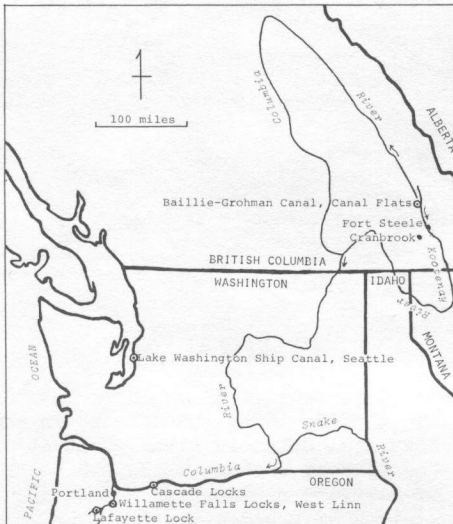


A Practical Guide to the Historic Canals of the United States and Canada  
Published by the American Canal Society, Box 638, Glen Echo, Md. 20768  
Part 1 The West Coast September 1974



This guide, one of the Bicentennial projects of the American Canal Society, is intended to encourage the preservation of historical canals and their use in the creation of open space. Readers are urged to join the society (individual membership \$6 to the Secretary, William H. Shank, 809 Rathton Road, York, PA 17403) and to send additions and corrections to Bill Trout, 1932 Cinco Robles Drive, Duarte, CA 91010. Additional copies of Part 1 are available at 50¢ ppd. from this address.

The editors gratefully acknowledge the generous assistance of the organizations, companies, and Corps of Engineers districts mentioned in the text; and of the many individuals who have supplied information and have worked to support their local canal.

## BRITISH COLUMBIA

The BAILLIE-GROHMAN CANAL is located at Canal Flats, 53 miles north on Route 95 from Cranbrook, which can be reached by commercial plane and has car rentals. There is a small hotel in Canal Flats (Columbia Hotel, Canal Flats, B.C.) and a ranger station. There is an historic marker at the N end of the canal, on Route 95 just N of Canal Flats. To reach the lock, turn W (right) 1.0 mi. S of the marker, for 0.2 mi., then left 0.1 mi. to the canal; the lock is a few yards to the right (N).

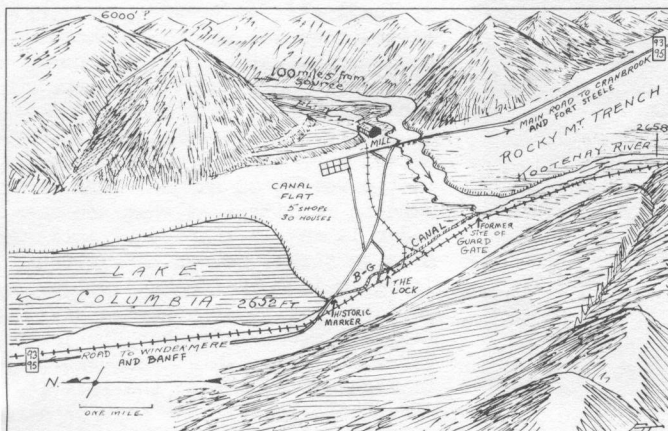
At Canal Flats, the headwaters of the Columbia and Kootenay (Koo'te-nay) rivers are within a mile of each other across the flat, the Columbia (which in fact has its source in springs in the canal) being about 6 feet lower in elevation. Originally, William Adolph Baillie-Grohman (1851-1921), big-game hunter and author, planned to dig a ditch to drain Kootenay floodwaters into the Columbia, to make the Kootenay flood-plains habitable. However, the Canadian Pacific RY was building along the Columbia and objected, so he built instead a steamboat canal a mile long with a wooden lift lock 30x100 feet in the chamber, and a guard gate at the upper (Kootenay) end. In spite of its recent date of construction, 1887-1889, these were pioneer days in British Columbia. A steam sawmill was shipped in by rail and boat from Ontario, and also steam pumps to drain the lock excavation.

