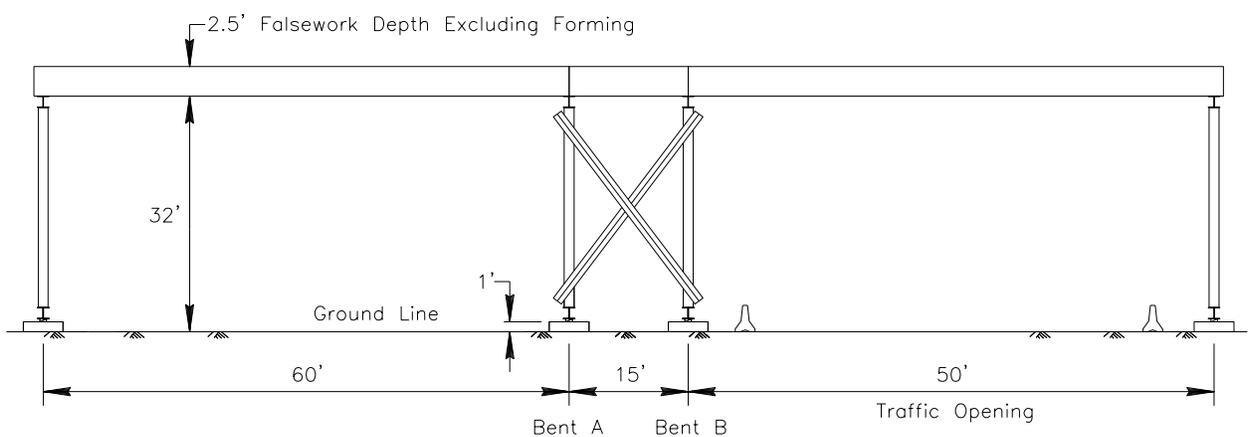


Appendix D Example 4 – Wind Loads on Conventional Falsework

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 .

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

$$\therefore Q = 10 \text{ max.}$$

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
	<u>All other locations</u>	<u>Adjacent to traffic locations</u>
0-30	$1.5Q = 1.5(10) = 15 \text{ psf}$	$2.0Q = 2.0(10) = 20 \text{ psf}$
30-32	$2.0Q = 2.0(10) = 20 \text{ psf}$	$2.5Q = 2.5(10) = 25 \text{ psf}$
32-34.5	$2.0Q = 2.0(10) = 20 \text{ psf}$	$2.5Q = 2.5(10) = 25 \text{ psf}$

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

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

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

Height Zone	Bent A	Bent B
0-30	$15 \text{ psf} \times 225 \text{ sqft} = 3375 \text{ lb}$	$20 \text{ psf} \times 225 \text{ sqft} = 4500 \text{ lb}$
30-32	$20 \text{ psf} \times 15 \text{ sqft} = 300 \text{ lb}$	$25 \text{ psf} \times 15 \text{ sqft} = 375 \text{ lb}$
32-34.5	$20 \text{ psf} \times 93.75 \text{ sqft} = 1875 \text{ lb}$	$25 \text{ psf} \times 81.25 \text{ sqft} = 2031 \text{ lb}$

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 = <u>60469</u> ft-lb	2031lb x 32.25ft = <u>65500</u> 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
	$\frac{116719 \text{ ft}\cdot\text{lb}}{31\text{ft}} = \underline{\underline{3765 \text{ lbs}}}$	$\frac{139750 \text{ ft}\cdot\text{lb}}{31\text{ft}} = \underline{\underline{4508 \text{ lbs}}}$