



Florida Department of
TRANSPORTATION

Temporary Barrier Inspection Training

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Office of Construction**

Course Objective

- At the end of this course, you will be:
 - Familiar with common temporary barrier terms and the ATSSA Quality Guidelines for Temporary Traffic Control Devices and Features,
 - Aware of the different types of temporary barrier and their installation,
 - Able to recognize some common issues with temporary barrier installation found in the field during MOT Process Reviews

Temporary Barrier Inspection Training

- Temporary Barrier Terminology & Barrier Wall Inspection
 - Common temporary barrier terms
 - ATSSA Quality Guidelines
- Installation of Common Products
- MOT Process Review Findings

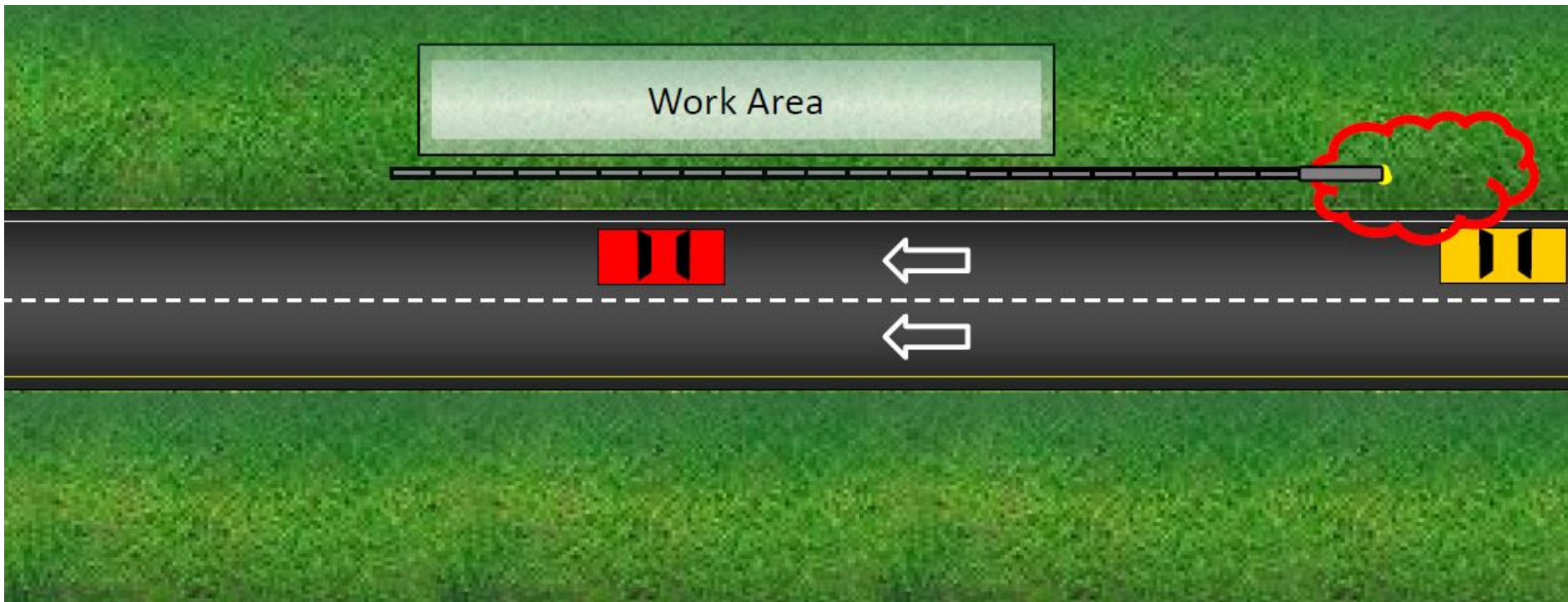


Temporary Barrier Terminology & Barrier Wall Inspection

In this section, we will review some common temporary barrier terms and the ATSSA Quality Guidelines for Temporary Traffic Control Devices and Features.

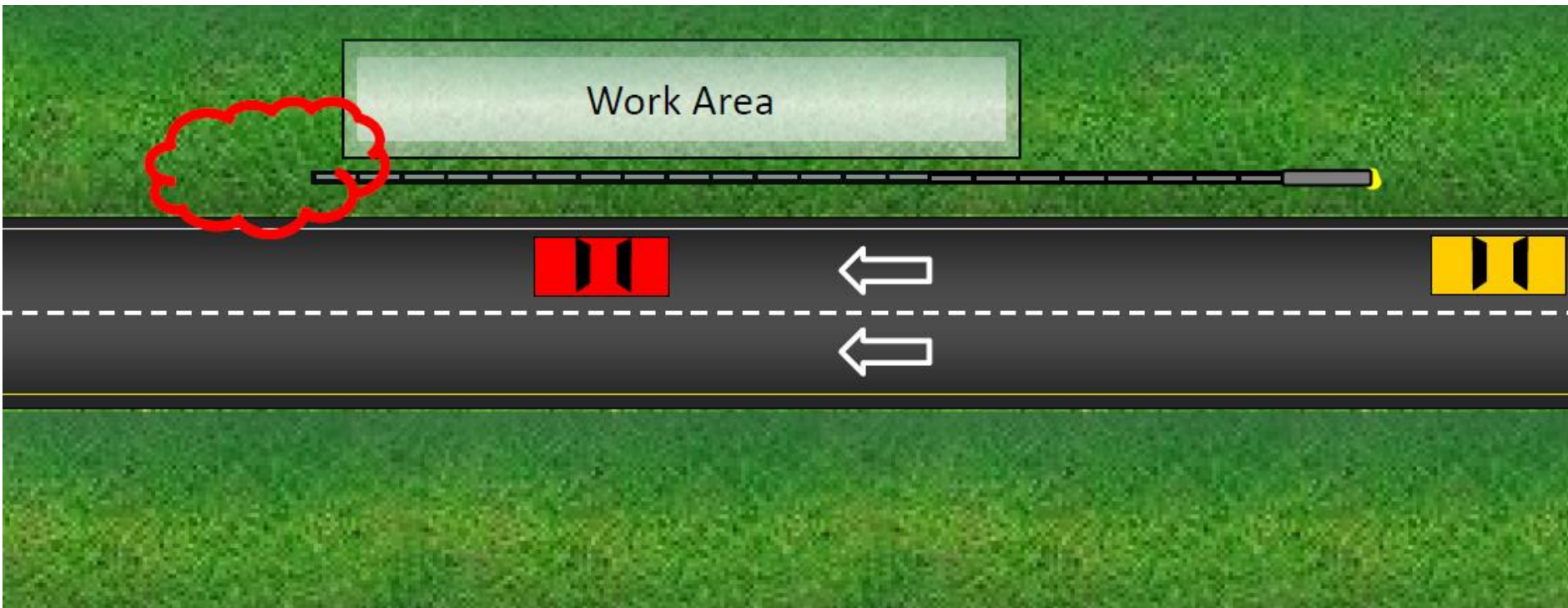
Temporary Barrier Terminology

- Approach End
 - The portion of a barrier system exposed to approaching traffic



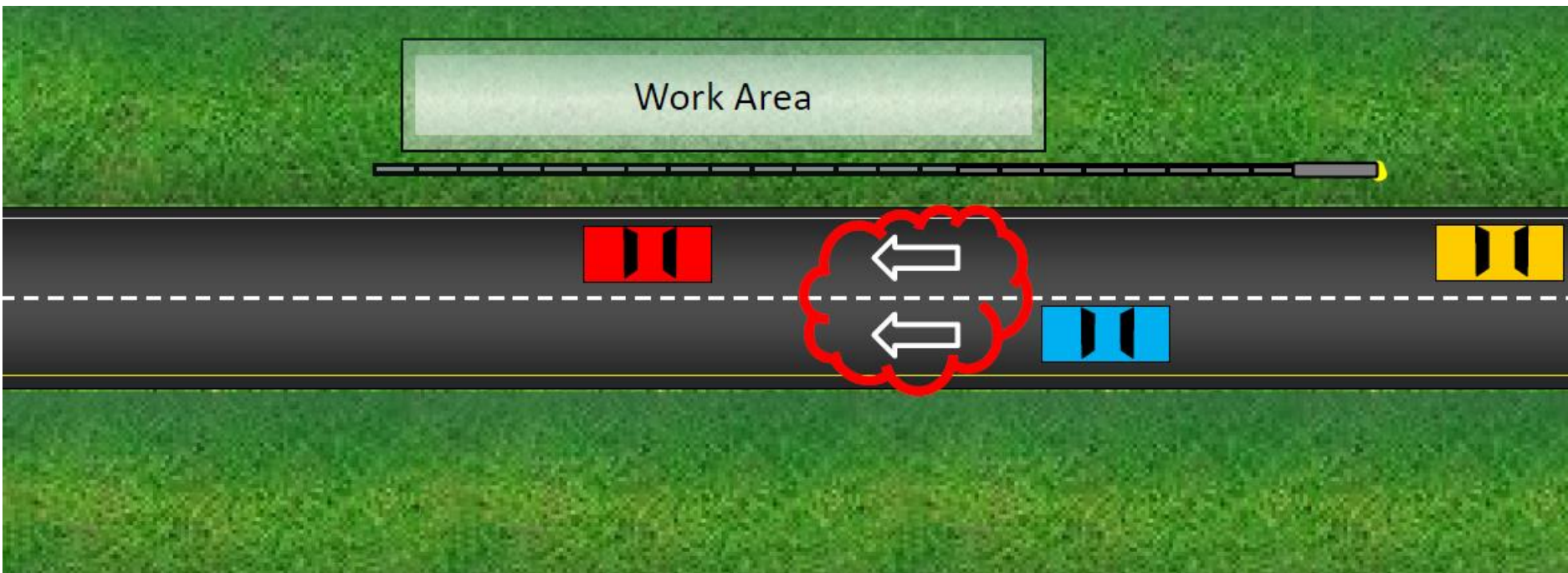
Temporary Barrier Terminology

- Trailing End
 - Downstream end of a barrier system that is not exposed to approaching traffic



