

# Safety & Engineering

## Construction Safety

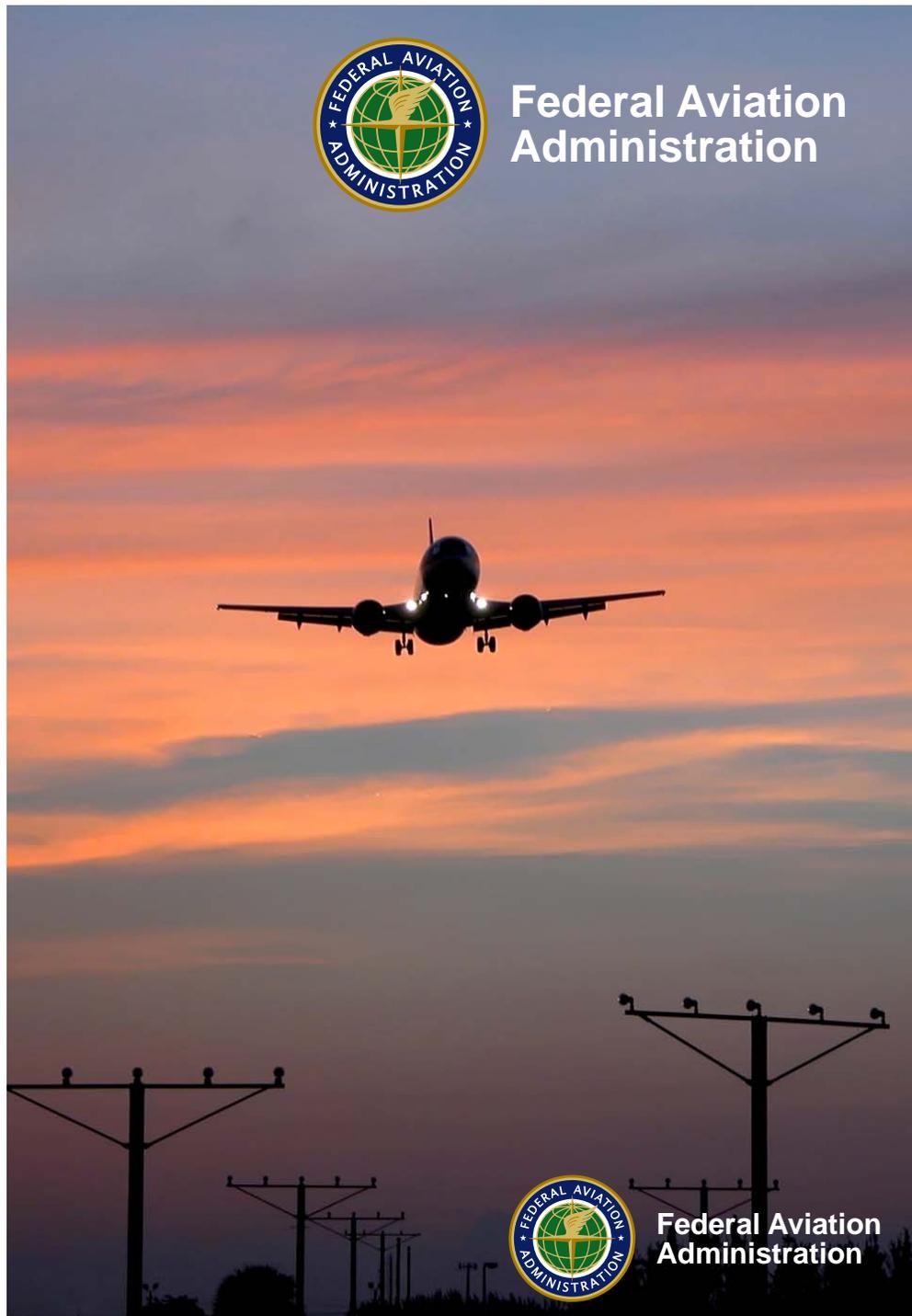
Prepared for: 2018 Southwest Region  
Airport Conference

Presented by: Mike Fray  
Airport Certification Safety  
Inspector  
ASW – 620

Date: January 31, 2018



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# Construction Related Incidents

- **Chicago O'Hare:**

- In 2009, rwy 10-28 was shortened by approx. 3,700' with a frangible barrier placed on the closed portion of the rwy to protect a localizer antenna array.
- During the brief time that this construction project required, five serious safety events occurred:
  - Two acft overran into the closed portion of rwy,
  - one acft touched down and went around after seeing chevrons in the same area, and
  - two heavy acft departed toward the barrier not knowing of its existence or how much rwy was available.



# Construction Related Incidents

- **Blue Grass Airport, Lexington Kentucky:**
  - In 2006, a CRJ-100ER attempted to take off on a different and much shorter runway than the one actually intended for departure.
  - Unknown to the crew, the airport signage was inconsistent with current airport diagram charts of construction at the airport. Various taxiway and runway lighting systems were also out of operation and the crew did not have information about all the changes.
  - The aircraft struggled to get airborne before colliding with terrain.



# OBJECTIVES

- Operational Safety on Airports During Construction
- Construction Safety Phasing Plan
- Inspecting Construction



# Operational Safety on Airport During Construction



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## Advisory Circular

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**Subject:** Operational Safety on  
Airports During Construction

**Date:** 9/29/11  
**Initiated by:** AAS-100

**AC No:** 150/5370-2F

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1. **Purpose.** This AC sets forth guidelines for operational safety on airports during construction.
2. **What this AC Cancels.** This AC cancels AC 150/5370-2E, Operational Safety on Airports During Construction, dated January 17, 2003.
3. **Whom This AC Affects.** This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, Certification of Airports (Part 139). For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) Program. See Grant Assurance No. 4, "Policy, Standards, and Specifications," and PFC Assurance No. 9, "Standard and Specifications." While we do not require non-certificated airports without grant agreements to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.
4. **Principal Changes.**
  - a. Construction activities are prohibited in safety areas while the associated runway or taxiway is open to aircraft.
  - b. Guidance is provided in incorporating Safety Risk Management.
  - c. Recommended checklists are provided for writing Construction Safety and Phasing Plans and for daily inspections.



