



Federal Aviation
Administration
Southern Region
Airports Division

A Quick Reference to

Airfield Standards



This November 2015 edition supersedes all previous editions

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PURPOSE

This publication provides a quick reference to several FAA standards as detailed in current FAA Advisory Circulars (ACs) as of the date of this publication. This guide is not all-inclusive and the applicable ACs should be consulted for information that is more comprehensive.

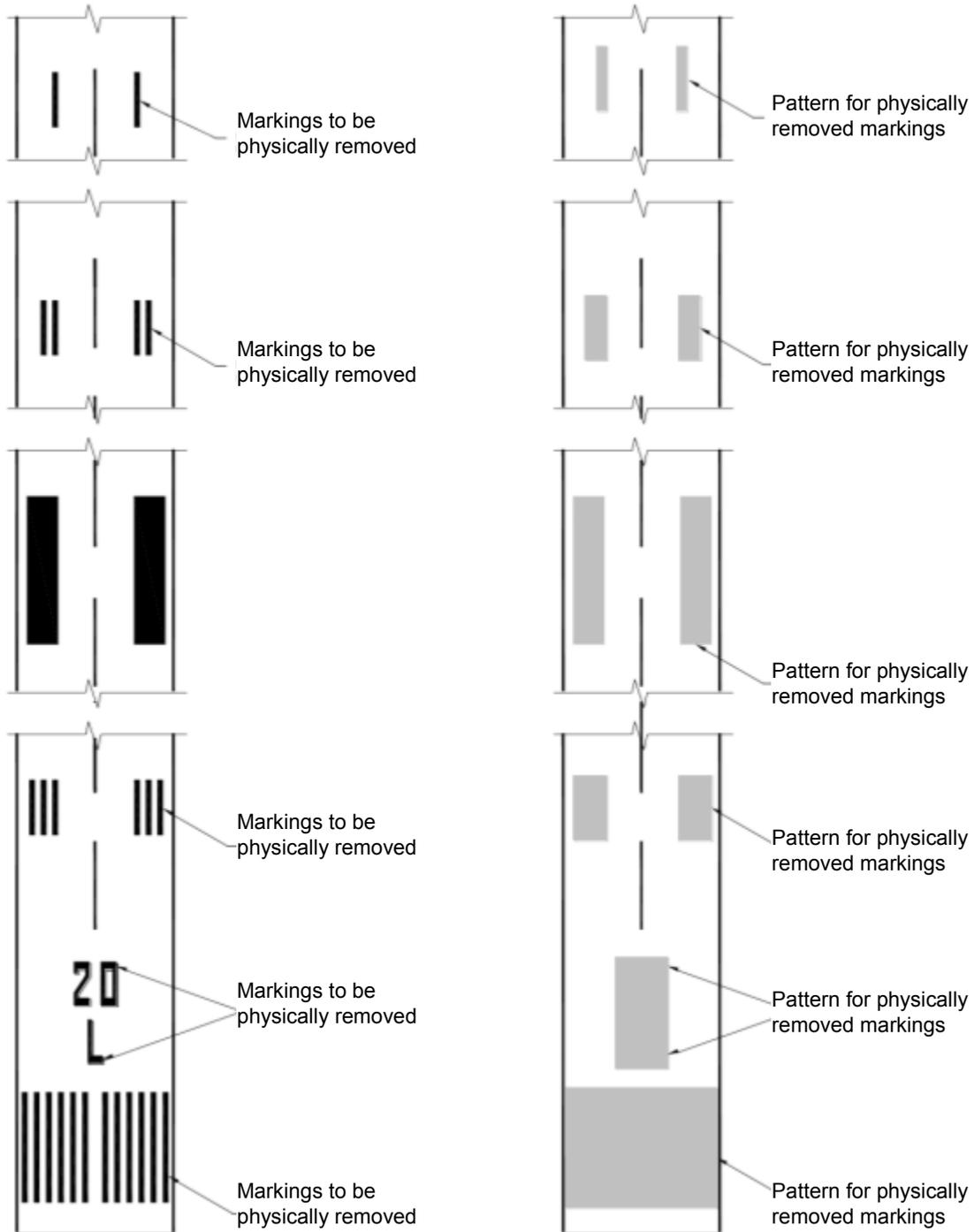
Cover photo – Fort Lauderdale/Hollywood International Airport (FLL)

Chapter 1 - Airfield Markings

Reference: AC 150/5370-2F

Removal of Markings

Physically remove pavement markings that are no longer needed. Do not just paint over them. This prevents a continued visual appearance of the removed markings.

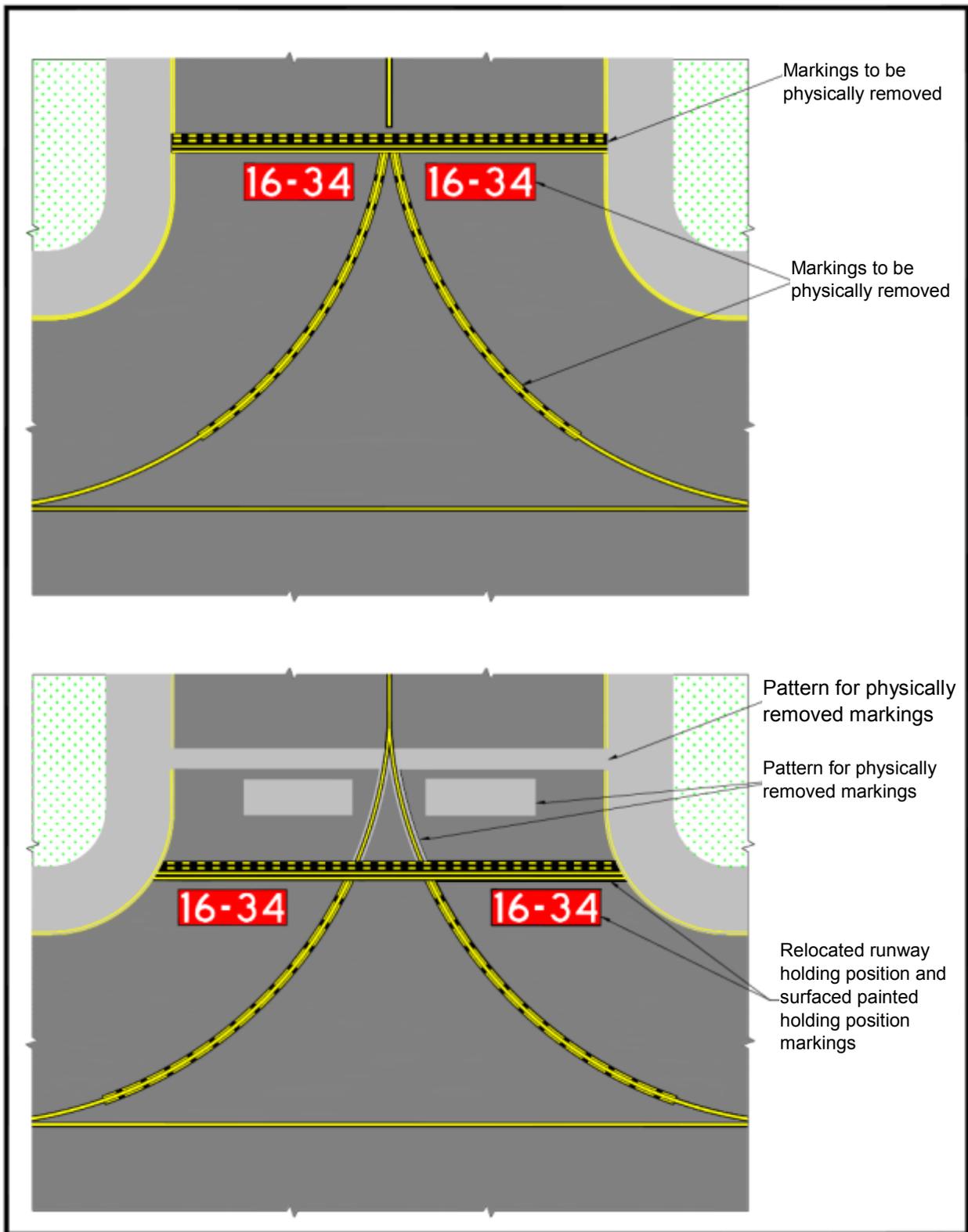


Markings to be physically removed



Markings to be physically removed





Use of Glass Beads

| Where Required | Where Recommended |
|---|--|
| <ul style="list-style-type: none"> • Runway designation • Runway and taxiway centerline • Threshold markings and bar • Aiming point marking • Touchdown zone • All holding position markings • Geographic position markings • Surface painted signs • Non-movement area boundary markings | <ul style="list-style-type: none"> • Runway side stripes • Runway edge markings • Taxiway side stripes • Displaced threshold markings • Demarcation bar |

Note: Glass beads are not to be used in black paint.
Type III beads shall not be applied to red or pink paint

Use of Black Borders

| Where Required* | Where Recommended |
|--|---|
| <ul style="list-style-type: none"> • All holding position marking • Enhanced Twy centerlines • Non-movement area boundary markings • SMGCS Twy centerlines • Surface painted holding signs • Intermediate holding position • Geographic position marking (see AC150/5340-1L, 4.11(d)) • All runway markings except edge stripe | <ul style="list-style-type: none"> • Taxiway centerlines • Taxiway edge markings • Chevrons • Shoulder markings |

*On all "light" colored pavements (includes fading asphalt.)
See table on next page.

General Guidelines for Determining Light-Colored Pavements

Painting a Black Border

| Pavement Surface Type | Age of Pavement Surface | | |
|--------------------------|-------------------------|-------------------|------------------|
| | New | Up to 2 years old | Over 2 years old |
| Portland Cement Concrete | Yes | Yes | Yes |
| Asphalt Concrete | No | No | Yes |
| Asphalt Treated | No | No | Yes |

This table serves only as a general guide since an existing asphalt pavement at one airport location may not experience the same rate of surface color deterioration as at another airport location.

Runway Marking Elements

| Runway Surface Marking Scheme | Threshold Approach Category | | |
|-------------------------------|--|---|---|
| | Visual Approach | Non-precision Approach (Approaches with vertical guidance not lower than 0.75 statute mile visibility) | Precision Approach (Approaches with vertical guidance lower than 0.75 statute mile visibility) |
| Runway diagram |  |  |  |
| Landing Designator | X | X | X |
| Centerline | X | X | X |
| Threshold | Note 1 | X | X |
| Aiming Point | Note 2 | Note 3 | X |
| Touchdown Zone | (not applicable) | (not applicable) | X |
| Side Stripes | Note 4 | Note 4 | X |

Note 1: Required on runways serving approach categories C and D airplanes and for runways used, or intended to be used by international commercial air transport.

Note 2: Required on 4,200 foot or longer runways serving approach categories C and D airplanes.

Note 3: Required on 4,200 foot or longer instrumented runways.

Note 4: Used when the full runway pavement width may not be available for use as a runway.

Groupings of Touchdown Zone Markings Required When Installed From One Threshold

| Distance Between Thresholds (or displaced thresholds) (Feet) | Markings for Precision Approach End (includes displaced threshold) | Other Runway End Visual or Non-precision |
|--|--|---|
| 6,065 or greater (Note 1) | Full set of markings | Aiming point markings |
| 5,565 - 6,064 | Less one grouping of rectangular bar markings (Note 2) | Aiming point marking |
| 5,065 - 5,564 | Less two groupings of rectangular bar markings | Aiming point marking |
| 4,565 - 5,064 | Less three groupings of rectangular bar markings | Aiming point marking |

Note 1: The value of 6,065 feet is derived as follows:

1. For the non-precision or visual runway end, the table assumes the 900 foot “no marking zone” criterion **plus** the length of a preferred aiming point marking, which starts 1,020 feet from the start of the threshold to obtain a length of 1,920 feet.
2. Add to this the length of the aiming point marking. The length of the aiming point marking is either 150 or 100 feet. This table uses a length of 150 feet because all the entries in column 1 are greater than 4,200 feet. Therefore, adding 150 feet to 1,920 feet obtains a length of 2,070 feet. For the precision end, which equals 3,995 feet, it assumes the 900 foot “no marking zone” followed by the standard 75-foot long rectangular bar for a total length of 975 feet.
3. Add to this value the full 3,000 foot touchdown zone marking scheme **and** the 20 foot separation between the actual starting point of the runway threshold (or displaced threshold) **and** the bottom edge of the threshold marking to obtain 3,995 feet.
4. Summing the values 3,995 and 2,070 yields 6,065 feet.

Note 2: Each reduction in a pair of rectangular bar markings from the precision end equates to a 500-foot reduction between the thresholds.

The painting rationale for this table is to ignore the midpoint between the thresholds so the precision instrumented landing is favored over non-precision or visual landings.

The length of the non-precision or visual side of the runways always remains at 2,070 feet in length to promote the painting a full set of touchdown zone markings.

Groupings of Touchdown Zone Markings Required When Installed From Both Thresholds

| Distance Between Thresholds (or displaced thresholds) (Feet) | Markings for Each Threshold (or displaced threshold) |
|--|---|
| 7,990 or greater (Note 1) | Full set of markings |
| 6,990 - 7989 | Less one grouping of rectangular bars from each side nearest to the runway midpoint (Note 2) |
| 5,990 - 6,989 | Less two groupings of rectangular bars from each side nearest to the runway midpoint (Note 2) |
| 4,990 - 5,989 | Less three groupings of rectangular bars from each side nearest to the runway midpoint (Note 2) |

Note 1: The value of 7,990 feet is derived as follows:

1. Proceed from the runway midpoint in one direction and you will have the 900-foot “no marking zone” criterion followed by the standard 75-foot long rectangular bar for a total length of 975 feet.
2. Add to this value the full 3000 foot touchdown zone marking scheme **plus** the 20 foot separation between the actual starting point of the runway threshold (or displaced threshold) **and** the edge of the threshold marking to obtain 3,995 feet.
3. Double this value for both directions to obtain 7,990 feet.

Note 2: Each reduction in a pair of rectangular bar markings from both sides equates to a 1,000-foot reduction between the thresholds.

The painting rationale for this table is to preserve the midpoint between the thresholds, thereby promoting an equal treatment of painting pairs of rectangular bar markings for both sides.

Runway Threshold Stripes for Standard Runway Widths

| Runway width | Number of stripes |
|--------------|-------------------|
| 60 feet | 4 |
| 75 feet | 6 |
| 100 feet | 8 |
| 150 feet | 12 |
| 200 feet | 16 |

Runway Marking Dimensions

Precision Instrument

| Runway marking | 100' Wide | 150' Wide | 200' Wide |
|-----------------------------|--------------|--------------|--------------|
| Designation | 60'L | 60'L | 60'L |
| Centerline (note 1) | 120'Lx36"W | 120'Lx36"W | 120'Lx36"W |
| Edge | 36" wide | 36" wide | 36" wide |
| Threshold Bar | 10' wide | 10' wide | 10' wide |
| Threshold Markings | 150'Lx5.75'W | 150'Lx5.75'W | 150'Lx5.75'W |
| Aiming Point | 150'Lx20'W | 150'Lx30'W | 150'Lx30'W |
| Touchdown Zone | 75'Lx4'W | 75'Lx6'W | 75'Lx6'W |
| Demarcation (note 2) | 3' wide | 3' wide | 3' wide |



Notes:

1. Gaps are 80 feet in length. Adjustments to the length of the stripes and gaps, where necessary to accommodate the runway length, are made near the runway midpoint.
2. A demarcation bar delineates a runway with a displaced threshold from a blast pad, stopway, or taxiway that precedes the runway and is not usable pavement. A demarcation bar is yellow in color.

Non-Precision Instrument

| Runway marking | 100' Wide | 150' Wide | 200' Wide |
|---------------------------------|--------------|--------------|--------------|
| Designation | 60'L | 60'L | 60'L |
| Centerline (note 1) | 120'Lx18"W | 120'Lx18"W | 120'Lx18"W |
| Edge (optional) (note 2) | 36" wide | 36" wide | 36" wide |
| Threshold Bar | 10' wide | 10' wide | 10' wide |
| Threshold Markings | 150'Lx5.75'W | 150'Lx5.75'W | 150'Lx5.75'W |
| Aiming Point (note 3) | 150'Lx20'W | 150'Lx30'W | 150'Lx30'W |
| Demarcation (note 4) | 3' wide | 3' wide | 3' wide |



Notes:

1. Gaps are 80 feet in length. Adjustments to the length of the stripes and gaps, where necessary to accommodate the runway length, are made near the runway midpoint.
2. Used when the full pavement width may not be available as a runway.
3. Required on 4,200 feet or longer instrumented runways.
Note: Aiming Point markings may be reduced to 100 feet in length for runways under 4200 feet.
4. A demarcation bar delineates a runway with a displaced threshold from a blast pad, stopway, or taxiway that precedes the runway and is not usable pavement. A demarcation bar is yellow in color.

Visual

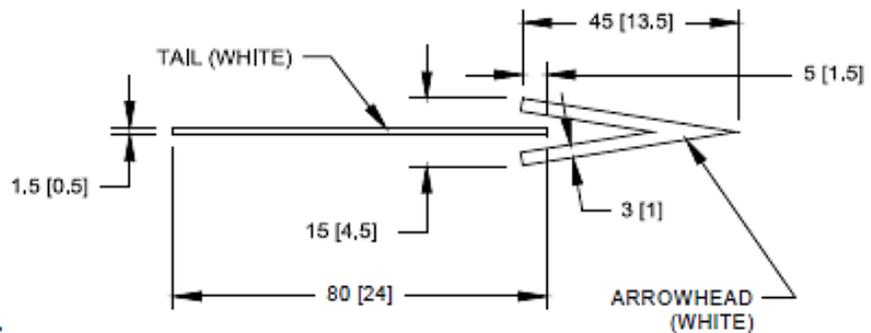
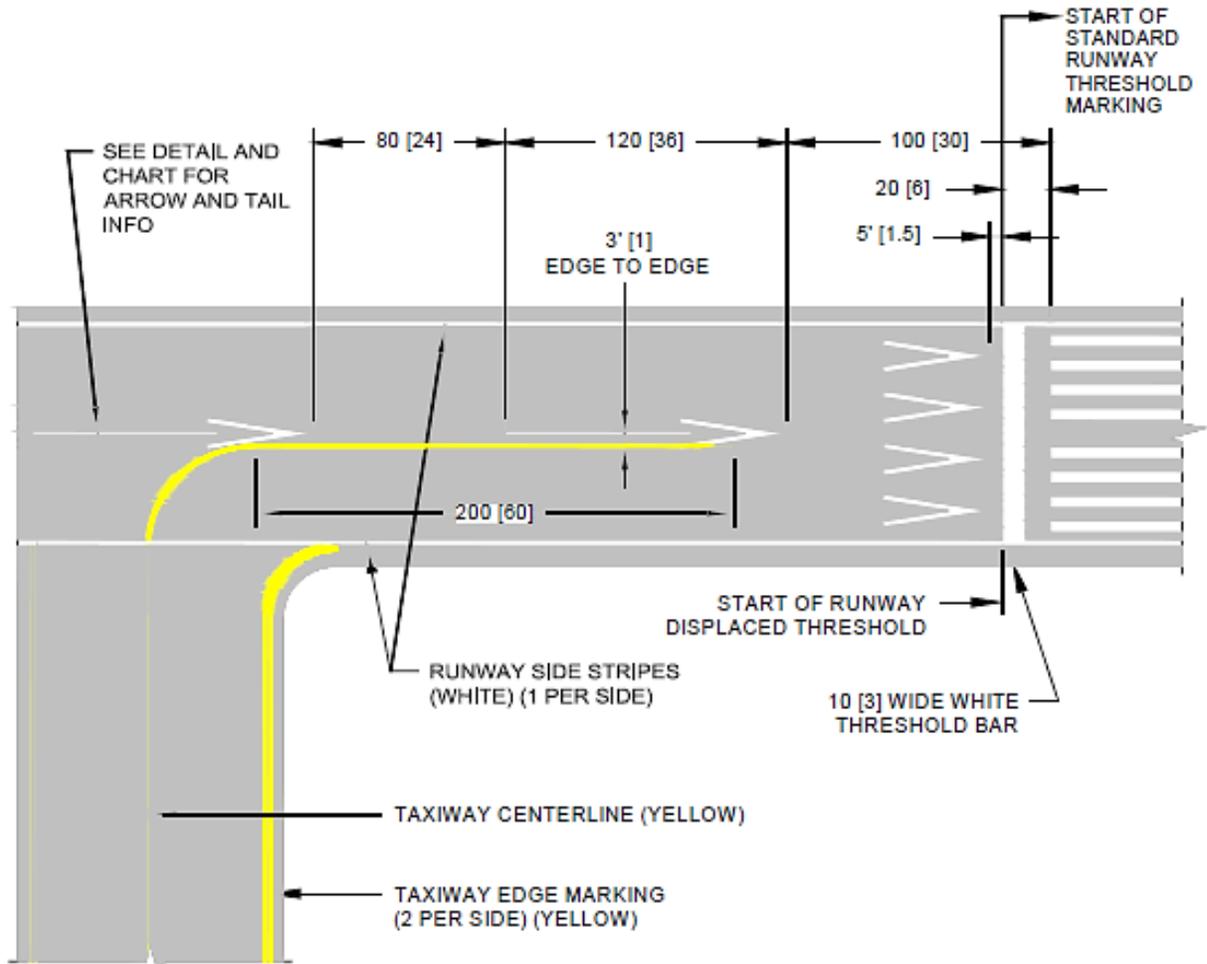
| Runway | 100' Wide | 150' Wide | 200' Wide |
|------------------------------------|--------------|--------------|--------------|
| Designation | 60'L | 60'L | 60'L |
| Centerline (note 1) | 120'Lx12"W | 120'Lx12"W | 120'Lx12"W |
| Edge (optional) (note 2) | 36" wide | 36" wide | 36" wide |
| Threshold Bar | 10' wide | 10' wide | 10' wide |
| Threshold Markings (note 3) | 150'Lx5.75'W | 150'Lx5.75'W | 150'Lx5.75'W |
| Aiming Point (note 4) | 150'Lx20'W | 150'Lx30'W | 150'Lx30'W |
| Demarcation (note 5) | 3' wide | 3' wide | 3' wide |



Notes:

1. Gaps are 80 feet in length. Adjustments to the length of the stripes and gaps, where necessary to accommodate the runway length, are made near the runway midpoint.
2. Used when the full pavement width may not be available as a runway.
3. Required on runways serving approach category C and D airplanes or on runways used by international commercial transport.
4. Required on runways 4,200 feet or longer used by approach category C and D aircraft. Note: Aiming Point markings may be reduced to 100 feet in length for runways under 4200 feet.
5. A demarcation bar delineates a runway with a displaced threshold from a blast pad, stopway, or taxiway that precedes the runway and is not usable pavement. A demarcation bar is yellow in color.

