

TABLE I (SIGN SPACING)

ROAD TYPE	DISTANCE (A) BETWEEN SIGNS (FT)
MAJOR CONVENTIONAL	500
FREEWAY & EXPRESSWAY	1000

TABLE II

SPEED LIMIT (MPH)	PB FLARE RATE MINIMUM	CLEAR ZONE WIDTH (E) (FT)
25	8:1	15
30	8:1	15
35	9:1	15
40	10:1	15
45	12:1	19
50	14:1	19
55	16:1	23
60	18:1	30
65	19:1	30
70	20:1	30

TABLE III (RAMP DESIGN SPEED)

MAINLINE DESIGN SPEED (MPH)	30	35	40	45	50	55	60	65	70	75
RAMP DESIGN SPEED (MPH)	25	30	35	40	45	48	50	55	60	65

LEGEND

WORK AREA	
PORTABLE BARRIER (PB)	
REMOVE EXISTING MARKINGS	
ATTENUATOR	
PCB "Y" CONNECTOR	
DIRECTION OF TRAVEL	

THIS DRAWING REPLACES MT-98.21 DATED 07-18-2014.

SD NUMBER

MT-98.21

STANDARD ROADWAY CONSTRUCTION DRAWING

LANE CLOSURE AT EXIT RAMP USING PORTABLE BARRIER

OFFICE OF ROADWAY ENGINEERING

STATUS ENGINEER

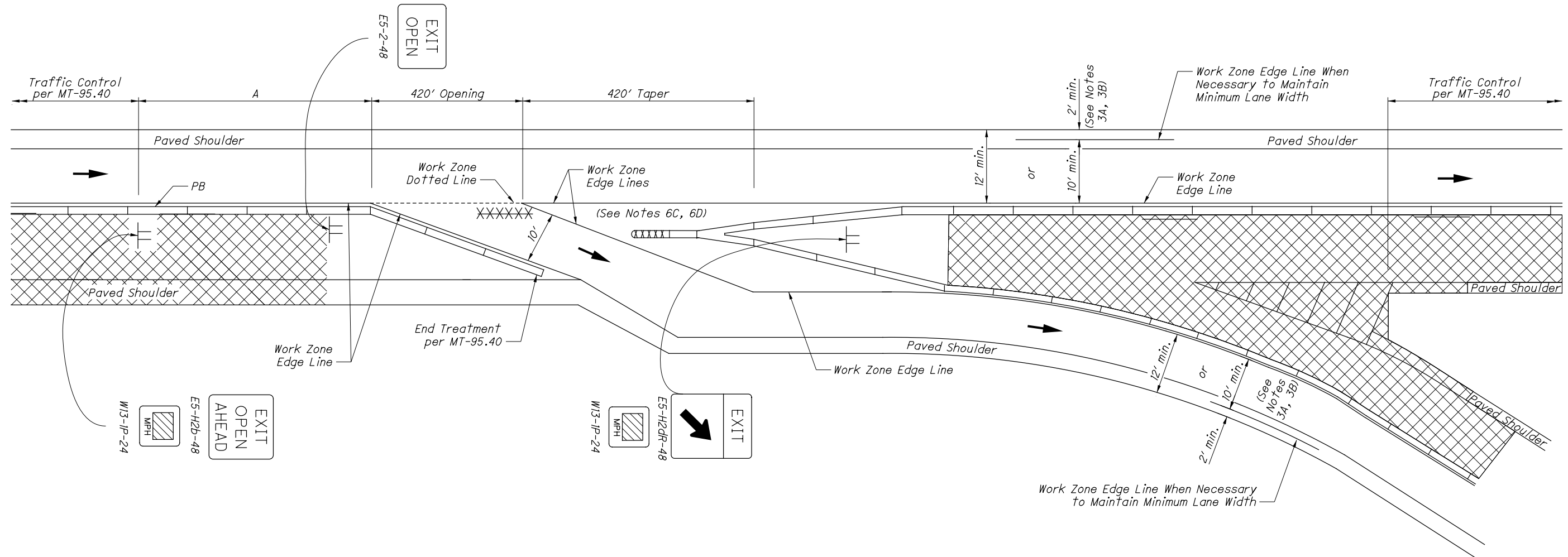
Soisson

STATE OF OHIO DEPARTMENT OF TRANSPORTATION ADMINISTRATOR

David L. Holstein

REVISION DATE

01-17-2020



OPENING IN ADVANCE OF GORE

TABLE I (SIGN SPACING)

