Lake Bottom Canal Risk Management

Civil Engineering Capstone Spring 2024

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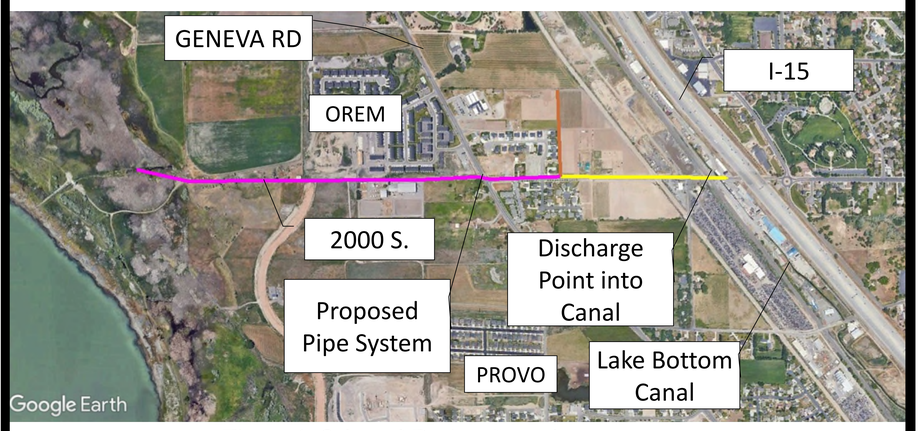

Figure 1. Selected Project Location

Project Objectives

- **Provide solutions to the current risks associated with discharging stormwater into a privately owned open channel**

Why?

- **Open channel exposed to atmosphere**

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Water Quality (exposed)

Water Conservation (loss, seepage)

WORST CASE SCENARIO: CANAL BREACH

Property Damage

Public Health and Safety Risk

City May be Liable

*** All this adds up to RISK**

Figure 2. Example of a Canal Breech in Murray, Utah

Solution #1 – Box Culvert

Closes Existing System (less risk, safer)

Water Quality (not exposed to elements)

Water Conservation (less seepage)

Cost (> $6 Million)

Figure 3. Box Culvert Bridge Further Downstream the Lake Bottom Canal

Solution #2 – Piped System

Closes Existing System

Water Quality

Water Quantity

Cost ($2.35 Million)

Incorporates Future Growth in the Area (housing etc.)

Easy to Maintain and Long Lifespan

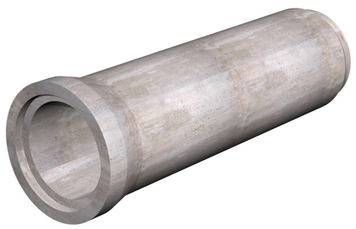

Figure 4. RCP Stormwater Pipe

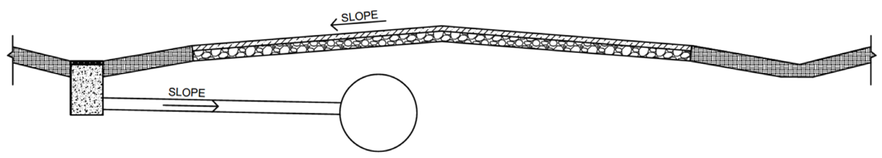

Figure 5. Piped System Serves as Stormwater Transmission line and Can Pick Up Stormwater Discharge From Future Developments Along 2000 S.

Solution #3 – Diversion System

Determined Not Feasible (scope creep, detention sizing limitations, high collaboration with third parties required)

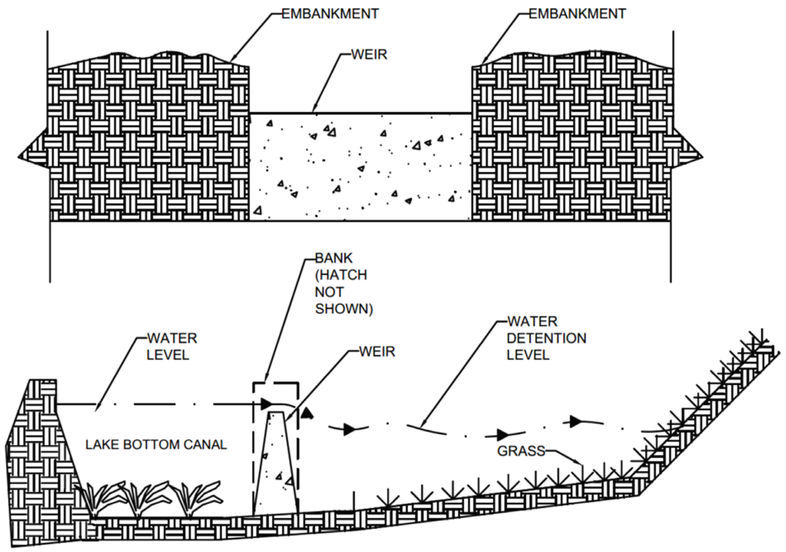

Figure 6. Divert Weir From LBC to Detention Basin

Software and Resources

Civil 3d, Sanitary Sewer Analysis (Autodesk), Hydraulic Toolbox, HydroExpres

Recommendations

- **Based on analysis and the input of the City of Orem, Solution #2 – Piped System was selected for the design.**