

Traffic Control and Work Zone Mobility

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Work Zone Limitations for Construction Projects on 4-Lane Highways

Length of one lane closures on 4-lane highways

- 2016 There were a number of complaints from the public
- Length of the work zone
- No activity in the work zone
- Speed limit signs not placed exiting the work zone
- Direction was to limit the length of a closure

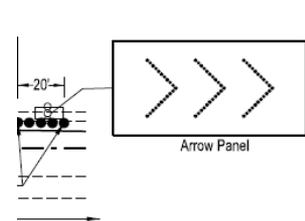
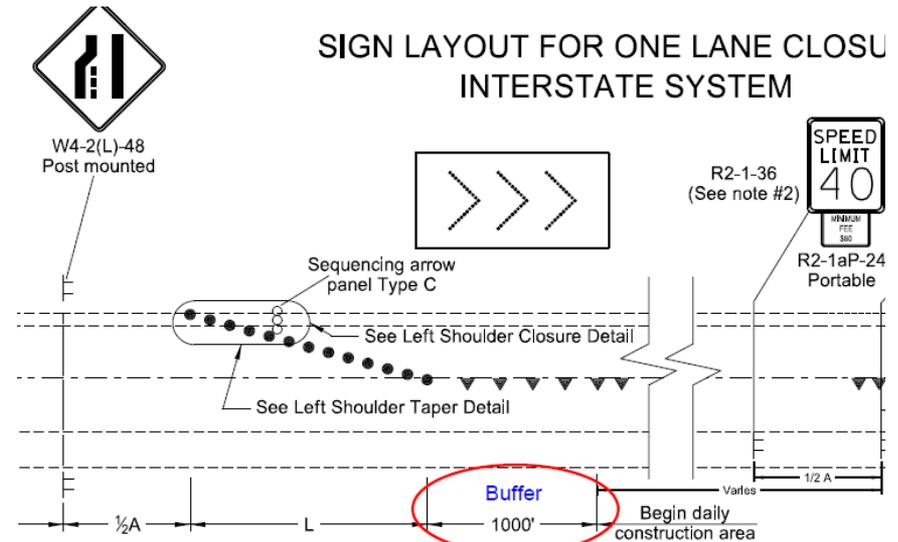
Question

What is the max length of daily construction area for a CPR project?

- A) 3 miles ✘ 3 miles between work zones
- B) 5.81 miles 6 mi work zone less 1,000 ft buffer
- C) 6 miles ✘ max work zone length
- D) 10 miles ✘ exceeds max work zone length

Buffer Space

- 1,000 feet buffer space after entry taper



LEFT LANE CLOSED WORKERS IN WORK AREA

Longitudinal Buffer Space	
Speed (mph)*	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

*Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

- Notes:
1. Install advance
 2. Move the advance flagger, move the speed limit sign, when workers are
 3. RAMP: When sign as necessary
 4. Variables:
S= Numerical
W= The width
L= Minimum length
WxSxS/60
 5. Space delineator
 6. Place sequencing arrow panel at the work area. Use Type C
 7. Re-establish the
 8. Cover existing signs
 9. Upon approval,
 10. Install flags on vehicles, and at successive
 11. Determine the minimum speed limit. If less than 30 mph, install a
 12. As an option, use
 13. Sign R20-55-96