ROAD TYPE	DISTANCE (A) BETWEEN SIGNS (FT)
MAJOR CONVENTIONAL	500
FREEWAY & EXPRESSWAY	1000

TABLE II

SPEED LIMIT (MPH)	PB FLARE RATE MINIMUM	CLEAR ZONE WIDTH (E) (FT)
25	8:1	15
30	8:1	15
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TABLE III (RAMP DESIGN SPEED)

MAINLINE DESIGN SPEED (MPH)	30	35	40	45	50	55	60	65	70	75
RAMP DESIGN SPEED (MPH)	25	30	35	40	45	48	50	55	60	65

LEGEND

- WORK AREA
- PORTABLE BARRIER (PB)
- REMOVE EXISTING MARKINGS
- ATTENUATOR
- PCB "Y" CONNECTOR
- DIRECTION OF TRAVEL

END ROAD WORK (G20-2-48)
Sign 200' from End of Work

NOTES:

SIGNING

- 1A. All signs approaching the exit shall be dual-mounted where two or more lanes remain open.
- 1B. The Advisory Speed (W13-1P) plaque shall be used when specified in the plan, or when it is necessary for the vehicle to reduce speed by more than 10 mph in order to safely exit from the mainline, as directed by the Engineer. The following additional criteria shall also apply:
 - a) Advisory speeds within 10 mph of the posted speed limit need not be displayed.
 - b) When provided at exit ramp openings (see Note 2A), the Advisory Speed plaque should typically be mounted below the EXIT (arrow) (E5-H2d) sign. The Advisory Speed plaque shall not be mounted below the permanent gore (E5-H1a) sign. As an alternative, the Advisory Speed plaque may be mounted below the EXIT OPEN (E5-2) sign.
 - c) The advisory speed displayed shall not be greater than would otherwise be required to accommodate the permanent ramp geometry at the exit.
- 1C. END ROAD WORK (G20-2) signs are only required for lane closures of more than 1 day. It is intended that these signs be placed on the mainline, on all exit ramps, and on roadways exiting the work limits. Any END ROAD WORK sign which would fall within the limits of another work zone may be omitted.
- 1D. The work zone sign spacings shown in Table I are minimums. Maximum spacing should not be greater than 1.5 times the distance shown in Table I.
- 1E. Sign spacing should be adjusted to avoid conflict with existing signs. Minimum spacing to existing signs shall be 200' for speeds of 45 mph or less and a minimum of 400' for speeds of 50 mph or greater.
- 1F. For advance signing and pavement marking, and any other traffic control procedure to be implemented approaching the subject location, see Standard Construction Drawings (SCDs) MT-95.30, MT-95.40 or the MT-102 series as maybe appropriate.

RAMP OPENING

- 2A. The opening to the ramp should be 420' or more whenever possible. A lesser opening may be provided if no other alternative is available. When a lesser opening is provided, the advisory speed applicable to such condition shall be as follows:

<u>Opening/Taper</u>	<u>Advisory Speed</u>
390'	65 mph
360'	60 mph
330'	55 mph
300'	50 mph
270'	45 mph
240'	40 mph
210'	35 mph

- 2B. The opening shall never be less than 200'. If a 200' minimum dimension cannot be provided, the ramp should be closed when so determined by the Engineer.

