SECTION 64-CONSTRUCTION IN SWAMPS

1325. General- Improvised swamp crossings are dealt with in Section 119. For more permanent construction, important points to remember are:-

a. No plant or vehicles should be allowed on the proposed alignment untill soil and surface condition have been investigated.

b. For hasty work, a fill of 3 feet or more of sound material, placed on the existing surface, will often carry traffic satisfactorily, provided that the surface mat of vegetation has not been disturbed.

c. Fill must always be placed by moving material forward along the alignment.

Removal of Soft Material

1326. By Excavator. The normal method of excavating unsuitable material form wet or swampy areas is to use a dragline. This method is extremely slow, and excavation should be limited to the actual width of the formation.

1327. By blasting. This method is rapid but it requires very skilled control. The depth of firm material is first determined, at 50-ft intervals along the centre line and along both sides of the formation. The surface mat of vegetation, etc, is then removed over the area of the formation by detonating a pattern of small charges just below the surface, eg, a series of $\frac{1}{2}$ 1b single cartridges of high explosive, 6 ins below the surface, spaced about 14 ins apart transversely, and 36 ins apart longitudinally.

TABLE 13.1 COMPACTION DATA

Ser No	Type of soil	Condition of soil	Max thickness of loose layer		Type of roller best suited	Minimum number of passes	Remarks
			Subgrade	Lower layers of deep fills and embankments (ins)			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	GW, CP	See colm (h)	8	18	Smooth wheeled	8	Best when soil is at BS compaction test OMC
2	GC, SC	Dry	Not more than 2 ins greater than length of foot on roller	Not more than 2 ins greater than length of foot on roller	Sheep foot	24: recommended 32	A possible use for sheepsfoot rollers. Unlikely soil condition in UK
3	ditto	Moist	8	12	Pneumatic tyred	8	
4	GF, SF	Dry and moist	8	12	Pneumatic tyred	8	
5	ML, CL, OL, MH, CH, OH	Dry	Not more than 2 ins greater than length of foot on roller	Not more than 2 ins greater than length of foot on roller	Sheepsfoot	24: recommended 32	Unlikely soil condition in UK
6	ditto	Moist	6	10	Pneumatic tyred	8	

7	Hardcore, crushed rock		10		Heavy smooth wheeled	4	
8	Chalk		6	12	Smooth wheeled	8	
9	Clinker, broken brick, etc		10		Medium or light smooth wheeled	6	

For the main charges about $2\frac{1}{2}$ 1b of explosive are used per cu yd of fill material. A shattering explosive is required for peat; a slower explosive with a lifting action is better for clay. Alternative methods of blasting are:

a. After the embankment has been partially or completely tipped, fire charges place in vertical holes so as to settle the fill in longitudinal sections of convenient length (see Figure 13.2). This method is suitable for the removal of peaty material beneath a fill of fine material through which boreholes can be drilled.

b. Place the charge in holes driven in the soft material and trip the fill over them. The charges will sink as the fill settles and explosion will complete the settlement. This method is adopted for the removal of peaty material when the fill contains rock and a high proportion of stone or gravel which makes the drilling of boreholes impracticable.

c. To remove heavy clay material in shallow swamps short longitudinal sections of fill are best settled as they are placed. In this case, charges are usually placed at 10-ft intervals across the formation.