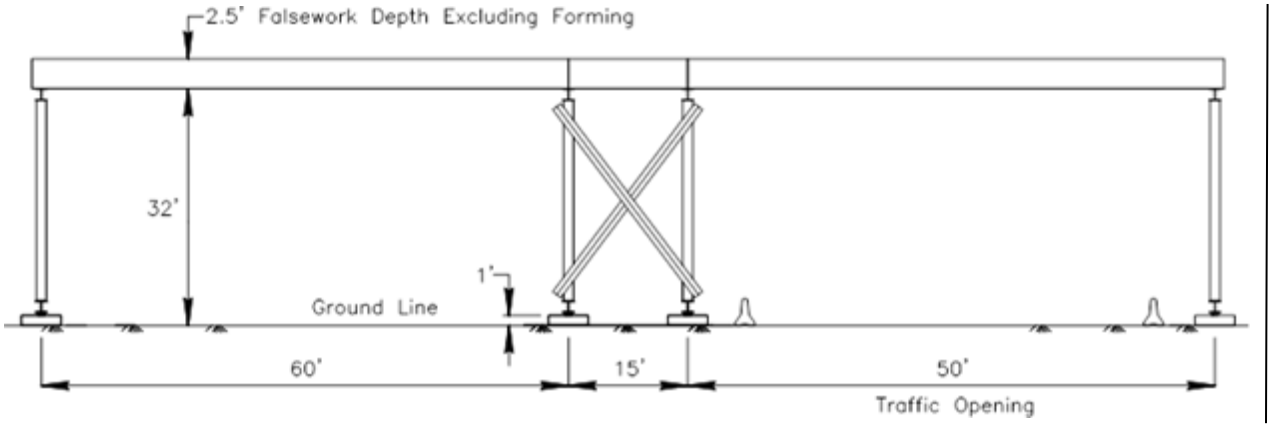
Appendix D Example 4 – Wind Loads on Conventional Falsework

This example demonstrates how to perform wind load calculations on conventional falsework. Refer to *Falsework Manual*, Section 3-3, *Horizontal Load.*

Given Information



Conventional Falsework

Transverse width of falsework = 58' (into paper)

Determine the Wind Load

Determine the Horizontal Design Wind Load for Bents A and B

1. Determine the width of the falsework system in the wind direction. W = 58'.
2. Calculate the drag coefficient Q.

   Q = 1+0.2W = 1+0.2(58) =12.6 > 10

   ∴ Q = 10 max.

3. Calculate the wind pressure value for each height zone using the wind velocity coefficient for each height zone listed in *Standard Specifications*, Section 48-2.02B(2), *Falsework – Design Criteria – Loads:*

Height Zone	Bent A	Bent B
	All other locations	Adjacent to traffic locations
0-30	1.5Q = 1.5(10) = 15 psf	2.0Q = 2.0(10) = 20 psf
30-32	2.0Q = 2.0(10) = 20 psf	2.5Q = 2.5(10) = 25 psf
32-34.5	2.0Q = 2.0(10) = 20 psf	2.5Q = 2.5(10) = 25 psf

4. Calculate the wind impact area for each height zone:

Height Zone	Bent A	Bent B
0-30	30ft x $\frac{15\text{ ft}}{2}$ = 225 sqft	30ft x $\frac{15\text{ ft}}{2}$ = 225 sqft
30-32	2ft x $\frac{15\text{ ft}}{2}$ = 15 sqft	2ft x $\frac{15\text{ ft}}{2}$ = 15 sqft
32-34.5	2.5 ft x ($\frac{15\text{ ft}}{2}$ + $\frac{60\text{ ft}}{2}$) = 93.75 sqft	2.5ft x ($\frac{15\text{ ft}}{2}$ + $\frac{50\text{ ft}}{2}$) = 81.25 sqft

5. Calculate the total wind load for each height zone:

Height Zone	Bent A	Bent B
0-30	15 psf x 225 sqft = 3375 lb	20 psf x 225 sqft = 4500 lb
30-32	20 psf x 15 sqft = 300 lb	25 psf x 15 sqft = 375 lb
32-34.5	20 psf x 93.75 sqft = 1875 lb	25 psf x 81.25 sqft = 203**1** lb

6. Calculate overturning moment.

Height Zone	Bent A	Bent B
0-30	3375 lb x 14ft = 47250 ft-lb	4500 lb x 14ft = 63000 ft-lb
30-32	300 lb x 30ft = 9000 ft-lb	375 lb x 30ft = 11250 ft-lb
32-34.5	1875 lb x 32.25ft = 60469 ft-lb	2031lb x 32.25ft = 65500 ft-lb
Total	116719 ft-lb	139750 ft-lb

7. Calculate the horizontal design wind load applied at top of post (bottom of top cap)

Height Zone	Bent A	Bent B
	$\frac{116719\ \text{ft}-\text{lb}}{31\text{ft}}$ = **3765 lbs**	$\frac{139750\text{ft}-\text{lb}}{31\text{ft}}$ = **4508 lbs**