

TABLE OF FACTORS.

DEPTH.	BOTTOM WIDTHS.							
	$\frac{1}{2}$ ft.	1 ft.	$1\frac{1}{2}$ ft.	2 ft.	3 ft.	4 ft.	5 ft.	6 ft.
1	.91	1.00	1.09	1.15	1.21	1.25	1.26	1.28
2	.86	1.00	1.07	1.12	1.18	1.21	1.22	1.23
3	.83	1.00	1.05	1.09	1.13	1.15	1.15	1.16
4	.81	1.00	1.03	1.06	1.08	1.09	1.09	1.09

Professor Carpenter has made his calculations for a ditch with side slopes one to one, which I would never use unless at the upper end of a ditch in a stiff soil, and very seldom even then, as there is a great liability of caves being washed out by the water, and the "shelling" off is always greater in a steep bank in the spring. One to one and one-quarter is sufficiently steep, and one and one-half to one I consider the best slope of the three for a ditch which is supposed to be permanent. It is apparent that unless there is a surplus fall in the outlet part of the ditch it would be impossible to use side slopes of one and one-half to one in the upper part of the ditch, and slopes of one to one, for the sake of economy, in the firmer land in the outlet.

The term *outlet*, as I use it, requires a little explanation. In an amendment to the Ditches and Watercourses Act it is provided that an engineer cannot leave the surplus water brought down by a ditch on a lot of land if it overflowed the natural channel so as to damage the said lot unless so authorized by the owner thereof. The outlet is then made a great deal shallower than the main ditch, but on account of the alteration in the depth it should be made proportionally wider, so as to confine the surplus water as much as possible in the natural watercourse. In making the outlet it is sometimes expedient to clean out the natural watercourse, at others to make the outlet as straight as possible; but in such matters the engineer has to use his own discretion, the amount of fall generally assisting him in the determination of which is the most advisable course to pursue.

When the outlet to a ditch or drain is a creek which would not carry all the water brought into it without overflowing its banks on account of the creek bed being choked with fallen timber, logs, roots, stones, etc., it has been my custom to award the cleaning out of the said creek bed to all the parties interested combined; that is, that they should make a *bee* and have it done. It seemed to work very well, as I never heard any grumbling about it until lately, when I was informed that it was almost impossible to get the parties to work together, especially if they were not satisfied with the other portions of the award. The next case I have of the kind, it is my intention to give it to all the parties combined and place the date of completion of said portion (Sec. 8) very close upon the date of the