(*Paper No. 3127.*)

"Leith Docks Reclamation Embankment."

By PETER WHYTE, M. Inst. C.E.

THERE are few places where the natural conditions are less favourable to the construction of a port than at Leith. No natural harbour existed there, except a small stream known as the Water of Leith flowing into the sea, in the narrow bed of which the original inner harbour was situated. The harbour and docks have been formed entirely on a long stretch of sandy foreshore, portions of which have been reclaimed by successive stages from the sea. This sand is dry at low water of spring tides, whilst at high water there is a depth of about 16 feet.

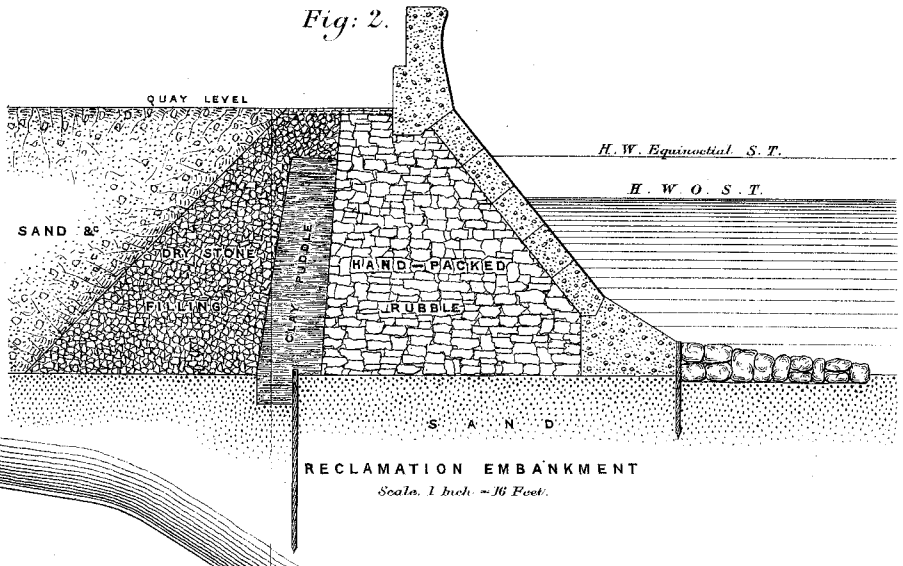
The docks and works cover an area of about 350 acres, Fig. 1, Plate 10. The sea-wall, or reclamation embankment enclosing the greater portion of this area, is of somewhat unusual design, consisting of a mound of hand-packed rubble stone, 22 feet wide at the base and 9 feet at the top. The sea-face above the toe-block is formed to a slope of about $\frac{3}{4}$ to 1, and faced with cement-concrete blocks, 6 feet long, 4 feet wide, and 2 feet 6 inches thick, Fig. 2, Plate 10. The toe-blocks are 6 feet long, 8 feet wide, and 6 feet high, and weigh 14 tons. At the back of the wall, a row of sheet-piling was driven down, through the sand, about 2 feet into the clay; and at the toe, a row of greenheart sheet-piling was driven about 7 feet into the sand, in order to keep the sand between the rows of piling in place, and was quite successful. Broken stone spread over it made it resemble a road, upon which the toe-blocks were expeditiously set. Above the sheet-piling, the embankment was backed up to high-water level of equinoctial spring tides with clay puddle, 5 feet thick, so as to make the embankment act as a cofferdam to exclude the water from the reclaimed area. The clay was kept in place by a backing of quarry refuse, stones, earth, &c. A layer of large, rough stones was laid on the sand along the front of the embankment, to prevent the back-wash eroding the sand. The embankment is surmounted by a parapet of concrete in mass, the top of which is

15 feet above high water ordinary spring tides. The embankment was constructed from a stage formed of three rows of piles, 15 feet apart centre to centre longitudinally, upon which gantries and cranes travelled. The gantries spanned two lines of rails by which the materials were brought forward. The reclamation embankment was finished so as to exclude the water in June 1896, and it has stood the gales of two winters quite satisfactorily. Its cost was £50 per lineal yard.

The Paper is accompanied by two drawings, from which Plate 10 has been prepared.

LEITH HARBOUR, DOCKS, AND RECLAMATION EMBANKMENT.

Fig: 2.



RECLAMATION EMBANKMENT

Scale, 1 inch = 16 Feet.

Fig: 1.

	WIDTH OF ENTRANCE	DEPTH ON SILL AT SPRING TIDES
OLD DOCKS	35 FT	17 FT 6 IN
VICTORIA DOCK	60 "	23 " 6 "
ALBERT DOCK	60 "	25 " 6 "
EDINBURGH DOCK	60 "	25 " 6 "
NEW DOCK	70 "	30 " 6 "

LEITH HARBOUR AND DOCKS

Scale of Feet.

Feet 500 0 500 1000 1500 Feet