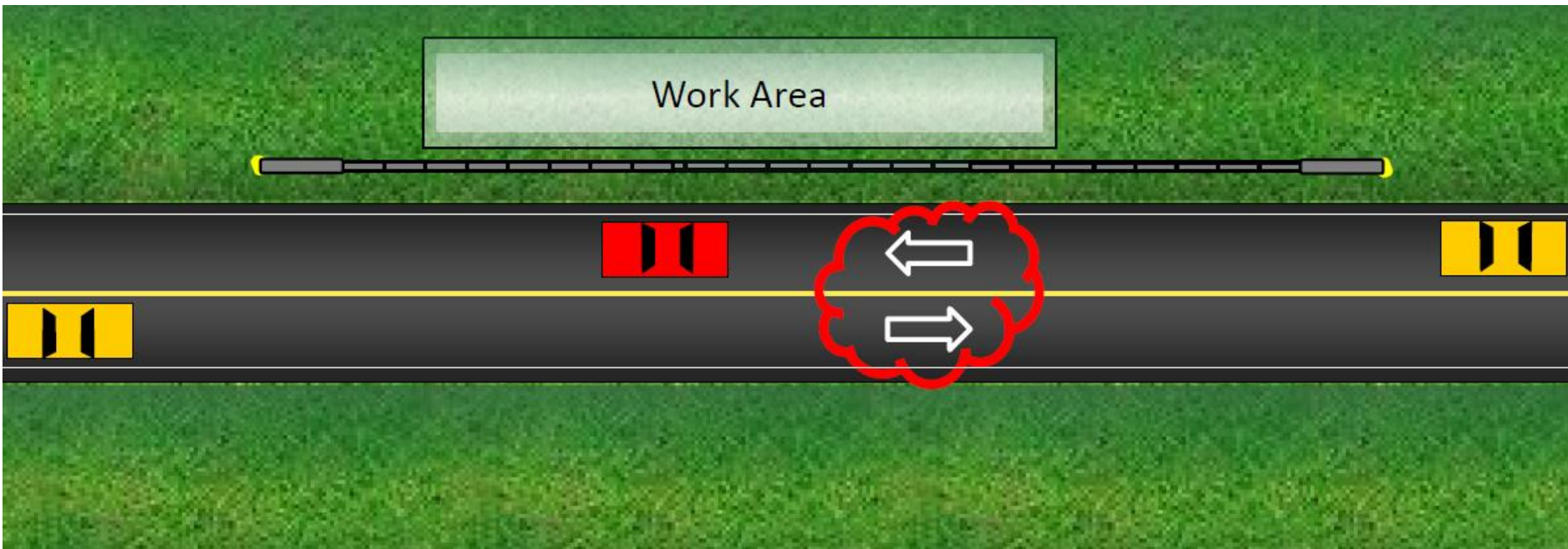
Temporary Barrier Terminology

- Unidirectional
 - Exposed to traffic approaching from one direction only



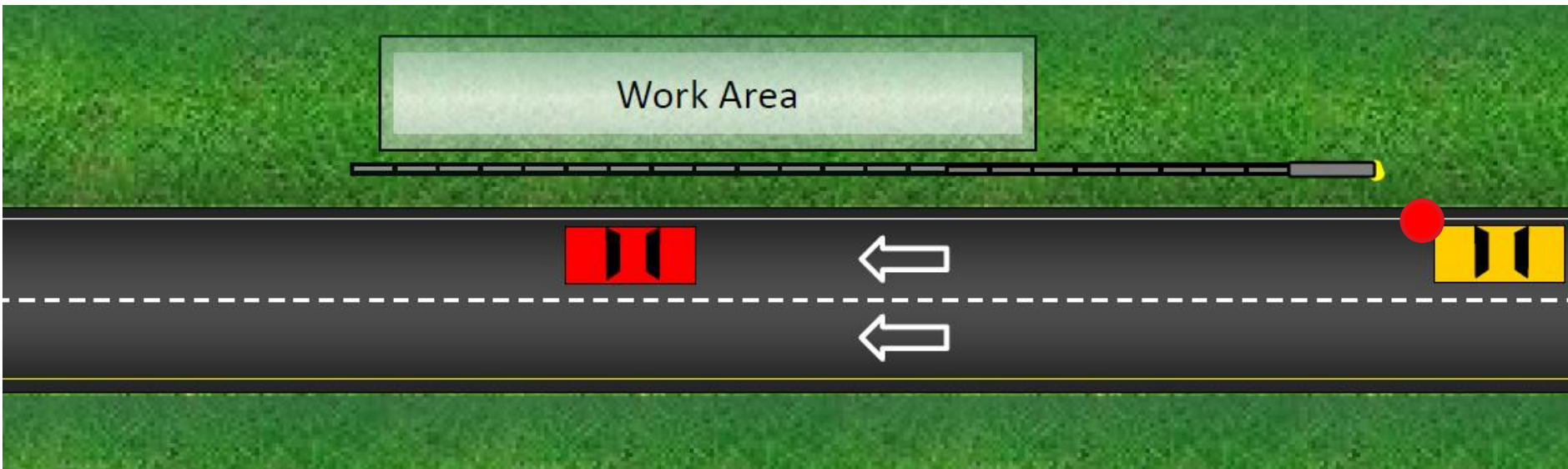
Temporary Barrier Terminology

- Bidirectional
 - Exposed to traffic approaching from opposing directions



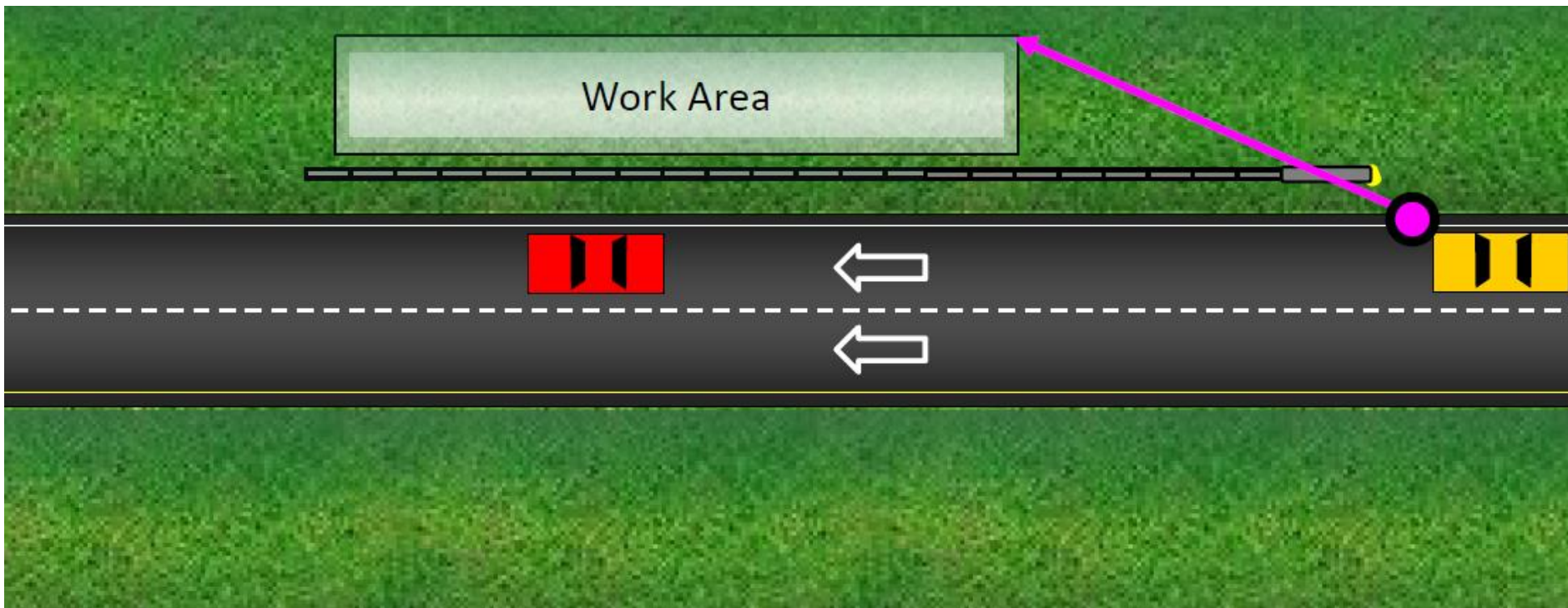
Temporary Barrier Terminology

- Point of Departure
 - A point on the edge of a lane at which an errant vehicle leaving the lane will likely impact the leading face of a hazard or area of concern



Temporary Barrier Terminology

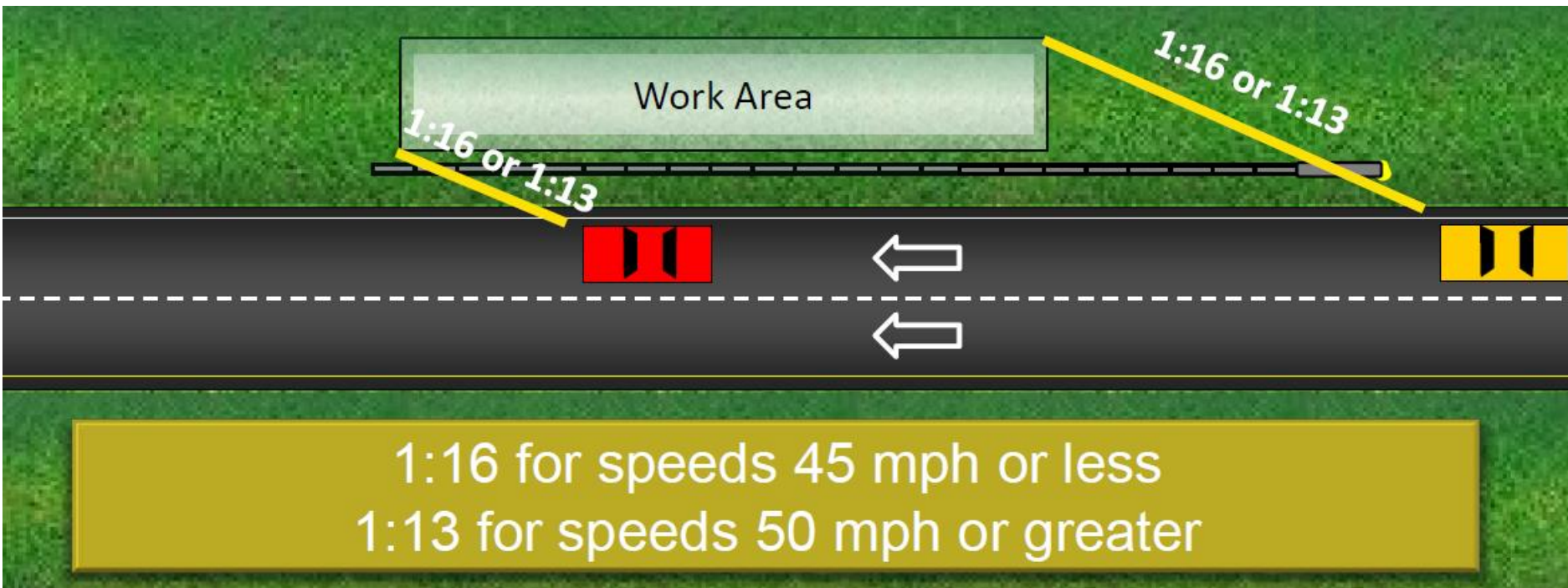
- Departure Line
 - A line extending from the Point of Departure to the back of a hazard or Clear Zone



Temporary Barrier Terminology

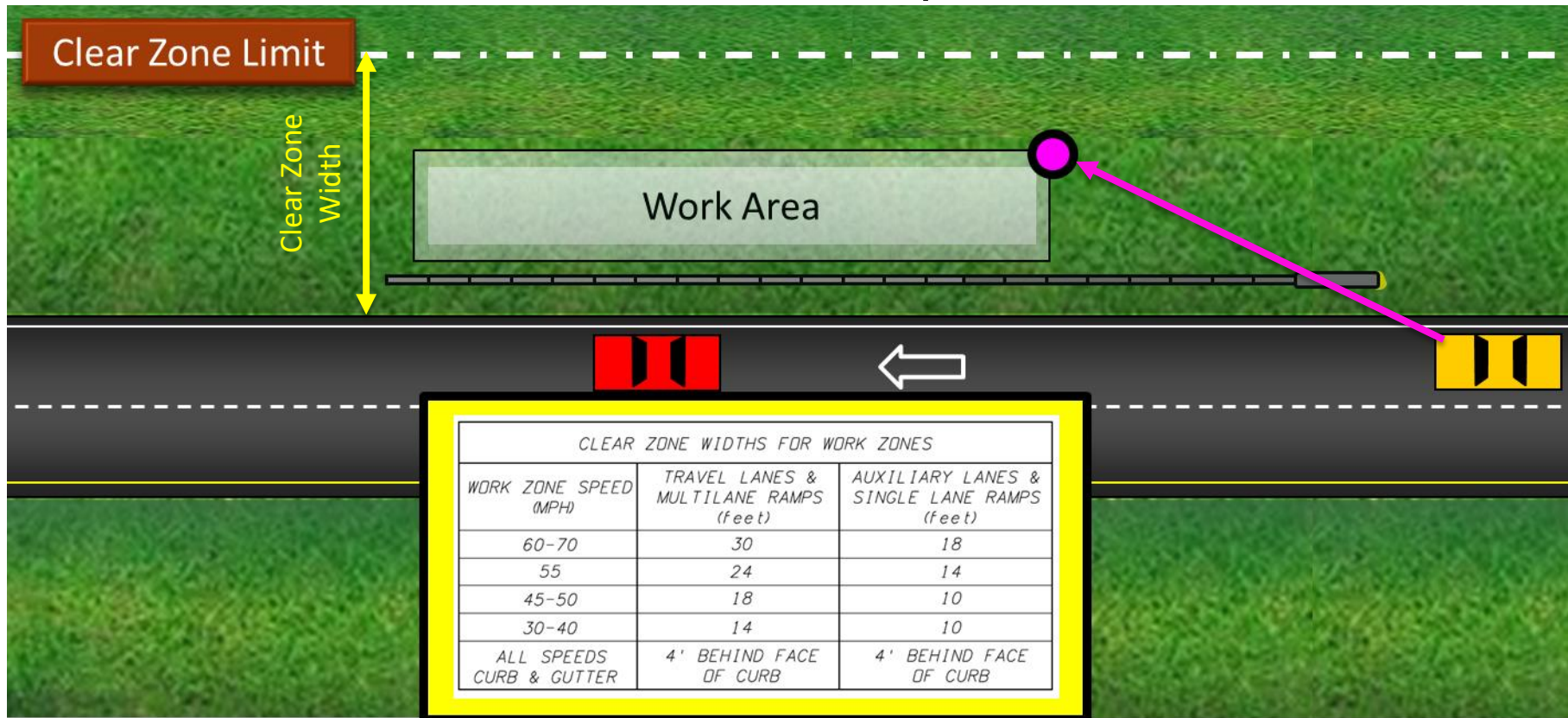
- **Departure Rate**

- The rate at which the Departure Line leaves the roadway and extends to the back of a hazard or clear zone



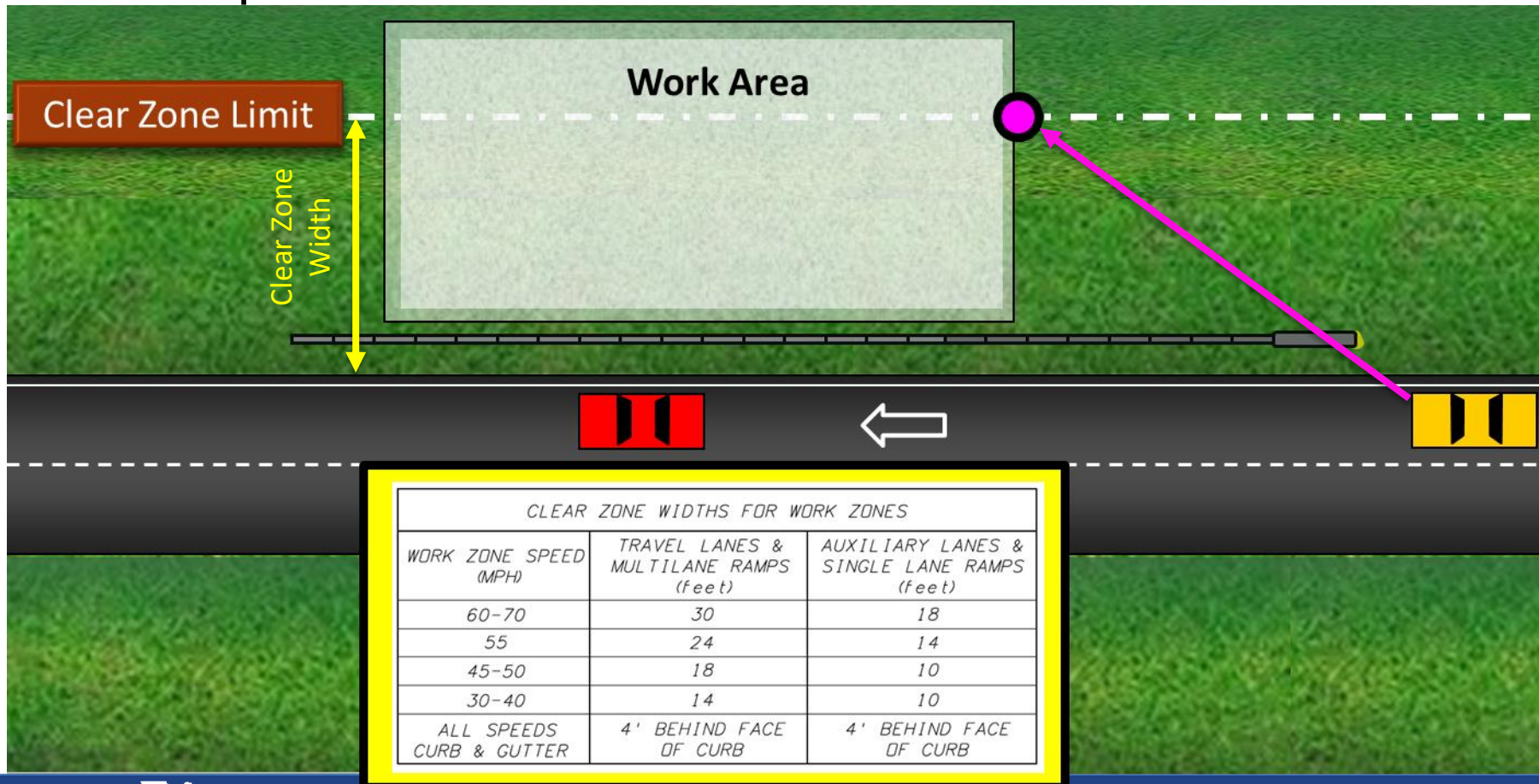
Temporary Barrier Terminology

- Work Area INSIDE Clear Zone Limit
 - Use the Back of Hazard or Back of Work Area Inside of Clear Zone to determine departure line



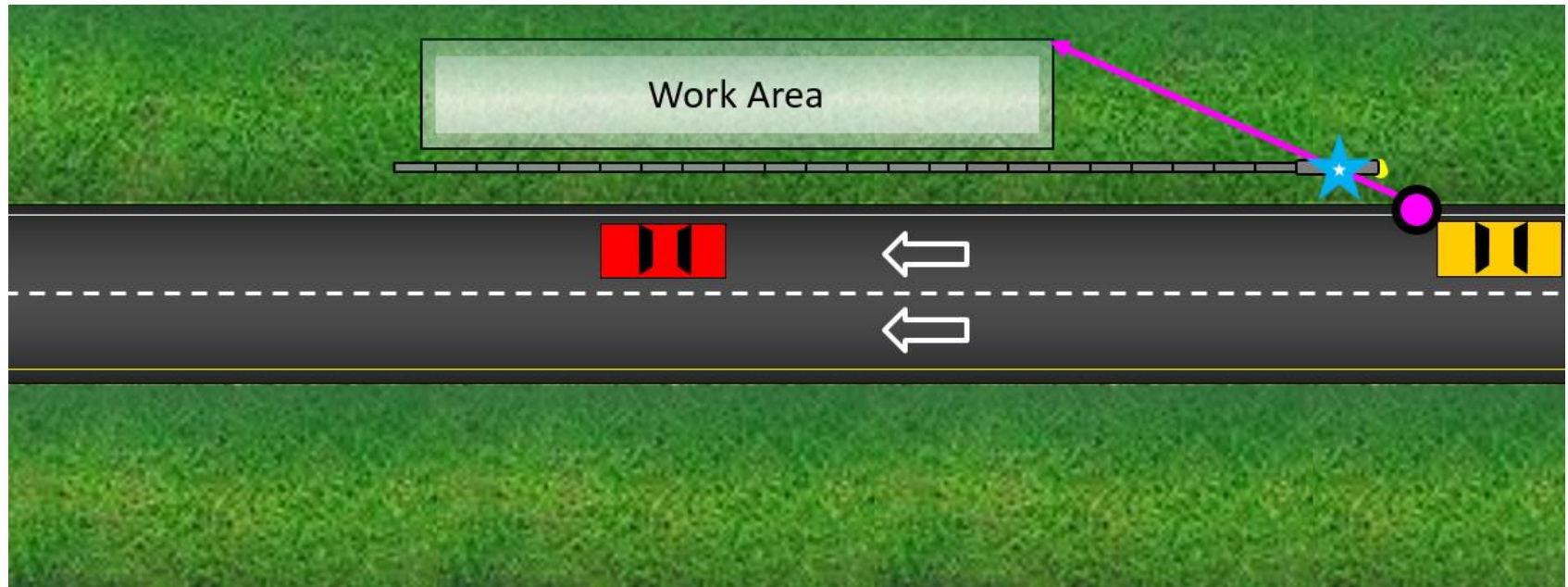
Temporary Barrier Terminology

- Work Area extends OUTSIDE Clear Zone Limit
 - Use the Clear Zone Limit Distance to determine departure line