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# Operational Safety on Airport During Construction



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## Advisory Circular

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**Subject:** Operational Safety on  
Airports During Construction

**Date:** 12/13/2017  
**Initiated By:** AAS-100

**AC No:** 150/5370-2G  
**Change:**

1 **Purpose.**

This AC sets forth guidelines for operational safety on airports during construction.

2 **Cancellation.**

This AC cancels AC 150/5370-2F, *Operational Safety on Airports during Construction*, dated September 29, 2011.

3 **Application.**

This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP). See Grant Assurance No. 34, *Policies, Standards, and Specifications*. While we do not require non-certificated airports without grant agreements or airports using Passenger Facility Charge (PFC) Program funds for construction projects to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4 **Related Documents.**

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. [Appendix A](#) contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as



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# Principal Changes

- **Impacts to NAVAIDS**
  - FAA Owned
    - 45 day notification to appropriate ATO service area
    - Coordinate work with local FAA ATO / Tech Ops office
  - Airport Owned
    - 45 day notice if outage is greater than 24 hours, or
    - More than 4 hours daily on consecutive days
  - Short Notice:
    - For emergency notification about impacts, contact: 866-432-2622 (Midstate Operational Control Center).
    - Applies to airport owned & FAA owned



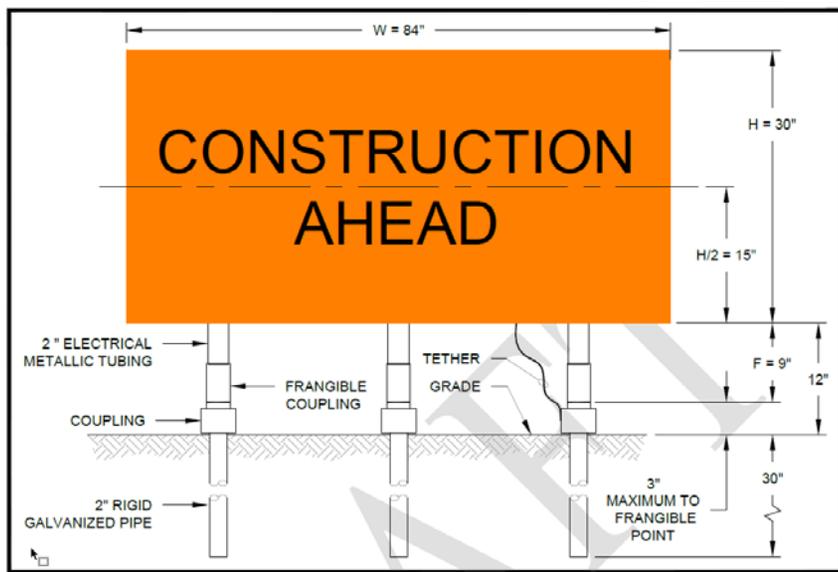
# Principal Changes

- **Signs**

- 2.18.4.2 Temporary Signs: Orange construction signs
  - Black on orange
  - Help pilot maintain awareness of changed conditions
  - Airport Operator may choose to introduce
  - Located so pilots can take timely action
  - Permissible sign legends:
    - Construction Ahead
    - Construction on Ramp
    - Rwy XX Takeoff Run Available ##### Feet

