"ONTARIO HYDRO'S" ELECTRIC LOCOMOTIVES

SIX more electric locomotives are being built for the Hydro-Electric Power Commission of Ontario for use in the construction of the Chippawa-Queenston power canal. Twelve similar locomotives have already been placed in service at Niagara Falls. Following are the general dimensions of each locomotive:—

Length over all, 41 ft.; length of truck centres, 25 ft.; length of main cab, 16 ft.; length of auxiliary cab, 9½ ft.; width over side sills of locomotive, 9 ft.; width over main cab, 9 ft.; width over auxiliary cab, 6½ ft.; height of rail to bottom of side sills, 3 1-3 ft.; height of rail to centre of coupler knuckle, 2 ft. 10½ ins.; height of rail to top of roof, 12 ft. 8½ ins.; truck wheel base, 7 ft.; track gauge, 4 ft. 8½ ins.

Through the courtesy of Frederick A. Gaby, chief engineer of the Commission, *The Canadian Engineer* has received the following description of the locomotives:—

Each locomotive is designed for double-end operation for either switching or road service. Both ends are symmetrical about the centre line across the body, the total weight, including equipment, being 100,000 lbs.

General Description

The trucks are of the arch-bar type, with M.C.B. class C springs. The wheels are 36 in. chilled grey iron, M.C.B., 1912 profile; axles, M.C.B., 5½ in. x 10 in. journals, with centre between hubs of wheels of 50 in. to take motor bearing, and cast steel gears which are pressed on the axle.

The underframe has six 12 in. I-beams at 40 lbs. sills the full length of the locomotive, with 8 in. I-beams at 25 lbs. cross sills rivetted to longitudinal sills; end buffers, 15 in. channel at 33 lbs. rivetted to sides of longitudinal sills; bolster, 1 in. by 14 in. by 9 ft. longitudinal sills.

The locomotives are of the main cab box type, with two side doors, two end doors, four side windows, four end windows and removable doors between the main cab and hoods. Two hoods are located one at each end of the main cab, with two removable doors on one side of each hood. Car lines and posts in hoods and main cab are standard structural shapes, with inside finish in main cab only.

Additional ballast is added in flooring by placing solid cast iron slabs, 2¾ in. thick by 18 in. by 9 ft. long, in the floor under the hoods at each end only. This ballast weighs altogether 24,080 lbs., and brings the weight of body, truck equipment, etc., up to the required 100,000 lbs. total necessary for proper tractive effort.

The electrical equipment consists of four G.E. 66 B motors, 125 h.p. each, two mounted on each truck; type M multiple unit control, consisting of two sets of D.B. 31 contactors, each set consisting of 13 contactors.

There are two D.B. 20 reversers, ten frames of rheostats, two C. 6 controllers, two B.T. 335 junction boxes, the necessary kicking coils, lightning arrester, main switch, motor cut-out switches, fuse-boxes, choke coil control switch, lighting headlight and heater switches, trolleys, etc.

Two Sets of Equipment

Each pair of two motors is wired up in such a way as to give two sets of equipment, separate and distinct from each other, which are paralleled together in each controller, one of which is at each operating end. Located in front of each operating position where they can be readily seen and used in operation and under the hood is one set of contactors, one reverser, air gauges, whistle valve, sander valve, dump line valves, ammeter and all control switches.

All control leads are special standard 19-25 wire, and run in conduit without colors, each individual wire being tested out before connection.

All main leads are special standard extra flexible wire, and are run singly, each one in a separate conduit, with bell-mouths and gaskets in each end for weatherproofing and to prevent wearing of insulation on wires in operation.

Air brake equipment is Westinghouse No. 14 E.L. locomotive air-brake as used by present steam roads, with two 50 cu. ft. motor-driven air-compressors, both located in main cab. Extra features are the dump line operating couplers and valves used for operating 20 cu. yds. dump cars on the Niagara power development.

All compressors and control are equipped with multiple unit features, so that it is possible for one operator to operate two or more locomotives from the one controller.

Four trolley bases are used, due to the double-end operation and side trolley wire construction used. The trolley wire on which these locomotives will operate is located 7 ft. from the centre line of the track and 24 ft. from the rail, requiring the use of four trolley bases with poles bent out to reach this wire.

CHLORAMINE TRIED BY NEW YORK CITY*

APPLICATION of chloramine to the somewhat polluted water of Esopus Creek before it goes into the Ashokan reservoir at the head of the Catskill Aqueduct was described at the February meeting of the New York Section of the American Water-Works Association by Dr. Frank E. Hale, director of laboratories of the Department of Water Supply, New York City.

Although the water from the Ashokan reservoir has a long period of storage and is subjected to treatment with liquid chlorine before it reaches New York City, chlorination of the water of Esopus Creek before it reaches the reservoir was considered desirable. This was decided on in 1917 as soon as control of the Catskill watershed was taken over by the department.

Local conditions prevailing at that time led to the adoption of hypochlorite instead of liquid chlorine for the Esopus Creek water. Immediately upon introduction of the hypochlorite (0.4 ppm.) complaints were received that the water was killing trout in the creek.

Cost Was Excessive

This led to trial of the chloramine process (ammonia used with the hypochlorite), in an attempt to reduce the amount of chlorine and sludge. A material reduction in the unit rate of free chlorine applied (from 0.4 to 0.1 ppm.) was found to be possible, with good bacterial results and elimination of the fish problem, but the comparison of results obtained throughout more than a year's study indicated that equally good results were obtained by the use of hypochlorite alone.

For example, the total bacteria and the B. coli removal with application of 0.05 ppm. available chlorine, bleach compared with chloramine, was, respectively, for bacteria 71% and 74%, and for B. coli 98% and 96%. These results indicated that the cost per unit of available chlorine applied for chloramine was double that of hypochlorite alone, since the ammonia cost four times as much as the hypochlorite, and the relative amounts of each applied were in the inverse ratio of one to four. This ratio was indicated by the experiments to be the correct ratio, the formation of chloramine being shown by a decidedly larger amount of free chlorine in the treated water than when bleach alone was used.

An important point brought out in the paper was that a given amount of available chlorine applied, and found by analysis to be actually in the water, did the same work—that is, percentage removal of bacteria and of B. coli—*at all temperatures*, winter or summer, from 32° F. to 76° F. Another point to be emphasized is that very small amounts of available chlorine may be effective in waters of low mineral and organic content.

The paper and discussion following brought out the fact that chloramine cannot safely be used except where there is very strict laboratory control, since otherwise the hypochlorite and the ammonia are likely to result in a variety of reactions and compounds, depending chiefly upon the proportion of chemicals applied and the strength of the solutions.

*From "Engineering News-Record," New York.