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5.19 WINDSOR PROBE

5.19.1 Introduction

The penetration test, typically utilizing the Windsor Probe test system, consists of a device that drives a probe into the concrete using a constant amount of energy. The probe is made of a hardened steel alloy specifically designed to crack the aggregate particles and to compress the concrete being tested. Once fired, the length of the probe projecting from the concrete is measured. A test typically consists of firing three probes and averaging the projecting lengths. Refer to Figure 5.19.1-1 for a view of a Windsor Probe Test Kit.

This test is covered in American Society for Testing and Materials (ASTM) C803/C803M-97C1, "Standard Test Method for Penetration Resistance of Hardened Concrete."



Figure 5.19.1-1: Windsor Probe Test Kit.

5.19.2 Applications

Penetration tests are used to assess the uniformity of in-situ concrete and to delineate zones of poor quality or deteriorated concrete. It is also well suited for estimating compressive strength of concrete and the relative strength of concrete across the same structure. Penetration tests are commonly used to estimate early age strength of concrete for the purpose of stripping forms.

5.19.3 Limitations

The penetration test method is basically a qualitative tool, and like the rebound hammer, requires that other tests be conducted to determine the actual strength of the concrete being tested. The penetration test requires an appropriate amount of accessibility to the concrete surface being tested. The probe must be able to be oriented perpendicular to the surface. The use of the penetration method also damages the concrete at the test location. The probes must be removed and the holes patched.