Unfortunately, the traffic was somewhat less than expected. The first steamboat went through the lock in 1894 and the second, the North Star in 1902, was 3 in. too wide and 30' too long for the lock, so the gates were burned and the lock torn up to pass the boat. Since that time floods have completely washed away the guard gate and have scattered bits of the lock along the canal. Enough of the lock is left to deserve study. Note the dove-tailed timbers and the boiler-plate used instead of hollow quoins, for the gates to pivot against. The Historical Association of East Kootenay (921 4th St. S., Cranbrook, B.C.) is investigating the possibility of clearing a trail along the canal and taking advantage of this historical resource.

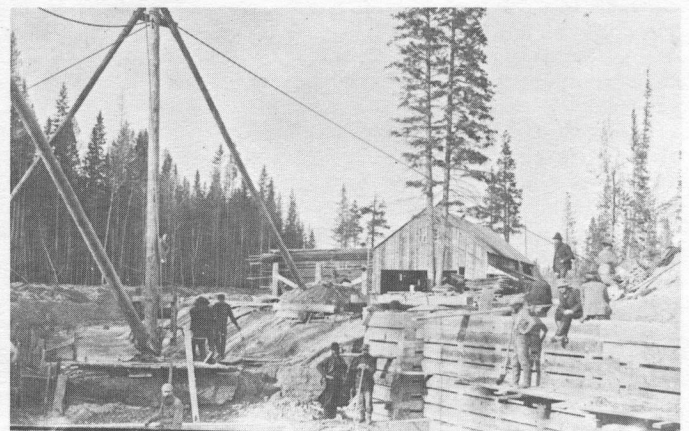
UTM co-ordinates (see General Information) 11.583.5555; topo map 82J/4 West, Canal Flats, from Canadian Map Office, Dept. of Energy, Mines and Resources, Ottawa, Ontario, Canada K1A 0E9.

For further details see American Canals, Nov. 1973, p.8; ACS Canal Index Sheet #4; and "The Kootenay Reclamation and Colonization Scheme and William Adolph Baillie-Grohman" by Mabel E. Jordon in the British Columbia Historical Quarterly, v.20, 1956.

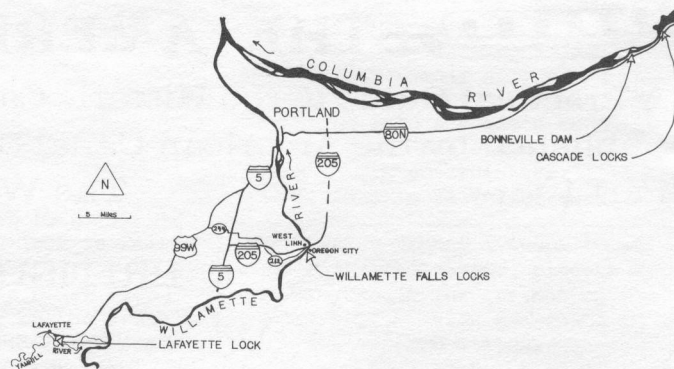
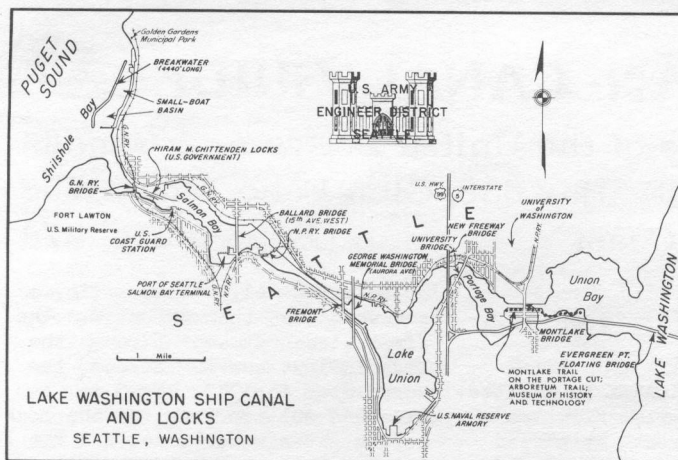
On the way to the canal don't miss Fort Steele Historic Park (Fort Steele, B.C.), a mecca for industrial archaeologists, 10 mi. N of Cranbrook on Route 95. Open daily 9 to 9 from June 16 to Labor Day, and 9 to 5 from May 1 to June 15 and Sept. 4 to Oct. 31. Write them for a free brochure.



