

Guides for Pricing Excavation

Samuel Hodgkinson's table giving the cubic yards of earth involved in excavating specific depths per yard, and his letter to John Rennie, are included at the end of this book. The original came from the microfilms of Rennie's Notebooks held in the Scottish National Library in Edinburgh. Hodgkinson seems to have been a canal contractor in the 1790s, becoming some form of site engineer in the next decade. The Kennet & Avon Canal records mention, on the 19 July 1808, that Samuel Hodgkinson has left Company and gone to Birmingham, his health not permitting him to do his duty. He was paid 100 guineas over and above his salary in consideration of his good conduct in the business of the Company. Similar such tables were published subsequently, such as in 1833, with John MacNeill's book *Tables for Calculating the Cubic Quantity of Earth Work in the Cuttings and Embankments of Canals, Railways and Turnpike Roads*. Perhaps this was an indicator of improving education, and the need to provide more reliable estimates for an increasing number of railway and other civil engineering projects. By that time, contracting work had become much more extensive, and the market for such a book must have made it economic to publish.

Hodgkinson's Tables for Canal Cutting, 1817

Rennie Notebooks, Edinburgh, Mf.Sec.MSS.500. Archives & Manuscripts.

Sir, With this I beg leave to present you with some Tables of Canal Cutting, Embanking etc, of which I beg the favour of your acceptance.

The Tables are calculated according to your Specification of the works on the Kennet & Avon Canal and are all correct, but I wish the copys had been done in a neater manner. I have some other Tables of Cutting and Embanking for canals of different Dimensions, calculated put the car in my opinion not so well proportioned as the ought to be, neither is the Towing Path and Benching included in the Cuting [sic].

If you consider that tables of the same kind for Canals of different Dimensions would be at all useful and will favour me with the Dimensions, Slopes etc. I will make the Calculations and forward them to you free of expence, and I trust you will not consider the task to arduous. I am in good health and at present have not any engagement and I cannot pass my time pleasantly unemploy'd. I have a son at home also who is not in any employ at present, and who can make the Calculations, as well as myself and will give some assistance. If you consider that any improvements, or additions, can be made to these Tables to make them more useful and will have the Goodness to inform me what they are they shall be made or any other Tables made so long as my time is not otherwise employed and if you have any Canal Surveying or Situations where I should be useful, I should be much obliged for your favouring me with it. I hope you will give me something to do in making Tables for I assure you it is my wish, and I trust they will be found useful in calculations being free from errors and I am perswaded [sic] that it is not uncommon for errors to happen by the common method of calculations, waiting your directions.

I am, Sir, your most obdnt, Sam'l Hodgkinson

Bath Row, Birmingham

Augst 20th, 1817

PS I have not made any calculations of land to be taken for Spoil Banks, or Soiling Spoil Banks in deep cutting for I do not know any General Rule for those things. I have some Idea that about 11,000 Cube Yards would cover an Acre of land on the Average and that 160 cubic yards would require a Rood of Soiling of 66 Superficial Yards.

Canal Cuting [Sic]

Which shows by inspection the number of Cube Yards and Decimal parts of a yard, in 1 yard, in length of the canal, from one Hundreth part of a yard, to 15 Yards Deep. The Dimensions and Slopes of the canal being made as follows visible

The bottom of the canal to be 24 feet wide, the time in Perth 10 feet wide and the benching 3 feet wide at 1 yard, 4 feet to yards, 5 feet at 3 yards and 6 feet at 4 yards above top water level and to be made in the same proportion at all intermediate depths but not to exceed 6 feet in any case. The slopes of the canal to be made in the proportion of five horizontal to 3 vertical. The time path and benching to be 1 foot above top water level.

The following extract for the table provided gives Depth, in Yards and Points, and the resulting Cubic Content, in Cubic Yards and Points. I used a copy from a microfilm, so the numbers were difficult to identify correctly.

Table 1 Cuting [Sic]

<i>Depth</i>	<i>C^b Con^{ts}</i>	<i>Depth</i>	<i>C^b Con^{ts}</i>	<i>Depth</i>	<i>C^b Con^{ts}</i>	<i>Depth</i>	<i>C^b Con^{ts}</i>	<i>Depth</i>	<i>C^b Con^{ts}</i>
<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>	<i>Yds pts</i>
0,01	0,00010	0,02	0,16066	0,03	0,24750	0,04	0,32266	0,05	0,40416
0,06	0,49600	0,07	0,56816	0,08	0,64066	0,09	0,73350	0,10	0,81666
0,11	0,90016	0,12	0,96400	0,13	1,06116	0,14	1,15266	0,15	1,23730
0,16	1,32266	0,17	1,40816	0,18	1,49400	0,19	1,51016	0,20	1,66666
...	...								
1,86	20,64600	1,87	20,78816	1,88	20,93066	1,89	21,07350	1,90	21,21666
1,91	21,21666	1,92	21,50400	1,93	21,64816	1,94	21,79266	1,95	21,93750
1,96	22,08266	1,97	22,22816	1,98	22,37400	1,99	22,52016	2,00	22,66666