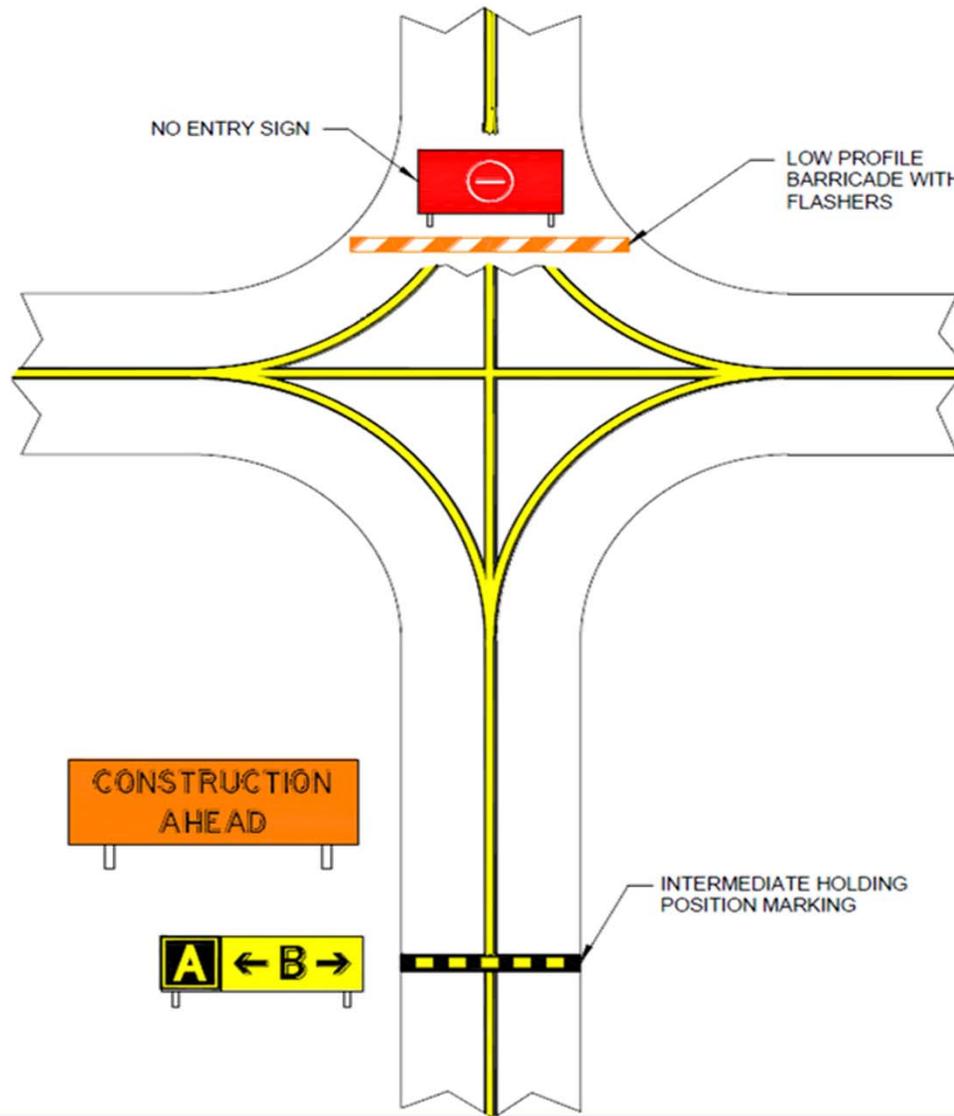


# Approved Sign Legends



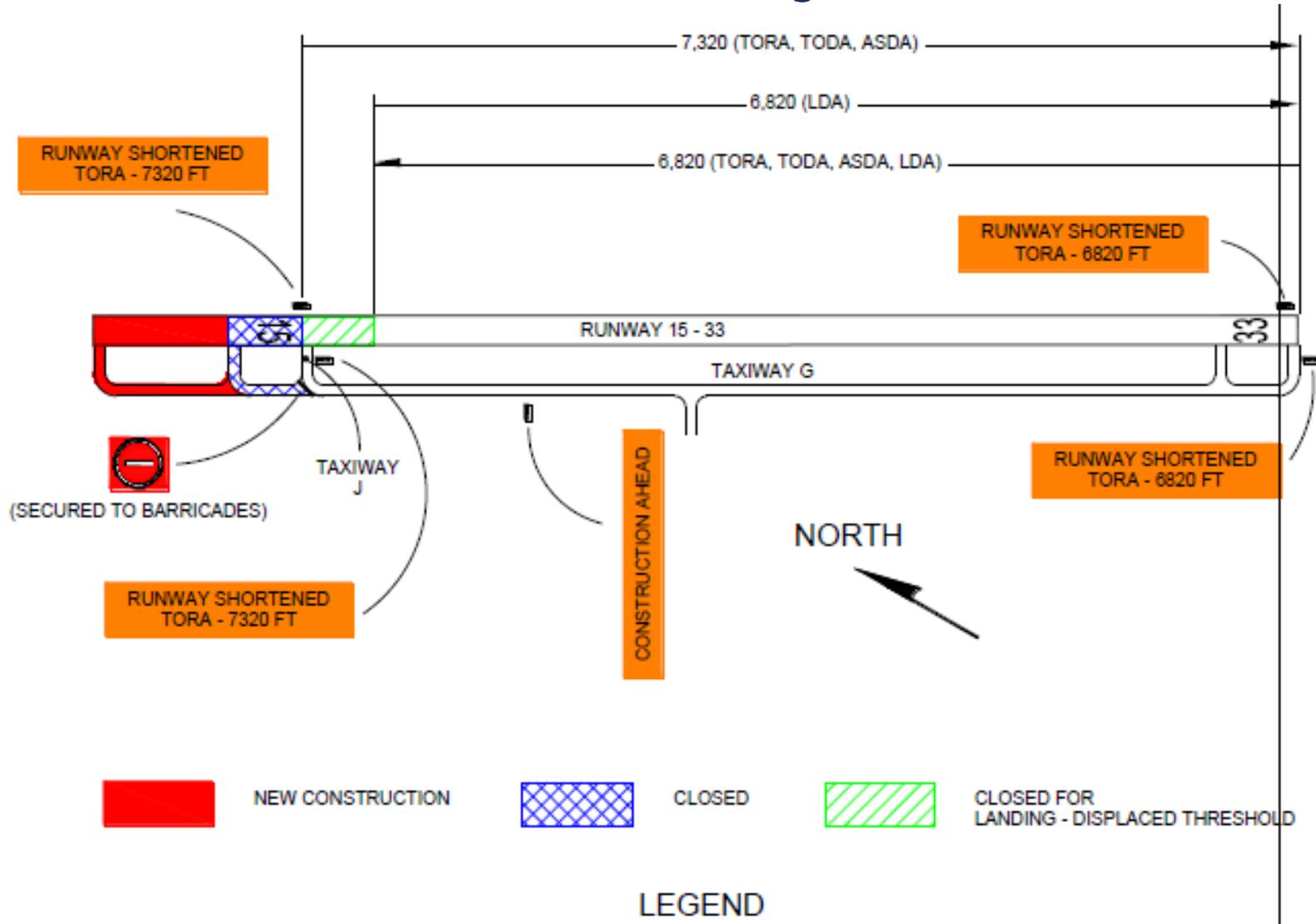
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# Example Layout



