

LMVD STANDARD TEST METHOD FOR GRADATION

A. Select a representative sample (Note #1), weigh and dump on hard stand.

B. Select specific sizes (see example) on which to run "individual weight larger than" test. (See Note #2). Procedure is similar to the standard aggregate gradation test for "individual weight retained".

C. Determine the largest size stone in the sample. (100% size)

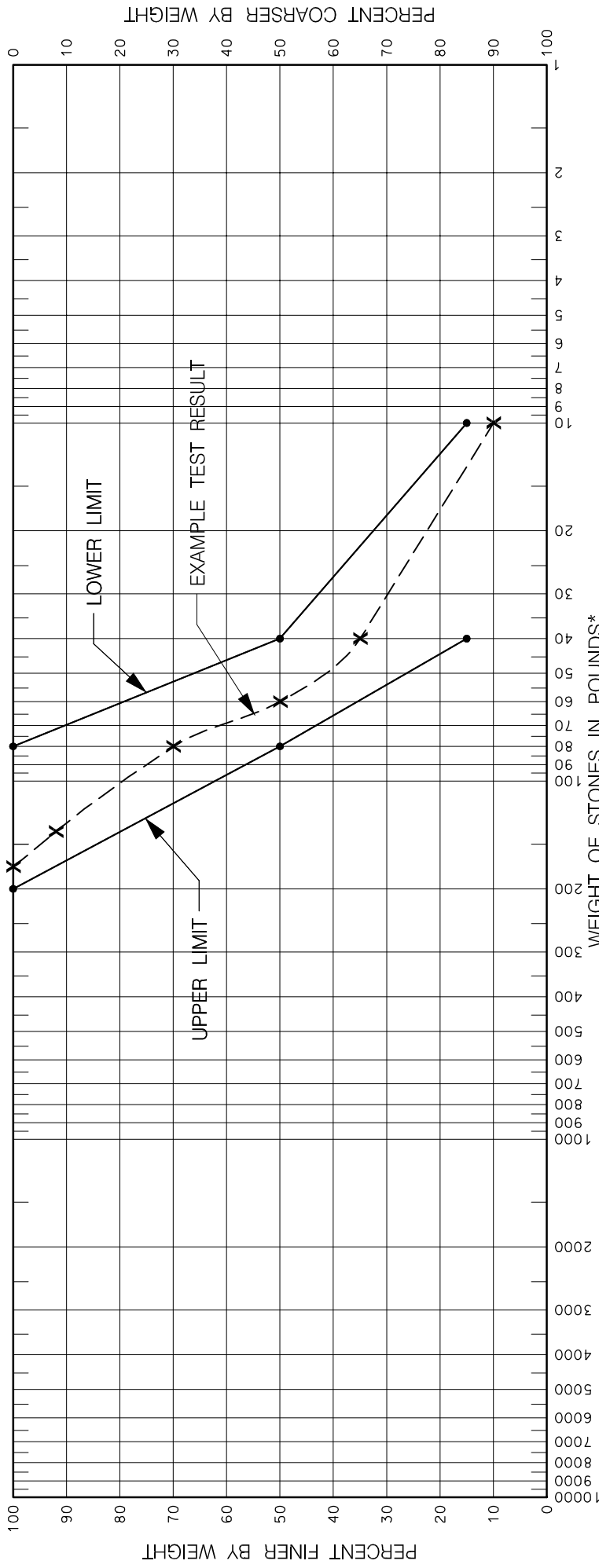
D. Separate by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, identified weights, for visual comparison in separating the obviously "larger than" stone. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weigh each size group, either individually or cumulatively.

E. Paragraph D above will result in "individual weight retained" figures. Calculate individual percent retained (heavier than) and cumulative percent retained and cumulative percent passing (lighter than). Plot percent passing, along with the specification curve on ENG Form 4055.

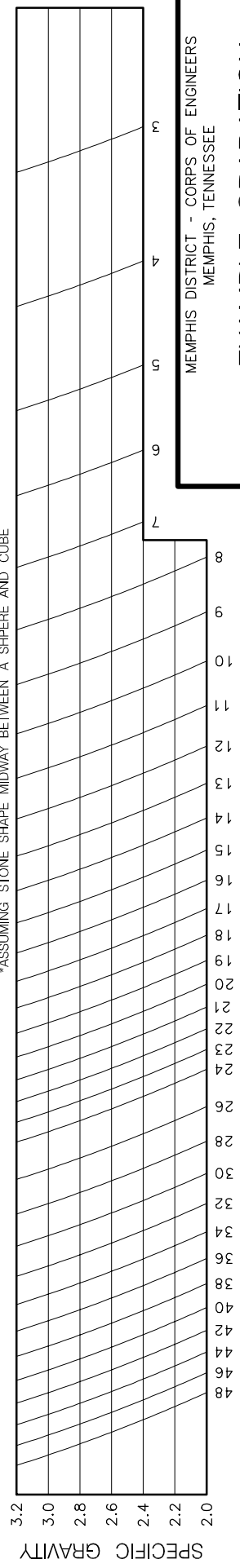
NOTES

1. Sample Selection. The most important part of the test and the least precise is the selection of a representative sample. No "standard" can be devised; larger quarry run stone is best sampled at the shot or muck pile by given direction to the loader; small graded riprap is best sampled by random selection from the transporting vehicles. If possible, all parties should take part in the sample selection and agree before the sample is run that the sample is representative.

2. Selection of Size for Separation. It is quite possible and accurate to run a gradation using any convenient sizes for the separation, without reference to the specifications. However, it is usually more convenient to select weights from the gradation limits, such as the 200 lbs., 80 lbs., 40 lbs., and 10 lbs. as shown in the following "R-200" example. After the test is plotted on ENG 4055 and a curve drawn, the gradation limits from the specifications shall be plotted.



WEIGHT OF STONES IN POUNDS*
 SPECIFIC GRAVITY OF ROCK
*ASSUMING STONE SHAPE MIDWAY BETWEEN A SPHERE AND CUBE



SIZE OF STONE IN INCHES

MEMPHIS DISTRICT - CORPS OF ENGINEERS
 MEMPHIS, TENNESSEE

EXAMPLE GRADATION
 BASED ON "R-200"

PROJECT: _____

DATE: _____

RIPRAP GRADATION CURVES

**EXAMPLE GRADATION - SPECIFICATIONS
BASED ON "R - 200"**

Stone Weight in Lbs.	Percent Finer by Weight
200 - 80	100
80 - 40	50
40 - 10	15

**EXAMPLE GRADATION - WORKSHEET
BASED ON "R - 200"**

Stone Size (lbs)	Weight Retained	Individual % Retained	Cumulative % Ret.	% Pass	Specification % Finer by wt
200	0	0	-	100	
140	3840	8	8	92	
80	10560	22	30	70	
60	9600	20	50	50	
40	7200	15	65	35	
10	12000	25	90	10	
<10	4800	10	100	-	
Total Weight	48000lbs				