

CHOOSING THE CORRECT BARRIER FOR THE WORK ZONE

Minnesota Statewide Work Zone Safety
Committee

March 31, 2015

Factors for a Work zone

- Duration of Time – Length of Time Work zone will be Present
- Length of Working Area within Work zone and Length (Lineal Feet of the Work zone Set Up)
- Type of Work



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Factors for a Work zone

- Duration of Time
 - Short Term Work zone
 - **One Hour to One Day**
 - Pothole Repair
 - Sweeping
 - Utility Emergencies (Water Main Break)
 - Patching Repair
 - Quick Mill and Overlay same day
 - Guardrail Repair
 - Crash Cushion Installation or Repair
 - Etc.

Factors for a Work zone

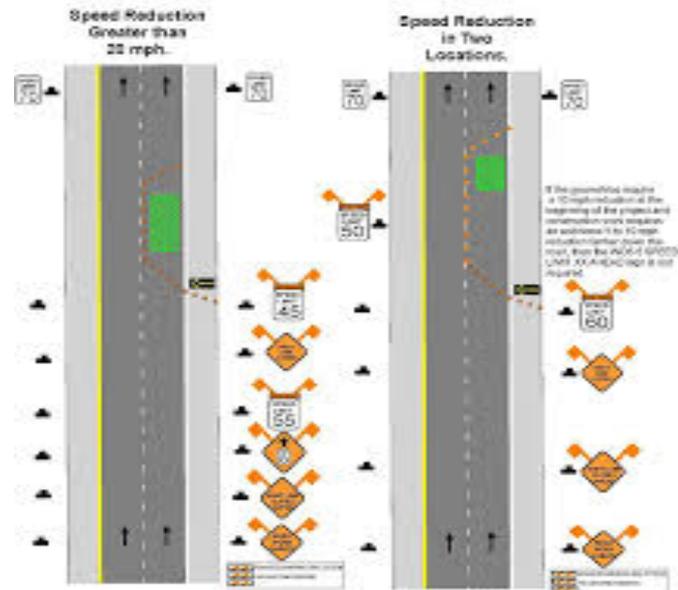
- Duration of Time
 - Mid Term Work zone
 - Greater than **One Day to One Month**
 - Bridge Painting
 - Cable Rail / Guard Rail Installation
 - Overlay Work
 - Stripping
 - Shoulder Refurbishment
 - Etc.

Factors for a Work zone

- Duration of Time
 - Long Term Work zone
 - **Greater than One Month to Full Construction Season**
 - Full Roadway Modification
 - Bridge Removal and Rebuild
 - Etc.

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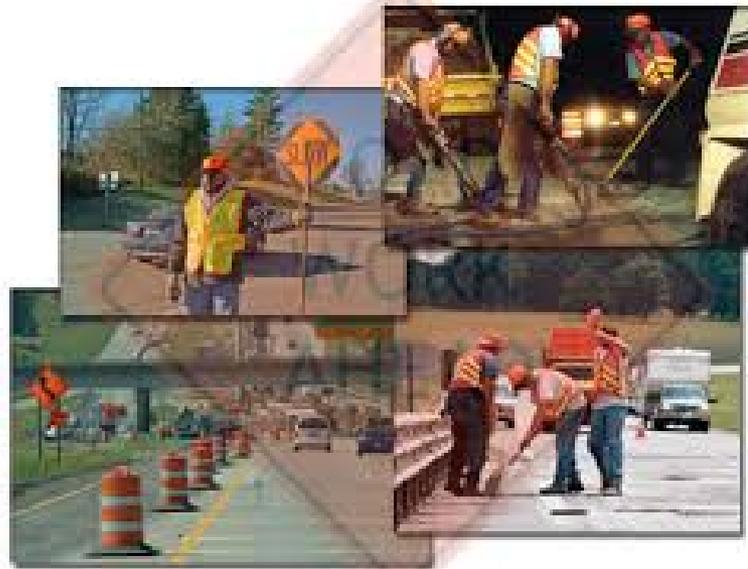


Factors for a Work zone

- Length of Working Area within Work zone
 - Different working spaces within work zone to complete project
 - Saw Cutting
 - Pavement Removal
 - Pavement Pouring
- Defining Length of Need to Set Up Work zone
 - How Much Lineal Feet is necessary to perform work

Factors for a Work zone

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Factors for a Work zone

- Type of Work
 - What Kind of Project
 - Road Surface Repair
 - Roadway Modification – Lane Widening / Lane Addition
 - Bridge Repair / Modification – New Deck / New Structure



How Do We Choose the Correct Barrier Based on the Work zone Factors?

