



RUNWAY MARKINGS



What Are Airport Markings?

Airport markings are a system of symbols, lines, and colors found on runways, taxiways, aprons, and other areas of an airport. They serve as visual aids to guide pilots, ground crew, and Air Traffic Control, indicating the boundaries and areas of different spaces of the airfield, such as runways, taxiways, holding positions, and parking areas.

These markings are crucial for safe and efficient airport operations, helping to prevent accidents and ensure the orderly movement of aircraft and vehicles on the ground.

The Importance of Airport Markings

Airport markings are vital to airport operations. The most notable example of the importance of airport markings is Air Traffic Control's ability to issue instructions to aircraft and vehicles on the ground.

Much like roads, airport taxiways and runways have dedicated letters assigned to them. Similarly, like addresses, parking areas also have unique identifiers.

This is true for most airport markings, such as runway designators and parking areas.

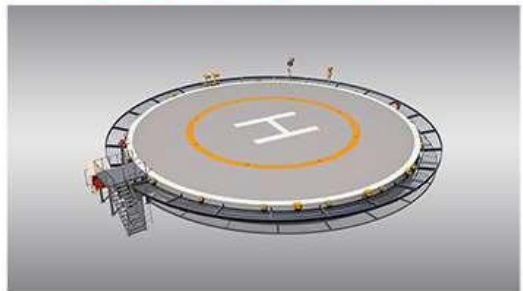
Airport Marking Colors

Airport markings use defined colors to prevent confusion and

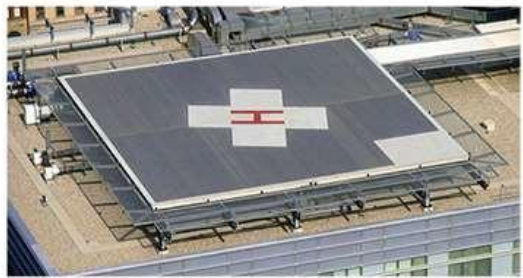
Markings on runways are white. It's the same for heliports too, except for hospital heliports – Hospital heliports have a red “H” (usually on a white cross).



Runway - White Stripes



Normal Heliport - White "H"



Hospital Heliport - Red "H"

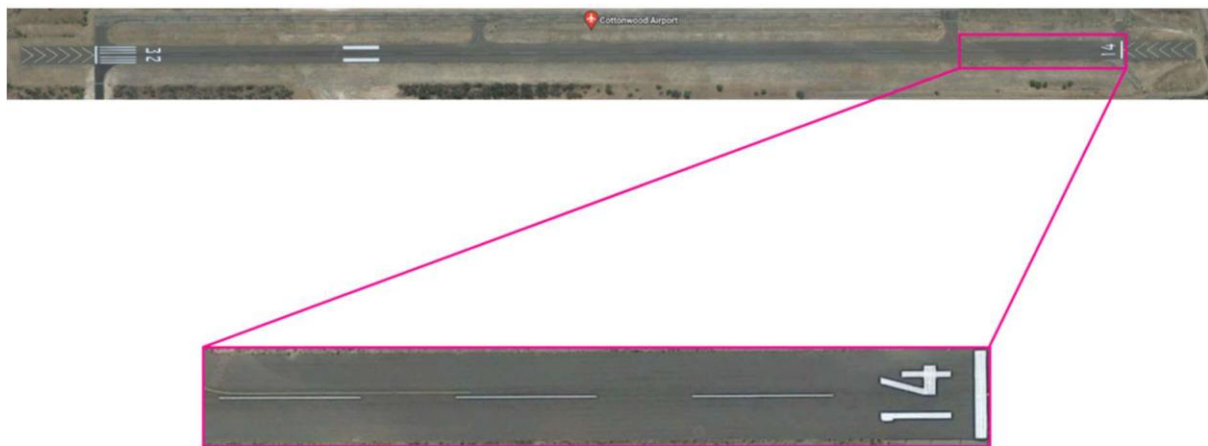
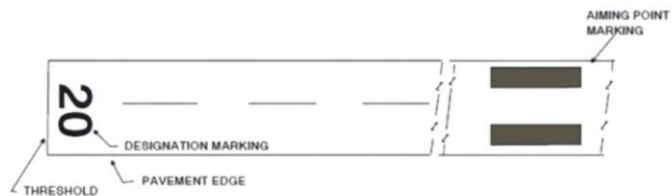
The markings for taxiways and other areas that aircraft aren't supposed to use (like closed or dangerous spots) are all yellow.

Holding positions have yellow markings, even if they're on the runway itself



Runway Type

Visual Runway



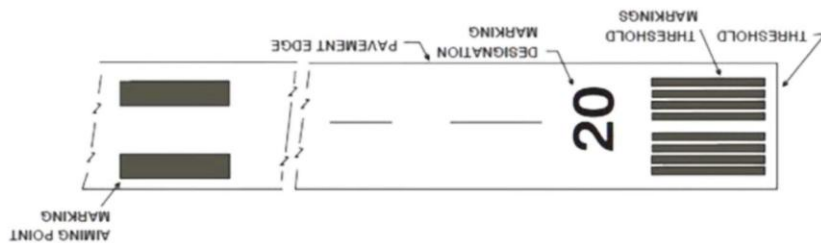
Visual runway at Cottonwood Airport, NZ

Visual runways have no instrument approach procedure available. Visual runways are marked with a dashed centerline and runway identification number.

On runways used by international commercial flights, a threshold must be present

Visual runways feature aiming point markings if the runway is 4,000ft or longer or used by jet aircraft.