Displaced Threshold Markings

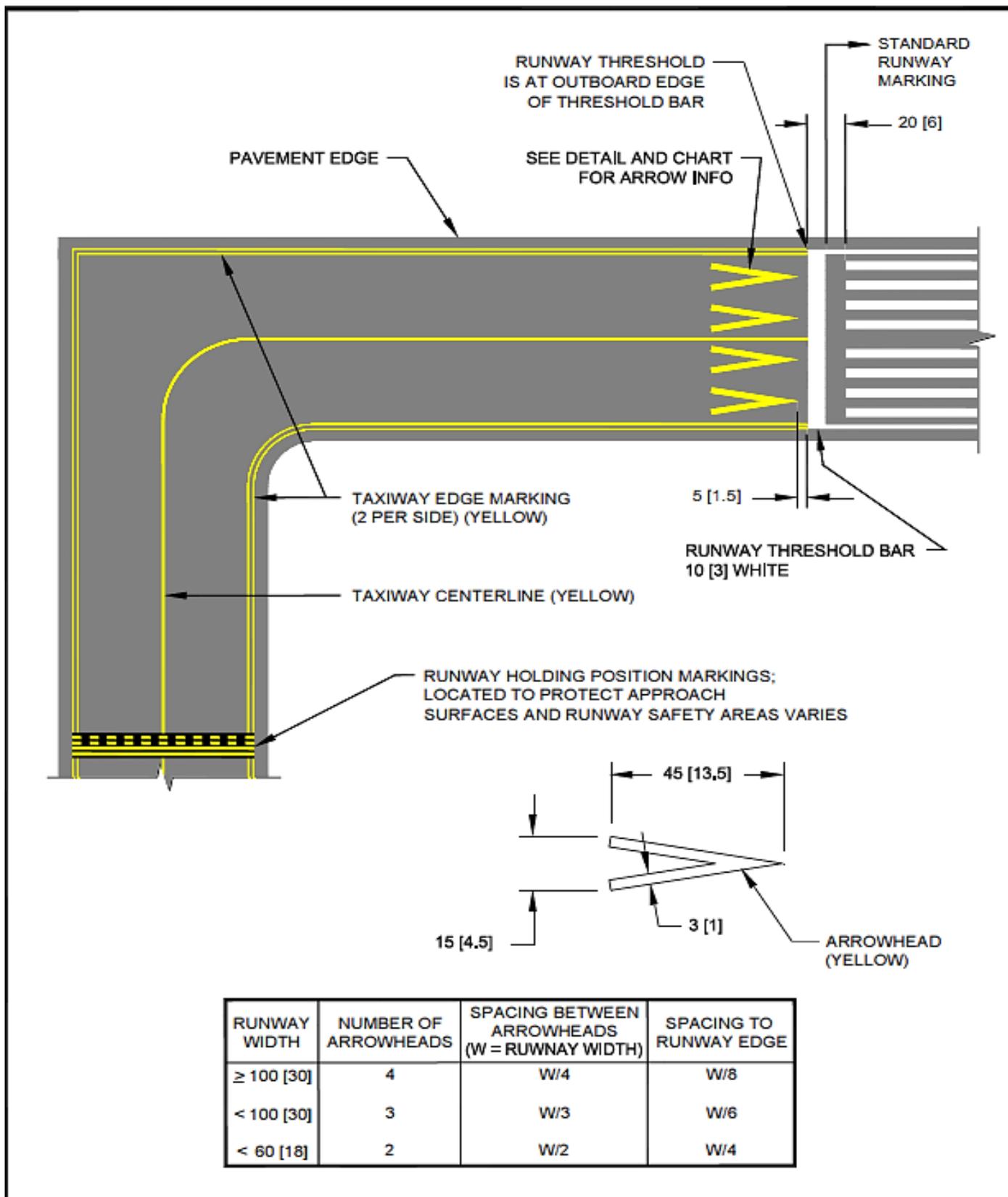


NOTES:

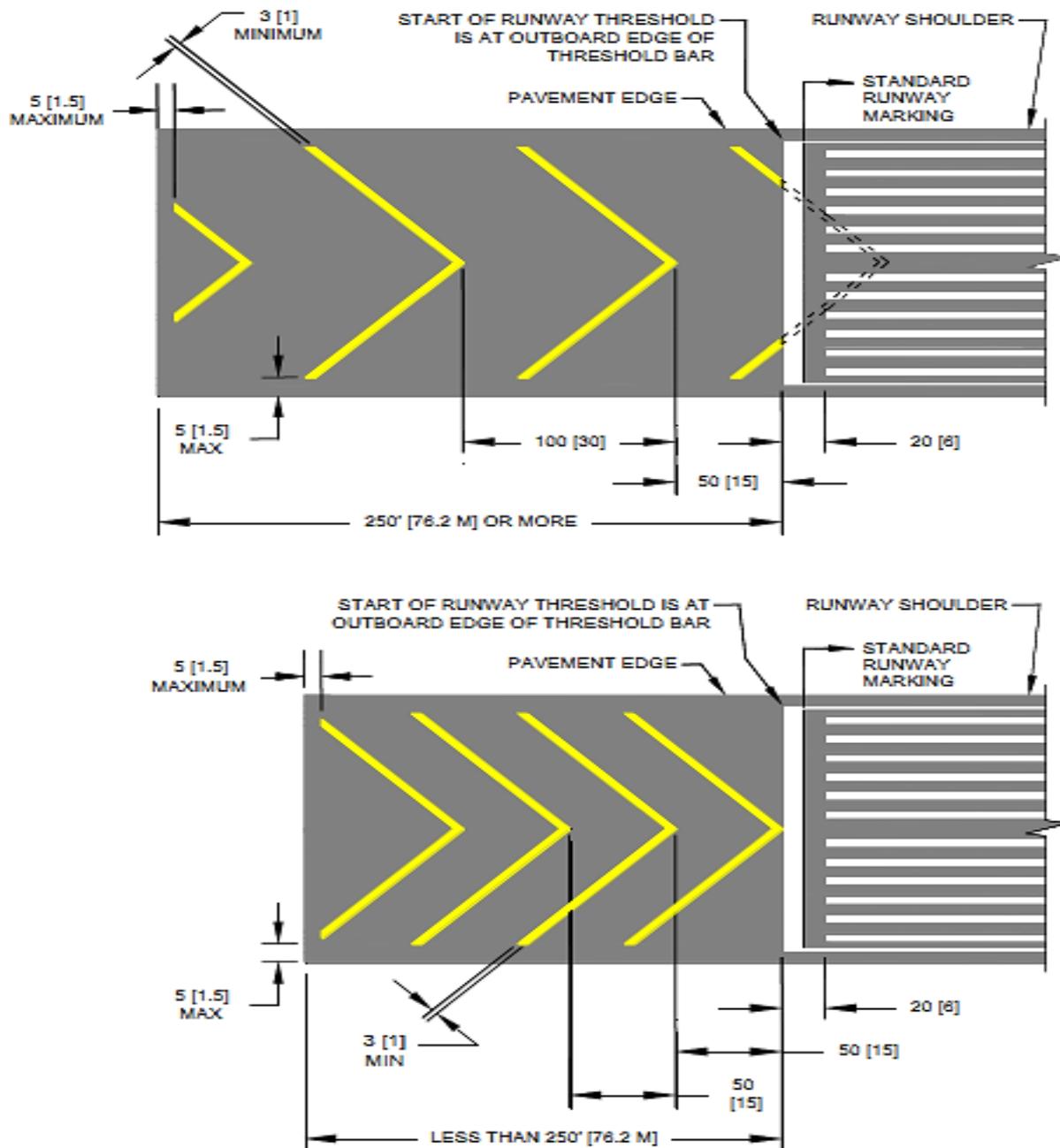
1. DIMENSIONS ARE IN: FEET [METERS]
2. RUNWAY SIDE STRIPES, WHEN USED ON THE RUNWAY, EXTEND INTO THE DISPLACED AREA.
3. RUNWAY MARKINGS (EXCEPT HOLDING POSITION MARKINGS) INCLUDING THOSE IN THE DISPLACED THRESHOLD ARE WHITE.

| RUNWAY WIDTH | NUMBER OF ARROWHEADS | SPACING BETWEEN ARROWHEADS (W = RUNWAY WIDTH) | SPACING TO RUNWAY EDGE |
|--------------|----------------------|---|------------------------|
| ≥ 100 [30] | 4 | W/4 | W/8 |
| < 100 [30] | 3 | W/3 | W/6 |
| < 60 [18] | 2 | W/2 | W/4 |

Taxiway Aligned With a Runway



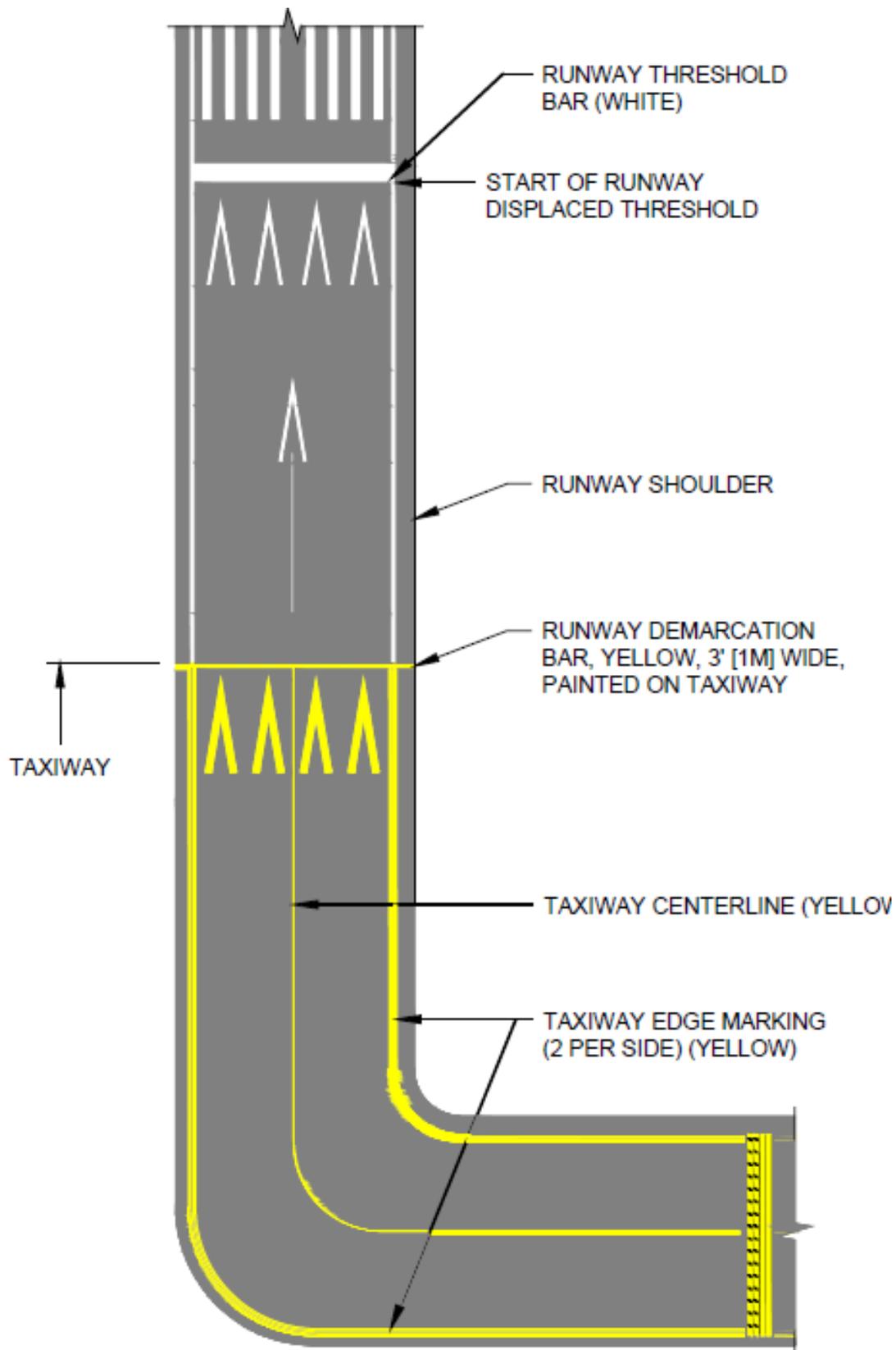
Blast Pad Markings



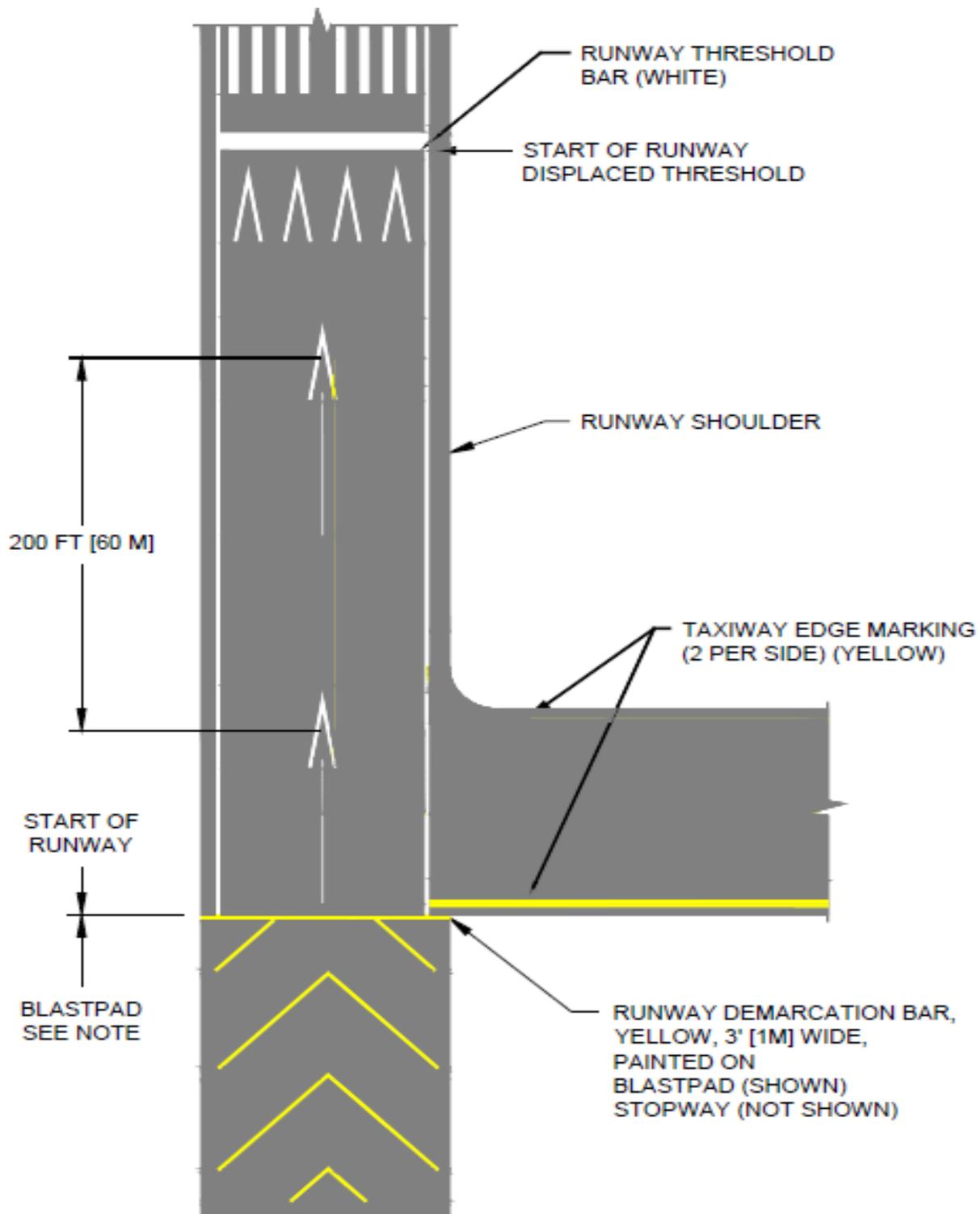
Notes:

- Dimensions are expressed in feet (meters).
- The width of the stopways and blast pads are not the same. Stopways equal runway width. Blast pads equal runway width plus runway shoulders.
- 50 ft. (15m) spacing may be used when length of area is less than 250 ft. (7.5m) in which case the first full chevron starts at the index point (intersection of runway centerline and runway threshold).
- Chevrons are painted yellow and at an angle of 45 degrees to the runway centerline.
- Chevron spacing may be doubled if length of area exceeds 1000 ft. (300m)

Aligned Taxiway Preceding a Displaced Threshold

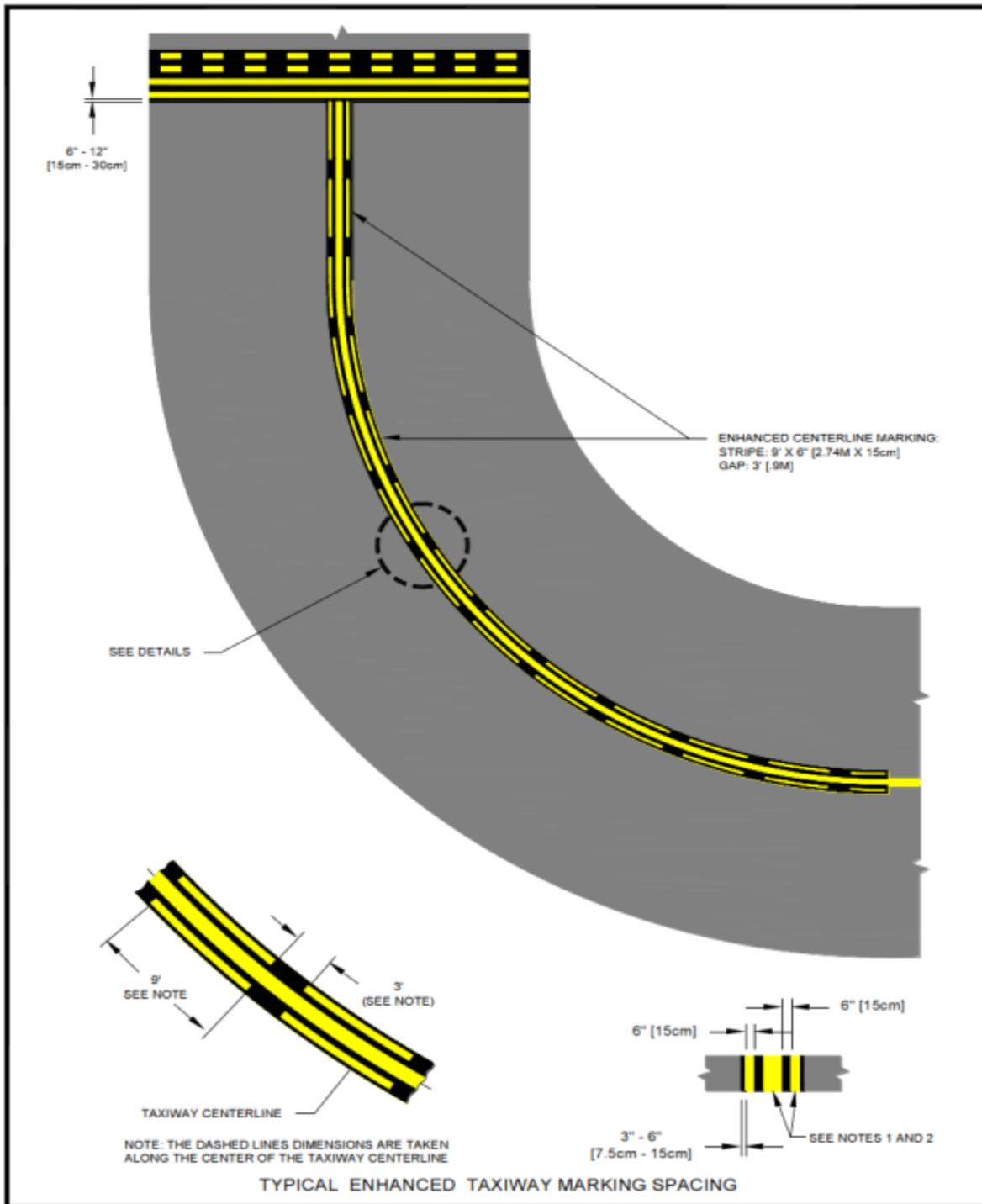


Blast Pad Preceding a Displaced Threshold



Note: Demarcation bars are 3 feet wide and NOT part of the useable pavement. Stopway width equals runway width. Blast pad width equals runway width plus runway shoulders.

