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(includes notes and highlights)

Straight Edge Requirements for Airfield Testing

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Engineering Technical Letter (ETL) 09-2: Contingency Airfield Pavement Specifications

Straight Edge for Airfield Testing

220.3.2.6. Straightedge. Furnish and maintain at the site a 3.6-meter [12-foot] straightedge for use in testing the finished surface. Straightedges shall be **constructed of aluminum** or other lightweight metal and shall have blades **of box or box-girder cross section with flat bottom reinforced** to ensure rigidity and accuracy. Straightedges **shall have handles to facilitate** movement on pavement

For Compacted Soil

220.5.11. Smoothness Test. This test is used only if the stabilized material is the final surface, such as a landing zone surface. The surface of a stabilized layer shall show no deviations in excess of 12 millimeters [1/2 inch] when tested with the 3.6-meter [12-foot] straightedge. Correct deviations exceeding this amount by removing material and AF 220 11 of 11 replacing with new material, or by reworking existing material and compacting. Take measurements for deviation from grade and cross section shown in successive positions parallel to the road centerline with a 3.6-meter [12-foot] straightedge. Also, take measurements perpendicular to the road centerline at 15-meter [50-foot] intervals.

For Stabilized Course

230.7.2. Smoothness Test. The surface of a stabilized layer shall show no deviations in excess of 12 millimeters [1/2 inch] when tested with a 3.6-meter [12-foot] straightedge. Correct deviations exceeding this amount by removing material and with replacing new material, or by reworking existing material and compacting. Take measurements for deviation from grade and cross section shown in the drawings in successive positions parallel to the runway centerline with a straightedge. Also take measurements perpendicular to the runway centerline at 15-meter [50-foot] intervals.

For Aggregate Layer

240.4.4. Smoothness Test. The surface of the top lift shall not deviate more than 12 millimeters [1/2 inch] when tested with a 3.6-meter [12-foot] straightedge applied parallel with and at right angles to the centerline of the area to be paved. Correct deviations exceeding 12 millimeters [1/2 inch] in accordance with paragraph 240.3.12.

For Paved Layer

250.3.6. Surface Smoothness. The surface layer will not show deviations in excess of 9.5 millimeters [3/8 inch] when tested with a 3.6-meter [12-foot] straightedge applied with and at right

angles to the centerline of the area. Deviations will be corrected by removing material and replacing it with new material. Skin patches will not be used. An area may be reworked if the surface is scarified, material added to the surface, and the surface recompact.

For Days Production

250.4.2. Surface Smoothness. Tests for surface smoothness will be a 3.6-meter [12-foot] straightedge applied with and at right angles to the centerline of the area to ensure that the surface layer will not show deviations in excess of 9.5 millimeters [3/8 inch]. Tests will be taken randomly, at least one test for each subplot.

For Completed Asphalt Paving Smoothness

410.4.9. Smoothness. After completion of the final rolling of a lot, the inspector will test the final wearing surface with a 3.6-meter [12-foot] straightedge. Take measurements parallel to and across all joints at equal distances along the joint not to exceed 7.6 meters [25 feet]. Record locations that fail the straightedge test. Use the tolerance criteria in Table 410-4

Table 410-4. Surface Smoothness Tolerance

Pavement Category	Direction of Testing	Tolerance
Runways and taxiways	Longitudinal transverse	3 mm [0.125 in]
		6 mm [0.25 in]
All other airfields and helicopter paved areas	Longitudinal transverse	6 mm [0.25 in]
		6 mm [0.25 in]

Straight Edge For Concrete Testing

510.5.5. Smoothness Requirements. Use a 3.6-meter [12-foot] straightedge to determine if the finished surface meets the specified smoothness requirements. The straightedge shall be constructed of **aluminum or magnesium alloy** and shall have blades of **box or box-girder cross section with flat bottom adequately reinforced to ensure rigidity and accuracy**. Straightedges shall **have handles** for operation on the pavement. Observe measurements and ensure that the measurement procedure is correct and that all deviations are marked for repair/replacement as outlined in the specifications.

For Completed Concrete Paving Smoothness

510.5.5.1. Surface Smoothness Requirements. The finished surfaces of the pavements shall have no abrupt change of 3 millimeters [0.125 inch] or more, and all pavements shall be within the tolerances specified in Table 510-1 when checked with the straightedge.

Table 510-1. Straightedge Surface Smoothness for Pavements

Pavement Category	Direction of Testing	Tolerance
Runways and taxiways	Longitudinal transverse	3 mm [0.125 in]
		6 mm [0.25 in]
All other airfields and helicopter paved areas	Longitudinal transverse	6 mm [0.25 in]
		6 mm [0.25 in]

510.5.5.2. Surface Smoothness Testing Method. Test the surface of the pavement with the straightedge to identify all surface irregularities exceeding the tolerances specified in Table 510-1. Test the entire area of the pavement in both a longitudinal and a transverse direction on parallel lines approximately 4.5 meters [15 feet] apart. Hold the straightedge in contact with the surface and move ahead one-half the length of the straightedge for each successive measurement. Determine the amount of surface irregularity by placing the straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points.