



SECTION 20 – NUCLEAR GAUGES (FAA 120)

20-1 GENERAL

This section covers the use of nuclear gauges for material testing.

**SECTION 120
NUCLEAR GAGES**

120-01 TESTING. When the specifications provide for nuclear gage acceptance testing of material for Items P-152, P-154, P-208, and P-209, the testing shall be performed in accordance with this section. At each sampling location, the field density shall be determined in accordance with ASTM D 2922 using the Direct Transmission Method. The nuclear gage shall be calibrated in accordance with Annex A1. Calibration and operation of the gage shall be in accordance with the requirements of the manufacturer. The operator of the nuclear gage must show evidence of training and experience in the use of the instrument. The gage shall be standardized daily in accordance with ASTM D 2922, paragraph 8.

Use of ASTM D 2922 results in a wet unit weight, and when using this method, ASTM D 3017 shall be used to determine the moisture content of the material. The moisture gage shall be standardized daily in accordance with ASTM D 3017, paragraph 7.

The material shall be accepted on a lot basis. Each Lot shall be divided into eight (8) sublots when ASTM D 2922 is used.

120-02. When PWL concepts are incorporated, compaction shall continue until a PWL of 90 percent or more is achieved using the lower specification tolerance limits (L) below.

The percentage of material within specification limits (PWL) shall be determined in accordance with the procedures specified in Section 13 (FAA 110) of these specifications. The lower specification tolerance limit (L) for density shall be:

<u>Specification Item Number</u>	<u>Specification Tolerance (L) for Density, (percent of laboratory maximum)</u>
Item P-152	90.5 for cohesive material, 95.5 for non-cohesive
Item P-154	95.5
Item P-208	97.0
Item P-209	97.0



If the PWL is less than 90 percent, the lot shall be reworked and recompacted by the Contractor at the Contractor's expense. After reworking and recompaction, the lot shall be resampled and retested. Retest results for the lot shall be reevaluated for acceptance. This procedure shall continue until the PWL is 90 percent or greater.

120-03 VERIFICATION TESTING. *(For FAA Items P-152 and P-154 only.) The Engineer will verify the maximum laboratory density of material placed in the field for each lot. A minimum of one test will be made for each lot of material at the site. The verification process will consist of; (1) compacting the material and determining the dry density and moisture-density in accordance with ASTM D 1557, and (2) comparing the result with the laboratory moisture-density curves for the material being placed. This verification process is commonly referred to as a "one-point Proctor". If the material does not conform to the existing moisture-density curves, the Engineer will establish the laboratory maximum density and optimum moisture content for the material in accordance with ASTM D 1557.*

Additional verification tests will be made, if necessary, to properly classify all materials placed in the lot.

The percent compaction of each sampling location will be determined by dividing the field density of each subplot by the laboratory maximum density for the lot.

END OF SECTION 120

20-2 METHOD OF MEASUREMENT

Use of nuclear gauges will not be measured for payment

20-3 BASIS OF PAYMENT

Use of nuclear gauges, if approved by the Engineer, will be considered incidental to the bid items for which they are utilized and no separate payment will be made.

END OF SECTION 20