

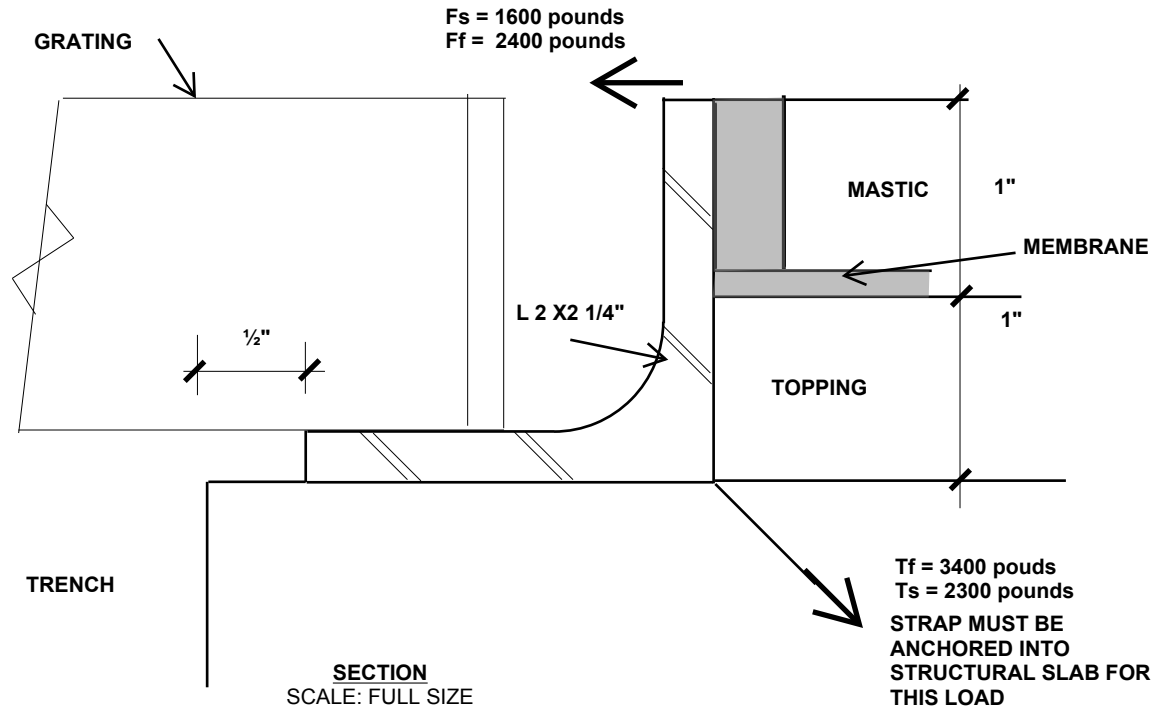
CASE 1 : FORCE ACTING TOWARDS TRENCH

WHEEL LOAD = 2000 pounds minimum
COEF OF FRICTION TIRE ON ROAD 0.80

$F_{hor} = 0.80 \times 2000 = 1600$ pounds
 F_{hor} factored = 2400 pounds

T_f - factored force in strap (assuming strap at 45 deg) = $2400 / \cos 45 = 3400$ pounds

If angle anchored at 18", horizontal deflection = 3/8" if considered fixed against rotation at 18" o/c.



CASE 2 : FORCE ACTING AWAY FROM TRENCH

Applied force magnitude same as above, but now the strap takes no load and the load must be resisted by the mastic.

There is nothing to resist the force unless there is mastic or concrete placed right up to the angle.

There are no published values that I could find for compressive strength of mastic but I would not expect it to be very high.

If the 1600 pound force is spread over the tire width plus say 4" each side for say 8" wide tire plus 4" + 4" = 16", then the compressive stress applied to the mastic is about 100 psi, but the mastic would have to butt right up against the angle, and you would have to delete the flexible bituminous filler.

A concrete backup placed tight against the angle, rather than mastic would likely perform better since it can take much greater compressive stress with negligible deformation, but you would have to waterproof the concrete with membrane.

The concrete, like all concrete will likely crack, but if that is protected by and concealed by a membrane, then that may be ok.

This all still leaves the question oh how to anchor the straps for the force as shown n Case 1, but I expect that we can come up with something for that.

