

The piles were driven to a depth of about 12 feet, the remaining 14 feet standing above the surface. They were prevented from spreading by iron straps and rods, in the following manner:—

Along the face of the north wall of the old lock, 18 inches below the top of the coping, holes 12 feet apart were drilled 1 foot deep. Flat iron straps 16 feet long, 4 inches wide and $\frac{1}{2}$ inch thick were secured to the wall with 12 inch fox-tail bolts. At the end of these straps, a set of three connecting rods of $\frac{3}{4}$ inch iron were hooked through holes punched so as to retain the full strength of the strap. The end of the rods passed through the head of a pile securing it by means of an iron nut and washer. On the inner face of the piles, three rows of 4 inch plank waling pieces were spiked and afforded a bearing to a double row of 2 inch sheet piles driven, each plank breaking joint over the other. Inside the sheet piling, puddle was rammed down to an average height of 4 to 6 feet.

The dam being complete no more fears of leakage were anticipated, the unwatering of the lock-pit was resumed, and without further delay the entire excavation of the pit was concluded.

The operations of building the lock foundation were then proceeded with as follows:—

1st. Six pile trenches from 3 to 4 feet wide and $4\frac{1}{2}$ feet deep were excavated, one at each end of the lock-pit 50 and 73 feet long respectively, and two at each end of the two mitre sill platforms 73 feet long. In each of the trenches an anchor timber of pine 12 inches square was placed, embedded in cement grouting 3 inches thick. In the end trenches, the anchor timbers afforded a proper bearing for the sheet piles, and in the trenches on either side of the mitre sill platforms 14 feet apart, 3 anchor screw bolts 5 feet long and $1\frac{1}{2}$ inches diameter were secured to the timbers by means of a heavy nuts and washers. Pine sheet piles, 4 inch in diam and 6 feet long, were driven so as to bear against the timbers, the toe of each pile being bevelled off 6 inches, and embedded in cement mortar.

The trenches were filled to the top and closely packed with concrete. A space of 2 inches between the inner face of the piles and the trench was filled with cement grouting, thus making the whole perfectly water-tight.

2nd. Over the whole extent of the lock-pit, a stratum of concrete 9 inches thick, and averaging from 65 to 73 feet wide, was carefully packed down to a uniform level.

3rd. Two mitre sill platforms 14 feet wide, made up of pine timbers 12 inches square and 72 feet long, and well jointed with a plane, so as to make joints water-tight, were then laid. Each of the platforms were secured by five wrought iron screws bolts $1\frac{1}{2}$ in. diameter, passing through horizontally. Both ends of each of the three middle bolts had double nuts and washers, and formed connection with heavy iron shackles 12 inches long and $1\frac{1}{2}$ square. They were secured to the anchor running through the timbers at the bottom of the trenches.

Each platform was raised sufficiently to admit the spreading of thin mortar over its berth.

Hydraulic jacks were used in lowering the platforms which were well beaten down to their proper bed and bearing on sub-sills 4 inches thick embedded in mortar.

The joints throughout were caulked with two threads of oakum, and the piles on each side of the platforms were secured with 7 inch iron spikes.

4th. The remaining part of the foundation consisted of 12 inch square pine timbers of full length to reach across the space occupied by the walls, laid on two rows of 4 inch sub-sills under the seat of the walls. The sub-sills were embedded in $1\frac{1}{2}$ inch cement mortar and the timbers placed crosswise on top, 6 inches apart, being also embedded in $1\frac{1}{2}$ inch of mortar.

The spaces between the timbers were carefully packed with concrete and a layer 1 inch thick of cement mortar to level off. The top of each timber was dubbed to a uniform surface, so as to ensure a true bearing for the planking.

At each end of the foundation the sheet piles were secured to the adjoining timbers with 7-inch spikes.

5th. The mitre sills were of white oak timber, framed, morticed, tenoned and dressed with a plane. The main sills were 49 feet long, and 19 x 16 inches square, the mitre sills, main braces and side braces were 19 inches square, and of such length as to correspond to an angle of $27^{\circ} 30'$ from the half width of the lock. A cheek 3 inches