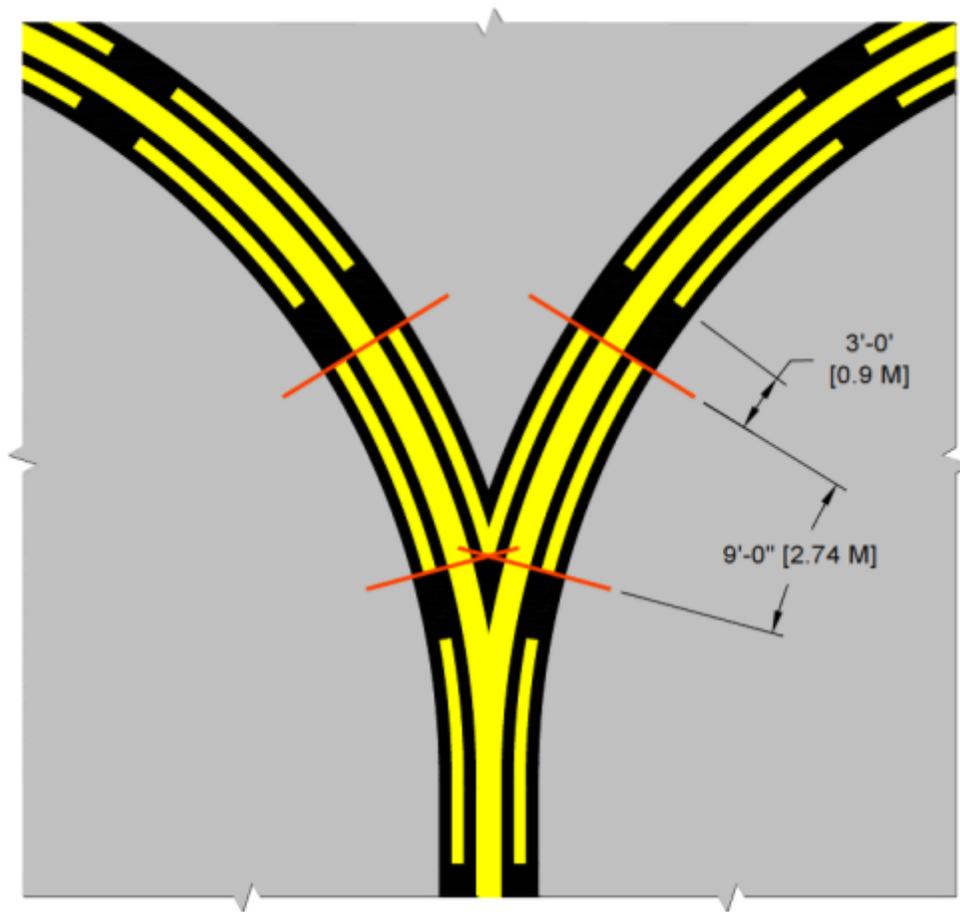
Enhanced Taxiway Centerline Marking



Notes:

- Dashed lines for the enhanced taxiway centerline marking are 6 inches in width and separated by 6 inches from the taxiway centerline. This applies to both 6 inch and 12-inch taxiway centerline markings
- The taxiway centerline markings may be shifted left or right to avoid interference with the taxiway centerline lights.

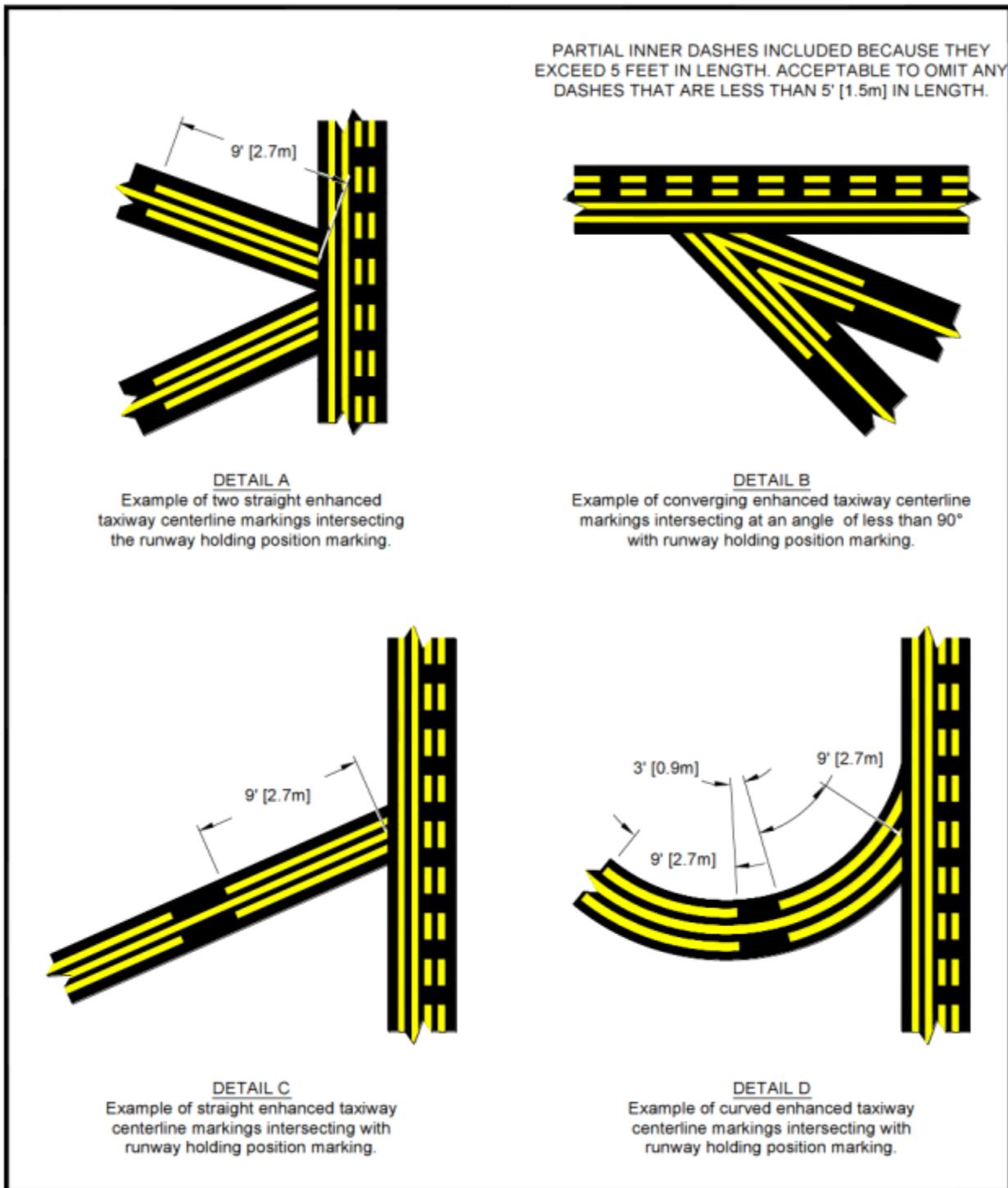
Dashed Lines at Converging Taxiway Centerlines



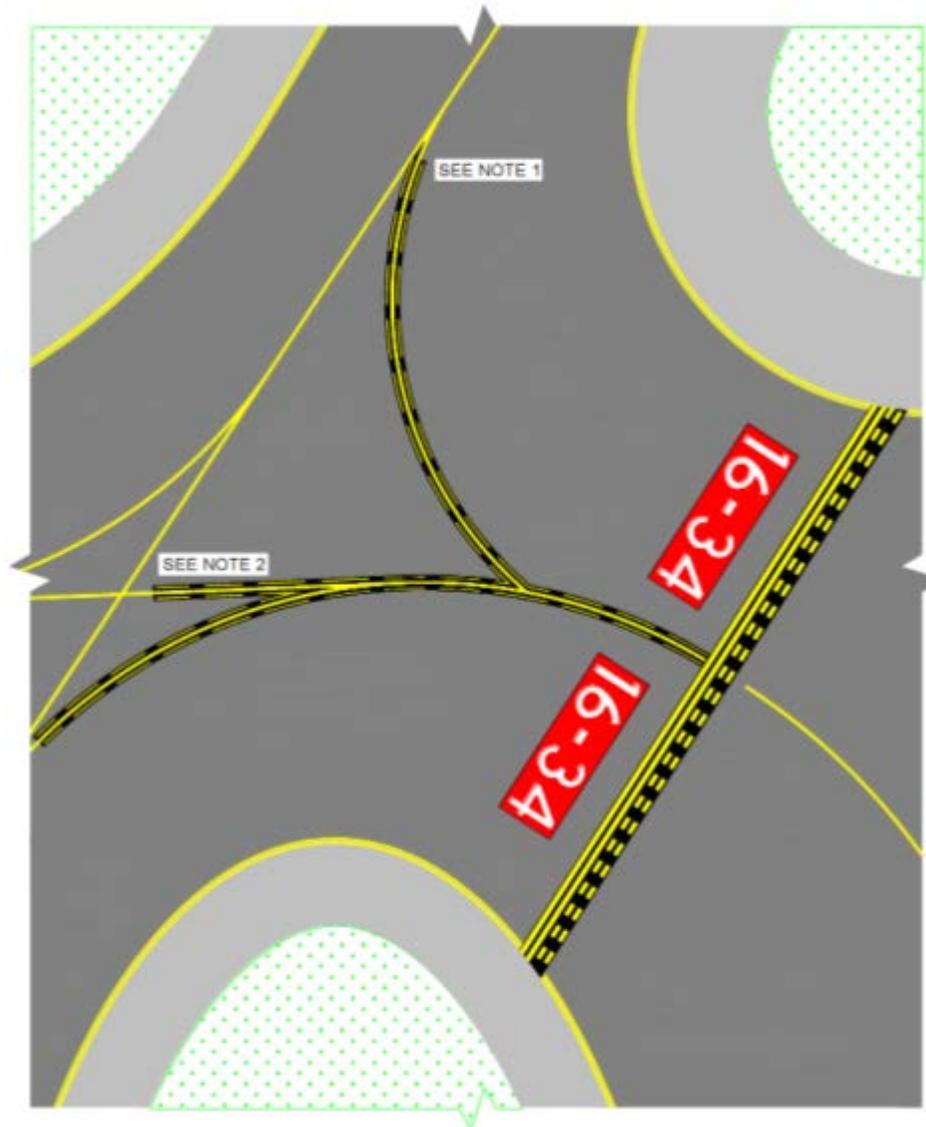
Notes:

- As shown in this case, the V-shaped inner dashes start and stop with the outside 9-foot (3 m) dashes. However, this may not always be the case for the inner dashes. If the V-shaped are less than 5 feet (1.5 m), they may be omitted.
- Measurements are taken along the center of the centerline stripe.

Enhanced Taxiway Centerlines Intersecting with Holding Position Marking

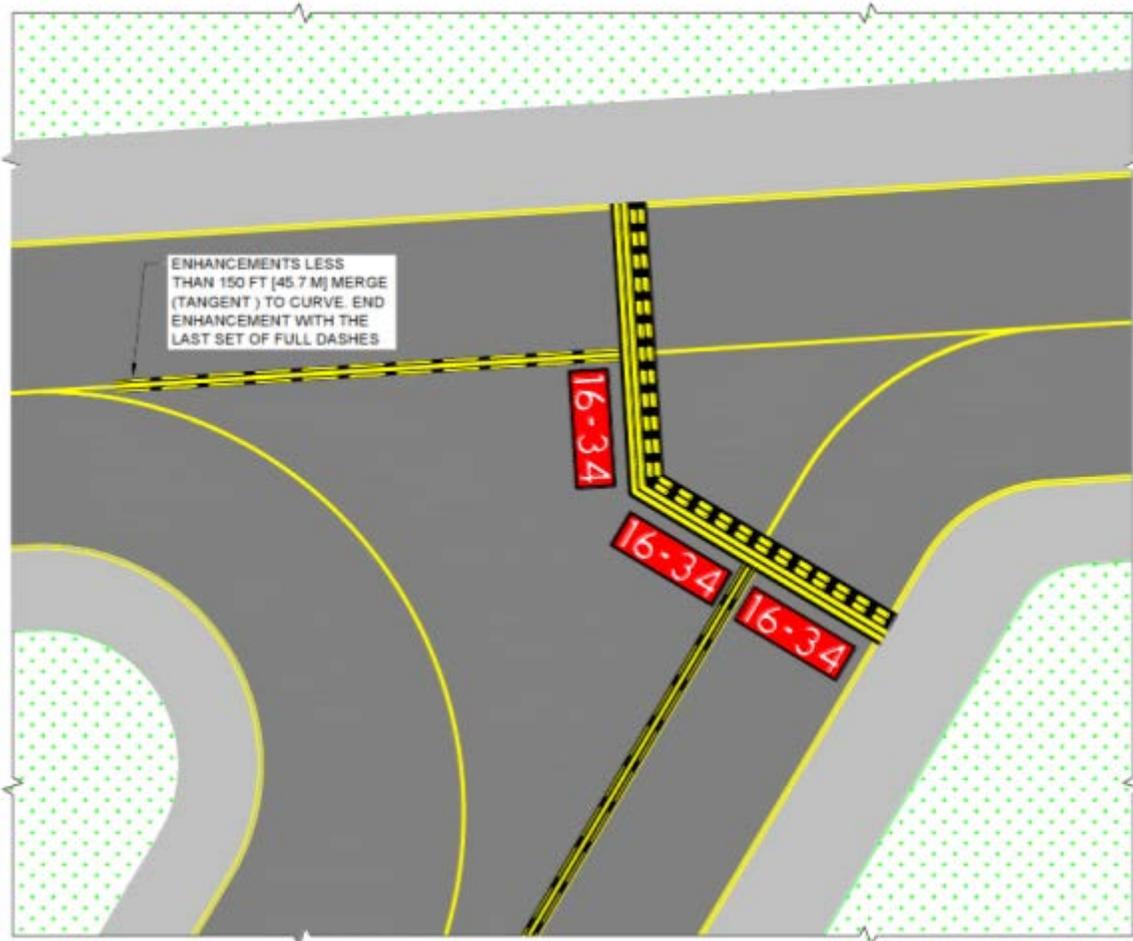


Note: All measurements are taken along the center of the centerline.



Notes:

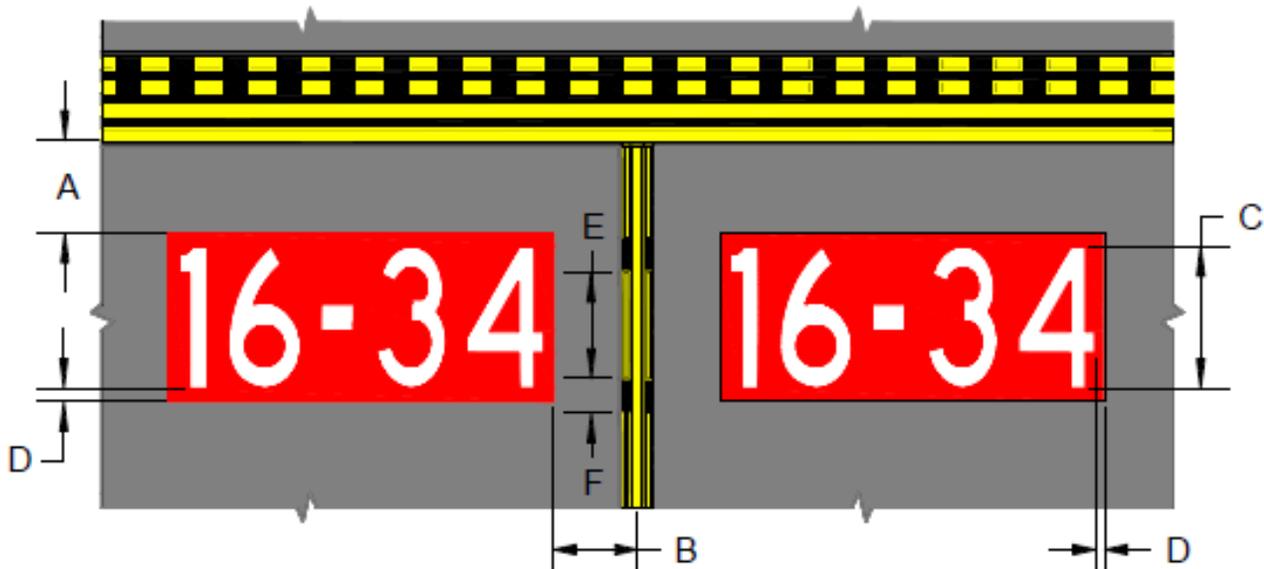
1. Enhancement is tangent to merging curve.
2. Enhancement terminates 5 feet (1.5 m) from intersection.



Notes:

- Enhancements less than 150 ft. (45.7 m) merge (tangent) to the curve
- End enhancement with the last set of full dashes

Surface Painted Holding Position Signs for Taxiway Widths Greater Than Thirty Five Feet



Notes: Dimensions are expressed in feet.

A = 2-4 feet

B = 3-10 feet

C = 9-12 feet

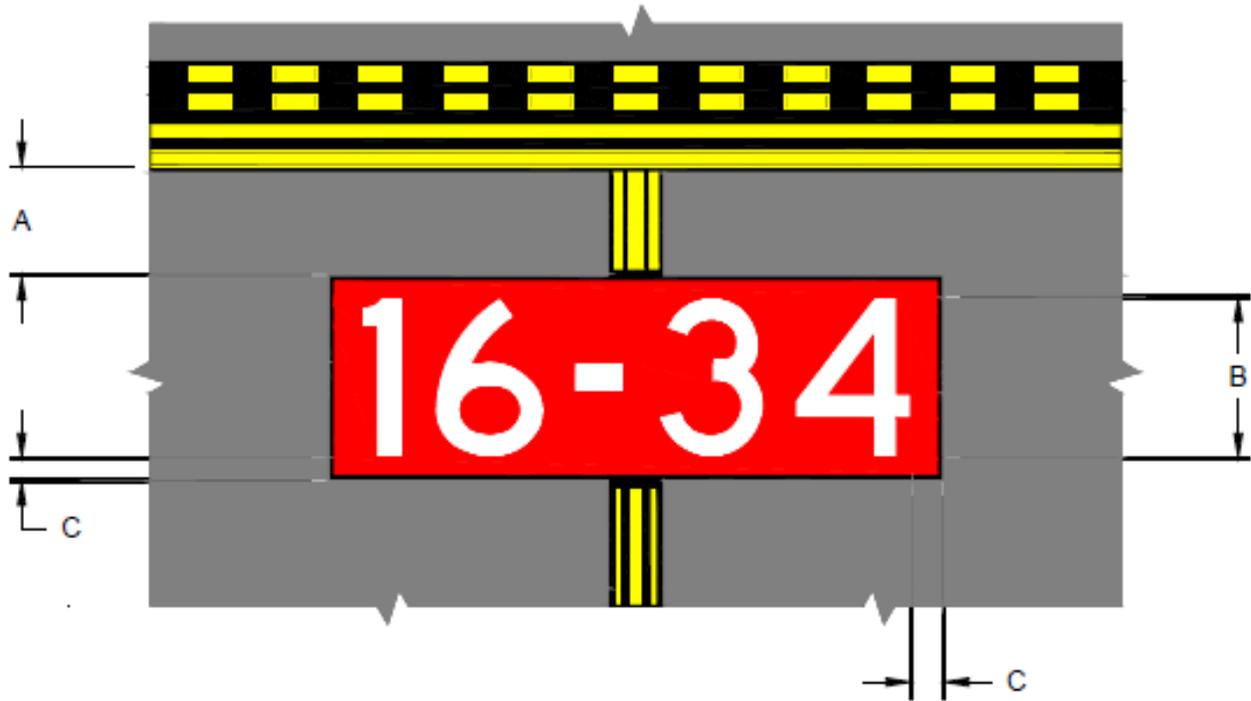
Inscriptions must have a height of 12 feet; however, the height may be reduced as necessary, to the minimum height of 9 feet. In special situations, the surface painted marking may be reduced to less than 9 feet in order to fit the marking appropriately. Examples of special situations include taxiways with widths narrower than 75 feet or taxiways that need to display multiple runway designations with arrows. In all cases, inscriptions follow the Advisory Circular, Appendix A, inscription criteria. All other taxiway entrances to the same runway not needing the reduction are to maintain the 12 foot height dimension. For practicality, the lowest height reduction is 6 feet. In all cases the dimension D is not reduced.