Non-Precision Runways

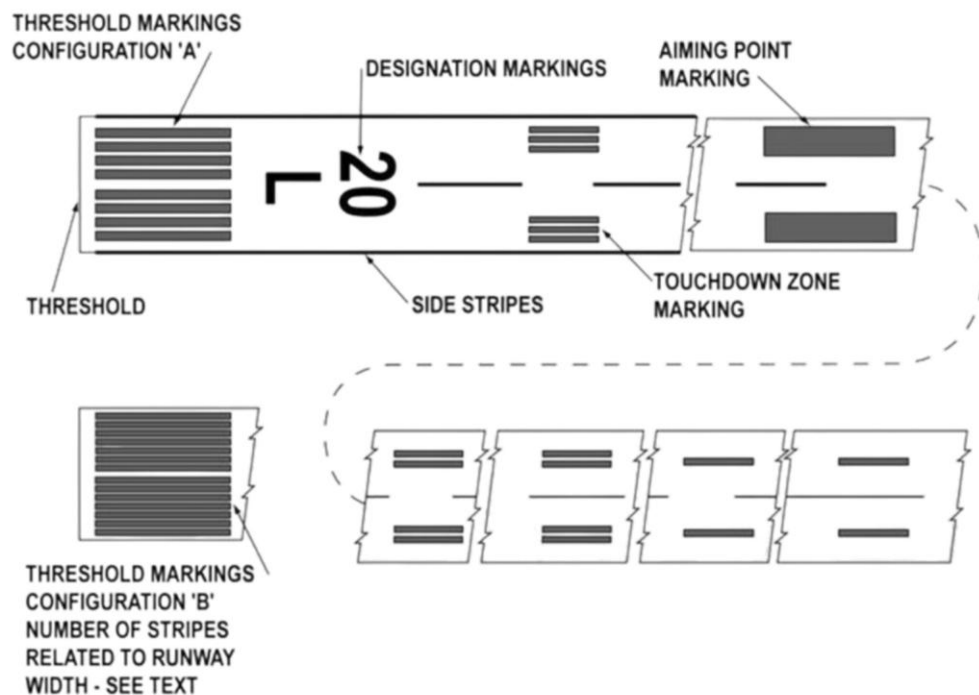


Non-Precision runway at Cottonwood Airport-AZ

Non-precision runways have at least one non-precision approach available.

Non-precision runways often look similar to visual runways but feature threshold and aiming point markings.

Precision Runways



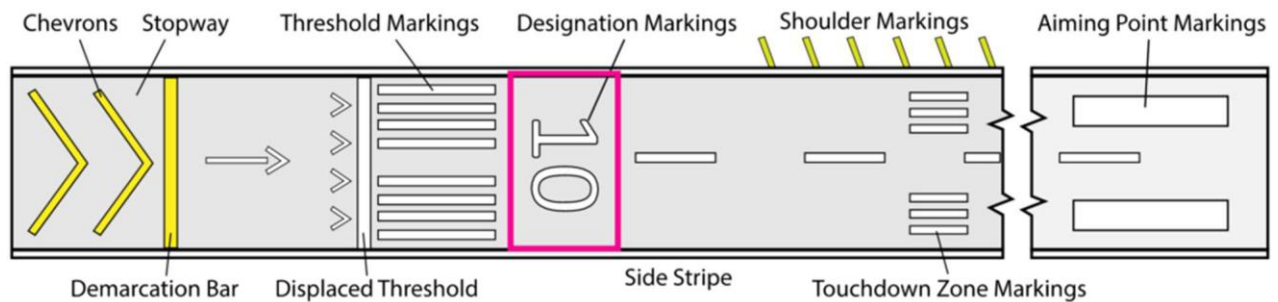
Precision runway at Flagstaff Pulliam Airport-AZ

Precision runways feature at least one precision approach aid at either end of the runway, such as an Instrument Landing System (ILS).

Precision runways feature additional markings to assist pilots in determining runway distance and landing areas.

With the three types of runways defined, let's look at the markings you may find on a runway.

Runway Designators



Runways feature perhaps the most important airport markings – runway designators.

You may be surprised to learn how simple the naming system is.

Runways are designated using the magnetic direction that they point towards, rounded to the nearest 10 degrees. For example, a runway pointing in a 063 magnetic heading will be designated as “Runway 6” (“Runway **06**” outside of the US). A runway pointing in a 068 magnetic heading will be designated as “Runway 7” (heading 068 rounded to the nearest 10 is 070).

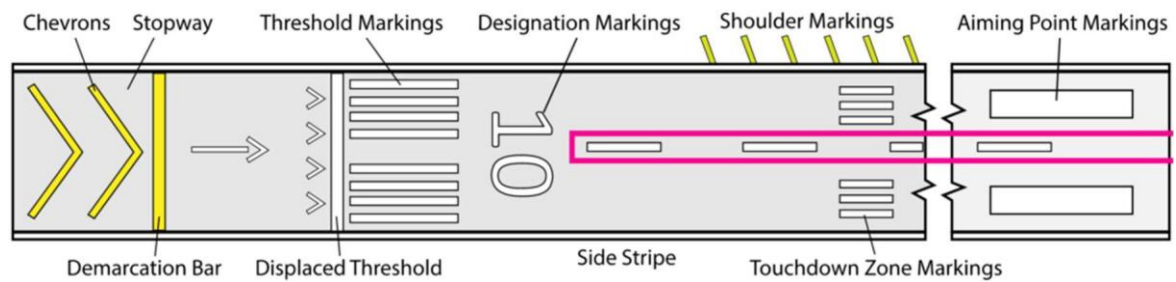
The opposite end of the runway is designated with the reciprocal (opposite) heading. For example, the opposite end of Runway 6 would be Runway 24. In other words, the heading for Runway 6 was 063, so we add 180 degrees to 063, which equals **243**. The opposite end is therefore Runway **24**.

Parallel runways feature an additional letter describing their position; “L,” “C,” or “R” for “Left,” “Center,” and “Right.”

If there are only two parallel runways, only “L” and “R” are used.

Runway 4L and 4R (“four left” and “four right”) at Newark Liberty International Airport.

Runway Centerlines

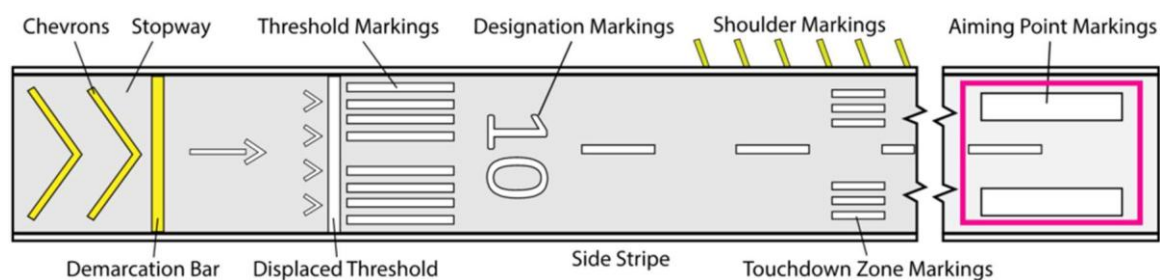


T

Runway centerline markings are similar to the centerline on a road; only your aim with a runway centerline is to stay in the middle of it, not to the side.