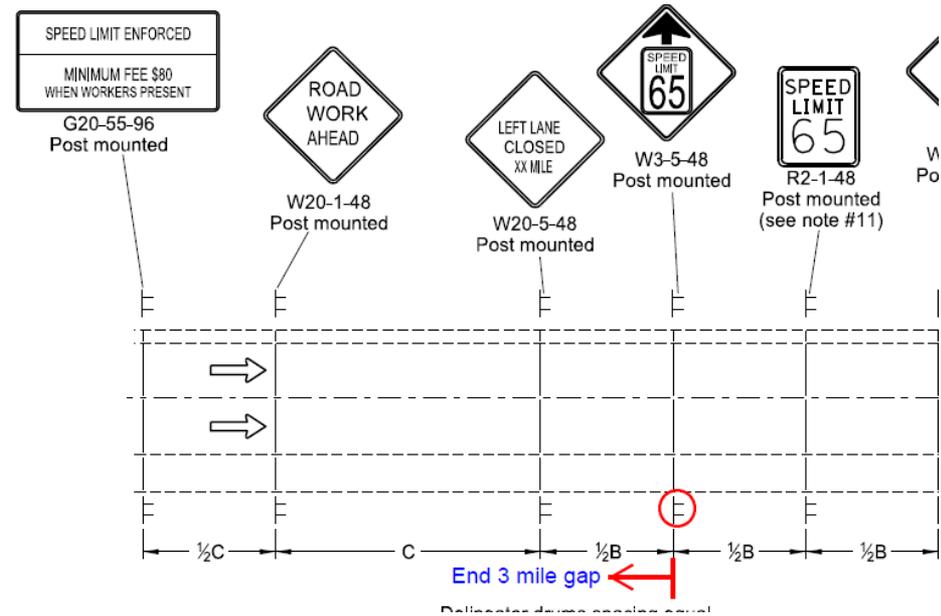
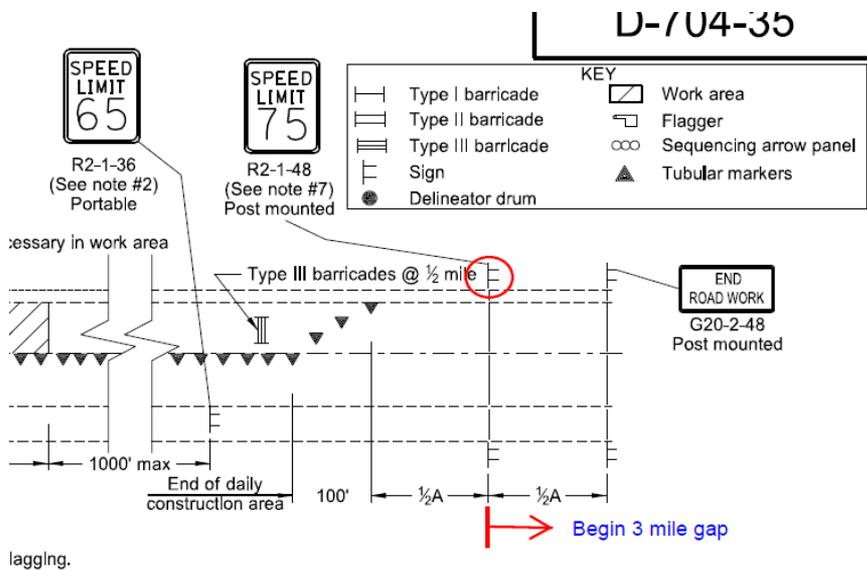
Question

When two work zones are used on a CPR project, there is a 3 mile gap between the work zones. Where is the 3 miles measured?

- ✘ A) End taper to begin taper
- ✘ B) End to begin daily construction area
- ✔ C) Reestablished speed limit to reduced speed ahead
- ✘ D) Whatever fits

Gap between closures

- From reestablishing normal speed limit to reduced speed ahead for second closure



CPR

- Use maximum of 6 mile closure
- Two closures allowed
- Use 3 mile gap between closures
- Length of closure includes the daily construction area plus the longitudinal buffer space
- Pay for all necessary devices deployed

Question

If a reestablished speed limit sign is not installed, which of the following is true?

- A) Continue driving the last posted speed
- B) Drive preconstruction posted speed
- C) HP can ticket based on last posted speed
- D) Possibility of speed differential
- E) Gun it when you see Roscoe Pico Train

Be sure to reestablish speed at end of work zone

HMA Overlays

- Maximum Length limited to one day's production
 - Length paved in one day or
 - Length paved in one day plus the length milled in one day
- Base length on production rate for one day, not entire length of project for long projects
- Remove closures if no work for more than 3 consecutive days
- Pay for all necessary devices deployed

Microsurfacing and Slurry Seal

- Maximum Length limited to one day's production
- Base length on production rate for one day, not entire length of project for long projects
- Remove closures if no work for more than 3 consecutive days
- Pay for all necessary devices deployed

Chip Seal

- Maximum Length limited to one day's production
- Base length on production rate for one day, not entire length of project for long projects
- Chip seal so lanes are event at end of the day
- Remove closures at end of day
- Pay for all necessary devices deployed

3 Topics to Discuss

- ▶ Work Zone Safety and Mobility Process Review
- ▶ Portable Rumble Strips in Work Zones
- ▶ Speed in Work Zones on Standard Drawings

Work Zone Safety and Mobility

- ▶ 23 CFR 630 Subpart J requires each state to have a Work Zone Safety and Mobility (WZSM) policy
 - NDDOT WZSM policy in February 2007
 - Process review every 2 years
 - ❖ Method to assess effectiveness of work zone safety and mobility procedures
 - ❖ Lead to improvements in work zone safety and mobility

Who is the WZSM Process Review Team?

