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DESIGN MEMORANDUM NO. 02-14

TO: Chief District Engineers
Design Engineers
Active Consultants

FROM: William S. Gulick, Director
Division of Highway Design

DATE: May 14, 2014

SUBJECT: Design Guidance for Proposed Shoulder Widths on New Construction and/or Reconstruction Projects

Due to inconsistencies in the current KYTC practices concerning the widths of proposed shoulders and the corresponding widening needed for guardrail installation, it is necessary to clarify how shoulder widths are to be determined and how these widths relate to guardrail placement.

A shoulder is the portion of the roadway contiguous to the travel way that serves many purposes including accommodation of stopped vehicles, emergency use, lateral support of the pavement and in certain situations, accommodates bicycle traffic.

KYTC definitions of the various shoulder components are as follows:

Usable Shoulder: The actual width available for vehicles to pull off the roadway.

Graded Shoulder: Distance from the edge of the travel lane to the normal slope break. Typically this distance is the Usable Shoulder + 2 feet when barriers are not present.

Paved Shoulder: The width of the shoulder paving, which may be any portion of the usable shoulder up to the face of barrier (if present) or to within 2' of the normal slope break.

As part of the Typical Section development for a project, the Designer, along with help from the project team, must decide on the Minimum Usable Shoulder Width desired for the project. This should be based upon the Functional Classification of the facility, the Design Speed, the Volume

of Traffic and the Composition of the Traffic. Various guidance is available to assist in the determination of the Usable Shoulder Width for a particular project, including "AASHTO's : "A Policy on the Geometric Design of Highways and Streets", current edition; "Roadside Design Guide", current edition; "A Guide for Achieving Flexibility in Highway Design", 2004; "Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT $\leq$ 400), current edition; "A Policy on Design Standards Interstate System", current edition; and the KYTC Design Manual, current edition.

Once the Minimum Usable Shoulder Width is established and it is determined that guardrail is needed, the Graded Shoulder would be the Usable Shoulder + 3 feet, with the face of the barrier located at the edge of the usable shoulder. Under normal circumstances the Graded Shoulder should not be wider than 13' when barrier is present.

The Minimum Usable Shoulder widths should be continued across all new structures. Per AASHTO Guidance, on long bridges (in excess of 200') it may be acceptable to have bridge shoulder widths less than the approach roadway shoulder widths.

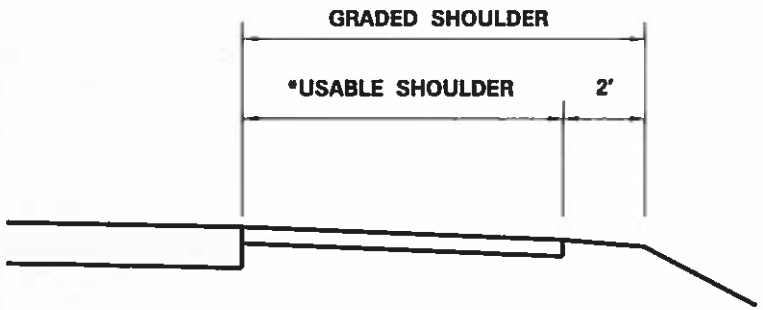
Typically on Interstate Highways with a 4-lane section, the Minimum Usable Shoulder Width shall be paved and not less than 4' on the left side and not less than 10' on the right side. On sections with six or more lanes, a 10' paved usable left shoulder should be provided. Where truck traffic exceeds 250 DDHV, a paved (usable) width of 12' should be considered.

Contrary to the current KYTC Design Manual, the Usable Shoulder on an Interchange Ramp should be paved and no less than 4' on the left side and no less than 6' on the right side. Where guardrail is needed, widen to 3' beyond the usable shoulder.
This Design Memorandum supersedes the information in the current KYTC Design Manual and should be applied to all future New Construction or Reconstruction Projects and current projects that have not received Line and Grade approval. If a project has received Line and Grade approval, the Project Manager may choose to adopt this guidance or continue with the current typical section.

