

CE388 - FUNDAMENTALS OF STEEL DESIGN

2014-2015 Spring Term

Problem Set 3 - Answers

1)

	Case a	Case b
M_p (kNm)	196.31	47.47

2)

M_y (kNm)	M_p (kNm)
631.36	917.62

3)

Case	Classification			
	i	ii	iii	iv
a	FLANGES: Compact WEB: Compact SECTION: Compact	FLANGES: Compact WEB: Slender SECTION: Slender	FLANGES: Slender WEB: Compact SECTION: Slender	FLANGES: Noncompact WEB: Compact SECTION: Noncompact
b	FLANGES: Compact	FLANGES: Compact	FLANGES: Noncompact	FLANGES: Noncompact
c	FLANGES: Compact WEB: Noncompact SECTION: Noncompact	FLANGES: Compact WEB: Slender SECTION: Slender	FLANGES: Slender WEB: Compact SECTION: Slender	FLANGES: Noncompact WEB: Compact SECTION: Noncompact
d	Slender	FLANGES: Slender WEB: Nonslender SECTION: Slender	Flanges: Nonslender WEB: Nonslender SECTION: Nonslender	

4)

	LRFD		ASD
M_u (kNm)	2376	M_a (kNm)	1620
ϕM_n (kNm)	2779.33	M_n/Ω (kNm)	1849.1
V_u (kN)	990	V_a (kN)	675
ϕV_n (kN)	2524.05	V_n/Ω (kN)	1682.7
Deflection (mm)	2.03	Deflection (mm)	1.39
Lightest Section	HEA800	Lightest Section	HEA800

5)

Mn (kNm)	1082.95
W (kN/m) due to Bending	64.05
Vn (kN)	1650
W (kN/m) due to Shear	219.56
W (kN/m) overall	64.05

6)

	a	b	c
Mn (kNm)	519	749.62	828.67
Wu (kN/m)	46.13	66.63	73.66

7) HEA700

8)