- ▶ David Ferrell – FHWA
- ▶ Kevin Gorder – Fargo District
- ▶ Craig Faul – Maintenance Division
- ▶ Seng Marohl – Local Government Division
- ▶ Phil Murdoff – Construction Services Division
- ▶ Donovan Slag – Programming Division
- ▶ Doug Schumaker – Design Division

January 2017 Last Process Review

- ▶ Evaluated Contractor compliance with respect to work zone traffic control specifications for watchperson reports
 - 149 projects in 2016
 - Random sample of 20% of the projects (31 projects)
 - Watchperson reports from 20th, 40th, 60th and 80th percentile interval of the project duration
 - In addition, any watchperson reports from any day a project had a crash reported (15 projects reported a crash)

Observations

- ▶ Watchperson reports were available on most projects
- ▶ Traffic Control Watchperson Report SFN 14634 or Contractor provided form were used
- ▶ Older versions of SFN 14634 were used
- ▶ Some projects had 2 reports per work day instead of 3 per day as per NDDOT specifications
 - Changed in 2014 specifications
- ▶ No reports stated cause of crash from construction vehicles or traffic control devices

Recommendations

- ▶ Provide 3 inspections per work day
- ▶ Revise watchperson form (SFN 14364)
- ▶ Educate and make personnel aware of process review
- ▶ Create process for Project Engineers to track watchperson report submittals
- ▶ Gather data for future process reviews

Thoughts to take with you

- ▶ WZSM Process Reviews are conducted to make the work zone a safer work place.
- ▶ Watchperson reports are useful information
- ▶ 3 watchperson reports per day when work is performed, 2 per day when no work is performed
- ▶ Use most current version of the Traffic Control Watchperson Report

Looking Ahead to Future Projects

- ▶ Watchperson Report SFN 14634
 - Current version (June 2016)

Looking Ahead to Future Projects

- ▶ Watchperson Report SFN 14634
 - Current Version (June 2016)
 - Possible revision soon
- ▶ Future Process Review
 - User delays in work area
 - Flagging station delays
 - Survey will be sent out to Project Engineers

Portable Rumble Strips

- ▶ Topic brought up at 2016 Construction and Material Coordinator Conference
- ▶ 2017 Construction Trial
 - To see how effective rumble strips got driver's attention by providing physical and audible warnings to motorist
 - 8 projects (chip seals, overlays, sliver grading, slide)
 - Survey sent to Project Engineers
- ▶ January 2018 Decision Document Signed

Decision Document Requirements

- ▶ All Construction and Maintenance Work Zones where:
 - Flagger Station is used
 - Paved surface available to place rumble strips
 - Pre-construction posted speeds are greater than 25 MPH

Purpose of Rumble Strips

- ▶ Get the attention of the driver to make them aware of the flagger, signs, and workers in the immediate work area