RAMP WIDTH

- 3A. Normally a 10' minimum ramp width is to be maintained on existing ramp pavement.
- 3B. Where the condition in Note 3A is not possible, a minimum width of 12' to the outside edge of the paved shoulder may be used only if the shoulder pavement buildup is adequate to carry the load. Where an edge line is required to designate a shoulder, the edge line shall be placed such that the minimum lane width is 10' and the minimum shoulder width is 2'.

PAVEMENT MARKING

- 4A. If the construction operation requires a lane closure for more than 1 day, the existing conflicting reflectors from the raised pavement markers shall be removed.
- 4B. Additionally, if a lane closure of greater than 3 days is required, the appropriate color work zone edge lines shall be applied along the taper, and existing conflicting pavement markings shall be removed or covered as per CMS 614.11G.
- 4C. Work zone pavement markings which would conflict with the final traffic lanes shall be removable tape (CMS 740.06, Type I) unless the area will be resurfaced prior to project completion.
- 4D. After completion of the work, pavement markings other than CMS 740.06, Type I shall be removed in accordance with CMS 614.11I. The original markings and raised pavement marker reflectors shall be restored at no additional cost unless separately itemized in the plans.

(RESERVED FOR FUTURE USE)

- 5A. (intentionally blank)

PORTABLE BARRIER (PB)

- 6A. When PB provided at the gore, the impact attenuator shall be installed parallel to mainline traffic.
- 6B. Where the impact attenuator is intended to apply to two NCHRP 350 portable concrete barriers within the gore, one from the mainline and one from the ramp, the two NCHRP 350 portable concrete barriers shall be joined to form one unit using a PCB "Y" connecting segment. For the "Y" details, see Roadway Plan Insert Sheet "Portable Concrete Barrier 'Y' Connector Segment."

Contractors may choose to install a wide impact attenuator in lieu of utilizing the concrete "Y" segment to join two NCHRP 350 portable concrete barriers into one. For example, a wide impact attenuator at a minimum of 48" wide and rated for the design speed of the roadway could be installed in place of the aforementioned (1) work zone impact attenuator (2) PCB "Y" connector segment and (3) one standard NCHRP 350 PCB section. However, if Contractors use this connection method, the wider impact attenuator must be crashworthy in accordance with NCHRP Report 350, or MASH-16 and installed per the manufacturer's instructions.

If using steel barrier or MASH portable concrete barrier, the Contractor shall install the wide impact attenuator option as detailed above, ensuring that all connections are maintained per the manufacturer's specifications.

The Contractor shall repair or place a damaged unit within 24 hours of a damaging impact.

- 6C. Where a PCB "Y" connecting segment is provided, one standard section of NCHRP 350 PCB shall be provided between the "Y" connecting segment and the impact attenuator.
- 6D. Connection of the impact attenuator to the PB shall be by positive connection. Appropriate crashworthy transitions between the impact attenuator and the first PB shall be installed.
- 6E. For installation procedures for the PB and the impact attenuator, refer to the manufacturer's installation instructions.
- 6F. For details on delineation of PB, see SCD MT-101.70.
- 6G. Where PB is located beyond the edge of the paved shoulder, the cross slope within the clear zone, including the surface on which the PB is placed, shall be graded at 10:1 or flatter. If the cross slope is steeper than 10:1, the PB shall be terminated on the paved shoulder. The PB shall be extended along the paved shoulder as necessary to satisfy the length of need, and then terminated using the impact attenuator.

THIS DRAWING REPLACES MT-98.21 DATED 07-18-2014.

STANDARD ROADWAY CONSTRUCTION DRAWING

LANE CLOSURE AT EXIT RAMP USING PORTABLE BARRIER

SCD NUMBER

MT-98.21

OFFICE OF ROADWAY ENGINEERING

STATE ENGINEER

Soisson

STATE OF OHIO DEPARTMENT OF TRANSPORTATION ADMINISTRATOR

David L. Holistein

REVISION DATE

01-17-2020