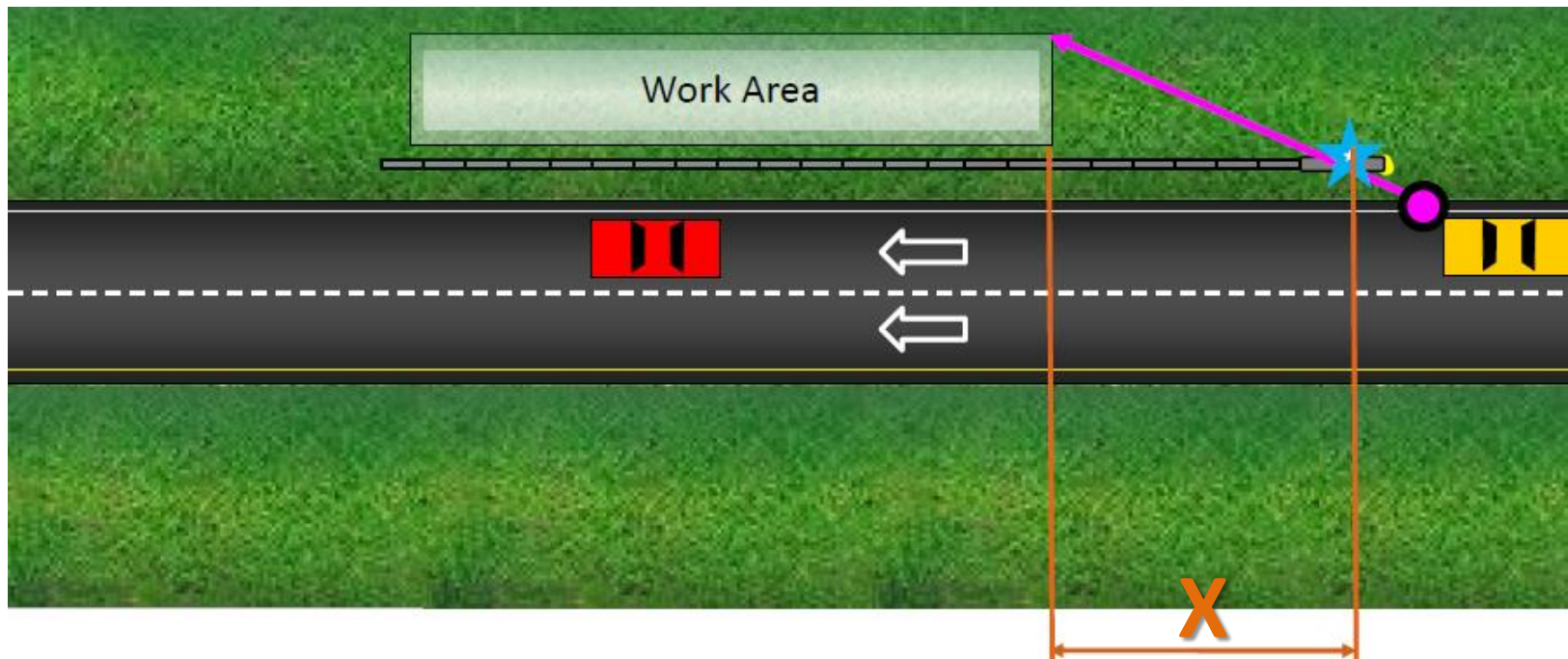
Temporary Barrier Terminology

- Beginning Length of Need
 - The point at which a barrier intersects the Departure Line establishes the Beginning of the Length of Need



Temporary Barrier Terminology

- Length of Advancement (X)
 - The distance a longitudinal barrier must be extended in advance of a hazard or area of concern in order to adequately shield the hazard or area

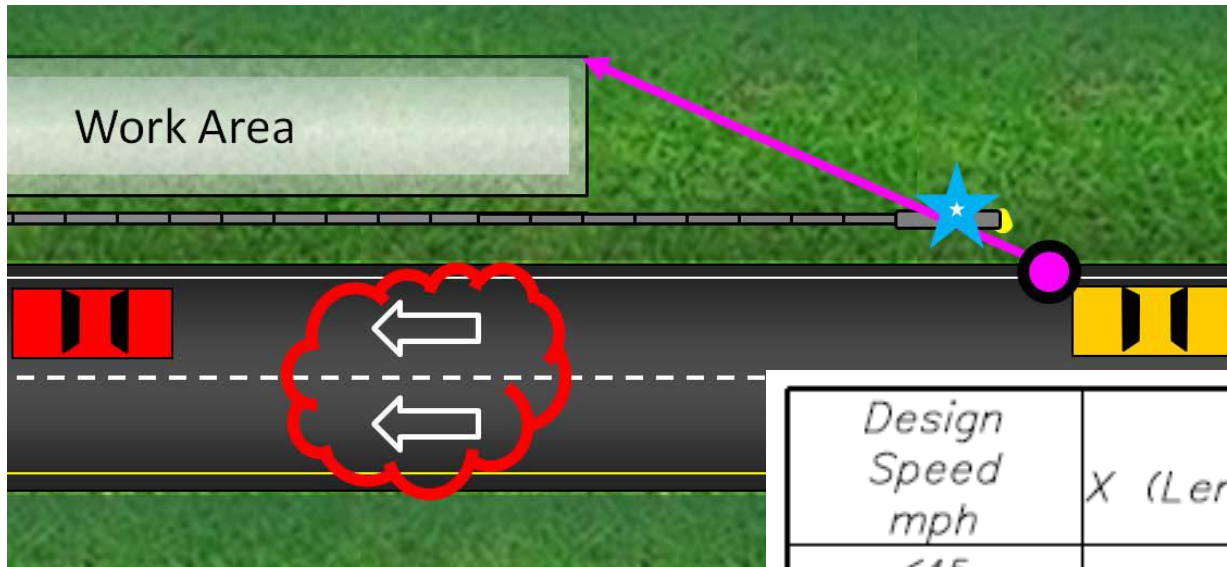


Temporary Barrier Terminology – Length of Advancement

- Example: For 45 mph with CZ of 18' with barrier set at 2' from Edge of Pavement

$$X = 16 (18-2)$$

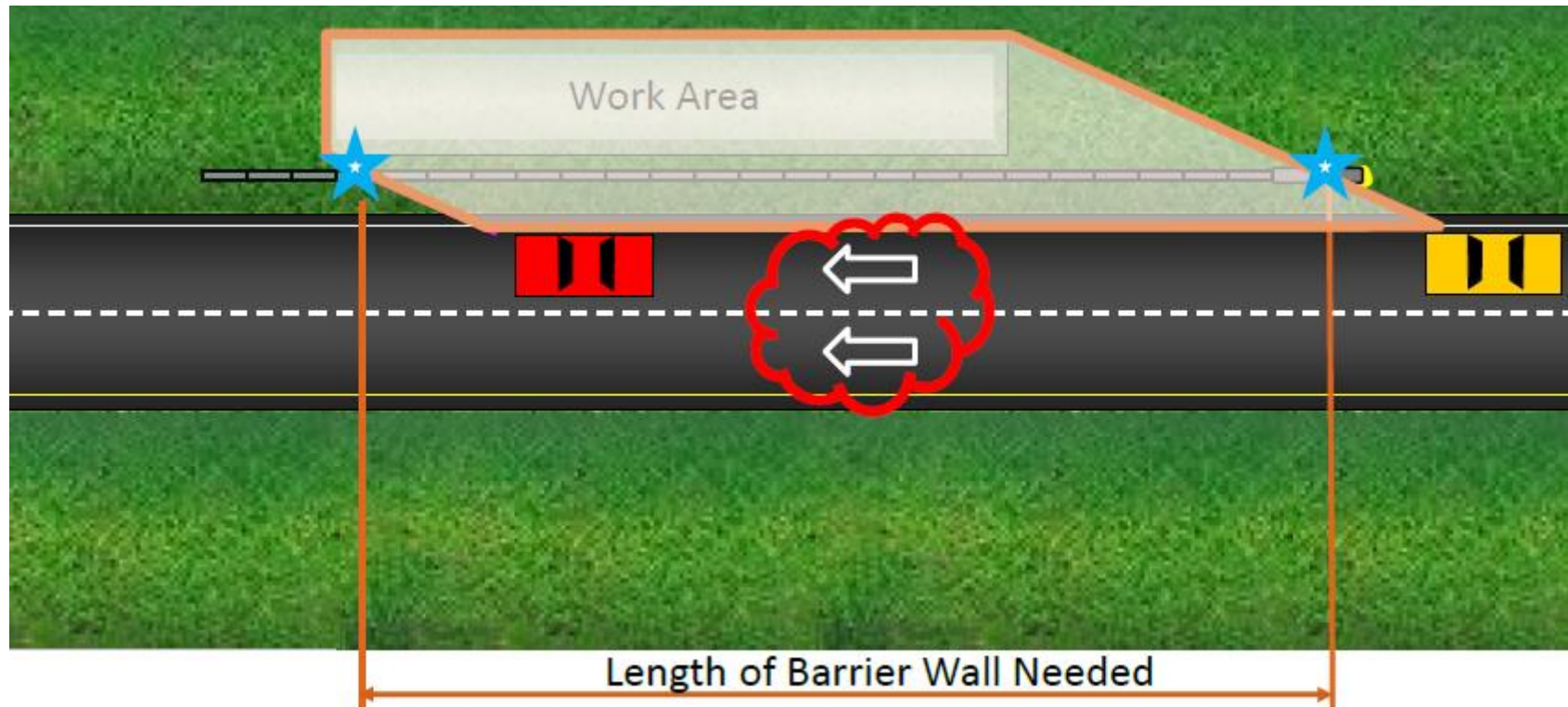
$$X = 256'$$



Design Speed mph	X (Length Of Advancement) Ft. ▣
≤45	= 16 (D-d)
≥50	= 13 (D-d)

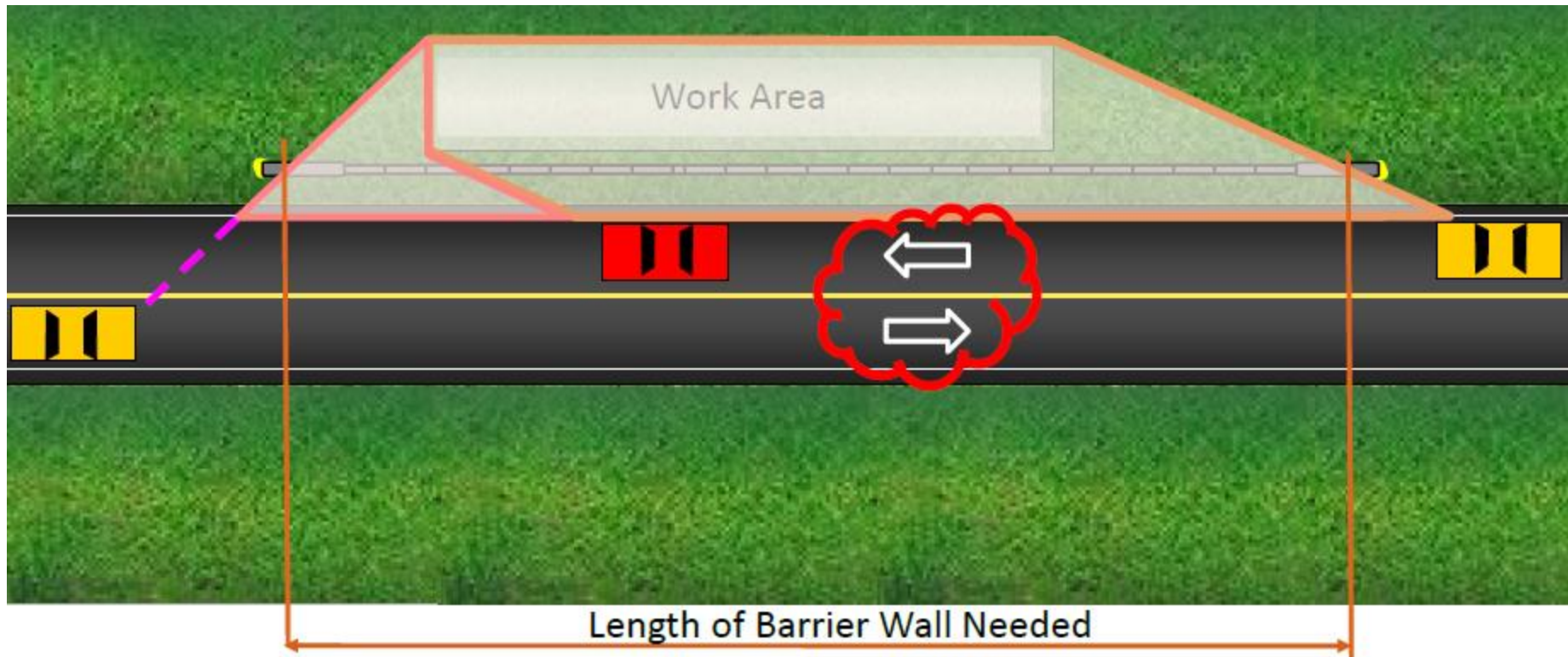
Temporary Barrier Terminology

- Length Of Need Unidirectional
 - Barrier needed is from the approach departure line to the trailing departure line.



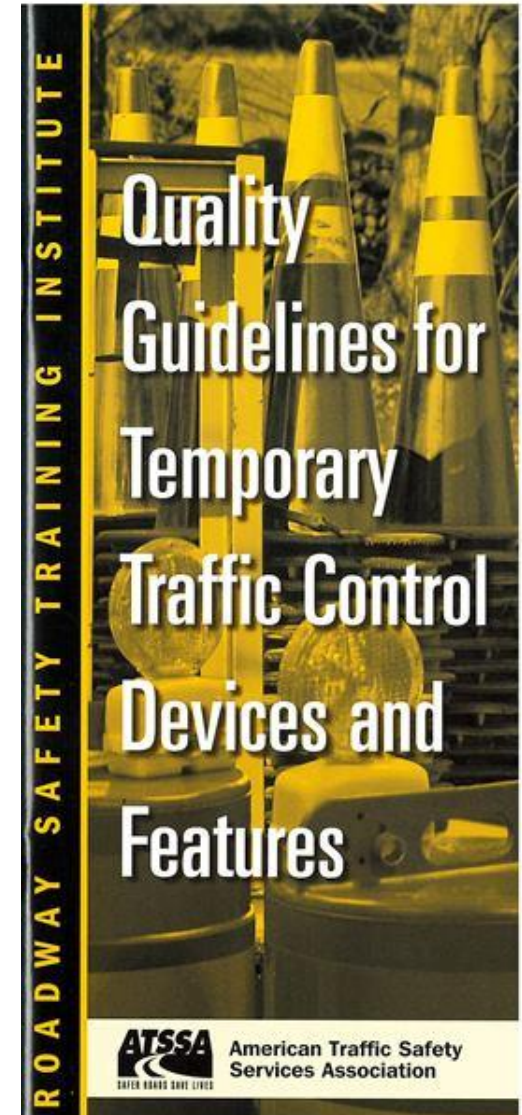
Temporary Barrier Terminology

- Length Of Need Bidirectional
 - Barrier needed is from the approach departure line to the trailing departure line



Barrier Wall Inspection

- Quality Guidelines for Temporary Traffic Control Devices and Features
 - ATSSA American Traffic Safety Services Association (ATSSA)
 - Helps personnel determine when a traffic control device has outlived its usefulness
 - Device condition may be acceptable, marginal or unacceptable
 - **FDOT does not allow the use of units in “marginal” and “unacceptable” conditions (Specification 102-9.1)**



Barrier Wall Inspection

- Acceptable
 - New
 - Spalls & chipped concrete are small and pose no threat of damaging or snagging tires
 - Loops are in good condition



Barrier Wall Inspection

- Marginal
 - Minor spalls
 - Hairline cracks
 - Minor imperfections
 - Loops are in good condition



Barrier Wall Inspection

- Unacceptable
 - Large spalls
 - Hairline cracks
 - Exposed rebar
 - Loops are not in good condition



Barrier Delineators

- Description

- Yellow or White Sheeting
- 3 inches wide by 4 inches high Sheeting
- Type IV or XI Sheeting

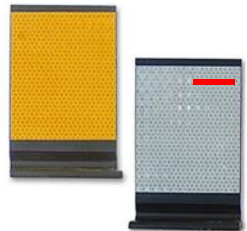


- Placement

- On top of temporary barrier wall or LCD

- Purpose

- Placed in a line to delineate the travel way





Types of Temporary Barrier

In this section, we will take a closer look at the different types of temporary barrier and their installation. Also, we will review some common issues with temporary barrier installations found during MOT Process Reviews.

