## 12_16 Criteria - Update Shoulder Widening 2nd Update

Criteria Update:
In accordance with The Roadway Design Manual, Part 1, Chapter 1-4B, F-1A (pictured below), the criteria files have been modified to be in compliance with Roadway's policy concerning the usable shoulder widths plus the Index Factor depending on the fill side slopes for Arterials, Interstate, and Freeway Design Side Slopes when guardrail is not needed.

The criteria files have been recoded to do a second check to see when the additional Index Factor width is added to the usable shoulder width, if the shoulder width needed to be widened for regular guardrail installation. Currently, if criteria determine guardrail is not required, then the additional Index Factor is applied to the shoulder width and the side slopes are drawn to the slope stake point.
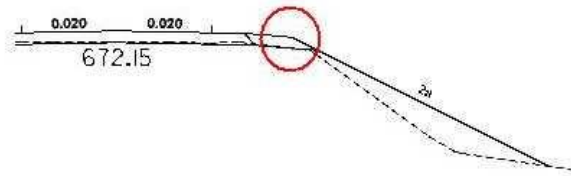
Usable shoulder widen by 2' (Index Factor, no guardrail).
With this update, a second check is done to see if regular guardrail installation is needed when the Index Factor is considered. The correct scenario is then applied.
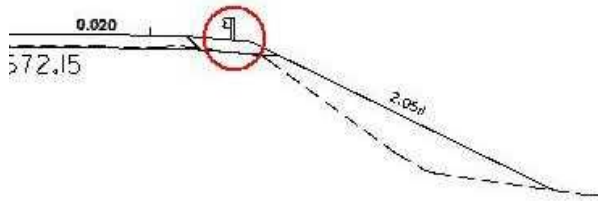
Usable Shoulder widen by 3' for guardrail when fill height is greater than 7' and side slope is at 2:1.

1. For the unconditional adherence to the Roadway Design Manual, Roadway CADD Support recommends the following statements to be key-in in the criteria input file for cross sections processing:
DEFINE "SH01 WIDTH FILL" 8 /*** usable shoulder width ***/
DEFINE "AD01 FILL SHOULDER WIDENING" 5 /*** 2' to the face of GR + 3' to fill hinge point ***/
The byproduct of these two key criteria statements is illustrated below.
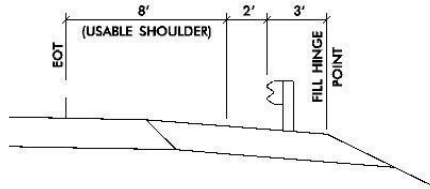
2. Because of a better engineering judgment in design and from past common practices, some Roadway Designers will opt not include the extra 2' of shoulder widening. There are other criteria used to add additional widths to the usable shoulder. From the Design aspect of this practice, approval from the Design Engineer or Project Engineer is required. From the CADD aspect of this practice, it is totally valid. The following statement is the only one required for this practice.
DEFINE "SH01 WIDTH FILL" 8 /*** usable shoulder width ***/
The byproduct of this criteria statement is illustrated below.
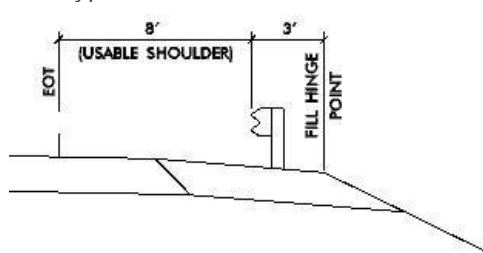
Having to interpret the Roadway Design Manual, Chapter 1-4B, Figure 1 and Figure 1A, all three standard side slopes (Local, Arterial, and Freeway Design Side Slopes) share one common key property. The guardrail face is always offsetted 3' to the fill hinge point. Our criteria library has been recoded to model after this line of thought. The only exception to this is in case of On-Site Detours.

3. For On-Site Detours, temporary guardrail installation pay item requires only 2' (0.6 M) from the guardrail face to the fill hinge point. Roadway CADD Support recommends the following statements to be key-in in the criteria input file for cross sections processing:
DEFINE "SH01 WIDTH FILL" 8 /*** usable shoulder width ***/
DEFINE "LD01 FILL SHOULDER WIDENING" 2 /*** 2' to the face of GR to fill hinge point ***/
The byproduct of these two key criteria statements is illustrated below.
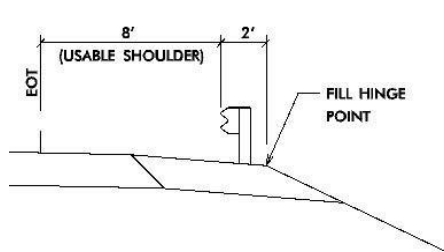
Two other questions that need addressing.

1. Can I not just include the extra 2' with my usable shoulder width in my DEFINE "SHO1 WIDTH FILL" statement?
It is not recommended that Designers add other widths, beside what is instructed in the Roadway Design Manual, to the usable shoulder and calling it the total usable shoulder width in criteria. This practice will render you shoulder design faulty because the extra 2' feet is only applicable in guardrail installation scenarios.

2. What about if I have guardrail in a cut section, should I consider widening the shoulders strictly base on the Roadway Design Manual policy?
This question should be appropriately answer by the Project Engineers. To answer this question and still keeping it in CADD perspective, Roadway CADD Support recommend that if the Designer wants to widened the shoulder a total of 5' for guardrail installation scenarios in a cut section, then key-in DEFINE "SH01 SET WIDTH BY DGN ELEMENT" 1. The total width of the shoulder, including the 5' widening, is drawn in the design file.