D = 15 inches

E = 9 feet

F = 3 feet

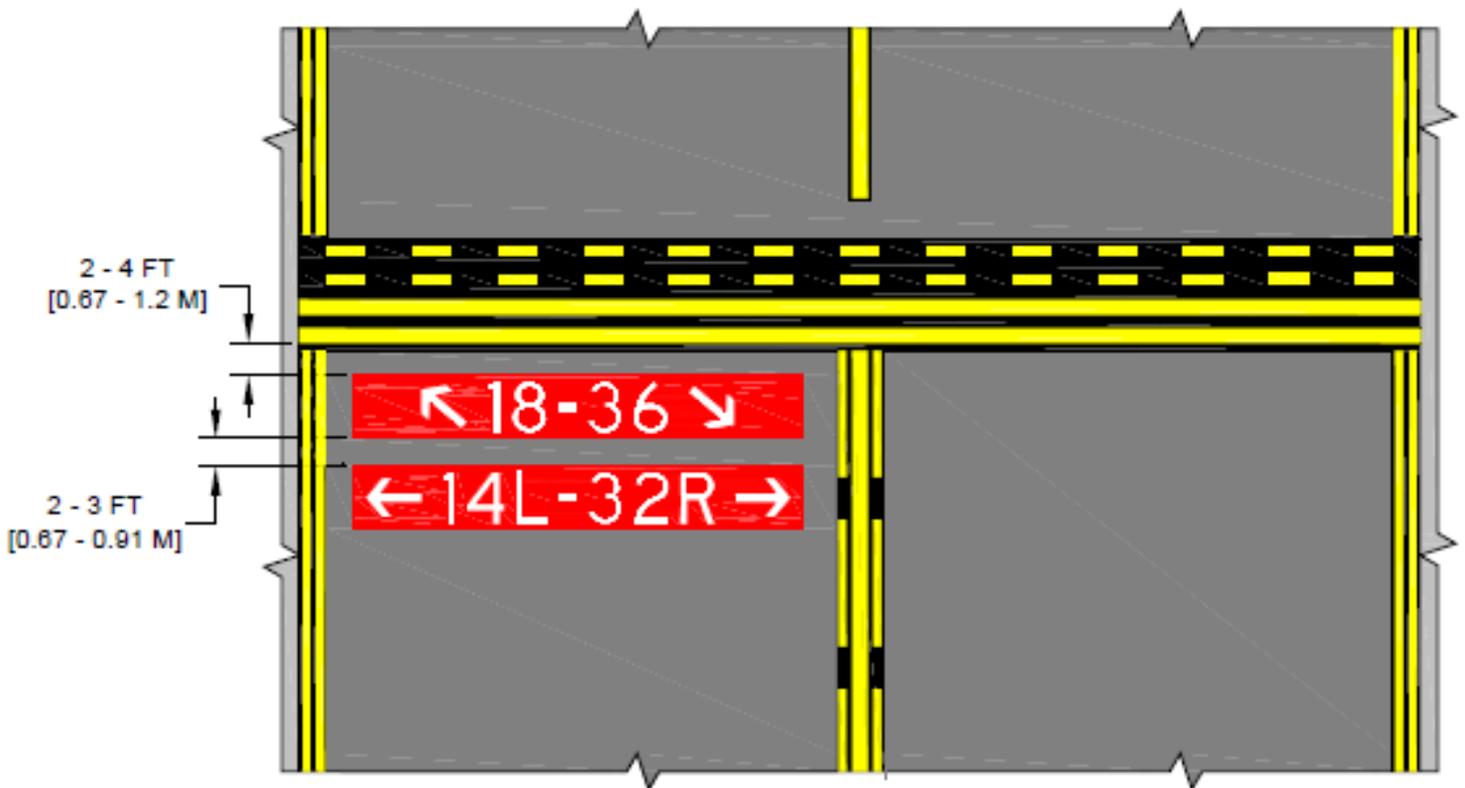
Surface Painted Holding Position Sign for Taxiway Widths Equal to or Less Than 35 Feet.



| Dimension Letter | Dimension Feet | Notes |
|------------------|----------------|--|
| A | 2-3 | (none) |
| B | 6 | <p>Inscriptions follow the Advisory Circular, Appendix A, inscription criteria. The size of the sign inscription is scaled to fit taxiways 35 feet or less in width for Airplane Design Group I and II. Reference AC 150/5300-13.</p> <p>In special situations the surface marking may be reduced to less than 6 feet in order to fit the marking appropriately. Examples of special situations include taxiways that need to display multiple runway designations with arrows. In all cases, the inscriptions follow the Advisory Circular, Appendix A, inscription criteria. All other taxiway entrances to the same runway not needing the reduction are to maintain the 6 foot height dimension.</p> <p>For practicality, the lowest height reduction is 3 feet.</p> |
| C | 7.5 inches | (none) |

Note: The dimensions for the enhanced taxiway centerline are in Figure D-1 of the Advisory Circular. The spacing between the enhanced taxiway centerline and the surface painted holding position sign is 6-12 inches.

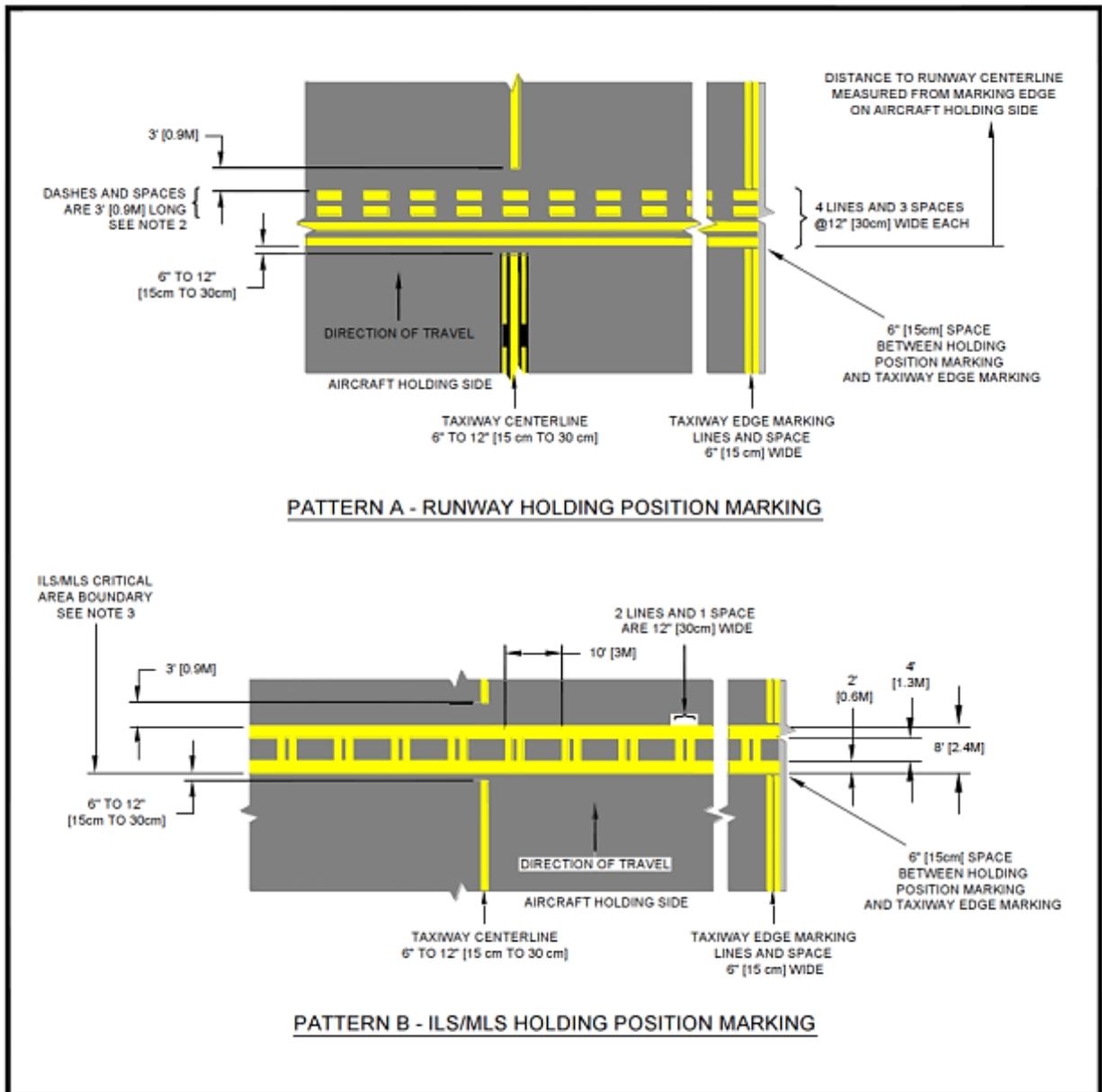
Narrow Taxiway Stacked Surface Painted Holding Position Signs



Notes:

1. Stacked surface painted holding position signs for narrow taxiways - Only to be used per AC 150/5340-1, Paragraph 4.5(d)(1)(ii).
2. The **recommended** order of appearance is as follows:
 - (A) If the "stacked" surface painted holding position signs are for a taxiway that clearly accesses one runway (for example, Runway 14L-32R) before another runway (Runway 18-36), then the order of appearance is from "bottom up" as shown above.
 - (B) If the "stacked" surface painted holding position signs are for a taxiway that equally offers access to two or more runways, then follow a "clockwise" order of appearance as viewed for the holding position. Hence, the bottom surface painted holding position sign is the first runway as viewed from the holding position. This practice follows the signage convention.

Runway Holding Position Marking Details



Chapter 2 – Airfield Lighting

Legend and General Notes

Reference: AC 150/5340-30H

The image below shows the lighting color symbols used in images in the rest of this chapter.

| | |
|---|---|
|  | Runway Threshold / End Lights Green (G) / Red (R) |
|  | Runway Edge Lights (See note 3) Yellow (Y) / White (W) |
|  | Runway Edge Light White (W) |
|  | Runway Edge Light (In-pavement) White (W) |
|  | Runway Threshold / End Light Red (R) |
|  | Taxiway Edge Light Blue (B) |
|  | Runway Edge Light at Displaced Threshold Yellow (Y) / Red (R) |
|  | Threshold / Runway Edge Lights at Displaced Threshold Green (G) / Yellow (Y) |
|  | Runway Threshold Light with a Uni-Directional Green (G UNI) |

Notes:

- AC 150/5345-46 specifies the light fixtures for the lights identified in the color code chart above
- Black in the image above indicates white lights
- Install yellow runway edge lights on the last 2,000 ft. (609.9 m) or one-half of an instrument runway, whichever is less
- Pavement markings shown on the drawing in AC 150/5340-30G are *for reference only*. AC 150/5340-1 describes the detailed marking specifications.

Runway Edge Light Spacing

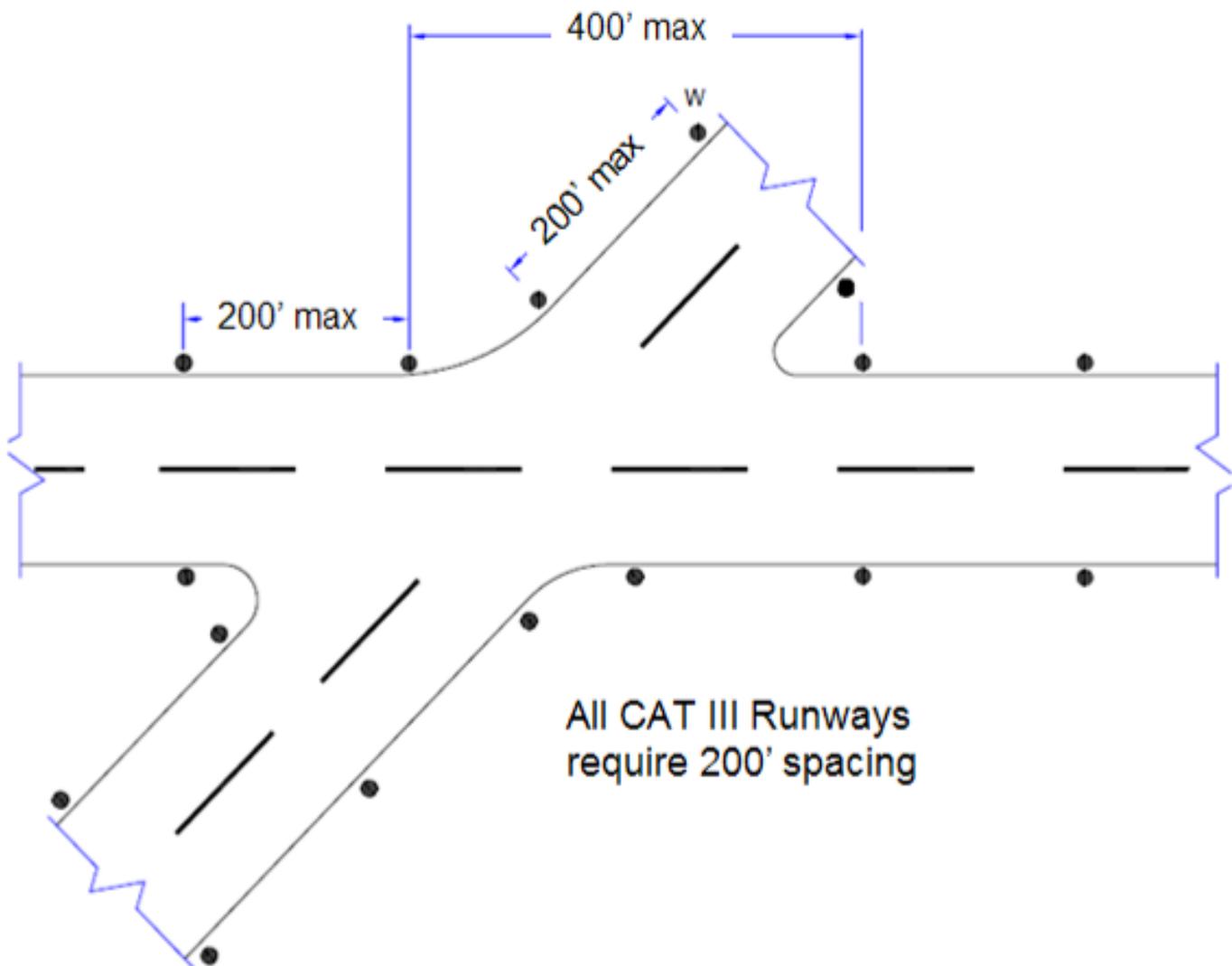
2' minimum – 10' maximum from the runway edge (full strength pavement).

Longitudinal Spacing: 200' maximum

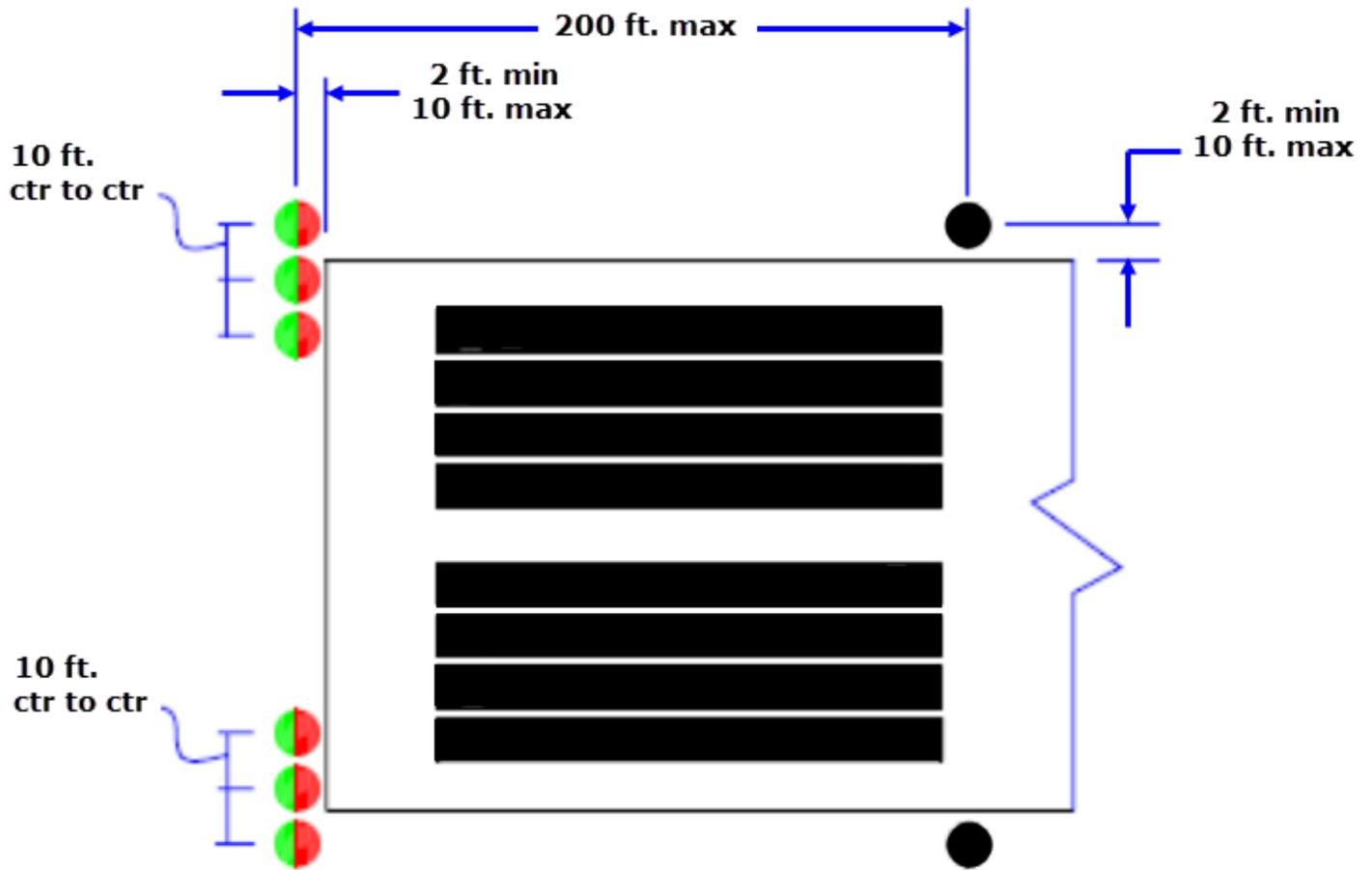
At taxiway and runway intersections:

Up to a 400' gap is allowed (except CAT III operations w/ HIRL)

CAT III operations require uniform spacing from threshold to threshold, not to exceed 200'. Install in-pavement lights at intersections, as needed.



Visual Runway End/Threshold Lights

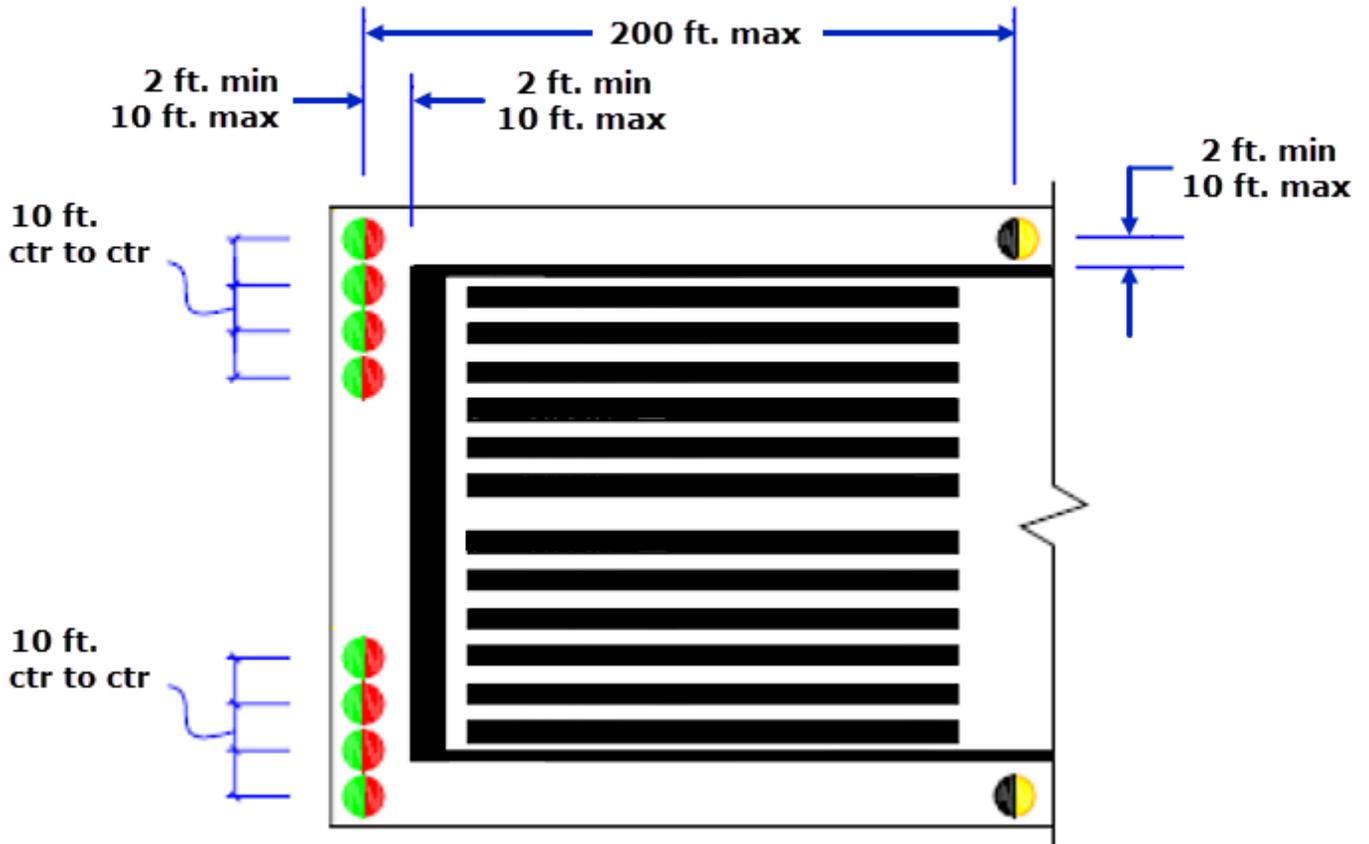


Legend:

ctr = center

NOTE: Install **six** threshold lights on visual runways.

