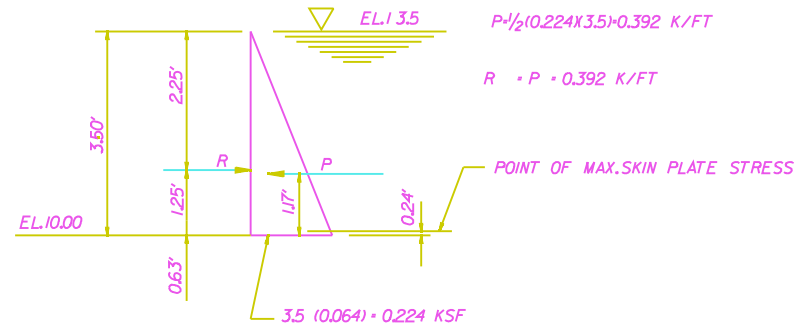


LOADING

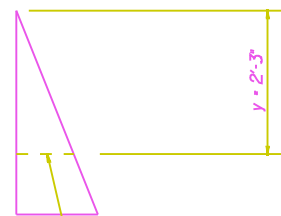


SKIN PLATE

LOAD, $w = 0.064 (3.5 - 0.24) = 0.209 \text{ K/FT}$
 USE $\frac{5}{16}$ " MINIMUM THICKNESS OF SKIN PLATE
 $S = \frac{bl^2}{6} = 0.953 \text{ IN}^3/\text{FT}$
 MAXIMUM ALLOWABLE MOMENT $= S F_b$
 $0.953 (20.0) = 3.91 \text{ IN-K/FT} = 0.3255 \text{ K/FT}$
 INTERIOR SPAN, $M = \frac{1}{2} w l^2$
 $\frac{1}{2} w l^2 = 0.3255$
 $\frac{1}{2} (0.209) l^2 = 0.3255$
 $l = 4.32 \text{ FT (ALLOW. SPAN), USE 3.50 FT}$
 EXTERIOR SPAN, $M = \frac{1}{10} w l^2$
 $\frac{1}{10} w l^2 = 0.3255$
 $l = 4.08 \text{ FT (ALLOW. SPAN), USE 3.00 FT}$

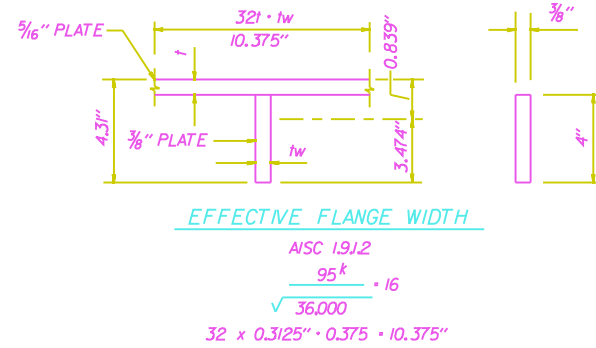


VERTICAL STIFFENERS



MOMENT $= 0.064 \times 2.25^3 \times \frac{1}{6}$
 $= 0.12 \text{ K/FT}$

PT. OF MAX. MOMENT @ APPROX C/L GIRDER



ITEM	AREA	y	Ay	Ay ²	Io
PLATE 10.375" x 5/16"	3.242	0.156	0.506	0.079	—
PLATE 4" x 3/8"	1.50	2.313	3.470	8.026	2
	4.742	(0.838)	3.976	8.105	2

$y = \frac{\sum Ay}{\sum A} = \frac{3.976}{4.742} = 0.839$

$I = I + \sum Ay^2 = (Ay \times y)$
 $2 \cdot 8.105 + (3.976 \times 0.839)$
 $= 6.769 \text{ IN}^4$

$S_{TOP} = \frac{I}{C_{TOP}} = \frac{6.769}{0.839} = 8.068^3$

$S_{BOT} = \frac{I}{C_{BOT}} = \frac{6.769}{3.474} = 1.949^3$

$f_s = \frac{M}{S_{BOT}} = \frac{(0.12)(3.125)(12)}{1.949} = 2.309 \text{ ksi} \ll \text{allow} = 20 \text{ ksi}$

GIRDERS

Span = Opening $\cdot \frac{\text{Column Face to c/l Seal}}{\text{Column Face to c/l Seal}}$
 Span = 62.0 $\cdot \frac{1.75}{2.75} = 66.50'$

Try W30 x 99
 Load, $w = 0.39 \text{ k/ft}$
 $M = \frac{1}{8} w l^2 = \frac{1}{8} (0.39)(66.50) = 215.6 \text{ ft-k}$
 per AISC 1.5.1.4.1 and EM 1110 - 1 - 2101

