

**Allowable Member Stresses (psi)
Eastern White Pine Sawn Lumber (1.)**

		Adjustment Factors																						
AASHTO Reference			13.5.5.2 T 13.5.5A	13.5.5.1 T 13.5.1A		13.6.4.4	13.6.4.2 T 13.5.1A	13.6.4.3		T 13.5.1A		T 13.5.1A		13.6.4.5	13.7.3.3	T 13.5.1A		13.6.6.3						
NDS Reference			2.3.2 Append B	2.3.3 Table 4D	2.3.4 Append C	2.3.7 3.3.3	4.3.2 Table 4D	5.3.2	4.3.3, 5.3.3	2.3.11	4.3.4	5.3.4	2.3.8	2.3.9 3.7.1	Table 4D	4.4.3	2.3.10							
Loading	Member	Tabulated design		x	Load	Wet	Temper-	Beam	Size	Volume	Flat	Incising	Repetitive	Curvature	Form	Column	Shear	Buckling	Bearing	=	Allowable			
		Value (psi)	White Pine Table 4D		Duration	Service	ature	Stability			Use		Member		Stability	Stress	Stiffness	Area	Value		(psi.)			
					CD	CM	Ct	CL	CF	CV	Cfu	Ci	Cr	Cc	Cf	CP	CH	CT	Cb					
Dead Load	Beams & Stringers (Chords)	Fb	875	x	0.90	1.00	1.00	1.00	1.00												=	Fb'	788	
		Ft	600	x	0.90	1.00	1.00		1.00													=	Ft'	540
		Fv	65	x	0.90	1.00	1.00											1.00				=	Fv'	59
		Fc	350	x		0.67	1.00													1.00		=	Fc '	235
		Fc	575	x	0.90	0.91	1.00			1.00							1.00					=	Fc'	471
		E	1,100,000	x		1.00	1.00															=	E'	1,100,000
	Fg	880	x	0.90		1.00															=	Fg'	792	
	Posts & Timbers (Vert. End Posts and Diagonals)	Fb	800	x	0.90	1.00	1.00	1.00	1.00													=	Fb'	720
		Ft	525	x	0.90	1.00	1.00		1.00													=	Ft'	473
		Fv	65	x	0.90	1.00	1.00											1.00				=	Fv'	59
		Fc	350	x		0.67	1.00													1.00		=	Fc '	235
		Fc	625	x	0.90	1.00	1.00			1.00							1.00					=	Fc'	563
		E	1,100,000	x		1.00	1.00															=	E'	1,100,000
	Fg	880	x	0.90		1.00															=	Fg'	792	
Foot Notes									2	3	4	11	4	3	5	6			4					
Live Load	Beams & Stringers (Chords)	Fb	875	x	1.00	1.00	1.00	1.00	1.00												=	Fb'	875	
		Ft	600	x	1.00	1.00	1.00		1.00													=	Ft'	600
		Fv	65	x	1.00	1.00	1.00											1.00				=	Fv'	65
		Fc	350	x		0.67	1.00													1.00		=	Fc '	235
		Fc	575	x	1.00	0.91	1.00			1.00							1.00					=	Fc'	523
		E	1,100,000	x		1.00	1.00															=	E'	1,100,000
	Fg	880	x	1.00		1.00															=	Fg'	880	
	Posts & Timbers (Vert. End Posts and Diagonals)	Fb	800	x	1.00	1.00	1.00	1.00	1.00													=	Fb'	800
		Ft	525	x	1.00	1.00	1.00		1.00													=	Ft'	525
		Fv	65	x	1.00	1.00	1.00											1.00				=	Fv'	65
		Fc	350	x		0.67	1.00													1.00		=	Fc '	235
		Fc	625	x	1.00	1.00	1.00			1.00							1.00					=	Fc'	625
		E	1,100,000	x		1.00	1.00															=	E'	1,100,000
	Fg	880	x	1.00		1.00															=	Fg'	880	
Foot Notes					7				2	3	4	9	4	3	5	8			4					

- Assuming all truss members are replaced with Grade No. 1 Eastern White Pine. (requested change as per 6/17/02 email)
- (For d > 12") CF = (12/d)^(1/9) = 1.0 (not applicable to Bickham, because d < 12")
- Applies to glued laminated members, not sawn lumber
- Not applicable to timbers
- For circular or diamond sections
- Factors for CP (dead load) =

Bickham U.C.	0.96
Bickham Diag.	0.80
- Based on a permanent D.L. and a ten year cumulative L.L. duration
- Factors for CP (live load) =

Bickham U.C.	0.96
Bickham Diag.	0.77
- Members are not incised
- Allowable stress for wrought iron = 20,000 psi (per AASHTO)