Panoramic view of the Baillie-Grohman Canal, by Griffith Taylor, adapted with permission from the Geographical Review, v.32, 1942, p.391.



The lock under construction in 1888, with the steam sawmill in the background. Photo courtesy of Mrs. Mabel Jordon and Vice Admiral H. T. Baillie-Grohman.



Portland - the hub of Oregon's canals

## WASHINGTON

The LAKE WASHINGTON SHIP CANAL's Hiram M. Chittenden locks, operated by the Corps of Engineers, are located at the S end of 32nd Ave., N.W., about 4 mi. NW of downtown Seattle. The grounds, with a 7-acre ornamental garden, are open from 7 a.m. to 9 p.m. daily. The Gray Line (MU2-1234) conducts harbor tours through the locks from downtown Seattle, 1 to 3 times daily from April 27 to Oct. 23.

This canal connects Seattle's fresh-water harbor, composed of Lake Washington, Salmon Bay and Lake Union, with Puget Sound and the Pacific. These lakes have been connected by segments of the canal and brought to the same level, which no longer fluctuates, making an excellent harbor. The fresh water also gets rid of barnacles! There are two locks, one large (80x825') with a third set of center gates; and one small (28x150'), constructed at the same time, between 1911 and 1916. Lockage through the large lock takes about 25 min. and through the small lock, 10 min. The lift varies between 6 and 26', depending on the tide. The locks have been written up for the National Register of Historic Places; but already on the Register is the stern-wheeler snagboat W.T. Preston, moored at the locks when it is not working.

An interesting technical problem at these locks is the inflow of salt water to the lake during lockage. To trap the salt water, a large excavation was made in the bottom of the canal above the large lock. The heavy salt water tends to sink into this excavation and is removed through a drain to the sound. In addition, there is a salt-water barrier at the head of the large lock.

A free Brochure, "Lake Washington Ship Canal and Hiram M. Chittenden Locks", is available from the U.S. Army Engineer District, Seattle, 1519 Alaskan Way South, Seattle, WA 98134.

UTM co-ordinates: 10.54850.527745, Seattle North 7 1/2' quadrangle. Nautical Map: #690-SC, \$2.20 from NOS (see General Information).

There is a hiking trail along the canal's Portage Cut, connecting with the waterfront trail of the University of Washington Arboretum (open 8 a.m. to sunset), near the Museum of History and Technology.

Also of interest might be an underground tour of Seattle's waterfront built over in 1880. Reservations required one day in advance from Bill Speidel Tours, 682-4646.



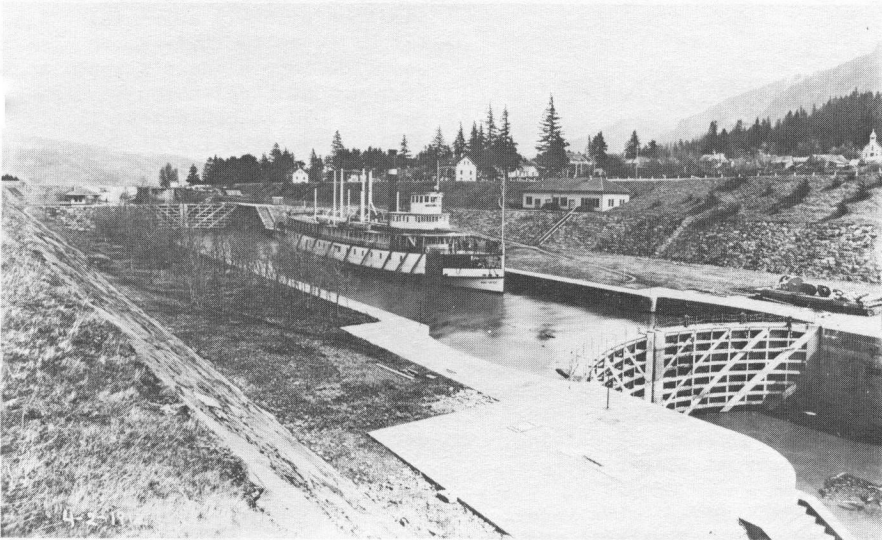
The Hiram M. Chittenden Locks, looking westerly. (U.S. Army Engineer District, Seattle)