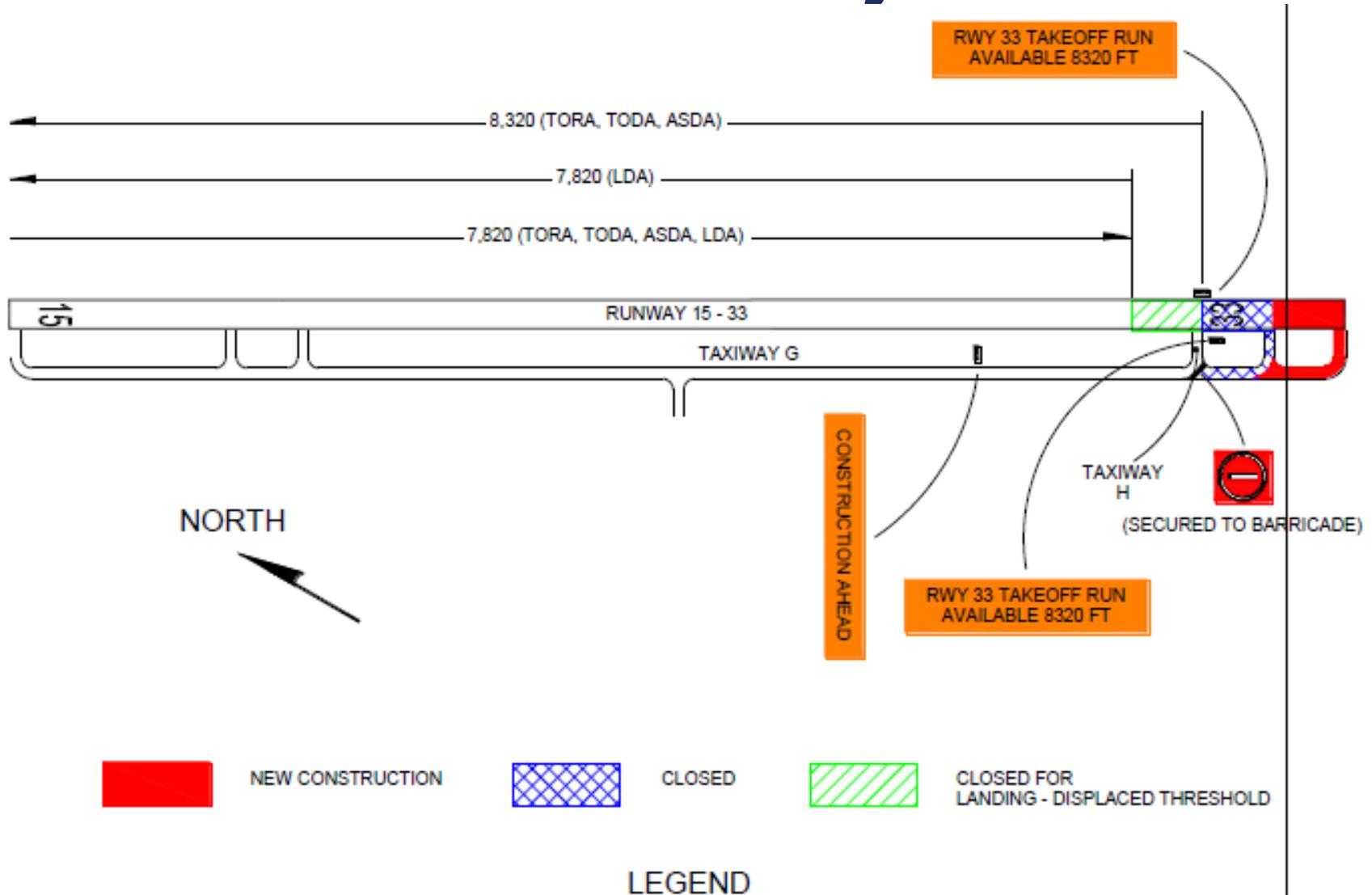
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# Phased Project



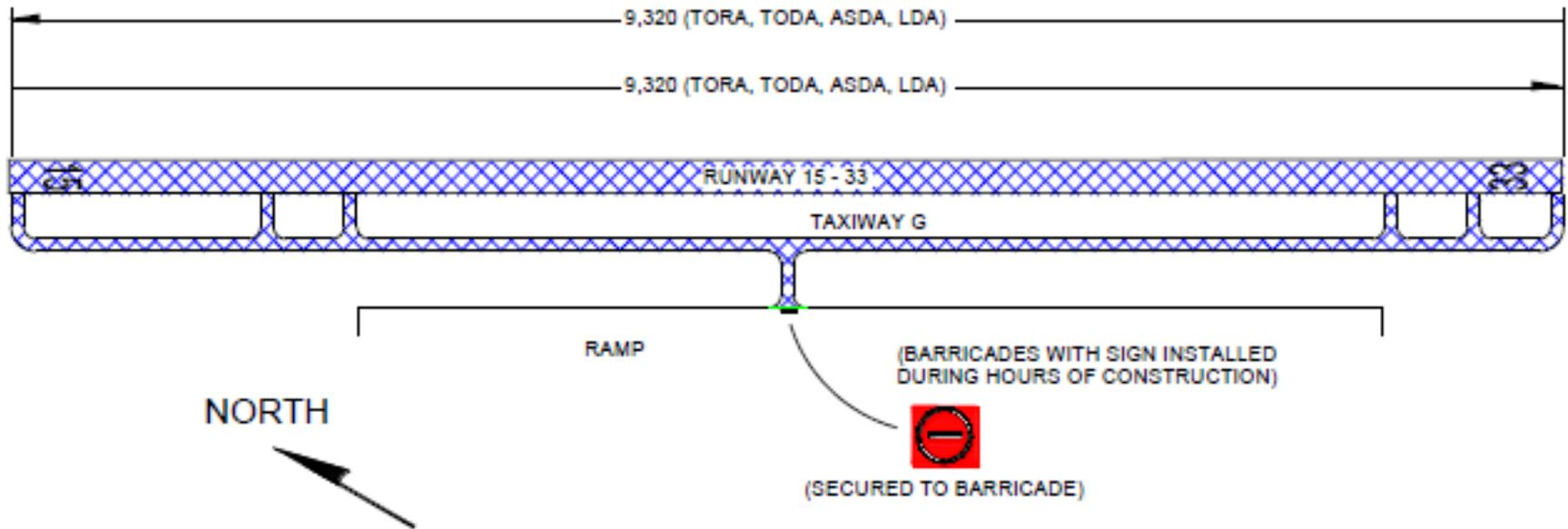
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# Phased Project

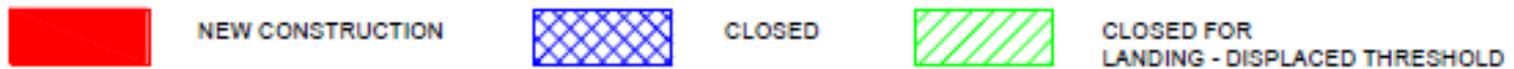


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# Phased Project



NOTE: INSTALL LIGHTED "X" OR YELLOW "X" ON NUMBERS AND REMOVE WHEN RUNWAYS ARE OPEN FOR OPERATIONS.



