Federal Aviation Administration

Memorandum

Date: March 2, 2022

To: All Office of Airports (ARP) Regional Directors

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Subject: Engineering Brief No. 103, Engineered Materials Arresting System Retroreflective Markers

This Engineering Brief provides additional advisory guidance for Advisory Circular (AC) 150/5220-22B, Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns, to alert aircraft pilots and vehicle operators of the presence of an Engineered Materials Arresting System (EMAS) bed by allowing the use of retroreflective markers placed around the EMAS bed. These markers could reduce the risks of inadvertently entering an EMAS bed.

Attachment

Airports

ENGINEERING BRIEF #103

Engineered Materials Arresting System Retroreflective Markers

I. PURPOSE

This Engineering Brief (EB) describes additional advisory guidance for Advisory Circular (AC) 150/5220-22B, to alert aircraft pilots and vehicle operators of the presence of Engineered Materials Arresting System (EMAS) beds. These markers potentially reduce the risks of inadvertently entering an EMAS bed.

II. BACKGROUND

EMAS marking and installation guidelines are in AC 150/5220-22B, *Engineered Materials Arresting Systems for Aircraft Overruns*, Section 14 Markings. Currently the only standard markings are painted chevrons on the top surface of the EMAS. These markers indicate that the EMAS area is unusable for airport vehicle traffic and aircraft that are landing, departing, and taxiing. Several recent incidents occurred at airports where vehicle operators and aircraft inadvertently entered EMAS beds and damaged them. In addition, these incidents raised questions about whether or not pilots are aware of EMAS beds and if current EMAS marking standards are sufficient. Based on FAA surveys and research, airports currently install various and inconsistent visual aid markers and signs around EMAS beds. Based on the findings from the research, the FAA tested and validated both the configurations and placement of markers around EMAS to better identify the area.

III. APPLICATION

Use these standards and guidelines contained in this EB as additional guidance and specifications for AC 150/5220-22B, *Engineered Materials Arresting Systems for Aircraft Overruns*, Section 14 Markings, for retroreflective markers for EMAS. The guidance herein is not legally binding in its own right and will not be relied upon by the FAA as a separate basis for affirmative enforcement action or other administrative penalty. Conformity with this guidance, as distinct from existing statutes, regulations, and grant assurances, is voluntary only, and nonconformity will not affect existing rights and obligations. The standards and guidelines contained in this EB are practices the FAA recommends to establish an acceptable level of safety, performance and operation for enhancing visual identification of an EMAS. There may be existing applications at airports where modification of standards (MOS) requests have been approved. For those that are aligned with this EB, the MOS can be rescinded. Applications where those are not in accordance

with this EB, the FAA expects the airport sponsors to address those applications and install accordingly.

IV. DESCRIPTION

The following standards will be included in the future revision of AC 150/5220-22B.

1. Install retroreflective markers around the perimeter of the EMAS bed. See Figure 1. AC 150/5345-39, *Specification for L-853, Runway and Taxiway Retroreflective Markers*, contains standards for retroreflective markers.

   - Install solid red Type II cylindrical markers along the side and rear boundaries of the EMAS.

   - Install solid yellow Type II cylindrical markers along the front (closest to runway threshold) of the EMAS.

2. Installation height of markers is 14 inches above grade, or 24 inches above grade if the airport experiences significant snow accumulation

3. Space the markers 7.5 feet (2.3 m) apart from adjacent markers per Figure 2.

4. Install the markers between 1 foot (0.3 m) and 10 feet (3.0 m) away from the EMAS bed equally on each side and back, per Figure 2. When installing the markers along the front of the EMAS, ensure that the installation distance will not interfere with the approach lighting systems. Therefore, place the markers at the appropriate distance within the specified range to avoid interference.

V. EFFECTIVE DATE

This Engineering Brief is effective after signature by the Manager of FAA Airport Engineering Division, AAS-100 for new EMAS installations, replacements or retrofits.