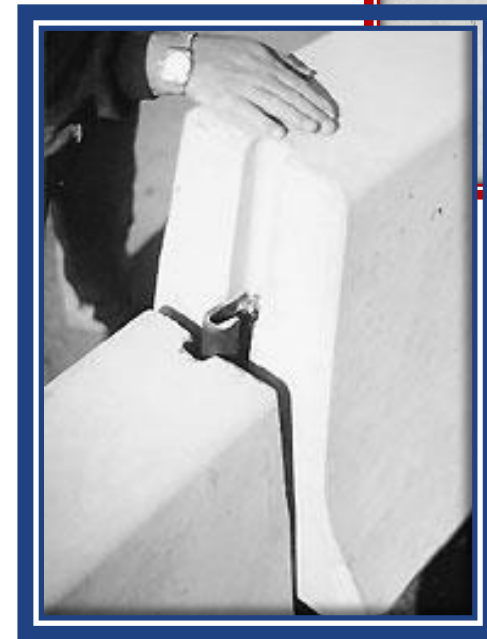
Always refer to the Specifications, Design Standards, and vendor product manuals listed on the [APL](#) for full installation requirements.

Temporary Barriers

- 4 Types
 - 32” Precast Concrete
 - Low Profile Precast Concrete
 - Water Filled
 - 32” Steel

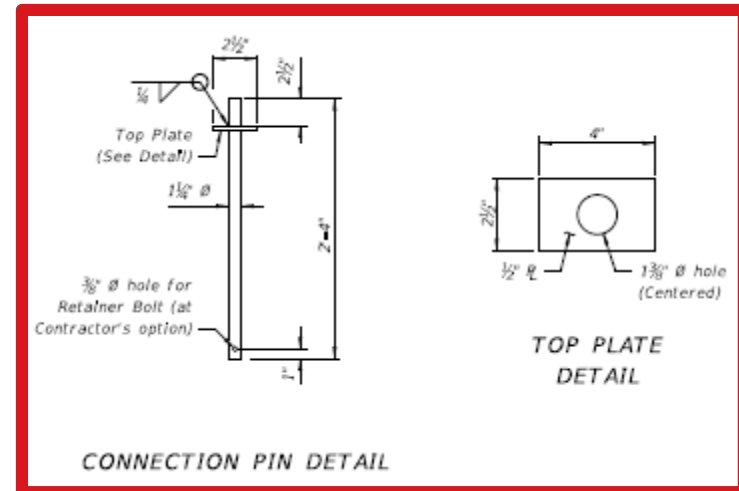
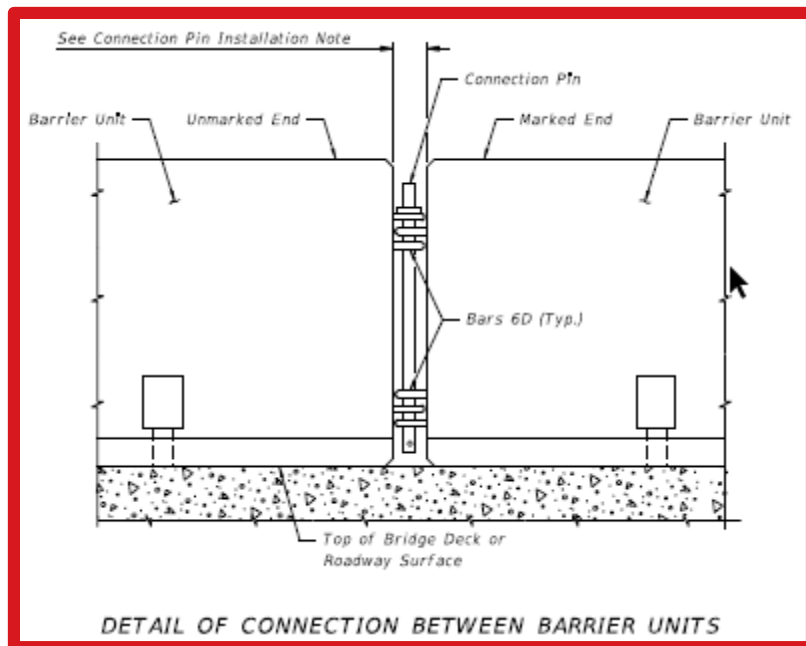
Precast Concrete

- 2 Types of 32" Precast Concrete
 - Type K
 - F-shape generic barrier developed by FDOT for both roadway and bridge applications
 - Segments are joined with a steel connecting loop and pin
 - Proprietary
 - Must be listed on the Approved Products List
 - Meet the requirements for “Alternate Designs” in Index 414 or meet the requirements of Index 415



Type K Barrier – Index 414

- Segments are joined with a steel connecting loop and pin
- The top plate of the connection pin is rectangular with correct dimensions



Type K Barrier – Index 414

- Only Type K Barriers and Proprietary Steel Barriers are approved for use on bridges



Type K Barrier

- Installation
 - Bolted
 - Staked
 - Free Standing
 - Backfilled

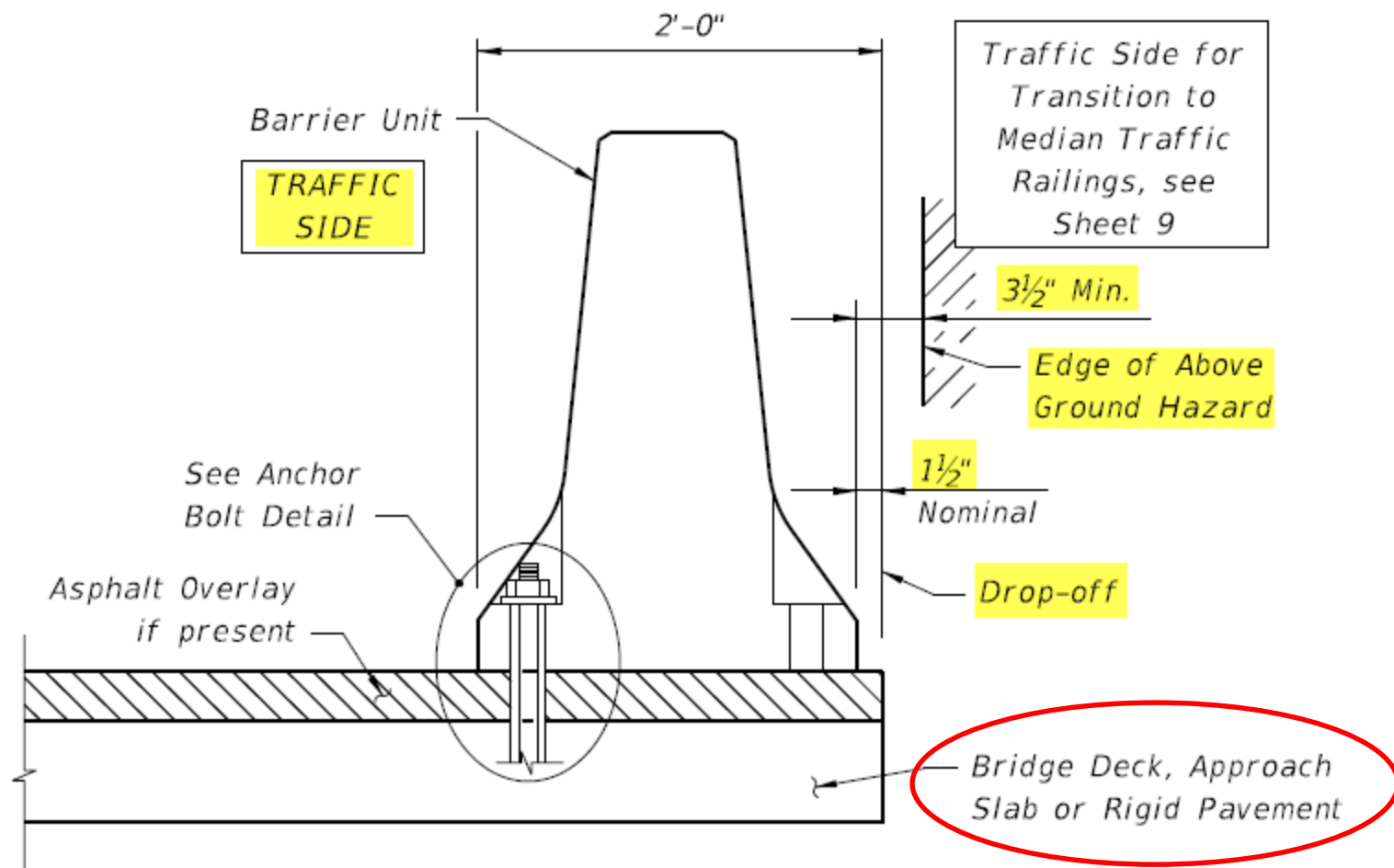
- Surface
 - Rigid Pavement (Concrete)
 - Flexible Pavement (Asphalt)
 - Cross Slope of 1:10 or flatter

Type K Barrier

- Transitions
 - Required Between Type K Freestanding, Bolted, Stake and Backfilled
 - Required between other types of Barriers
 - Overlapping transitions between other types of barriers are governed by Index 415
- Deflection Space
 - Varies on Type of Installation, Use, Location and Speed
 - Defined in Index 414, Sheets 5, 6, and 7 as distance to the edge of flexible or rigid pavement
 - Defined in Index 600 as “Setback Distance”