## LEGEND



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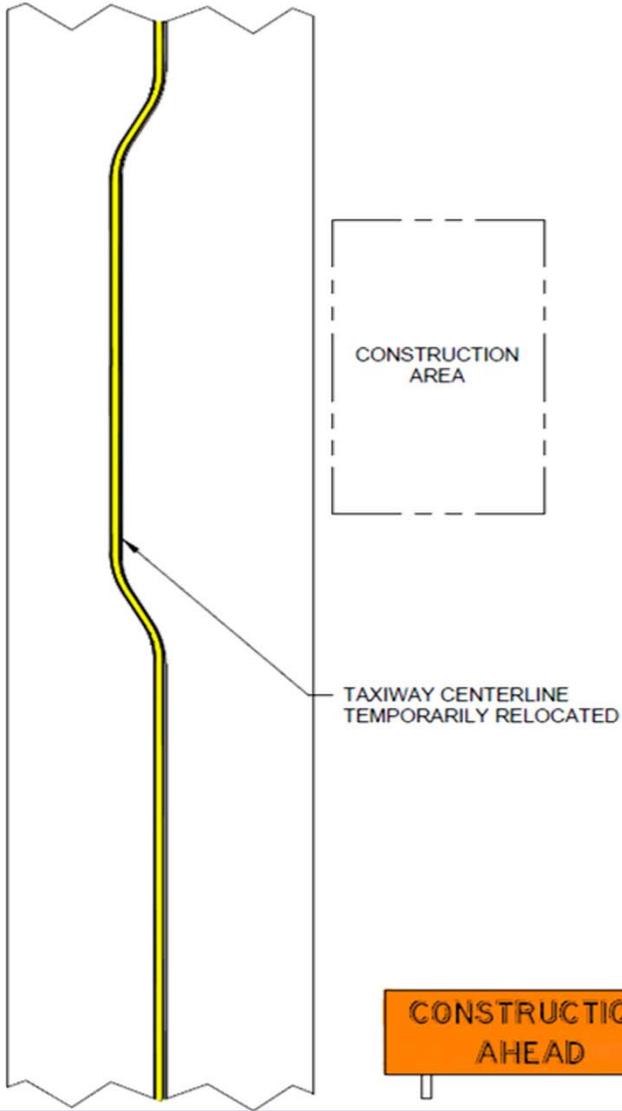
# Principal Changes

- **Excavations (2.22.3.4)**

- Taxiway Curved Sections. **NO CHANGE...**no open trenches allowed if taxiway will be opened
- Taxiway Straight Sections. Open trenches or excavations are not permitted within the TSA while the taxiway is open for **unrestricted** aircraft operations.
  - **Exception**: When impractical to backfill or cover...is acceptable to open the taxiway with a non-standard TSA subject to:
    - Taxiing speed limited to 10 mph.
    - Appropriate NOTAMs issued.
    - Marked and lighted IAW paragraphs 2.18 and 2.20.
    - Low profile lighted barricades installed on pavement edges.
    - Appropriate orange construction signs are installed.



