to separate out and a quantity of pebbles may arrive in the forms ahead of the more even mix. This is not detrimental where the previous mix is still plastic, but if allowed to occur on a previous mix already hardened, it will result in a gravel pocket and poor bonding. The previous application of a bonding slurry of neat cement and water will help bonding, but will not remove the gravel pocket, which must be done by tamping.

The method of handling concrete must be arranged to suit the work. The degree of plasticity can be suited to the work, but for some work where there is external water the mix can be used dry. In the construction of a bag dam (described in the article "Establishing a Farm Water Supply System," which appeared in the February, 1949, issue of the "Journal") the dry mix is placed in bags and the creek water allowed to moisten the mix by percolation.

Dry-mix concrete, that is, a mix with a small amount of water to produce a consistency of damp earth, is used for the manufacture of concrete blocks or concrete field tiles by machine. A normal mushy mix is used for under-water concreting and is placed by means of a tremie. If under-water concrete were placed in the normal way, the cement would be washed out as the particles settled. A tremie, which consists of a length of pipe with a funnel attached, is placed with its discharge end near the bottom of the under-water mould. Concrete is then fed into the funnel and carefully placed in the mould by the tremie, the bottom of which is kept embedded in the concrete, which displaces water without the cement being washed out.

Because of the detrimental effects of regauging or remixing concrete, no more concrete should be mixed than can be used before the initial set commences. Special care is necessary in hot weather, when setting may occur in a much shorter period than under normal conditions. It is desirable that concrete should be placed within half an hour of the addition of water and that it should not be disturbed after that period. Concrete mixed some time before it is deposited should be used only if it can be remixed to a workable consistency without the addition of water; if this cannot be done, it should be discarded.

Concrete should never be placed in very cold weather, as hardening is considerably retarded as freezing point is approached.

Tables 4, 5, 6, and 7 contain information which will assist in the calculation of quantities of materials required for different concrete work. In the tables concrete is divided into two classes—No. 1, extra-strong and relatively watertight concrete; and No. 2, ordinary, good concrete.

Curing of Concrete

Concrete attains its best results if it hardens in a warm, damp atmosphere. If it is exposed to a hot, dry atmosphere while hardening, there is danger of the water required by the cement for hardening being evaporated and possibly preventing hardening and certainly tending to produce contraction cracks.

TABLE 4—AREA COVERED BY 1 CUB. YD. OF CONCRETE OF DIFFERENT THICKNESSES

Thickness in.	Area covered sq. ft.	Thickness in.	Area covered sq. ft.
3/8	864	4	81
1/2	648	4 1/2	72
3/4	432	6	54
1	324	8	40.5
2	162	9	36
3	108	12	27

TABLE 5—QUALITY OF CONCRETE AND SIZE OF GRAVEL FOR DIFFERENT PURPOSES

Class of work	Thickness in.	Quality of concrete	Size of graded gravel in.
Light footpaths, dairy and light shed floors, and base course for tennis courts	3 to 4	No. 2	1 or less
Cow yards, heavy shed floors, ordinary garage floors, and drives	4 to 6	No. 2	1 1/4 or less
Floors, drives, etc., for extra-heavy wear	4 to 6	No. 1	1 1/2 or less
Thick foundations and unimportant large masses such as retaining walls and thick dams (under 6ft. high)	As required	No. 2	3 or less
Thick dams over 6ft. high	As required	No. 1	3 or less
Reinforced inside walls and unimportant shed walls	3 to 6	No. 2	3/4 or less
Reinforced important outside walls, cisterns, tanks, swimming pools, ponds, silos, and cellars	As required	No. 1	3/4 or less
Fence posts (farm)	4 to 8	No. 2	1/2 or less
Plaster coats for paths, floors, walls, etc., top course for tennis courts, and thin troughs, stucco, rough cast, and ornaments such as sundials, fountains, seats, etc.	1/2 to 3/4	No. 1	Sand only

TABLE 6—QUANTITIES OF MATERIALS TO MAKE 1 CUB. YD. OF CONCRETE

If aggregate used is graded up to	Cement (124 lb. per hessian bag; 94lb. per paper bag) lb.	Sand, moist (loose measurement) cub. ft.	Gravel or metal (loose measurement) cub. ft.	Sand and gravel if already mixed (loose measure) cub. ft.
For No. 1 concrete				
3/8in.	740	13 1/2	24	27
1/2in.	720	13	24	27
3/4in.	676	12	26	27
1in.	640	11 1/2	27	28
1 1/2in.	600	11	27	27 3/4
2in.	580	10 1/2	27	27
3in.	560	10	26	27
For No. 2 concrete				
3/8in.	530	17	26	31
1/2in.	520	16 1/2	27	31
3/4in.	480	15 1/2	28	31
1in.	460	15	29	31
1 1/2in.	430	14	28	30
2in.	420	13 1/2	28	29 1/2
3in.	410	13	27	29 1/2

TABLE 7—QUANTITIES OF SAND AND GRAVEL TO MIX WITH 1 BAG OF CEMENT TO MAKE CONCRETE

If aggregate used is graded up to	Quantities to mix with 1 bag of cement: Sand, moist (loose measure) cub. ft.	Gravel or metal (loose measure) cub. ft.	Sand and gravel if already mixed (loose measure) cub. ft.	Approx. amount of concrete cub. ft.
For No. 1 concrete (using 6 gals. of water)				
3/8in.	2 1/4	4	4 1/2	4 1/2
1/2in.	2 1/2	4 1/2	4 3/4	4 3/4
3/4in.	2 3/4	4 3/4	5	5
1in.	2 3/4	5 1/4	5 1/2	5 1/4
1 1/2in.	2 1/4	5 1/2	5 3/8	5 3/8
2in.	2 1/4	5 3/4	5 7/8	5 3/4
3in.	2 1/4	5 3/4	6	6
For No. 2 concrete (using 8 gals. of water)				
3/8in.	4	6	7 1/4	6 1/4
1/2in.	4	6 1/2	7 1/2	6 1/2
3/4in.	4	7 1/4	8	7
1in.	4	7 3/4	8 1/4	7 1/4
1 1/2in.	4	8 1/4	8 1/2	7 3/4
2in.	4	8 1/4	8 3/4	8
3in.	4	8 1/4	9	8 1/4

NOTE: Moist sand or aggregate contains about 1/4 gal. of water per cubic ft.