SECTION 8
EXPLOSIVE AS AIDS TO EXCAVATION AND DITCHING

Excavation

0801. For underground excavation (tunneling) see ESPB No. 9*, and for quarrying see ESPB No 5E*

0802. As an aid to making gun pits, emplacements etc,the basic calculation is that one pound of explosive buried 2 ft deep will break up the soil within a radius of 2 ft and to a depth of 3 ft. The procedure is as follows:

a. Outline the required excavation by a channel dug 4 ins deep and shovel width.

b. Mark Position of each charge starting with a series at 3 ft centres and 2 ft within the perimeter and then filling in the middle of the area with charges approximately 3 ft apart.

c. Bury prepared charges 2 ft deep, re-place excavated soil and tamp.

d. Connect up all charges to ring main for initiation and fire.

e. If greater depth is required, below first series of charges, clear away loose soil, lay and fire another set of charges and repeat until required depth is attained.

0803. Since the blast throws loose soil over a large area, the problem of concealment is aggravated.

Ditching

0804. For making ditches rapidly, eg, for inundations anit-tank defense etc, especially in marshy or frozen ground, and when plant either is not available or cannot be used, the normal procedure is to fire a single row of crater charges along the centre line of the ditch to be formed, any further widening required being effected by firing further charges along the lines of the banks of the new channel. Table 27 gives details of this ""single line" method.

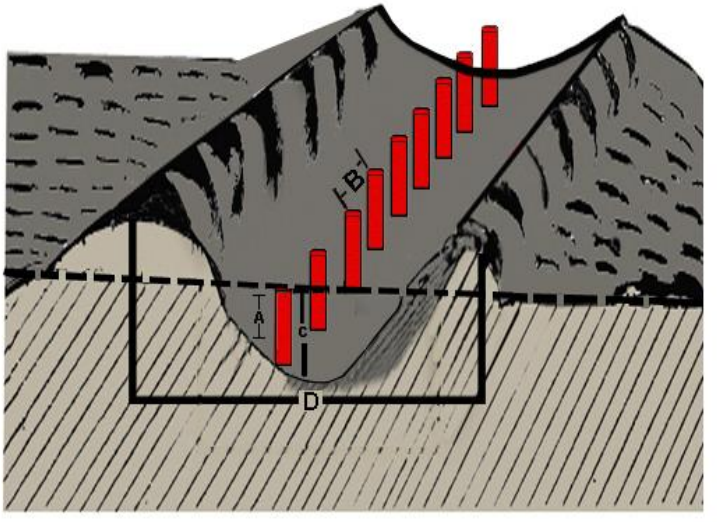
0805. If a quantity of water can be accumulated upstream behind a sluicegate or similar barrier and released immediately the line of charges has been fired, the soil disturbed by the blasting will be effectively scoured away.

0806. If it is necessary to blast the full width of the channel in one operation the ""cross-section" method can be used (see Table 28).

0807. If the soil is firm and shallow holes only are required, the holes can be made with crowbar or jumping bar and the charges laid direct. If, as is usually the case, the sides of such holes tend to fall in, or if deep holes with comparatively large charges are to be used, the camouflet equipment or an improvised tool of similar nature, such as that illustrated in Figure 23, must be used.

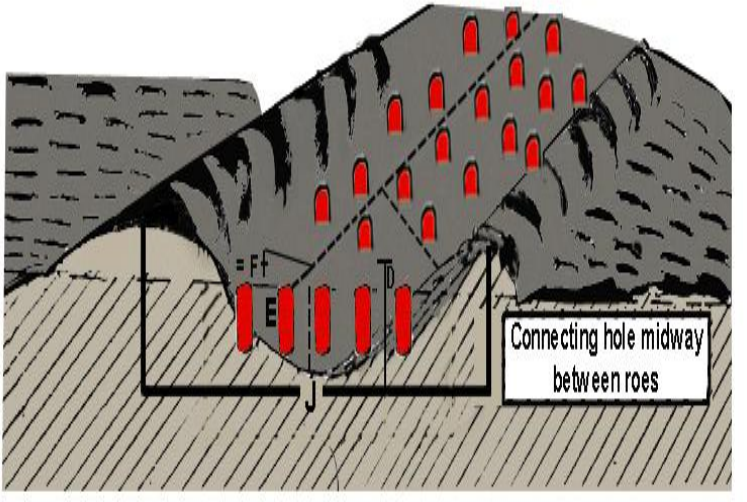
0808. The normal method of initiation is by detonating cord in each charge clipped to a detonating cord main lead.

Table 27- Ditching with Explosives – Single Line Method



Ser	Charge per hole (Ib)	Depth of hole (A) (ft)	Distance between holes (B) (ft)	Probable depth of channel (C) (ft)	Probable top width of channel (D) (ft)
(a)	(b)	(c)	(d)	(e)	(f)
1	$\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	5
2	1	2	2	3	7
3	2	3	3	4	9
4	5	5	4	6	12
5	10	8	5	10	16

Table 28- Ditching with Explosives – Cross Section Method



Ser	Charge per hole (lb)	Depth of hole (E) (ft)	Distance between holes (F) (ft)	Distance between rows (G) (ft)	Probable depth of channel (H) (ft)	probable width of channel (J)(ft)				
						Number of holes in each cross row				
						3	5	7	9	11
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(j)	(k)	(l)
1	$\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	8	11	13	16	18
2	1	2	$1\frac{1}{2}$	3	3	10	13	16	19	22
3	2	3	$2\frac{1}{2}$	$4\frac{1}{2}$	4	14	19	24	29	34
4	5	5	4	6	6	20	28	36	44	52
5	10	8	5	8	10	26	36	46	56	66

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