

Chapter 12: Wedging

12.1 Introduction

The purpose of this chapter is to establish the guidelines set forth by the Traffic Control Unit concerning wedging and tie-ins in the work zone and how to best utilize the resources available for designing traffic control plans.

Wedging and tie-ins are an integral part of work zone design. The terms wedging and tie-ins are used to describe asphalt paving operations where lanes shift, superelevations change, or any place where proposed grades meet existing pavements. It is a series of variable depth pavement lifts that are used to “tie together” proposed grade surfaces with existing roadways. (See Figures on page 3 for sample details.) Over the years, wedging has become standard practice in the highway construction field to update roadways to new design speeds and improve safety in curves. In some cases, in concert with milling operations, wedging operations modify vertical clearances under overhead structures.

Tie-ins are usually designed where a smooth transition is needed to maintain traffic at a certain posted speed limit or to keep driveways to businesses and residences operational during construction.

12.2 Definitions & Abbreviations

The primary definitions needed for this chapter will be the following:

Base Course – The part of the pavement structure between the surface course (or intermediate course, if recommended) and the subgrade.

Centerline – The longitudinal mid-point of all travel lanes (Surveyed stations are normally on the centerline of travel lanes or median).

Cross Section – Produced by a vertical plane cutting through the roadway at right angles to the centerline showing the profile of existing and proposed earth.

Grade Point – The point where the proposed grade is referenced or tied to the typical section.

Intermediate Course – The part of the pavement structure between the surface course and the base course (not used in all cases).

Layer – A pavement structure design consisting of a lift or lifts of pavement types.

Lift – A single or series of variable depth applications of pavement types within a layer (pavement structure design).

Milling – The removal of existing pavement to lower the vertical elevation and/or to improve the riding surface.

Overlay Resurfacing – The placement of a new lift of asphalt over the existing pavement surface.

Pavement Schedule – The identification and thickness of the asphalt pavement design.

Profile Grade – A longitudinal side view of the roadway showing the engineered (designed) “up and down” (rise and fall) of the roadway.

Superelevation – The pavement cross slope of the roadway.

Surface Course – The top layer or riding surface of the pavement structure.

Typical Section – A cross-sectional view of a roadway showing how the structure of the roadway would appear after it is completed

Work Zone – Any continuous tract or area of a roadway in which construction or maintenance is being performed.