## OREGON

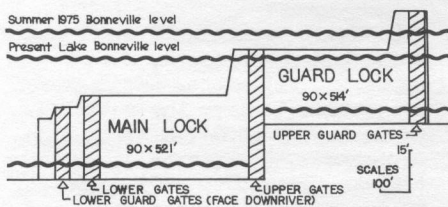
The CASCADE LOCKS are located in the beautiful Columbia River gorge at the town of Cascade Locks, 40 mi. E of Portland on Interstate 80N, and 3 mi. E of Bonneville Dam. Turn off I-80N onto Route 30 through Cascade Locks, then left after 1/2 mile at the sign to Cascade Locks Marine Park. The Port of Cascade Locks has made a fine park and marina here, with overnight camping allowed. There is a Scandian Motor Lodge (Cascade Locks, OR 97014, 503/374-8417) where you can insist on a room overlooking the lock, with a picture of it on the wall. Cascade Locks Marine Park Museum, in one of the three former lock-tender's houses, has much canal material, and is open daily from noon to 6 in June-September, and only on weekends in May and October. There is even a little steam engine in front of the museum, used on a portage railway around the falls before the locks were constructed in 1878-1896. Pamphlets about the area are available from the Port of Cascade Locks, Box 416, Cascade Locks, OR 97014, 503/374-8619.

The locks, on the National Register, comprise an impressive and handsome masonry structure, complete with huge cavities in the stonework which once housed the hydraulic pistons which operated the gates, once the largest miter gates in the world, 40 and 46' high. It is hard to realize that what one sees today is merely the top of this massive structure, which was inundated in 1937 by the Bonneville Dam. In fact, the lock proper is now entirely submerged; what you see is the guard lock, which was used only in high water, making the lock a 2-lock staircase. The lock proper was 90x523' in the chamber, with a lift of 4 to 24'; the guard lock was 90x514' and could provide an additional 22' of lift.





Looking up the main Cascade Lock during the steamboat era. The guard lock is in the background. (U.S. Army Engineer District, Portland)



Cascade Locks: the tip of an iceberg

Unfortunately, by the summer of 1976 the Bonneville Dam will be raised 8 feet, submerging even the guard lock walls, except for the high upper abutments, across which the city has placed a footbridge. The Corps of Engineers hopes to raise the walls while retaining their present appearance.

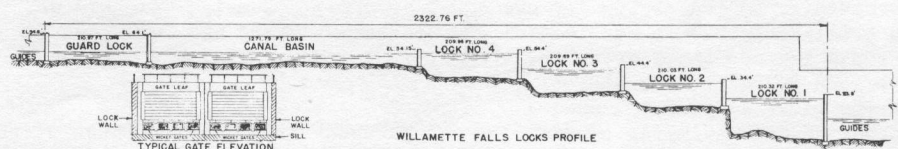
UTM co-ordinates: 10.58610.505765, Lake Bonneville 15' quadrangle. For further information see ACS Canal Index Sheet #5.

There are 8 modern dams with locks on the Columbia and Snake rivers, operated by the Corps of Engineers, which provide slack-water navigation from Idaho to the Pacific. On the Columbia River in Oregon are BONNEVILLE LOCK AND DAM, with an underwater fish viewing window, 3 mi. below Cascade Locks on I-80N; THE DALLES LOCK AND DAM, 40 mi. above Cascade Locks on I-80N (in 1956 this dam completely inundated the older 1905-1915 DALLES-CELILO CANAL, 8 1/2 mi. long with 5 locks primarily of concrete); JOHN DAY LOCK AND DAM, 22 mi. E of The Dalles on I-80N near Rufus; and McNARY LOCK AND DAM 2 mi. E of Umatilla on Oreg. 730. On the Snake River, in Washington, are ICE HARBOR LOCK AND DAM, 8 mi. E of Burbank on Wash. 124; LOWER MONUMENTAL LOCK AND DAM, 6 mi. S of Kahlottus; LITTLE GOOSE LOCK AND DAM, 8 mi. E of Starbuck on Wash.

