



**CITY OF KIRKLAND**  
**Department of Public Works**  
123 Fifth Avenue, Kirkland, WA 98033 425.587.3800  
www.kirklandwa.gov

---

## **MEMORANDUM**

**To:** Kurt Triplett, City Manager

**From:** Ray Steiger, P.E., Public Works Director

**Date:** July 7, 2011

**Subject:** TOTEM LAKE FLOOD CONTROL MEASURES UPDATE

### **RECOMMENDATION:**

It is recommended that City Council receive this update of the ongoing Totem Lake Boulevard Flood Control Measures Project – CNM 0059.

### **BACKGROUND DISCUSSION:**

The Totem Lake area has experienced a number of flood events during the fall and winter months over the past few years. Development in the basin, natural erosion, and surface water runoff, combined with the growth of vegetation, accumulation of sediment, and other factors along the watercourse downstream of Totem Lake are restricting its natural flow (Attachment A). The City has been required to close roads in the vicinity of Totem Lake with regular frequency, and this has had a profound impact on commerce and travel in the Totem Lake neighborhood (Attachments B, C, D). In response to these issues, a City sponsored capital improvement project was developed with the majority of funding provided by the King County Flood Control Zone District's Sub-Regional Opportunity Fund.

In early 2011, the City contracted with the consulting firm CH2M Hill, of Bellevue, WA, to undertake a detailed survey of the drainage system from Totem Lake, downstream (and west) to approximately Juanita High School. The drainage system includes piped conveyance and natural open channels for this Juanita Creek tributary that eventually enters Lake Washington at Juanita Beach Park. Using GIS and survey techniques, the Consultant worked with City staff to measure the water surface level along the Project limits, to ascertain the system and watercourse geometry, and to locate the stream/watercourse channel bottom. The survey also confirmed specific locations of considerable accumulations of sediment along the watercourse, the presence of significant invasive vegetation, and a number of beaver dams. The identification of these "stream barriers" indicates that there are a finite number of locations along the drainage course that appear to impact the entire Totem Lake basin (Attachment E).

From the Consultant's findings, two locations along the drainage course, #1 and #4, appear to be critical and are being addressed immediately; their impacts appear to be such that their removal will likely alleviate future area flooding. In association with the Consultant's findings, staff is proceeding with securing all appropriate State permitting for addressing these locations.

Location #1 is adjacent to I-405, immediately upstream of twin culverts that cross I-405 (Attachment E). Due to the density of the grasses and vegetation along this drainage channel there is a significant accumulation of sediment blocking the flow of water. Working closely with the Washington State Department of Transportation (WSDOT), the City has been granted access through the WSDOT right-of-way west of Totem Lake Boulevard. Further, because the City does not have large enough equipment to access Location #1, staff has been in conversation with the King County Rivers Group to have the work performed under an existing 2008 Interlocal Agreement with the City. The County crews are uniquely qualified for watercourse work, as it is their primary focus for King County, and they are available to immediately proceed with this maintenance activity.

Location #4, further to the west, is an active beaver dam for which the City has had a State Department of Fish and Wildlife programmatic permit for dam removals in the past. The activities to do away with this barrier require hand removal of the various materials used to build the dam. The permit lapsed in 2010; however, it has already been renewed by the State.

The Consultant's recommendation is to address locations #1 and #4 immediately and, by doing so, the hydraulic modifications may result in minimizing or eliminating the other known downstream barriers. Staff will be monitoring the water level upon removal of the barriers and will also prepare additional measures to remove other barriers, as needed and as future funding for this Project becomes available. Initial estimates are that the removal of these two initial barriers will provide up to three feet of additional storage capacity to Totem Lake – this will become valuable as we approach the next fall and winter rainy seasons.

