ERRATA for

PE Civil Structural Practice Exam

ISBN 978-1-932613-72-8

Errata posted 3-7-2018

Revisions are shown in red.

Question 509, p. 36:

Design Code:
ACI 318: *Building Code Requirements for Structural Concrete*, 2014.

Solution 540, p. 95:

Reference: ACI 318-14.

ACI 318 26.12.3.1(b)

Concrete is unsatisfactory. Every arithmetic average of any three consecutive strength tests should be equal to or exceed the required f'_c.

THE CORRECT ANSWER IS: (A)

Previously posted errata continued on next page.

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Revisions are shown in red.

Question 521, p. 47:

Question 521 should read as follows:

521. The W10 × 22 steel beam (F_y = 50 ksi) shown in the figure is only braced at the center of span.

Work either the ASD or the LRFD version of the question, considering the most conservative instance.

ASD

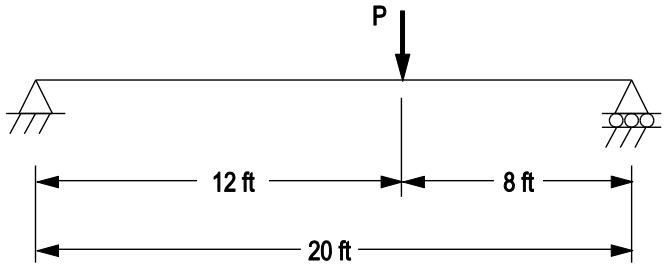
The allowable flexural strength (ft-kips) of the beam is most nearly:

(A) 45
(B) 51
(C) 56
(D) 65

LRFD

The design moment capacity ϕMn (ft-kips) of the beam is most nearly:

(A) 68
(B) 76
(C) 84
(D) 97



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Errata posted 8-16-2017

Solution 521, p. 96:

Solution 521 should read as follows:

521. The properties of a W10 × 22 are as follows: AISC, 14th ed., Table 3-2.

$\phi_b M_p x = 97.5$ ft-kips

$M_p x/\Omega_b = 64.9$ ft-kips

$BF/\Omega_b = 2.68$ kips (ASD) or $\phi_b BF = 4.02$ kips (LRFD)

$L_p = 4.7$ ft

$L_b = 10$ ft

ASD: $M_p x/\Omega_b - BF(L_b - L_p) = M_n/\Omega_b$

$64.9 - 2.68(10 - 4.7) = 50.7$ ft-kips

LRFD: $\phi_b M_p x - BF(L_b - L_p) = \phi_b M_n$

$97.5 - 4.02(10 - 4.7) = 76.2$ ft-kips

THE CORRECT ANSWER IS: (B)

Previously posted errata continued on next page

ERRATA for

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Revisions are shown in red.

Solution 533, p. 96:

Line 4 should read as follows:

Allowable load = 2(13)(0.79) = 21.2 kips

Previously posted errata continued on next page

ERRATA for

PE Civil Structural Practice Exam

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Errata posted 8-25-2016

Revisions are shown in red.

Question 509, p. 38:

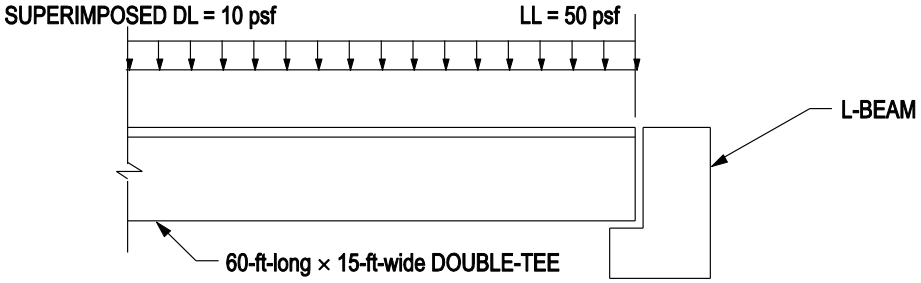
Question 509 should read as follows:

