

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

MEMBER FORCES OF ARCH RIB

Joint	Total DL w/o FWS		FWS		Maximum Axial Force						Maximum Moment						Minimum Moment					
	Axial Force	Moment	Axial Force	Moment	Live Load		Impact		Total DL+LL+I		Live Load		Impact		Total DL+LL+I		Live Load		Impact		Total DL+LL+I	
					Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment
T0	-4864	+1152	-475	+385	-866	+714	-67	+55	-6270	+2306	-832	+690	-64	+53	-6234	+2281	+91	-95	+18	-19	-5230	+1423
R1	-4836	+798	-459	+97	-866	-17	-67	-1	-6228	+877	-218	+647	-37	+109	-5550	+1652	-556	-421	-63	-48	-5913	+427
R2	-4615	+951	-459	+96	-820	-91	-62	-7	-5955	+948	-241	+1032	-40	+175	-5355	+2254	-541	-787	-61	-89	-5675	+171
R3	-4426	+1002	-440	+116	-779	-50	-59	-4	-5704	+1063	-253	+1201	-42	+204	-5161	+2523	-471	-928	-53	-105	-5390	+84
R4	-4219	+974	-424	+126	-741	+21	-57	+2	-5440	+1123	-281	+1259	-42	+190	-4965	+2549	-421	-970	-51	-120	-5114	+10
R5	-4126	+969	-410	+133	-708	+93	-54	+7	-5298	+1204	-312	+1186	-47	+179	-4895	+2468	-371	-912	-51	-124	-4958	+67
R6	-4008	+944	-398	+138	-683	+219	-52	+16	-5141	+1317	-359	+1019	-49	+139	-4814	+2240	-324	-757	-44	-103	-4774	+222
R7	-3914	+879	-390	+139	-664	+300	-51	+22	-5019	+1341	-375	+831	-52	+113	-4731	+1962	-283	-559	-42	-85	-4629	+374
R8	-3905	+900	-375	+138	-637	+363	-49	+28	-4966	+1429	-350	+671	-59	+114	-4689	+1823	-293	-398	-33	-46	-4606	+595
R9	-3905	+900	-375	+138	-637	+363	-49	+28	-4966	+1429	-350	+671	-59	+114	-4689	+1823	-293	-398	-33	-46	-4606	+595
R10	-3931	+880	-391	+139	-664	+300	-51	+22	-5037	+1342	-375	+831	-52	+113	-4749	+1963	-283	-559	-42	-85	-4648	+376
R11	-4035	+946	-399	+139	-683	+219	-52	+16	-5169	+1319	-359	+1019	-49	+139	-4842	+2242	-324	-757	-44	-103	-4802	+225
R12	-4146	+971	-411	+134	-708	+93	-54	+7	-5319	+1205	-312	+1186	-47	+179	-4916	+2469	-371	-912	-51	-124	-4978	+68
R13	-4284	+974	-425	+127	-741	+21	-57	+2	-5507	+1124	-281	+1259	-42	+190	-5032	+2550	-421	-970	-51	-120	-5181	+12
R14	-4451	+1000	-442	+116	-779	-50	-59	-4	-5731	+1062	-253	+1201	-42	+204	-5188	+2521	-471	-928	-53	-105	-5417	+83
R15	-4640	+951	-461	+96	-820	-91	-62	-7	-5982	+947	-241	+1032	-40	+175	-5382	+2254	-541	-787	-61	-89	-5702	+170
R16	-4857	+789	-461	+97	-866	-17	-67	-1	-6250	+868	-218	+647	-37	+109	-5572	+1643	-556	-421	-63	-48	-5936	+417
T17	-4885	+1154	-477	+385	-866	+714	-67	+55	-6294	+2307	-832	+690	-64	+53	-6258	+2282	+91	-95	+18	-19	-5253	+1425

Hanger	DL w/o FWS	FWS	Total DL	LL	Impact	Total DL+LL+I
T1-R1	283	28	311	51	4	365
T2-R2	305	36	340	63	4	408
T3-R3	307	36	343	65	5	412
T4-R4	307	36	343	64	5	412
T5-R5	309	36	346	64	5	414
T6-R6	312	36	349	64	5	417
T7-R7	313	36	349	64	4	417
T8-R8	313	36	349	63	4	417
T9-R9	313	36	349	63	4	417
T10-R10	313	36	349	64	4	417
T11-R11	312	36	349	64	5	417
T12-R12	309	36	346	64	5	414
T13-R13	307	36	343	64	5	412
T14-R14	307	36	343	65	5	412
T15-R15	305	36	341	63	4	408
T16-R16	283	28	311	51	4	365