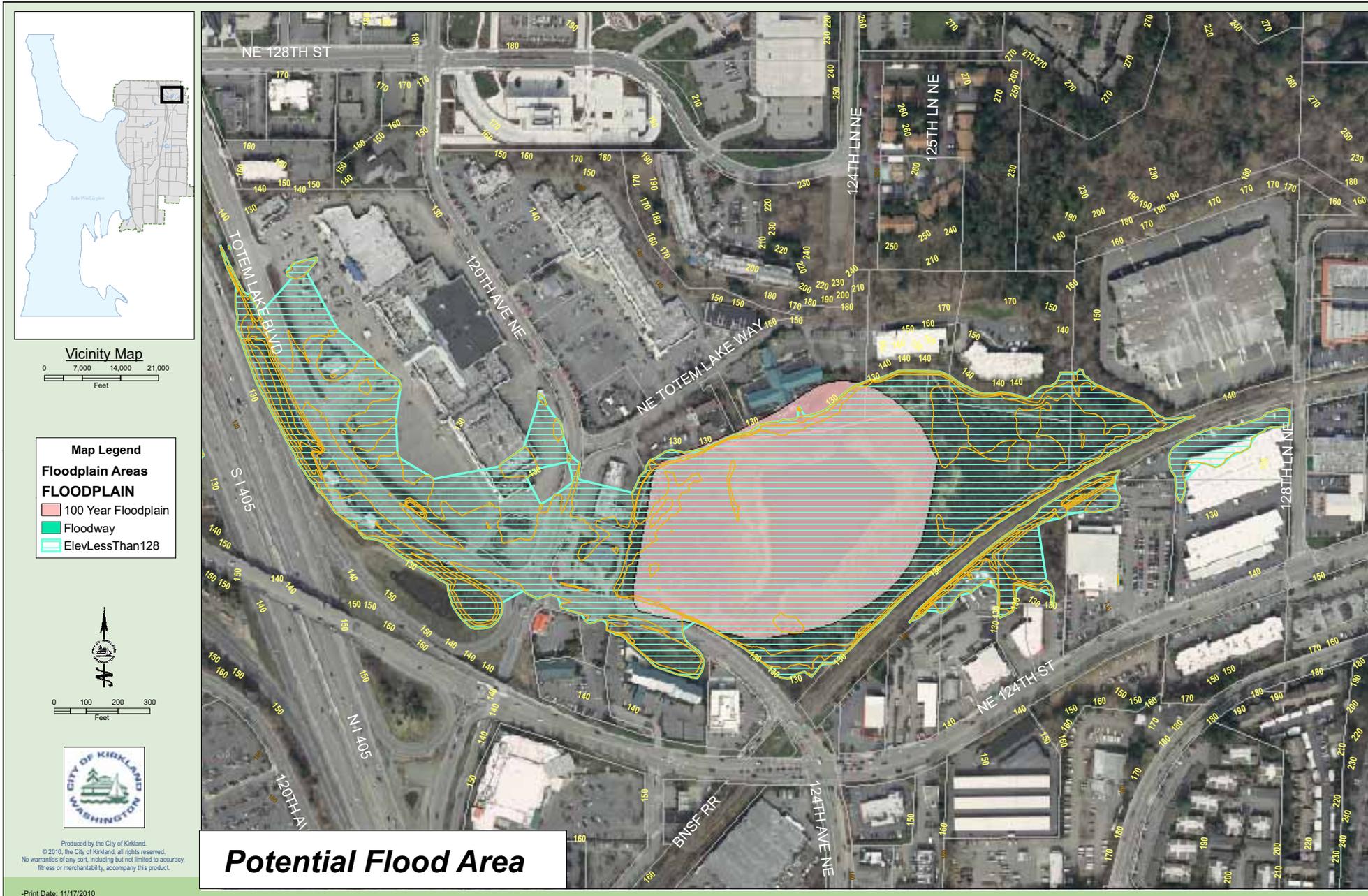


# City of Kirkland 2011 Totem Lake Flood Control Feasibility Analysis



--- Open Channel  
— Pipe





Vicinity Map

0 7,000 14,000 21,000  
Feet

**Map Legend**

**Floodplain Areas**

**FLOODPLAIN**

- 100 Year Floodplain
- Floodway
- Elev.LessThan128

0 100 200 300  
Feet



Produced by the City of Kirkland.  
© 2010, the City of Kirkland, all rights reserved.  
No warranties of any sort, including but not limited to accuracy, fitness or merchantability, accompany this product.

## Potential Flood Area



Figure 13: Intersection of Totem Lake Blvd and NE 120<sup>th</sup> Street, Facing South



Figure 14: Totem Lake Blvd and Totem Lake Mall, Facing East



**Figure 5: Pizza Hut Entrance and Totem Lake Blvd, Facing East**



**Figure 6: Pizza Hut Entrance and Totem Lake Blvd, Facing North**

Totem Lake Flood Control and Feasibility Analysis  
Site Map



1 Identified area of stream barrier