Runway End/Threshold Lights installed with HIRLs

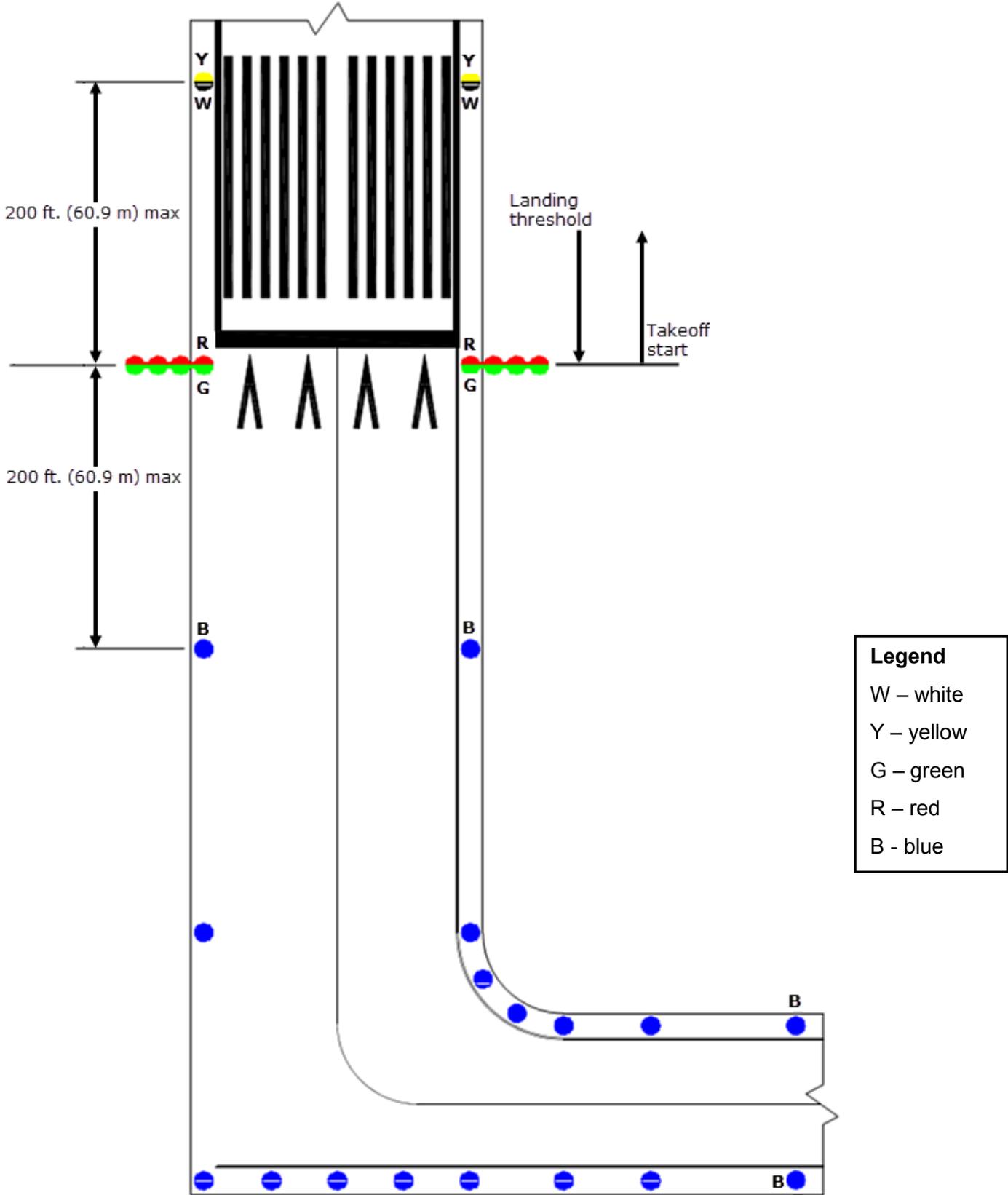


Legend:

ctr = Center

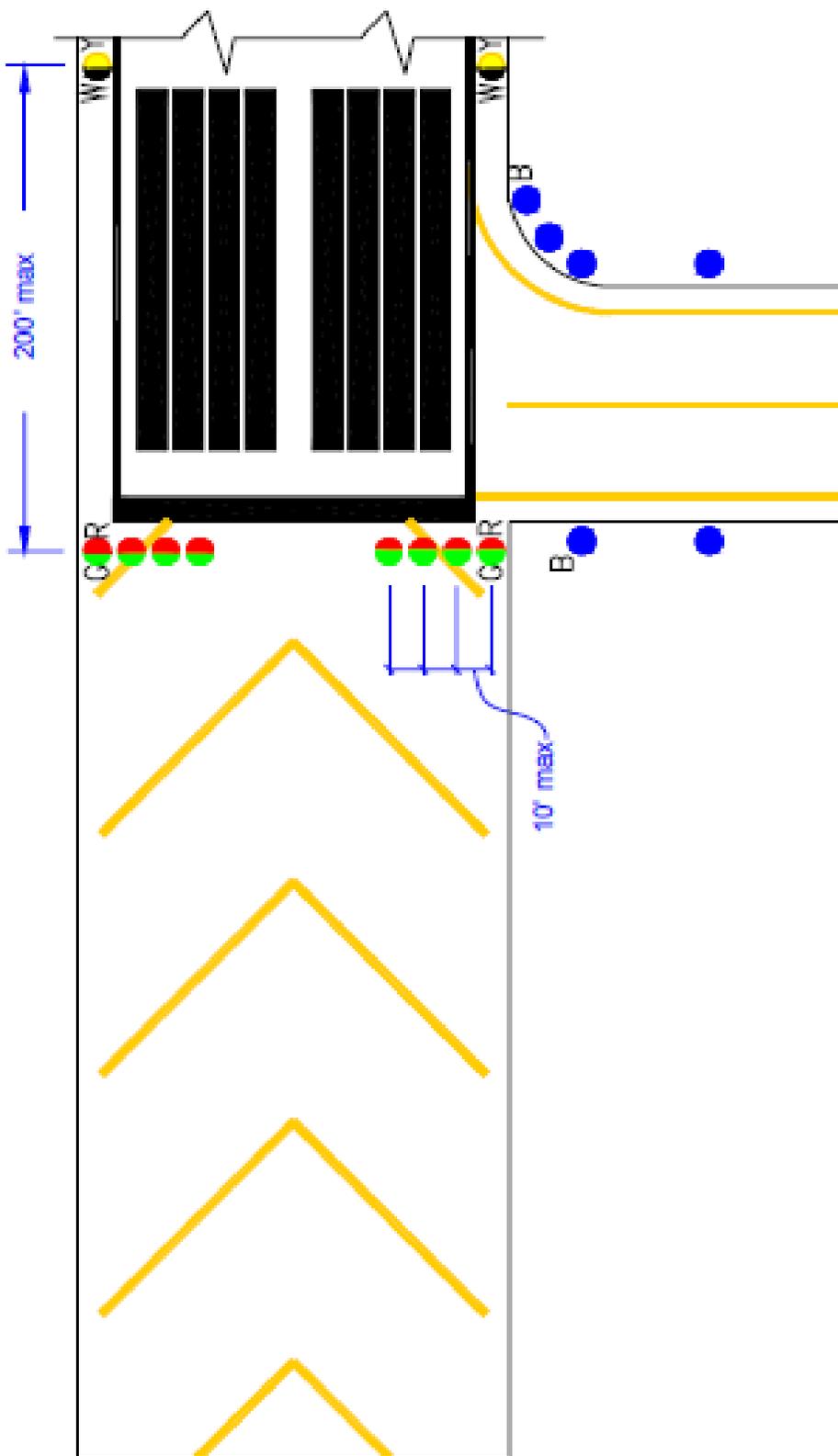
NOTE: Install **eight** threshold lights on instrument runways.

Runway with a Taxiway at the End



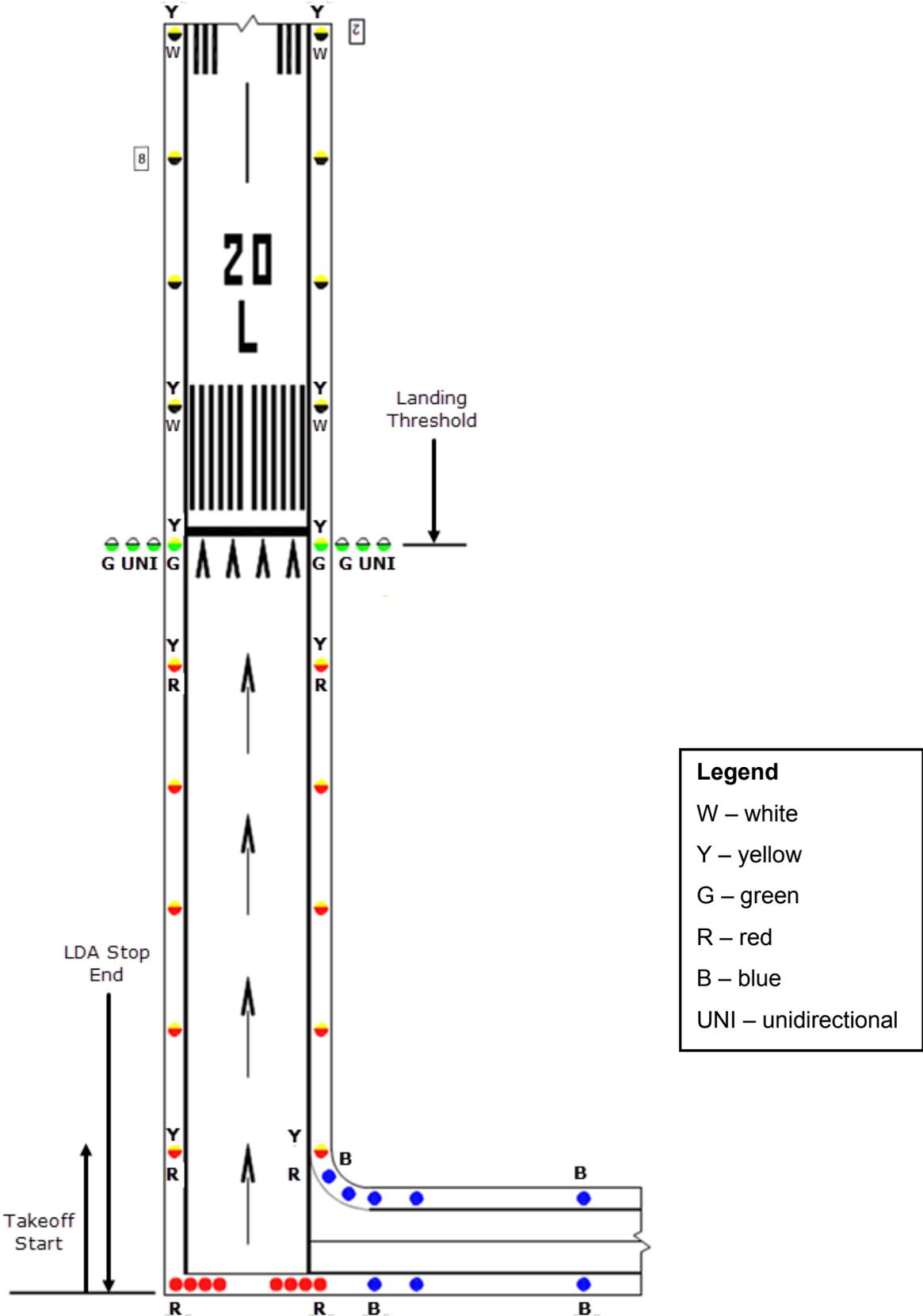
| Legend | |
|--------|--------|
| W | white |
| Y | yellow |
| G | green |
| R | red |
| B | blue |

Runway with a Blast Pad



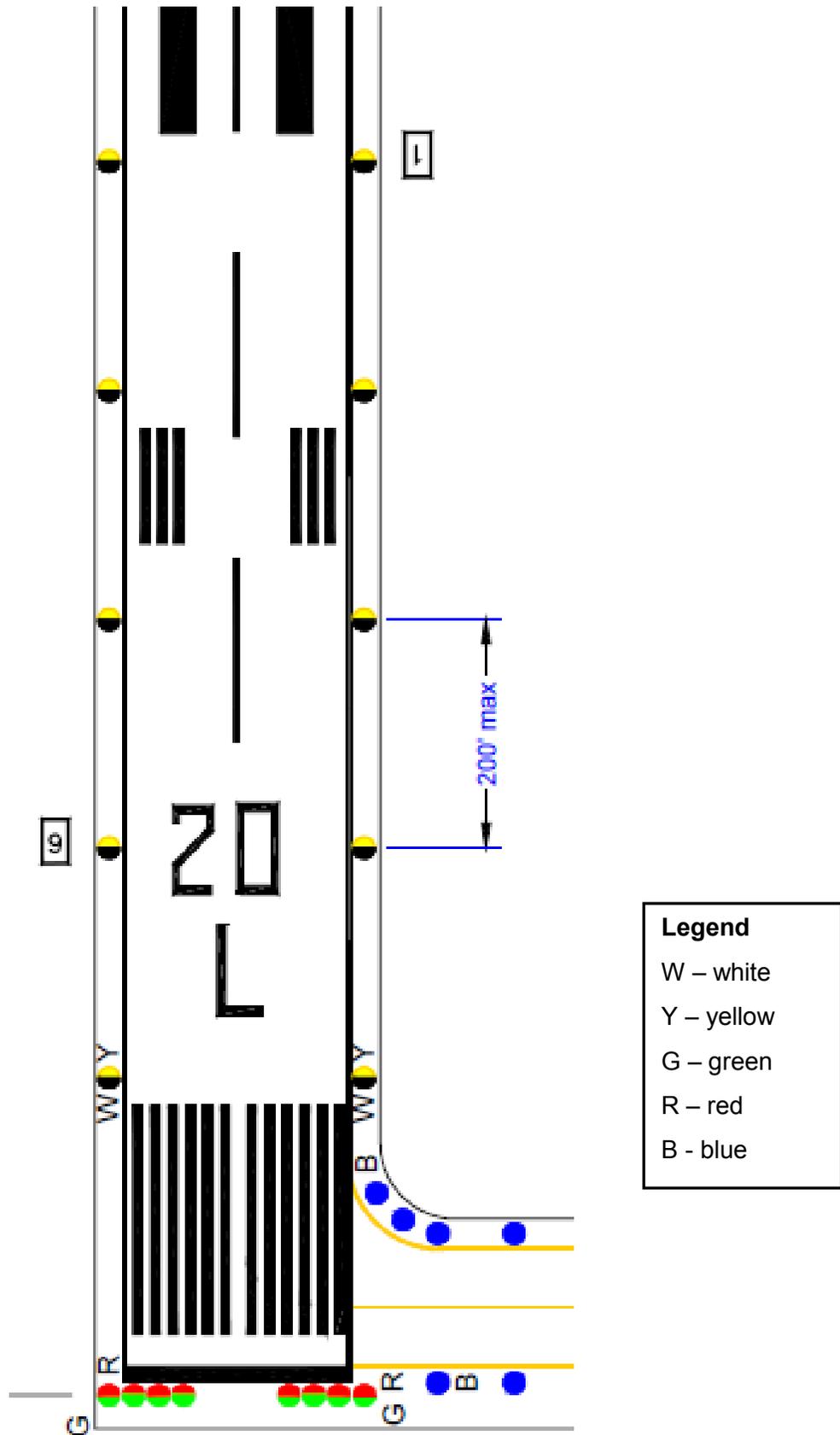
| Legend | |
|--------|--------|
| W | white |
| Y | yellow |
| G | green |
| R | red |
| B | blue |

Runway with a Displaced Threshold

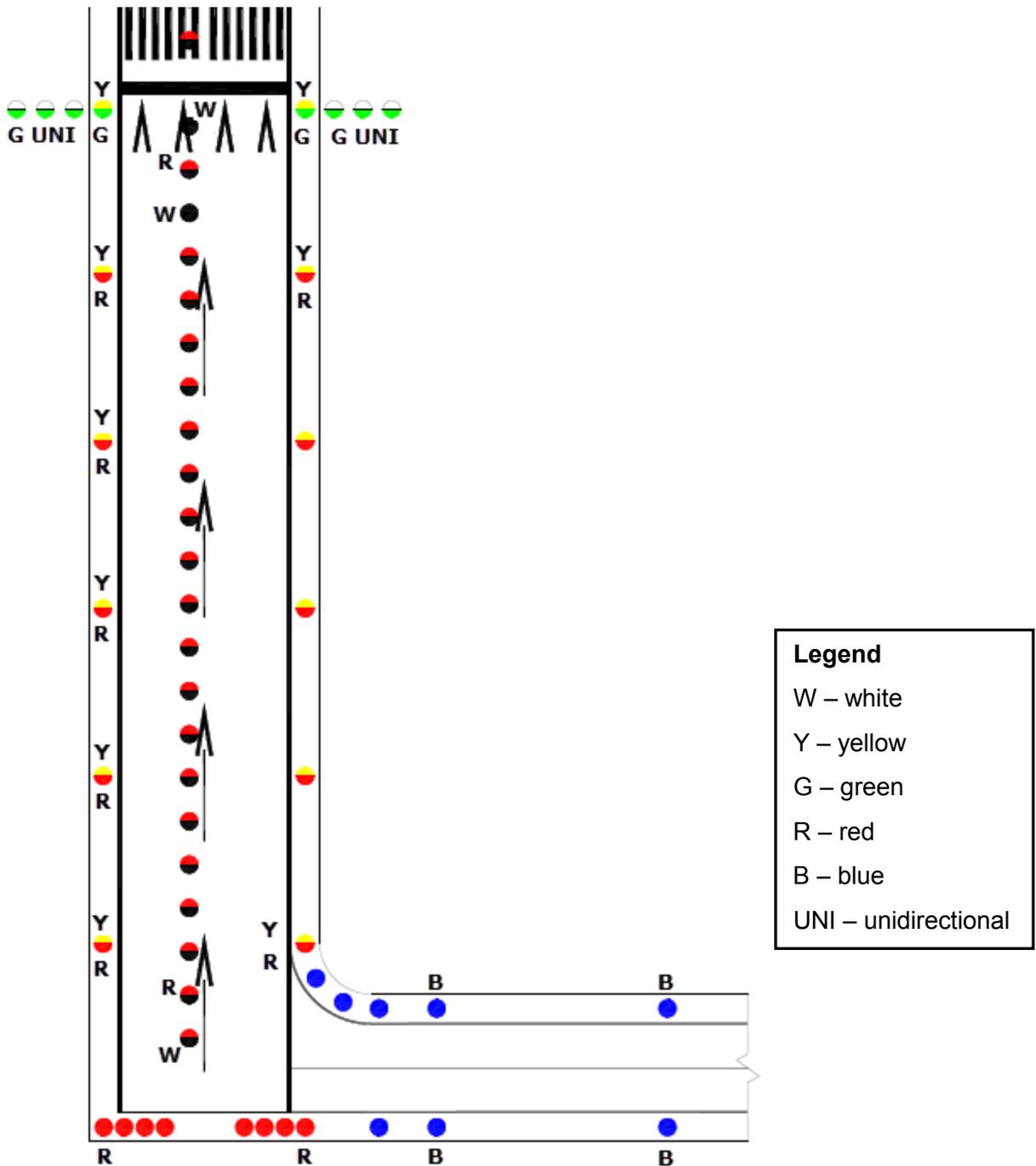


| Legend | |
|--------|----------------|
| W | white |
| Y | yellow |
| G | green |
| R | red |
| B | blue |
| UNI | unidirectional |

Normal Runway with a Taxiway

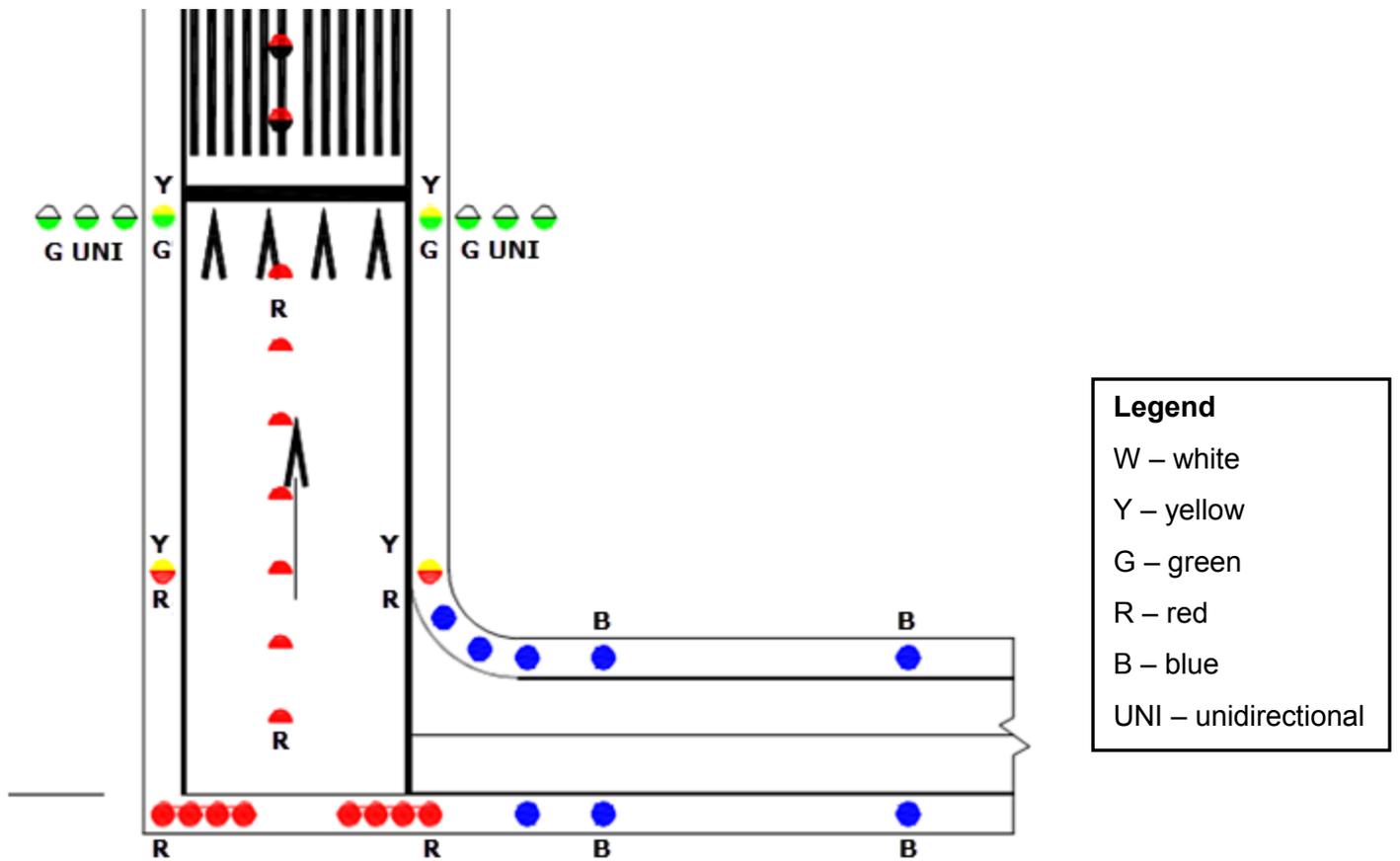


Runway Centerline Lights with a Displaced Threshold Greater than 700'