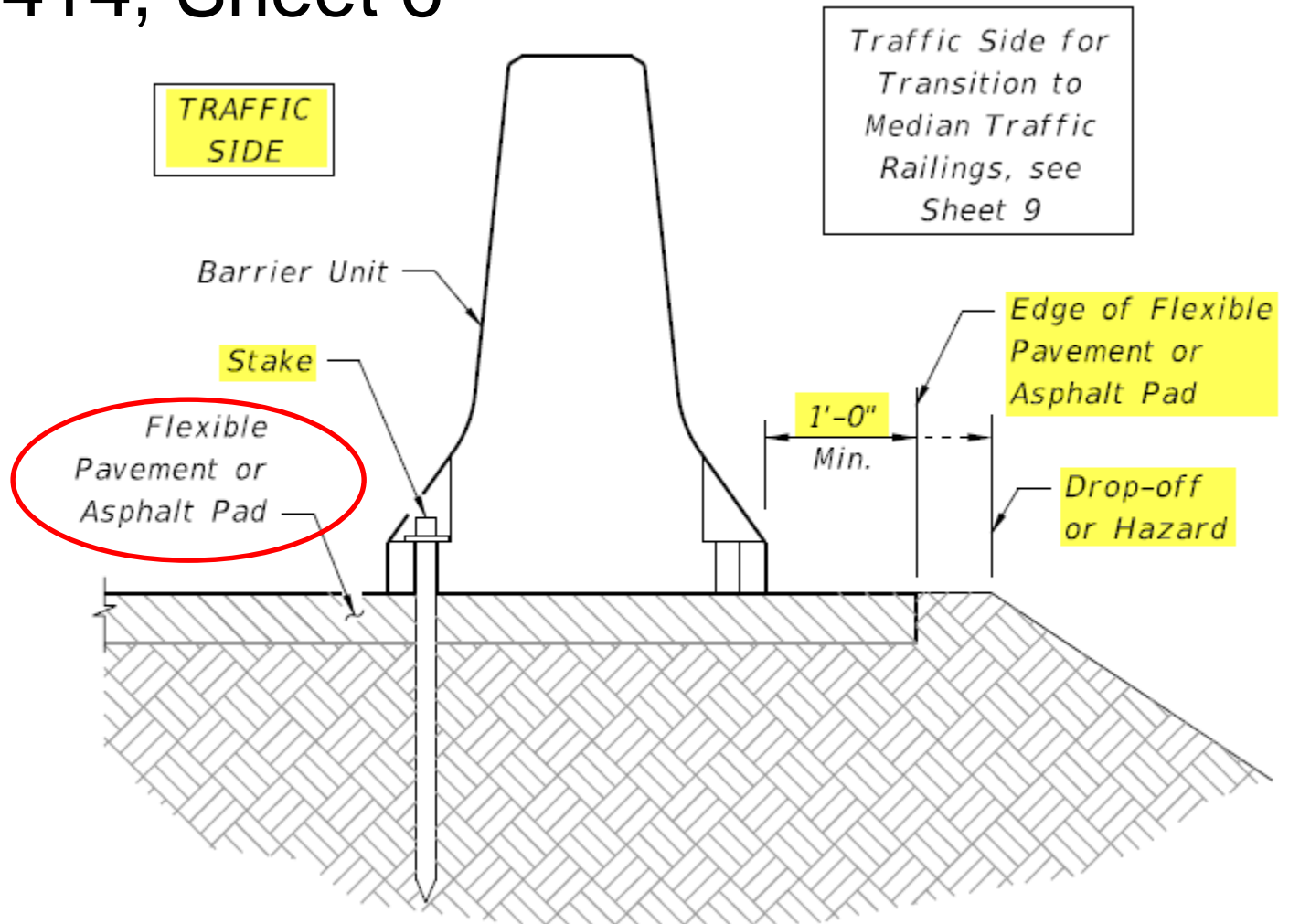
Type K Barrier – Bolted

- Index 414, Sheet 5



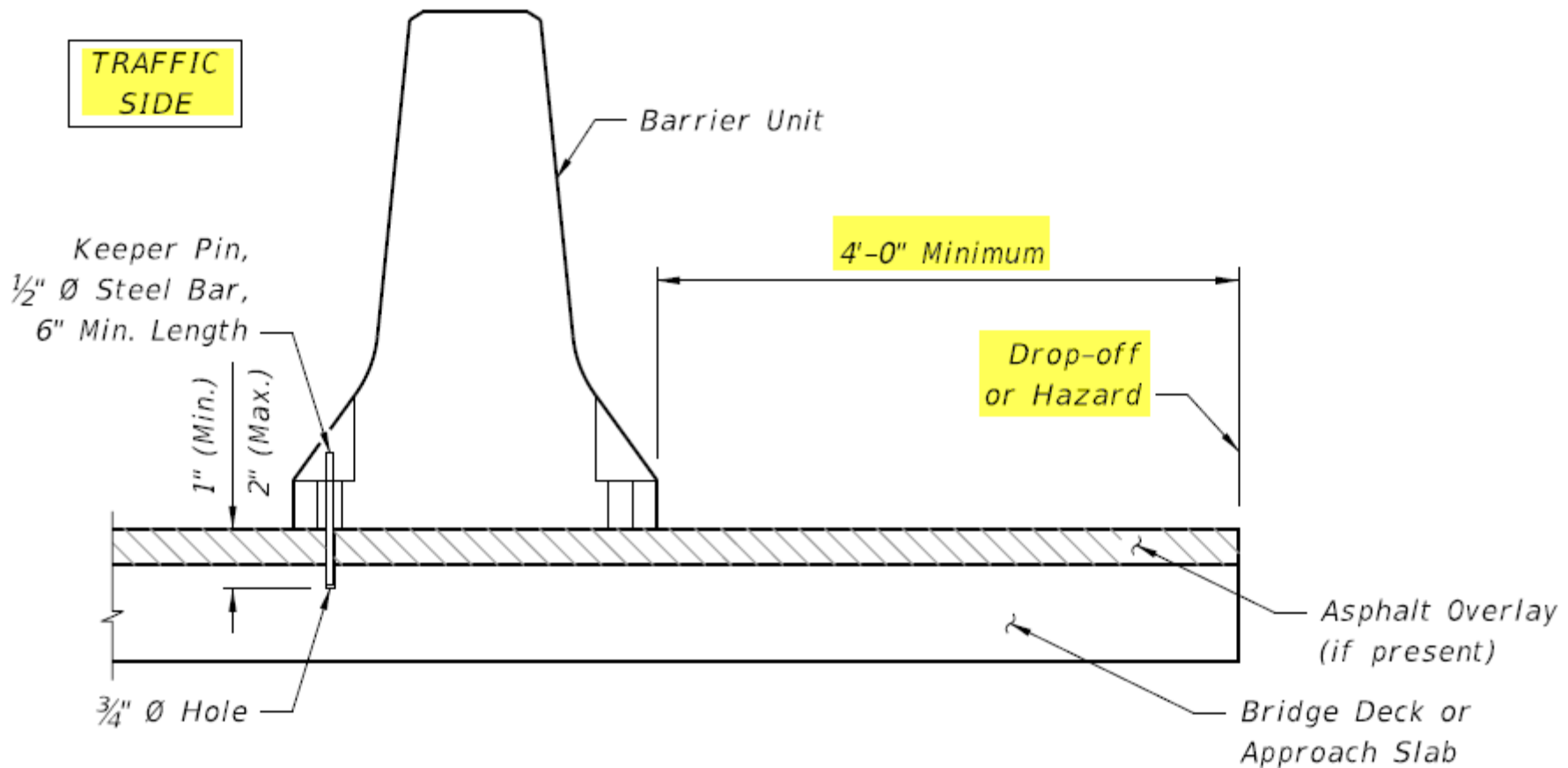
Type K Barrier – Staked

- Index 414, Sheet 6



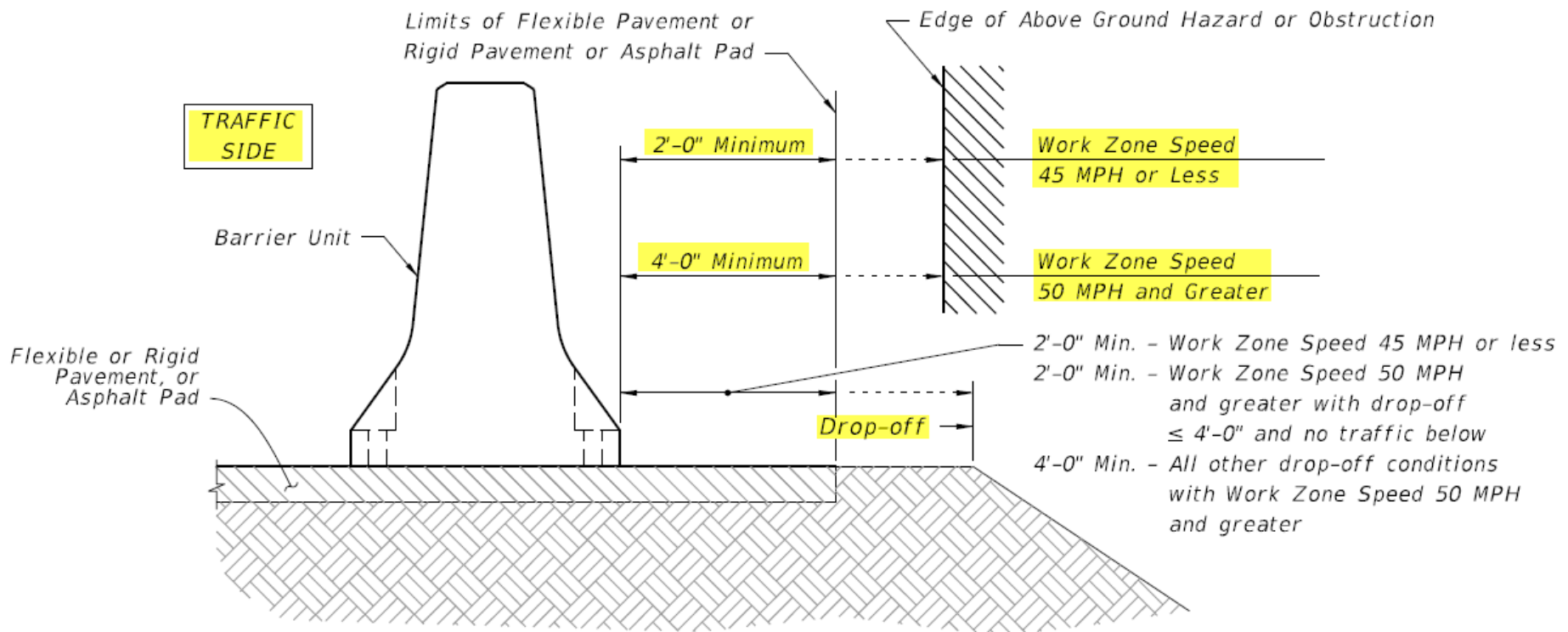
Type K Barrier – Freestanding (Bridge)

- Index 414, Sheet 6



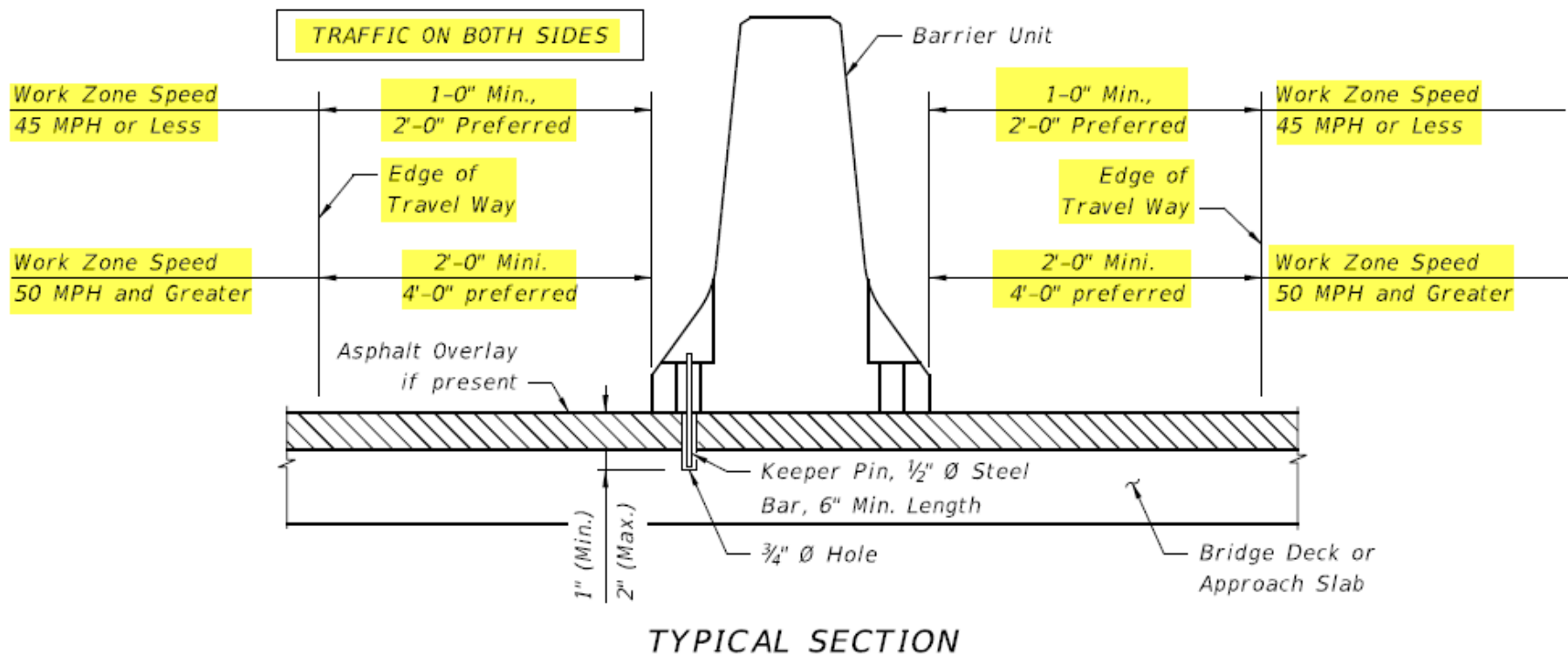
Type K Barrier – Freestanding (Roadway)

- Index 414, Sheet 6



Type K Barrier – Freestanding (Median)

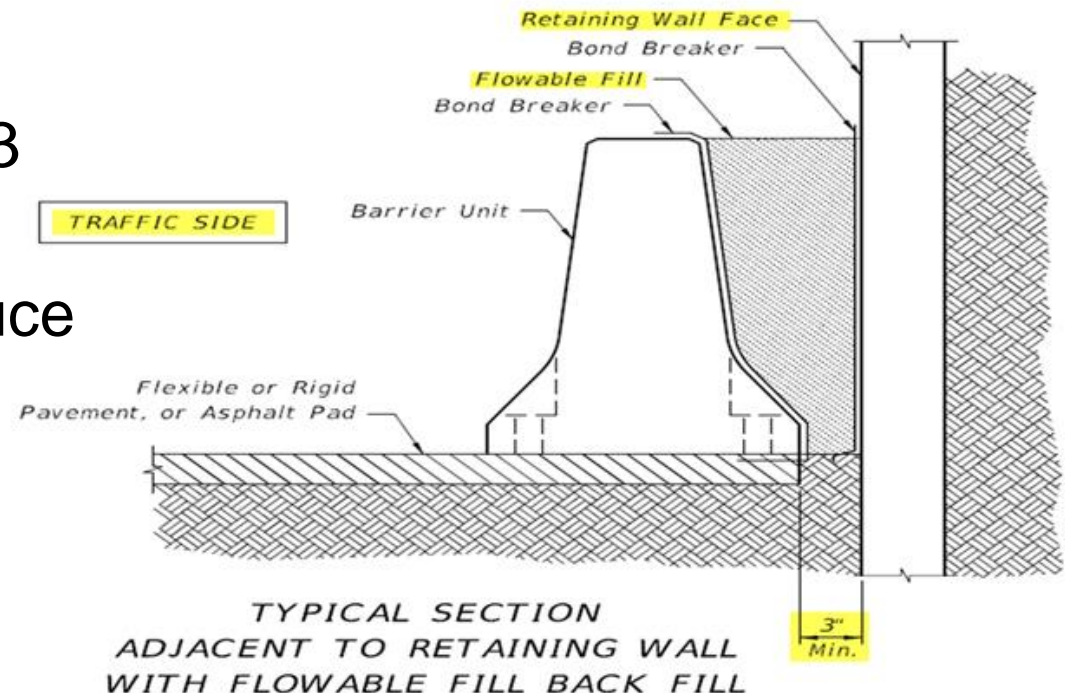
- Index 414, Sheet 7



This application applies to bridge decks, approach slabs, asphalt pads, flexible or rigid pavement

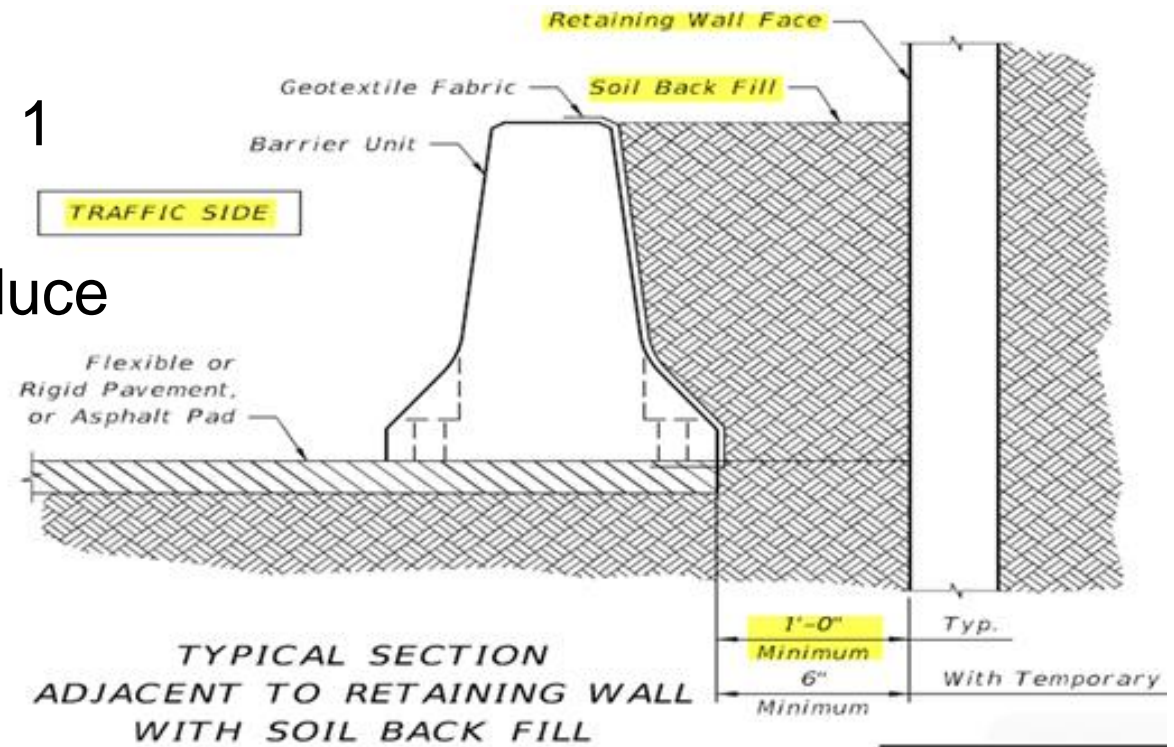
Type K Barrier – Back Filled

- Permanent Retaining Wall
 - Flowable Fill (Non-compressive)
 - Minimum offset is 3 inches
 - This is only to reduce damage to the retaining wall



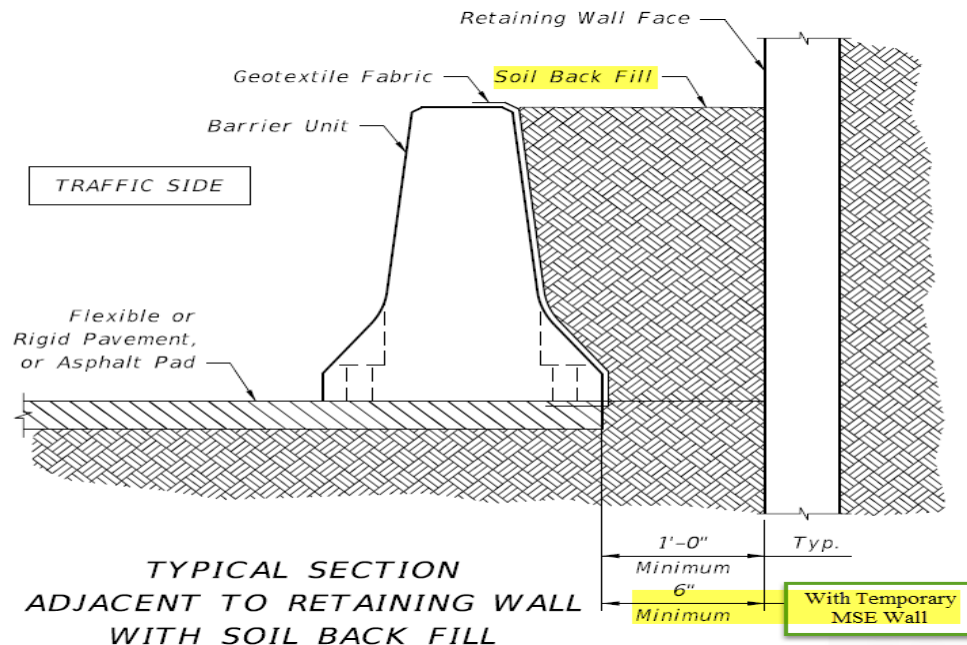
Type K Barrier – Back Filled

- Permanent Retaining Wall
 - Soil (compacted using filter fabric)
 - Minimum offset is 1 foot
 - This is only to reduce damage to the retaining wall