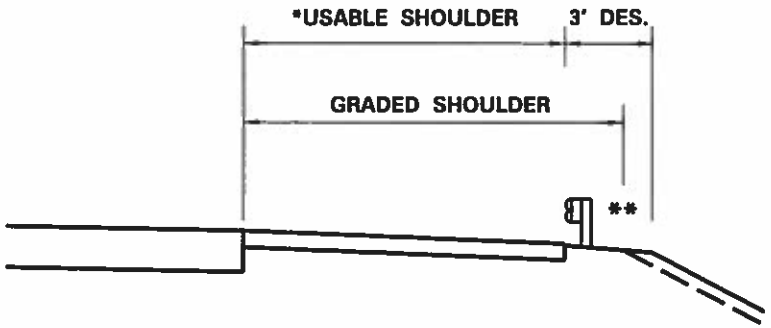
WSG/JJF

Attachments

NON INTERSTATE SHOULDER WIDTHS



SHOULDER WIDTH



SHOULDER WIDTH WITH GUARDRAIL

* USABLE SHOULDER IS TYPICALLY PAVED

** FOR SLOPES STEEPER THAN 3:1

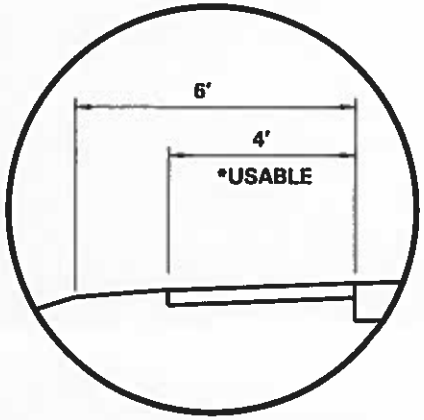
INTERSTATE SHOULDER WIDTHS

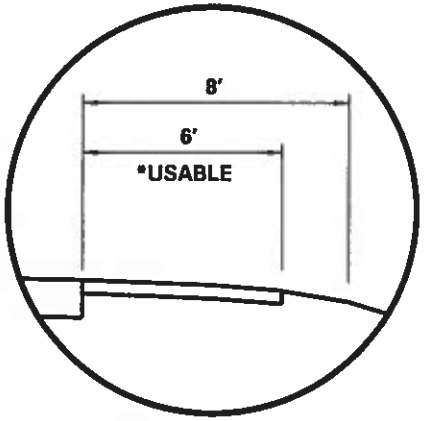
INTERSTATE SHOULDER

INTERSTATE SHOULDER WITH GUARDRAIL

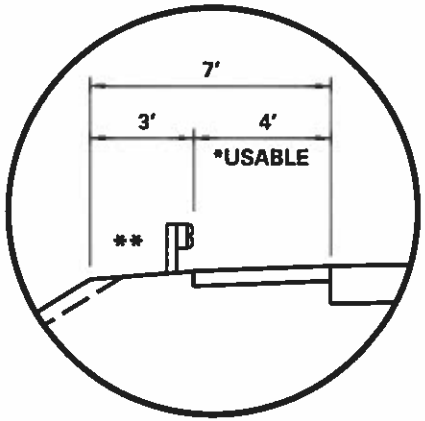
* USABLE SHOULDER SHALL BE PAVED

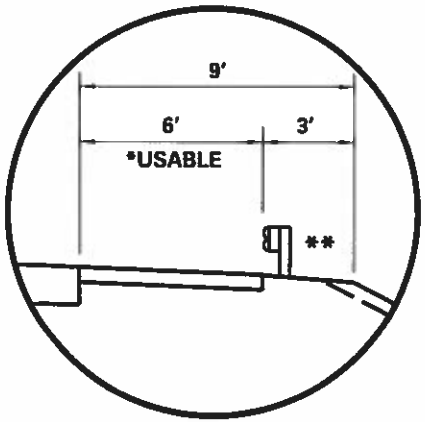
** FOR SLOPES STEEPER THAN 3:1





RAMP SHOULDER





RAMP SHOULDER WITH GUARDRAIL