Table 1

BICKHAM COVERED BRIDGE TRUSS LOAD RATING ANALYSIS (H15 TRUCK)

LOGAN COUNTY, OHIO
 MEMBER PROPERTIES, FORCES, STRESSES AND RATING
 FILE: PR30099\ETC\REVISED ANALYSIS FOR PROPOSED TRUSS\PROPOSEDTRUSS.XLS

By: M. Killian / T. Butz (Burgess & Niple)
 October-01

Member Description	Member No.	DIMENSIONS (Inches)										PROPERTIES				FORCES (Lbs. & Inches)				ALLOWABLE STRESS (PSI)			DEAD LOAD STRESS (PSI)			REMAINING STRENGTH (PSI)			LIVE LOAD STRESSES (PSI)			Member No.	Member Description	H=[F/G]*Gross Tonnage				NDS REQUIREMENTS	COMMENTS	FINAL RATING (GROSS VEHICLE TONS)							
		outside member			middle member			inside member			full member				DEAD LOAD				HIS LIVE LOAD			AXIAL			L. SHEAR			BENDING			AXIAL			L. SHEAR			BENDING										
		width	height	diameter	width	height	diameter	width	height	diameter	area	I	weight	Joint deduct	Joint area	FX	C/T	FY	MZ	MAX	C/T	FY	MZ	Fu' / Fe'	Fv'	Fb'	FX	C/T	VL	MAX.	FX			VL	MAX.	FX	C/T				VL	MAX.	FX	C/T	VL	MAX.	
		(w)	(h)	(d)	(w)	(h)	(d)	(w)	(h)	(d)	(in**2)	(in**4)	(lb/inch)	(if any)?	(in**2)																																
Lower Chord	1	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	13773	T	134	18506	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	97.2	T	1.4	74.6	1	Lower Chord	76.7	T	670.0	173.3	0.43	---	76.7		
	2	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	22805	T	290	30383	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	160.9	T	3.1	122.5	2	Lower Chord	39.5	T	308.2	105.6	0.71	---	39.5		
	3	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	28307	T	334	37101	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	199.7	T	3.5	149.6	3	Lower Chord	28.6	T	268.5	86.5	0.88	---	28.6		
	4	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	30957	T	403	41707	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	218.4	T	4.3	168.1	4	Lower Chord	25.2	T	221.5	75.6	0.98	---	25.2		
	5	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	30957	T	403	41707	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	218.4	T	4.3	168.1	5	Lower Chord	25.2	T	221.5	75.6	0.98	---	25.2		
	6	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	28307	T	334	37101	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	199.7	T	3.5	149.6	6	Lower Chord	28.6	T	268.5	86.5	0.88	---	28.6		
	7	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	22805	T	290	30383	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	160.9	T	3.1	122.5	7	Lower Chord	39.5	T	308.2	105.6	0.71	---	39.5		
	8	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3188	13773	T	134	18506	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	97.2	T	1.4	74.6	8	Lower Chord	76.7	T	670.0	173.3	0.43	---	76.7		
Upper Chord	9	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	13773	C	63	8762	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	0.7	43.2	9	Upper Chord	NO LOAD	C	1,278.2	294.9	0.08	---	294.9		
	10	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	12681	C	154	16093	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	98.9	C	1.8	79.3	10	Upper Chord	58.9	C	522.6	160.6	0.54	---	58.9		
	11	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1141	20469	C	193	23135	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	159.6	C	2.3	113.9	11	Upper Chord	28.9	C	421.7	114.5	0.83	---	28.9		
	12	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	24329	C	224	23861	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	189.7	C	2.6	117.5	12	Upper Chord	20.5	C	362.2	109.1	1.02	---	20.5		
