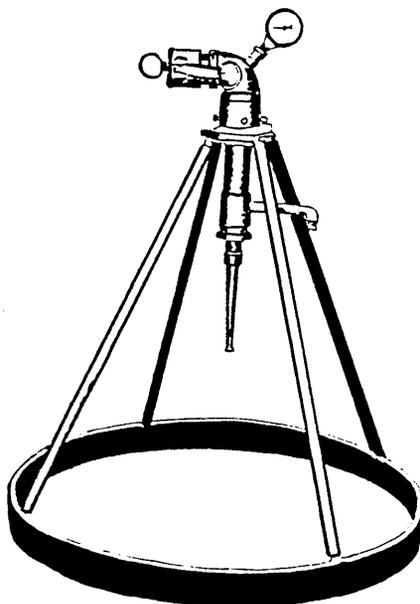




REMR TECHNICAL NOTE GT-SE-1.2

WATER-JET ERODIBILITY MEASUREMENT DEVICE



Water-jet device developed by the Soil Conservation Service to measure erodibility of natural materials in emergency spillway and dry channel floors

PURPOSE: To describe a device, the water-jet erodibility measurement device, for use in measuring relative erodibility of natural materials (soil and rock).

APPLICATION: A simple means of measuring relative erodibility of natural materials in emergency spillway and dry channel floors.

ADVANTAGES: Simple, portable, capable of in-situ measurements.

EQUIPMENT AND REQUIREMENTS: A water supply, a pump (or water under pressure), and hoses are required. The device may be simply fabricated from readily available parts.

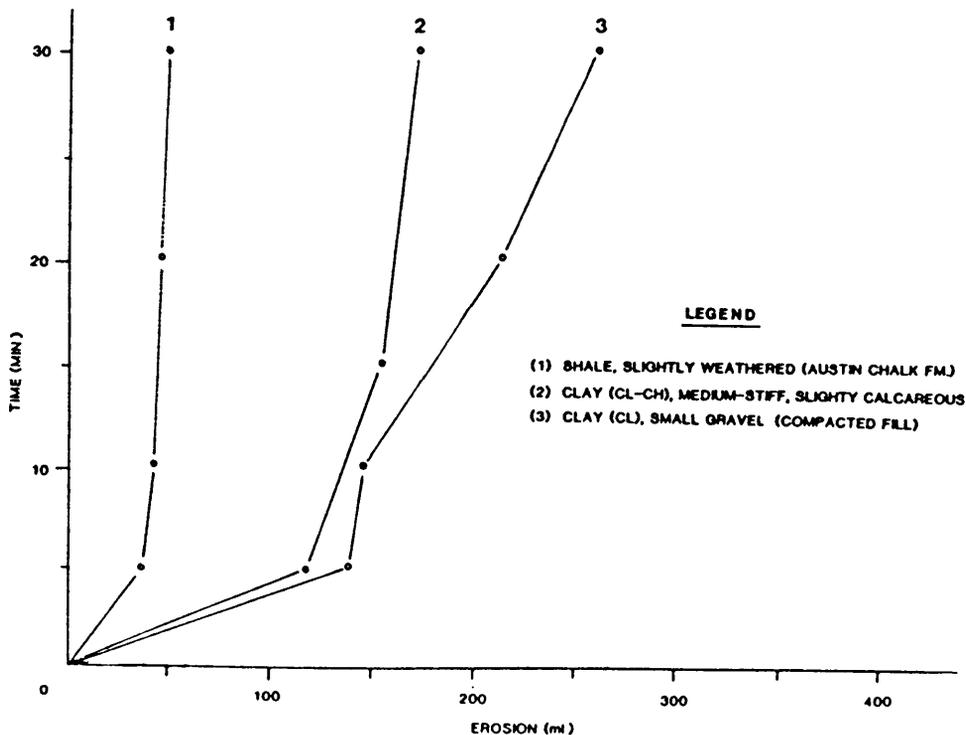
BACKGROUND: Emergency spillways and dry channels may sit idle for long periods of time, many years in some cases, only on rare occasions performing their design function of conducting emergency overflows. However, on these rare occasions, the potential for severe erosive damage is great. It is necessary to be able to rate the relative erodibility of natural materials in the flows of

these spillways and channels in order to anticipate erosion problems when flow does occur and if necessary to institute precautionary protective measures.

The water-jet erodibility measurement device was developed at the Fort Worth, Texas, office of the US Department of Agriculture, Soil Conservation Service (SCS), and has been used in erodibility studies at various SCS field sites.

DESCRIPTION: The test device consists of a small fire-hose nozzle mounted in a four-legged frame so as to discharge vertically downward; water-supply fittings; and a gage to monitor the water pressure. The nozzle is 6 in. long and its discharge diameter is 1/4 in. The feet of the legs are fixed to a 24-in.-diameter iron ring for stability.

TEST PROCEDURE: The procedure is to jet water vertically on a prepared level soil or rock surface at 20 psi, and to measure depth and volume of the jetted void at 5-minute or longer time intervals for a 30-minute period. Volume of void in milliliters is then plotted against time in minutes. The slope of the void-volume/time curve gives an indication of erodibility (erosion resistance).



This procedure can be used for assigning soils and weathered rocks to several grades of erosion resistance for design purposes. Cementation, stratification, mineralogy, fractures, and natural partings have an observed influence on erosion potential. Test data indicate that the void shape, depth, and volume can be related to soil and rock features. Use of the tool is not intended to simulate spillway flow, only to classify erosion resistance.