

DESIGN MEMORANDUM

Client: ~~XXXXXXXXXX~~

Sheet 1 Of 4

Project: ~~XXXXXXXXXX~~

Date: ~~XXXX/XX/XX~~

Data For: ~~XXXXXXXXXX~~

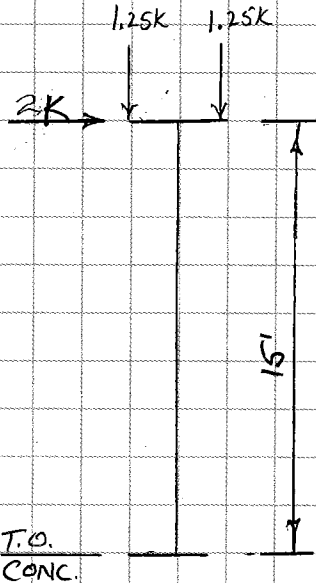
Work Order: ~~XXXXXXXXXX~~

Prepared By: ~~XXXXXXXXXX~~

Checked By: ~~XXXXXXXXXX~~

File No: ~~XXXXXXXXXX~~

Note: This form must be used for project calculations and original filed in project files



$$M = Pd = 2K(15') = 30K \cdot ft = 360 K \cdot in$$

LIMIT DEFLECTION TO $L/240$ (FROM PIPING)

$$\Delta_{MAX} = \frac{15(12)}{240} = 0.75''$$

$$\Delta_{MAX} = \frac{P(L)^3 (1728 \frac{in^3}{ft^3})}{3(29000) I} = 0.75''$$

$$\frac{2(15)^3 (1728)}{3(29000)(0.75'')} = I_{MIN} \Rightarrow I \geq 178.8 in^4$$

Try TS 9x9x1/2 ($I = 193 in^4$)
CHECK STRESS

$$K=2 \Rightarrow KL=30 \quad P_{ALLOW} = 220K$$

By OBSERVATION $P_{ALLOW} \gg P \therefore$ NEGLECT AXIAL IN STRESS

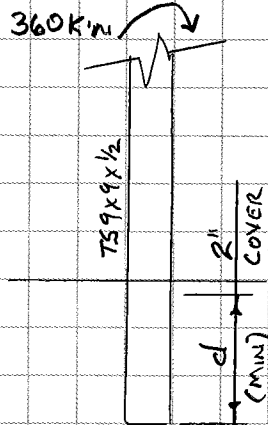
$$\sigma = \frac{M}{S} = \frac{360}{42.9} = 8.4 Ksi < 0.66(46) \therefore OK$$

DESIGN MEMORANDUM

Client: [REDACTED] Sheet 8 Of 4
Project: [REDACTED] Date: 12/19/06
Data For: Bridge Work Order: [REDACTED]
Prepared By: [REDACTED] Checked By: [REDACTED] File No: [REDACTED]

Note: This form must be used for project calculations and original filed in project files

Find MIN CONC. EMBEDMENT:



$$f'_c = 3000 \text{ psi}$$

$$\text{Embed} = TS9 \times 9 \times \frac{1}{2}$$

SUBTRACT $(2)\frac{1}{2}$ FROM WIDTH (OMIT RADII)

$$\text{Width} = 8"$$

$$f'_{c \text{ ALLOW}} = 0.35(f'_c) = 1050 \text{ psi (BEARING)}$$

SAY 1 KSI ALLOWABLE

$$\frac{M}{S} \leq 1 \text{ KSI} \Rightarrow S \geq \frac{360 \text{ K-IN}}{1 \text{ K/IN}^2} = 360 \text{ IN}^3$$

$$S = \frac{bd^2}{6} \Rightarrow \frac{8(d)^2}{6} = 360 \text{ IN}^3$$

$$d^2 = 270 \Rightarrow d = 16.5"$$

$$\text{MIN EMBEDMENT} = 2"(\text{COVER}) + 16.5" = 18.5"$$