**4C**

**GROWTH CURVE**

(Effective January 22, 2015)

This Special Provision shall apply to all mixes shown in the HMA Mixture Requirement Table located in the plans that have Growth Curve shown as the Density Test Method.

All work shall be performed according to Sections 406, 407, and 1030 except as described below.

The Contractor shall perform a growth curve at the beginning of placement of each lift within the first 200 tons (180 metric tons). If an adjustment is made to the mix design, the Engineer may request an additional growth curve and supporting tests at the Contractor’s expense.

Compaction of the mixture shall commence immediately after the lift is placed and at a temperature of not less than 280° F (140° C) (unless WMA). The growth curve, consisting of a plot of lb/cu ft (kg/cu m) vs. number of passes with the breakdown roller, shall be developed using a nuclear density gauge according to Illinois Modified ASTM D 2950-91. Roller speed during the growth curve testing shall be the same as the normal paving operation. Nuclear density tests shall be taken after each roller pass until the highest lb/cu ft (kg/cu m) is obtained. This value shall be the target density provided the HMA Gyratory air voids are within acceptable limits. If the HMA Gyratory air voids are not within the specified limits, corrective action shall be taken, a new growth curve performed, and a new target density shall be established.

A new growth curve shall be performed if the breakdown roller is changed. The target density shall apply only to the specific nuclear gauge used. If additional nuclear gauges are to be used to determine density specification compliance, the Contractor shall establish a unique minimum allowable target density at the growth curve location for each nuclear gauge.

The Engineer may require the contractor to take core samples at any time at a location specified by the Engineer to verify density from the nuclear gauge.

The QC Manager shall assure the required number of roller passes have been accomplished.

All lifts and confined longitudinal joint edges shall be compacted to an average nuclear gauge density between 95 percent and 102 percent of the target density obtained on the growth curve. Unconfined longitudinal joint edges shall be compacted to an average nuclear gauge density between 93 percent and 102 percent of the target density obtained on the growth curve.

Quality Control density tests shall be performed at randomly selected locations within ½ mile (800 m) intervals per lift per lane. In no case shall more than one half day’s production be completed without density testing being performed. Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (50 mm) from each pavement edge.

If the speed of the paver exceeds 50 feet per minute or the Contractor is not controlling the compaction process and is making no effort to take corrective action, the operation shall stop as directed by the Engineer.

This work will not be paid for separately, but shall be included in the cost of the applicable hot-mix asphalt pay items.

Designer Note: Use when requested by the Bureau of Materials.