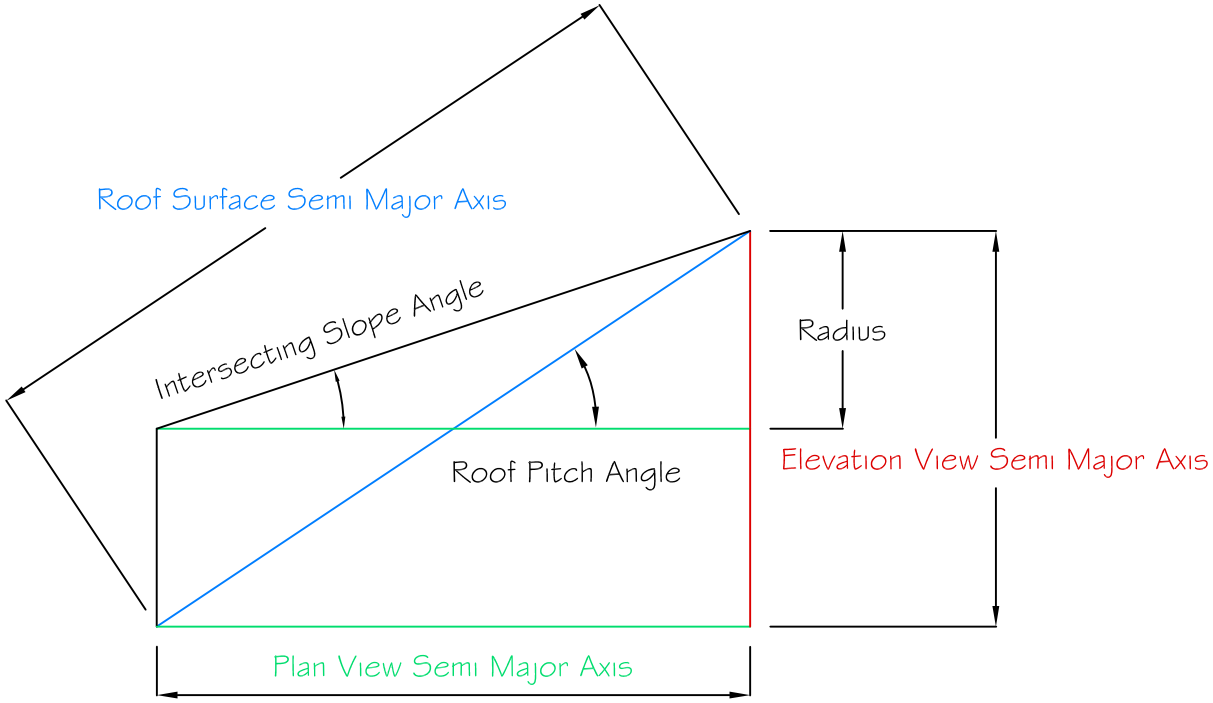
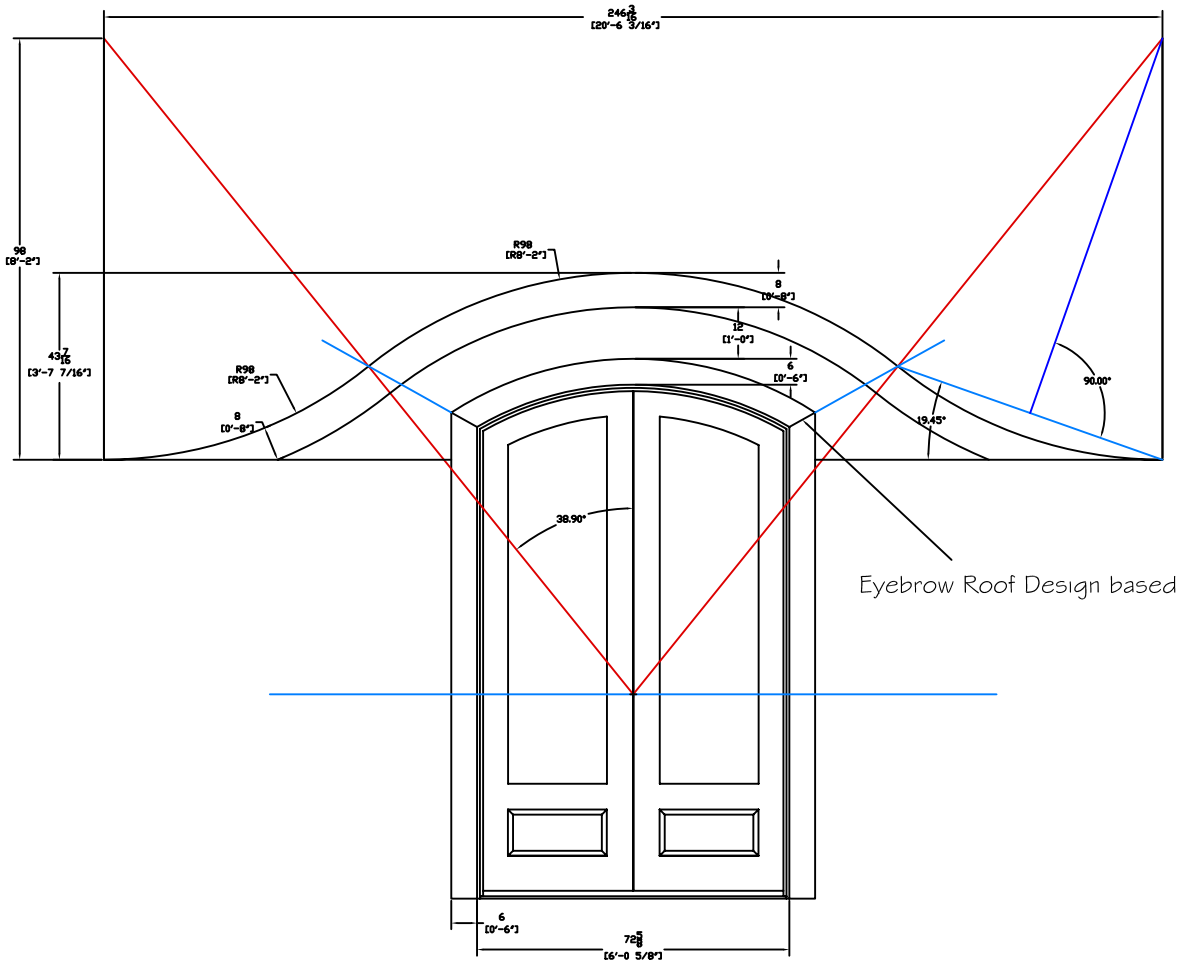
Ellipse Formulas for Eyebrow Roof Design