	13	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	24329	C	224	23861	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	189.7	C	2.6	117.5	13	Upper Chord	20.5	C	362.2	109.1	1.02	---	20.5		
	14	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1140	20469	C	193	23135	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	159.6	C	2.3	113.9	14	Upper Chord	28.9	C	421.7	114.5	0.83	---	28.9		
	15	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	12681	C	154	16093	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	98.9	C	1.8	79.3	15	Upper Chord	58.9	C	522.6	160.6	0.54	---	58.9		
	16	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	63	8762	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	0.7	43.2	16	Upper Chord	NO LOAD	C	1,278.2	294.9	0.08	---	294.9		
End Posts	17	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	59	C			625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	1.0	C	0.0	0.0	17	End Posts	9181.4	C	---	---			9181.4		
	18	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	59	C			625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	1.0	C	0.0	0.0	18	End Posts	9181.4	C	---	---			9181.4		
Counter Diagonals	19	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	19	Counter Diagonals	NO LOAD	C	---	---			Always in tension & removed	---	
	20	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	2250	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	90.9	C	0.0	0.0	20	Counter Diagonals	79.4	C	---	---			79.4		
	21	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	5238	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	211.6	C	0.0	0.0	21	Counter Diagonals	34.1	C	---	---			34.1		
	22	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	8452	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	341.5	C	0.0	0.0	22	Counter Diagonals	21.1	C	---	---			21.1		
	23	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	8452	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	341.5	C	0.0	0.0	23	Counter Diagonals	21.1	C	---	---			21.1		
	24	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	5238	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	211.6	C	0.0	0.0	24	Counter Diagonals	34.1	C	---	---			34.1		
	25	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	2250	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	90.9	C	0.0	0.0	25	Counter Diagonals	79.4	C	---	---			79.4		
	26	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	26	Counter Diagonals	NO LOAD	C	---	---			Always in tension & removed	---	
Compression Diagonals	27	5.50	9.00	0.00	0.00	0.00	0.00	5.50	9.00	99.00	668.25	2.75	0.00	99.00	23666	C	103	0	22115	C			481	65		239.1	C	1.6	0.0	242.2	63.4	0.0	223.4	C	0.0	0.0	27	Compression Diagonals	16.3	C	---	---			16.3		
	28	5.50	6.50	0.00	0.00	0.00	0.00	5.50	6.50	71.50	251.74	1.99	0.00	71.50	16593	C	74	0	18838	C			481	65		232.1	C	1.6	0.0	249.2	63.4	0.0	263.5	C	0.0	0.0	28	Compression Diagonals	14.2	C	---	---			14.2		
	29	5.50	5.50	0.00	0.00	0.00	0.00	5.50	5.50	60.50	152.51	1.68	0.00	60.50	10026	C	63	0	15390	C			481	65		165.7	C	1.6	0.0	315.5	63.4	0.0	254.4	C	0.0	0.0	29	Compression Diagonals	18.6	C	---	---			18.6		
	30	4.50	5.50	0.00	0.00	0.00	0.00	4.50	5.50	49.50	124.78	1.38	0.00	49.50	3262	C	51	0	11920	C			481	65		65.9	C	1.6	0.0	415.4	63.4	0.0	240.8	C													

