

## **134 NAVIGATION AND TRAFFIC AIDS-OTHER (NON-SHIP RELATED)**

This code group applies to structures which function as aircraft navigation/traffic aids.

### **134 10 ANTENNA - NAVIGATION (EA)**

An antenna system for navigation aid will vary with the type and purpose of the navigational aid. No specific planning factors are applicable. This category code shall be used to indicate entire antenna systems.

### **134 20 BEACON - AIRCRAFT (EA)**

An aircraft beacon is an internationally recognized rotating or flashing illuminated beacon operated as a visual aid to air navigation to assist pilots in locating and identifying airports and hazards or obstructions to flight operations. Basic criteria on usage of airport beacons may be found in National Standard for Aeronautical Beacons, AGA-NS-6.

Three functional types of aircraft beacons are: (1) airport rotating, (2) identification or code, and (3) hazard or obstruction beacons. Requirements for each type are as follows:

(1) An airport rotating beacon is required for each airfield except that two adjacent airfields may have a common beacon. A lighted military airport is identified by a beacon showing alternating flashes of two white and one green light. An unlighted military airport is identified by white flashes only.

(2) An identification or code beacon is required when the airport beacon is more than 5,000 feet from the nearest point of the usable landing area or where two or more adjacent airfields use one common airport beacon. The identification or code beacon is nonrotating and flashes a signal, the code and color of which identify the field. Where a helipad is not part of an airfield and an operational requirement has been established, an identification beacon is required.

(3) A hazard or obstruction beacon is a nonrotating beacon with a flashing red light used where special warning is required to identify a hazard to air navigation. See Obstruction Lighting - Aircraft, Category Code 134 50.

For design criteria and technical requirements of aircraft beacons, see NAVFAC DM-23.

### **134 40 GROUND CONTROL APPROACH SYSTEM (EA)**

A Ground Control Approach (GCA) System provides guidance to aircraft approaching and landing at airfields under all weather conditions. The system employs electronic equipments which will land aircraft automatically, will display signals in the aircraft allowing the pilot to fly the aircraft to the minimums in effect, or will display information for an approach controller on the ground who will talk the pilot in. Equipments used include precision approach radar (PAR), instrument landing system,

and automated control and landing system, independently or in combination. The technical manuals for the respective equipment describe the siting of the equipment, its supporting utilities, and its relationship with other locations and equipments on the airfield. The equipments are remotely controlled and furnish information for metering, monitoring, recording, and control by underground cables.

PAR equipment usually is placed on turntables near the designated instrument runways; site selection depends upon the number and orientation of runways, local operational requirements, and local weather conditions. Access to the site is programmed with the facility.

For design criteria, see NAVFAC DM-23.

### **134 50 OBSTRUCTION LIGHTING - AIRCRAFT (EA)**

Obstruction lighting is a system of lights which define the vertical and horizontal limits of a hazard to aircraft operations. Hazardous conditions exist when any obstruction encroaches on the standard airfield clearance surfaces or an unsafe condition, such as construction, on the airfield exists. Obstruction lighting includes flashing beacons and steady burning lights, both of which are aviation red in color. One or more flashing beacons are displayed in each case where an early or special warning is needed. It is necessary to provide lighting on all obstructions so that visibility of the lighting is assured from any normal angle of approach and from any direction.

Standards for determining obstructions to air navigation have been established by the Department of Defense and are published in Federal Aviation Regulations, Part 77, which covers "Objects Affecting Navigable Airspace." For design criteria, see NAVFAC DM-23.

### **134 55 VISUAL APPROACH SLOPE INDICATOR (EA)**

The Visual Approach Slope Indicator is an unattended system which provides visual glide slope guidance to pilots of aircraft during the final landing approach. The system consists of two rows of light boxes spaced along the runway about 500 and 1,200 feet from the threshold. By observing the color of light emitted from the boxes, the pilot can tell whether his glide path is proper.

The system is intended for use during Visual Flight Rules (VFR) conditions in deceptive approach areas where the topography in the approach zone does not provide an adequate reference for approach to the runway. It is normally installed only on runways which are not equipped for precision approach. Examples of deceptive approaches are embankments, open water, featureless terrain, or dense growth adjacent to the runway threshold. It is also employed where obstructions make pilot judgment of clearance difficult.

The full Visual Approach Slope Indicator (VASI) system (12 light boxes, six on each side of the runway) is the standard installation. The abbreviated (AVASI) system (four light boxes on left side of the runway) is installed only on minor runways where the environmental conditions and air traffic of the particular airfield do not justify the full VASI system.

For design criteria, see NAVFAC DM-23.

### **134 60 OPTICAL LANDING SYSTEM (EA)**

An Optical Landing System (OLS) is a land runway duplication of the arrangement of lights and mirror-reflective apparatus which provide visual aid to pilots when landing aircraft on carrier decks. It is required for runways designated for Field Mirror Landing Practice (FMLP) and may be used as a visual landing aid on other runways. Two Optical Landing System installations are generally planned at each air installation where mirror landing practice is conducted.

Two principal types of optical landing systems used are the Fresnel Lens Optical Landing System (FLOLS) and the Mirror Optical Landing Systems (MOLS). The Mirror system can be provided as a trailer-mounted portable system or constructed as a fixed installation. See NAVFAC DM-23 and P-272 for specific design information.

Auxiliary equipment, Manually Operated Visual Landing Aid System (MOVLAS), can also be provided for use as an emergency backup system for FLOLS or MOLS. This equipment can be installed independently of the primary system with its own datum, wave-off, and cut lights.

### **134 62 WIND DIRECTION INDICATOR (EA)**

A Wind Direction Indicator is rotating structure which serves as a continuous day and night indicator of wind direction to pilots making an orientation approach to an airfield. The "wind tee" is a "T" shaped rotating structure used at Navy and Marine Corps air installations as a navigational aid. It is positioned on the ground where it will be visible from all directions of approach and centrally located for identification and orientation from the air. The "wind tee" is outlined with green lights which when lit, give it the appearance of a single green "T" when viewed from above. When the lights are not lit, it appears as a single stroke yellow "T". A background of crushed stone, gravel, or similar material that will retard the growth of vegetation and provide sharp contrast to the "wind tee" colors is provided.

For design criteria, see NAVFAC DM-23.

### **134 64 RUNWAY DISTANCE MARKERS (EA)**

Runway distance markers are numbered signs positioned on each side of a runway at 1,000-foot intervals to inform pilots of the distance remaining to the end of the runway. The markers are internally illuminated. Runway

distance markers are planned for all runways located at Navy and Marine Corps air installations.

For design criteria, see NAVFAC DM-23 and NAVFAC P-272.

### **134 66 VOR/TACAN CHECK SIGN (EA)**

A VOR/TACAN check sign is a visual identification marker erected in the area adjacent to the aircraft holding point at the taxiway access to runway ends. It provides pilots with operational check information on the navigation equipment of the aircraft. Check signs are planned for all runway ends at each air installation equipped with a tactical air navigation or visual omnidirectional range installations.

For design criteria, see NAVFAC DM-23.

### **134 70 RADAR TOWER (EA)**

Radar towers must be planned on an individual basis. Planning criteria are not presently available.