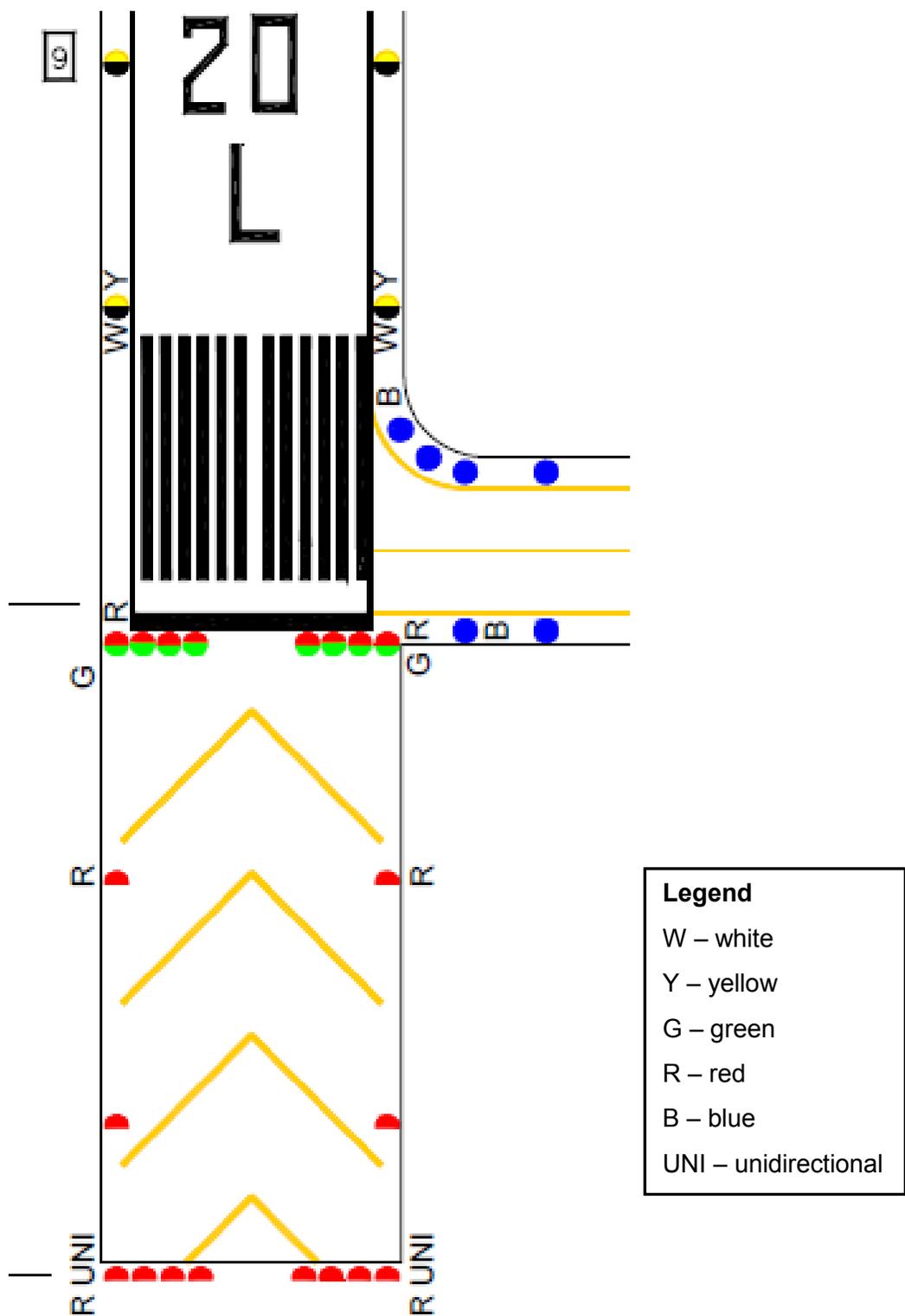
Note: The centerline lights in the displaced area should be circuited separately from the non-displaced area to permit turning-off during landing operations (not required if approach lights are high intensity).

Runway Centerline Lights with a Displaced Threshold Less than 700'



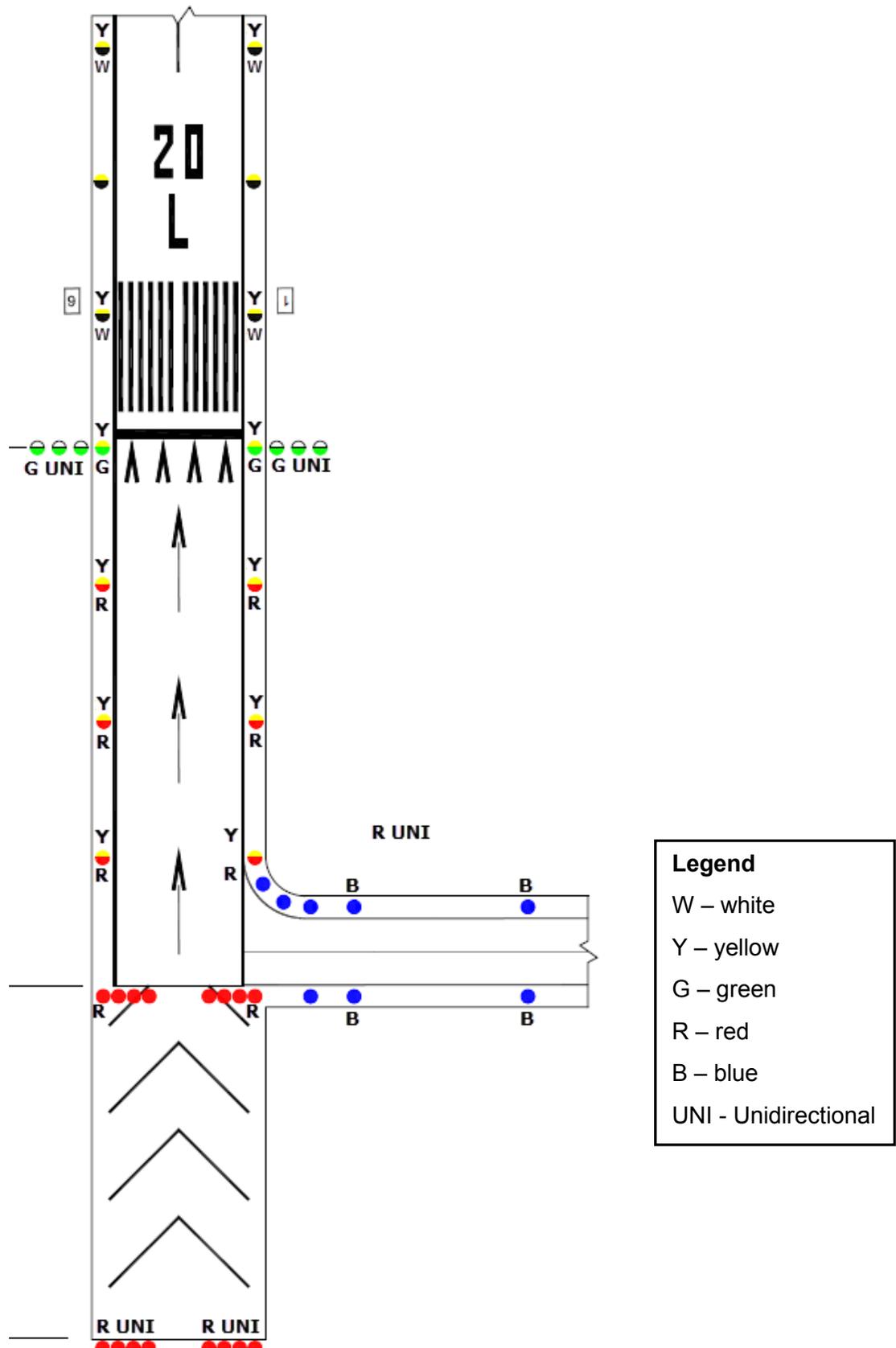
Note: The centerline lights in the displaced threshold are blanked out in the approach direction.

Runway with a Stopway

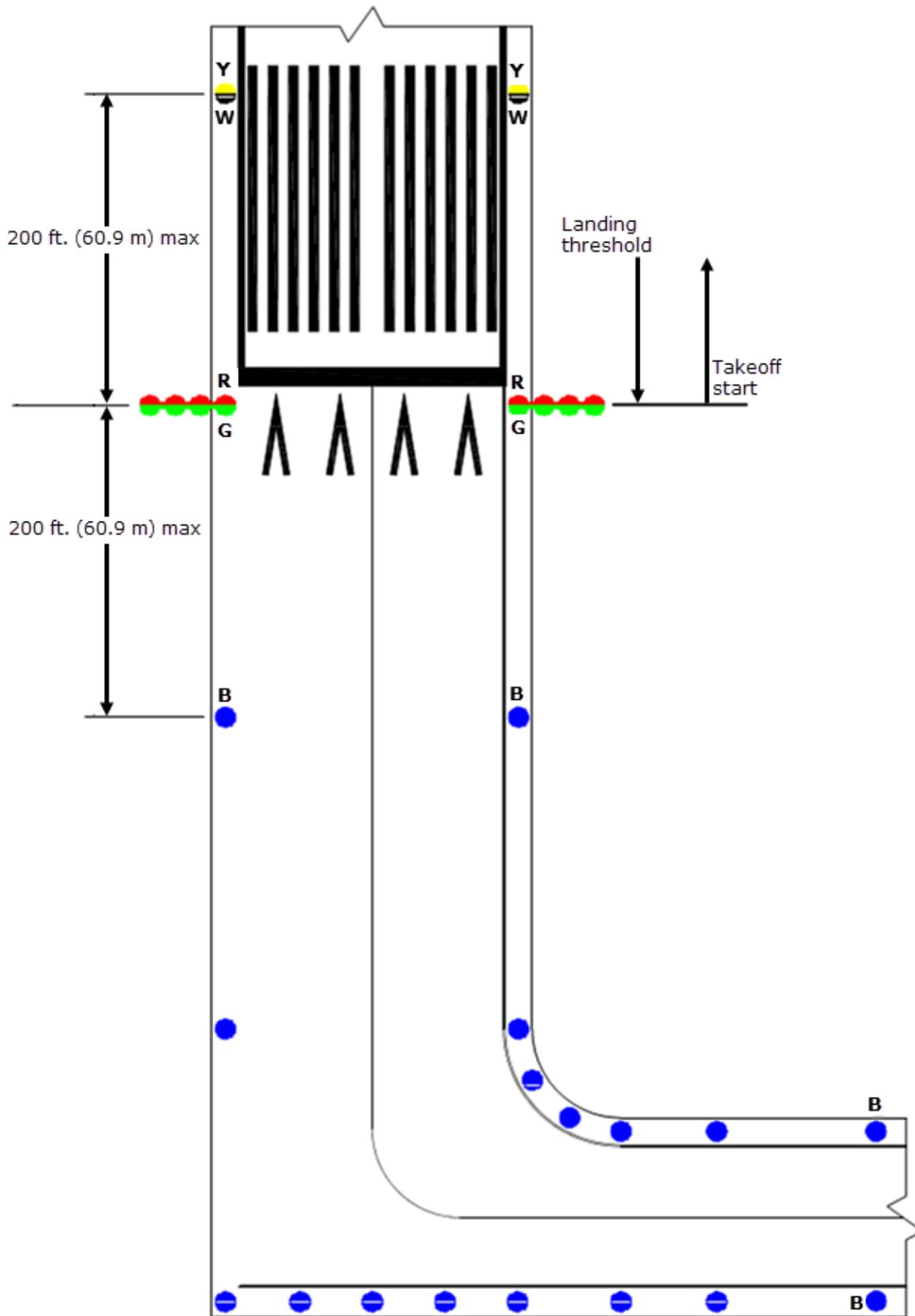


Note: Stopways look like blast pads but are considered full-strength pavement and are suitable to support aircraft during an aborted take-off.

Runway with a Displaced Threshold and Stopway

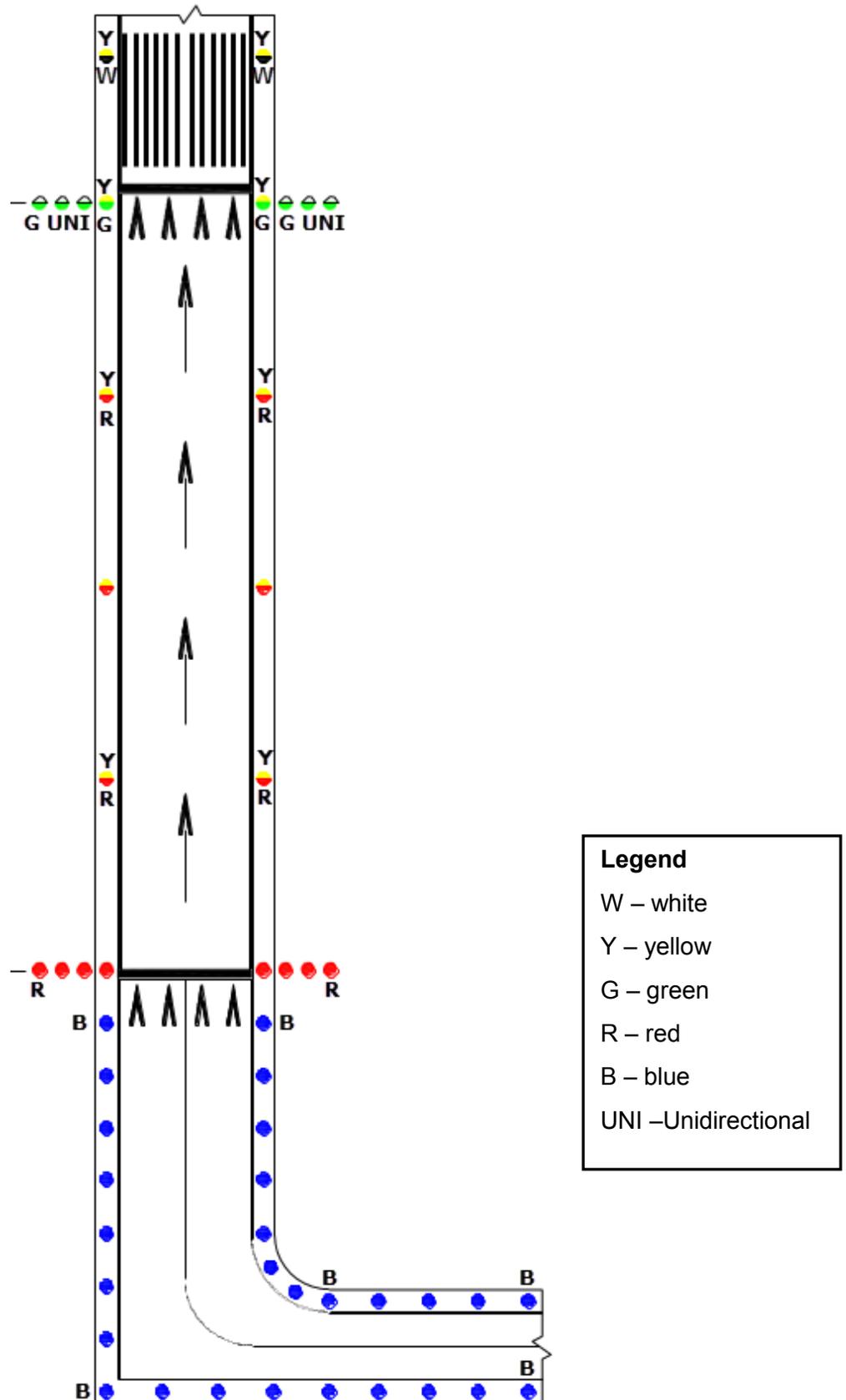


Runway with End Taxiway

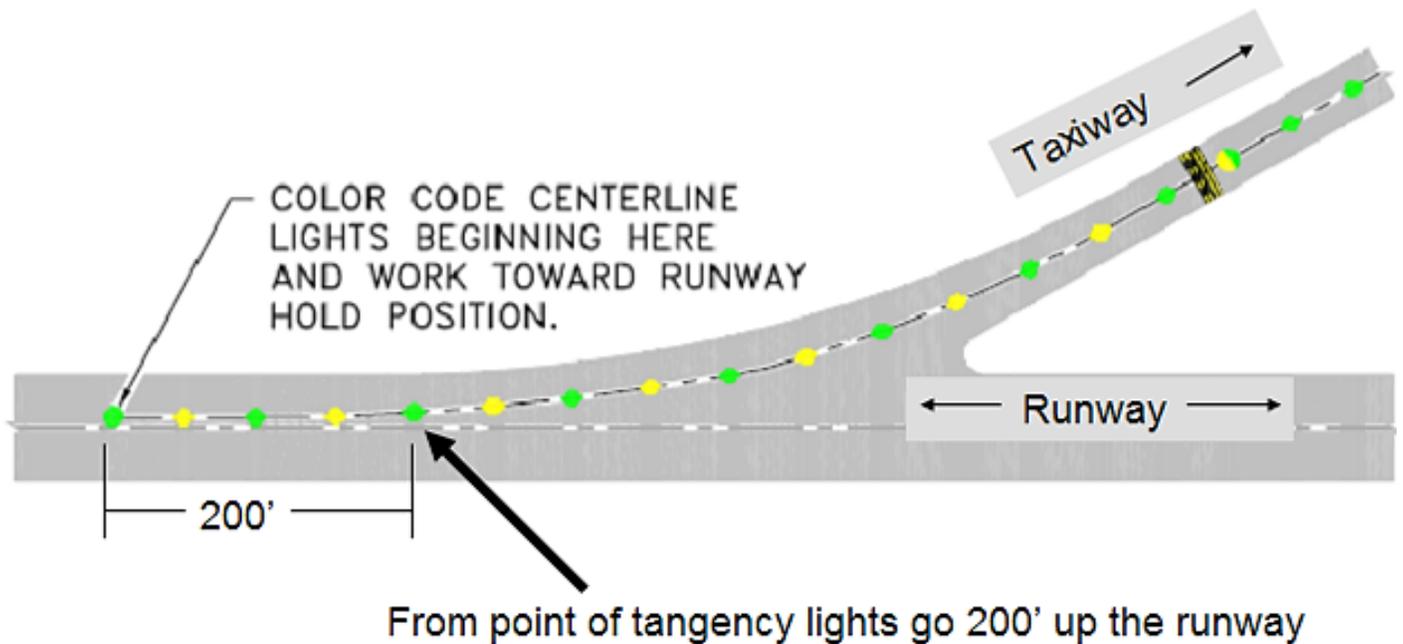


| Legend | |
|--------|--------|
| W | white |
| Y | yellow |
| G | green |
| R | red |
| B | blue |

Runway with a Displaced Threshold and End Taxiway



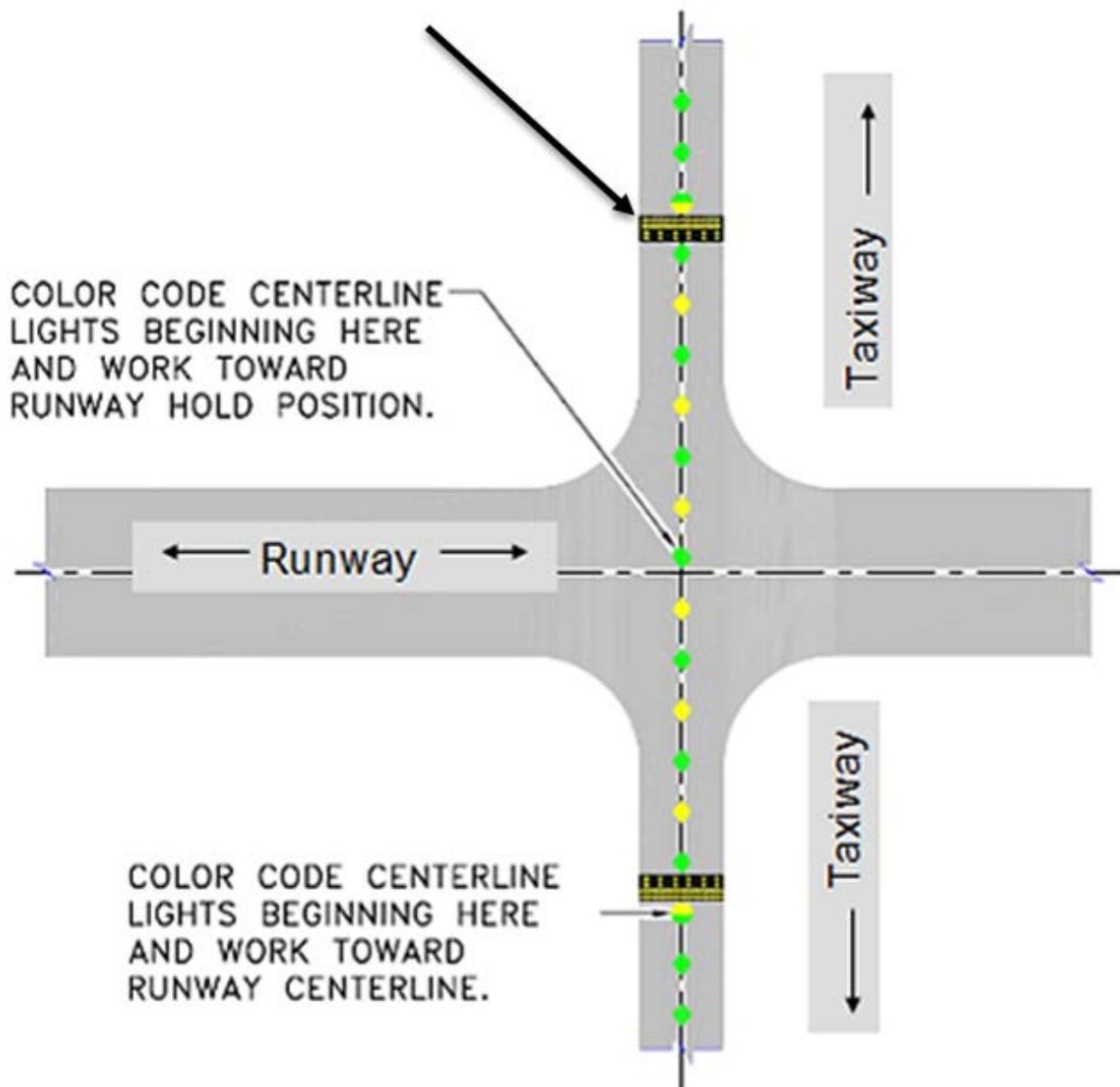
Exit Taxiway Lead-off Lights



Notes:

- If there is an ILS critical area present beyond the runway holding position, the color-coded lights continue to the ILS critical area holding position.
- The fixture used prior to the runway hold or ILS/MLS critical area position must always be bidirectional: green when approached from the taxi direction and yellow when approached from the runway direction.
- If the layout of the lights results in an odd number of color-coded lights, the first two taxiway centerline lights on the runway should be green.

