

April 23, 2015

To: Portland City Council

Washington Park Reservoir Case File- LU-14-249689 DM

Demolition review for Washington Park

From- Testimony of Scott Fernandez M.Sc. Biology/ microbiology, chemistry

Mayor appointed- Portland Utility Review Board 2001-2008

Water Quality Advisory Committee 1995-2000

The historic value of the Washington Park open reservoirs is based on structure and engineering foresight as well as public health benefits of no illnesses for over 100 years.

There is time and scientific basis to save our historic reservoirs and community health; ask for EPA LT2 waiver as New York City and New Jersey have requested for their open reservoirs. We ask for a community wide discussion when submitting our scientifically supported request for a waiver from EPA LT2 regulation.

Portland Water Bureau comments have been misleading and are corrected below.

Seismic vulnerability–

The seismic safety of open reservoirs was confirmed by the 2004 Open Reservoir Independent Review Panel. The remarkable open reservoir engineering of Ernest Ransome has withstood the seismic test of time for over 100 years without incident. As example-Ransome's two 1890's buildings at Stanford University survived the 1906 San Francisco Peninsula earthquake without damage; while the university's newer, conventional structures literally crumbled around them. The published analysis of these two buildings by fellow engineer John B. Leonard did much to advance engineering and the safety of building in post-1906 San Francisco and nationwide.

(No Model.)

E. L. RANSOME.
BUILDING CONSTRUCTION.

No. 305,226.

Patented Sept. 16, 1884.

FIG. 1.

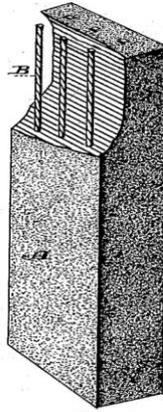
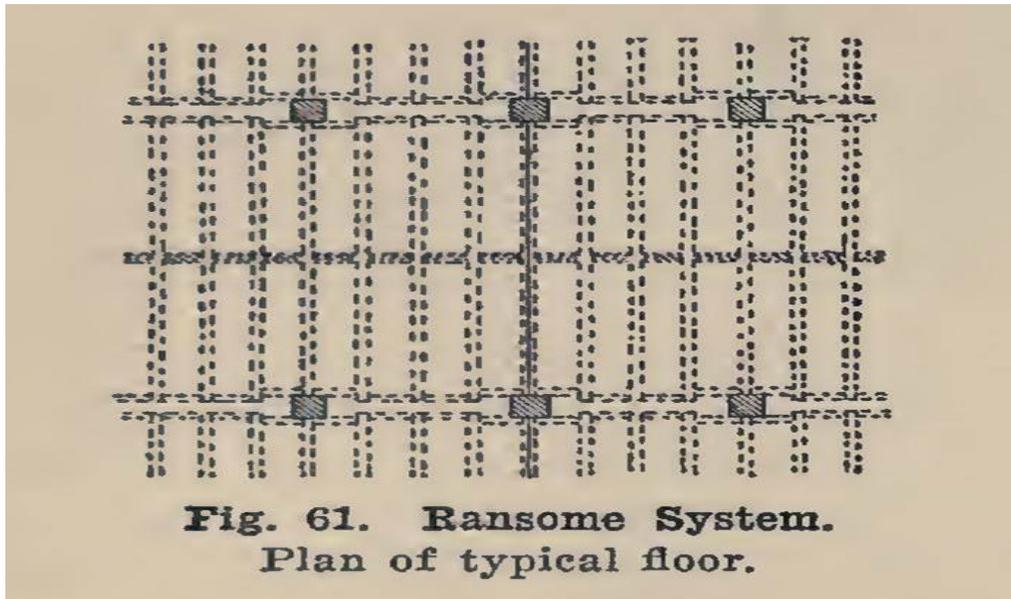
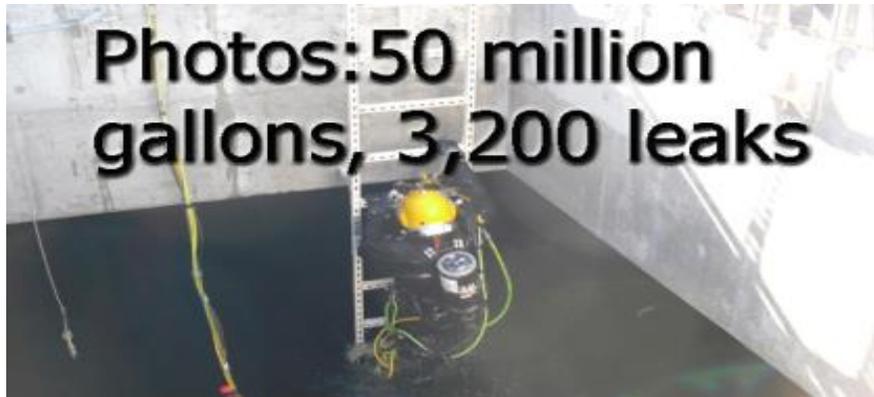


FIG. 2.