Runway Aiming Point

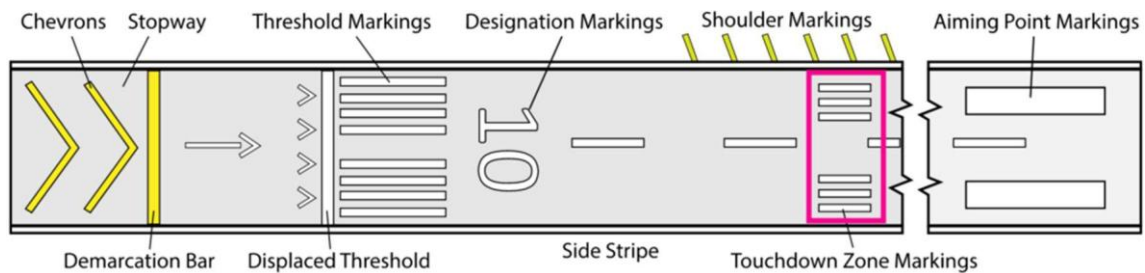


Runway aiming point markers consist of two thick white stripes on each side of the centerline, usually 1,000 ft from the runway threshold.

Aiming point markers are used as a target on the runway to fly towards. In other words, if you kept flying on the glideslope and did not flare, you would hit the aiming point markers.

Aiming point markers are often mistaken for touchdown zone markings.

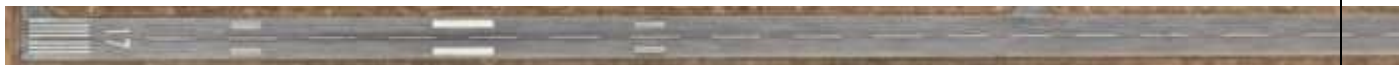
Runway Touchdown Zone



Runway touchdown zone markers are thin white stripes (aiming point stripes are thick) that identify the touchdown zone of the runway.

Runway Side Stripe Markings

Runway side stripe markings are solid white lines that mark the edge of a runway. They are the least complicated markings on a runway but are crucially important for identifying the width (and middle) of the runway



STOPAWAY

Runway side stripe markings are solid white lines that mark the edge of a runway. They are the least complicated markings on a runway but are crucially important for identifying the width (and middle) of the runway.

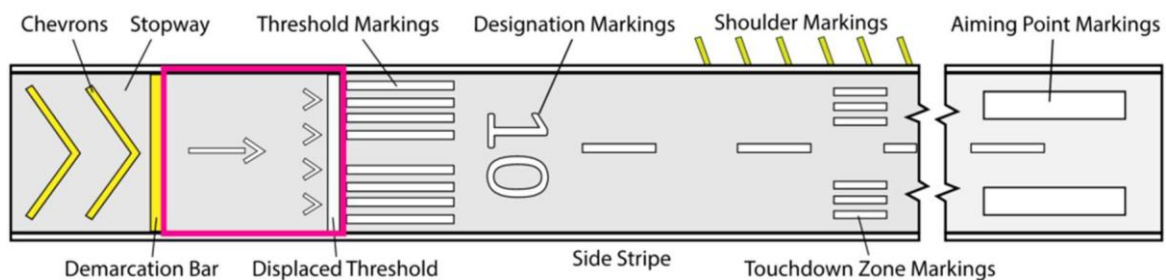
Runway Threshold Markings

Runway threshold markings are some of the most misunderstood but vitally important runway markings used.

A runway threshold identifies the beginning of a runway.

But the threshold can become even more unique if it is relocated or displaced.

Displaced Threshold



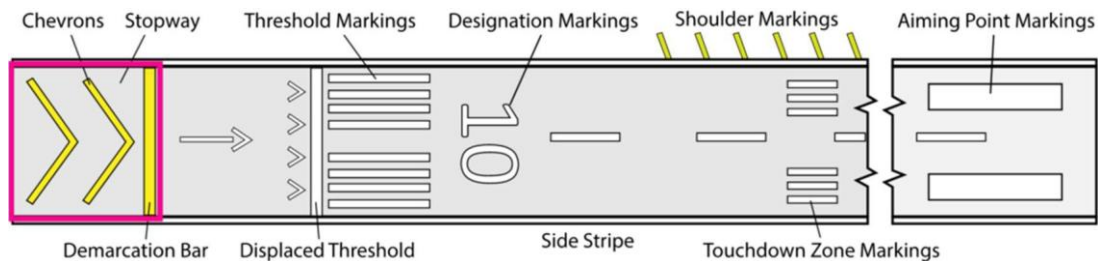
A displaced threshold is any threshold that is not located at the beginning of the runway. A displaced threshold is generally used due to obstructions at the beginning of the runway, such as buildings or trees.

It is important to note that the area behind the displaced threshold can be used for takeoffs but not landings. During landing, it can only be used as a landing rollout (i.e., for stopping at the end of the runway after a landing).

The displaced threshold consists of white arrows along the centerline of the runway.

The displaced threshold should not be confused with a blast pad or stop-way (also known as an overrun area).

Blast-Pad, Stop-Way, Overrun Area



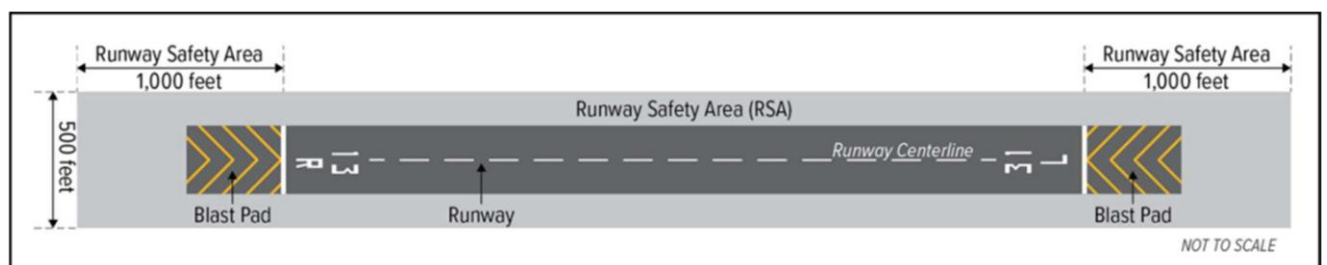
This area of the runway is marked with yellow arrows (known as chevrons), and it is not used for normal operations.

The stop-way (as it is most commonly referred to) serves two main purposes:

1. To prevent a runway excursion during landing by providing additional tarmac for emergencies.
2. To provide a clear area for jet and propeller blasts to dissipate.

The stop-way forms part of the runway safety area.