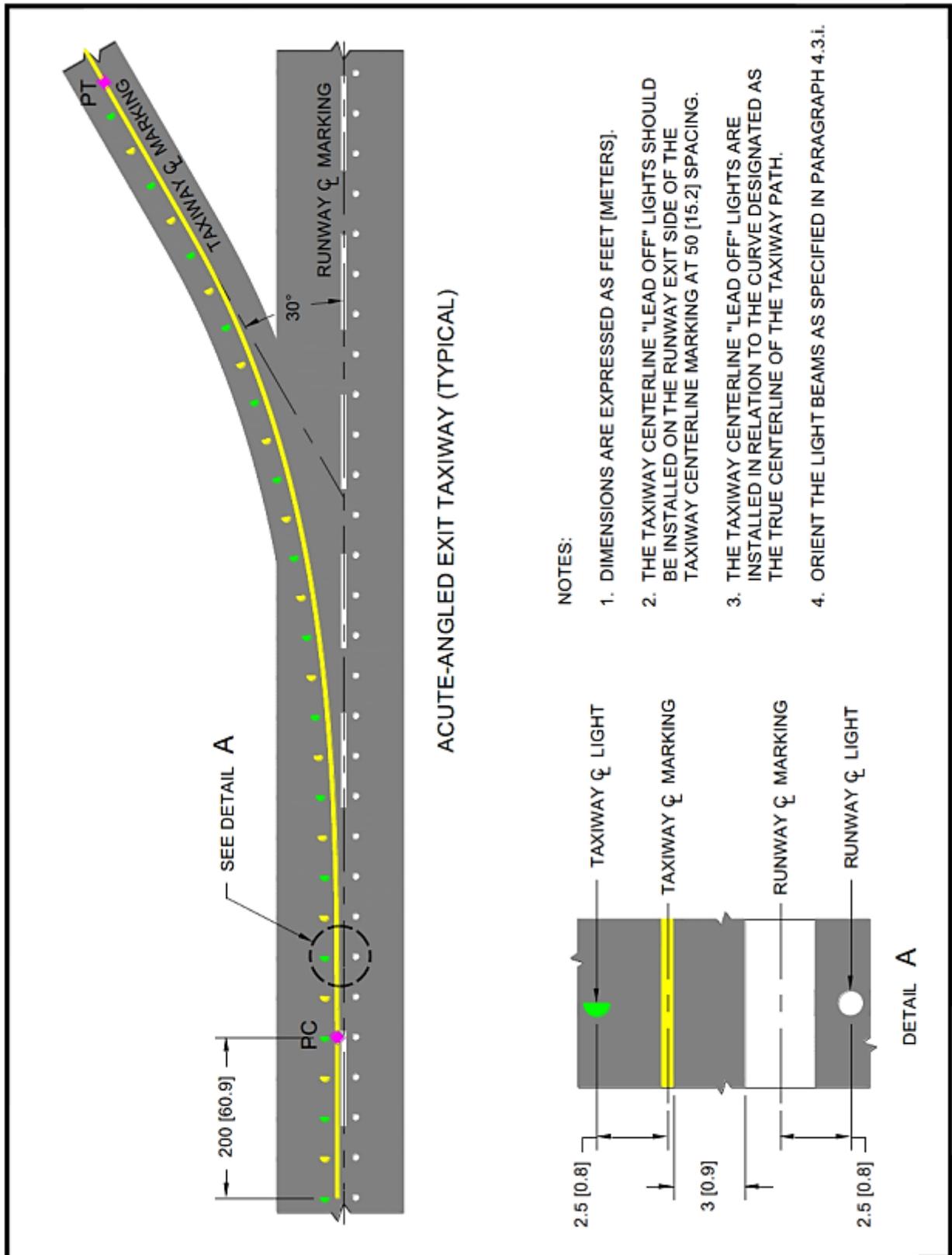
Taxiway Centerline Lights Crossing a Runway



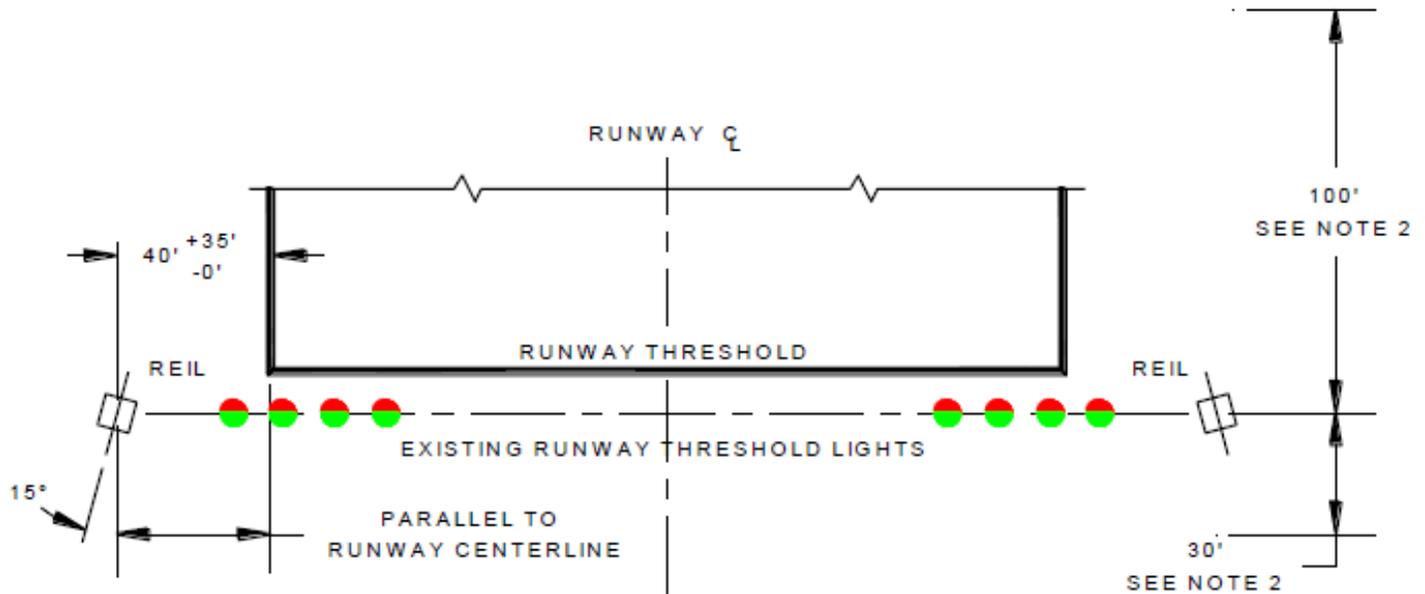
Notes:

- If the layout of the lights results in an odd number of lights, make the two lights near the runway centerline green.
- The fixture prior to the runway hold-position must always be green when approached from the taxi direction and yellow when approached from the runway direction (bi-directional).

Taxiway Centerline Lighting Configuration for Acute - Angled Exits



Runway End Identifier Lights (REILs)



Notes:

- The optimum location for each light unit is in line with the runway threshold at 40 ft. from the runway edge.
- A 100 ft. upwind and a 30 ft. downwind longitudinal tolerance are permitted from the runway threshold in locating the light units.
- The light units shall be equally spaced from the runway centerline. When adjustments are necessary the difference in the distance of the units from the runway centerline shall not exceed 10 ft.
- The beam centerline (aiming angle) of each light unit is aimed 15 degrees outward from a line parallel to the runway centerline and inclined at an angle 10 degrees above the horizontal. If angle adjustments are necessary, provide an optical baffle and change the angles to 10 degrees horizontal and 20 degrees vertical.
- Locate the ADL equipment a minimum distance of 40 ft. from other runways and taxiways.
- If REILs are used with VASI, install REILs at 75 ft. from the runway edge. When installed with other glideslope indicators REILs shall be installed at 40 ft. from the runway edge unless there are concerns with jet blast and wing vortices.
- The elevation of both units shall be within 3 ft. of the horizontal plane through the runway centerline

Chapter 3 – Construction Safety

Reference: AC 150/5370-2F

Safety Areas and Work Limits

- Construction activities are prohibited in safety areas while the associated runway or taxiway is open to **ANY** aircraft. In the past, this prohibition applied only to air carriers.
- Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway.
- Stockpiled materials and equipment storage are not permitted within the runway safety area and object free zone, and if possible should not be permitted within the object free area of an operational runway.
- Stockpiling material in the object free area requires submittal of a 7460-1
- Open trenches or excavations are not permitted in the Taxiway Safety Area while the taxiway is open.

Construction Reminders

- Establish procedures for the immediate notification of users and the FAA of any condition adversely affecting safety.
- Develop a good, specific Construction Safety and Phasing Plan. Update during the project, as needed.
- Conduct periodic safety meetings with contractors and tenants.
- Continually review NOTAMs.
- Don't forget to include the aircraft rescue and firefighting department in all construction planning, updates, and NOTAM notification.
- Penalties for non-compliance established in construction contracts are useful in ensuring contractor compliance with safety procedures.
- Remember to use sweepers to control FOD from construction vehicles at movement area crossings.
- Inspect construction areas completely before opening/re-opening any airport surfaces.
- Use a "start-up/shut-down" checklist.
- Train, train, train, all employees and contractors who move around the Airport Operations Area.
- Check construction barricades and other lighting during the night inspection.
- Coordinate all construction at the planning stage with the Air Traffic Control Tower to determine if a Safety Risk Management Document (SRMD) is needed.

Construction Barricades



In Movement Areas

| YES | NO |
|--|---|
| <ul style="list-style-type: none"> • low mass and height • weighted (if exposed to jet blast) • easily collapsible • retro-reflective orange and white in color • frangible (if attached) • weighted traffic cones • orange/white flags attached • red lights (flashing or steady burning) | <ul style="list-style-type: none"> • railroad ties • cement blocks • tall barrels or metal drums • Jersey (cement) barriers • amber (yellow) lights • wooden saw horses • heavy, metal A-frames • concrete filled buckets |

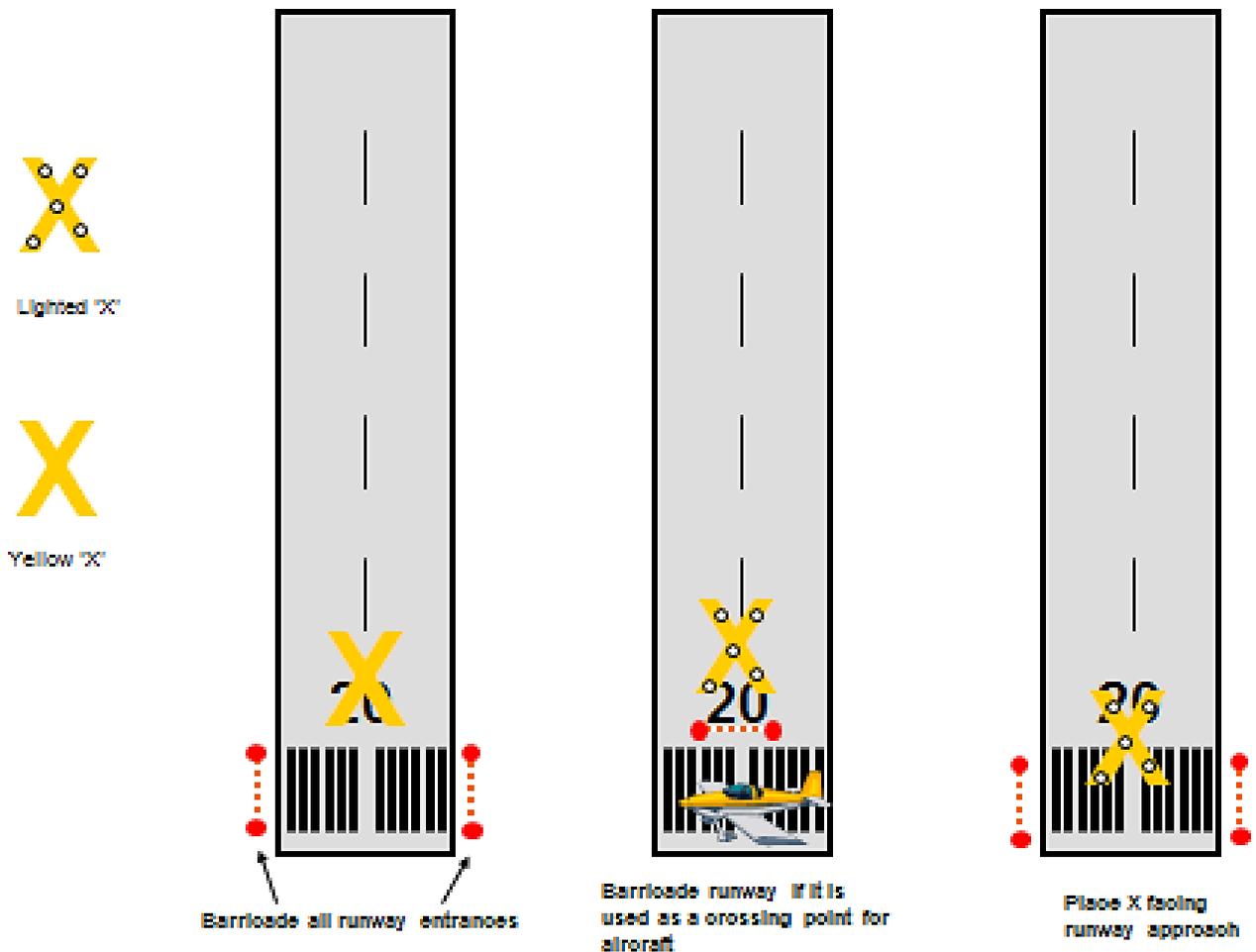
ALL closed areas must be appropriately barricaded, especially taxiways and closed runway entrances.

- The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles; generally, 4 ft. Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished using ropes, securely attached to prevent FOD.
- Supplement barricades with signs; "No Entry" "No Vehicles" (optional)
- Barricades are not permitted in any active safety area.
- Even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.
- All barricades adjacent to any open runway or taxiway, taxilane, safety area, or apron must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights and flags.

Temporarily Closed Runways

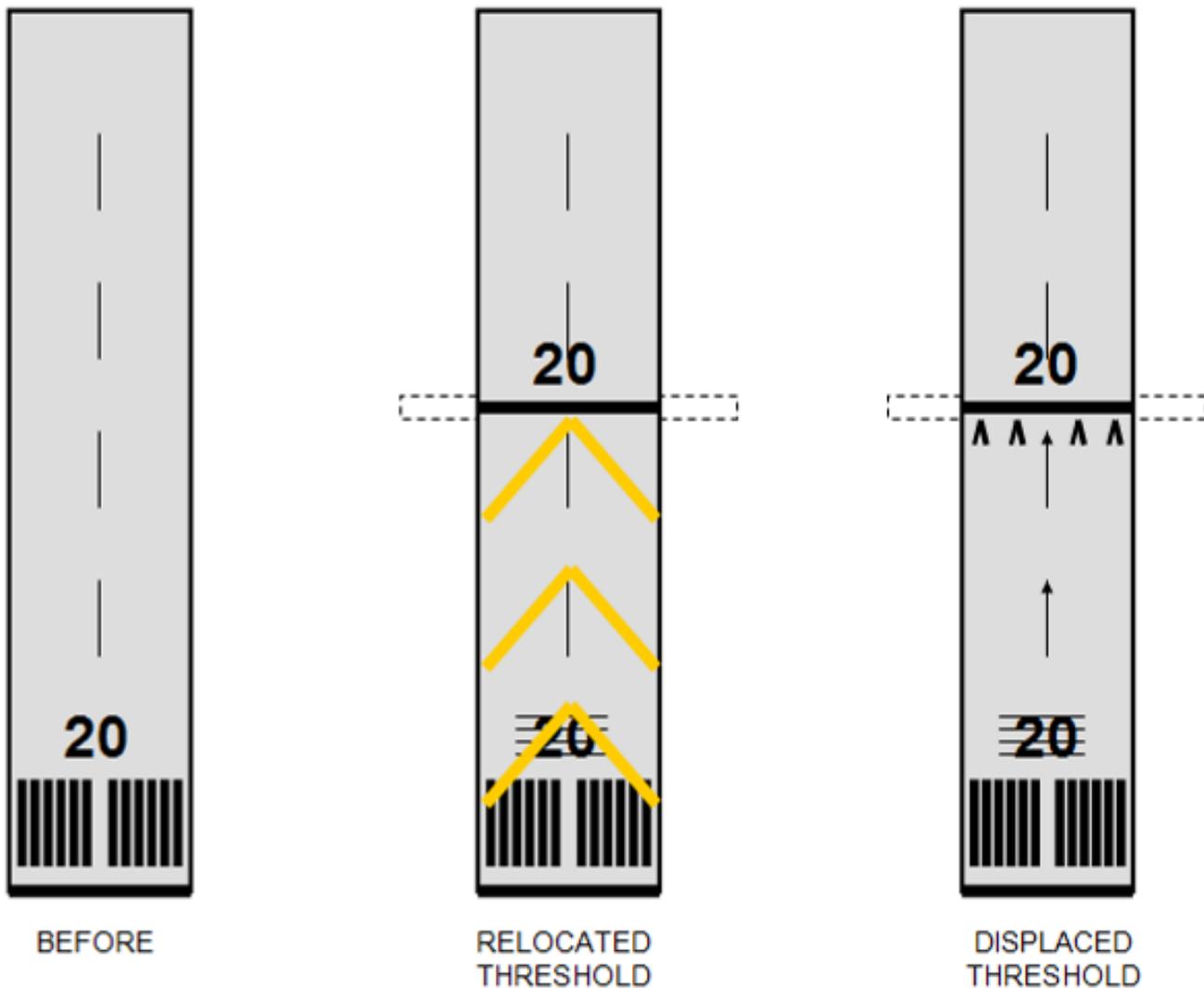
When temporarily closing runways:

- Turn off runway lights and approach lights.
- Turn off PAPIs or VASIs.
- Activate stop bars if available.
- Issue NOTAMs.
- Place X at each end of runway directly on or as near as practical to runway designation.
- If available, use lighted X, both day & night. These are required at night if runway lights are on.
- Place an X facing the runway approach.

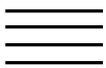


Marking Temporarily Relocated or Displaced Runway Threshold

- Closed portions of the runway, not suitable for take-off or landing, must be marked with yellow chevrons. These can be painted or double-layered snow fence, plywood, colored plastic or other materials.
- Runway numeral, in the closed portion, should be covered or removed.
- A temporary runway threshold bar should be provided. This can be painted at the new runway end or use the elevated or flush type, mounted outboard of the pavement edge.
- Full runway safety area must be maintained for the relocated threshold or aircraft type should be restricted as appropriate.
- Runway numeral should be painted at new threshold.
- NOTAM with Declared Distances is an option for the decreased runway length.



