USE OF AKDOT&PF ATM 212, ITD T 74, WSDOT TM 606, OR WFLHD HUMPHRYS CURVES

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Background

01 Coarse-grained granular soils are free-draining and have little or no cohesion. These soils are, therefore, not particularly well suited for the moisture-density relations procedures of AASHTO
02 T 99, or AASHTO T 180. Transportation agencies have developed specialized test methods that are hybrids of those moisture-density procedures and methods that employ compaction under load with vibration. Those methods include:

03

- AKDOT&PF's ATM 212
- ITD's T 74
- WSDOT's TM 606
- WFLHD's Humphrys

Description of Procedure

04 In these tests, material is compacted in a mold and in a manner similar to those used in a Proctor test, after which the material is further compacted through a combination of applied loads and vibration. A laboratory maximum dry density is determined, as is the percent of material passing a certain sieve such as the No. 4. A number of determinations are made for different percentages passing the specified sieve. A graph is developed in which dry density is plotted versus the percentage of material passing that sieve. These tests are conducted in the agency's central lab, and the curve developed is a central lab function. Figure 1 is an example of such a curve.

05

Construction specifications will call out a percent of maximum dry density required for the granular materials used on the job. These specified values will be based on ATM 212, T 74, TM 606, and Humphrys depending on the agency.

In the field, the dry density of the granular material will be determined in accordance with the FOP for AASHTO 310. The percent of material passing the specified sieve will be determined for a sample obtained at the site of the density test. The dry

density and percent passing values will then be compared with the curve developed in the lab for that particular granular material to determine conformance with the project specifications. 06

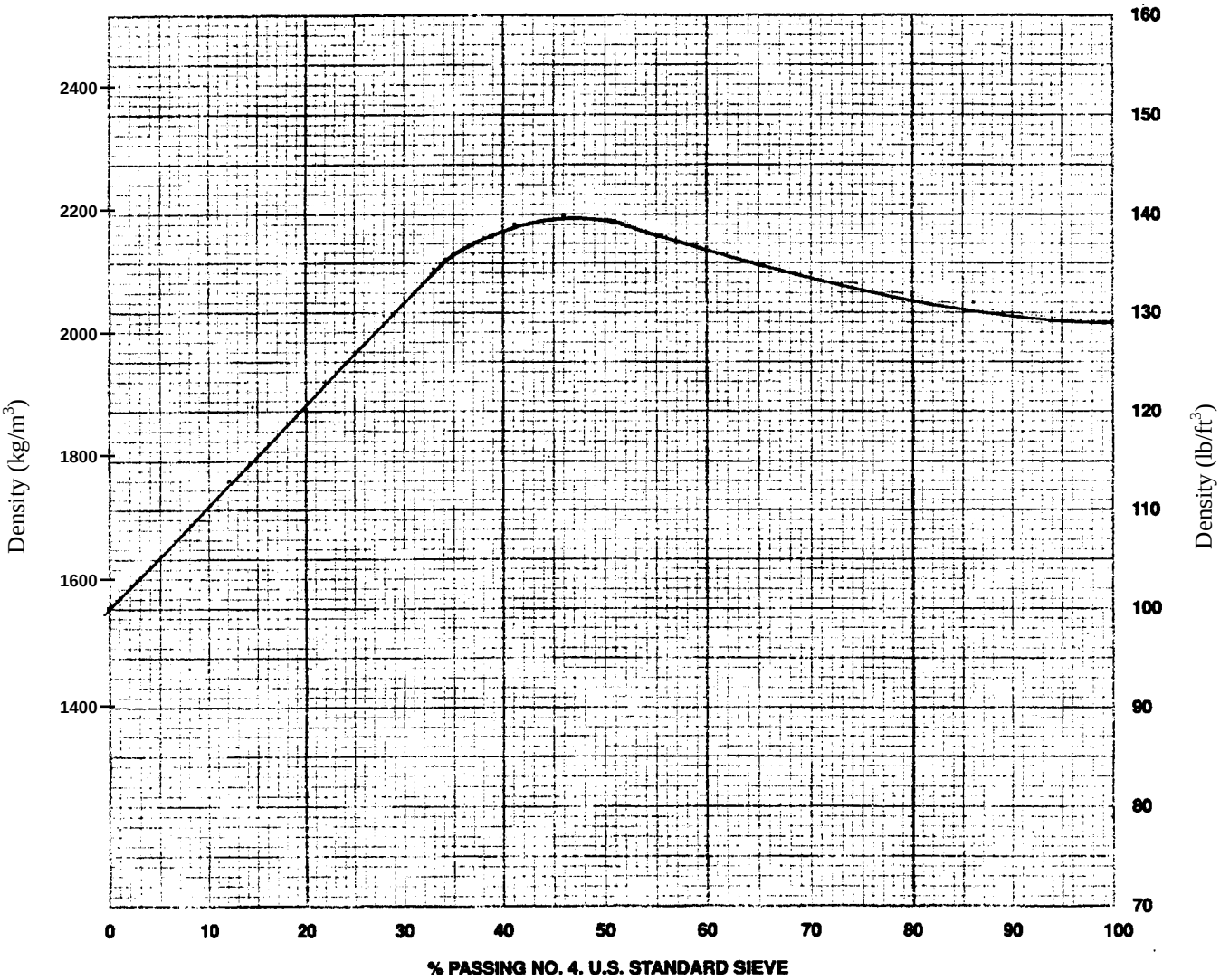

Figure 1. Maximum Density Curve Graph

Example:

A compaction test was taken and a sample was removed from the test site per the FOP for T 310. The sample was graded over a No. 4 sieve. The following results were reported.

Dry Density from T 310 =	137.0 lb/ft^3	
Percent passing No.4 sieve =	49%	07
Maximum Density =	139.0 lb/ft^3	
Percent Compaction =	99%	08