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## TECHNICAL MEMORANDUM

Date: January 6, 2014  
To: Gina Piazza, Area Habitat Biologist  
From: JC Hungerford, P.E.  
Subject: Calistoga Setback Levee – Sluice Gate Operation  
cc: Pad Smith, WDFW, Environmental Engineer  
Ken Wolfe, City of Orting  
Kay Caromile, RCO  
Project Number: 216-1711-003  
Project Name: Calistoga Setback Levee



The 72-inch-diameter reinforced concrete pipe culvert located at Station 4+44, will be equipped with a sluice gate to prevent flooding during large stormwater events. Under normal conditions, the gate will remain open, allowing water from the unnamed stream channel to flow to the Puyallup River.

During extreme high water events and periods of heavy rain in the City, it will be necessary to close the sluice gate. High river elevations will cause a backwater situation, preventing water from exiting through the culvert system. This may expose the City to potential flooding. In a flood event scenario, the City will be monitoring the river elevation closely. When the water elevation in the river reaches 196 feet, the City will begin to close the gate. The gate is lifted utilizing a hand operator. This operator can be fitted with a hand crank or can be fitted to be operated with a drill or screw gun adapter. It is anticipated that the gate will open and close at a rate of 0.15 feet/minute, taking approximately 40 minutes for the full operation.

While the gate is closed, stormwater will be routed to the 42-inch-diameter bypass culvert under Calistoga Street West, and will flow through the conveyance channel located behind the levee. The upstream invert of the bypass culvert is at an elevation of 193.1. This invert elevation is much lower than the river elevation will be during a flood event, creating a headwater control on the upstream side of the gate. If the bypass culvert and conveyance channel reach capacity, higher backwater elevations will occur behind the sluice gate. In both scenarios, re-opening of the gate will require careful attention by the City in order to reduce potential scour of the streambed material in the culverts. The City will monitor the water elevation upstream and downstream of the gate, and will begin to open the gate when these elevations are equal. The timing of this is necessary to prevent high velocities and excessive energy from flowing through the culvert system, washing away streambed material.

In addition to the operation of the gate during a flood event, the City will also be responsible for regular maintenance, to include:

- Inspection and repair (as needed) of the gate structure elements for wear, corrosion, and other damage.
- Inspection, lubrication, and repair (as needed) of gate operable elements including hand wheel, gear box, threaded riser, etc. Operate the gate through its full range of motion once per year in October, and maintain/repair as required.
- The City will also inspect the gate and culvert monthly for obstructions by sediment, wood, or debris, and remove as appropriate.