261; and LOWER GRANITE LOCK AND DAM, 20 mi. NE of Pomeroy (follow signs). All of these have recreational facilities and camping. For more details ask for "Lakeside Recreation in the West" and brochures on the Oregon dams from U.S. Army Engineer District, Portland, P.O. Box 2946, Portland, OR 97208; and brochures on the Washington dams from U.S. Army Engineer District, Walla Walla, Bldg. 602, City-County Airport, Walla Walla, Washington 99362.



Looking down the falls of the Willamette, with the canal at left. (U.S. Army Engineer District, Portland)



The 4-lock staircase of the Willamette Falls flight. (U.S. Army Engineer District, Portland)

The WILLAMETTE FALLS LOCKS are in West Linn, about 10 mi. S of Portland on Interstate 205, on the opposite (W) bank of the Willamette River from Oregon City. Take the West Linn exit and head for Oregon City but before crossing the old bridge over the river, park in back of the West Linn Inn. The old bridge offers a good view up the flight. Parking near the locks is tight so walk down to them via the road or Crown-Zellerbach's wooden walkway.

The Willamette (pronounced wi-lam-et) Falls Locks were built in 1870-73 by private interests (and later purchased by the Corps of Engineers), so they are probably the oldest navigation locks in the west, and surely the oldest still in operation, as well as the longest flight. They are on the National Register. This flight is a 5-lock staircase, with a total lift of 50', plus a guard lock at the head of the flight. The locks, 50x210' in the chamber, are of wood with some masonry work, little changed from the original except for the steel gates and remote-controlled operation. The Lockmaster's office is at the head of the flight; he can be called ahead of time to find out when locking operations are going on (656-3381, a local call from Portland).

There is no picnic area, but there are rest rooms in the Crown-Zellerbach Paper Co. office. This company is a major user of the flight, usually shunting barges between 11 and 3 during the week. There are 1-hour tours of their paper mill at the flight, M-F at 10 and 2, no children under 6 (and preferably not under 12).

To see the head of the canal, and Crown-Zellerbach's log intake at the falls, drive S on Falls Drive (Route 212) on the West Linn side, for about 1/4 mi., just beyond a power substation, and walk to the edge of the cliff.

A brochure, "Willamette Falls Locks", is available free from the U.S. Army Engineer District, Portland, P.O. Box 2946, Portland, OR 97208.

UTM co-ordinates: 10.53032. 502250; Oregon City OR 7 1/2' quadrangle.



Lafayette Lock, in Lafayette Locks County Park, 1974.

LAFAYETTE LOCK is located on the Yamhill River about 35 mi. SW of Portland via the Pacific Highway (99W). Turn left (S) at the Lafayette Locks County Park sign just before entering Lafayette, and drive 1 mi. to the end of the road. The lock is in a pleasant sylvan park maintained by the Yamhill Co. Dept. of Public Works, Yamhill Co. Court House, McMinnville OR 97128, 503/472-9371, ext. 313. Always open, one night parking permitted. Picnic area; rest rooms; drinking water in season. The lock, of concrete, is 38x175' with a lift of 16', built in 1898-1900 under the Corps of Engineers to provide 3' of water in the Yamhill River, for 18 mi. up to McMinnville, for timber traffic. By the 1930's log traffic rarely passed through and in 1956 the lock was turned over to the county for use as a park. Little is now left of the dam and the gates are gone. The lock is on the far side of the narrow river so you will need a rubber boat or swimming trunks to actually walk on it.

UTM co-ordinates: 10.49190. 500841; Dayton OR 7 1/2' quad.