Portable Rumble Strip Specifications

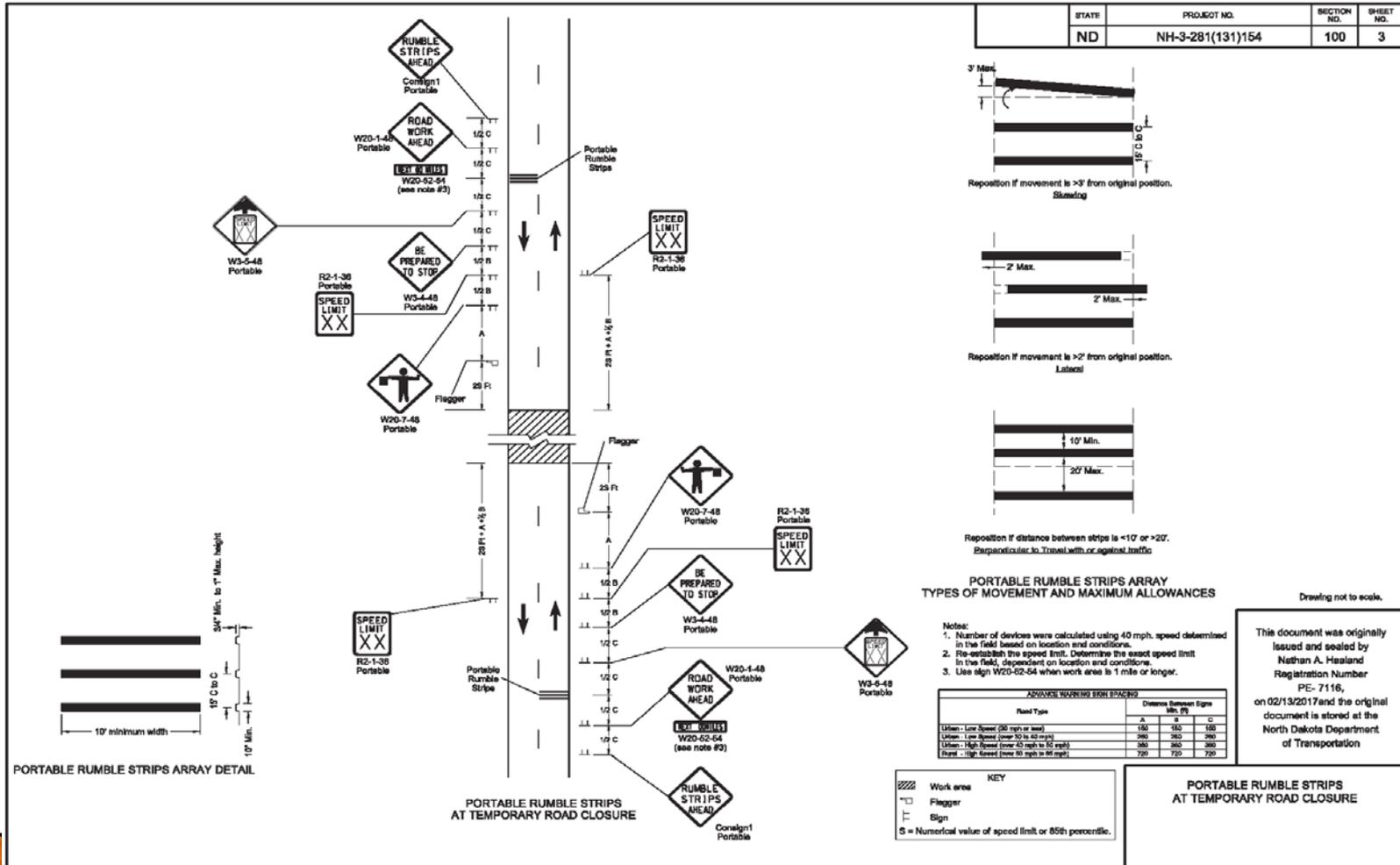
- ▶ Made of rubber or engineered polymer
- ▶ No adhesives or fasteners for placement
- ▶ Manufacture's speed rating meets or exceeds posted speed limit
- ▶ Each strip weighs a minimum of 100 lbs
 - Single piece
 - Interlocking segments or
 - Two pieces hinged at the middle

What to look for in plans

- ▶ Currently
 - Standard note in Section 6 of the plans
 - Details in Section 100 of the Plans
- ▶ Future
 - Spec book
 - Standard drawings

Portable Rumble Strips

Project NH-3-281(131)154



Manufacturers

- ▶ **TraFFix Devices, Inc. (TraFFix Alert)**
 - Does not meet specifications
 - Each strip weighs 72 lbs
 - Consist of 3 pieces interlocked together
- ▶ **Plastic Safety Systems (RoadQuake 2 or 2F)**
 - Meets current specifications
 - Each strip weighs 110 or 115 lbs
 - RoadQuake 2 consist of three interlocking pieces
 - RoadQuake 2F consist of a single piece hinged in the middle

