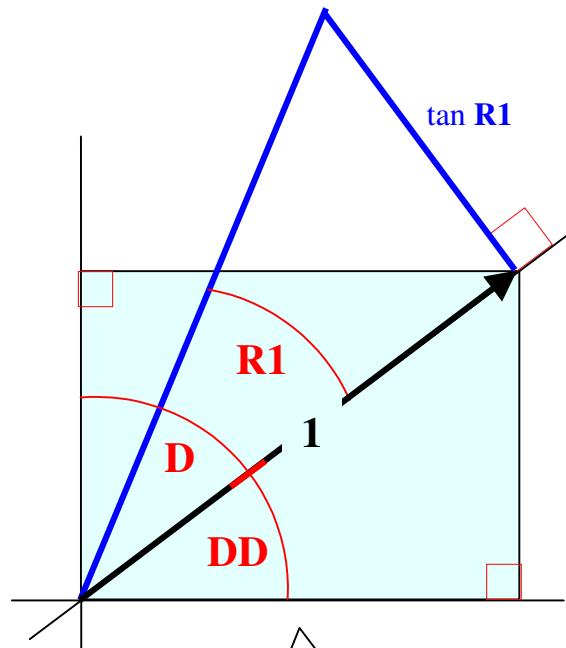


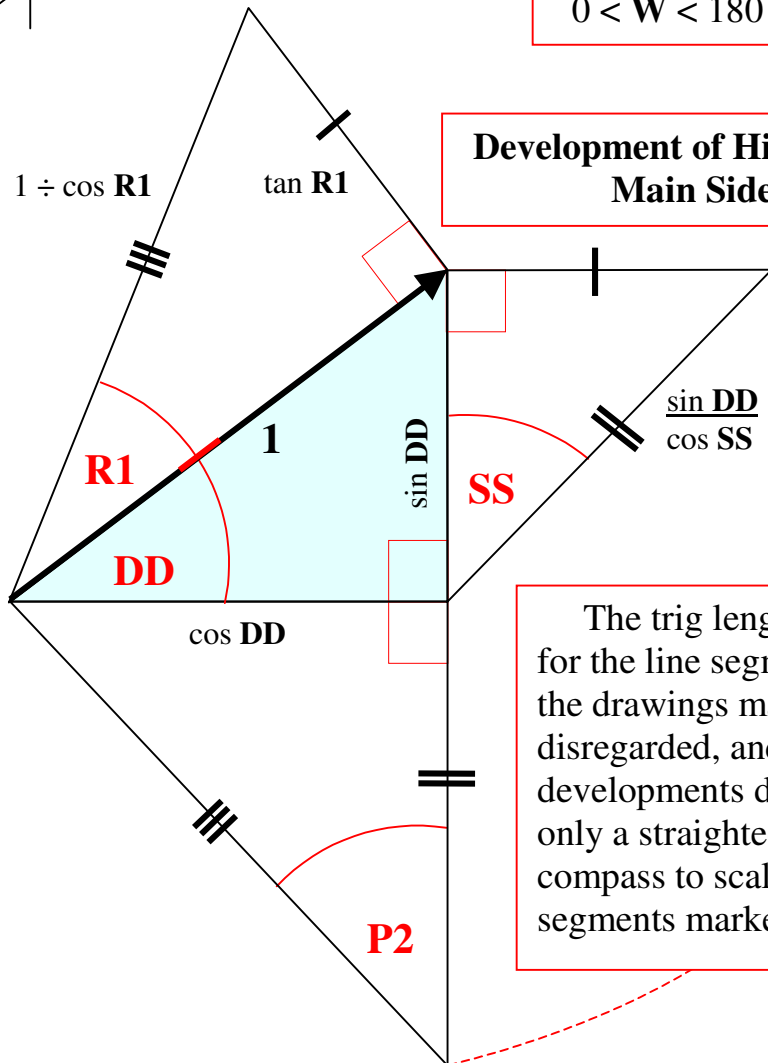
Development of SS, DD, R1, and P2 Angles



Plan showing Deck angles **DD** and **D**, and Hip pitch angle **R1**. Rises of the Common pitch angles **SS**, **S**, and **R1** are all equal (the line segment labelled $\tan R1$).

Deck angles **DD** and **D** are located at the **Hip eaves** or **Valley ridges**. Angles resulting from a projection of the Deck angles will follow this pattern.

