steamers plying on Lake Ontario, and it was increased to 55 feet, such change involving the widening of the body of the dock, increasing the size of the caisson and the dimensions of the caisson chamber. After cleaning the bottom in front of the site, an earthen coffer-dam was placed, the material (clay) composing it being obtained from the channel of the Cataraqui through the marsh above the highway bridge. This dam failed when the work was about one-third completed, but the break was easily filled and the work resumed.

The dock is bui't of limestone obtained from quarries at Belleville, and fully up to the requirements of the specification, which demanded that the ashlar in the altars, except in two instances, should be built of stone 2 feet 8 inches in height. As stretchers could not be less than 4 feet in length, with a bed not less in width than 1½ times the rise, the smallest stone that could be used weighed over three tons. The coursing of the sidewalls was carried through the body of the work, the whole with quarter-inch joints, and dressed with the fine end of a Bouchard hammer. The backing consisted of large and well-shaped stones of such thickness that *two* courses were equal to *one* course of face-work. The floor is of stone, the central 6 feet carrying the keel-blocks being raised 6 inches above the dock bottom. The foundation of the engine house, chimney and machinery were carried up from the rock, and the floors paved with stone. A quantity of concrete was used, composed of 6 parts of broken stone, 1 part clean, sharp sand, and 1 part of Portland cement. The whole of the masonry was laid in a compound of *one* of Portland cement to *two* of sand, mixed and used as required, each course being grouted up and filled full with the compound. All joints were lipped for 4 inches from the face with a compound of 1 of cement to 1 of sand, and neatly pointed and finished off when green. Only Portland cement was used in the work, and a constant testing was carried on during construction. Samples were taken from every *tenth* barrel as delivered, and tested for fineness by the whole sample passing through a 2,500 sieve. Briquettes of neat cement, after remaining for twelve hours in the air and seven clear days in water, gave an average tensile strength of 445 lbs. per square inch. The quoins of the outer face of the inner invert and side walls are of grey granite, all remaining stones in the invert being of limestone. The granite and limestone quoins facing on the caisson berth, and of the walls on either side, are worked with a projection of ¾ inch, and a full width of 12 inches, and set absolutely perpendicular and in a true plane, the faces being finely axed and rubbed down, for on these meeting faces depends the tightness with which the caisson fits, thus preventing leakage when the dock is empty. An extension of the caisson-berth forms a chamber into which the caisson is drawn to admit a vessel. Along each side of the bottom are heavy cast iron rollers placed at intervals, on which the caisson rests and travels when being moved.

The width of the inner invert is 55 ft., and of the outer invert 57 ft., this difference being necessary to permit the caisson being floated into its berth. They are built to a radius of 193 ft., and the stones forming them are cut with radial joints. The lowest point in the inverts is 15 ft. 6 ins. below zero, or the assumed average low water level of the lake, 22 ft. below coping level, and 4 ft. 6 ins. above the floor of the dock. Outside the outer invert is an apron of stone 20 ft. in width and 2 ft. lower than the centre of the invert, in which are placed granite blocks on which the caisson can rest if at any time it is found expedient or necessary to effect repairs in the caisson berth or chamber, or to dock a vessel longer than the floor of the dock, or, in other words, a vessel of 310 ft. in length. Under the foundation of the dock bottom are arterial drains, by means of which the leakage from the lake is carried to and discharged by the auxiliary pump, when the dock is empty. Access is had to the dock floor by steps on either side at the entrance end, and on either side of the timber slide at the head. In the floor at the lake end is a rudder well, 24 ft. long, 3 ft. wide and 12 ft. deep, which has proved of much service, as it permits an easy removal and replacing of a rudder. Sixteen (16) cast-iron mooring parts, set in and filled with concrete, are placed around the dock, together with six heavy, double purchase capstans. On the dock floor are cast-iron keel-blocks capped with hard wood, placed at intervals of 5 ft., and 32 bilge-blocks at 10 ft. centres, which are operated from the dock coping. The dock is filled through a culvert 4 ft. in diameter, the mouth of which is outside the entrance works, and the discharge over the inner invert, the whole being submerged 6 ft. below zero, and controlled by a 4 ft. cast-iron valve. Provision has been made whereby, in an emergency, filling can take place through the emptying culvert, which is also 4 ft. in diameter and controlled by a valve. The caisson chamber and berth is connected by a 12-in. pipe with the auxiliary pump, so that either can be emptied in the event of the stop logs being put in place.

The engine-house, which comprises an engine-room, boiler-room and dynamo-room, is of stone. The chimney —also of stone, and 90 feet in height—is placed partly within and partly without the building. Over the engine and dynamo-rooms the roof trusses are of wood, and over the boilers of iron, the party walls being carried up to the roof as a safeguard in case of fire. The major portion of the floor of the engine-room is 6½ feet below zero, or 13 feet below coping level, and on it is placed the pumping plant, which consists of two vertical 18-inch centrifugal pumps, one right-handed, the other left-handed, having discs 4 feet 8 inches in diameter; each operated by a vertical, high-pressure engine, having cylinders 18 inches in diameter, and a stroke of 18 inches. The pumps are connected directly with the engines and are in line, and by means of clutches they can be geared together so that *one* engine can drive both pumps, or an engine can drive the opposite pump. The suction pipes, which are 22 inches in diameter, are furnished with foot-valves, and are led through the engine-room floor to the pumps, all joints being absolutely water-tight. The pumps discharge through 22 inch pipes, the centres of which are 9 feet below coping level, or 2 feet 6 inches below zero, and when the lake is at that level, the pumps operate against a head of that height. To prevent inflow when the pumps are not in use and the dock is empty, each discharge pipe is provided with a 22-inch valve.

The auxiliary pump and engines are placed on the upper or higher portion of the engine-room floor. This pump, which is an 8-inch horizontal centrifugal, has a maximum lift of 31 feet 6 inches, and discharges 3 feet above zero. It is operated by a pair of vertical, high pressure engines, having 12-inch cylinders and 12-inch stroke, which are also used to move, by means of intermediate gearing, the caisson into and out of place. On the lower floor of the engine-room is a "Knowles"