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 September-01
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Member Description	Member No.	DIMENSIONS (inches)										PROPERTIES										FORCES (Lbs. & Inches)				ALLOWABLE STRESS (PSI)			DEAD LOAD STRESS (PSI)			REMAINING STRENGTH (PSI)			LIVE LOAD STRESSES (PSI)			Member No.	Member Description	H=[F/G]*Gross Tonnage				NDS REQUIREMENTS		COMMENTS	FINAL RATING (GROSS VEHICLE TONS)		
		outside member		outside rod		middle member		inside rod		inside member		full member				DEAD LOAD				Bus LIVE LOAD			FX / Fc'			FX			L. SHEAR			BENDING			Gross Tonnage: 13					MZ & FX									
		width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	area (in**2)	I (in**4)	weight (lb/inch)	Joint deduct width (in) (if any)?	joint area (in**2)	FX	C/T	FY	MZ	MAX	C/T	FY	MZ	Fu' / Fc'	Fv'	Fb'	FX	C/T	VL	MAX.	FX	VL	MAX.	FX	C/T			VL	MAX.	FX	C/T	VL	MAX.			3.9.1 (Fu) or	Interaction
		width (w)		height (h)		diameter (d)		width (w)		height (h)		area (in**2)		I (in**4)		weight (lb/inch)		Joint deduct width (in) (if any)?		joint area (in**2)		FX		C/T		FY		MZ		FX		C/T		VL		MAX.				FX		C/T		VL				MAX.	
Lower Chord	1	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	11115	T	92	12717	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	78.4	T	1.0	51.3	1	82.3	T	845.0	218.6	0.37	---	82.3		
	2	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	18486	T	205	21588	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	130.4	T	2.2	87.0	2	42.3	T	377.9	128.8	0.61	---	42.3		
	3	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	23090	T	255	27883	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	162.9	T	2.7	112.4	3	30.4	T	304.4	99.8	0.78	---	30.4		
	4	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	25547	T	300	31147	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	180.2	T	3.2	125.6	4	26.4	T	257.7	87.7	0.86	---	26.4		
	5	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	25547	T	300	31147	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	180.2	T	3.2	125.6	5	26.4	T	257.7	87.7	0.86	---	26.4		
	6	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	23090	T	255	27883	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	162.9	T	2.7	112.4	6	30.4	T	304.4	99.8	0.78	---	30.4		
	7	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	18486	T	205	21588	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	130.4	T	2.2	87.0	7	42.3	T	377.9	128.8	0.61	---	42.3		
	8	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	11115	T	92	12717	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	78.4	T	1.0	51.3	8	82.3	T	845.0	218.6	0.37	---	82.3		
Upper Chord	9	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	45	6218	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	0.5	30.6	9	NO LOAD	C	1,561.1	360.1	0.07	---	360.1		
	10	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	10398	C	104	11203	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	81.1	C	1.2	55.2	10	62.2	C	674.7	199.9	0.48	---	62.2		
	11	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1141	16877	C	136	16367	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	131.6	C	1.6	80.6	11	30.4	C	516.6	140.2	0.74	---	30.4		
	12	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	20047	C	166	17862	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	156.3	C	1.9	88.0	12	21.6	C	422.4	126.3	0.92	---	21.6		
	13	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	20047	C	166	17862	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	156.3	C	1.9	88.0	13	21.6	C	422.4	126.3	0.92	---	21.6		
	14	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1140	16877	C	136	16367	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	131.6	C	1.6	80.6	14	30.4	C	516.6	140.2	0.74	---	30.4		
	15	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	10398	C	104	11203	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	81.1	C	1.2	55.2	15	62.2	C	674.7	199.9	0.48	---	62.2		
	16	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	45	6218	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	0.5	30.6	16	NO LOAD	C	1,561.1	360.1	0.07	---	360.1		
End Posts	17	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	0	37	C		625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	0.6	C	0.0	0.0	17	NO LOAD	C	---	---					---
	18	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	0	37	T		525	65		10.9	C	0.0	0.0	514.1	65.0	0.0	0.6	T	0.0	0.0	18	NO LOAD	T	---	---					---
Counter Diagonals	19	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	19	NO LOAD	C	---	---					---
	20	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	58.5	C	0.0	0.0	20	106.9	C	---	---					106.9
	21	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	144.9	C	0.0	0.0	21	43.2	C	---	---					43.2
	22	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	254.0	C	0.0	0.0	22	24.6	C	---	---					24.6
	23	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	23	24.6	C	---	---					24.6
	24	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	144.9	C	0.0	0.0	24	43.2	C	---	---					43.2
	25	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	53.8	C	0.0	0.0	25	116.3	C	---	---					116.3
	26	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	26	NO LOAD	C	---	---					---
Compression Diagonals	27	5.50	9.00	0.00	0.00	0.00	0.00	5.50	9.00	0.00	5.50	9.00	99.00	668.25	2.75	0.00	99.00	23666	C	103	0	17848	C			481	65		239.1	C	1.6	0.0	242.2	63.4	0.0	180.3	C	0.0	0.0	27	17.5	C	---	---					17.5
	28	5.50	6.50	0.00	0.00	0.00	0.00	5.50	6.50	0.00	5.50	6.50	71.50	251.74	1.99	0.00	71.50	16593	C	74	0	14983	C			481	65		232.1	C	1.6	0.0	249.2	63.4	0.0	209.5	C	0.0	0.0	28	15.5	C	---	---					