VI. APPLICABLE DOCUMENTS

AC 150/5220-22, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns*

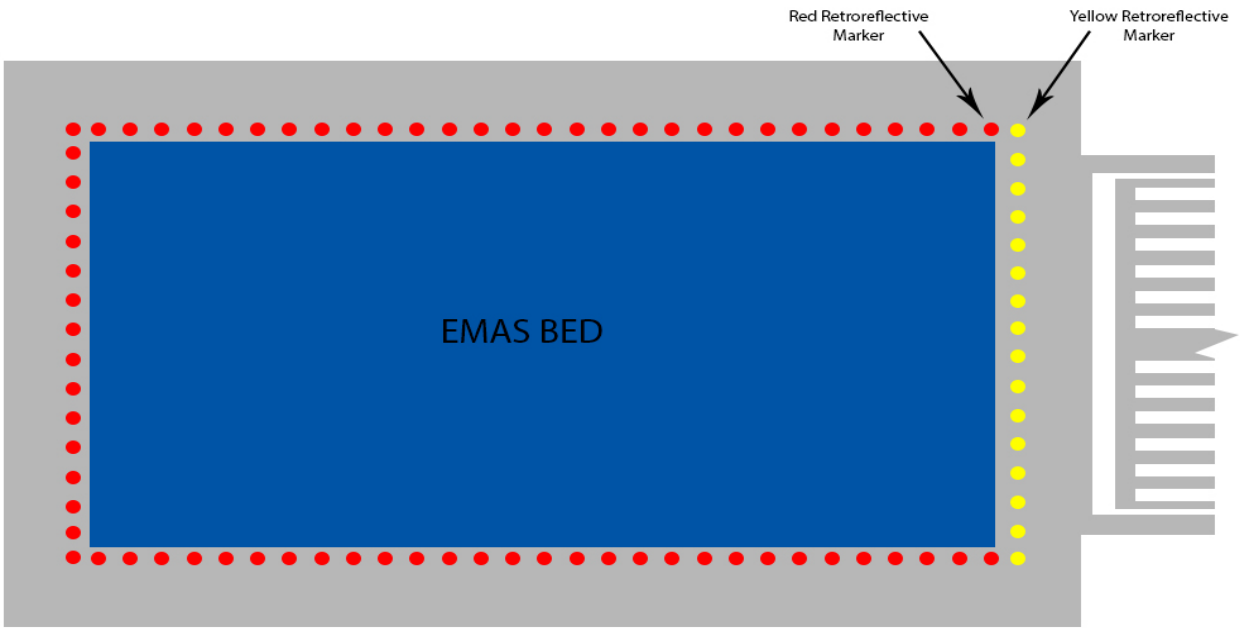
AC 150/5345-39, *Specification L-853, Runway and Taxiway Retroreflective Markers*

AC 150/5340-30, *Design and Installation Details for Airport Visual Aids*

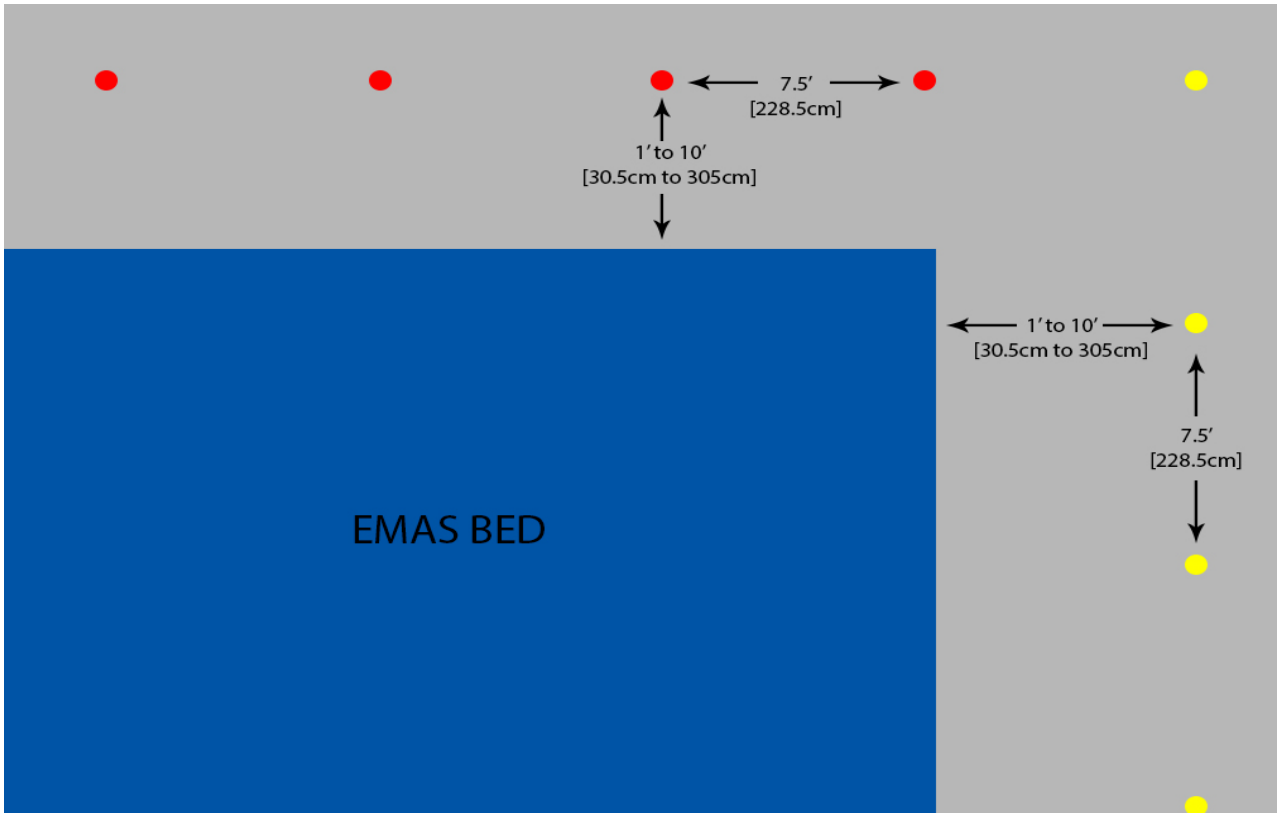
AC 150/5340-1, *Standards for Airport Markings*

Figure 1: EMAS retroreflective markers around the perimeter of the bed

Figure 2. EMAS Bed Retroreflective Marker Layout



General Layout



Dimensional Layout