- Duration of the Work zone
 - Classification
 - Short Term – Plastic Delineation Devices – Arrow Boards / Truck Mounted Attenuators
 - Mid Term – Positive Protection – Barrier – Steel or Concrete
 - Long Term – Definitely Positive Protection – Steel or Concrete



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How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of Steel Barrier

- *Lighter Weight*
 - *Easier to handle – Smaller Equipment needs to Unload and position*
 - *Stackable – Can Carry up to 750 feet on a single truck*
 - *On Projects where weight is a concern (Bridge Deck work) The lightweight nature of the barrier allows for Positive Protection without compromising the sensitive weight balance during project*
 - *50ft Section = 3,000 lbs.*



How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of Concrete Barrier

- *Quantity of Concrete*
 - *The Work zone standard for years*
 - *Contractors have Amounts and Invested in equipment to deploy*
 - *Perceived Strength Due to Weight*
 - *10 ft. section = 6,100 lbs.*



How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of Steel Barrier

- *Performance*
 - *Steel Barrier can be used in Two Configurations*
 - *Standard Performance Anchored only at beginning run of barrier and end run of barrier (4 Anchors on each End)*
 - *Standard Performance – Dynamic Deflection – 65 inches**
 - *Minimum Deflection Anchoring beginning and end and additional anchoring throughout run of barrier*
 - *Minimum Performance – Dynamic Deflection – 4 inches**

**Deflections based on NCHRP 350 Test 3-11*

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of Concrete Barrier

- *Performance*
 - *Concrete can be used in Two Configurations*
 - *Stand Alone*
 - *Stand Alone Performance – 48 inches of Dynamic Deflection**
 - *Anchored*
 - *Anchored Performance – 24 inches of Dynamic Deflection* – with four anchors each section*

**Deflections based on NCHRP 350 Test 3-11*

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Economical Benefits

- *Work zone Barrier Length - 1500 Lineal Feet*
- *Duration of Work zone – 30 Days*
 - *Lump Sum Mobilization for the Work zone*
 - *Barrier “A”* *\$5,800**
 - *Barrier “B”* *\$5,800**

**Calculations based on \$.04 a foot a day for Concrete and \$.10 a foot a day for Steel, \$1,000 for Traffic Control to set barrier one time cost, and \$200 a truck to deliver barrier to project (manpower and equipment cost)*

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How Do We Choose the Correct Barrier Based on the Work zone Factors?

Economical Benefits

- *Work zone Barrier Length - 3750 Lineal Feet*
- *Duration of Work zone – 30 Days*
 - *Lump Sum Mobilization for the Work zone*
 - *Barrier “A” \$13,100 - Concrete*
 - *Barrier “B” \$13,250 - Steel*

**Calculations based on \$.04 a foot a day for Concrete and \$.10 a foot a day for Steel, \$1,000 for Traffic Control to set barrier one time cost, and \$200 a truck to deliver barrier to project (manpower and equipment cost)*