Type K Barrier – Back Filled

- Temporary MSE Wall
 - Soil (compacted using filter fabric)
 - Minimum offset is 6 inches
 - This is only to reduce damage to MSE wall



Type K Barrier – Transitions

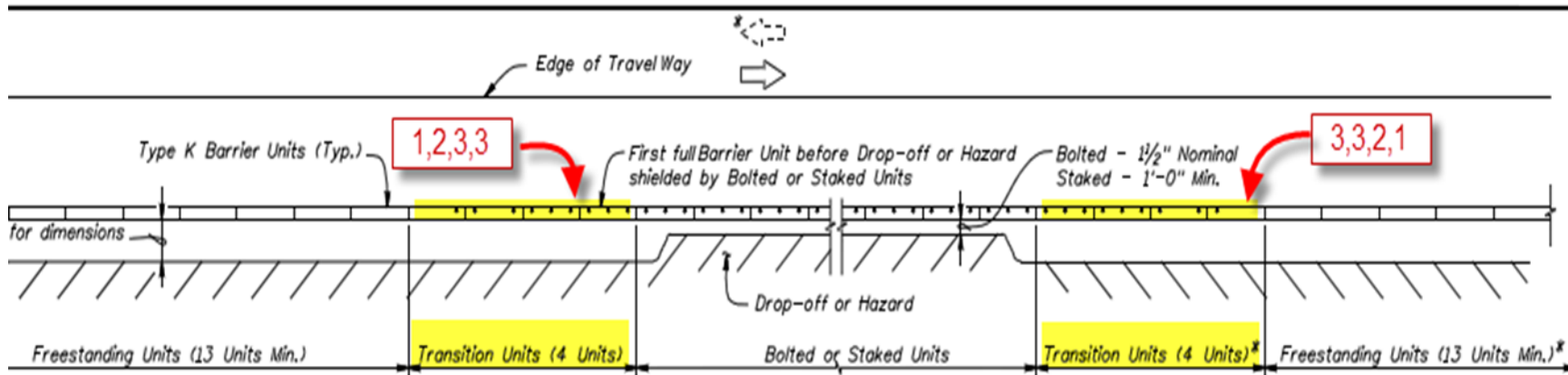
- Transition Types
 - Index 414, Sheet 8
 - Approach from Freestanding to Bolted or Staked Type K Barrier
 - Approach from Freestanding to Backfilled Type K Barrier
 - Trailing End Transition from Bolted or Staked to Freestanding Type K Barrier
 - Trailing End Transition from Backfilled to Freestanding Type K Barrier

Type K Barrier – Transitions

- Transition Types
 - Index 414, Sheet 9
 - From Freestanding Type K Barrier to Bridge Median Traffic Railing or Roadway Median Concrete Barrier Wall
 - From Freestanding Type K Barrier to Bridge Traffic Railing or Roadway Concrete Barrier Wall
 - From Bolted or Staked Type K Barrier to Bridge Traffic Railing or Roadway Concrete Barrier Wall
 - Overlapping transitions between other types of barriers are governed by Index 415

Type K Barrier – Transitions

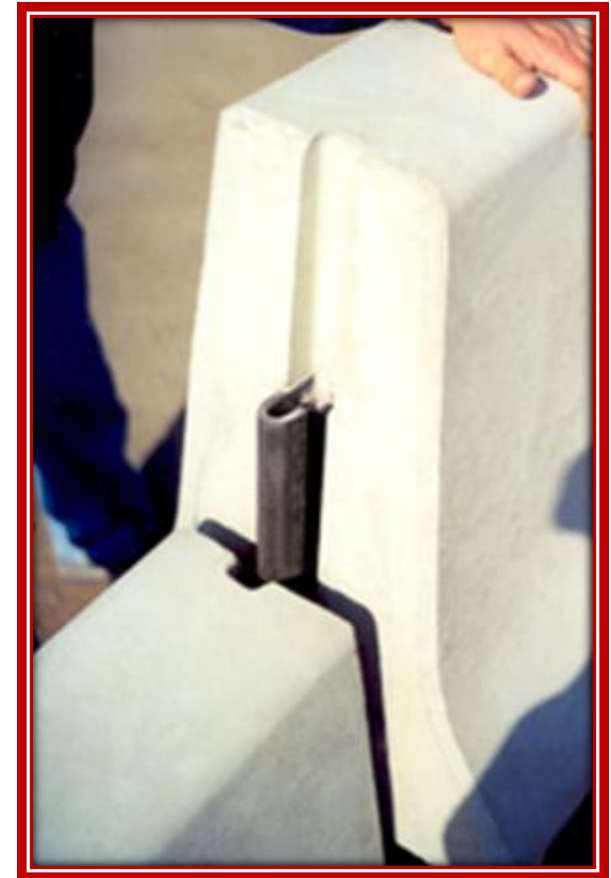
- Required Between Semi-Rigid (Freestanding) and Rigid (Bolted, Staked or Back Filled) Conditions
- Required Between Other Types of Barriers
- Most Common Type of Transition is Semi-Rigid to Rigid
 - Bolt or stake pattern for transition units is shown below



APPROACH TRANSITION FROM FREESTANDING TO BOLTED OR STAKED DOWN TYPE K TEMPORARY CONCRETE BARRIERS

Proprietary Barriers – Index 415

- 2 Types on APL
 - JJ Hooks
 - Quickchange Moveable



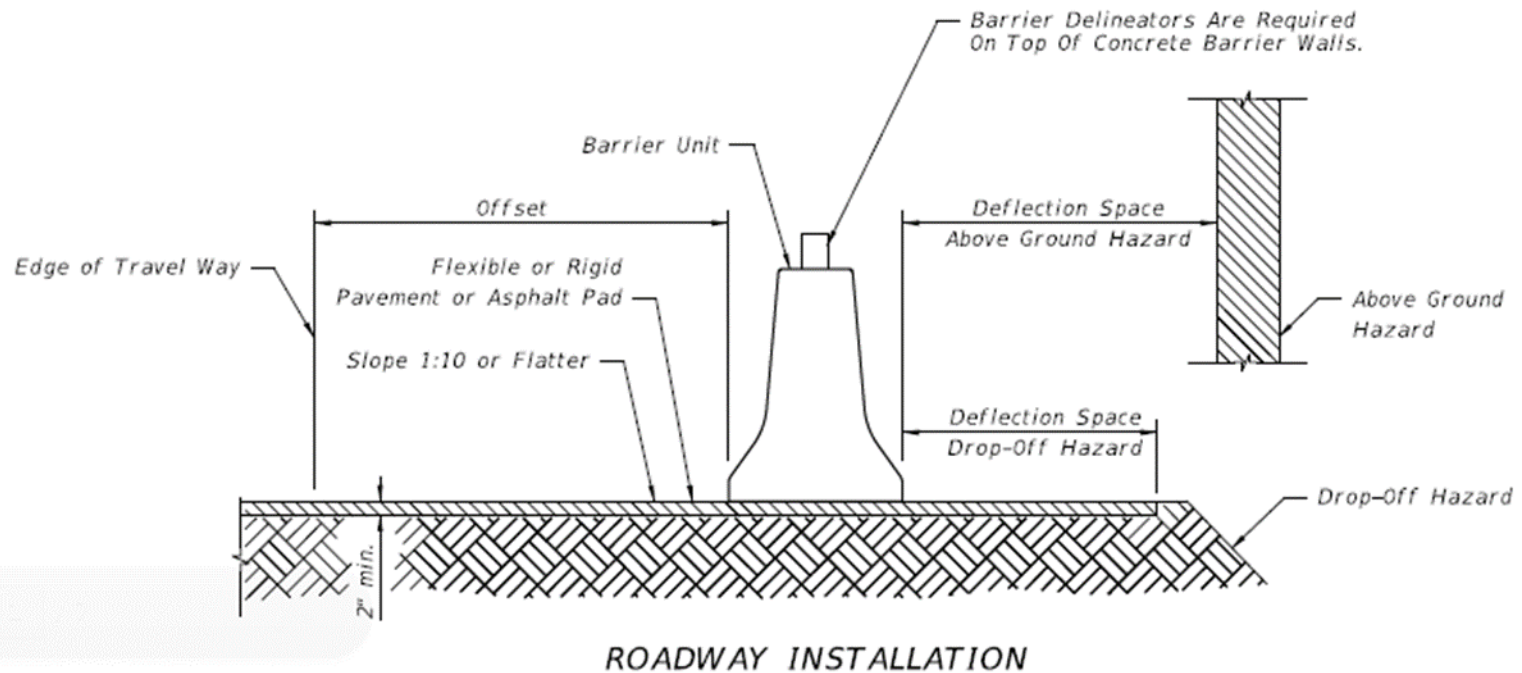
Proprietary Barriers

- Deflection Space
 - See Index 415, Sheet 1
 - Installation required on Asphalt or Concrete Surfaces

<i>OFFSET AND DEFLECTION SPACE REQUIREMENTS</i>					
<i>Installation</i>	<i>Shielding</i>	<i>Work Zone Speed</i>	<i>Offset to Travelway</i>	<i>Deflection Space</i>	
<i>Left or Right Shoulder</i>	<i>Above Ground Hazards</i>	<i>45 mph or Less</i>	<i>1' min, 2' preferred</i>	<i>2' min.</i>	
		<i>50 mph and Greater</i>	<i>2' min, 4' preferred</i>	<i>4' min.</i>	
	<i>Drop-Off Hazards</i>	<i>45 mph or Less</i>	<i>1' min, 2' preferred</i>	<i>2' min.</i>	
		<i>50 mph and Greater</i>			
		<i>a. Drop-offs 4' or Less and NO traffic below</i>		<i>2' min, 4' preferred</i>	<i>2' min.</i>
		<i>b. All drop-off conditions other than 'a'</i>		<i>2' min, 4' preferred</i>	<i>4' min.</i>
<i>Separating Traffic</i>	<i>Adjacent Opposing Traffic</i>	<i>45 mph or Less</i>	<i>1' min, 2' preferred</i>	<i>1' min., 2' preferred</i>	
		<i>50 mph and Greater</i>	<i>2' min, 4' preferred</i>	<i>2' min., 4' preferred</i>	

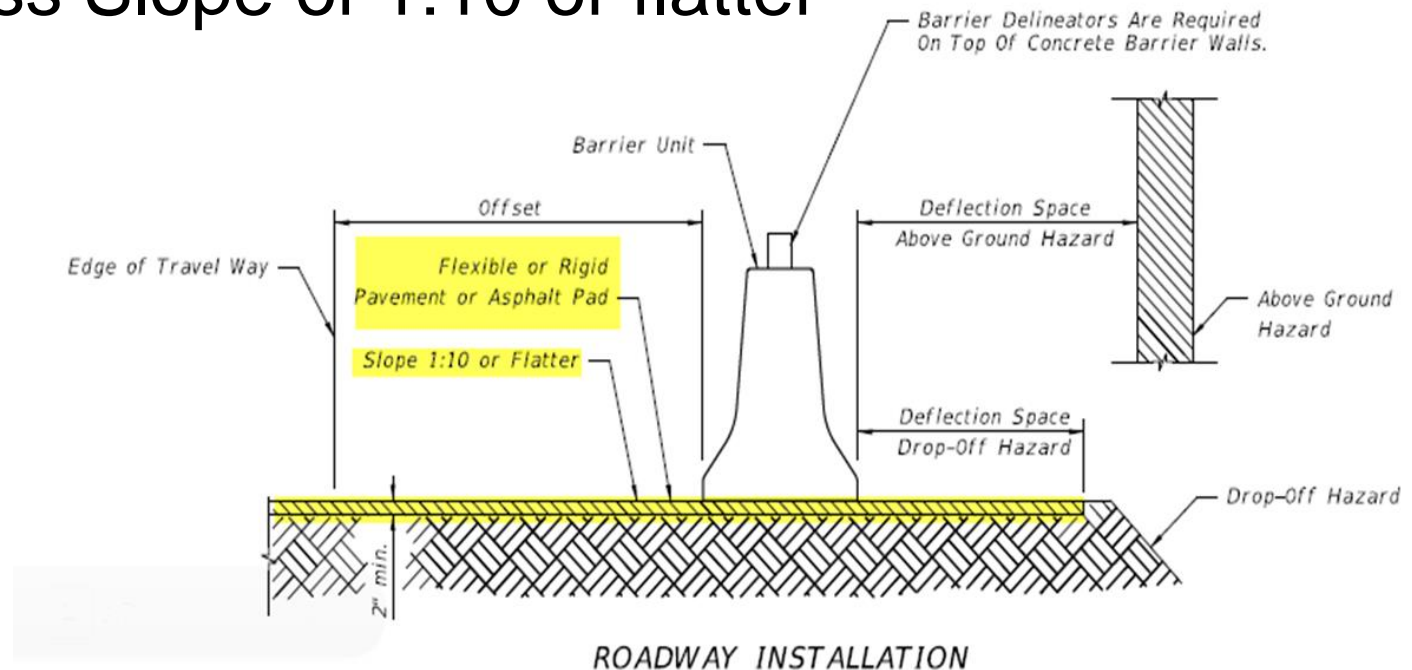
Proprietary Barriers

- Installation
 - Freestanding



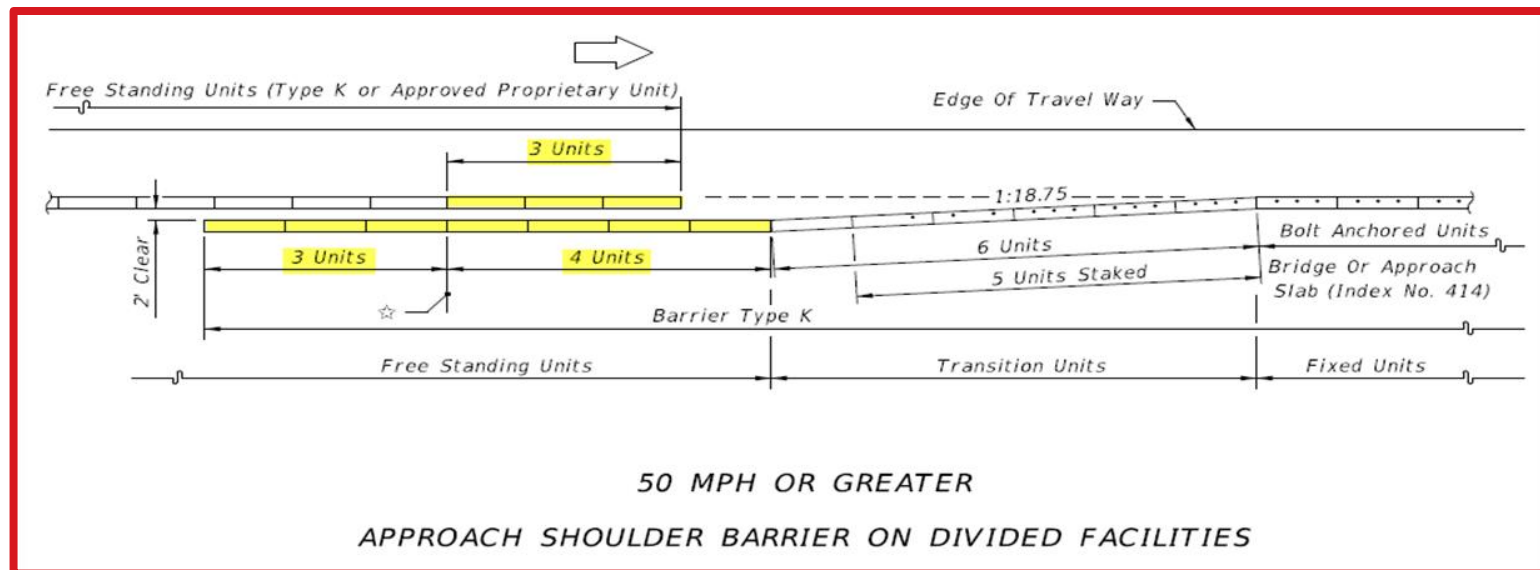
Proprietary Barriers

- Surface
 - Rigid Pavement (Concrete)
 - Flexible Pavement (Asphalt)
 - Cross Slope of 1:10 or flatter