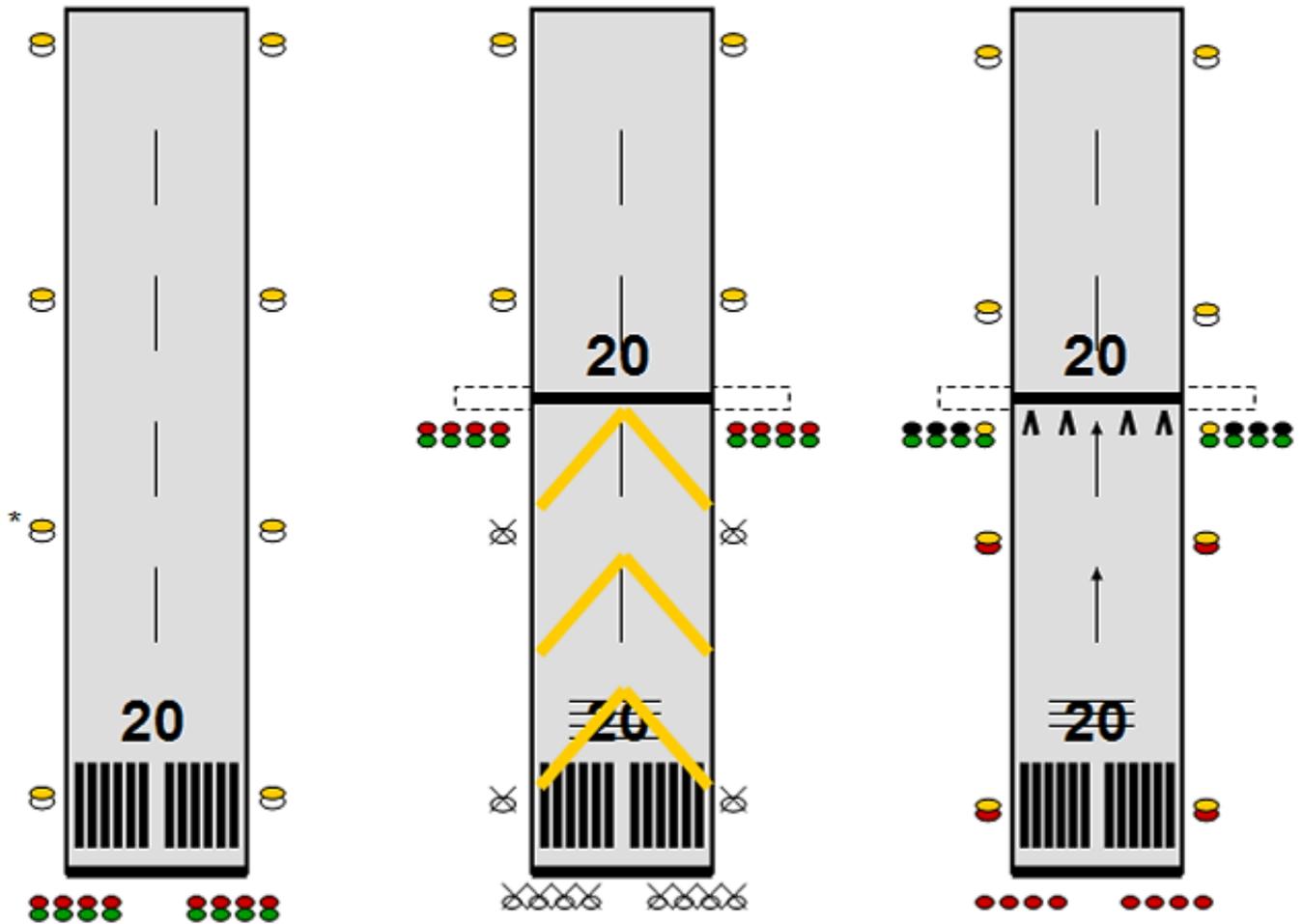
Legend:



In the figure above denotes a covered or removed runway designation.

Lighting Temporarily Relocated or Displaced Runway Thresholds

- Lighting in a closed area should be shut-off or covered.
- Removal of lamps from the fixture is not recommended since it may damage regulators.
- Temporary threshold light wires may run above ground with lamps weighted with sandbags or mounted on frangible couplings.
- Amber lights on instrument runways must be adjusted.
- Runway End Identifier Lights or relocated VASI/PAPI may be used.
- Distance Remaining Signs must be adjusted or covered.



* Amber last 2000' of instrument runway X= OFF

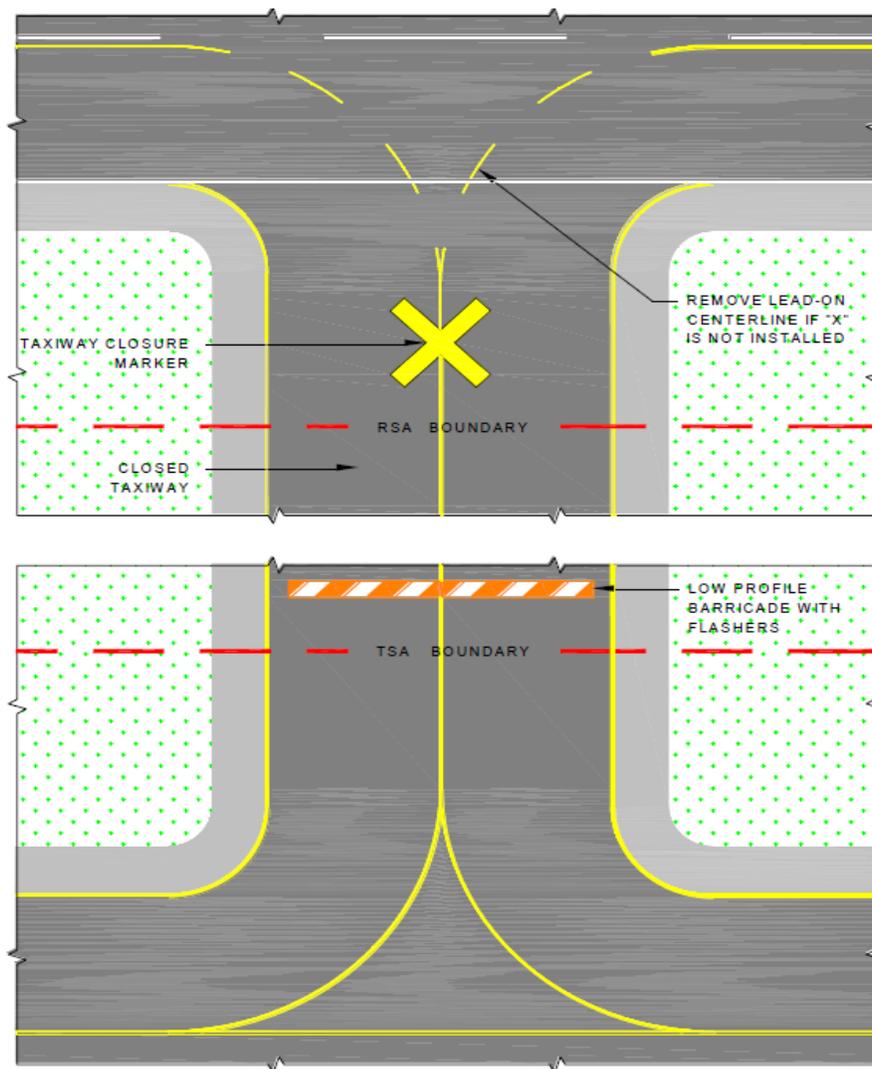
Legend:


 Denotes a covered or removed runway designation

Temporarily Closed Taxiways

- Taxiway lighting should be shut-off or covered.
- Taxiway centerlines that lead into closed areas should be removed if the project has a long duration.
- Place barricades outside the safety area of intersecting taxiways or runways.
- For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway.
- If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed section.
- If the centerline marking will be reused upon reopening the taxiway, it is preferable to paint over the marking.
- Notices to Airmen (NOTAMs) must be issued.

CAUTION: Removal of lamps from the taxiway edge light fixtures is not recommended. This may cause damage to the regulators. Shut off or cover them, instead.



Chapter 4 - Fuel Fire Safety

References:

- [AC 150/5230-4B](#)
- Addendum for [AC 150/5230-4B](#), Aircraft Fuel Storage, Handling, Training, and Dispensing on Airports
- NFPA 407 - Standard for Aircraft Fuel Servicing- 2012 Edition

National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
1-800-344-3555

<http://www.nfpa.org/catalog/>



NFPA 407 standards include the following:

4.1.3 - Entrances to fueling areas shall be posted with “no smoking” signs.

4.3.6.6 - Gasoline-powered engines on fuel servicing vehicles shall be provided with flame and spark-arresting exhaust systems.

4.3.6.7 - Non-turbo-charged diesel engines on fuel servicing vehicles shall be equipped with flame and spark-arresting exhaust systems.

4.3.9.1 - Each aircraft fuel servicing tank vehicle shall have two listed fire extinguishers, each having a rating of at least 20-B:C with one extinguisher mounted on each side of the vehicle. Multipurpose dry chemical (ammonium phosphate) should not be selected due to corrosion concerns relative to the agent. Carbon dioxide extinguishers should not be selected due to their limited range and effectiveness in windy conditions.

4.3.9.3 - Extinguishers shall be readily accessible from the ground. The area of the paneling or tank adjacent to or immediately behind the extinguisher(s) on fueling vehicles or carts shall be painted with a contrasting color.

4.3.11.2 - Smoking equipment such as cigarette lighters and ashtrays shall not be provided. If a vehicle includes such equipment when initially procured, it shall be removed or rendered inoperable.

4.4.5.7 - Airport Fuel Systems. Each emergency fuel shutoff station shall be placarded EMERGENCY FUEL SHUTOFF in letters at least 2 inches high. Placards shall be weather resistant, shall be located at least 7 feet above grade, and shall be positioned so that they can be seen readily from a distance of at least 25 feet.

5.1.3 - Aircraft fueling vehicles shall be marked with the name of the operator or the responsible organization.

5.1.3.1 - The marking shall be approved, legible signs on both sides of the exterior of the vehicle.

5.2.3 - Fuel nozzles shall not be dragged along the ground.

5.3.4 - Emergency fuel shutoff systems shall be operationally checked at intervals not exceeding 6 months. Each individual device shall be checked at least once during every 12-month period.

5.3.5 - Suitable records shall be kept of tests required by this section.

5.8.5 - Personnel shall not carry lighters or matches on their person while engaged in fuel servicing operations.

5.8.6 - Lighters or matches shall not be permitted on or in fueling equipment.

5.9.1 - Fuel servicing operations shall be suspended where lightning flashes are in the immediate vicinity of the airport.

5.13.6 - Fuel servicing personnel shall be trained in the use of the available fire extinguishing equipment they could be expected to use.

5.15.2 - Fuel flow shall be controlled by use of a deadman control device. The use of any means that defeats the deadman control shall be prohibited.

5.17.2 - Leaking vehicles or carts shall be removed from service, defueled, and parked in a safe area until repaired.

Quarterly Inspection – Aircraft Fuel Servicing Vehicles

Inspector: _____ Fueling Agent: _____ Date: _____

Enter an “S” or “U” in blocks for lines 1-20. S = Satisfactory; U = Unsatisfactory

| Criterion | Truck number, Type fuel | Truck number, Type fuel | Truck number, Type fuel |
|--|----------------------------|----------------------------|----------------------------|
| 1. Fuel trucks parked 50 ft. from buildings and 10 ft. apart | | | |
| 2. Fuel trucks marked with operator name on both sides | | | |
| 3. No Fuel Leaks | | | |
| 4. Vehicle exhaust system: Shielded; leak-free; spark arrestor if required | | | |
| 5. No Smoking sign-cab; no evidence of smoking; no ashtray | | | |
| 6. Flammability / product signs sides-back / HazMat placards all sides | | | |
| 7. Bonding cables provided and clips; plugs functional | | | |
| 8. 2 extinguishers on sides / BC / Insp; 1 extinguisher on hydrant vehicle/carts | | | |
| 9. Deadman Control for all nozzles; not bypassed | | | |
| 10. Integral system for nozzles to be stowed before moving fuel vehicle | | | |
| 11. Brake interlock system for bottom loading coupler / overwing nozzles | | | |
| 12. Emergency fuel shutoffs operable and properly placard /1 each side | | | |
| 13. Aircraft fueling hose: no blistering, cracking, saturation, separation | | | |
| 14. Dry break couplers / adaptors are installed | | | |
| 15. Aviation fueling hose used / no kinks | | | |
| 16. Explosion proof electrical / light lens intact | | | |
| 17. Dome cover seals intact with forward mounted hinge | | | |
| 18. Truck cabinets have grating type flooring or open flooring | | | |
| 19. Vehicle DPF Regeneration Area meets standards, if applicable | | | |

20. Proper Fueling Procedures Observed:

Remarks: [Enter line number – remark]

This checklist is based on the NFPA 407 Standard for Aircraft Fuel Servicing 2012 Edition

Quarterly Inspection – Airport Fuel Systems

Inspector: _____ Fueling Agent: _____ Date: _____

Enter an “S” or “U” in blocks for lines 1-19. S = Satisfactory; U = Unsatisfactory

| Criterion | Jet A Section | 100LL Section |
|---|---------------|---------------|
| 1. Entrances to fueling areas posted with “No Smoking” signs | | |
| 2. No evidence of smoking | | |
| 3. All tanks, machinery, piping is bonded or grounded | | |
| 4. Areas around tanks are free of weeds, trash or combustible materials | | |
| 5. Emergency fuel shutoffs provided for each fueling system / outside spill area | | |
| 6. Proper EMERGENCY FUEL SHUTTOFF placards / 7 ft. above grade | | |
| 7. Emergency fuel shutoffs kept clear and tested every 6 months | | |
| 8. Fuel servicing equipment properly maintained free of leaks | | |
| 9. Procedures for prevention & control of spills and notification to fire department | | |
| 10. Bonding connections available for loading stations | | |
| 11. Deadman controls available for loading stations / not bypassing deadman | | |
| 12. Dry break couplers/adaptors installed | | |
| 13. Aircraft fuel hose/blistering, cracking, carcass saturation, separation, kinks | | |
| 14. Fueling hydrants, pits, cabinets located 50 ft. from building, except loading bridges | | |
| 15. Portable fire extinguishers at fuel storage areas and loading stations | | |
| 16. Portable fire extinguishers on aircraft servicing ramps/aprons | | |
| 17. At least 1 wheeled extinguisher if >200 gpm aircraft fueling system or equipment | | |
| 18. Explosion proof electrical equipment | | |
| 19. Above ground fuel piping on aircraft movement area protected by barrier guard | | |

Remarks: [Enter line number – remark]

This checklist is based on the NFPA 407 Standard for Aircraft Fuel Servicing 2012 Edition

Quarterly Inspection – Self-Service Fuel Stations

Inspector: _____ Fueling Agent: _____ Date: _____

Enter an “S” or “U” in blocks for lines 1-18. S = Satisfactory; U = Unsatisfactory

| Criterion | Jet A Section | 100LL Section |
|--|---------------|---------------|
| 1. Entrances to fueling areas posted with No Smoking signs | | |
| 2. Controlled access to dispensing equipment | | |
| 3. All tanks, machinery, piping is bonded or grounded | | |
| 4. Areas around tanks are free of weeds, trash or combustible materials | | |
| 5. Emergency fuel shutoff provided/Incorporating a thermally actuated device | | |
| 6. Emergency fuel shutoff located more than 20 ft. but less than 100 ft. from dispenser | | |
| 7. Proper EMERGENCY FUEL SHUTTOFF placards; 7 ft. above grade | | |
| 8. Dispensing devices located on an island; protected by pipe bollards/guards | | |
| 9. Dispensing equipment properly maintained free of leaks | | |
| 10. Instructions provided for notification to fire department by emergency fuel shutoff | | |
| 11. Bonding connections available for dispensing equipment | | |
| 12. Deadman controls available for dispensing equipment | | |
| 13. 1 extinguisher at dispenser and 1 extinguisher at emergency fuel shutoff | | |
| 14. Aircraft fueling hose: No blistering, cracking carcass saturation, separation | | |
| 15. Fueling hydrants, pits, cabinets located 50 ft. from building except loading bridges | | |
| 16. Emergency Instructions posted in dispensing area | | |
| 17. Operating Instructions posted | | |
| 18. Explosion proof electrical equipment | | |

Remarks: [Enter line number – remark]

Checklist based on 2012 NFPA 407, Fire Code for Airport Fueling Operations

Chapter 5 - Wildlife

Reference: AC 150/5200-33B

Each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected.

A Wildlife Hazard Assessment must be conducted by a qualified Wildlife Damage Management Biologist if:

An air carrier aircraft experiences:

- Multiple wildlife strikes
- Substantial damage from striking wildlife
- Engine ingestion of wildlife
- Wildlife in size, or in numbers, capable of causing one of the above, is observed to have access to airport flight patterns or movement areas.

An assessment will identify if a Wildlife Hazard Management Plan is needed.

Wildlife Hazard Management Plan:

- Must meet all requirements of 14 CFR part 139
- Must be approved by the FAA and become a part of your Airport Certification Manual.
- Must be reviewed and valuated every 12 consecutive calendar months or following a trigger event (above).
- A training program conducted by a qualified wildlife damage management biologist must be provided to all personnel responsible for implementing the plan.

Chapter 6 - Aircraft Rescue and Fire Fighting (ARFF)

Reference: 14 CFR Part 139

ARFF Vehicles

The information below is for quick reference *only*.
Refer to 14 CFR Part 139.317 for complete requirements.

| ARFF Index | Aircraft Length (feet) |
|------------|--------------------------------|
| A | Less than 90 |
| B | At least 90 but less than 126 |
| C | At least 126 but less than 159 |
| D | At least 159 but less than 200 |
| E | At least 200 |

Index A. One vehicle carrying one of the following:

- 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; **or**
- 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total **100** gallons for simultaneous dry chemical and AFFF application

Index B. Either of the following:

- **One vehicle** carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production
- **Two vehicles:** One with the extinguishing agents specified for Index A and one vehicle carrying water and AFFF so the total carried by both vehicles is at least **1,500** gallons.

Index C. Either of the following:

- **Two vehicles:** One vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production and one vehicle carrying water and AFFF so the total carried by both vehicles is at least **3,000** gallons.
- **Three vehicles:** One with the extinguishing agents specified for Index A and two vehicles carrying water and AFFF so the total carried by all vehicles is at least **3,000** gallons.

Index D. Three vehicles:

- One with the extinguishing agents specified for Index A and two vehicles carrying water and AFFF so the total carried by all vehicles is at least **4,000** gallons.

Index E. Three vehicles:

- One with the extinguishing agents specified for Index A and two vehicles carrying water and AFFF so the total carried by all vehicles is at least **6,000** gallons.

ARFF Training

14 CFR part 139.319(i)(2)

The curriculum for initial and recurrent training must include at least the following areas:

- Airport Familiarization, including airport signs, marking, and lighting
- Aircraft familiarization
- Rescue and firefighting personnel safety
- Emergency communications systems on the airport, including fire alarms
- Use of the fire hoses, nozzles, turrets, and other appliances required for compliance with this part
- Application of the types of extinguishing agents required for compliance with this part
- Emergency aircraft evacuation assistance
- Firefighting operations
- Adapting and using structural rescue firefighting equipment for aircraft rescue and firefighting
- Aircraft cargo hazards, including hazardous materials/dangerous goods incidents
- Familiarization with firefighters' duties under the airport emergency plan
- Live fire drill

Note: Any other subject area, as assigned in the Airport Certification Manual must be included. Examples include Airport Safety Self-Inspection and NOTAM procedures.

Chapter 7 - Pedestrians and Ground Vehicles

References:

AC 150/5210-5

AC 150/5210-20

- Anyone with unescorted access to the Airport Operations Area must be trained.
- Initial and recurrent training must include airport procedures, safety, work area limits, security, and radio communications and must be airport-specific.
- This training can be delegated to tenants and contractors but must be acceptable to and reviewed by the airport operator and records must be kept.
- Construction traffic should use only designated haul routes or roads.
- All vehicles must be appropriately marked and lighted.
- Aircraft always have the right of way!

BE ALERT – READ BACK



Types of Incidents:

- **V/PD** - Vehicle or Pedestrian Deviation
- **PD** - Pilot Deviation
- **OE/OD** - Operational Error or Deviation

Runway Incursion: Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.

Surface Incident: Unauthorized access to the movement area, excluding the runway

Chapter 8 - References

FAA Advisory Circulars

| Subject | AC 150/ |
|---|---------|
| Airport Design | 5300-13 |
| Construction | 5370-2 |
| Design and Installation Details for Airport Visual Aids | 5340-30 |
| Foreign Object Debris Management | 5210-24 |
| Fuel Storage, Handling, and Dispensing | 5230-4 |
| Ground Vehicle Marking/Lighting | 5210-5 |
| Ground Vehicle Operations | 5210-20 |
| Landfill/ Waste | 5200-34 |
| Lighted 'X' | 5345-55 |
| Maintenance of Airport Visual Aids | 5340-26 |
| Markings | 5340-1 |
| Notice to Airmen (NOTAM) | 5200-28 |
| Precision Approach Path Indicator (PAPI) Systems | 5345-28 |
| Retro-reflective Markers | 5345-39 |
| Safety Management Systems (SMS) | 5200-37 |
| Self-Inspection | 5200-18 |
| Signs | 5340-18 |
| Specification Portable Runway and Taxiway Lights | 5345-50 |
| Wildlife | 5200-33 |
| Wildlife Biologist | 5200-36 |
| Winter Operations | 5200-30 |

More Advisory Circulars are available online:

http://www.faa.gov/airports/resources/advisory_circulars/

The Airport Certification & Safety Team, FAA Southern Region, prepared this Quick Reference