRIVING STAKES.
2. IN HARD GROUND USE AN IRON BAR OR STAR DRILL TO PREPARE HOLES FOR THE STAKES.
3. AVOID STRIPPING BARK OR BRUISING STAKES DURING INSTALLATION.
4. BACKFILL VOIDS AROUND STAKE WITH NATIVE SOIL.

K1 WILLOW LIFT CROSS SECTION
NTS



F1 EXISTING CONDITIONS - LEVEE ARMORING CROSS SECTION
NTS



A1 PROPOSED REPAIR - LEVEE ARMORING CROSS SECTION
NTS

GENERAL NOTES:

1. PROJECT SITE EXTENDS FOR 828 LINEAL FEET INCLUDING TRANSITIONS FROM NATIONAL LEVEE DATABASE (NLD) FROM STATION 302+72 TO STATION 311+00. ACTUAL STATION OF CROSS SECTIONS WILL VARY DEPENDING ON FIELD CONDITIONS.
2. USACE SHALL BE RESPONSIBLE FOR LOCATING UNDERGROUND AND OVERHEAD UTILITIES AS APPLICABLE PRIOR TO COMMENCING WORK.
3. QUARRY SPALLS SHALL CONFORM TO GRADATIONS IN TABLE 1 ON C-301 AND SHALL CONSIST OF CLEAN, ANGULAR, SCREENED AND CRUSHED ROCK.
4. CLASS V RIPRAP SHALL CONFORM TO THE GRADATIONS IN TABLE 2 ON C-301. STONE SHALL BE HARD, SOUND, AND DURABLE MATERIAL, FREE FROM SEAMS, CRACKS AND OTHER DEFECTS TENDING TO LEAD TO PREMATURE WEATHERING.
5. TOPSOIL PLANTING MATRIX SHALL CONSIST OF A 75/25 MIXTURE O SOIL AND ORGANIC COMPOST. ENGINEERED TOPSOIL SHALL CONFORM TO GRADATION IN TABLE 3 ON C-301 AND SHALL BE FREE OF ROOTS, CHEMICALS GARBAGE AND DEBRIS.
6. WHERE HISTORICAL RIVERWARD TOE EXCEEDS THE EXTENT OF THE LEVEE REPAIR, EFFORT SHOULD BE MADE FOR EXISTING MATERIAL TO REMAIN INTACT SUCH THAT SAFE CONSTRUCTION PRACTICES AND STABLE SLOPES ARE STILL MAINTAINED.
7. LIMIT CONSTRUCTION ACTIVITIES TO WORK AREAS SHOWN.
8. 828LF OF 2 STAGGERED WILLOW LIFTS APPROXIMATELY AT OHW AND 18INCHES ABOVE OHW. WILLOWS SHALL BE SITKA WILLOW AND/OR HOOKER'S WILLOW 3' TO 4' LONG. LIVE STAKES WILL BE PLACED EVERY 12INCHES INTO A 6INCH LAYER OF SOIL PLANTED 2/3 THE LENGTH OF THE STAKE. SEE DETAIL K1 ON SHEET C-301 FOR MORE DETAIL.
9. HYDROSEED MIX: 2000LBS OF MULCH PER ACRE 400LBS OF FERTILIZER (10-20-20) PER ACRE 200LBS OF SEED PER ACRE 48.24% MAXIMA CREEPING RED FESCUE 24.51% ELF PERENNIAL RYEGRASS 14.62% HIGHLAND BENTGRASS 9.93% WHITE DUTCH CLOVER 40-80LBS OF TACKIFIER PER ACRE.

TABLE 1: QUARRY SPALL GRADATION

SIEVE SIZE	PRECENT PASSING
8"	100
4"	0

TABLE 2: RIPRAP GRADATIONS (ASSUMED SPECIFIC GRAVITY = 2.60)

DISTRIBUTION	CLASS V	
	SIZE (IN)	WEIGHT (LB)
100% SMALLER THAN	34	3000
50% SMALLER THAN	21	750
10% SMALLER THAN	13	188
Cu	2.2	

TABLE 3: ENGINEERED TOPSOIL GRADATION

SIEVE SIZE	PRECENT PASSING BY WEIGHT
1/2"	100
NO. 4	75-100
NO. 10	40-75
NO. 16	25-55
NO. 40	25-50
NO. 200	10-20

TABLE 4: MATERIAL QUANTITIES

SITE	LENGTH (FEET)	CLASS V RIPRAP (CY)	FILTER SPALLS (CY)	EMBANKMENT SOIL (CY)	TOPSOIL* (CY)	HYDROSEED* (ACRES)
TOTAL	828	6815	1520	330	0	0

*INCLUDES QUANTITIES FOR RESTORATION TO MATCH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

US Army Corps of Engineers ®

MARK | DESCRIPTION | DATE

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98134

DESIGNED BY: J. SKRINDE
DRAWN BY: A. ROTHERY
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SUBMITTED BY: PROJECT MANAGER
SIZE: ANSI D
ISSUE DATE: 08 OCTOBER 2020
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER: E-6-7-53

FY20 P2 489172 DD12
SKA DD12 LEVEE REHAB 2020
BURLINGTON, WA

CROSS SECTIONS

SHEET ID
DD12
C-301

95% DESIGN SUBMITTAL

Plot Date: $DATE$ $TIME$

Appendix B: Project photos.

Figure 1. DD 3 repair site showing slope failure.

Figure 2. DD 3 damaged segment scour.

Figure 3. DD 12 300 LF flood fight segment looking upstream.

Figure 4. DD 12 cracking along the riverward bench.