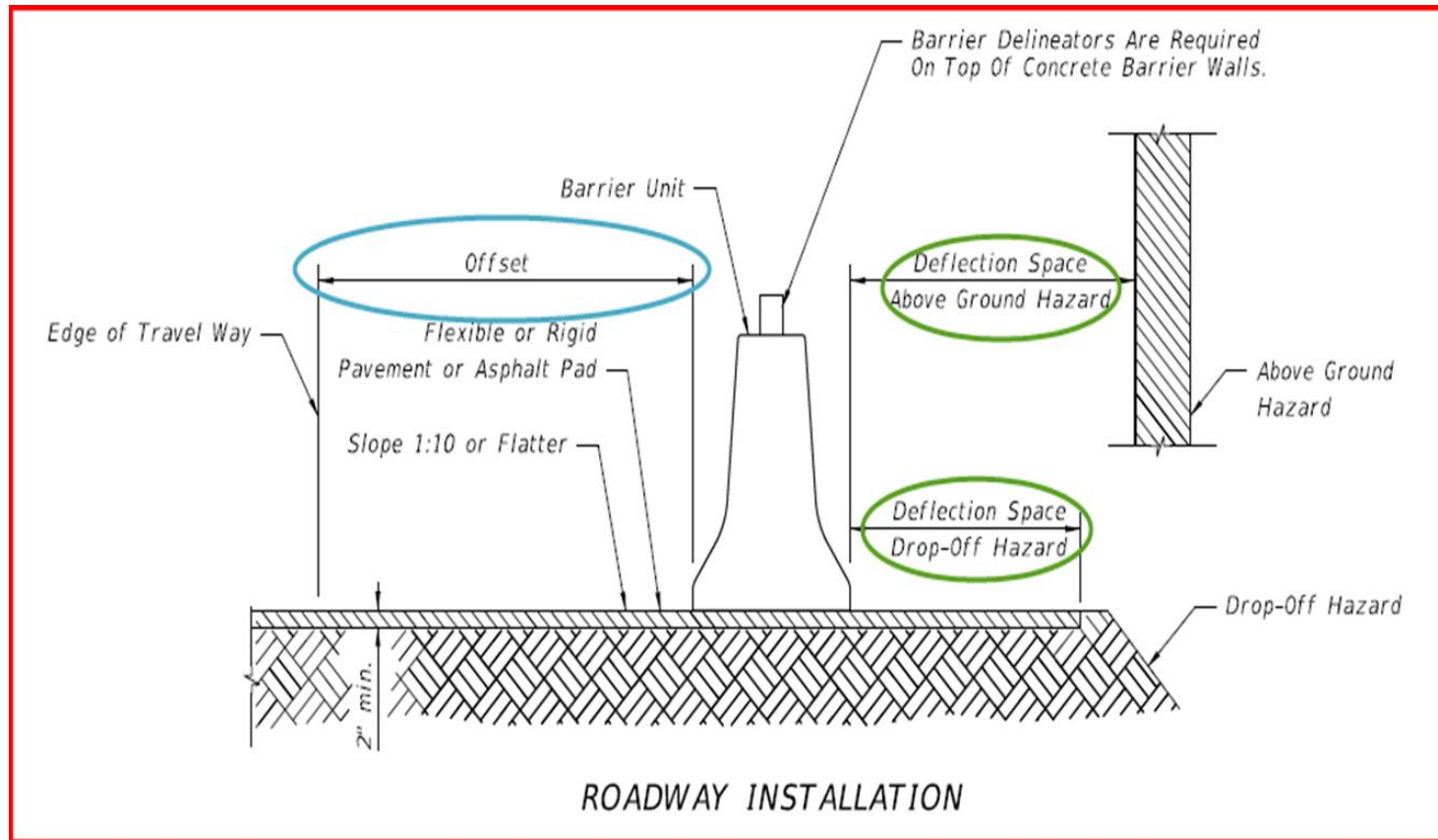
Proprietary Barriers

- Transitions
 - Overlapping transitions required between other types of barriers



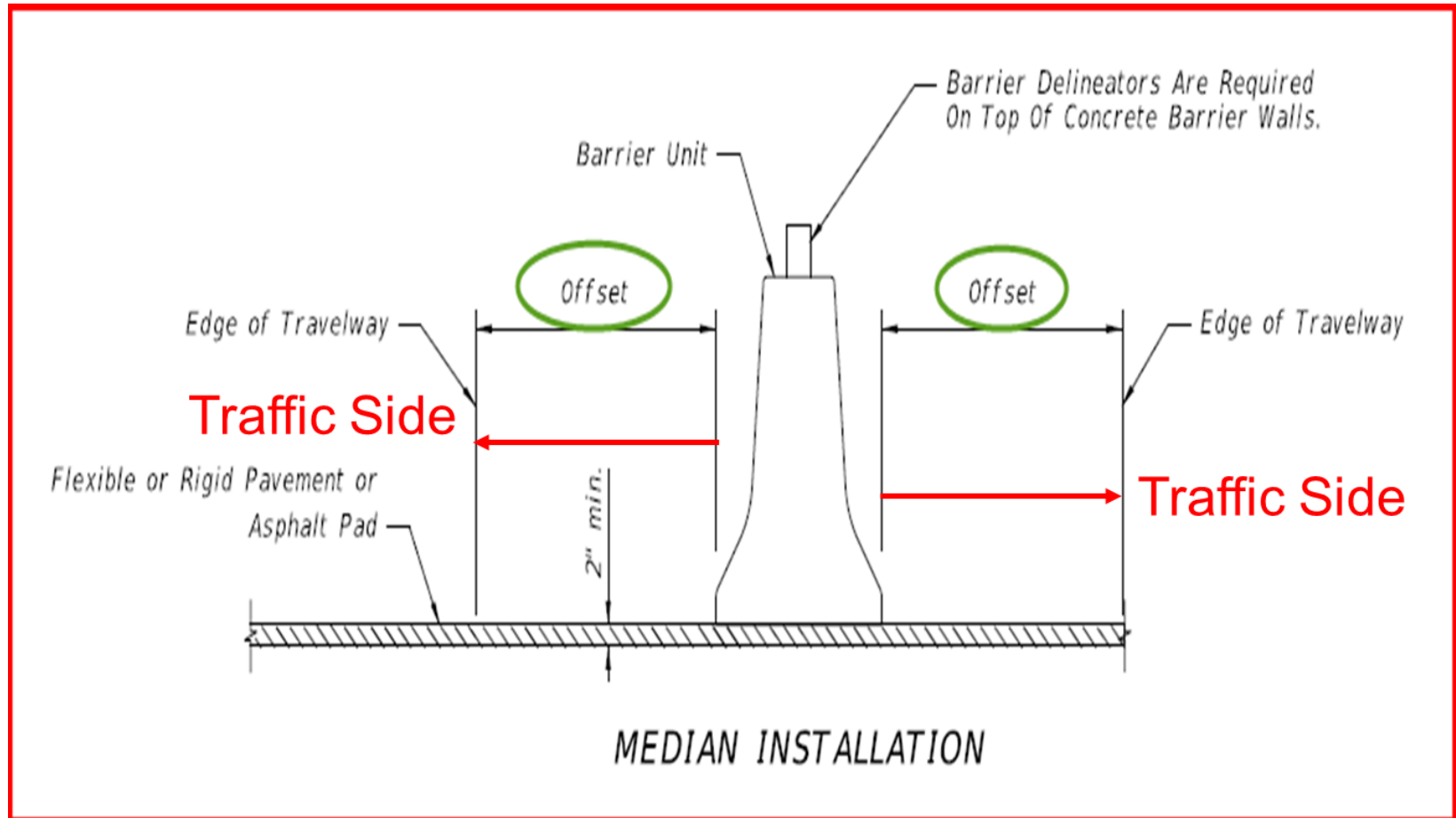
Proprietary Barriers

- Deflection Space and Offset



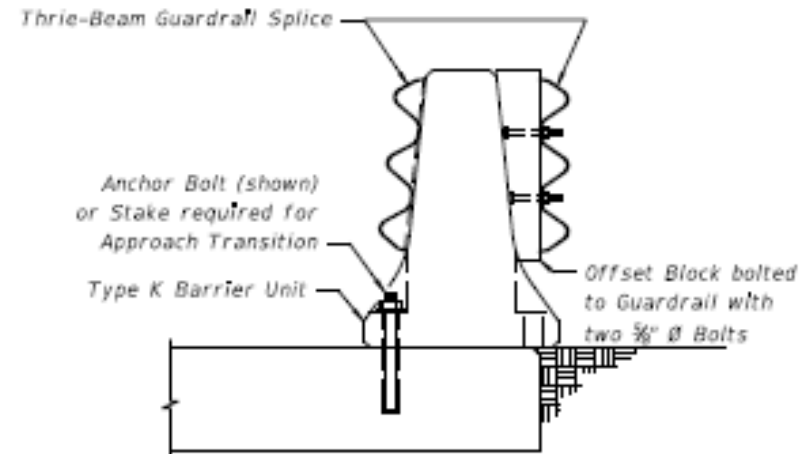
Proprietary Barriers

- Deflection Space and Offset



Common MOT Process Review Findings For Temporary Concrete Barriers

**Nonstandard connection to
bridge railing – Index 414
requires transition splice to
connect Type K to bridge railing.**



SECTION B-B
Adjacent to Shoulder Traffic Railings

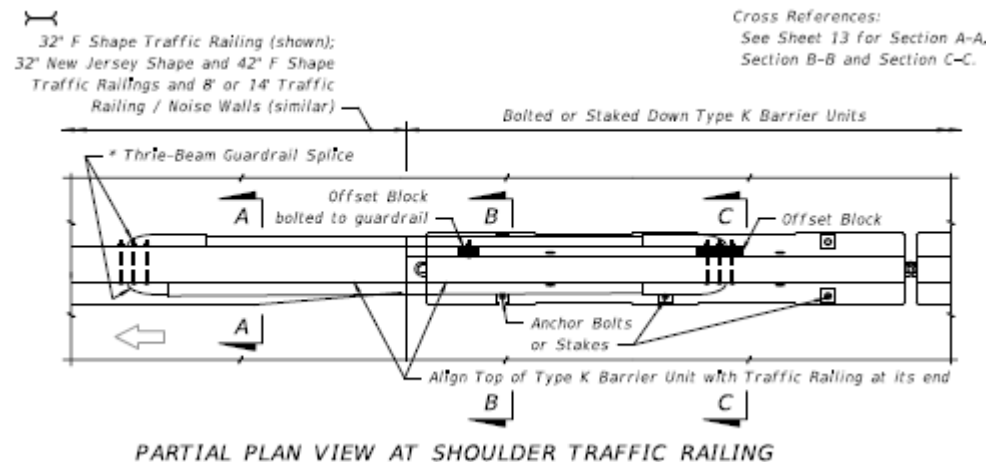
**Example of transition splice from
Index 414**

Common MOT Process Review Findings for Concrete Barriers

Nonstandard transition between W-beam guardrail and Type K barrier



Example of transition W-beam guardrail to Type K barrier from Index 414



Common MOT Process Review Findings for Concrete Barriers



Less than two foot of paved deflection behind barrier wall on a 1:10 slope – Index 414 requires 2 feet of paved deflection space on a 1:10 slope for 45 mph or greater.

Common MOT Process Review Findings for Concrete Barriers



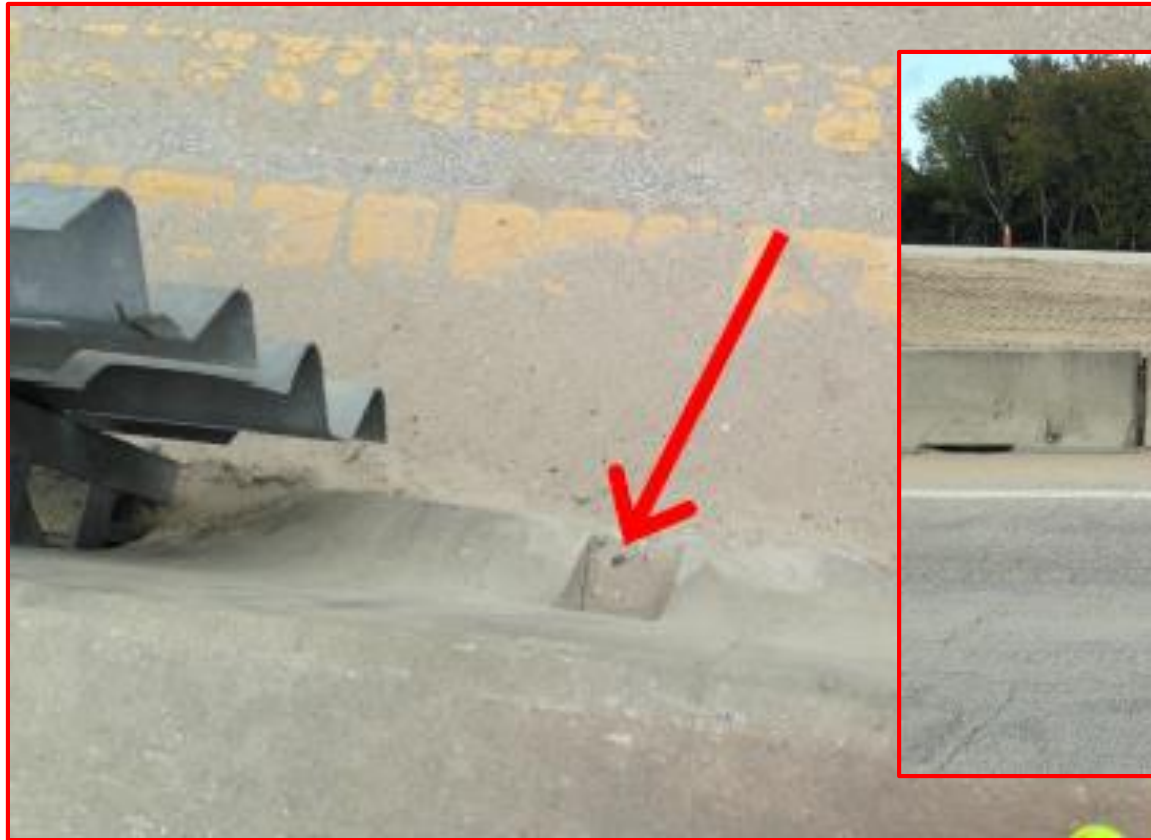
Overlap of temporary barrier does not meet clear space between walls – **Index 415** requires a minimum of six sections of barrier wall at overlap and two feet of clear space between the walls.

