



Arizona Department of Transportation

Roadway Design - Mail Drop 615E

MEMORANDUM

To: Roadway Design Personnel
ADOT and Consultant

Date: August 18, 2005

From: William J. Lyons, Manager
Design Section
Roadway Engineering Group

Subject: Design Memorandum
"2 Foot Offset Distance
to Roadside Barriers"

The attached three pages supersede the previously issued memorandum dated August 6, 2004. Revisions are made on page 3 to clarify that a) with 12 ft outside shoulders, the 2 ft offset to barrier is not applied and b) for urban freeways in the Interim condition, 8 ft median shoulders may be used.

Please direct any questions to William Lyons or Terry Otterness.

Attachment

C:

Roadway Engineering Group

Valley Project Management

Traffic Group

Statewide Project management Group

Local Government Section

Materials Group

Bridge Group

Regional Traffic Engineers

Engineering Consultant Services

Districts (10)

FHWA

Roadway Design website

2 FT OFFSET DISTANCE TO BARRIER

Roadway Design Section has prepared this summary to clarify issues concerning the 2 ft offset distance to any type of barrier in response to various inquiries concerning various applications. The following is a compilation of references, guidelines, sources of information and standard practices relating to the 2 ft offset distance. The 2 ft offset distance is as measured from the normal shoulder width.

GUARDRAIL

C-10.01 / TYPE A GUARDRAIL INSTALLATION -

Guardrail is installed at normal shoulder width.

C-10.02 / TYPE B GUARDRAIL INSTALLATION -

Guardrail is installed with a 2 ft offset from the normal shoulder width. The extra 2 feet of pavement is gained by widening from the normal roadway shoulder. The location of subgrade or slope hinge point is not affected by the 2 foot pavement widening.

Standard Practice:

Type B guardrail with a 2 ft offset shall be used in all new roadway construction projects, major reconstruction and most pavement widening projects.

Type A guardrail may be used on roadway widening projects when the new guardrail is consistent with existing guardrail in the vicinity.

A replace-in-kind (Type A or B) process is used on pavement preservation projects when the existing guardrail components are being upgraded. Since the typical on standards C-10.01 and C-10.02 is for new construction only, a detail must be provided to cover the guardrail installation on pavement preservation projects. An exception to the replace-in-kind process on pavement preservation projects is the replacement of existing Type A guardrail with Type B guardrail in locations where the extra offset is desired and the existing embankment shoulder has adequate width to preclude new slope construction.

2 FT OFFSET DISTANCE TO BARRIER

RURAL HIGHWAYS:

Controlled-Access

Mainline	Two foot offset distance to the barrier shall be provided.
Ramps (Non-directional)	Two foot offset distance to the barrier shall be provided.
Freeway to Freeway Ramps (No Structure)	Two foot offset distance to the barrier shall be provided as noted below.
One Lane Ramp (No Structure) Minimum Width With and Without Barrier	6 ft 12 ft 10 ft = 28 ft* Shld Travel Lane Shld
Two Lane Ramp (No Structure) Minimum Width With Barrier both sides	2 ft 4 ft 12 ft 12 ft 8 ft 2 ft = 40 ft Offset Shld Travel Lane Travel Lane Shld Offset
Freeway to Freeway Ramps (With Structure)	Two foot offset distance to the barrier shall be provided as noted below.
One Lane Ramp (With Structure)	6 ft 12 ft 10 ft = 28 ft* Shld Travel Lane Shld
Two Lane Ramp (With Structure)	2 ft 4 ft 12 ft 12 ft 8 ft 2 ft = 40 ft Offset Shld Travel Lane Travel Lane Shld Offset

* Do not add any additional width to these ramps. The two foot offset for the barrier is included in the shoulder width.

Non-Controlled-Access

Rural and Fringe-Urban Roadways	Two foot offset distance to the barrier shall be provided.
Frontage Roads (No Curb & Gutter)	Two foot offset distance to the barrier shall be provided.
Ramps	Two foot offset distance to the barrier shall be provided.

2 FT OFFSET DISTANCE TO BARRIER

URBAN HIGHWAYS:

Controlled-Access

Mainline Outside Shoulder Two foot offset distance to the barrier shall be provided except when 12 ft shoulders are warranted. (See Roadway Design Guidelines Table 302.4)

Mainline Median Shoulder Two foot offset distance to the barrier is normally provided in the Ultimate condition.

Ramps Two foot offset distance to the barrier shall be provided throughout high speed area of the ramp and at tight-radius loop ramps. The inside barrier on the ramps of a single point urban interchange shall have the 2 ft offset distance.

Freeway to Freeway Ramps (No Structure) Two foot offset distance to the barrier shall be provided as noted below.

One Lane Ramp (No Structure)	6 ft 12 ft 10 ft = 28 ft*
Minimum Width With and Without Barrier	Shld Travel Lane Shld

Two Lane Ramp (No Structure)	2 ft 4 ft 12 ft 12 ft 8 ft 2 ft = 40 ft
Minimum Width With Barrier both sides	Offset Shld Travel Lane Travel Lane Shld Offset

Freeway to Freeway Ramps (With Structure) Two foot offset distance to the barrier shall be provided as noted below.

One Lane Ramp (With Structure)	6 ft 12 ft 10 ft = 28 ft*
	Shld Travel Lane Shld

Two Lane Ramp (With Structure)	2 ft 4 ft 12 ft 12 ft 8 ft 2 ft = 40 ft
	Offset Shld Travel Lane Travel Lane Shld Offset

* Do not add any additional width to these ramps. The two foot offset for the barrier is included in the shoulder width. Consider 36 ft minimum width to allow for future lane, if applicable.

Non-Controlled-Access

Frontage Roads (With Curb & Gutter) Barrier to match curb line – no additional offset required.

Most controlled-access urban highways have freeway curb & gutter using concrete half barriers, where applicable, in lieu of guardrail. The 2 ft offset distance is provided by widening the 2.5 foot gutter width to 4.5 feet as shown in Construction Standard Drawings.