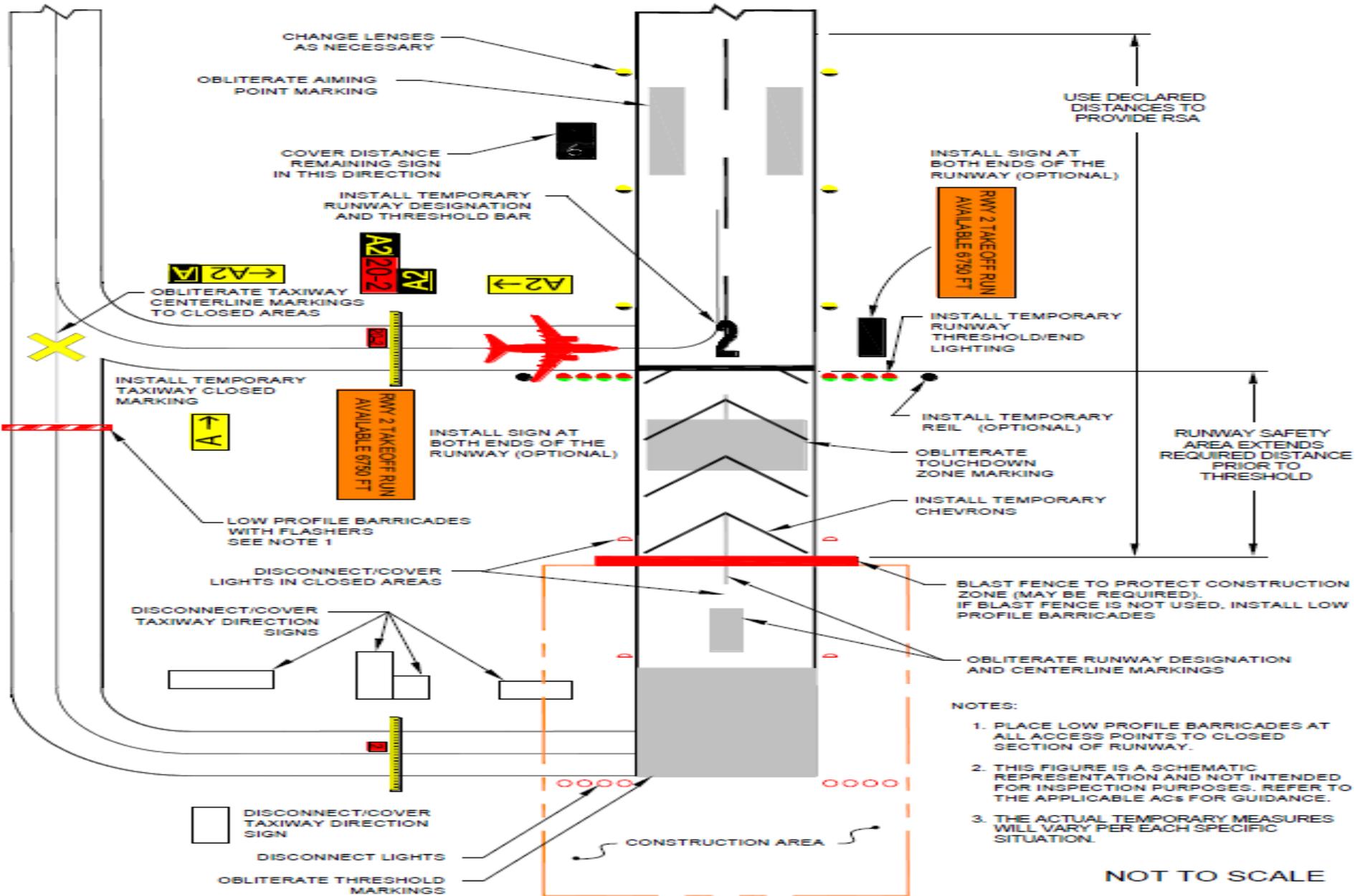
# Temporary Relocated Taxiway



# Principal Changes

- **Guidance for temporary shortened runways and displaced thresholds have been enhanced.**
  - Figure 2-1, temporary partially closed runway
  - Figure 2-2, temporary displaced threshold
  - Figure 2-4, temporary taxiway closure
  - Figure 2-5, temporary outboard white threshold bars and yellow arrowheads





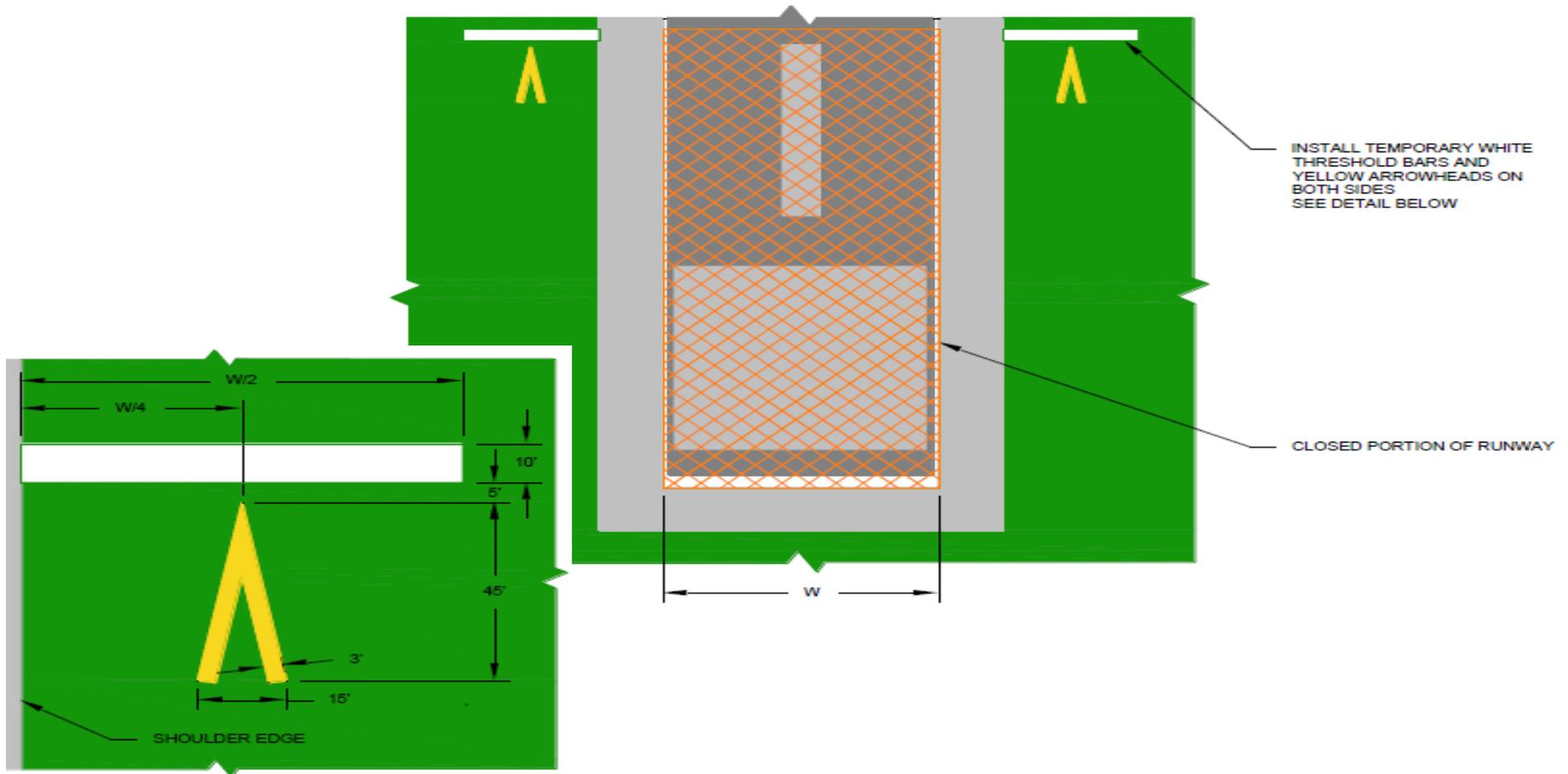
# Partially Closed Runway



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# Outboard White Threshold Bars and Yellow Arrowheads