Intersecting Slope Angle = arctan((Roof Pitch - Dormer Pitch) ÷ 12)
Semi Minor Axis = Radius
Roof Surface Semi Major Axis = (Radius ÷ tan(Intersecting Slope Angle)) ÷ cos(Roof Pitch Angle)
Plan View Semi Major Axis = Radius ÷ tan(Intersecting Slope Angle)
Elevation View Semi Major Axis = (Radius ÷ tan(Intersecting Slope Angle)) * tan(Roof Pitch Angle)





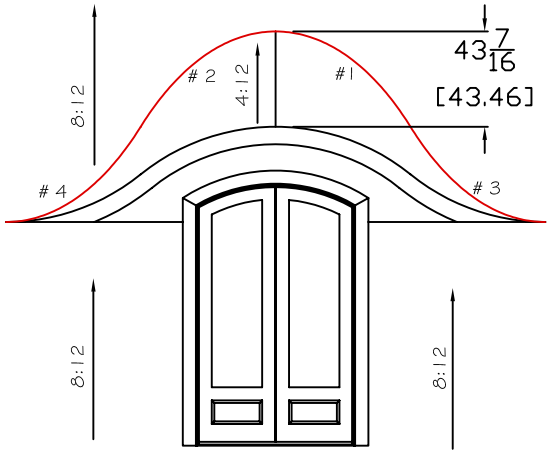
Eyebrow Roof Design based on 6" door trim miter angle

