




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

July 22, 2022

MEMORANDUM

TO: Chris Peoples, PE, Chief Engineer
FROM: J. Kevin Lacy, PE, State Traffic Engineer 
SUBJECT: MASH Crash Testing of Category IV Traffic Control Devices

The Department's MASH implementation committee met May 9, 2022, to make a determination on MASH crash testing for category IV traffic control devices. Category IV devices are portable, trailer mounted, and include Flashing Arrow Boards, Portable Changeable Message Signs, Temporary Signals, Digital Speed Limit Signs, Automated Flagger Assistance Devices, and Driveway Assisted Devices. When in use, these devices are on the roadway shoulder, inside the clear zone, and many times not behind any form of positive protection.

The committee reviewed the *Work Zone Devices' Role in Crash Severity* report dated December 19, 2019, prepared by the Department's Traffic Safety Unit. This study queried data from the North Carolina Crash Database for all work zone crashes related to fixed and moveable object crashes from 2000 – 2018 and found 4,952 crashes involving a work zone device. 265 of these crashes involved a category IV device, which included one fatal crash and two type A injury crashes. In none of the 265 crashes was it found that the category IV work zone device penetrated the vehicle. The report concluded that category IV work zone devices should be considered low risk.

The committee noted that category IV devices were not required to be NCHRP-350 crash tested by FHWA and that no MASH crash testing matrix has been developed thus far for these devices.

The committee acknowledged that the benefit of the category IV devices was greater than the risk of having the device on the roadway shoulder.

The committee subsequently determined that category IV devices will remain exempt from crash testing until a MASH crash testing matrix is developed. The Work Zone Traffic Control Section will review any MASH testing and make the committee aware of any change.

Furthermore, the committee recommends that the Traffic Safety Unit provide an update to the *Work Zone Devices' Role in Crash Severity* Report by December 31, 2027. This update will be an aid to the MASH committee in making informed decisions regarding MASH crash testing of work zone devices in advance of the 2030 update of the Department's *Standard Specifications for Roads and Structures*.

If there are any questions or comments, please contact State Work Zone Traffic Control Don Parker at (919) 814-4935 or by email at daparker@ncdot.gov.

JKL/dap:sh

cc: NCDOT MASH Committee Members
Roger Kluckman, PE NCDOT Guardrail Committee Chair
Lamar Sylvester, PE Deputy Chief Engineer
Greg Burns, PE, Eastern Deputy Chief Engineer
Mark Gibbs, PE, Western Deputy Chief Engineer
Joe Hummer, PE, PhD, Transportation Management Engineer
Division Engineers
Brad Hibbs, PE, FHWA
Tom Bell, President, Carolinas ATSSA Chapter



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November 24, 2021

MEMORANDUM

TO: Lamar Sylvester, PE, Director of Field Support

FROM: Don Parker, PE State Work Zone Engineer DocuSigned by:
Don A. Parker NOV 24, 2021
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SUBJECT: Anchoring Portable Concrete Barrier Type K in Asphalt Pavement
(UPDATE)

This is an update to the July 6, 2021 memorandum issued by the Work Zone Traffic Control Section which stated the non-proprietary K wall barrier system design currently on the approved products list would be permitted to be anchored into asphalt pavement using the NCHRP 350 approved method until a suitable and practical MASH-16 approved solution becomes available. This method requires a 1 ½" diameter A36 steel pin, a minimum of 36" long with a 3" x 3" x ½" A36 steel cap installed in each of the three holes on the traffic side of each barrier segment.

This matter was addressed at the Department's MASH Committee meeting held September 22, 2021 and it was decided that the above described anchoring method would be permitted with the following requirement:

When the anchored K wall is shielding an excavation, there shall be a minimum of 24" of paved asphalt surface between the back (non-traffic) side of the K wall and the excavation. If the 24" of paved asphalt surface cannot be attained, then an approved alternative shall be utilized.

Any comments pertaining to this should be directed to myself or Karmen Dais at (919) 814-4935 or by email at daparker@ncdot.gov or kedais@ncdot.gov

DAP/dap

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