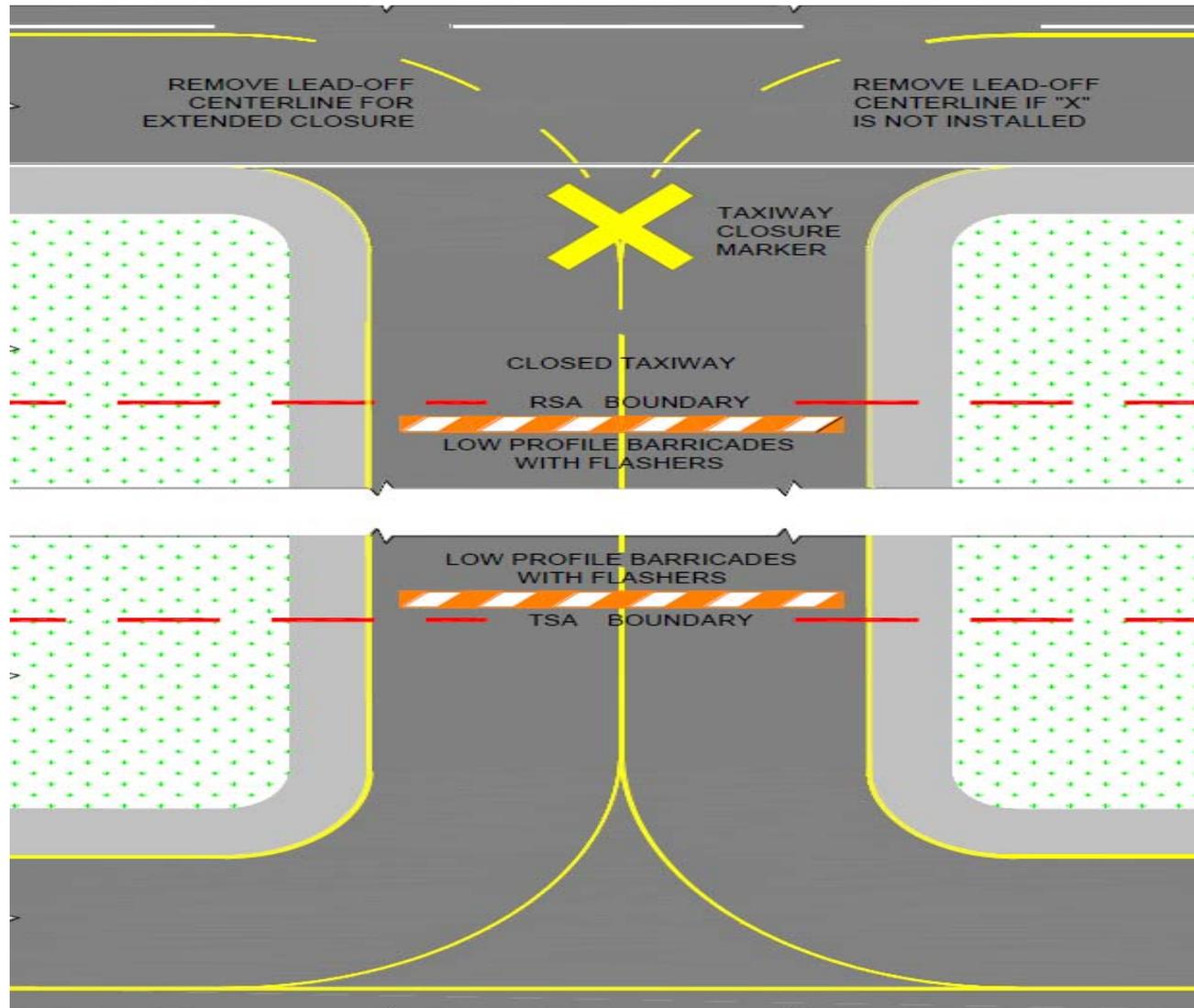


YELLOW ARROWHEAD DETAIL



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# Taxiway Closure



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# Construction Safety Phasing Plan

- ***AC 150/5370-2G, Operational Safety on Airports During Construction.***
  - Chapter 2
    - Safety guidelines of a CSPP
  - Chapter 3
    - Writing guidelines of a CSPP
  - Appendix C
    - CSPP checklist



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- a. **Daily Inspections.** Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the Construction Safety and Phasing Plan (CSPP).
- b. **Interim / Final Inspections.** Inspections of all areas to be reopened to air traffic to ensure proper orientation of lights and signs, correct markings, absence of FOD.