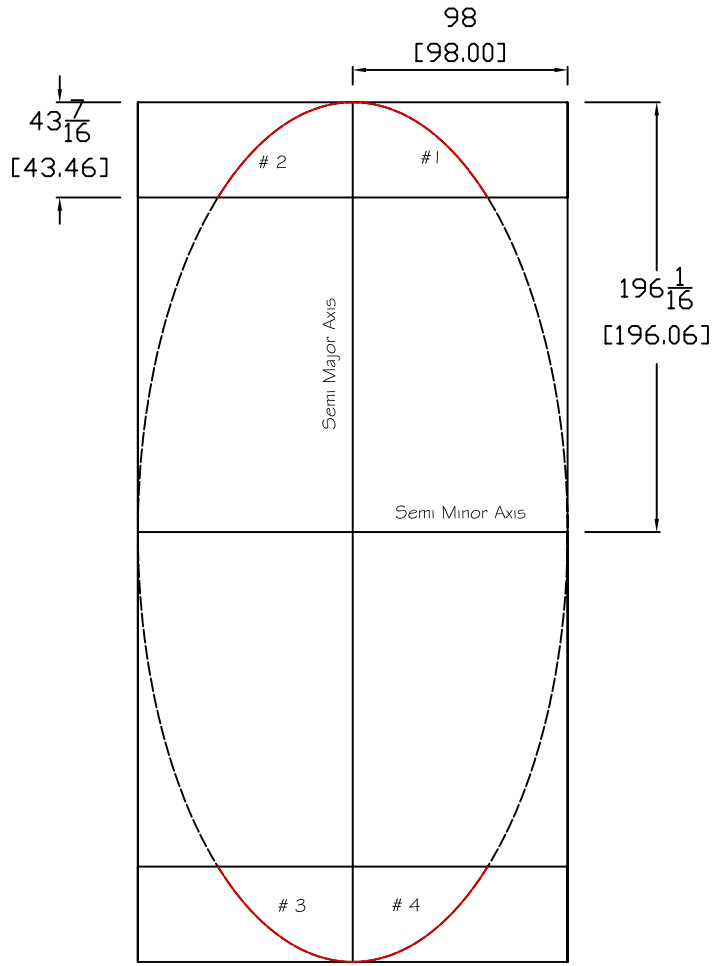
Ellipse Formulas for Eyebrow Roof Design

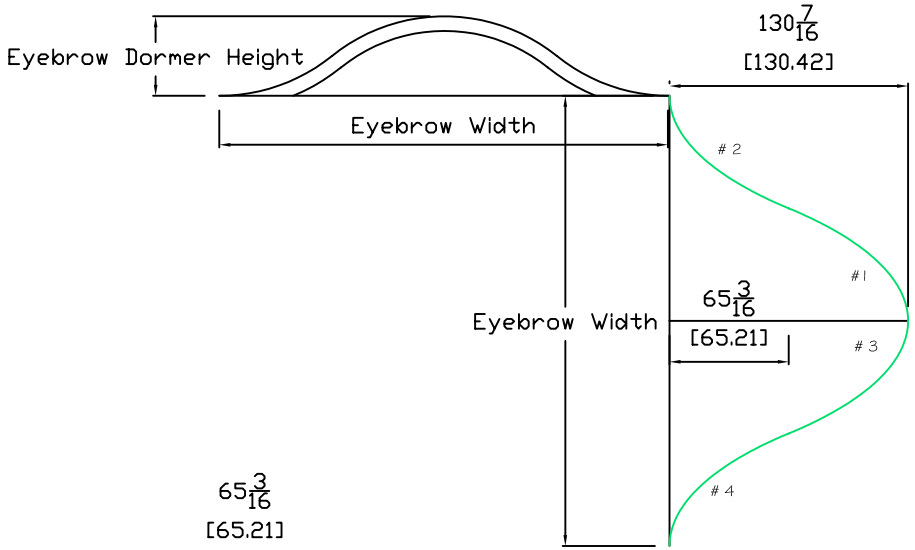
Intersecting Slope Angle = arctan((Roof Pitch - Dormer Pitch) ÷ 12)
Semi Minor Axis = Radius
Elevation View Semi Major Axis = (Radius ÷ tan(Intersecting Slope Angle)) * tan(Roof Pitch Angle)

Eyebrow Dormer Height = 43.46
Eyebrow Roof Height = 43.46
Radius = 98"
Roof Pitch = 8:12
Dormer Pitch = 4:12
Roof Pitch Angle = 33.69°
Dormer Pitch Angle = 18.43°
Intersecting Slope Angle = arctan((8 - 4) ÷ 12) = 18.43°