Runway Safety Area

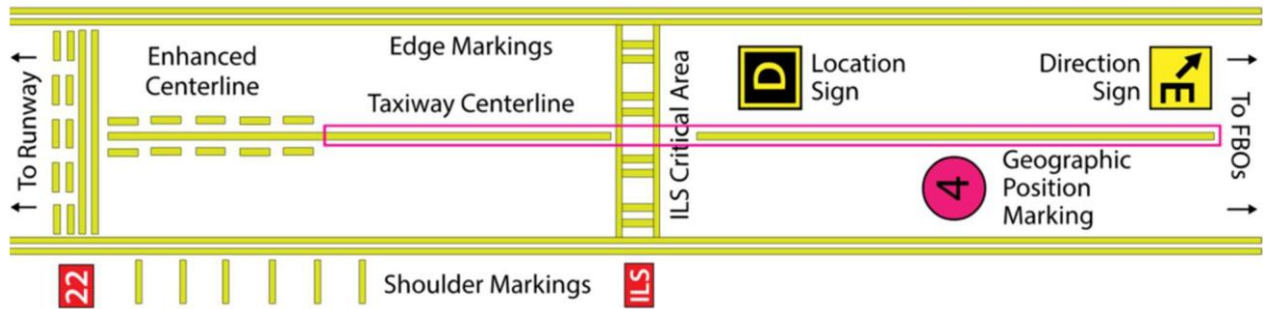


A Runway Safety Area (RSA) is an area around the runway that has saved several lives since its implementation.

The RSA is a buffer zone for aircraft when they come up short, go off-center, or go off the end of the runway. The RSA is usually kept clear and obstacle-free so aircraft can slow down or stop without any issues during emergencies.

Additionally, RSAs provide valuable maneuvering areas for firefighting and rescue equipment.

Taxiway Centerline Markings



Unlike the runway centerline markings, which are dashed and white, taxiway centerline markings are solid yellow lines with a black outline.

There are two types of taxiway centerlines:

1. Normal Taxiway Centerline:
 - A single continuous yellow line with a black outline.
2. Enhanced Taxiway Centerline
 - Parallel yellow dashes on either side of the continuous yellow line. Also featuring a black outline.

Enhanced taxiway centerlines are used to warn pilots that they are approaching a runway. The yellow dash markings of an enhanced taxiway line extend for a maximum of 150 ft from a runway entry point (known as a “holding point”).

Taxiway Edge Markings

Taxiway edge markings identify the edges of a taxiway. They are not required and are generally only used when the paved area used for the taxiway does not correspond to the designated taxiway.

There are two types of taxiway edge markings:

1. Continuous Markings:
 - Continuous taxiway markings consist of two yellow lines, each 6 inches wide and separated by 6 inches.
2. Dashed Markings:

Surface-Painted Taxiway Direction Signs

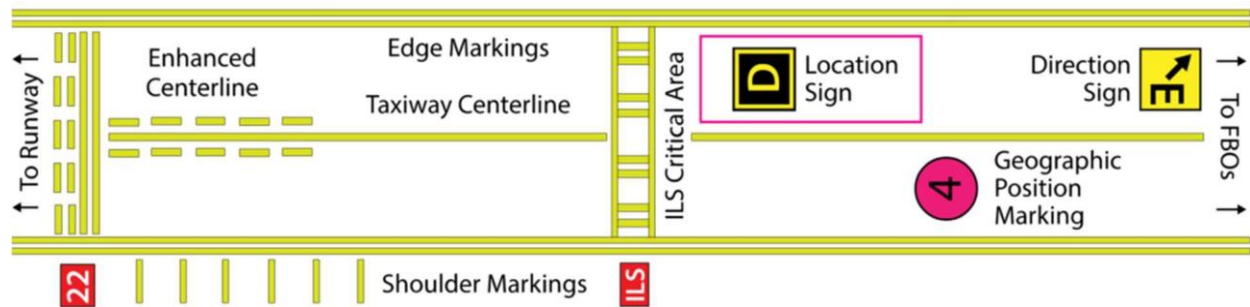


Surface-painted taxiway direction signs are used to supplement physical signs or when it is not possible to use physical signs.

Surface-painted signs look the same as their physical counterparts. Taxiway direction signs and markings use a yellow background with black inscriptions.

Surface-painted taxiway direction signs are painted on the side of the centerline in the direction of the turn. In other words, if the taxiway direction sign points to the left, it will be on the left side of the taxiway centerline.

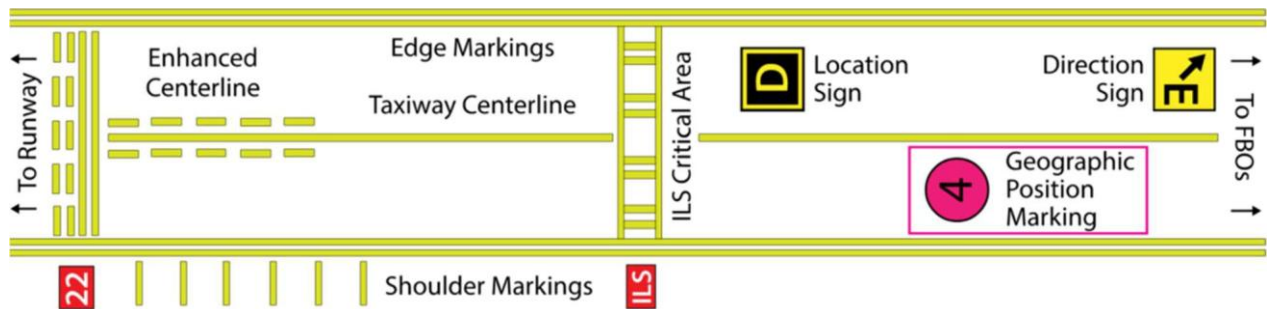
Surface-Painted Location Signs



Surface-painted location signs are also the painted version of their physical counterparts.

Surface-painted location signs feature a black background with yellow inscriptions. They are painted to the right of the taxiway (so if you see one on the left of the taxiway, you're reading it upside down).

Geographic Position Markings

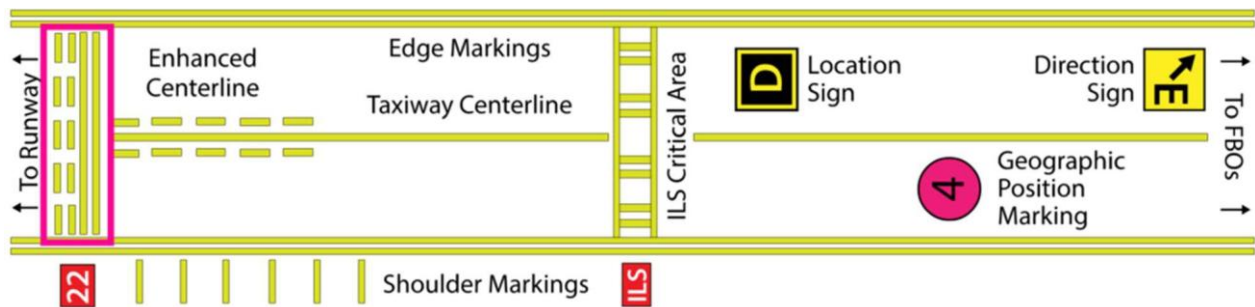


Geographic position markings are used to identify the location of aircraft during low-visibility operations. Geographic position markings are identified by a number and letter or only a number.

