

CONCRETE AND MORTAR

WATERPROOFING

| Part | Page |
|-------------------------------|-------------|
| 1. General | 1 |
| 2. Watertight Concrete | 1 |
| 3. Watertight Seams | 2 |
| 4. Stopping Water Leaks | 2 |

1. GENERAL

1.01 Watertight construction will result when the concrete itself is made watertight and when workmanship is such that all seams and other construction joints will resist the passage of water. This section summarizes the information available for guidance in securing watertight construction.

2. WATERTIGHT CONCRETE

2.01 An essential requirement for watertight concrete is the use of durable aggregates which are completely coated with a cement paste that resists the passage of water. Leakage through concrete, if any, usually is through the paste, and it can be prevented by having a sufficient quantity of watertight paste to coat all particles of aggregate and to fill all spaces between them. The Class 1 concretes described in G45.140.1 have water-cement ratios that will produce watertight concrete and should be used wherever this requirement is important.

2.02 To ensure that concrete will be watertight, it is necessary to have a plastic, workable mixture that can be thoroughly spaded to fill the forms without segregation of the materials. Thorough mixing, therefore, is required. Methods of handling must be used that will permit the concrete to be transported and placed without segregation of the materials. In addition, water must be prevented from flowing through or over the freshly placed concrete and washing away the cement paste.

2.03 Admixtures shall not be used for the purpose of producing watertight concrete.

3. WATERTIGHT SEAMS

3.01 Leakage through concrete manhole walls and floors often is due to openings in seams rather than to the lack of watertightness in the concrete itself.

3.02 Seams between the floors and walls of manholes can be avoided by the employment of monolithic construction in which the floor and part or all of the wall is poured in one operation. This construction is described in the sections on manholes and should be utilized wherever conditions permit in preference to pouring the floor and walls separately.

3.03 If monolithic construction is not practicable, watertight seams usually can be obtained by the proper installation of construction joints as described in G45.150.1.

4. STOPPING WATER LEAKS

4.01 If proper procedures are followed in manhole construction, the manholes should be reasonably watertight. Occasionally, however, water leaks may develop at construction joints or in locations where honeycomb has occurred for one reason or another. Such points of weakness require special methods for correcting and are covered in detail in G43.410.1.