BICKHAM COVERED BRIDGE TRUSS LOAD RATING ANALYSIS (2F1 TRUCK)

LOGAN COUNTY, OHIO
 MEMBER PROPERTIES, FORCES, STRESSES AND RATING
 By: M. Killian / T. Butz (Burgess & Niple)
 September-01
 FILE: PR30099\ETCREVISED ANALYSIS FOR PROPOSED TRUSS\PROPOSEDTRUSS.XLS

Member Description	Member No.	DIMENSIONS (inches)										PROPERTIES										FORCES (Lbs. & Inches)				ALLOWABLE STRESS (PSI)			DEAD LOAD STRESS (PSI)			REMAINING STRENGTH (PSI)			LIVE LOAD STRESSES (PSI)			H=[F/G]*Gross Tonnage				COMMENTS	FINAL RATING (GROSS VEHICLE TONS)					
		outside member		outside rod		middle member		inside rod		inside member		full member		Joint deduct width (in.) (if any)?	Joint area (in**2)	DEAD LOAD				2F1 LIVE LOAD				FX / Fc'			AXIAL			L. SHEAR			BENDING			Gross Tonnage: 15		NDS REQUIREMENTS										
		width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	area (in**2)	I (in**4)	weight (lb/inch)	FX			C/T	FY	MZ	MAX	C/T	FY	MZ	Fu' / Fc'	Fv'	Fb'	FX	C/T	VL	MAX.	FX	VL	MAX.	FX	C/T	VL	MAX.	3.9.1 (Fv) or 3.9.2 (Fc) (<1)	Interaction Rating (tons)										
		width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	area (in**2)	I (in**4)	weight (lb/inch)	FX	C/T	FY	MZ	MAX	C/T	FY	MZ	Fu' / Fc'	Fv'	Fb'	FX	C/T	VL	MAX.	FX	VL	MAX.	FX	C/T	VL	MAX.	3.9.1 (Fv) or 3.9.2 (Fc) (<1)	Interaction Rating (tons)												
Lower Chord	1	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	14742	T	142	19586	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	104.0	T	1.5	79.0	1	71.6	T	633.0	163.8	0.45	---	71.6	
	2	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	22738	T	313	32795	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	160.4	T	3.3	132.2	2	39.7	T	285.1	97.8	0.72	---	39.7	
	3	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	28433	T	341	37898	600	65	875	219.6	T	1.7	12.2	380.4	63.0	862.8	200.6	T	3.6	152.8	3	28.4	T	263.0	84.7	0.88	---	28.4	
	4	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	31321	T	414	42719	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	221.0	T	4.4	172.2	4	24.9	T	215.6	73.8	0.99	---	24.9	
	5	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	31321	T	414	42719	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	221.0	T	4.4	172.2	5	24.9	T	215.6	73.8	0.99	---	24.9	
	6	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	28433	T	341	37898	600	65	875	219.6	T	1.7	12.2	380.4	63.0	862.8	200.6	T	3.6	152.8	6	28.4	T	263.0	84.7	0.88	---	28.4	
	7	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	22738	T	313	32795	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	160.4	T	3.3	132.2	7	39.7	T	285.1	97.8	0.72	---	39.7	
	8	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	14742	T	142	19586	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	104.0	T	1.5	79.0	8	71.6	T	633.0	163.8	0.45	---	71.6	
Upper Chord	9	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	70	9679	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	0.8	47.7	9	NO LOAD	C	1,156.8	267.0	0.09	---	267.0	
	10	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	13632	C	160	16958	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	106.3	C	1.9	83.5	10	54.8	C	502.9	152.4	0.56	---	54.8	
	11	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1141	20549	C	188	22793	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	160.2	C	2.2	112.2	11	28.8	C	431.9	116.2	0.84	---	28.8	
	12	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	24568	C	220	23941	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	191.6	C	2.6	117.9	12	20.3	C	368.7	108.7	1.02	---	20.3	
	13	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	24568	C	220	23941	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	191.6	C	2.6	117.9	13	20.3	C	368.7	108.7	1.02	---	20.3	
	14	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1140	20549	C	188	22793	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	160.2	C	2.2	112.2	14	28.8	C	431.9	116.2	0.84	---	28.8	
	15	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	13632	C	160	16958	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	106.3	C	1.9	83.5	15	54.8	C	502.9	152.4	0.56	---	54.8	
	16	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	70	9679	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	0.8	47.7	16	NO LOAD	C	1,156.8	267.0	0.09	---	267.0	
End Posts	17	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	0	49	C						625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	0.8	C	0.0	0.0	17	NO LOAD	C	---	---	---	---	---
	18	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	0	49	C						625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	0.8	C	0.0	0.0	18	NO LOAD	C	---	---	---	---	---
Counter Diagonals	19	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	19	NO LOAD	C	---	---	---	---	---	
	20	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	2185	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	88.3	C	0.0	0.0	20	81.8	C	---	---	---	---	---	
	21	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	5621	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	227.1	C	0.0	0.0	21	31.8	C	---	---	---	---	---	
	22	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	7927	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	320.3	C	0.0	0.0	22	22.5	C	---	---	---	---	---	
	23	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	7927	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	320.3	C	0.0	0.0	23	22.5	C	---	---	---	---	---	
	24	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	5621	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	227.1	C	0.0	0.0	24	31.8	C	---	---	---	---	---	
	25	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	2206	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	89.1	C	0.0	0.0	25	81.0	C	---	---	---	---	---	
	26	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	C			481	65	0.0	0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	26	NO LOAD	C	---	---	---	---	---	
Compression Diagonals	27	5.50	9.00	0.00	0.00	0.00	0.00	5.50	9.00	99.00	668.25	2.75	0.00	99.00	23666	C	103	0	23671	C						481	65	239.1	C	1.6	0.0	242.2	63.4	0.0	239.1	C	0.0	0.0	27	15.2	C	---	---	---	---	---		
	28	5.50	6.50	0.00	0.00	0.00	0.00	5.50	6.50	71.50	251.74	1.99	0.00	71.50	16593	C	74	0	18472	C						481	65	232.1	C	1.6	0.0	249.2	63.4	0.0	258.3	C	0.0	0.0	28	14.5	C	---	---	---	---	---		
	29	5.50	5.50	0.00	0.00	0.00	0.00	5.50	5.50	60.50	152.51	1.68	0.00	60.50	10026	C	63	0	15180	C					</																							

BICKHAM COVERED BRIDGE TRUSS LOAD RATING ANALYSIS (3F1 TRUCK)