Geographic position markings feature a pink circle with a black and white border with black text.

Geographic position markings are only used during low-visibility operations (Runway Visual Range below 360m), which means that you won't need to use them during normal operations.

Runway Holding Position Markings



Runway holding position markings are the most arguably the most important airport markings used.

Runway holding position markings mark the intersection between the taxiway and the runway where aircraft are required to stop if they have not been cleared to enter the runway. It is effectively where the runway begins and the taxiway ends.

These markings are usually placed 125 – 250 feet from the runway centerline.

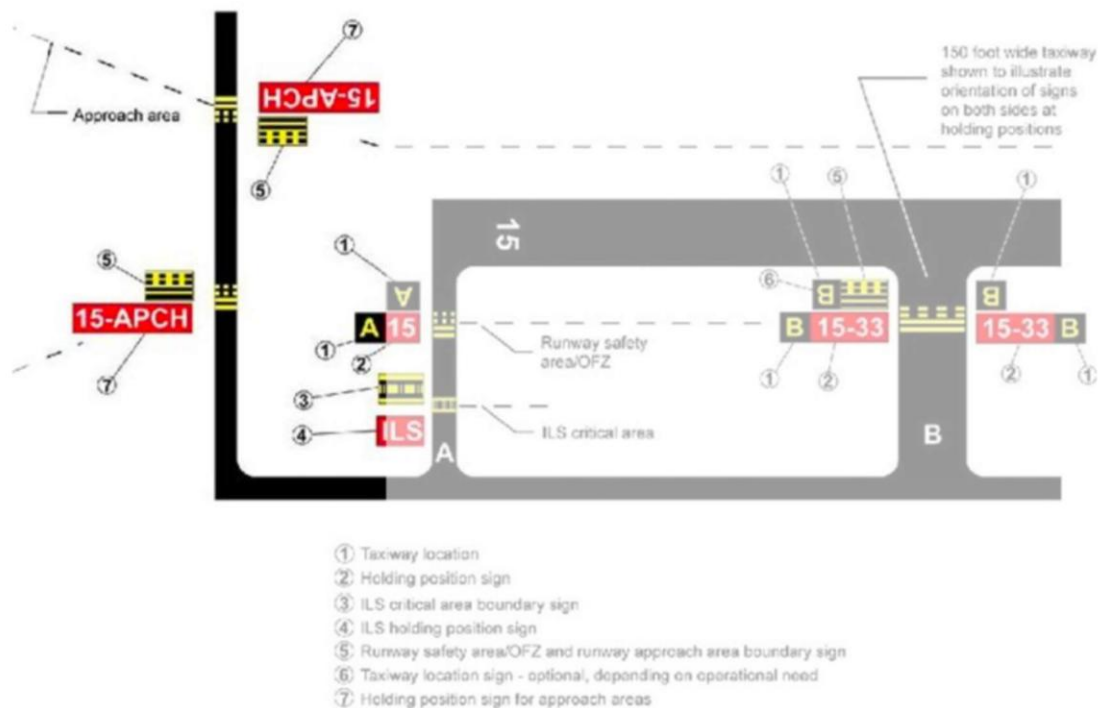
The general convention used for these holding position markings is that the solid lined side should only be crossed with permission, while the dashed line side may be crossed without permission.

Runway holding position markings are also used on intersecting runways if Land and Hold Short Operations (LAHSO) are used.

An aircraft that is exiting a runway must have all parts of the aircraft over the holding position marking for it to be considered clear of the runway.

If you miss a runway holding position marking, you're likely going to be in trouble, so pay attention!

Holding Position Markings in Runway Approach Areas

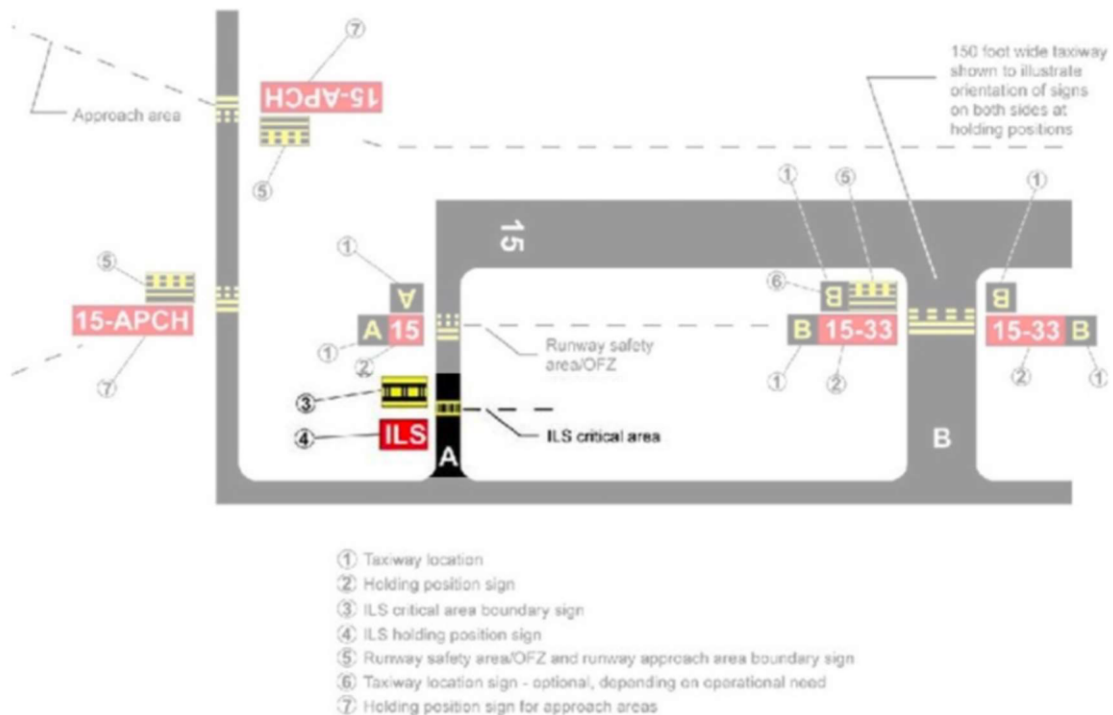
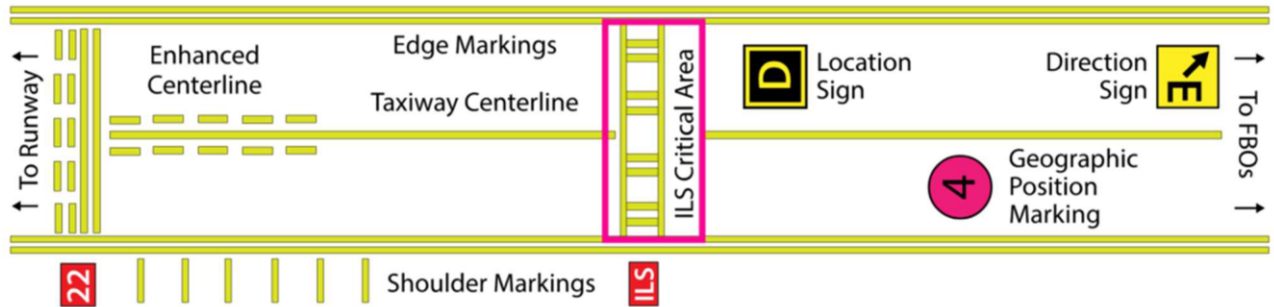


