January 28, 1910.

A PAGE OF COSTS ACTUAL, ESTIMATED and CONTRACTED

CONCRETE BOUNDARY MONUMENTS

Concrete is now generally recognized as a cheap and eminently satisfactory substitute for granite for use as boundary monuments. The following details of construction and cost are therefore of interest. They are drawn from the report of Leonard Metcalf, civil engineer, Boston, to Kennebec Water District, Waterville, Me., and relate to an exceptioaally fine piece of work done under Mr. Metcalf's direction in connection with the China Lake Water Supply.

These bounds were built upon the ground in post holes 5 feet or more in depth and in forms, either flush with the ground, in mowing fields or grass lands, or about 1 foot above the surface of the ground, along fence and property lines. The bounds were of the following general form:— Below the ground eight inches in diameter, 5 feet in depth, with the base flared out to from 4 to 6 inches greater diametre; above the surface of the ground, or at the top of the post, 6 inches square for a length of 6 or 16 inches according as the bounds were built flush with or above the surface; in the four corners of the square top and extending to the bot-



Sketch of Concrete Boundary Monument for Kennebec Water District.

tom of the post were bedded bars of ¼-inch steel bent in U form across the top of the post. In the top of the post was bedded a small iron casting with expanded bottom bearing the letters K.W.D. and the number of the bounds, as for instance: K.W.D. 95. The concrete of which these bounds were made was mixed on the ground in the proportion of one part of Portland cement to two parts of sand to four parts of gravel or broken stone of approximately ½-inch diameter. The cost of these bounds erected was considerably less than it would have been for granite bounds, and it is believed that they will prove even more satisfactory, since it seems probable that there will be less danger of heaving by frost; time alone however, can determine whether this is the fact.

The total cost of the bounds in final position averaged about \$4.30 each, including therein the cost of all materials, supplies and forms, and all teaming, labor and supervision.

Cost of Monuments.

	No. Built.	Cost per Month.	Average.
September	. 52	\$211.85	\$4.07
October	36	160.25	4.45
November	15	65.25	4.35
Total	103	\$437.35	\$4.25

This includes \$1.00 per day for 48 days for district horse, but does not include cost of forms, which amounted to between \$4.00 and \$5.00 making the total average cost per bound (in place) \$4.30.

COSTS OF CONCRETE SIDEWALK*

The cost of concrete sidewalks during the past seven years in the City of Kingston, Ontario, has been as follows: Cents

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In	1903	the cost	per sq.	ft.	was	29.3
In	1904	"	"	""		17.5
In	1905	"	"	"		15.6
In	1906	"		""		15.7
In	1907	"	"	"		17.3
In	1908	"	"	"		16.0
		Exclusive	of iron	pipe	s	15.0
In	1909	the cost	per sq.	foot	was	13.8
]	Exclusive	of iron	pipe	es	13.1

*From information furnished by H. B. R. Craig, City Engineer, Kingston, Ont.

REMOVING SNOW

The cost of removing snow during December, 1908, and January and February, 1909, from the lines of the Hull Electric Railway was 2.7 cents per car mile. This amounted to 18 per cent. of the total expenses.

COST OF PUMPING WATER

At Waterloo, Ontario, during 1909 the cost of pumping water was \$2.06 per thousand gallons. Per pound of coal used 150 gallons of water was pumped.

CLEARING LAND*

The C. P. R. are clearing about one thousand acres of land on Shaughnessy Heights, Vancouver, B. C. The land is covered with very heavy stumps, most of which are Douglas fir and the land being gravelly their roots go straight down to a great depth.

The work is being carried on under the supervision of Mr. J. A. Johnston.

A gin pole is erected in the middle of a fifteen to twenty-acre tract of land and a sixty horse-power logging engine

*See also Can. Eng. Vol. XVII. Page 68.