

				Sheet #	25
				Job #	PIN 8756.59
Program:	LEAP® Bridge Concrete CONNECT Edition	C&S Companies		Designed	MAR/JSB
Module:	Precast/Prestressed Girder	Copyright © Bentley Systems, Inc. 2019 - 2019		Date	Feb/5/2020
Version:	19.02.00.33	www.bentley.com	Phone: 1-800-778-4277	Checked	
File Name:	120 ft NEBT LRFD.lbcx			Date	

ULTIMATE MOMENT

ULTIMATE - Span : 1, Beam : 2, STRENGTH I

(Mr-prvd computed by Strain Compatibility method. Ult. Conc. Strain = 0.00300)

Location (ft) Mu k.ft	dp in	Aps in ²	fps ksi	c in	a in	Mr-prvd k.ft	eps_t	Phi	Mcr k.ft	min Mr k.ft	Crkg Ratio	Mu-p/r Ratio
Transfer	-0.17											
0.0	52.8	6.872	263.1	11.4	9.67	7237.4	0.013T	1.00	-	-	-	-
H/2	2.67											
719.3	53.1	8.089	263.1	12.3	10.46	8430.2	0.012T	1.00	-	-	-	-
0.1L	9.46											
2396.6	54.1	10.724	263.2	14.4	12.26	11183.4	0.010T	1.00	-	-	-	-
0.2L	22.10											
4945.6	55.8	11.206	263.3	16.7	14.23	12155.9	0.008T	1.00	8710.7	6577.7	1.40	-
0.3L	34.73											
6731.6	57.2	11.284	264.3	16.2	13.77	12389.6	0.008T	1.00	8806.7	8806.7	1.41	-
0.4L	47.37											
7791.0	58.6	11.284	264.5	16.3	13.82	12762.3	0.008T	1.00	8996.4	8996.4	1.42	-
0.5L	60.00											
8138.2	58.6	11.284	264.5	16.3	13.82	12762.3	0.008T	1.00	8949.8	8949.8	1.43	-
0.6L	72.64											
7791.0	58.6	11.284	264.5	16.3	13.82	12762.3	0.008T	1.00	8996.4	8996.4	1.42	-
0.7L	85.27											
6731.6	57.2	11.284	264.3	16.2	13.77	12389.6	0.008T	1.00	8806.7	8806.7	1.41	-
0.8L	97.90											
4945.6	55.8	11.206	263.3	16.7	14.23	12155.9	0.008T	1.00	8710.7	6577.7	1.40	-
0.9L	110.54											
2396.6	54.1	10.724	263.2	14.4	12.26	11183.4	0.010T	1.00	8367.7	3187.5	1.34	-
H/2	117.33											
719.3	53.1	8.089	263.1	12.3	10.46	8430.2	0.012T	1.00	-	-	-	-
Transfer	120.17											
0.0	52.8	6.872	263.1	11.4	9.67	7237.4	0.013T	1.00	-	-	-	-

Legend: C = Compression-Controlled ($0 < \text{eps}_t < 0.0020$)

I = In-Transition ($0.0020 \leq \text{eps}_t < 0.0050$)

T = Tension-Controlled ($\text{eps}_t \leq 0$ or $\text{eps}_t \geq 0.0050$)

Note : fr used for calculating Mcr is computed using AASHTO method (Art.5.4.2.6.)

Consider Bottom Tension Steel Contribution : NO

For this Bulb Tee design ($f'_c = 10$ ksi), composite with a 3 ksi concrete deck, the LEAP output for strength does not provide sufficient information to confirm cross-section equilibrium. The total area of prestress steel, d_p , steel stress, "c", and "a" are all given, but no information is provided regarding the compressive stress blocks above the neutral axis used for the strain compatibility analysis. In this particular example, if all concrete above "a" is at $0.85f'_c$, with 10 ksi being used for girder web and flange areas, and 3 ksi used for the CIP deck, then the total of compression forces above the N.A. does not equal the total tensile force below the N.A. which is implied by the LEAP output to be: $11.284 \text{ in}^2 \times 264.5 \text{ ksi} = 2984.6 \text{ kip}$. Is it possible that LEAP is using non-linear stress-strain relationships for the concrete above the N.A., similar to discussions in the papers of Seguirant, Brice, and Khaleghi, which are referenced in both AASHTO LRFD and the PCI Design Manual?

PROPERTIES

Span:1, Beam:2

PRECAST DATA:

Section Id	NYSDOT NEBT 55					
Type	I-Girder					
Flng width	Top	47.250	in	Bot	31.880	in
thick	Top	3.380	in	Bot	8.630	in
Stems	No	1				
	Top	7.130	in			
	Bot	7.130	in			
Shear width		7.130	in			

Minimum Thickness Criteria, Article 5.12.3.2 checked: OK.

GENERAL BRIDGE DATA:

Bridge Width	30.50	ft
Curb-to-curb	27.17	ft
Beam Spac. Lt./Rt	6.29/ 6.29	ft
Lane width	12.00	ft
Number of lanes	2	
Interior/Exterior	Interior	
Start Skew Angle	30.00	degrees
End Skew Angle	30.00	degrees

TOPPING DATA:

Effective Deck	Thickness	8.000	in	
Sacrificial Deck	Thickness	1.500	in	
Haunch:				
	Thickness	1.000	in	
	Width	47.250	in	
Effective	width	75.500	in	(Art. 4.6.2.6.1)