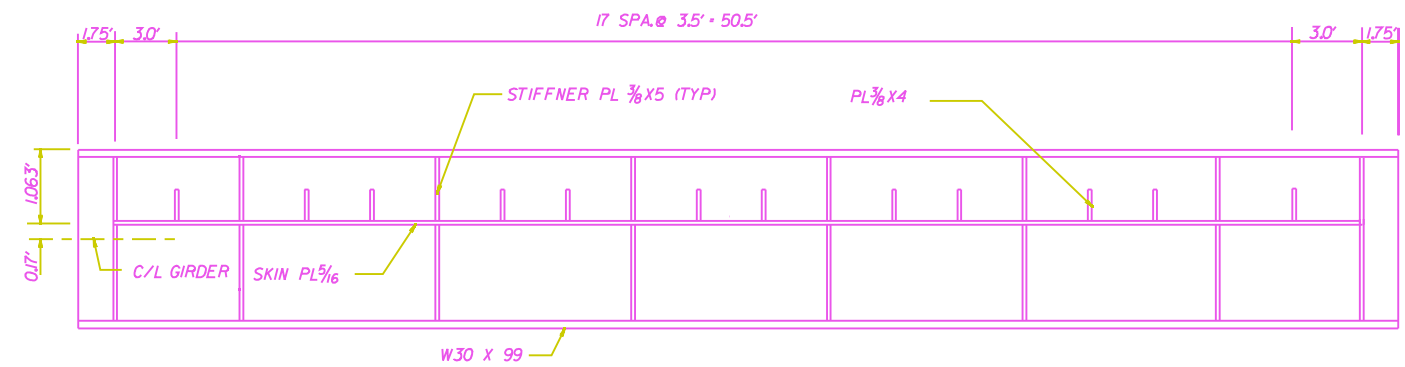
$f_b = \frac{M}{S} = \frac{215.6(12)}{269} = 9.62 \text{ ksi} < 20.0 \text{ ksi, ok use W30 x 99}$

DEFLECTION :

$\Delta_{max} = \frac{5w l^4}{384EI}$

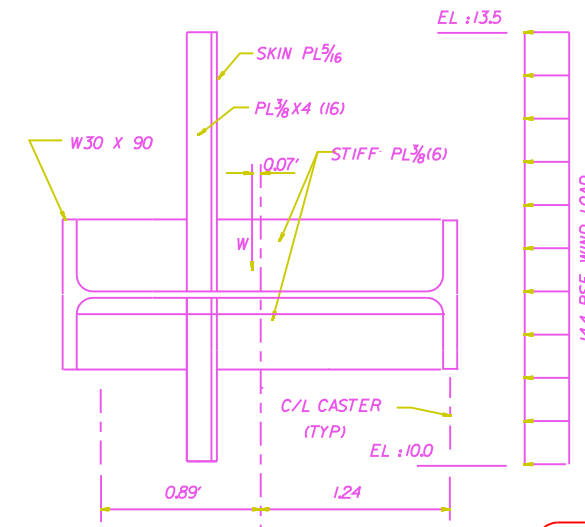
$= \frac{5(0.39)(66.50)(66.50)(12)^3}{384(29 \times 10^3)(3990)} = 0.12'$

$\Delta_{allow} = \frac{l}{360} = \frac{66.50}{360} = 2.21' < 0.33' \text{ OK USE WF30X99}$



ITEM	COMPUTATION	WEIGHT (LB) x (FT) TO C/L GIRDER	w x (FT - LB)
5/16 PL	3.42 x 65.50 x 12.8	2867	0.17
W30x99	69 x 99	6831	0.0
PL 3/8 x 4 x 2.25 (12)	12 x 2.25 x 5.1	138	0.33
PL 3/8 x 4 x 1.25 (12)	12 x 1.25 x 5.1	77	0.33
PL 3/8 x 4 x 0.83 (6)	6 x 0.83 x 5.1	25	0.33
PL 3/8 x 4 x 1.83 (6)	6 x 1.83 x 5.1	56	0.33
PL 3/8 x 5 (16)	16 x 2.36 x 6.38	241	0.0
L 5 x 3 1/2 x 1/2	65.5 x 13.6	891	0.1
L 6 x 4 x 1/2	2 x 3.50 x 16.2	113	1.11
WELD	0.21 x 12 x 65.5 x 40 x 3.50	57	0.17
1/2 1" Bar	2 x 3.5 x 7.66	54	1.30
		11,350	(0.070)

GATE DEAD WEIGHT



CHECK GATE STABILITY

GATE WEIGHT 'W' = 11,350
 RESISTING MOMENT 'M_R' = 11,350 (0.89 - 0.7)
 $= 9,799 \text{ FT-LBS}$
 FOR 75 MPH WIND, WIND PRESSURE = 0.00256 x 75²
 $= 14.40 \text{ PSF}$
 OVER TURNING MOMENT 'M_O' = 1/2 x 14.4 x 3.5² x 65.5
 $= 5,777 \text{ FT-LBS}$
 $M_R > M_O \text{ GATE IS STABLE}$



LAKE PONCHARTRAIN, LA. AND VICINITY
 HIGH LEVEL PLAN
 DESIGN MEMORANDUM NO. 20 GENERAL DESIGN
 ORLEANS PARISH - JEFFERSON PARISH
 17TH. STREET OUTFALL CANAL
 (METAIRIE RELIEF)

ROLLER GATE DESIGN

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
 CORPS OF ENGINEERS
 DATE: MARCH 1990 FILE # H-2-30300