At certain airports, you'll come across runway approach areas holding position markings.

These markings are crucial because they indicate where you should stop your aircraft on a taxiway that's situated near the approach or departure area of a runway. By doing this, you'll prevent any interference with operations taking place on the runway.

These markings are found alongside the runway approach area holding the position sign.

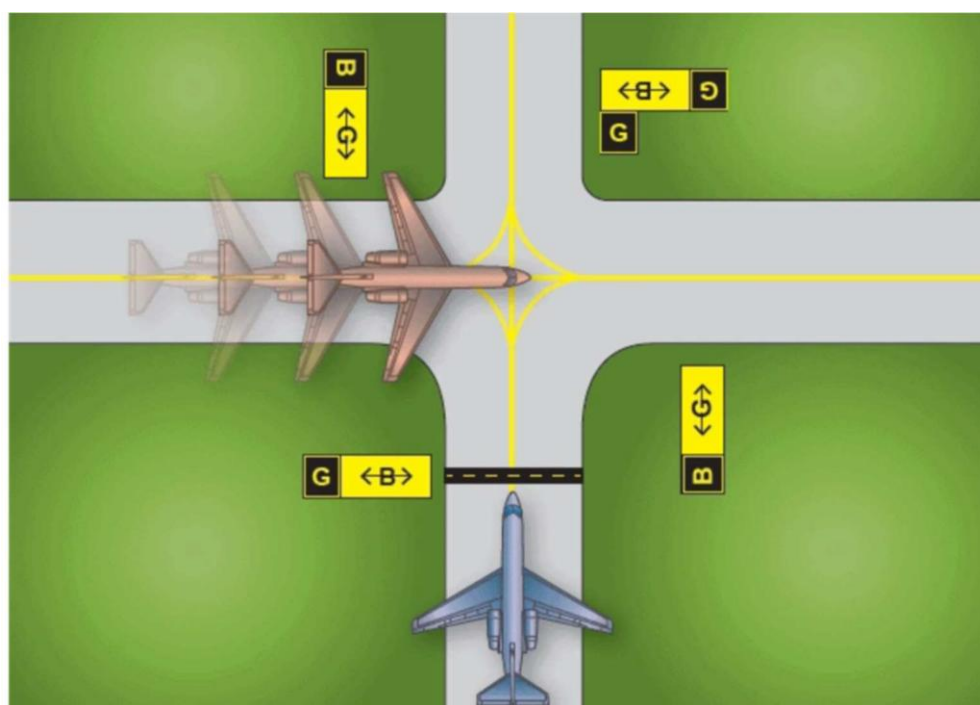
Holding Position Markings for Instrument Landing Systems (ILS)



At airports with an Instrument Landing System (ILS), you may notice that the holding position line is moved back or that a specific ILS holding position line is created for certain operations.

You might hear these ILS holding position markings referred to by the specific ILS category they're protecting, like "CAT I" or "CAT II" (for example, "Runway 15 CAT I holding point"). The usual holding point closer to the runway is sometimes called the "visual holding point."

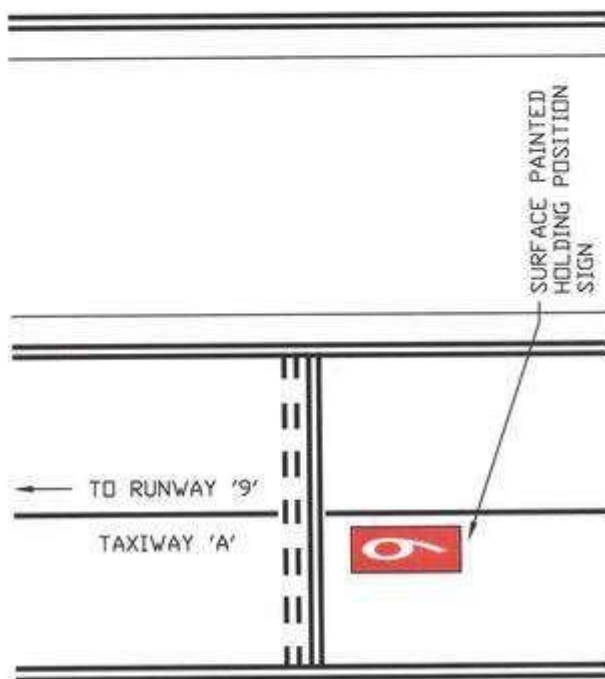
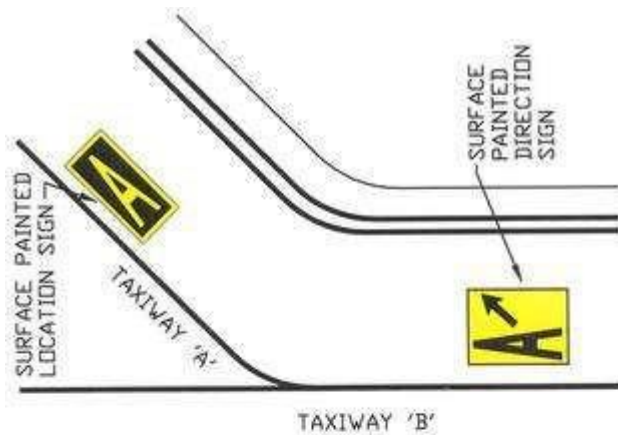
Holding Position Markings for Intersecting Taxiways



When it comes to taxiway intersections, you'll find holding position markings that consist of a single dashed line extending across the entire width of the taxiway. These markings are placed on taxiways where Air Traffic Control (ATC) needs to hold aircraft short of the intersection.