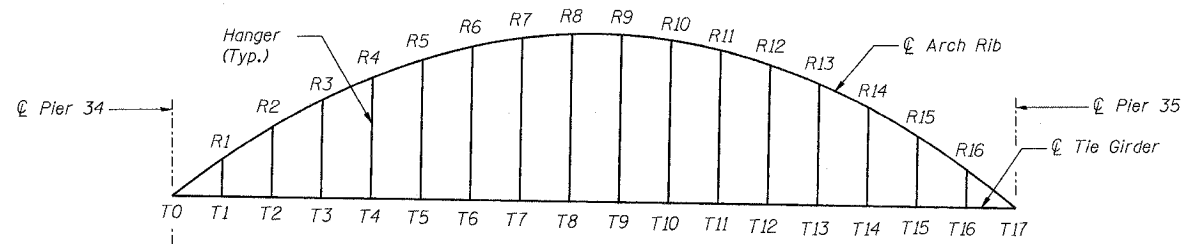
MEMBER FORCES OF TIE GIRDER

Joint	Total DL w/o FWS		FWS		Maximum Axial Force						Maximum Moment						Minimum Moment					
	Axial Force	Moment	Axial Force	Moment	Live Load		Impact		Total DL+LL+I		Live Load		Impact		Total DL+LL+I		Live Load		Impact		Total DL+LL+I	
					Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment	Axial Force	Moment		
T0	+3863	-1151	+346	-384	+490	-590	+38	-46	+4736	-2171	+127	+95	+25	+19	+4360	-1421	+394	-690	+30	-53	+4632	-2279
T1	+3863	+414	+318	+115	+490	-58	+37	-4	+4708	+466	+123	+5024	+24	+978	+4328	+6531	+369	-4318	+42	-490	+4592	-4279
T2	+3815	+327	+310	+221	+477	-421	+37	-31	+4640	+95	+135	+8269	+26	+1611	+4287	+10427	+362	-7109	+41	-808	+4528	-7369
T3	+3813	+603	+319	+273	+464	-433	+35	-35	+4631	+407	+150	+10000	+26	+1696	+4308	+12572	+350	-8703	+40	-989	+4522	-8816
T4	+3819	+134	+331	+300	+540	+378	+41	+27	+4731	+840	+170	+10800	+26	+1628	+4346	+12862	+335	-9384	+42	-1159	+4526	-10109
T5	+3844	+343	+320	+370	+532	+406	+41	+31	+4736	+1150	+196	+9734	+29	+1468	+4388	+11915	+314	-8510	+39	-1052	+4517	-8848
T6	+3831	+121	+324	+403	+550	+1131	+42	+87	+4747	+1742	+229	+8280	+32	+1129	+4415	+9934	+283	-7097	+39	-968	+4477	-7540
T7	+3842	-591	+333	+400	+560	+1409	+43	+108	+4778	+1326	+272	+6736	+37	+919	+4484	+7464	+240	-5468	+37	-824	+4452	-6483
T8	+3859	-312	+325	+433	+562	+1268	+43	+97	+4788	+1486	+268	+5204	+46	+883	+4497	+6208	+247	-3892	+28	-442	+4458	-4213
T9	+3866	-314	+325	+433	+562	+1268	+43	+97	+4795	+1485	+268	+5204	+46	+883	+4504	+6206	+247	-3892	+28	-442	+4465	-4215
T10	+3855	-592	+333	+400	+560	+1409	+43	+108	+4791	+1325	+272	+6736	+37	+919	+4497	+7463	+240	-5468	+37	-824	+4465	-6484
T11	+3844	+120	+324	+403	+550	+1131	+42	+87	+4761	+1741	+229	+8280	+32	+1129	+4429	+9932	+283	-7097	+39	-968	+4491	-7541
T12	+3861	+342	+320	+370	+532	+406	+41	+31	+4753	+1149	+196	+9734	+29	+1468	+4406	+11914	+314	-8510	+39	-1052	+4534	-8849
T13	+3825	+136	+331	+300	+540	+378	+41	+27	+4738	+841	+170	+10800	+26	+1628	+4352	+12863	+335	-9384	+42	-1159	+4533	-10108
T14	+3815	+604	+319	+273	+464	-433	+35	-35	+4633	+408	+150	+10000	+26	+1696	+4310	+12573	+350	-8703	+40	-989	+4524	-8815
T15	+3813	+326	+310	+221	+477	-421	+37	-31	+4637	+94	+135	+8269	+26	+1611	+4285	+10427	+362	-7109	+41	-808	+4526	-7370
T16	+3869	+417	+318	+116	+490	-58	+37	-4	+4714	+470	+123	+5024	+24	+978	+4334	+6535	+369	-4318	+42	-490	+4598	-4276
T17	+3869	-1153	+346	-385	+490	-590	+38	-46	+4741	-2174	+127	+95	+25	+19	+4366	-1424	+394	-690	+30	-53	+4638	-2281

Properties	T0 & T17
R @ (K)	3108
R FWS (K)	310
R L (K)	539
Imp. (K)	36
R (Total) (K)	3994

**SIGN CONVENTION:**  
Axial loads in Kips, positive = tension, negative = compression.  
Bending moment in ft-Kips, positive = tension in bottom of section,  
negative = compression in bottom of section.

- NOTES:**
- DL reactions are due to permanent loads including self-weights, barriers, and FWS.
  - LL reaction is due to AASHTO HS-20 loading.
  - Work this sheet with sheet 205.



ELEVATION OF TIED ARCH

Note: Geometric shape under dead load only.

DESIGNED -	HAA
CHECKED -	HMA
DRAWN -	RMG
CHECKED -	MRB

**benesch**

alfred benesch & company  
Engineers - Surveyors - Planners  
205 North Michigan Avenue, Suite 2400  
Chicago, Illinois 60601  
312-565-0450  
Job # 3856

TIED ARCH SPAN TABLES - 6 OF 9  
ABRAHAM LINCOLN MEMORIAL BRIDGE OVER  
THE ILLINOIS RIVER (PUBLIC WATERS)

F.A.I. ROUTE 39 SEC. (50-4B) BR

LASALLE COUNTY

STATION 863+16.00

STRUCTURE NO. 050-0191 (SB & NB)