### Calculation Number

### Project Number

**Project Title:** Calculation of shear lug depth and thickness

**Subject/Feature:**
- Imperial Units calculation / spreadsheet

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#### Design shear force:

\[ V_{\text{lg}} = 10.00 \text{ kips} \]

#### Allowable stress of concrete:

\[ f'_{\text{c}} = 5.00 \text{ ksi} \]

#### Required bearing area for the shear lug:

\[ A_{\text{lg}} = \frac{V_{\text{lg}}}{(0.35* f'_{\text{c}})} = 5.71 \text{ in}^2 \]

#### Width of the shear lug:

\[ W_{\text{lg}} = 10.00 \text{ in} \]

#### Necessary shear lug depth below the concrete foundation:

\[ H-G = 0.57 \text{ in} \]

#### Grout thickness:

\[ G = 1.00 \text{ in} \]

#### Required minimum depth of the shear lug:

\[ H_{\text{min}} = 1.57 \text{ in} \]

#### Shear lug depth:

\[ H = 2.00 \text{ in} \]

#### Minimum yield stress of the type of steel being used:

\[ F_y = 50.00 \text{ ksi} \]

#### Cantilever end moment acting on a unit length of the shear lug:

\[ M_{\text{lg}} = \left( \frac{V_{\text{lg}}}{W} \right) * \left( \frac{H}{2+G} \right) = 2 \text{ kip-in/in} \]

#### Resistance factor for flexure:

\[ \phi_e = 0.75 \]

#### Required minimum thickness of the shear lug:

\[ t_{\text{lg}} = \left( \frac{6* M_{\text{lg}}}{(0.75* F_y)} \right)^{0.5} = 0.57 \text{ in} \]

### References:

- Manual of Steel Construction - American Institute of Steel Construction Inc.,
- Load and resistance factor design (LRFD)