Design of Curved Members/Façade Attachments
Quiz for Session 4: Curved Members Design Examples – July 9, 2018
Due: July 30, 8:00 a.m. EDT – Submit through the online form

AISC Night School

1. For Example 1, if H were reduced to 125 in., a first-order deflection of 2.00 in. at the apex indicates the need for a rigorous second-order finite element analysis.
    a. True
    b. False

2. For Example 1, if H were reduced to 125 in., resulting in $H/L_s = 0.15$, the arch member can be designed without a calculation of the snap-through buckling strength (Hint: See the discussion on snap-through buckling in Session 2).
    a. True
    b. False

3. Using the simplified method to determine the effects of local flange bending, a W14x90 curved about the strong axis (bent the hard way) to a 20 ft radius would have the section properties multiplied by a reduction factor, k_f, of:
    a. 1.00
    b. 0.917
    c. 0.762
    d. 0.591

4. For Example 1, if the curved member were rotated 90°, requiring the W18x86 to be curved about the weak axis (bent the easy way), the effective length factor for out-of-plane buckling, K_o, would be (Hint: $I_o = I_x = 1{,}530$ in.^{4} and $C_o = 0.00397$):
    a. 1.07
    b. 1.19
    c. 1.42
    d. 2.11

5. For Example 1, if the curved member were changed to a W14x90, the second-order moments would be calculated with an amplification factor, B_i, equal to (Hint: $r_i = r_x = 6.14$ in. and $P_{ei} = 925$ kips):
    a. 1.05
    b. 1.15
    c. 1.25
    d. 1.35

6. For Example 2, if the HSS10x0.375 post were removed, the corrected moments would be calculated with a correction factor, C, of (Hint: $\theta_s = 90° = \pi/2$):
    a. 1.00
    b. 1.07
    c. 1.14
    d. 1.35
    e. 1.62

7. For Example 2, if the W21x55 radial beam were removed, the flexural strength would be calculated with a lateral-torsional buckling modification factor for out-of-plane bending, C_{bo}, of (Hint: $\theta_b = 90° = \pi/2$):
    a. 0.563
    b. 0.879
    c. 1.00
    d. 1.14

8. For Example 2, if the required (corrected) strong-axis flexural moment, M_{uxc}, were increased from 514 kip-in. to 2,000 kip-in., the second-order torsional moment and rotation would be calculated with an amplification factor, B_o, of:
    a. 0.879
    b. 1.00
    c. 1.06
    d. 1.28

9. For Example 2, if the curved member were changed from a W21x101 to a W24x103, the radial load applied to the isolated flange, f_{fc}, would:
    a. Increase
    b. Decrease
    c. Remain the same

10. For Example 2, if the curved member were changed from a W21x101 to a W24x103, the available flexural strength of the isolated flange, $\phi_b M_{nw}$, would be (Hint: b_f = 9.00 in. and t_f = 0.980 in.):
    a. 893 kip-in.
    b. 1,370 kip-in.
    c. 1,890 kip-in