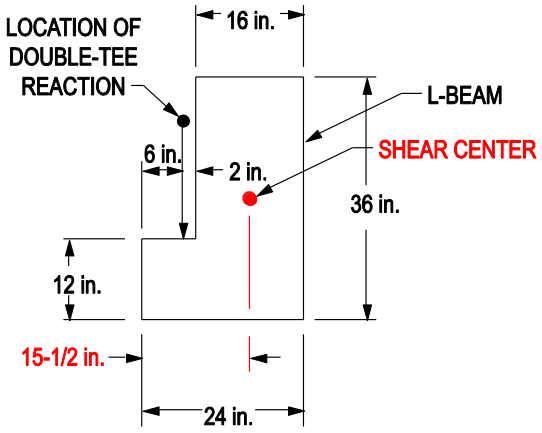
A double-tee supported by an L-beam is loaded as shown in the figure.

Design Code:
ACI 318: *Building Code Requirements for Structural Concrete*, 2011.

The magnitude of the ultimate torsion (ft-kips) induced into the L-beam, by superimposed dead and live load applied on the double-tee, is most nearly:

(A) 18.7
(B) 21.4
(C) 28.6
(D) 32.8





DETAIL

NOT TO SCALE

ERRATA for

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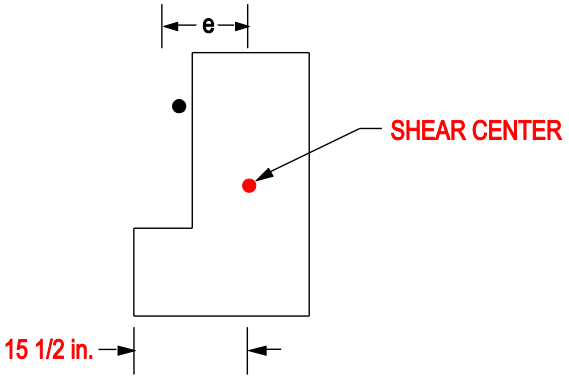
Errata posted 8-25-2016

Solution 509, p. 87:

Solution 509 should read as follows:



$15.5 \text{ in.} - 6 \text{ in.} = 9.5 \text{ in.}$

$$W_{u/DT} = [1.2(10 \text{ psf}) + 1.6(50 \text{ psf})]15 \text{ ft} = 1{,}380 \text{ plf}$$

$$R_{u/DT} = \frac{1}{2}(1.38 \text{ klf})(60 \text{ ft}) = 41.4 \text{ kips}$$

$$T_u = 41.4 \text{ kips}\left(\frac{9.5 \text{ in.}}{12 \text{ in./ft}}\right) = 32.8 \text{ ft-kips}$$

THE CORRECT ANSWER IS: (D)

Question 513, p. 41:

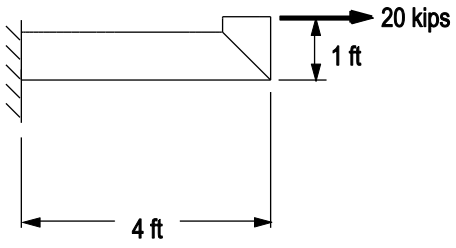
Question 513 should read as follows:

The pipe member shown in the figure has a constant section and the following properties:

Outside diameter	10 in.
Moment of inertia	90 in^4
Area	7 in^2

Neglecting the weight of the pipe, the maximum compressive stress (ksi) at the support is most nearly:

(A) 2.9
(B) 4.9
(C) 13.3
(D) 16.2



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Errata posted 8-25-2016

Solution 513, p. 88:

Solution 513 should read as follows:

$$M_S = (20 \text{ kips})(12 \text{ in.} - 5 \text{ in.}) = 140 \text{ in.-kips}$$

$$N_S = 20 \text{ kips}$$

$$\sigma_{flexure} = \frac{(140 \text{ in.-kips})(5 \text{ in.})}{90 \text{ in}^4} = 7.8 \text{ ksi} \begin{cases} \text{Top tension} \\ \text{Bottom compression} \end{cases}$$

$$\sigma_{axial} = \frac{20 \text{ kips}}{7 \text{ in}^2} = 2.9 \text{ ksi tension}$$

Max compressive stress (at bottom):

$-7.8 \text{ ksi} + 2.9 \text{ ksi} = -4.9 \text{ ksi}$

THE CORRECT ANSWER IS: (B)

Solution 520, p. 91:

Line 2 should read as follows:

Two or more spans not exceeding 10 ft

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Question 528, p. 52:

Question 528 should read as follows:

A connection is shown in the figure.