Plastic Safety Systems CRIB



PSS Retrieval System

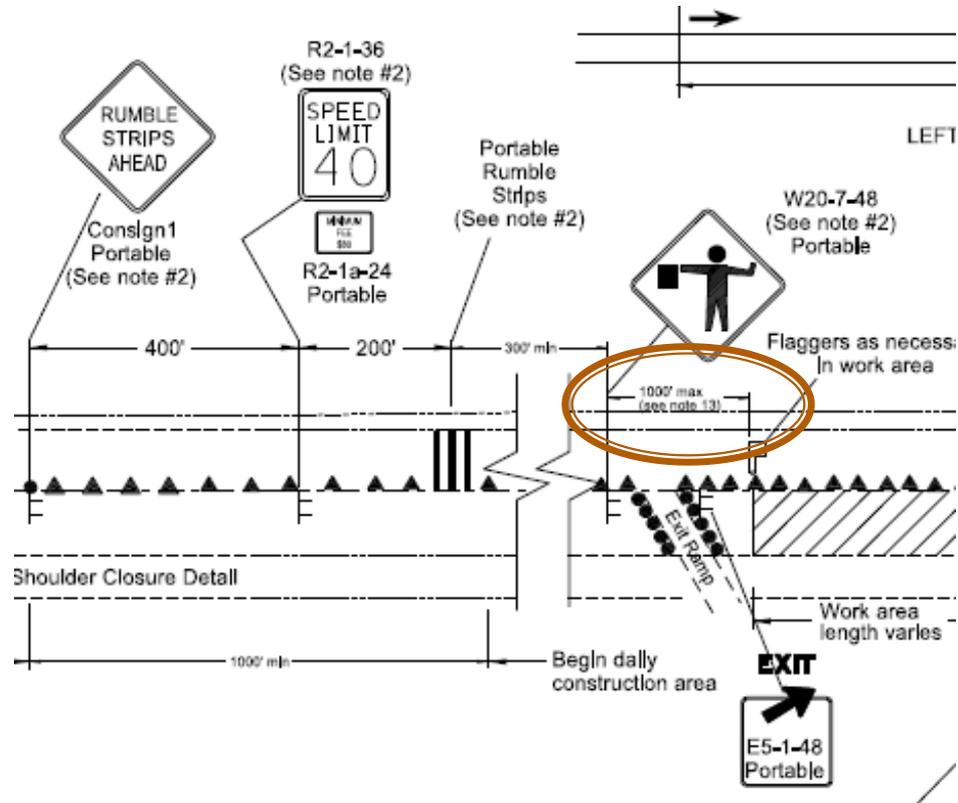


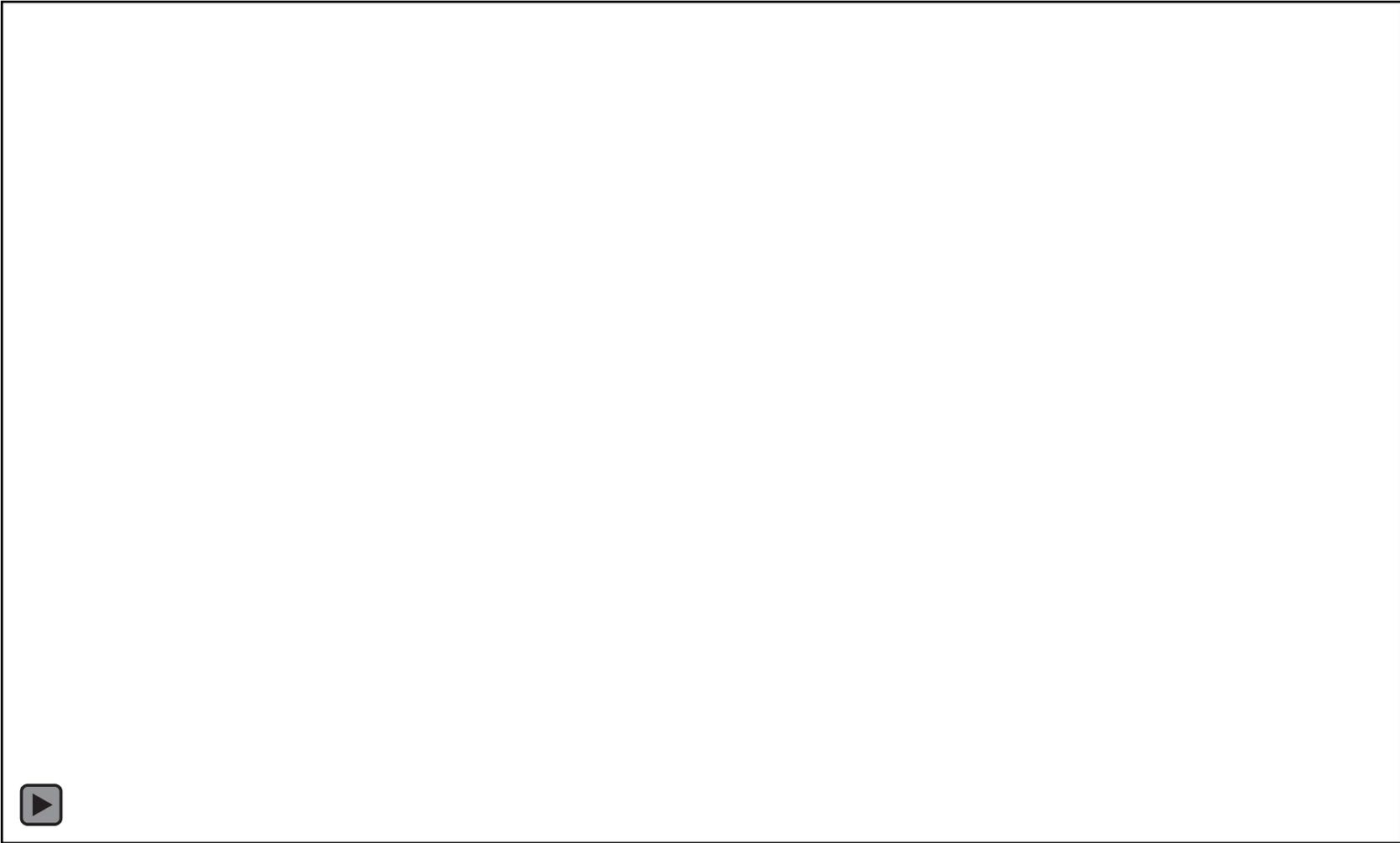
Retrieval System:

- Reduces workers' exposure to live traffic.
- Reduces manual exertion, possible injury.

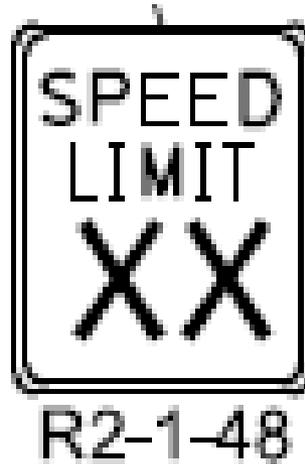
With Retrieval System, removal of Rumble Strips is a 1 person operation.

Moving Operation with One Lane Closure Revision





Speed Limit Signs on Standard Drawings and Details



- ▶ Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

Why Do We Recommend 40 MPH

- ▶ ATSSA created document from FHWA Grant which considers positive protection near high speed traffic
- ▶ High speed traffic is generally 45 mph or higher
- ▶ Speeds 40 mph or lower considered low speed and positive protection may not be necessary

Why Do the Standard Drawings Have XX in Signs

- ▶ During design phase the roadway condition or location may not be known during construction
 - Roadway surface may not be adequate
 - Sight distance may be limited
- ▶ Terminology XX provides flexibility for the Project Engineer to determine a safe speed based on existing conditions

What if a Speed Limit is Shown as a Number?

- ▶ If some geometric feature has a design speed less than the recommended speed, actual design speed should be specified
- ▶ Some standard drawings may have actual numbers on the speed limit signs

Summary

- ▶ Typically the maximum length of work zone is stated in section 6 of the plans and this length should be followed
- ▶ Work Zone Safety and Mobility Process Reviews
- ▶ Portable rumble strips used in work zones and move along with the flagging operation
- ▶ Speed limit in work zones generally recommended at 40 mph near workers unless conditions warrant otherwise

Questions ??

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