LOGAN COUNTY, OHIO
 MEMBER PROPERTIES, FORCES, STRESSES AND RATING
 By: M. Killian / T. Butz (Burgess & Niple)
 September-01
 FILE: PR30099ETCREVISED ANALYSIS FOR PROPOSED TRUSSPROPOSEDTRUSS.XLS

Member Description	Member No.	DIMENSIONS (inches)											PROPERTIES				FORCES (Lbs. & Inches)				ALLOWABLE STRESS (PSI)			DEAD LOAD STRESS (PSI)			REMAINING STRENGTH (PSI)			LIVE LOAD STRESSES (PSI)			H=[F/G]*Gross Tonnage				COMMENTS	FINAL RATING (GROSS VEHICLE TONS)								
		outside member		outside rod		middle member		inside rod		inside member		full member			DEAD LOAD				3F1 LIVE LOAD			FX / Fc' / Fv' / Fb'			AXIAL			L. SHEAR			BENDING			RATING (3F1) (TONS)		NDS REQUIREMENTS										
		width	height	diameter	width	height	diameter	width	height	area	I	weight	Joint deduct width (in. if any)?	Joint area	FX	C/T	FY	MZ	MAX	MAX	MAX	FX	C/T	FY	MZ	Fv' / Fc'	Fv'	Fb'	AXIAL	L. SHEAR	BENDING	AXIAL	L. SHEAR	BENDING	AXIAL	L. SHEAR			BENDING	3.9.1 (Fv) or 3.9.2 (Fc) (<1)	Interaction					
		(w)	(h)	(d)	(w)	(h)	(d)	(w)	(h)	(in**2)	(in**4)	(lb/inch)		(in**2)																																
Lower Chord	1	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	20630	T	197	27229	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	145.5	T	2.1	109.8	1	78.5	T	698.2	180.7	0.55	---	78.5		
	2	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	34483	T	430	45235	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	243.3	T	4.6	182.4	2	40.1	T	318.0	108.7	0.90	---	40.1		
	3	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	43191	T	510	56514	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	304.7	T	5.4	227.8	3	28.7	T	269.8	87.1	1.14	---	28.7		
	4	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	47371	T	616	63703	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	334.2	T	6.5	256.8	4	25.2	T	222.1	75.9	1.27	20.7	20.7		
	5	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	47371	T	616	63703	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	304.7	T	6.5	256.8	5	25.2	T	222.1	75.9	1.27	20.7	20.7		
	6	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	43191	T	510	56514	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	304.7	T	5.4	227.8	6	28.7	T	269.8	87.1	1.14	---	28.7		
	7	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	34483	T	430	45235	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	243.3	T	4.6	182.4	7	40.1	T	318.0	108.7	0.90	---	40.1		
	8	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3188	20630	T	197	27229	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	145.5	T	2.1	109.8	8	78.5	T	698.2	180.7	0.55	---	78.5		
Upper Chord	9	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	95	13178	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	1.1	64.9	9	NO LOAD	C	1,303.0	300.6	0.10	---	300.6		
	10	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	19180	C	223	23670	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	149.5	C	2.6	116.6	10	59.7	C	553.8	167.4	0.68	---	59.7		
	11	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1141	31199	C	287	34568	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	243.3	C	3.4	170.2	11	29.1	C	434.1	117.5	1.07	---	29.1		
	12	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	37215	C	329	35639	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	290.2	C	3.9	175.5	12	20.6	C	377.2	112.0	1.28	17.9	17.9		
	13	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	37215	C	329	35639	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	290.2	C	3.9	175.5	13	20.6	C	377.2	112.0	1.28	17.9	17.9		
	14	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1140	31199	C	287	34568	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	243.3	C	3.4	170.2	14	29.1	C	434.1	117.5	1.07	---	29.1		
	15	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	19180	C	223	23670	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	149.5	C	2.6	116.6	15	59.7	C	553.8	167.4	0.68	---	59.7		
	16	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	95	13178	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	1.1	64.9	16	NO LOAD	C	1,303.0	300.6	0.10	---	300.6		
End Posts	17	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	77	C			625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	1.3	C	0.0	0.0	17	10,665.8	C	---	---					10665.8
	18	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	77	C			625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	1.3	C	0.0	0.0	18	10,665.8	C	---	---					10665.8
Counter Diagonals	19	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	19	NO LOAD	C	---	---					---
	20	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	3168	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	128.0	C	0.0	0.0	20	86.5	C	---	---					86.5
	21	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	7687	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	310.6	C	0.0	0.0	21	35.6	C	---	---					35.6
	22	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	12492	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	504.7	C	0.0	0.0	22	21.9	C	---	---					21.9
	23	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	12492	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	504.7	C	0.0	0.0	23	21.9	C	---	---					21.9
	24	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	7687	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	310.6	C	0.0	0.0	24	35.6	C	---	---					35.6
	25	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	0.00	24.75	0	T	0	0	3090	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	124.8	C	0.0	0.0	25	88.7	C	---	---					88.7
	26	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	C			481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	26	NO LOAD	C	---	---					---
Compression Diagonals	27	5.50	9.00	0.00	0.00	0.00	5.50	9.00	99.00	668.25	2.75	0.00	99.00	23666	C	103	0	33126	C			481	65		239.1	C	1.6	0.0	242.2	63.4	0.0	334.6	C	0.0	0.0	27	16.6	C	---	---					16.6	
	28	5.50	6.50	0.00	0.00	0.00	5.50	6.50	71.50	251.74	1.99	0.00	71.50	16593	C	74	0	28060	C			481	65		232.1	C	1.6	0.0	249.2	63.4	0.0	392.4	C	0.0	0.0	28	14.6	C	---	---					14.6	
	29	5.50	5.50	0.00	0.00	0.00	5.50	5.50	60.50	152.51	1.68	0.00	60.50	10026	C	63	0	22906	C			481	65		165.7	C	1.6	0.0	315.5	63.4	0.0	378.6	C	0.0	0.0	29	19.2	C	---	---					19.2	
	30	4.50	5.50	0.00	0.00	0.00	4.50	5.50	49.50	124.78	1.38	0.00	49.50	3262	C	51	0	17712	C			481	65		65.9	C	1.6	0.0	415.4	63.4	0.0	357.8	C	0.0	0.0	30	26.7	C	---	---					26.7	
	31	4.50	5.50	0.00	0.00	0.00	4.50	5.50	49.50	124.78	1.38	0.00	49.50	3262	C	51	0	17712	C			481	65		65.9	C	1.6	0.0	415.4	63.4	0.0	357.8	C	0.0	0.0	31	26.7	C	---	---</						

