

SYMPOSIUM ON SOME APPROACHES TO DURABILITY IN STRUCTURES

INTRODUCTION

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The durability of structures is a broad subject in which it is obvious that consideration of components of structures in combination and their long life in such combinations are of importance. This symposium does not deal with industrial structural metals but rather with nonmetallic materials that are generally used in structures where weather plays a major part in the durability of the structure.

Since weather as applied to structures must be recognized as both natural and man-made and since both kinds produce factors of exposure that design engineers must cope with, the problems of variations of kinds of exposure and of associated moisture migrations are considered. That the kind of exposure of a structure plays an important role in its life is significant; one recalls the citations of the great durability of ancient mortars evidenced by still existing structures, only to learn that when parts of those structures were moved to another climate, failures promptly occurred.

Durability in structures has received consideration by both the buyer and the builder for many years. Progress in

improving structures from the standpoint of cost to give expected service with beauty of design as well as functional efficiency has brought out new engineering approaches to the study of service life. The older materials and techniques which had proven satisfactory appealed to conservative buyers, but growing costs per year of expected life encouraged consideration of new materials and new approaches to building techniques. In evaluating structures, durability as a part of safety for people and for property consistent with obsolescence is of prime importance.

Correlation between tests and field experience show no great agreement in engineering circles, particularly on the significance of the test results, even if the competitive sales aspects are recognized.

These presentations are directed toward correlations between tests of some commonly used structural materials and the effects of weather on them in the hope that future methods of test for durability will be better understood by structural engineers and by code authorities, both from the standpoint of test limits which indicate unsuitability for a specific structure as well as test limits which may increase costs or be unfair to a supplier because of general considerations rather than specific needs.

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It is hoped that this speaker's old gag, that the way to run a durability test program is to build a structure at the same time the tests start so that by the time the wrangles over the signifi-

cance of test results are resolved the structure will have a service life of 35 yr for everyone to see, will be so shortened that obsolescence is not the governing factor of service life.