Vermont AOT — PG 1/2

I-91 o/ Broad Brook & BB Road

Bridge No. 3N&S

BRIDGE DECK DESIGN CALCULATIONS — **DATE:** 2/17/09

TERMS		**LOADING**
d=	Dead-load deflection, inches.	Weight of Slab = Slab Thick. x 12.5#/inch of slab
E=	29,500,000 psi	Extra Concrete Valleys = xtra inches x 12#/inch of slab
Fs=	Form stress, psi	Construction load = 50 psf
I =	Moment of inertia, in 4/ft of width	Form Wt. = per form chosen
L =	Design span ft.	
S =	Section modulus, in. 3/ft of width	**DESIGN SPAN**
W =	Total uniform load, psf	Girder spacing - flange width - 2"
Wd=	Total uniform load - 55 psf construction load	
	Min. value per FHWA 120 psf	
Alow. Fs=	36,000 psi Grade 50&80 Steel; 29,000 psi Grade 40 Steel	
Alow. d=	L/180 or 1/2" which ever is less	

PROJECT:

CONTR:	*JA McDonald*	***STATE:***	*VT*	
STRUCT.	*3N&S*	***COUNTY:***	*Guilford*	

SLAB & GIRDER INFORMATION:

Slab Thick:	8.50	***Girder Spacing:*** ***(inches)***	Varies	***FLG. WDTH.:***	16.00

	Gdr Sp In	**Fl Wd In**	***2"***	**Dsgn Sp**
Design span =	99.00	16.00	***2"***	81.00
	88.00	16.00	***2"***	70.00

LENGTH FROM DRAWINGS ORDERED 1/2" LONGER THAN DESIGN LENGTH

	Slb Th. In.	**12.5#/in th**	**55 psf**	**Frm. Wt.**	**Load**	**Def Ld.**
Loading=	8.50	***12.5***	***55***	1.9		
	8.50	***12.5***	***55***	1.78		
	Inches X	**12#/in**				
	1	***12.0***				
	0.727	***12.0***				
					175.15	125.15
					171.754	121.754

Deck Producer	**Grade Stl.**	**Type**	**Gauge**	**S**	**I**	**Dsgn Span**	**Ft.**	**Wt/Frm**	***xtra " Con***
Wheeling	50 or 80	SW	22	0.382	0.518	81.00	6.75	1.9	1
Wheeling	50 or 80	2x8.5	22	0.276	0.328	70.00	5.83	1.78	0.727

Stress Calculations

Fs=1.5xWxLxL/S

Fs	**1.5**	**W**	**L^2**	**S**
31336.1461	1.500	175.15	6.75	0.382
31763.0812	1.500	171.754	5.83	0.276

Deflection Calculation

d=(5*Wd*L^4/384*E*I)*1728 — All = L/180 or =< 1/2"

							Allow.
							0.45
							0.3888889
	CONST.			CONST.		E	
Deflection	5	Wd=>120	L^4	384	1728	29.5*10^6	I
0.38254	5	125.15	6.75	384	1728	29.5	0.518
0.32782	5	121.754	5.83	384	1728	29.5	0.328

Weld Calculation

Terms:			
	Fu = 55,000 psi weld yield		
	Fv = .27 x 55,000 psi all. /AASHTO	14850	
	t = weld thickness 1/8" standard (.125")	0.125	
	L1 = length of weld 1 1/2" Min AASHTO	2	USED
	I = weld spacing in inches	12	
	R = Ws x I/12 x Dsgn. Lgth'/2	591.13	
L1 (min.) =	Sq. Root R^2+2R^2/.707xtxFv	1.01	

COMMONWEALTH OF MASSACHUSETTS — PAUL M. REMELE JR. — CIVIL — No. 33161 — REGISTERED PROFESSIONAL ENGINEER — FEB 20 2009