HESCO Barrier Installation
12.19.24
Phase 1
Alignment and Installation Considerations

Summary: The Mendenhall River Valley in Juneau, Alaska is under imminent threat of unusual flooding from what scientific experts expect will be recurring and likely record-breaking glacier lake outburst flood (GLOF) events. The impact and inundation area of these events have increased each of the last three years; a pattern that negatively impacts hundreds of homes and thousands of residents, as well as critical infrastructure, public facilities, and community and medical facilities.

CBJ is working tirelessly with Federal, State, Tribal and local partners to gather the additional information and resources needed to identify and implement a long-term solution. However, a long-term solution will take years before it can be implemented.

Therefore, emergency mitigation and immediate flood resilience action is needed to protect the most vulnerable in our community before the 2025 GLOF season.
With extensive consultation and involvement from United States Army Corps of Engineers (USACE) flood-fighting experts, CBJ plans to install USACE provided HESCO barriers as a near-term solution to mitigate potential widespread damage from future releases. Based upon factors such as the high-water marks obtained after the 2024 GLOF and the resources available to implement a solution before July 2025, a 2-mile stretch of riverbank was identified that would provide the most protection to the highest number of flood-vulnerable residents, homeowners, and properties. This is considered Phase 1 of CBJ's formal flood mitigation efforts. This interim solution is intended to protect against GLOFs that are up to 4 feet higher than the 2024 GLOF. CBJ will integrate the work of the hydrological and hydraulic analysis to implement Phase 1 in a manner to avoid downstream impacts. Site investigation by CBJ and the USACE of the 79 predominantly private properties along this Phase 1 route have led to the identification of a preliminary installation path.

Several factors were considered when developing the preliminary installation path to ensure that the HESCO barriers will function as intended, including technical and practical factors associated with the barriers and site conditions, and considerations of the nature of flooding, inundation, and bank erosion at different points along the river. Those factors are outlined below:

1. **Hydrological and Hydraulic Analysis:** Hydrological and hydraulic (H&H) analysis and modeling is currently underway. This initiative will deliver additional insight into the probable effects of more severe GLOF events. It will also provide information regarding the impact the HESCO barriers will have on the river and proximate properties during a GLOF event, including upstream and downstream impacts. The results of the H&H analysis and modeling will guide the final placement of the barriers.

2. **Armoring**: During the last several GLOF events, the river has displaced portions of the riverbank that were unarmored or insufficiently armored. Significant armoring along the river occurred after the 2023 GLOF. Armoring the banks of a few additional properties will prevent the continued loss of riverbank, provide the first line of defense against flooding, and protect the needed base/foundation for the HESCO barrier.

3. **Overtopping and Inundation Characteristics**: Properties along the riverfront were impacted in different ways during recent GLOF events. Some properties are located on segments of the river that saw direct and forceful overtopping. Other properties were natural drainage areas for floodwater to return to the river. And still other properties saw a slow but steady rise and fall of floodwater or were not flooded. These localized

characteristics require different armoring, configuration and alignment, and drainage considerations.

4. **Configuration (Height/Depth)**: The HESCO barrier project is intended to provide approximately four feet of added protection above the inundation levels seen during the 2024 flood event. Because certain areas along the riverfront experienced forceful overtopping of the riverbank or were more likely to be impacted by debris, different configurations will be needed to provide adequate load resistance and accommodate the varying topography along the riverfront, to protect from future overtopping. This may include stacking barriers to achieve the height needed, and buttressing barrier segments for additional strength.

5. **Base/Foundation (Scour, Erosion, and Settlement)**: Where possible, HESCO barriers will be placed on suitable soil that has adequate bearing capacity and can resist scouring and erosion. In areas with soil that is not suitable for barrier placement, soil improvement techniques, including compaction with shot rock, will be used to prevent scour, erosion, and settlement. Lastly, some areas will need to be "built up" to ensure adequate barrier height or to properly incorporate drainage features of the existing site conditions.

6. **Continuity of Barrier**: Although site/property specific considerations will influence the placement and configuration of individual HESCO cells, the cells must form a continuous barrier along the full, 2-mile length. Accommodation must be made to ensure that the barrier will perform as intended along its entire length. In some cases, the prevailing conditions on adjacent properties will constrain placement of individual cells.

7. **Drainage**: Manufactured drainage components will be incorporated at regular intervals along the barrier in accordance with manufacturers' recommendations to prevent water from accumulating on the dry side. Additionally, the barrier will be located and installed to take advantage of existing natural or constructed drainage elements.

8. **Slope and Cross Slope**: To the extent possible, HESCO barriers will be placed on a flat, level surface. Therefore, variations of the slope (ground surface along the length of the barrier) or cross-slope (ground surface from front to back of the barrier) will be avoided. These factors will influence placement and alignment.

9. **Constructability and Access (Installation, Maintenance, and Removal)**: The HESCO barrier project will involve the placement and assembly of HESCO cells along a 2-mile stretch of riverfront crossing 79 individual properties. To the maximum extent possible, construction equipment will be used to assist in the placement and fill of cells to facilitate the timely completion of the barrier before the next GLOF event. Constructing the barrier in a manner that will facilitate access for construction, maintenance, and eventual removal will influence the barrier's placement and alignment.

10. **Setbacks:** To avoid narrowing the river channel and the potential unintended consequences of elevating flood levels along the river, the HESCO barrier will be placed outside the riverbank and on the upland side of armored banks. To the extent possible, the barrier will be placed as far from constructed facilities (homes, attached structures, outbuildings, etc.) while still providing a suitable, continuous base along the barrier's length.

11. **Utilities**: The HESCO barrier will be placed on the river-side of existing utilities to protect public infrastructure and provide access for maintenance (e.g. installed electrical distribution equipment and transmission structures).

12. **Obstructions**: The HESCO barrier will be located to avoid obstructions on individual properties where possible. These obstructions include natural features (large trees/stumps, brush, etc.) and constructed features (fences, decks, outbuildings, etc.). In some cases, obstructions will be incorporated into the barrier or will relocated or removed to facilitate the construction of the barrier.

13. **Maintenance Access Points**: Three locations have been identified as barrier access points to facilitate road maintenance and snow removal activities. These segments of the barrier can be quickly removed to create openings as needed and immediately replaced to maintain the barrier's integrity.

14. **Manufacturer's Recommendations and USACE Technical Guidance**: Manufacturers' recommendations, technical advice and installation oversight provided by USACE will be relied upon to ensure that the placement and construction best serves the intended function of the barrier.

15. **Construction Approach and Timeline:** CBJ plans to complete site preparation and installation on each property before moving to the next property. (We do not plan to conduct site preparation for the entire alignment and later come back along the alignment to install the HESCO barriers.) Armoring may occur prior to and/or concurrent with barrier installation. CBJ likely will also start work from multiple points in the alignment simultaneously to expedite the process. An estimated construction timeline is below.

    Late December/early January – Publish a 95% design alignment
    January/February – CBJ to refine alignment with riverfront property owners
    February/March – CBJ/Property Owner MOU negotiation
    March/July – Bank armoring and barrier installation