**Hip Roof Models**

**Adjacent Span**

**Main Span**

**Above and Left:** Juxtaposed Main and Adjacent sections removed from the Hip roof.

**Below:** Main side section of Hip roof. This is also the standard model for a Valley roof.
Trigonometric Scaling

The model of the Hip Roof may be drawn to any scale. All angles remain equal, all lengths remain proportional. Trigonometric scaling creates right triangles which readily produce formulas relating angles on different faces of the model.

**Hip Run = 1**

- **Hip Length** = \(1 \div \cos \text{ Hip Pitch Angle}\)
- **Hip Rise** = **Common Rise** = \(\tan \text{ Hip Pitch Angle}\)
- **Common Run** = \(\sin \text{ Deck Angle}\)
- **Common Length** = \(\sin \text{ Deck Angle} \div \cos \text{ Common Pitch Angle}\)
- **Eave** = \(\cos \text{ Deck Angle}\)
Development of Hip Roof Model: Hip Run = 1

The triangles in the previous diagram have been juxtaposed about the triangle of the **Deck Angle**. **All** lengths may be multiplied by any convenient factor to create a development with a workable scale. Edges highlighted the same color are of equal length; most of the development can be drawn using only a compass and straightedge.
The model of the Hip Roof may be drawn to any scale. All angles remain equal, all lengths remain proportional. Trigonometric scaling creates right triangles which readily produce formulas relating angles on different faces of the model.

- **Common Run = 1**
- **Common Length** = \( \frac{1}{\cos \text{ Common Pitch Angle}} \)
- **Hip Rise** = **Common Rise** = \( \tan \text{ Common Pitch Angle} \)
- **Hip Run** = \( \frac{1}{\sin \text{ Deck Angle}} \)
- **Hip Length** = \( \tan \text{ Common Pitch Angle} \div \sin \text{ Hip Pitch Angle} \)
- **Eave** = \( \frac{1}{\tan \text{ Deck Angle}} \)
Development of Hip Roof Model: Common Run = 1

The triangles in the previous diagram have been juxtaposed about the triangle of the Deck Angle. All lengths may be multiplied by any convenient factor to create a development with a workable scale. Edges highlighted the same color are of equal length; most of the development can be drawn using only a compass and straightedge.
Hip Roof Models to Scale

Angular Model

Hip Run = 1

Common Run = 1

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