METHOD OF FINDING THE LENGTH OF THE LONG DIAGONALS IN A DOUBLE-INTERSECTION BRIDGE.

Let

\[ l = \text{panel length of bottom chord} = GD \text{ or } DB \text{ in the accompanying diagram}, \]
\[ c = \text{half increase of panel length in top chord}, \]
\[ d = \text{depth of truss between centres of chords} = AB, \]
\[ \alpha = \text{angle between radial line at panel point and perpendicular to lower chord}; \]

then

\[ \alpha = \sin^{-1} \frac{c}{d}, \]

and

\[ DE : c :: l : d, \]

or

\[ DE = \frac{cl}{d}, \]

\[ BG = 2GE = 2\sqrt{l^2 - \frac{c^2 l^2}{d^2}} = 2l\sqrt{\frac{d^2 - c^2}{d^2}}. \]

When the camber is small, \( BG \) can be taken equal to \( 2GD \).

In triangle \( ABG \), \( AB \) and \( BG \) are known, also angle

\[ ABG = 90^\circ + \alpha. \]