Patented New Engineering Used in Open Reservoir Construction

Twisted rebar at 1-2 foot intervals added strength to open reservoir floor and walls



Powell Butte 2 Covered Reservoir Engineering and Construction Defects Remain

Aging infrastructure-

City of Portland Auditor's Office- "Portland Water Bureau does not meet industry standards". The Portland Water Bureau has not kept up with maintenance of the reservoirs as acknowledged by City of Portland Auditor reports in 2004, 2011, 2012. The open reservoirs can function for many more decades if maintained properly.

Open Reservoir Public Health and Engineering Assessments-

"No waterborne disease outbreak or water quality incident of public significance has ever been recorded in connection with Portland's open reservoirs."

Montgomery Watson Harza. Open Reservoir Study: Phase I Summary Report. City of Portland. January, 2002.

"All features in good condition. ...a detailed maintenance program could extend the useful life of the open reservoirs to the year 2050."

Montgomery Watson Harza. Open Reservoir Study, Draft TM 5.7 Facilities Evaluation, City of Portland. August, 2001.

"All of the open reservoirs are historically significant, and thus are eligible for inclusion in the National Register of Historic Places and for local landmark status."

Open Reservoir Study, Technical Memorandum, Montgomery Watson Harza, 2001. Contracted by Portland Water Bureau (PWB)

“The reservoirs are historically significant as examples of early engineering, and serve as monuments to the social history of the City’s growth and development. They provide an early example of a planned landscape, including the views and vistas into and out of the landscape.”

Open Reservoir Study, Facilities Evaluation, City of Portland, 2001.

Landslides-

The Washington Park landslide was stabilized (1894-1904) in the early years of reservoir construction by first utilizing pumps to draw down the water table; followed by digging tunnels along the slip surface to provide a network of interconnecting gravity drains. Being stabilized for decades, today the landslide creeps at only a fraction of an inch each year. It is not the catastrophic situation PWB wants us to believe exists. Engineering reports show 14/100 of an inch movement that is diminishing for the last few decades. The underground water mitigation programs have worked as they should, de-watering and impeding movement. The soils near Washington Park reservoirs withstood intense rain inundation from the 1964 Christmas storm. But more importantly.... the State of Oregon recognized the February 1996 “once in a lifetime, **100 year super storm event**” as a milestone....with intense rain lasting for many days.... all without landslide issues at Washington Park. The surrounding reservoir soils and landscape survived the ultimate rainfall challenge in February 1996 all without landslide issue because of the engineering applications of soil stability mitigation.

Table 1: Historical Slide Movements Since Reservoir Construction

Date	Annual Rate of Movement	Description of Events
1893-1894	Unknown	Reservoirs constructed
1895-1896	15 inch/year	Water Bureau assessing cause of movements
1897-1898	1½ inch/year	Pump dewatering of exploratory shafts reduces movement rate; focuses stabilization techniques on dewatering options
1899-1900	4 inch/year	Exploratory shafts completed; movement rates increase due to stoppage of dewatering pumps; survey grid installed
1901-1904	¼ inch/year	Drainage tunnels constructed
1904-1906	1½ inch/year	Movements increase; additional drainage tunnels are installed
1906-1916	½ inch/year	Detailed survey monitoring
1920-1970	½ inch/year	Continued survey monitoring
1975-1986	¼ inch/year	Measurements obtained from 2 EDR casings
1987-2010	0.14 inch/year	Measurements obtained from 7 inclinometer casings

Public Health Benefits of Open Reservoirs- Radon removal

City of Portland secondary water source is the Columbia South Shore Well field (CSSW) groundwater that is highly radioactive with radon gas originating from uranium in the granite substrate. EPA is clear there is **“no safe level of exposure”** of radon and is the **“highest risk for cancer water contaminant”** they have registered. We need the open reservoirs to efficiently remove the gas as natural aeration of the water. Covered reservoirs cannot efficiently remove radon through their tiny vents. Radon gas kept in a closed and covered system without open reservoirs will end up in homes schools and work places; through our showers, toilets and washing machines generating 70% radon into the air leaving an additional 7 radioactive decay particles such as lead, polonium and bismuth.

Climate Change is producing less rain to depend on for drinking water, moving Portland to use the Columbia South Shore Wellfield (CSSW) radioactive groundwater as a supplemental source. Bull Run area will be drier (see NOAA) map. We need to retain open reservoirs in our system for historic value and for public health benefits of efficient removal of Radon, chloroform, and carbon tetrachloride gases. Covered reservoirs cannot remove toxins and carcinogens efficiently.