If you don't see a marking at an intersecting taxiway and you're instructed to hold short, make sure you stop your aircraft at a spot that offers enough clearance from any aircraft on the intersecting taxiway.

Surface Painted Holding Position Signs

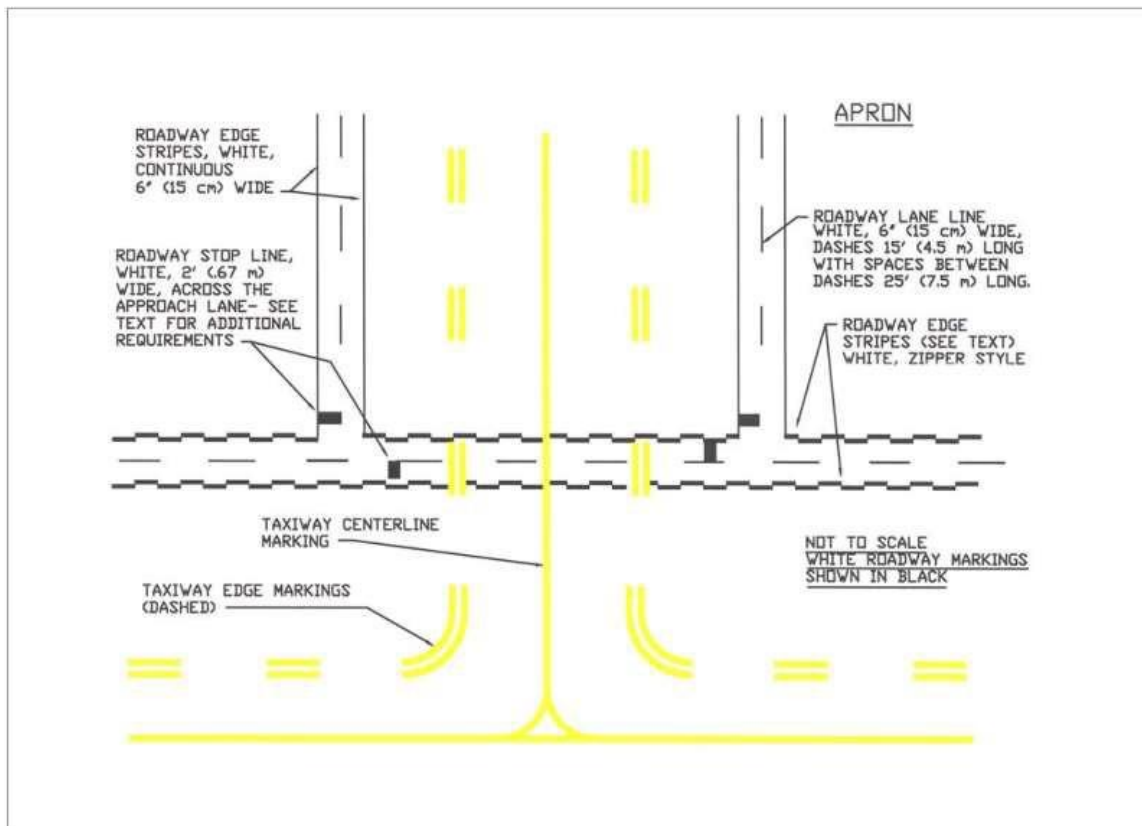


Surface-painted holding position signs look the same as their physical counterparts – red background with a white inscription.

They are generally used when the width of the holding position (i.e., the taxiway) is greater than 200 ft.

Vehicle Roadway Markings

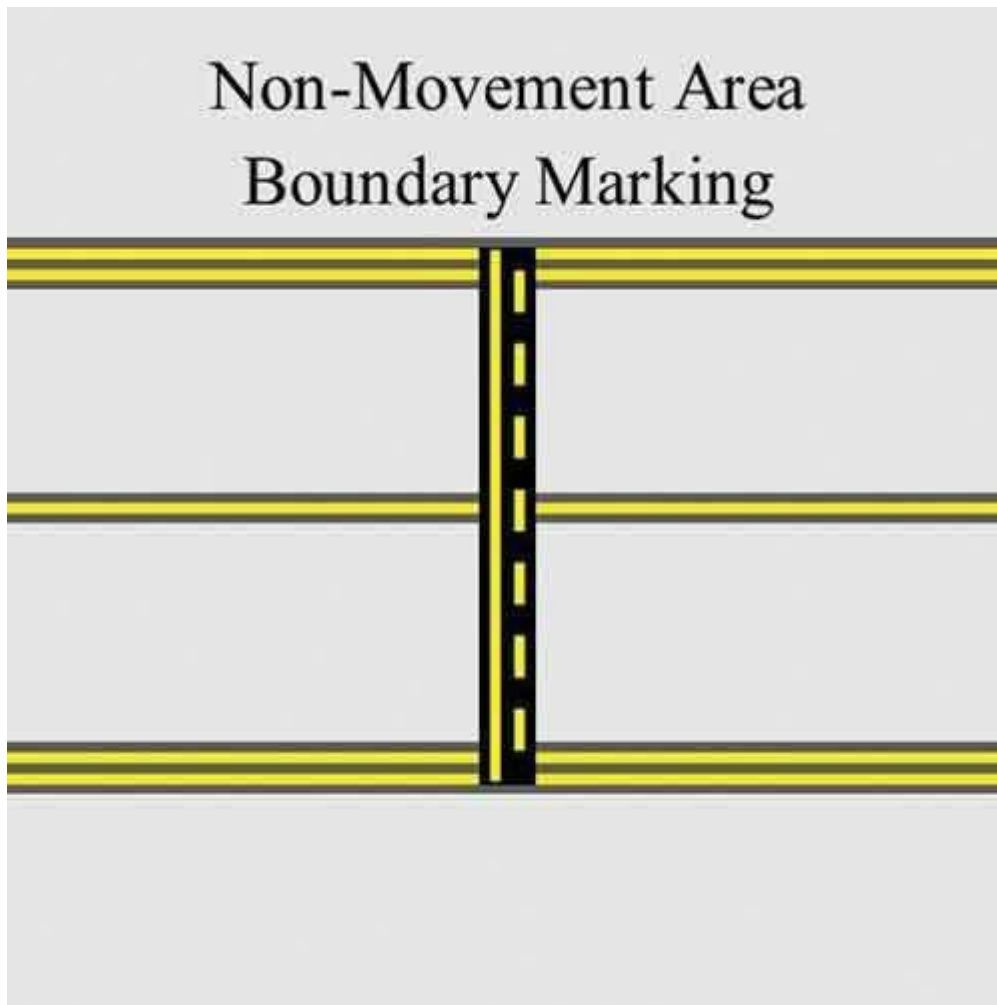
FIG 2-3-18
Vehicle Roadway Markings



Sometimes, vehicle roadway markings are necessary to outline a path for vehicles operating on or crossing areas that are also meant for aircraft. These markings help maintain order and safety on the ground.