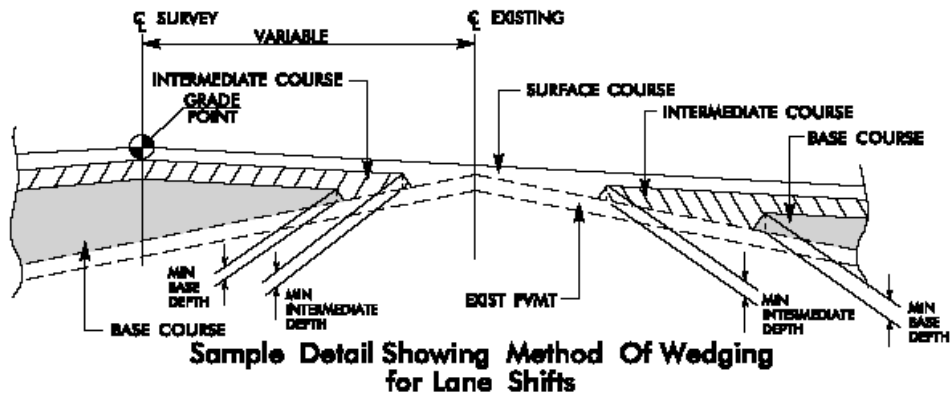


Figure 1 (Non-Symmetrical Widening) Grade Point Shift

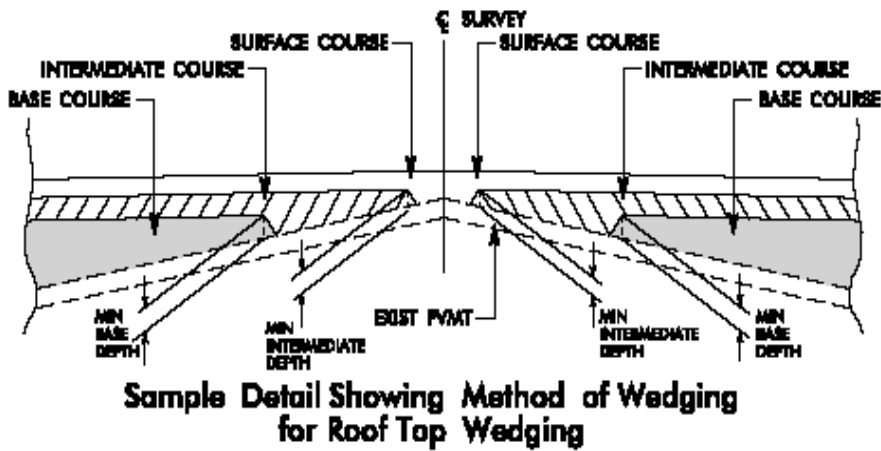


Figure 2 (Symmetrical Widening) Pavement Slope Change

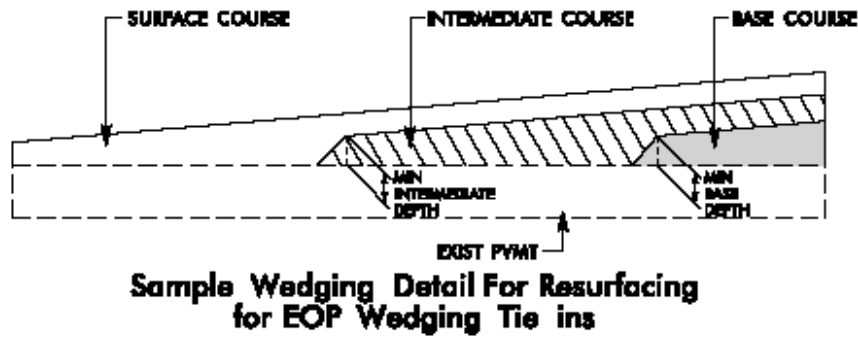


Figure 3 Raising the Grade Point

12.3 Guidelines

Over the years, wedging limits have varied from almost zero inches to three feet or more. The most important thing to remember is that wedging limits are a constructability issue more than a pavement issue. Whenever the proposed grade is higher than the existing pavement by **less** than the thickness of the proposed pavement, wedging is needed.

Whenever the proposed grade is higher than the existing pavement by **more** than the thickness of the proposed pavement, the decision to wedge or not is a coordinated decision between the designer, Resident and Division Construction Engineer, Roadway Designer and the Roadway Construction Engineer.

All lifts of pavement used in North Carolina have maximum and minimum values. Some of these values are listed below:

Minimum/Maximum Lifts for Pavement Types

<u>Mix Type</u>	<u>Minimum Lift Thickness</u>	<u>Maximum Lift Thickness</u>
SF9.5A	1.0"	1.5"
S9.5X	1.5"	2.0"
S12.5X	2.0"	2.5"
I19.0X	2.5"	4.0"
B25.0X	3.0"	5.5"

Note: For the most up to date minimums and maximums, see a current Pavement Schedule or see the Roadway Design Manual, Part II, 6-1D.

Remember that the number of lifts that can be constructed under traffic is dependent on how long the designer is willing to have traffic maintained in a temporary traffic pattern.

Wedging pavement under traffic is a slow process and the inconvenience to the motoring public can be enough to change the design of a roadway construction sequence. See the User Cost Chapter of this manual for more details.

12.4 Design Resources

Roadway Design Manual, Part II
 Pavement Designer
 Division Construction Engineer
 Roadway Construction Engineer