

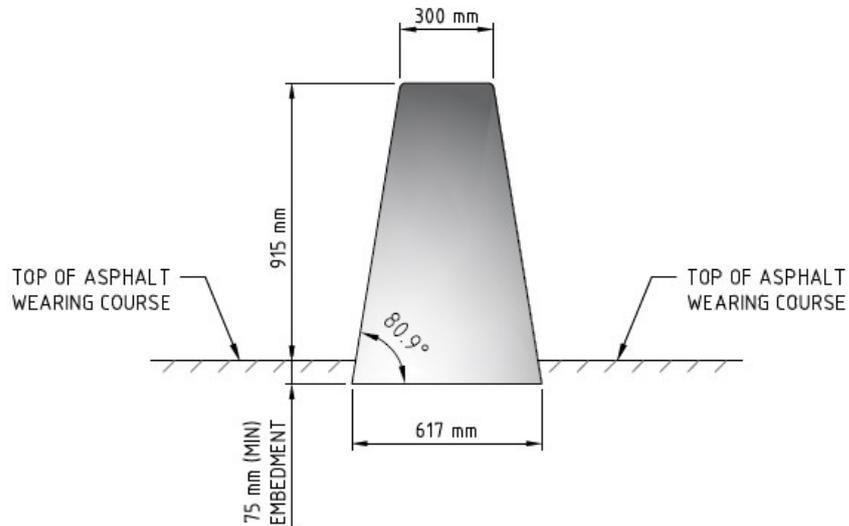
# CONCRETE BARRIER – CONSTANT SLOPE DESIGN SHEET

## REVISION REGISTER

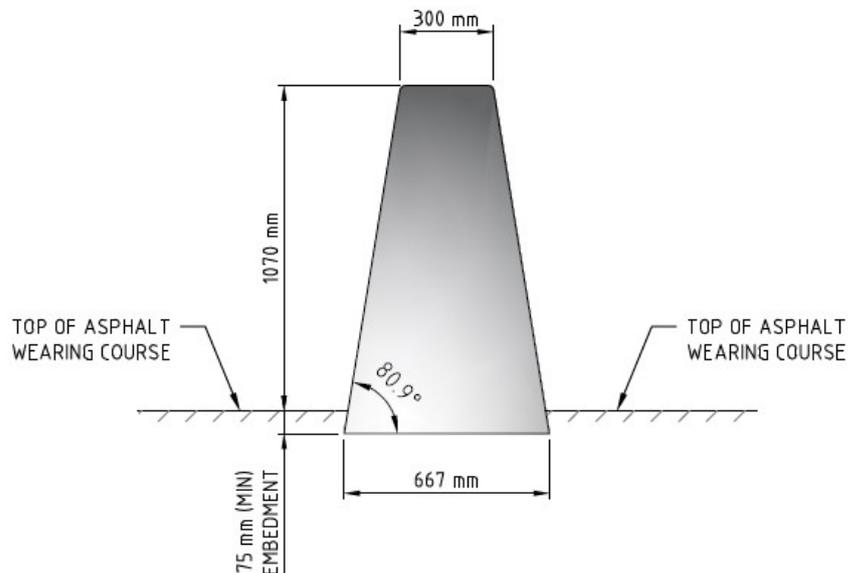
Revision	Description	Date
1	Issued for use.	23/02/2004.
1 A	General revision.	03/03/2006.
1 B	Minimum length modified.	11/05/2009.
1 C	General revision.	2/11/2017
1 D	MASH Test Levels adopted.	02/10/2018
1 E	Standard drawings added.	6/11/2018
1F	Vehicle roll allowance reference	31/10/2019

The Californian Constant Slope barrier is the preferred Main Roads concrete barrier shape.

### Drawings:



**MASH TEST LEVEL 4 CONCRETE BARRIER - CONSTANT SLOPE**



**MASH TEST LEVEL 5 CONCRETE BARRIER - CONSTANT SLOPE**

**Ownership:** Public Domain

**Supplier:** N/A

**Test Level:** MASH

MASH Test Level	Height (mm)	Foundation
4	915	The Constant Slope concrete barrier that was accepted to NCHRP 350 TL-4 requires the lateral restraint equivalent to 25mm thickness of asphalt for a width of 3.0m. Note that the impact energy for MASH TL-4 is 58% greater than the impact energy for NCHRP 350 TL-4. Note 75mm of embedment into the pavement is also required in addition to the provision of the required lateral restraint.
5	1070	Acceptance of the Constant Slope concrete barrier at Test Level 5 is based on the crash testing of the Ontario Tall Wall concrete barrier, which is 1070mm high and has a base width of 820mm and 75mm embedment. The Constant Slope concrete barrier requires lateral restraint equivalent to 75mm thickness of asphalt for a width of 3.0m.

**Design Considerations:**

**Deflection:** None.

**Minimum Length:** 30 m at lengths less than this the barrier has insufficient strength to resist impacts. Where the hazard extends above the barrier and the design vehicle is a heavy vehicle it is desirable to extend the barrier at full height past the hazard for a minimum of 5.0 m.

**Offset from Kerbing:** Kerbing is not to be placed in front of the barrier.

**Approach to barrier:** The approach to the barrier should be a trafficable running surface at a slope of 1 in 10 or flatter clear of objects and grade changes to allow an errant vehicle to hit the barrier at an appropriate height.

**Vehicle Roll:** Where the hazard being protected by a rigid barrier extends above the height of the barrier the Designer should ensure that adequate separation from the face of the barrier to the hazard is provided to allow for the roll of high vehicles (such as trucks) hitting the hazard. Refer to Main Roads Supplement to Austroads Guide to Road Design - Part 6, to determine the vehicle roll allowance.

**End Treatments:**

The ends of concrete barriers are typically protected with crash attenuators or by transitioning to another barrier type. For approved crash attenuators refer to the relevant End Treatment Design Sheet. Only crash tested transitions shall be used to transition between barrier types.

**Limitations:**

- Consideration of occupant impact values should be given when selected for use in situations of high impact angles (> 20 degrees).
- Objects should not be placed on top of concrete barriers where practical.

**References:**

Item	Description
1	Reports: <ul style="list-style-type: none"> <li>• Minimum Rail Height and Design Impact Load for MASH TL-4 Longitudinal Barriers.</li> <li>• Safety Performance of Concrete Median Barriers under Updated Crashworthiness Criteria.</li> </ul> Copies can be found on Main Roads file 08/1892

Relevant FHWA Approval Letters to NCHRP 350

[https://safety.fhwa.dot.gov/roadway\\_dept/countermeasures/reduce\\_crash\\_severity/barriers/pdf/b64.pdf](https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/barriers/pdf/b64.pdf)

Code	Description
B45	NCHRP 350 TL-3 approval.
B64	NCHRP 350 TL-4 approval at 810 mm and TL-5 approval at 1070 mm height.

**Drawings:**

Main Roads Standard Drawings	Description
200331-021	General Arrangement 'W' Beam to Concrete Barrier Connection
200331-022	General Arrangement 'Thriebeam' to Concrete Barrier Connection
200331-0023	Concrete Barrier Assembly Details
201831-0054	Structural Details
201831-0055	Installation Layouts
201831-0056	Departure Terminals
201831-0057	TL-4 Transition Details
201831-0058	TL-5 Transition Details