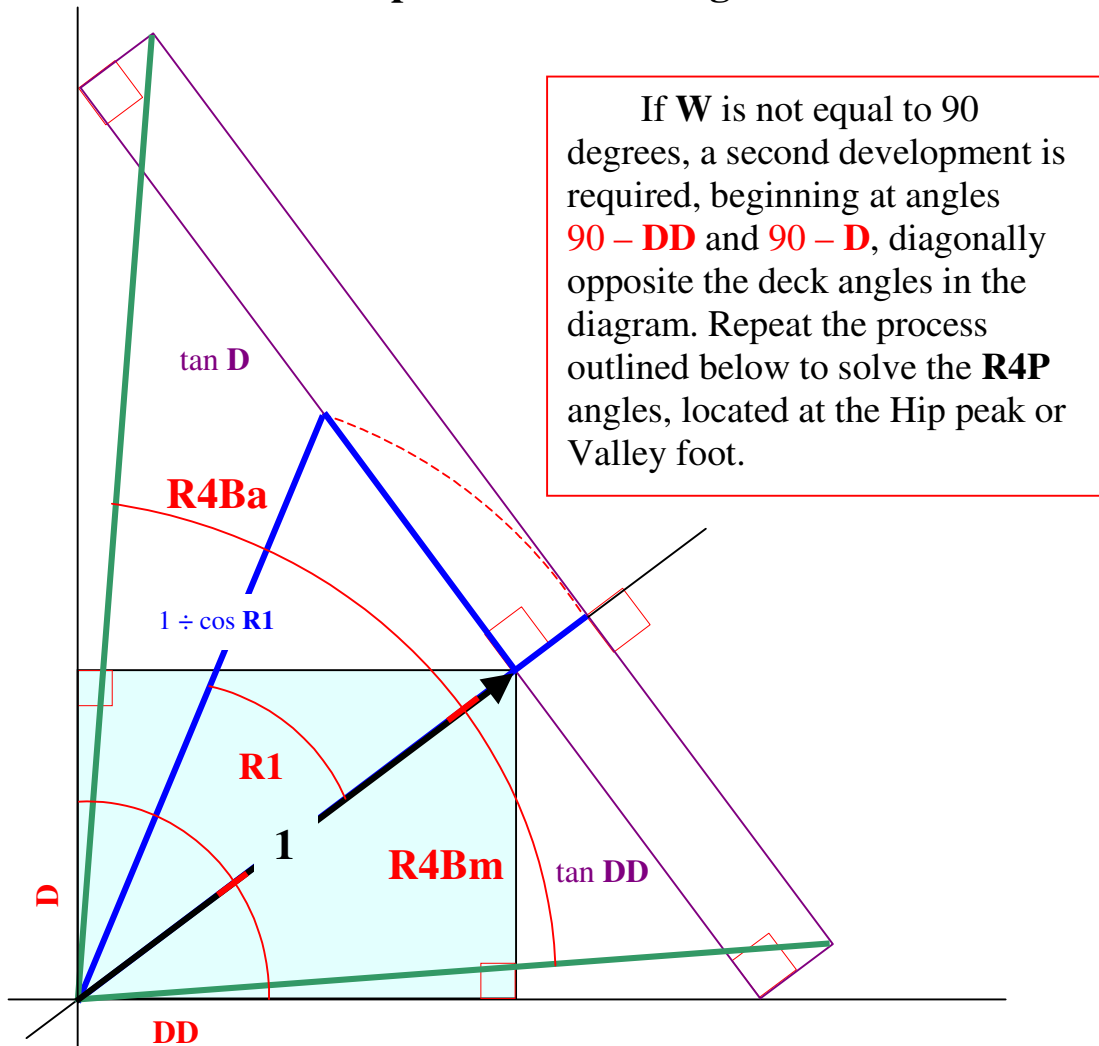
$$W = DD + D, \text{ where } 0 < W < 180 \text{ degrees}$$



Development of Hip Kernel Main Side

The trig lengths given for the line segments on the drawings may be disregarded, and the developments drawn using only a straightedge and a compass to scale the line segments marked equal.

Development of R4B Angles



If W is not equal to 90 degrees, a second development is required, beginning at angles $90 - DD$ and $90 - D$, diagonally opposite the deck angles in the diagram. Repeat the process outlined below to solve the **R4P** angles, located at the Hip peak or Valley foot.