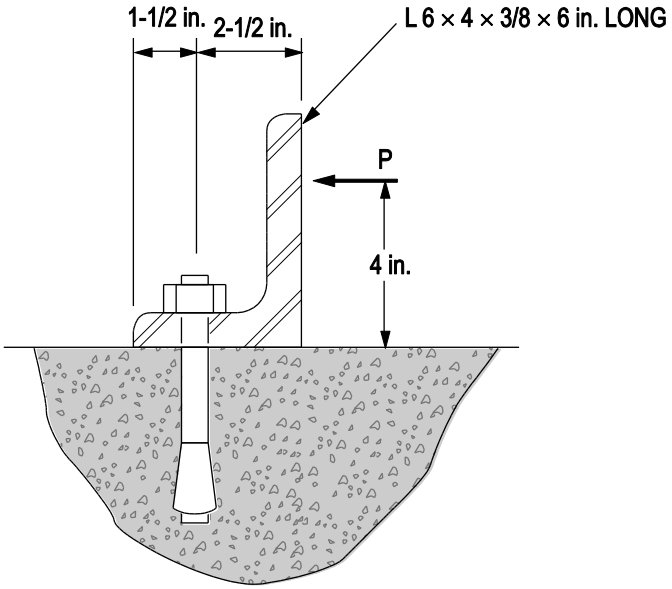
Design Code:
AISC: *Steel Construction Manual*, 14th edition.

Material:
A36 steel

Assumptions:
The bolt is sufficient.
The concrete is sufficient.
The load P is equally distributed along the entire 6-in.-long angle.

The maximum load P (ASD) or ϕP_n (LRFD) in kips that can be carried by the angle is most nearly:

	ASD	**LRFD**
(A)	0.8	1.2
(B)	1.1	1.7
(C)	1.2	1.8
(D)	2.0	2.0



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Errata posted 8-25-2016

Solution 528, p. 94:

Solution 528 should read as follows:

By inspection P controls.

$M_n = M_p = F_y Z_x \le 1.6\, M_y$

$F_y = 36$ ksi

$S_x = 1/6\ bd^2 = 1/6\ (6)(0.375)^2 = 0.141\ in^3$

$M_y = F_y S_x = (36)(0.141) = 5.076$ in.-kips

$Z_x = 1/4\ bd^2 = 1/4\ (6)(0.375)^2 = 0.211\ in^3$

$M_p = F_y Z_x = (36)(0.211) = 7.6$ in.-kips ← governs

Check $M_p \le 1.6\, M_y$ $\quad 1.6\,(5.076) = 8.1 > 7.6$ ∴ OK

AISC ASD:

$M_n/\Omega = 7.6/1.67 = 4.55$ in.-kips

$$P_{allow} = \frac{4.55}{\left[4 - (1/2)(3/8)\right]} = 1.19 \sim 1.2$$

AISC LRFD:

$\phi M_n = 0.9(7.6) = 6.84$ in.-kips

$$\phi P_n = \frac{6.84}{\left[4 - (1/2)(3/8)\right]} = 1.79 \sim 1.8$$

THE CORRECT ANSWER IS: (C)

Previously posted errata continued on next page

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Errata posted 5-7-2015

Revisions are shown in red.

Solution 538, p. 98:

Solution 538 should read as follows:

Reference: AASHTO Section 9.7.2.3.

AASHTO prescriptively calls out to add back a single flange overhang (not one on each side).

L_{eff} = 8.5 ft – b_f + flange overhang

= 8.5 ft – 1.5 ft + 0.25 ft

= 7.25 ft (7 ft 3in.)

THE CORRECT ANSWER IS: (C)