Semi Minor Axis = 98
Elevation View Semi Major Axis = (98 ÷ tan(18.43°)) * tan(33.69°) = 196.06





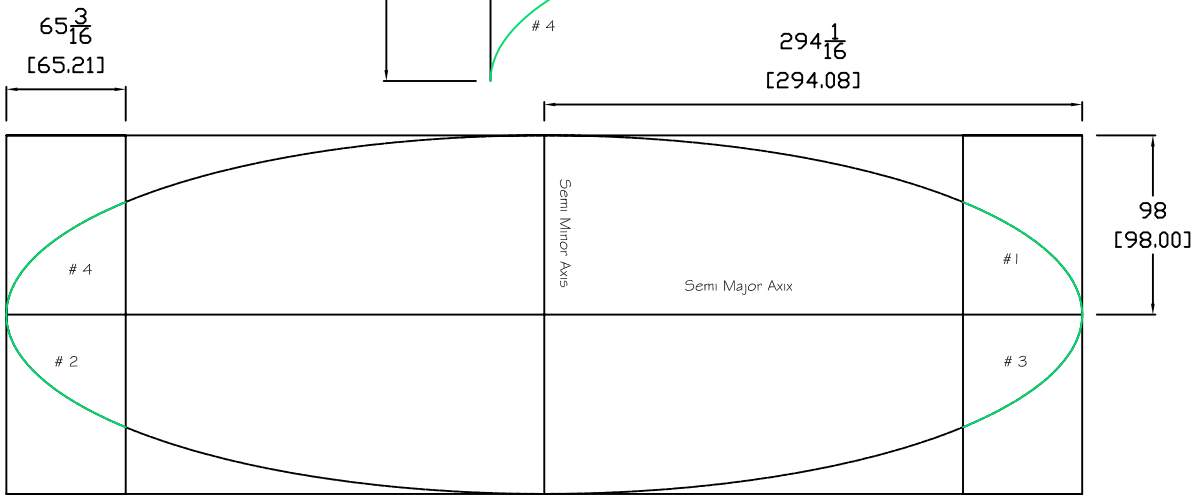


Ellipse Formulas for Eyebrow Roof Design

Intersecting Slope Angle = arctan((Roof Pitch - Dormer Pitch) ÷ 12)
Semi Minor Axis = Radius
Plan View Semi Major Axis = Radius ÷ tan(Intersecting Slope Angle)

Eyebrow Dormer Height = 43.46
Radius = 98"
Roof Pitch = 8:12
Dormer Pitch = 4:12
Roof Pitch Angle = 33.69°
Dormer Pitch Angle = 18.43°
Intersecting Slope Angle = arctan((8 - 4) ÷ 12) = 18.43°
Intersecting Run = Eyebrow Dormer Height ÷ tan(Intersecting Slope Angle)
Intersecting Run = 43.46 ÷ tan(18.43°) = 130.42

Semi Minor Axis = 98
Plan View Semi Major Axis = 98 ÷ tan(18.43°) = 294.08



Ellipse Formulas for Eyebrow Roof Design

Intersecting Slope Angle = arctan((Roof Pitch - Dormer Pitch) ÷ 12)
Semi Minor Axis = Radius
Roof Surface Semi Major Axis = (Radius ÷ tan(Intersecting Slope Angle)) ÷ cos(Roof Pitch Angle)

Eyebrow Dormer Height = 43.46
Radius = 98"
Roof Pitch = 8:12
Dormer Pitch = 4:12
Roof Pitch Angle = 33.69°
Dormer Pitch Angle = 18.43°
Intersecting Slope Angle = arctan((8 - 4) ÷ 12) = 18.43°
Intersecting Run = Eyebrow Dormer Height ÷ tan(Intersecting Slope Angle)
Intersecting Run = 43.46 ÷ tan(18.43°) = 130.42
Main Roof Pitch Roof Surface Rafter Length= Intersecting Run ÷ cos(Roof Pitch Angle)
Main Roof Pitch Roof Surface Rafter Length= 130.42 ÷ cos(33.69°) = 156.69

Semi Minor Axis = 98
Roof Surface Semi Major Axis = (98 ÷ tan(18.43°)) ÷ cos(33.69°) = 353.4455