Common MOT Process Review Findings for Concrete Barriers



Type K Barrier has partial fill in the deflection space – Index 414 requires a minimum of 5 foot wide back fill for the full height of the barrier.

Common MOT Process Review Findings for Concrete Barriers

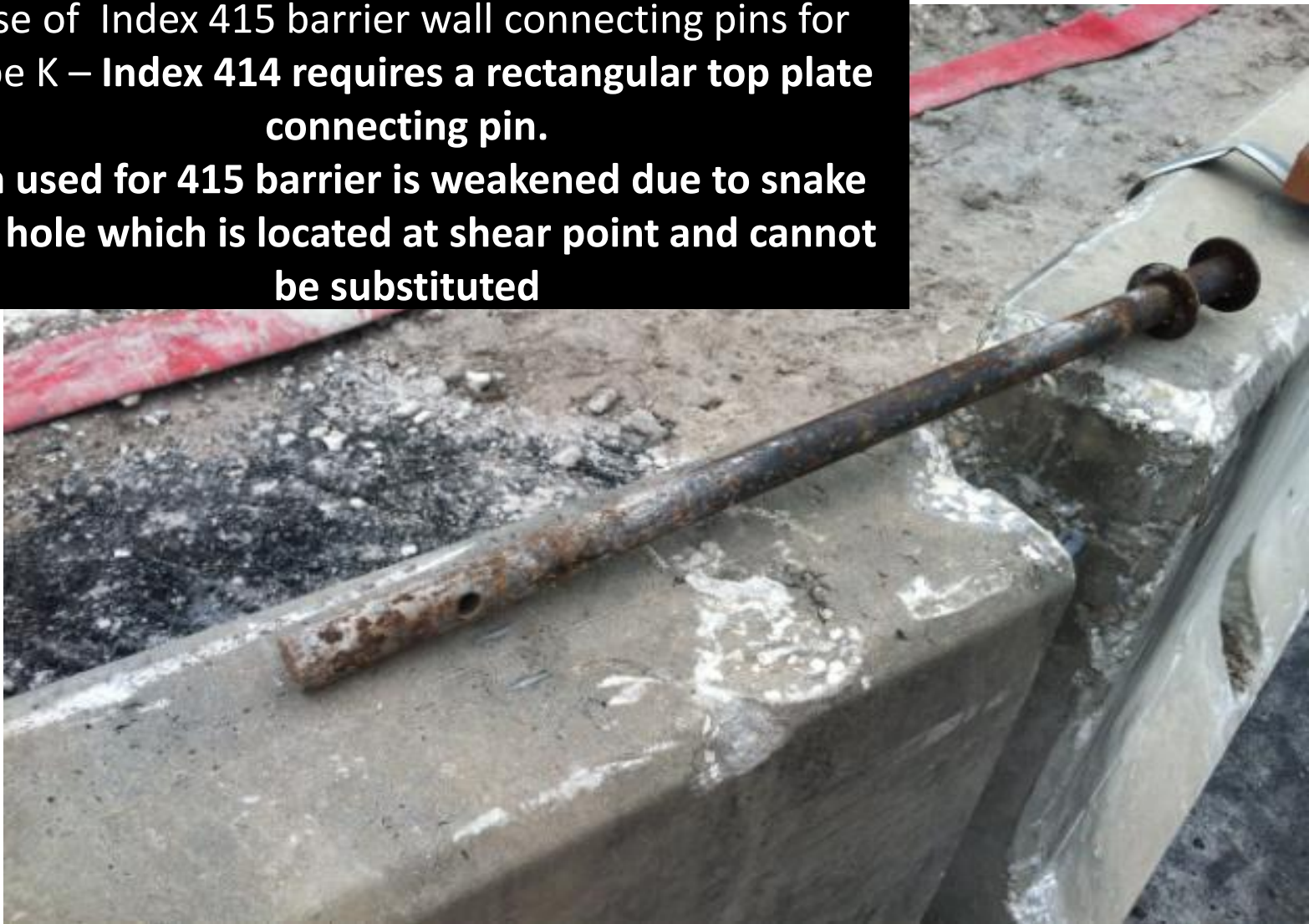


Type K Barrier anchored on the backside of barrier abutting crash cushion – **Index 415** requires stakes to be installed on traffic side

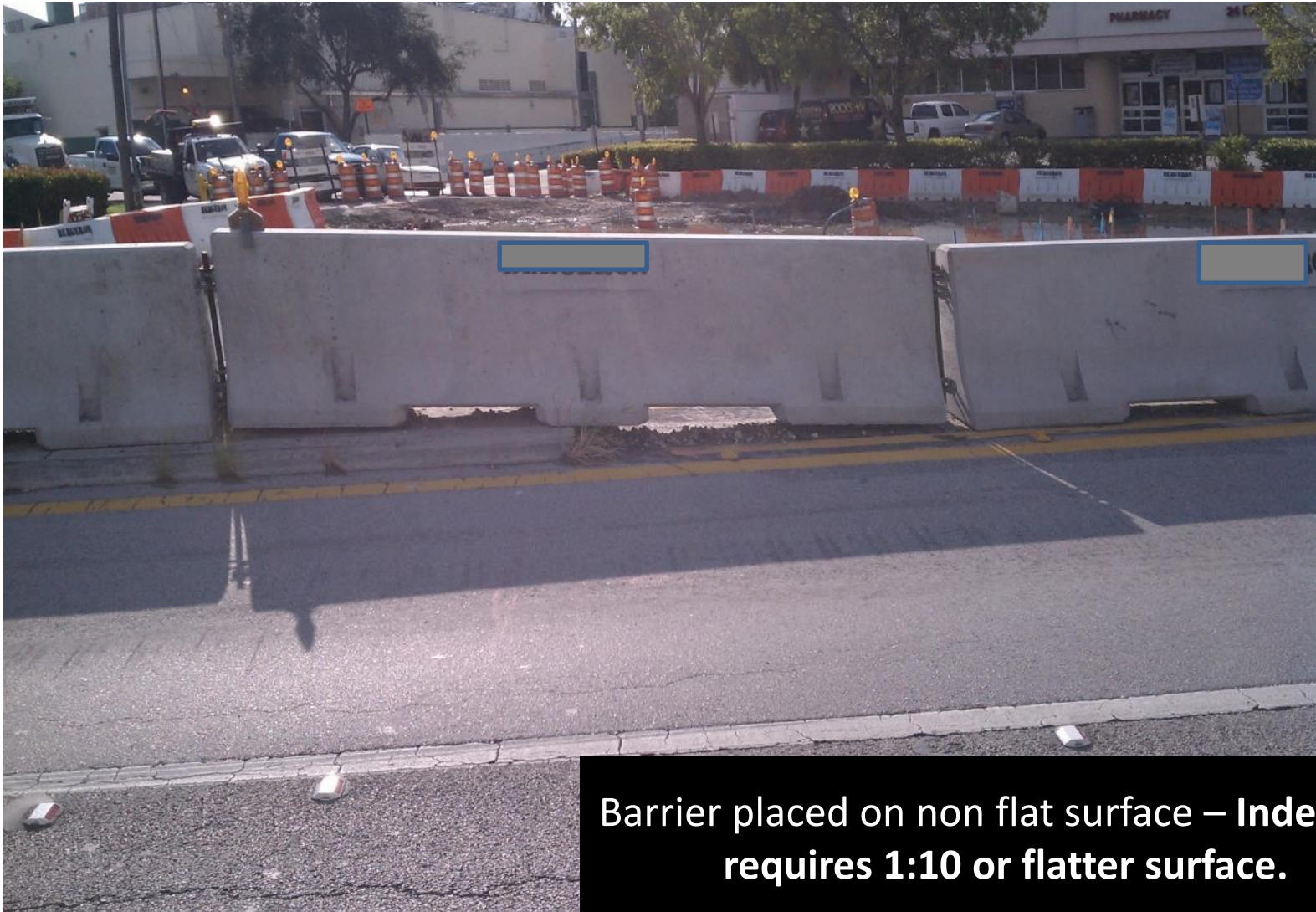
Common MOT Process Review Findings for Concrete Barriers

Use of Index 415 barrier wall connecting pins for Type K – Index 414 requires a rectangular top plate connecting pin.

Pin used for 415 barrier is weakened due to snake pin hole which is located at shear point and cannot be substituted



Common MOT Process Review Findings for Concrete Barriers



**Barrier placed on non flat surface – Index 415
requires 1:10 or flatter surface.**

Low Profile Barrier

- Intended for use in Urban Areas where sight distance for side streets and driveways may be a problem.



Low Profile Barrier

- Supplemental Devices
 - Allows drivers to clearly see barrier's location
 - Along the run of barrier:
 - Tubular Markers
 - 50' cc Tangent; 25' cc radii
 - Approach end:
 - Type 1 Object Marker

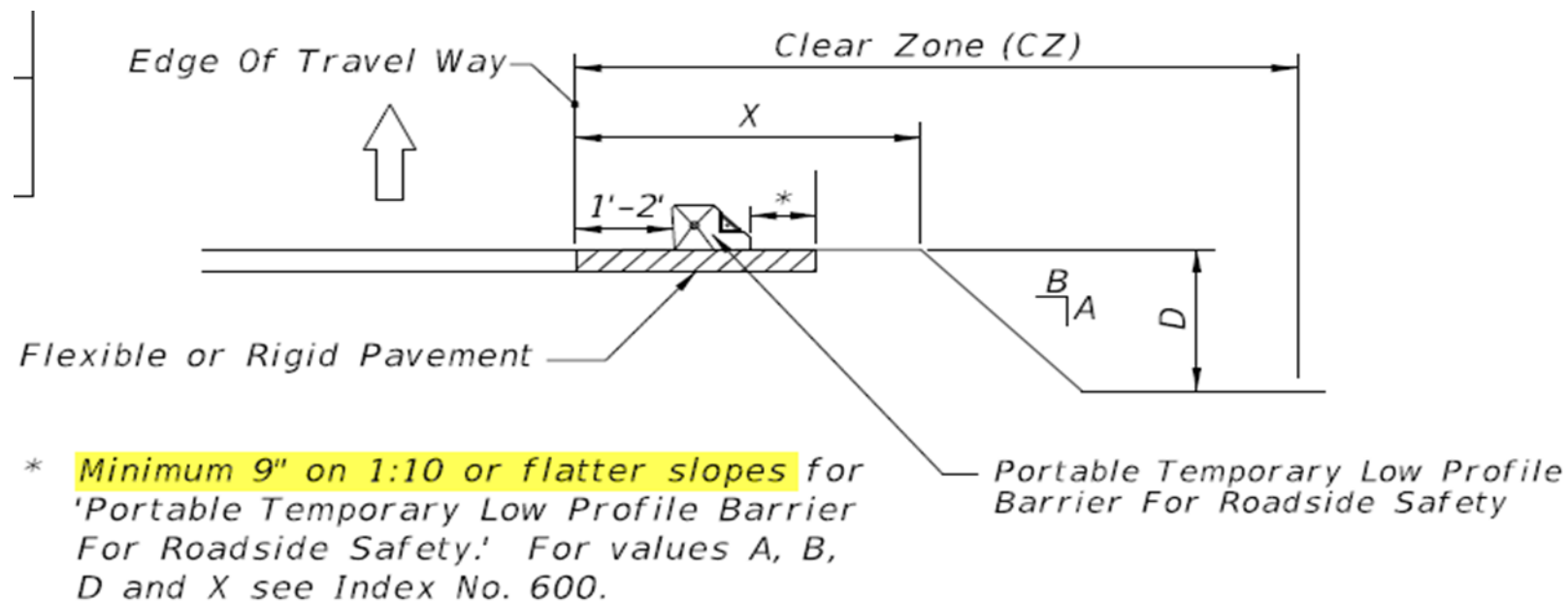


GENERAL NOTES

7. Tubular markers shall be orange in color and installed along the run of barrier at the ends and at 50' centers on tangents and 25' centers on radii. The markers shall be fixed to the top of the barrier by an adhesive or other method approved by the engineer. Approach end units shall be marked with a Type I object marker. The cost of the tubular markers and Type I object marker shall be included in the cost of the low profile barrier.

Low Profile Barrier

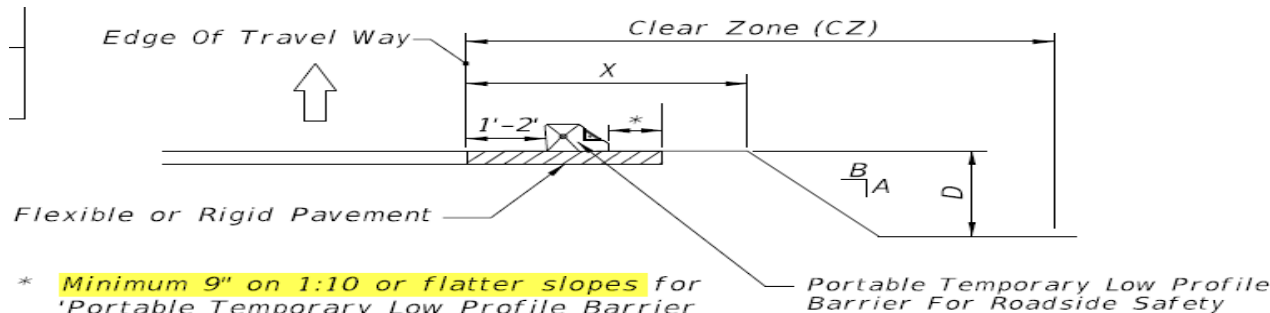
- Surface
 - Cross Slope of 1:10 or flatter



DEFLECTION SPACE AT DROPOFFS

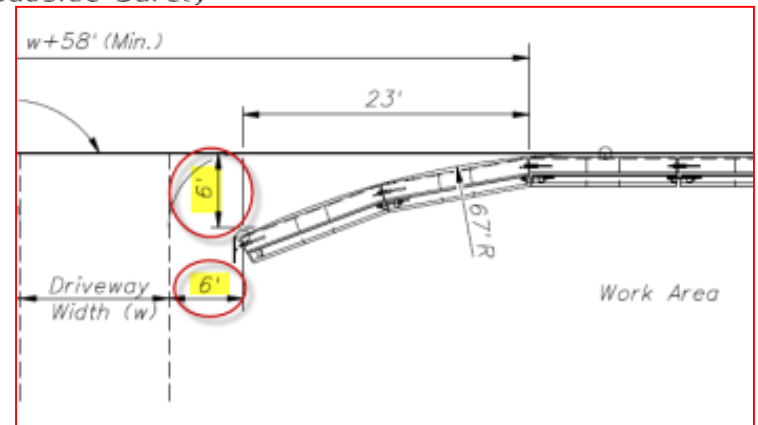
Low Profile Barrier

- Deflection Space & Offset
 - Deflection Space – 9 inch min
 - Approach End Offset – 6 foot min



* Minimum 9" on 1:10 or flatter slopes for 'Portable Temporary Low Profile Barrier For Roadside Safety.' For values A, B, D and X see Index No. 600.

DEFLECTION SPACE AT DROPOFFS



Common MOT Process Review Findings for Low Profile Barriers



Deflection space behind low profile barrier is not free and clear of material – **Index 412** requires **9 inches** deflection space

Common MOT Process Review Findings for Low Profile Barriers



White delineators are used on low profile barrier and the object marker is missing [Index 600, Sheet 12 requires orange tubular markers with white sheeting. Index 412, Sheet 1 requires a Type I object marker placed at end of barrier].

Water Filled Barriers

- 3 Systems:
 - Triton
 - Guardian
 - Yodock
- Only allowed with prior approval from Roadway Design Office
- See APL for Vendor Drawings



Steel Barriers

- BarrierGuard 800
- Vulcan Barrier
- ZoneGuard

- Check APL for Vendor Drawings

Steel Barriers

- BarrierGuard 800



Steel Barriers

- Vulcan Barrier



Steel Barriers

- ZoneGuard



Temporary Barrier Inspection Training

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