TRUCKING



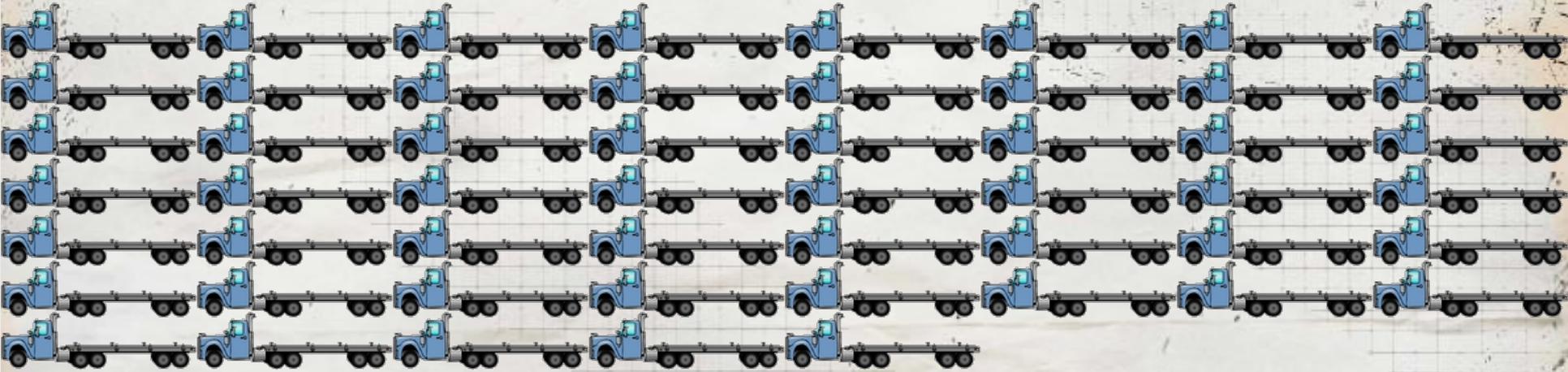
750 LF



100 LF

Trucking

For a project that requires 5,250 LF of portable barrier, here's how many trucks you would need to haul that much Portable Concrete Barrier...



AND here's how many trucks you would need to haul that much Zoneguard...



53 trucks vs. 7 trucks

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Economical Benefits

- *Work zone Barrier Length - 3750 Lineal Feet*
- *Duration of Work zone – 45 Days*
 - *Lump Sum Mobilization for the Work zone*
 - *Barrier “A” \$15,350 - Concrete*
 - *Barrier “B” \$18,875 - Steel*

**Calculations based on \$.04 a foot a day for Concrete and \$.10 a foot a day for Steel, \$1,000 for Traffic Control to set barrier one time cost, and \$200 a truck to deliver barrier to project (manpower and equipment cost)*



How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of One Barrier Over the Other

- On Projects of Weight Concern – Bridge Decks
- On Projects of Pavement Drop Off – Uneven Road Surfaces Greater than 4 inches – Minimum Deflection in an Anchored Application
- On Projects with Need to Set and Reset Barriers for Phasing

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Choice Steel Barrier
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Choice Steel Barrier

- On Projects with Need to Set and Reset Barriers for Phasing

Choice Steel Barrier – Faster to Move and Reset

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of Quick Moveable Barrier

- ***Need to Close and Open a lane Daily or Weekly***
 - *Barrier Machine can shift barrier up to two lanes in a single pass*
 - *Close or Borrow a lane on Off Peak Hours – Example I-494 Project*
 - *Only Product with this Capability*
- ***Deflection Performance***
 - *NCHRP 350 Test 3-11 – Dynamic Deflection = 53 inches*

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of One Barrier Over the Other

Choosing the Correct Barrier is Based on:

- *Duration of Time*
- *Length of Work zone*
- *Special Applications*

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of One Barrier Over the Other

Concrete

- Work zones Having Duration of 31 days or More - Economical
- Can not be Anchored – Have Deflection Area of Four Feet
- Performance of Un - Anchored Needed for less Dynamic Deflection than Standard Steel Installation

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of One Barrier Over the Other

Steel

- *Shorter Run of Barrier or Longer than 3750 Lineal Feet*
- *Duration of Work zone – Mid Range*
- *Minimum Deflection Necessary for Tight Work zone Space*
- *Less Anchoring for Minimum Deflection than Concrete*
- *Weight Concerns*
- *Need to Set and Reset Barrier – Phased Project*

How Do We Choose the Correct Barrier Based on the Work zone Factors?

Benefits of One Barrier Over the Other

Quick Moveable Barrier

- *Barrier Movement Frequent Every Day or Every Week*



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