

DATE: 8/28/2018
TIME: 2:28:41 PM

USER: \\USFAL31001\casasnet\com\Draw\Proj\leirs\60336253\900_Work\910_CAD\70_NCDOT\TIP\Structures\04_Drawings\401_019_LH974_SKU_LRFR3.dgn
DGN: \\USFAL31001\casasnet\com\Draw\Proj\leirs\60336253\900_Work\910_CAD\70_NCDOT\TIP\Structures\04_Drawings\401_019_LH974_SKU_LRFR3.dgn

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR CONCRETE ARCH RIBS																						
LEVEL	VEHICLE	WEIGHT (W) (TONS)	⬢	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER	
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT				SHEAR					LIVE-LOAD FACTORS (γ _{LL})	MOMENT					
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.48	--	1.75	1.52	1.48	D	N/A	197.08	1.53	2.38	C	N/A	12.50	NOT APPLICABLE					
	HL-93 (OPERATING)	N/A		1.86	--	1.35	1.52	1.86	D	N/A	197.08	1.53	5.93	D	N/A	190.21						
	HS-20 (INVENTORY)	36.000	2	2.67	127.05	1.75	1.52	2.67	D	N/A	197.08	1.53	8.85	D	N/A	190.21						
	HS-20 (OPERATING)	36.000		3.41	130.14	1.35	1.52	3.41	D	N/A	197.08	1.53	11.47	D	N/A	190.21						
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		4.78	81.06	1.40	1.52	4.78	D	N/A	197.08	1.53	16.69	D	N/A	190.21						
		SNGARBS2		3.61	92.48	1.40	1.52	3.61	D	N/A	197.08	1.53	12.38	D	N/A	190.21						
		SNAGRIS2		3.36	95.08	1.40	1.52	3.36	D	N/A	197.08	1.53	11.46	D	N/A	190.21						
		SNCOTTS3		3.78	98.94	1.40	1.52	3.78	D	N/A	197.08	1.53	9.38	D	N/A	190.21						
		SNAGGRS4		2.32	139.96	1.40	1.52	2.32	D	N/A	197.08	1.53	7.65	D	N/A	190.21						
		SNS5A		2.29	106.17	1.40	1.52	2.29	D	N/A	197.08	1.53	7.55	D	N/A	190.21						
		SNS6A		2.10	109.62	1.40	1.52	2.10	D	N/A	197.08	1.53	6.89	D	N/A	190.21						
		SNS7B		2.02	110.93	1.40	1.52	2.02	D	N/A	197.08	1.53	6.59	D	N/A	190.21						
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3		2.45	98.56	1.40	1.52	2.45	D	N/A	197.08	1.53	8.12	D	N/A	190.21						
		TNT4A		2.46	98.78	1.40	1.52	2.46	D	N/A	197.08	1.53	8.18	D	N/A	190.21						
		TNT6A		2.05	111.76	1.40	1.52	2.05	D	N/A	197.08	1.53	6.76	D	N/A	190.21						
		TNT7A		2.04	112.06	1.40	1.52	2.04	D	N/A	197.08	1.53	6.70	D	N/A	190.21						
		TNT7B		2.06	113.02	1.40	1.52	2.06	D	N/A	197.08	1.53	6.76	D	N/A	190.21						
		TNAGRIT4		1.99	128.42	1.40	1.52	1.99	D	N/A	197.08	1.53	6.51	D	N/A	190.21						
		TNAGT5A		1.92	135.88	1.40	1.52	1.92	D	N/A	197.08	1.53	6.29	D	N/A	190.21						
		TNAGT5B	3	1.91	112.50	1.40	1.52	1.91	D	N/A	197.08	1.53	6.19	D	N/A	190.21						

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}	γ _{TU}
	STRENGTH I (SHEAR)	1.25	1.5	0.50
	STRENGTH I (MOMENT)	0.90	0.65	0.50

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

ARCH RIBS ARE NOT PRESTRESSED, THEREFORE SERVICE III LIMIT STATE DOES NOT APPLY. PROVISIONS OF ARTICLE 5.7.3.5 HAVE BEEN SATISFIED FOR SERVICEABILITY.

USING THE MINIMUM LOAD FACTORS PER AASHTO TABLE 3.4.1-2 PRODUCES THE LOWEST RATING FACTORS.

EXISTING ARCHES WILL REMAIN AND BE REHABILITATED.

COMMENTS:

1.

2.

3.

4.

⬡

 CONTROLLING LOAD RATING

⬡1

 DESIGN LOAD RATING (HL-93)

⬡2

 DESIGN LOAD RATING (HS-20)

⬡3

 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. B-4974

STANLY/MONTGOMERY COUNTY

STATION: 339+86.39 -L-

SHEET 1 OF 2

AECOM

AECOM TECHNICAL SERVICES, INC.
701 CORPORATE CENTER DRIVE, SUITE 475
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

Professional Seal

Seal of the State of North Carolina
Professional Engineer
JOHN E. SLOAN
8/30/2018
035062

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR
CONCRETE
ARCH RIBS
(NON-INTERSTATE TRAFFIC)

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
S-9

TOTAL
SHEETS
148

DRAWN BY : T.B. STUMP
CHECKED BY : J.E. SLOAN
DESIGNED BY : N. BROWN
DESIGN CHECKED BY : J.E. SLOAN

DATE : 1/2018
DATE : 2/2018
DATE : 2/2018
DATE : 2/2018

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

LRFR SUMMARY