

**BRIDGE DECK DESIGN CALCULATIONS**

Date: 4/2/2014

**TERMS:**

d= Dead-load deflection, inches.  
 E= 29,500,000 psi  
 Fs= Form stress, psi  
 I = Moment of inertia, in<sup>4</sup> / ft of width  
 L = Design span ft.  
 S = Section modulus, in<sup>3</sup> / ft of width  
 W = Total uniform load, psf  
 Wd= Total uniform load - 55 psf construction load  
 Max. Fs= 36,000 psi Grade 50&80 Steel; 29,000 psi Grade 40 Steel  
 Max. d= L/180 or 1/2" which ever is less

**LOADING:**

Weight of Slab = Design Slab x 12.5#/inch of slab  
 Extra Concrete Valleys = xtra inches x 12#/inch of slab  
 Construction load = 50 psf  
 Form Weight = per form chosen

**DESIGN SPAN:**

Girder spacing - flange width - 2"

**PROJECT:**

Contractor: Schultz State: VT  
 Structure: Bridge No. 19 County: Windsor

**DESIGN INFO:**

Design Slab (in.): 9.00 C/C Girders (in.): 83.00 Flange Width (in.): 16.00

	C/C	Flange	2"	Design Span
Design Span:	83.00	16.00	2"	85.00

	Slab	12.5	55	Weight	Stress Load (W)	Deflection Load (Wd)
Loading:	9.00	12.5	55	1.89		
	Extra (in.)	12				
	0.00	12			169.39	114.39

Supplier	Grade	Type	Gage/Thk	S	I	Design Span (in.)	L	Weight	Extra (in.)
SIP	80	2x8.5	22	0.260	0.319	65.00	5.42	1.89	0.00

**Stress Calculation:**

$F_s = (1.5)(W)(L^2) / S$

Fs	1.5	W	L <sup>2</sup>	S
28672.79	1.5	169.39	29.34	0.260

**Deflection Calculation:**

$d = [(5)(Wd)(L^4) / 384 / E / I] * 1728$  Max. d = L/180 or <= 1/2" L/180

d	5	Wd	L <sup>4</sup>	384	1728	E	I
0.235	5	114.39	860.85	384	1728	29500000	0.319

**Weld Calculation:**

**Terms:**

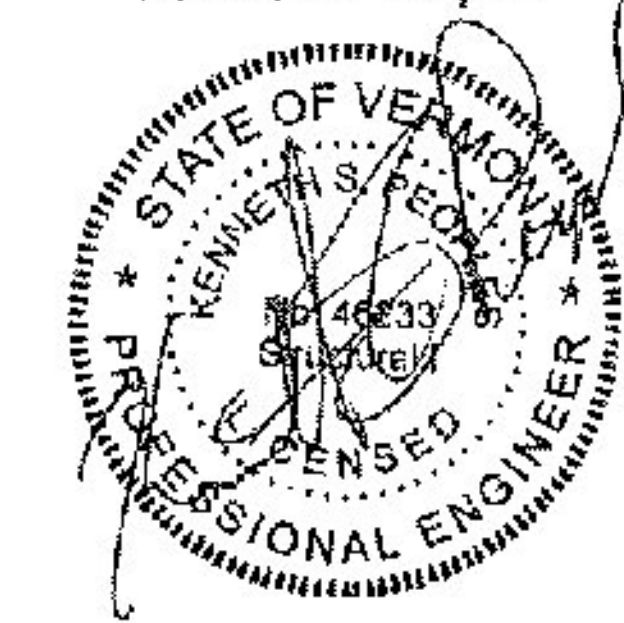
Fu = 55,000 psi Weld Yield  
 Fv = .27 x 55,000 psi Allowable  
 t = 1/8" Standard Weld Thickness  
 L1 = 2" Weld Length (1 1/2" min. AASHTO)  
 s = 15" Weld Spacing  
 $R = [(W)(s) / 12] * (L / 2)$

14850
0.125
2
15
573.46

$L1 (min.) = (Sq. Root [(R^2) + (2R)^2]) / (.707)(t)(Fv)$

0.98
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Date: April 3, 2014  
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