BICKHAM COVERED BRIDGE TRUSS LOAD RATING ANALYSIS (4F1 TRUCK)

LOGAN COUNTY, OHIO
 MEMBER PROPERTIES, FORCES, STRESSES AND RATING
 By: M. Killian / T. Butz (Burgess & Niple)
 September-01
 FILE: PR30099ETCREVISED ANALYSIS FOR PROPOSED TRUSS\PROPOSEDTRUSS.XLS

Member Description	Member No.	DIMENSIONS (Inches)										PROPERTIES										FORCES (Lbs. & Inches)				ALLOWABLE STRESS (PSI)			DEAD LOAD STRESS (PSI)			REMAINING STRENGTH (PSI)			LIVE LOAD STRESSES (PSI)			H=[F/G]*Gross Tonnage				NDS REQUIREMENTS	COMMENTS	FINAL RATING (GROSS VEHICLE TONS)		
		outside member		outside rod		middle member		inside rod		inside member		full member			Joint deduct width (in) (if any)?	Joint area (in**2)	DEAD LOAD				4F1 LIVE LOAD			Fv' / Fc'			Fv'			Fb'			RATING (4F1) (TONS)				MZ & FX									
		width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	area (in**2)	I (in**4)	weight (lb/inch)	FX	C/T			FY	MZ	MAX	MAX	MAX	FX	C/T	FY	MZ	Fv' / Fc'	Fv'	Fb'	AXIAL	L. SHEAR	BENDING	AXIAL	L. SHEAR	BENDING	AXIAL	L. SHEAR	BENDING	AXIAL	L. SHEAR	BENDING	3.9.1 (Fv) or 3.9.2 (Fv) (<1)				Interaction	
		width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	area (in**2)	I (in**4)	weight (lb/inch)	FX	C/T	FY	MZ	MAX	MAX	MAX	FX	C/T	FY	MZ	Fv' / Fc'	Fv'	Fb'	FX	C/T	VL	MAX.	FX	VL	MAX.	FX	C/T	VL	MAX.	FX	C/T	VL	MAX.				Rating (tons)	
		width (w)	height (h)	diameter (d)	width (w)	height (h)	diameter (d)	width (w)	height (h)	area (in**2)	I (in**4)	weight (lb/inch)	FX	C/T	FY	MZ	MAX	MAX	MAX	FX	C/T	FY	MZ	Fv' / Fc'	Fv'	Fb'	FX	C/T	VL	MAX.	FX	VL	MAX.	FX	C/T	VL	MAX.	FX	C/T	VL	MAX.				Rating (tons)	
Lower Chord	1	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3189	23689	T	219	30327	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	167.1	T	2.3	122.3	80.2	T	735.9	190.4	0.60	---	80.2
	2	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	39832	T	481	50620	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	281.0	T	5.1	204.1	40.8	T	334.3	114.1	0.99	---	40.8
	3	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	49950	T	578	63908	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	352.4	T	6.1	257.6	29.1	T	279.0	90.4	1.25	21.5	21.5
	4	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	54852	T	692	71675	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	387.0	T	7.3	288.9	25.6	T	232.0	79.2	1.40	20.8	20.8
	5	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	33119	T	192	6880	54852	T	692	71675	600	65	875	233.6	T	2.0	27.7	366.4	63.0	847.3	387.0	T	7.3	288.9	25.6	T	232.0	79.2	1.40	20.8	20.8
	6	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	31128	T	164	3034	49950	T	578	63908	600	65	875	219.6	T	1.7	12.2	380.4	63.3	862.8	352.4	T	6.1	257.6	29.1	T	279.0	90.4	1.25	21.5	21.5
	7	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	24934	T	192	3189	39832	T	481	50620	600	65	875	175.9	T	2.0	12.9	424.1	63.0	862.1	281.0	T	5.1	204.1	40.8	T	334.3	114.1	0.99	---	40.8
	8	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	0.00	4.50	10.50	141.75	1,302.33	3.94	0.00	141.75	14659	T	170	3188	23689	T	219	30327	600	65	875	103.4	T	1.8	12.9	496.6	63.2	862.1	167.1	T	2.3	122.3	80.2	T	735.9	190.4	0.60	---	80.2