These markings typically include solid white lines that outline each edge of the roadway and dashed lines to separate the lanes within the edges. Alternatively, you might see “zipper markings” used instead of solid lines to define the edges of the vehicle roadway.

Non-Movement Area Boundary Markings



Non-movement area boundary markings help differentiate the movement area (the area under ATC control) from the non-movement area at airports. These yellow markings are positioned right on the boundary between these two areas.

The non-movement area boundary markings consist of two yellow lines, each 6 inches wide – with one being solid and the other dashed. The solid line is situated on the non-movement area side, while the dashed yellow line is on the movement area side. They look like the runway holding position markings with one solid and one dashed line instead of two solid and two dashed lines.

Temporarily Closed Runway and Taxiway Markings

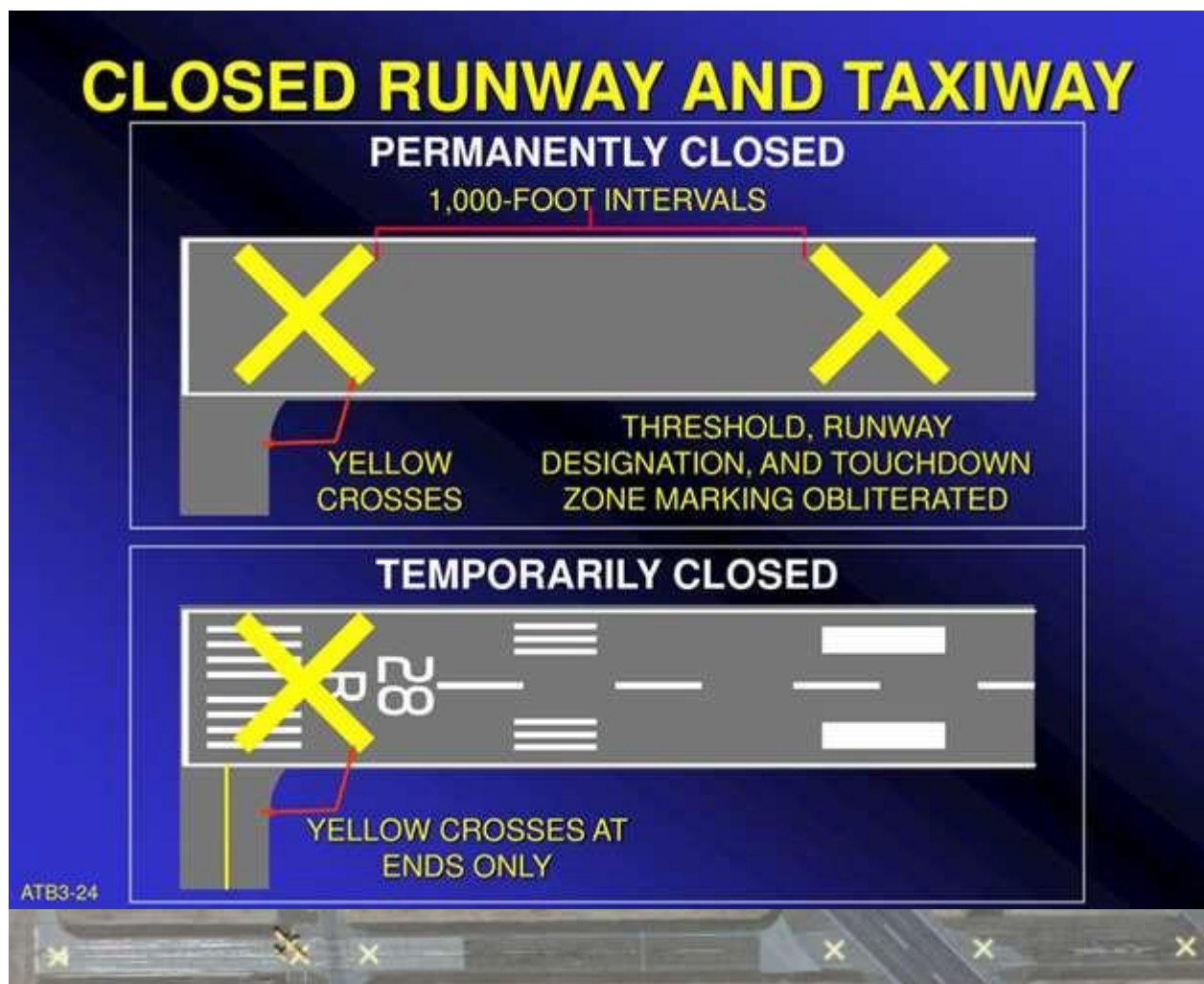


When a runway is temporarily closed, yellow "X" markings are placed on both ends of the runway to give pilots a visual cue. Instead of permanent markings, a raised lighted yellow cross may also be used to indicate the closure.

Keep in mind that a visual indication might not always be present, depending on factors like the reason and duration of the closure, airfield configuration, and the presence and operating hours of an airport traffic control tower. To stay informed about local runway and taxiway closures, always check NOTAMs and the Automated Terminal Information System (ATIS).

Temporarily closed taxiways are often considered hazardous, and aircraft shouldn't enter these areas. They're typically blocked with barricades, but sometimes a yellow cross is installed at each taxiway entrance instead. Just like with runways, visual indications for taxiway closures might not always be present, so be sure to consult NOTAMs and ATIS for updates.

Permanently Closed Runway and Taxiway Markings



When runways and taxiways are permanently closed, their lighting circuits will be disconnected. Additionally, the runway threshold, runway designation, and touchdown markings will be removed. Instead, yellow crosses are placed at each end of the runway and at 1,000-foot intervals to indicate the closure.

Short Takeoff and Landing Runways

For runways designed for short takeoff and landing (STOL) operations, you'll see "STOL" painted at the approach end. This helps identify the appropriate (and rare) runways for aircraft capable of STOL operations.

FUEL HYDRANT PIT

Lastly, if there are any pit systems on the ramp like a fuel hydrant pit, it is also marked with indicative ground markings as visual cues to anyone passing by for observing precaution and ensuring alertness and safety.



Note the black colored ground marking on the ramp for the fuel pit system