Produce the lines defining the Hip eaves or Valley ridges

$W = DD + D$, where $0 < W < 180$ degrees

Construct the triangle of Hip Pitch angle $R1$

Rotate the hypotenuse $1 \div \cos R1$ to the Hip run

Construct the line segments $\tan DD$ and $\tan D$ perpendicular to the Hip run

Construct the parallel sets of line segments $\tan DD$ and $\tan D$

perpendicular to the Hip run produced to $1 \div \cos R1$

Draw the line segments (hypotenuse) for **R4B** angles

$\tan R4Bm = \tan DD \div (1 \div \cos R1) = \tan DD \cos R1$

$\tan R4Ba = \tan D \div (1 \div \cos R1) = \tan D \cos R1$

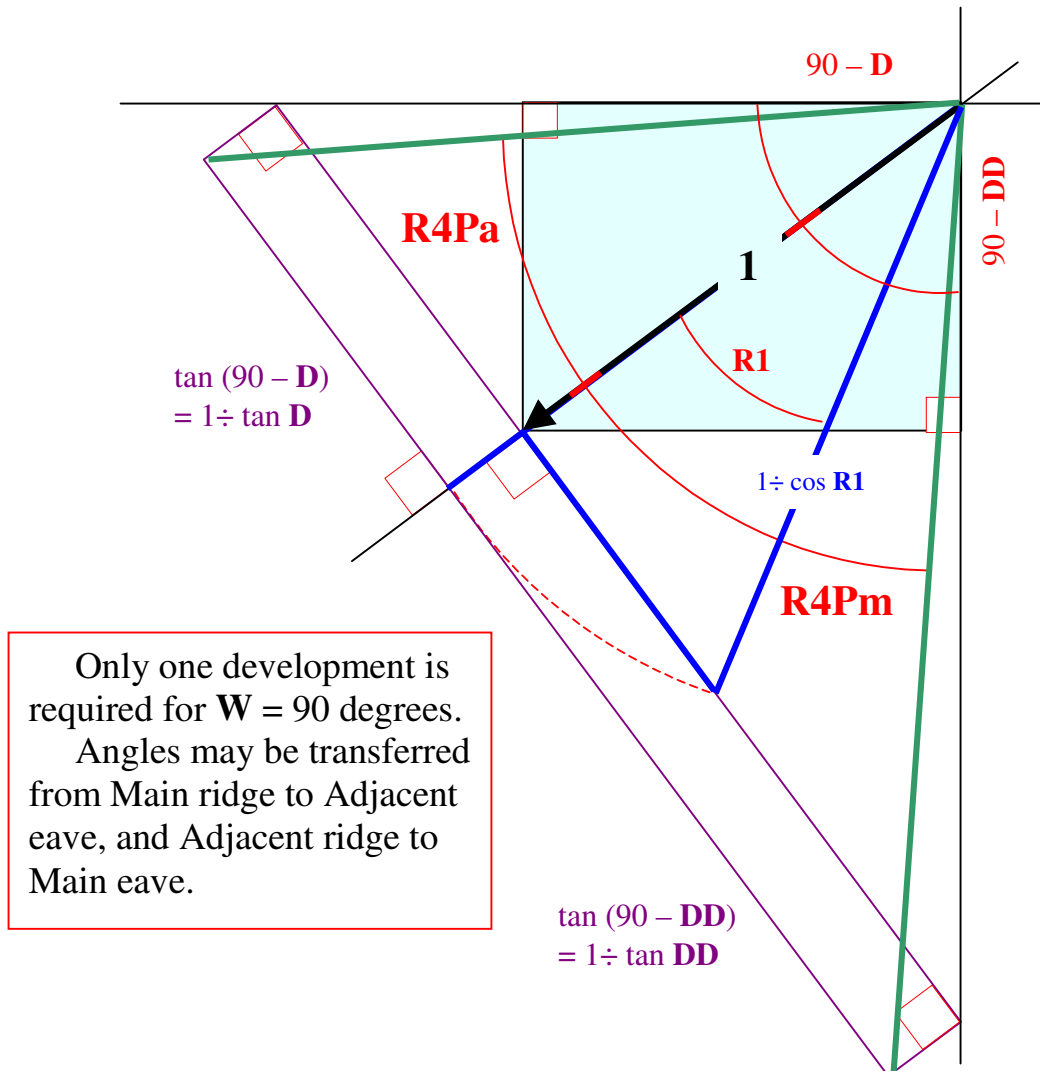
The **R4B** angles are projections of the Deck angles, and are

located at the **Hip eaves** or **Valley ridges**. For $W = 90$ degrees, the angles

developed above are sufficient, as the values may be transferred from Main

ridge to Adjacent eave, and Adjacent ridge to Main eave.

Development of R4P Angles



Produce the lines in plan representing $180 - W = 90 - DD + 90 - D$

Construct the triangle of Hip Pitch angle **R1**

Rotate hypotenuse $1 \div \cos R1$ to the Hip run

Construct the line segments $\tan(90 - DD)$ and $\tan(90 - D)$ perpendicular to the Hip run

Construct the parallel sets of line segments $\tan(90 - DD)$ and $\tan(90 - D)$ perpendicular to the Hip run produced to $1 \div \cos R1$

Draw the line segments (hypotenuse) for **R4B** angles

$\tan R4Pm = (1 \div \tan DD) \div (1 \div \cos R1) = \cos R1 \div \tan DD$

$\tan R4Pa = (1 \div \tan D) \div (1 \div \cos R1) = \cos R1 \div \tan D$

The **R4P** angles are projections of the **complements** of the Deck angles, and are located at the **Hip peak** or **Valley foot**.