Upper Chord	9	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	106	14652	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	1.2	72.2	9	C	1,375.9	317.4	0.11	---	317.4
	10	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	22129	C	249	26506	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	172.5	C	2.9	130.5	60.7	C	584.0	175.5	0.74	---	60.7
	11	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1141	36137	C	320	38596	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	281.8	C	3.7	190.1	29.5	C	458.3	123.5	1.16	---	29.5
	12	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	43079	C	370	40256	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	335.9	C	4.3	198.2	20.9	C	394.5	116.4	1.40	20.0	20.0
	13	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	31128	C	155	4151	43079	C	370	40256	502	65	875	242.7	C	1.8	20.4	259.6	63.2	854.6	335.9	C	4.3	198.2	20.9	C	394.5	116.4	1.40	20.0	20.0
	14	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	24934	C	134	1140	36137	C	320	38596	502	65	875	194.4	C	1.6	5.6	307.9	63.4	869.4	281.8	C	3.7	190.1	29.5	C	458.3	123.5	1.16	---	29.5
	15	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	14659	C	179	5431	22129	C	249	26506	502	65	875	114.3	C	2.1	26.7	388.0	62.9	848.3	172.5	C	2.9	130.5	60.7	C	584.0	175.5	0.74	---	60.7
	16	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	0.00	4.50	9.50	128.25	964.55	3.56	0.00	128.25	0	C	172	5431	0	C	106	14652	502	65	875	0.0	C	2.0	26.7	502.3	63.0	848.3	0.0	C	1.2	72.2	9	C	1,375.9	317.4	0.11	---	317.4
End Posts	17	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	0	85	C		625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	1.5	C	0.0	0.0	11,359.7	C	---	---			11,359.7
	18	4.50	6.50	0.00	0.00	0.00	0.00	4.50	6.50	0.00	4.50	6.50	58.50	205.97	1.63	0.00	58.50	638	C	0	0	0	85	C		625	65		10.9	C	0.0	0.0	614.1	65.0	0.0	1.5	C	0.0	0.0	11,359.7	C	---	---			11,359.7
Counter Diagonals	19	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	NO LOAD	C	---	---			---
	20	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	93.3	C	---	---			93.3
	21	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	37.9	C	---	---			37.9
	22	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	22.9	C	---	---			22.9
	23	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	22.9	C	---	---			22.9
	24	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	37.9	C	---	---			37.9
	25	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	93.3	C	---	---			93.3
	26	0.00	0.00	0.00	4.50	5.50	0.00	0.00	0.00	0.00	0.00	0.00	24.75	62.39	0.69	1.00	19.25	0	T	0	0	0	0	C		481	65		0.0	T	0.0	0.0	481.3	65.0	0.0	0.0	C	0.0	0.0	NO LOAD	C	---	---			---
Compression Diagonals	27	5.50	9.00	0.00	0.00	0.00	0.00	5.50	9.00	0.00	5.50	9.00	99.00	668.25	2.75	0.00	99.00	23666	C	103	0	38037	C			481	65		239.1	C	1.6	0.0	242.2	63.4	0.0	384.2	C	0.0	0.0	17.0	C	---	---			17.0
	28	5.50	6.50	0.00	0.00	0.00	0.00	5.50	6.50	0.00	5.50	6.50	71.50	251.74	1.99	0.00	71.50	16593	C	74	0	32015	C			481	65		232.1	C	1.6	0.0	249.2	6												