## CALIFORNIA

The WILLIAM G. STONE LOCK (1963), the only navigation lock in California, is at the head of the 43 mile long Sacramento River Deep-Water Ship Channel, on the south edge of West Sacramento, at Jefferson Boulevard. The lock gates are designed to reverse when the Sacramento River is lower than the ship channel. The lock overlook is open every day during daylight; guided tours can be arranged by calling the Lockmaster at 371-7540.

The SACRAMENTO RIVER DELTA is a fascinating maze of natural and artificial canals, used by pleasure boats (especially houseboats) as well as commercial traffic. Nautical Maps: 5527-SC and 5528-SC at \$1.25 each from NOS; and "Map of the Fabulous Delta Region" at \$1.25 ppd. from Delta Marina Yacht Harbor, Inc., 100 Marina Drive, Rio Vista, CA 94571. A working hydraulic model of San Francisco Bay and the delta canal maze can be visited at the Corps of Engineers Operations Base at the foot of Spring St. in Sausalito, across the Golden Gate Bridge from San Francisco. Open M-F 9 to 4 except holidays, and on selected Saturdays. Call 332-3870 to find out when the model is in operation.

Canal addicts visiting California's GOLD COUNTRY in the Sierras north of Yosemite will find hundreds of ditches dating back to the 1850's which carried water for hydraulic mining. These have obvious potential for recreation and open space planning and need systematic study by canal enthusiasts. Tuolumne County still has an extensive network of canals in use for power and water supply, most of which are open for hiking and some are even stocked with fish. For details ask for the map of the Tuolumne Water System, from the Pacific Gas and Electric Co., 77 Beale St., San Francisco, CA 94106 (or 222 S. Shepherd St., Sonora, CA 95370); and a map of the Mi-Wok District, from Stanislaus National Forest, 175 S. Fairview Lane, Sonora, CA 95370. Both maps are needed to locate roads and canals. Topo maps: Columbia, Columbia SE, Sonora, Standard and Tuolumne, CA 7 1/2' quadrangles, and Long Barn CA 15' quad.

A pleasant surprise for those visiting Fantasyland in DISNEYLAND are a couple of pseudo canal-boats painted in the traditional roses and

castles of British narrow boats. Few visitors probably appreciate this bit of authenticity! Where else can you ride into a whale's mouth in a narrow boat "Registered in Disneyland"? UTM co-ordinates: 11.414. 3741, Anaheim CA 7 1/2' quad.

This guide cannot attempt to cover the many prehistoric, pioneer and modern canals for irrigation and water supply which are found throughout the western states. These need separate treatment. Many of them are covered in a fascinating guide, WATER FOR THE SOUTHWEST, 204pp., ill., 1973, available at \$5 from the American Society of Civil Engineers, 345 East 47th St., N.Y., N.Y., 10017.

## GENERAL INFORMATION

NOS: Navigation charts of coastal areas and some rivers, such as the Columbia, Willamette and Sacramento, are available from the National Ocean Survey (NOS), Distribution Division, C44, Riverdale, MD 20804 (checks payable to NOS). Ask for their free chart catalogs #1 and 2 (Atlantic and Pacific).

UTM co-ordinates: The Universal Transverse Mercator (UTM) grid is ideal for pin-pointing canal structures on topographic maps. The grid divides the world into 60 north-south zones 6° wide. Within each zone the location of a structure is defined by its distance in kilometers across the zone (E) and from the equator (N). These distances are shown by blue ticks a kilometer apart on most U.S. Geological Survey topographic maps. A structure in zone 10, 548.5 km across the zone (E) and 5277.45 km from the equator (N) would be at UTM 10. 5485.527745.

U.S.G.S. TOPOGRAPHIC MAPS are available at 75¢ each from the Distribution Section, U.S. Geological Survey. Orders for quadrangles west of the Mississippi should be sent to the Survey at Federal Center, Denver, Colorado 80225; east of the Mississippi to 1200 S. Eads St., Arlington, VA 22202; mixed orders from either address. Ask for the free index map for the state desired.

Editors for Part 1:  
William E. Trout, III, Ph.D.  
Capt. T. F. Hahn, USN (Ret.)  
Peter Stott  
William H. Shank, P.E.