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# Self Inspection Program

## SECTION 139.327 – Self Inspection Program

### APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

**Table D-1. Potentially Hazardous Conditions**

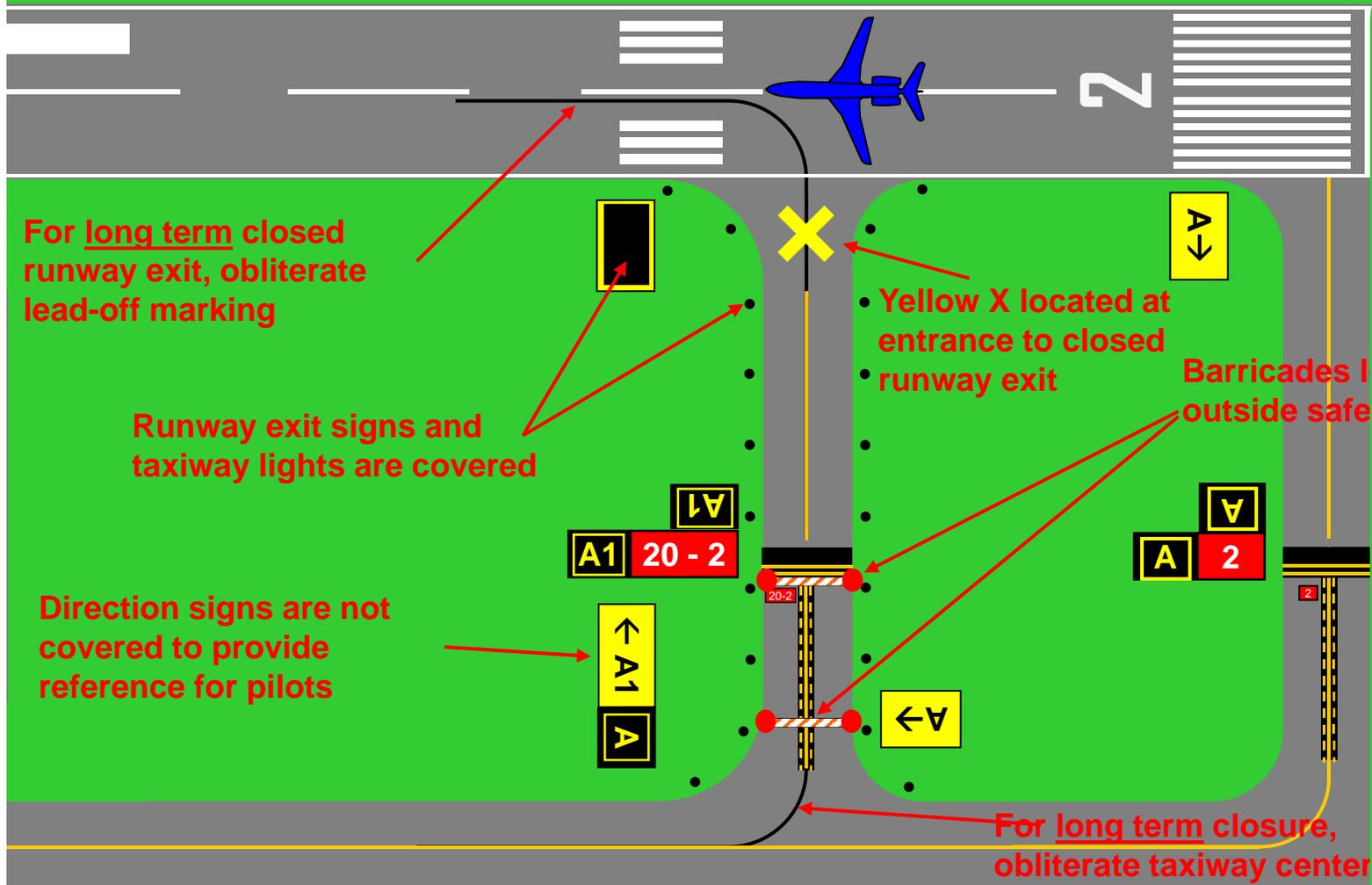
<b>Item</b>	<b>Action Required (Describe)</b>	<b>No Action Required (Check)</b>
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.		
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.		
Runway resurfacing projects resulting in lips exceeding 3 inch (7.6 cm) from pavement edges and ends.		

A daily construction safety inspection checklist is included in Appendix D of AC 150/5370-2G. The date, time and name of person conducting the inspection must be documented on this checklist if used.



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# Hazard Marking, Lighting & Signing



Barricades for a closed runway exit are placed at the holding position to remain outside the RSA. For closed taxiways, barricades are located outside the TSA for the open taxiway. A yellow "X" is placed at the entrance to the closed exit from the runway. The runway exit sign is covered. For nighttime operations, the taxiway lights are covered.

# Temporary Closed Taxiways

Runway exit signs for closed runway exits and outbound destination signs for closed runways are to be covered or the panels removed.



## AC 150/5370-2G, Par 2.18.4.1 – Existing Signs.

Runway exit signs are to be covered for closed runway exits. Outbound destination signs are to be covered for closed runways. Any time a sign does not serve its normal function; it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.



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# Inspecting Construction



**Runway Object  
Free Area**



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# Inspecting Construction

## Temporary Runway Closure Markers



Proper deployment of the Lighted X would include extending the arms. In addition, this Lighted X is too far down the runway.



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# Inspecting Construction

## Closed Taxiways and Closed Runway Exits

**Closed Taxiway**



**Closed Runway Exit**



The runway lead-off line and taxiway centerlines are not obliterated for extended closures.



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# Inspecting Construction

This “X” should have been installed closer to the runway in order to be located at the “entrance to the closed taxiway”.



**AC 150/5370-2G, Par 2.18..2.1.4.2 – Temporarily Closed Taxiways.**

Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. ....



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# Inspecting Construction

The Yellow X is missing at the “entrance to the closed taxiway”.



## AC 150/5370-2F, Par 2.18.2.1.4 Temporarily Closed Taxiways.

Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. ....



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This barricade using a railroad tie is not considered low mass easily collapsible when located in the runway or taxiway Object Free Area.



**150/5370-2F, Par 2.20.2.1 – Barricades.**

.... Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast.



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## 150/5370-2F, Par 2.20.2.4 – Air Operations Area – General.

.... 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 in high, exclusive of supplementary lights and flags. ....



**Barricades are over 18'' high in OFA  
and are over 4' apart**

## 150/5370-2F, Par 2.20.2.1 – Barricades.

.... 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. .... If barricades are intended to exclude pedestrians, they must be continuously linked. ....



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# Inspecting Construction

Construction standards require the spacing of red lights on barricades to be no more than 10' apart. That distance is exceeded since these barricades only have one red light.



**Red light  
spacing is  
more than 10'**

## 150/5370-2F, Par 2.20.2.2 – Lights.

**Lights must be red**, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 ft. Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.



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# Questions?



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